OMB Number: 4040-0001
Expiration Date: 06/30/2016

APPLICATION FOR FEDERAL ASSISTANCE
SF 424 (R&R)

3. DATE RECEIVED BY STATE	**State Application Identifier**

1. TYPE OF SUBMISSION*

❍ Pre-application ❍ Application ● Changed/Corrected Application

4.a. Federal Identifier

b. Agency Routing Number

2. DATE SUBMITTED | **Application Identifier**

c. Previous Grants.gov Tracking Number
GRANT11914129

5. APPLICANT INFORMATION

Organizational DUNS*: 063690705

Legal Name*: University of Alabama at Birmingham
Department: Office of Sponsored Programs
Division:
Street1*: 1720 2nd Avenue South
Street2: AB 1170
City*: Birmingham
County: Jefferson
State*: AL: Alabama
Province:
Country*: USA: UNITED STATES
ZIP / Postal Code*: 352940111

Person to be contacted on matters involving this application
Prefix: First Name*: Stephanie Middle Name: Last Name*: May Suffix:
Position/Title: Grants and Contracts Officer
Street1*: 1720 2nd Avenue South
Street2: AB 1170
City*: Birmingham
County: Jefferson
State*: AL: Alabama
Province:
Country*: USA: UNITED STATES
ZIP / Postal Code*: 352940111
Phone Number*: 2059345266 Fax Number: 2059755977 Email: stephmay@uab.edu

6. EMPLOYER IDENTIFICATION NUMBER *(EIN) or (TIN)** 1636005396A6

7. TYPE OF APPLICANT* H: Public/State Controlled Institution of Higher Education

Other (Specify):
Small Business Organization Type ❍ Women Owned ❍ Socially and Economically Disadvantaged

8. TYPE OF APPLICATION*

● New ❍ Resubmission
❍ Renewal ❍ Continuation ❍ Revision

If Revision, mark appropriate box(es).
❍ A. Increase Award ❍ B. Decrease Award ❍ C. Increase Duration
❍ D. Decrease Duration ❍ E. Other *(specify)* :

Is this application being submitted to other agencies?* ❍Yes ●No What other Agencies?

9. NAME OF FEDERAL AGENCY*
National Institutes of Health

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER
TITLE:

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT*
Training Program in Rheumatic and Musculoskeletal Diseases Research

12. PROPOSED PROJECT
Start Date* Ending Date*
04/01/2016 03/31/2021

13. CONGRESSIONAL DISTRICTS OF APPLICANT
AL-007

SF 424 (R&R) APPLICATION FOR FEDERAL ASSISTANCE

14. PROJECT DIRECTOR/PRINCIPAL INVESTIGATOR CONTACT INFORMATION

Prefix: First Name*: S. Louis Middle Name: Last Name*: Bridges, Jr. Suffix: MD, PhD
Position/Title: Professor
Organization Name*: University of Alabama at Birmingham
Department: Clin Immunology/Rheumatology
Division: Medicine
Street1*: 1720 2nd Avenue South
Street2: SHEL 176
City*: Birmingham
County: Jefferson
State*: AL: Alabama
Province:
Country*: USA: UNITED STATES
ZIP / Postal Code*: 352942182
Phone Number*: 2059344616 Fax Number: 2059341564 Email*: lbridges@uab.edu

15. ESTIMATED PROJECT FUNDING

a. Total Federal Funds Requested*
b. Total Non-Federal Funds* $0.00
c. Total Federal & Non-Federal Funds*
d. Estimated Program Income* $0.00

16.IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?*

a. YES ○ THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:
DATE:
b. NO ● PROGRAM IS NOT COVERED BY E.O. 12372; OR
○ PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. By signing this application, I certify (1) to the statements contained in the list of certifications* and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances * and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 18, Section 1001)

● I agree*

** The list of certifications and assurances, or an Internet site where you may obtain this list, is contained in the announcement or agency specific instructions.*

18. SFLLL or OTHER EXPLANATORY DOCUMENTATION File Name:

19. AUTHORIZED REPRESENTATIVE

Prefix: Mrs. First Name*: Lynn Middle Name: W Last Name*: Stedman Suffix: MBA
Position/Title*: Director
Organization Name*: University of Alabama at Birmingham
Department: Office of Sponsored Programs
Division:
Street1*: 1720 2nd Avenue South
Street2: AB 1170
City*: Birmingham
County: Jefferson
State*: AL: Alabama
Province:
Country*: USA: UNITED STATES
ZIP / Postal Code*: 352940111
Phone Number*: 2059345266 Fax Number: 2059755977 Email*: osp@uab.edu

Signature of Authorized Representative*
Stephanie May

Date Signed*
05/26/2015

20. PRE-APPLICATION File Name:

21. COVER LETTER ATTACHMENT File Name:1240-Cover Letter.pdf

424 R&R and PHS-398 Specific Table Of Contents

OMB Number: 4040-0010
Expiration Date: 06/30/2016

Project/Performance Site Location(s)

Project/Performance Site Primary Location

❍ I am submitting an application as an individual, and not on behalf of a company, state, local or tribal government, academia, or other type of organization.

Organization Name:	University of Alabama at Birmingham
Duns Number:	0636907050000
Street1*:	1720 2nd Avenue South
Street2:	AB 1170
City*:	Birmingham
County:	Jefferson
State*:	AL: Alabama
Province:	
Country*:	USA: UNITED STATES
Zip / Postal Code*:	352940111
Project/Performance Site Congressional District*:	AL-007

File Name

Additional Location(s)

Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

OMB Number: 4040-0001
Expiration Date: 06/30/2016

RESEARCH & RELATED Other Project Information

1. Are Human Subjects Involved?* ● **Yes** ❍ **No**

1.a. If YES to Human Subjects

Is the Project Exempt from Federal regulations? ❍ Yes ● No

If YES, check appropriate exemption number: _ 1 _ 2 _ 3 _ 4 _ 5 _ 6

If NO, is the IRB review Pending? ● **Yes** ❍ **No**

IRB Approval Date:

Human Subject Assurance Number 00005960

2. Are Vertebrate Animals Used?* ● **Yes** ❍ **No**

2.a. If YES to Vertebrate Animals

Is the IACUC review Pending? ● Yes ❍ No

IACUC Approval Date:

Animal Welfare Assurance Number A3255-01

3. Is proprietary/privileged information included in the application?* ❍ **Yes** ● **No**

4.a. Does this project have an actual or potential impact - positive or negative - on the environment?* ❍ **Yes** ● **No**

4.b. If yes, please explain:

4.c. If this project has an actual or potential impact on the environment, has an exemption been authorized or an environmental assessment (EA) or environmental impact statement (EIS) been performed? ❍ Yes ❍ No

4.d. If yes, please explain:

5. Is the research performance site designated, or eligible to be designated, as a historic place?* ❍ **Yes** ● **No**

5.a. If yes, please explain:

6. Does this project involve activities outside the United States or partnership with international collaborators?* ❍ **Yes** ● **No**

6.a. If yes, identify countries:

6.b. Optional Explanation:

	Filename
7. Project Summary/Abstract*	1235-Project Summary.pdf
8. Project Narrative*	1236-Narrative.pdf
9. Bibliography & References Cited	
10.Facilities & Other Resources	1237-Facilities and Other Resources.pdf
11.Equipment	1238-Equipment.pdf
12. Other Attachments	1239-Advisory Committee.pdf

Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

7. PROJECT SUMMARY / ABSTRACT

The UAB Training Program in Rheumatic and Musculoskeletal Disease Research (Director: S. L. Bridges, Jr.) builds on established strengths in adult and pediatric rheumatology, immunology, musculoskeletal medicine, and clinical/translational investigation. To provide a vibrant and effective interdisciplinary training environment, this program brings together the Divisions of Clinical Immunology and Rheumatology and Pediatric Rheumatology, the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC), and the Center for Outcomes and Effectiveness Research and Education (COERE). These units enable an integrated, interwoven fabric of collaborative science, which ranges from fundamental molecular discovery to applied clinical and translational research. This training program also builds on trans-departmental initiatives in autoimmunity and inflammation, genetics, and state of the art translational clinical and outcomes research. It incorporates an established faculty committed to training in the rheumatic diseases. There is also the explicit effort to incorporate young faculty to further strengthen the outstanding mentoring environment and to promote development of all phases of this program. An effective interdisciplinary training program requires faculty with collaborative and synergistic scientific interests and projects, as well as systematic coordination of training opportunities. The collaborative environment at UAB, embodied by the centers, programs, and departments in this application, provides a strong research foundation. The committed training environment of the thematically organized Graduate Biomedical Sciences program and an outstanding Office of Postdoctoral Education, provide an ideal setting for the implementation of training in interdisciplinary rheumatic and musculoskeletal disease research. Required coursework will be incorporated into the individual development plan (IDP) of each trainee, which will be augmented by a broad interdisciplinary enrichment program. Leadership will be provided by an Executive Committee and the overall performance of the Program will be evaluated by the Research Training Program Internal Advisory Committee and by an External Advisory Committee. To provide rigorous and timely feedback to both trainees and mentors, formal assessment of the Research Training Program will be performed. A series of benchmarks for progress will be formulated for each trainee and mentor and reviewed on a semi-annual basis. The members of the UAB training faculty are fully committed to continuing to provide mentorship, support, and guidance to young investigators to help them develop the tools and skills necessary to advance the diagnosis, treatment, and prevention of rheumatic and musculoskeletal diseases.

8. PROJECT NARRATIVE

This Training Program in Rheumatic and Musculoskeletal Disease Research at UAB enables vibrant, interdisciplinary, fundamental and translational research training. There is a large, diverse faculty with interests centered on Bone, Cartilage, Muscle and Connective Tissue; Epidemiology, Outcomes and Prevention; Experimental Therapeutics and Biomarkers; Genetics and Functional Genomics; Immunology, Autoimmunity and Inflammation; and Neurobehavioral Medicine. The training faculty, resources, and environment provide an exceptionally strong mentoring environment to train the next generation of rheumatic and musculoskeletal disease researchers.

10. FACILITIES & OTHER RESOURCES

A. The University of Alabama at Birmingham

1. Overview
2. The University-wide Interdisciplinary Research Centers Program
    i. Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center (CAMBAC)
    ii. Center for Outcomes and Effectiveness Research and Education (COERE)
    iii. UAB Center for Exercise Medicine (UCEM)
    iv. Center for Clinical and Translational Science (CCTS)
3. Buildings and Physical Plant
4. Affiliated Facilities
    i. HudsonAlpha Institute for Biotechnology
    ii. Southern Research Institute

B. The UAB School of Medicine

1. Overview
2. Department of Medicine
    i. Clinical Immunology and Rheumatology
    ii. Hematology/Oncology
    iii. Gastroenterology & Hepatology
    iv. Infectious Diseases
    v. Nephrology
    vi. Preventive Medicine
    vii. Pulmonary, Allergy & Critical Care Medicine
    viii. Endocrinology, Diabetes & Metabolism
3. Department of Dermatology
4. Department of Neurology
5. Department of Pediatrics
    i. Pediatric Allergy
    ii. General Pediatrics
    iii. Pediatric Rheumatology
6. Department of Physical Medicine and Rehabilitation
7. Department of Surgery
    i. Cardiovascular/Thoracic Surgery
    ii. Orthopaedic Surgery

C. Joint Health Sciences

1. Department of Biochemistry and Molecular Genetics
2. Department of Cell, Developmental, and Integrative Biology
3. Department of Genetics
4. Department of Microbiology
5. Department of Pathology
    i. Anatomic Pathology
    ii. Laboratory Medicine
    iii. Molecular & Cellular Pathology

D. The UAB School of Public Health

1. Biostatistics
2. Epidemiology
3. Health Behavior

E. The UAB School of Dentistry

1. Oral & Maxillofacial Surgery
2. Pediatric Dentistry
3. Periodontology

F. The School of Engineering
i. Biomedical Engineering

G. The College of Arts and Sciences
1. Biology
2. Psychology

H. The UAB Graduate School

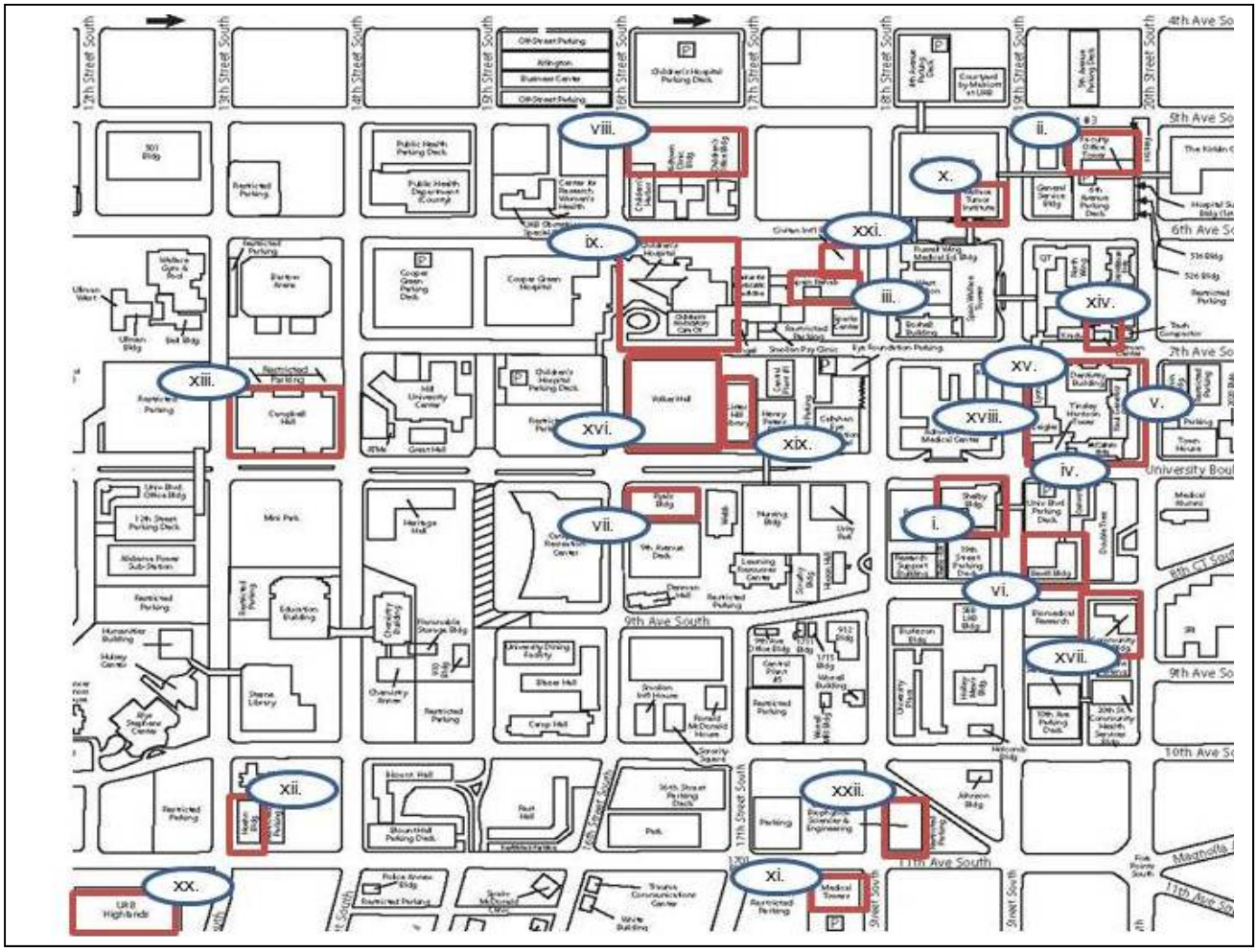
I. UAB Clinical and Translational Research Facilities
1. Clinical care facilities
    i. The Kirklin Clinic at UAB
    ii. UAB Highlands
    iii. University Hospital
    iv. Children's of Alabama
    v. Birmingham VA Medical Center
2. Clinical Core Facilities
    i. Clinical Research Unit
    ii. Methodology Core
    iii. Sample Processing and Analytic Nexus
    iv. Tissue Procurement Shared Facility

J. UAB Fundamental Science Core Facilities
1. Core Facilities
    i. Analytic and Preparative Flow Cytometry Core Facility
    ii. Epitope Recognition and Immunoreagent Core
    iii. High Resolution Imaging Facility
    iv. Gene Targeting Core Facility
    v. Heflin Genomics Core Laboratory
    vi. Multidisciplinary Molecular Interactions Core
    vii. Mass Spectrometry / Proteomics Shared Facility
    viii. Additional core facilities

K. UAB Informatics and Computing
1. Molecular and Genetic Bioinformatics Facility
2. High Performance Computing

L. UAB Graduate and Post-Graduate Training
1. UAB Graduate School
    i. Graduate Biomedical Sciences
2. Office of Postdoctoral Education

A. The University of Alabama at Birmingham (Ray Watts, MD, President)
1. Overview - The University of Alabama at Birmingham, one of three autonomous institutions within The University of Alabama System, is the only four-year, public university in the state's largest metropolitan area. The physical plant of the University spans more than 80 blocks in the city center with over 225 buildings providing over 10 million square feet of assignable space. For fiscal year 2013-2014 (most recent available), the University's budget was over $2.6 billion and its economic impact on the Birmingham metro area is over $5 billion annually. In 2013 UAB received over $365 million in extramural grants and contracts. As of the fall of 2013, the University employed 19,596 people, had a faculty of 2,408 (39 percent of whom are female), and had a student enrollment of 18,568 at the undergraduate through doctoral levels. The graduate student population is 67 percent female and 30% are among minority ethnicities. UAB is comprised of 11 academic colleges and schools in the health sciences and academic areas. The UAB Health Center includes the Schools of Medicine, Dentistry, Nursing, Optometry, Public Health, Health Professions, the Graduate School, and the Lister Hill Library of the Health Sciences. The University's academic campus consists of the College of Arts and Sciences, the Collat School of Business, Education, Engineering, the Graduate School, and the Mervyn Sterne Library. The university has 168 endowed chairs/professorships. The Institution has been ranked among the top quarter of all U.S. colleges and universities by *The Princeton Review*, and among the top 10 for diversity for three consecutive years. (http://www.uab.edu/home/)



i. **Shelby Interdisciplinary Biomedical Research Building:** CAMBAC; Medicine – Division of Clinical Immunology & Rheumatology; Pediatrics – Division of Pediatric Allergy & Immunology; Microbiology; Pathology – Division of Molecular & Cellular Pathology; Pediatrics – Division of Pediatric Rheumatology; Medicine – Division of Hematology/Oncology; Medicine – Division of Gastroenterology & Hepatology; Biomedical Engineering; Pathology – Division of Laboratory Medicine; Cell, Developmental, & Integrative Biology

ii. **Faculty Office Tower:** COERE; Medicine – Division of Clinical Immunology and Rheumatology; Surgery – Division of Orthopaedic Surgery; Medicine – Division of Endocrinology, Diabetes & Metabolism; UAB School of Medicine Dean's Office

iii. **Spain Rehabilitation Center:** Physical Medicine and Rehabilitation; Arthritis Clinical Intervention Program (ACIP)

iv. **McCallum/Tinsley Harrison Tower:** UCEM; Cell, Developmental, & Integrative Biology; Medicine – Division of Pulmonary, Allergy & Critical Care Medicine; Surgery – Division of Cardiothoracic Surgery

v. **Hugh Kaul Human Genetics:** Genetics; Biochemistry & Molecular Genetics

vi. **Bevill Biomedical Research Building:** Microbiology; Pediatric Dentistry; Pathology – Division of Anatomic Pathology

vii. **Ryals School of Public Health:** Biostatistics, Epidemiology, Health Behavior

viii. **Park Place Tower:** Pediatrics – Division of Pediatric Rheumatology; Pediatrics – Div of General Pediatrics & Adolescent Med

ix. **Children's Hospital & Children's Ambulatory Care:** Pediatrics – Division of Pediatric Rheumatology; Pediatrics – Division of Pediatric Allery & Immunology; Surgery – Division of Orthopaedic Surgery

x. **Wallace Tumor Institute:** Pathology – Division of Molecular & Cellular Pathology

xi. **Medical Towers:** COERE; Medicine – Division of Preventive Medicine

xii. **Hoehn Engineering Building:** Biomedical Engineering

xiii. **Campbell Hall:** Biology; Psychology

xiv. **Pittman Center for Advanced Medical Sciences:** UAB CCTS

xv. **School of Dentistry Building:** Oral & Maxillofacial Surgery; Periodontology

xvi. **Volker Hall:** Pathology – Division of Molecular & Cellular Pathology; Dermatology

xvii. **Community Care Building:** Medicine – Division of Infectious Diseases

xviii. **Zeigler Building:** Medicine – Division of Nephrology

xix. **Lister Hill Library:** Epidemiology

xx. **UAB Highlands:** Surgery – Division of Orthopaedic Surgery

xxi. **Civitan Building:** Neurology

xxii. **Ctr Biophysical Sciences and Engineering:** Microbiology

xxiii. **Southeastern Biosafety Laboratory Alabama Birmingham** (SEBLAB)

2. **The University-wide Interdisciplinary Research Center Program** - A system of University-wide Interdisciplinary Research Centers (UWIRC) provides a robust infrastructure for research and training that transcends departmental structures and clinical specialties. These multidisciplinary centers are available to all UAB investigators and greatly enhance the research opportunities and career development of their trainees. The Center-associated core facilities and enrichment programs are key trainee resources. Centers require sponsorship from three or more UAB schools, substantive interdisciplinary faculty involvement; provision of research infrastructure; contribution to the intellectual environment in order to enhance faculty and student recruitment, development, and retention; a financial base to support center and core activities; internal and external review processes to ensure quality and productivity; and leadership in the integration of research and service including community outreach or partnerships. In the most recent funding cycle, UAB committed over $5 million. See below for details on UWIRCs relevant to this T32 proposal.

i. **The Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center** (CAMBAC; S. L. Bridges, Jr., MD, PhD*, Director) - Established in 1977, the CAMAC was one of the first arthritis research centers in the nation supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). The Center has been federally funded since its establishment year and is now the only center in the nation focusing on adult arthritis and rheumatic diseases and supported by P30, P50, and P60 awards from NIAMS. Stimulated by the inception of the UWIRC program and its philosophy of interdisciplinary research and facilitated by the appointment of the current Center Director in 2013, the CAMBAC undertook strategic initiatives to develop work groups centered on: 1) Bone, Cartilage, Muscle and Connective Tissue; 2) Epidemiology, Outcomes and Prevention; 3) Experimental Therapeutics and Biomarkers; 4) Genetics and Functional Genomics; 5) Immunology, Autoimmunity and Inflammation; and 6) Neurobehavioral Medicine.

These initiatives have involved multiple schools as the Center has developed multiple collaborative programs and shared facilities. Currently, the CAMAC supports interdisciplinary, multi-investigator awards from NIAMS, NIAID, and the Agency for Healthcare Research and Quality (AHRQ). After 38 years, the Comprehensive Arthritis, Musculoskeletal Bone and Autoimmunity Center (CAMBAC) remains committed to its core mission: to generate new understanding and apply all knowledge to the diagnosis and treatment of patients with arthritis, musculoskeletal, bone, and autoimmune diseases. (http://www.uab.edu/medicine/camac/)

ii. **The Center for Outcomes Effectiveness Research and Education** (COERE, Kenneth G. Saag, MD*, Director) – The mission of the COERE is to build and maintain a program of research of improving the quality and outcome of heath care. This is accomplished through interdisciplinary teams to develop and test innovations to promote evidence-based practice, reduce inequities in care for under-served and minority populations, and improve quality of life and functional outcomes for patients. Additionally, in this process, there is a commitment to training and mentoring students, fellows and faculty in the development of methods and serving as a resource to UAB, health care systems, and related organizations to further disseminate outcomes research knowledge expertise. This University-wide Center has a broad, multidisciplinary membership and integrates a broad scientific expertise in all areas of outcomes and effectiveness research, including quantitative methods in healthcare services research, quality measurement and improvement, patient-based outcomes measurement, epidemiological and population-based research, comparative effectiveness research, pharmaco-epidemiology, economic and decision analytic modeling, clinical data analysis and analysis of large administrative datasets and health informatics. (http://www.dopm.uab.edu/coere.asp)

iii. **The UAB Center for Exercise Medicine** (UCEM, Marcus Bamman, PhD*, Director)- UCEM is focused on improving the health and well-being of children and adults of all ages through interdisciplinary research, the training of future leaders in science and healthcare, and community education based on clinical research findings. The UCEM interdisciplinary team brings together more than 160 investigators, 32 departments, and 10 schools for a multi-disciplinary approach. UAB is among the first of major academic medical centers to establish

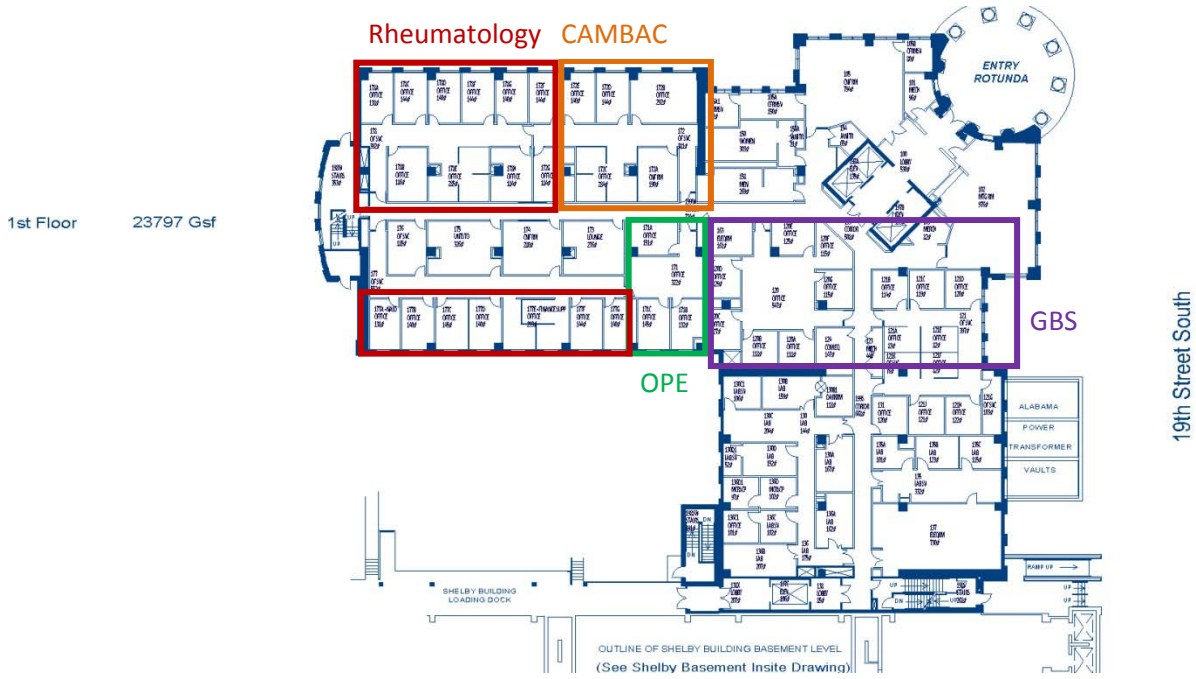
such a center. Among its activities, the Center sponsors an annual symposium. (http://www.uab.edu/medicine/exercise/)

iv. **The Center for Clinical and Translational Science** (CCTS, R. Kimberly, MD*, Director) - CCTS is a designated University-Wide Interdisciplinary Research Center of UAB. The CCTS was developed in response to the National Institutes of Health's (NIH) request for applications for Clinical and Translational Science Awards (CTSAs). The Center is comprised of 7 Components and the Research Commons: Biomedical Informatics; Pilots; Drug Discovery; Research Ethics, Education and Training; Participant and Clinical Interactions Resources (PCIR) and Regulatory Support; One Great Community; and Cores. Several of the T32 training faculty play important roles in the CCTS and the CCTS will support our training efforts through shared facilities and resources. (http://www.ccts.uab.edu/)

3. Buildings and Physical Plant

i. **The Shelby Interdisciplinary Biomedical Research Building -** The state-of-the-art Shelby Interdisciplinary Biomedical Research Building opened in March 2006. It stands 12 stories tall with 340,000 gross square feet of space, increasing the amount of research space for the University by approximately 25 percent. The new facility in the heart of UAB's campus and Academic Medical Center includes research laboratories, research support areas including a state-of-the art microscopy area, offices, administrative space for graduate programs, and conference rooms. It houses three interdisciplinary research programs, -- Autoimmunity and Immunobiology; Biomedical Engineering and Regenerative Medicine, and Neurosciences, -- and is the administrative locus for the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center (orange), Division of Clinical Immunology and Rheumatology (red) and this T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. On the same floor of this building also reside the administrative offices of the Office of Postdoctoral Education (green) and the Graduate Program for Biomedical Sciences (purple). See **Figure 1.**

Figure 1. The Shelby Interdisciplinary Biomedical Research Building: CAMBAC; Medicine – Division of Clinical Immunology & Rheumatology; Pediatrics – Division of Pediatric Allergy & Immunology; Microbiology; Pathology – Division of Molecular & Cellular Pathology; Pediatrics – Division of Pediatric Rheumatology; Medicine – Division of Hematology/Oncology; Medicine – Division of Gastroenterology & Hepatology; Biomedical Engineering; Pathology – Division of Laboratory Medicine; Cell, Developmental, & Integrative Biology



ii. **Faculty Office Tower:** COERE; Medicine – Division of Clinical Immunology and Rheumatology; Surgery – Division of Orthopaedic Surgery; Medicine – Division of Endocrinology, Diabetes & Metabolism; UAB School of Medicine Dean's Office
iii. **Spain Rehabilitation Center:** Physical Medicine and Rehabilitation; Arthritis Clinical Intervention Program (ACIP)
iv. **McCallum/Tinsley Harrison Tower:** UCEM; Cell, Developmental, & Integrative Biology; Medicine – Division of Pulmonary, Allergy & Critical Care Medicine; Surgery – Division of Cardiothoracic Surgery
v. **Hugh Kaul Human Genetics Building:** Genetics; Biochemistry & Molecular Genetics
vi. **Bevill Biomedical Research Building:** Microbiology; Pediatric Dentistry; Pathology – Division of Anatomic Pathology
vii. **Ryals School of Public Health:** Biostatistics, Epidemiology, Health Behavior
viii. **Park Place Tower:** Pediatrics – Division of Pediatric Rheumatology; Pediatrics – Division of General Pediatrics & Adolescent Medicine
ix. **Children's Hospital & Children's Ambulatory Care:** Pediatrics – Division of Pediatric Rheumatology; Pediatrics – Division of Pediatric Allery & Immunology; Surgery – Division of Orthopaedic Surgery
x. **Wallace Tumor Institute:** Pathology – Division of Molecular & Cellular Pathology
xi. **Medical Towers:** COERE; Medicine – Division of Preventive Medicine
xii. **Hoehn Engineering Building:** Biomedical Engineering
xiii. **Campbell Hall:** Biology; Psychology
xiv. **Pittman Center for Advanced Medical Studies:** UAB CCTS
xv. **School of Dentistry Building:** Oral & Maxillofacial Surgery; Periodontology
xvi. **Volker Hall:** Pathology – Division of Molecular & Cellular Pathology; Dermatology
xvii. **Community Care Building:** Medicine – Division of Infectious Diseases
xviii. **Zeigler Building:** Medicine – Division of Nephrology
xix. **Lister Hill Library:** Epidemiology
xx. **UAB Highlands:** Surgery – Division of Orthopaedic Surgery
xxi. **Civitan Building:** Neurology
xxii. **Ctr Biophysical Sciences and Engineering:** Microbiology

xxiii. **Southeastern Biosafety Laboratory Alabama Birmingham** (SEBLAB) - In 2003-2004, the National Institutes of Health (NIH) awarded 13 contracts to build Regional Biocontainment Laboratories (RBLs). The RBLs are designed to support basic research necessary to develop drugs, diagnostics and vaccines for emerging infections and biodefense, and to provide surge capacity in the event of a public health emergency. UAB is part of a consortium funded by the National Institutes of Health (NIH) known as the Southeastern Regional Center of Excellence for Emerging Infections and Biodefense (SERCEB). This group of six universities will work to develop the next generation of vaccines, drugs and diagnostic tests against emerging infections such as West Nile Virus, and for defense against organisms such as smallpox that might be used in bioterrorist attacks. SEBLAB is a major asset to the research and public health communities in the region. It houses state-of-the art biosafety level 2 and level 3 laboratories as well as animal biosafety level 3 laboratories. SEBLAB's design includes flexible and secure laboratories, animal housing and procedure space, and laboratory support space. Specialized resources at SEBLAB include an aerobiology suite, imaging suite, irradiator, vaporized H2O2 decontamination and a decontamination chamber. In the event of a bioterrorism emergency, SEBLAB can provide surge capacity for diagnostics and other necessary analyses to enhance state and regional public health responses. UAB researchers and other investigators in academia, not-for-profit organizations, industry and government studying biodefense and emerging infectious diseases may request the use of SEBLAB facilities. An oversight committee determines the priority usage of SEBLAB. (http://www.uab.edu/seblab/)

4. Affiliated Facilities

i. **HudsonAlpha Institute for Biotechnology** (HAIB)(Richard Myers, PhD*; Devin Absher, PhD*) - The HudsonAlpha Institute of Biotechnology is a non-profit, academic-style research institute

dedicated to basic and applied research in genomics and genetics. The Institute, which opened in April 2008, is housed in a four-story, 270,000 square foot building that has the capacity to house up to 700-800 scientists and staff. It is in Huntsville, Alabama, on the grounds of Cummings Research Park, a half-mile from the University of Alabama at Huntsville and next to the headquarters of NASA and a large number of engineering and computer science firms. The building houses well-equipped state-of the-art laboratories, numerous small- and medium-sized conference rooms, as well as a library, auditorium and conference center. The Institute is comprised of nine large laboratories with space for 15 to 18 Faculty Investigators, and is situated in the North Wing of the building and comprises almost half of the square footage. The remaining half, in the South Wing, houses the HudsonAlpha Genome Sequencing Center (formerly the Stanford Human Genome Center) and 16 biotechnology companies, all of which are involved in research, development or production related to genomics. A laboratory classroom for high school and college students, as well as teachers, is used to support an extensive education outreach program that is led by scientist/educator Dr. Neil Lamb, and is outfitted for distance education programs that originate from the Institute. High-definition video conferencing is placed throughout the building to connect our scientists and educators with colleagues, teachers and students in other locations. (http://www.hudsonalpha.org/)

ii. **Southern Research Institute** - Southern Research Institute (SRI) is a not-for-profit, 501(c)(3) organization conducting basic and applied research in Alabama, Maryland, and North Carolina in the areas of drug discovery, preclinical drug development, advanced engineering, and environmental protection. Southern Research is a self-sustaining contract research organization and an incorporated affiliate of The University of Alabama at Birmingham (UAB). We are brought together because of a shared belief in the power and potential of collaborative research. Southern Research and UAB have long-standing relationships in areas such as materials engineering, high-performance computing, breast cancer research, glial biology, cystic fibrosis research, and gene therapy. Through an extensive drug discovery and development program, Southern Research provides scientific expertise and a comprehensive suite of highly specialized capabilities which enable its clients to effectively and efficiently navigate the increasingly important and complex drug discovery and development continuum, from initial targeting and lead identification through the completion of preclinical research and into the early phases of clinical trials. As a leading contract research organization, Southern Research provides preclinical drug development services to pharmaceutical and biotechnology companies on an outsourced basis. Southern Research provides services in all phases of the early-stage drug discovery and development process and provides clients with comprehensive services and support to assist them in streamlining their custom drug discovery and development programs. (http://www.southernresearch.org/)

B. The UAB School of Medicine

1. Overview (Selwyn Vickers, MD, Senior Vice President for Medicine and Dean); est. 1945 - Located at the University of Alabama at Birmingham, one of the South's premier research universities, the School of Medicine is dedicated to the education of physicians and scientists in all of the disciplines of medicine and biomedical investigation. The school provides medical education and internship opportunities for students throughout the world. Its comprehensive approach to teaching future physicians covers all facets of medicine, including medical education, research, and patient care -- delivered in one of the most technologically advanced medical facilities in the country.

2. The Department of Medicine (Seth Landefeld, MD, Chair) - The UAB Department of Medicine strives for excellence in its teaching, research and patient care. In this way, it is committed to providing outstanding clinical service to its patients and to the community, to providing exceptional medical education for medical students, residents, and other health professionals, and to providing innovative research to expand the frontiers of biomedical knowledge and clinical practice. To attain this, the Department promotes life-long learning among faculty, staff, and students and integration of our missions so that each supports and, in turn, benefits from the others. Underlying this mission statement is the belief that biomedical research is the academic center's defining characteristic. The Department of Medicine's 2010 NIH funding, exclusive of contracts and ARRA awards, was up by approximately $4,000,000 from 2009, to nearly

$66million, ranking #17 nationally. The Department's (including affiliated) faculty are distributed among fourteen divisions, including the Division of Clinical Immunology and Rheumatology. All academic units have active, extramurally-funded research programs.

i. **Division of Clinical Immunology and Rheumatology** (S. L. Bridges, Jr., MD, PhD*, Director)(Andre Ballesteros-Tato, PhD*; Laurence Bradley, PhD*; W. Winn Chatham, MD*; Jeffrey R. Curtis, MD*; Maria Danila, MD*; Jeffrey Edberg, PhD*; Angelo Gaffo, MD*; Hui-Chen Hsu, PhD*; Laura Hughes, MD*; Robert P. Kimberly, MD*; Sarah Morgan, MD*; John D. Mountz, MD, PhD*; Iris Navarro-Millán, MD*; Chander Raman, PhD*; Troy D. Randall, PhD*; Richard Reynolds, IV, PhD*; Kenneth G. Saag, MD*; Harry W. Schroeder, Jr., MD, PhD*; Jasvinder Singh, MD*; Alex Szalai, PhD*) - Since its formation in the 1950s, the UAB Division of Clinical Immunology and Rheumatology has represented excellence in patient care, research, and teaching. Our faculty members have contributed substantially to the understanding of rheumatic diseases, including their pathogenesis, clinical manifestations, and current diagnostic and therapeutic approaches. In addition, we have trained clinicians, educators, and researchers who have impacted academic and clinical rheumatology. With a vision to become the best Rheumatology center in the world for the combination of basic and clinical research, education, and patient care for rheumatic diseases, the Division remains committed to its mission to better understand arthritis and related conditions in order to improve diagnosis and treatment, with the ultimate goal of cure or prevention of these diseases. (http://www.medicine.uab.edu/rheum/)

ii. **Division of Hematology & Oncology** (Ravi Bhatia, MD, Director) (Randall Davis, MD*) - The Division of Hematology and Oncology has basic research programs in the areas of cancer genetics, TGF-β signaling, transcriptional regulation, tumor suppressor gene biology, oncogene expression and function, signal transduction, antibody-mediated destruction of hematologic and malignant cells, chemotherapeutic agent pharmacology, and use of electromagnetic fields for the treatment of cancer. The majority of our faculty have independent research funding in these areas.

iii. **Division of Gastroenterology & Hepatology** (C. Mel Wilcox, MD, Director) (Charles O. Elson, MD*; Peter Mannon, MD*) - The UAB Division of Gastroenterology & Hepatology's primary goal is to advance the services, treatment and therapies for digestive and liver related diseases. With both industry and NIH funded research, we are active in basic science and clinical research to further the treatment and knowledge of digestive diseases. We are able to utilize our diverse research programs and foster collaborative research projects not only at UAB, but throughout the world. Our faculty members provide leadership to the UAB Liver Center, UAB Muscosal HIV & Immunobiology Center (MHIC), and the UAB Pancreaticobiliary Center (PBC). We also utilize an inclusive clinical research program (GHCRP), which provides a specialized infrastructure to facilitate clinical research for faculty members. This has allowed increased efficiency in our clinical research endeavors.

iv. **Division of Infectious Diseases** (Edward W. Hook, III, MD, Director) (Paul Goepfert, MD*) - Fellows and faculty actively participate in teaching and patient care at the three major hospitals within the University of Alabama at Birmingham Medical Center. Our strong clinical presence is evidenced by two separate consult services (one in the 1100 bed University Hospital which focuses on opportunistic infections in compromised hosts such as BM and solid organ transplant recipients, bone/joint and CNS infections in orthopedic, trauma and neurosurgical patients, and infections in neutropenic/cancer patients; another service combines HIV/AIDS consultation at University Hospital and general infectious diseases consultation at the VA Medical Center and the county hospital). ID faculty and fellows also provide care in a cross-section of ambulatory clinics which target general ID, HIV/AIDS, STD, tuberculosis and international travel.

v. **Division of Nephrology** (Anupam Agarwal, MD, Director) (Orlando M. Gutierrez, MD*) - The Division now has a multi-disciplinary group of faculty that provides state-of-the-art clinical care, research in basic and clinical aspects of nephrology and transplantation, teaching, and disease

management for patients with diverse types of kidney disease. The Division of Nephrology is home to the recently renewed NIDDK funded UAB-UCSD O'Brien Core Center, one of 7 such Centers in the nation. The grant provides funding of $5.64 Million over 5 years to expand efforts to enhance translational research in acute kidney injury.

vi. **Division of Preventive Medicine** (Mona Fouad, MD*, Director) (Cora E. Lewis, MD*; Isabel Scarinci, PhD*; Monika Safford, MD*) - The Division of Preventive Medicine (DOPM) is dedicated to medicine and public health through research, teaching, and dissemination and translation of knowledge for improved health outcomes. From its inception in 1967, the DOPM has played a key role in the many groundbreaking trials contributing to the knowledge of medical and health systems, behavioral aspects of disease, epidemiology, prevention, control, and disease outcomes. As a research-oriented division, we serve as the home for preventive medicine activities within the Department of Medicine. Our division supports over 26 primary faculty and approximately 250 staff. We also have active programs for the training of post-doctoral fellows and clinical scholars.

vii. **Division of Pulmonary, Allergy & Critical Care Medicine** (Victor Thannickal, MD*, Director) (Chad Steele, PhD*)- The division of Pulmonary, Allergy and Critical Care Medicine at UAB is committed to providing the highest quality of clinical care, leading the effort to elucidating basic mechanisms of disease and discovery of innovative treatments, while training the next generation of physician-scientists, educators, and clinicians. Our investigative programs are designed for bench-to-bedside and bedside-to-bench translation. Our clinical research programs participate in a number of national and international research network including the NIH-funded COPD and Pulmonary Fibrosis Networks, and the Cystic Fibrosis Foundation's Therapeutics Development Network. Partnership with Southern Research Institute and integration with the Center for Clinical Translational Science has facilitated the drug discovery and development in cystic fibrosis, COPD, and idiopathic pulmonary fibrosis. An NIH T32 Training Program in Lung Biology and Translational Medicine capitalizes on the interdisciplinary and interactive environment at UAB.

viii. **Division of Endocrinology, Diabetes, & Metabolism** (Stuart J. Frank, MD, Director) (Amy Warriner, MD*) - The Division has a broad mission that includes state-of-the-art clinical care for a wide variety of disorders of the endocrine system, clinical and basic endocrine investigation, and the education of medical students, graduate students, residents, and postdoctoral fellows. The Division has enjoyed continued expansion and extensive collaboration with many other DOM divisions. Additionally, a hallmark of the Division in recent years has been its broad interaction with Centers and other academic units outside the DOM. These interactions have allowed the Division to enhance its impact. Dr. Anath Shalev has directed the UAB Comprehensive Diabetes Center since 2010 and Dr. Frank has served as Co-Director of the UAB Center for Clinical and Translational Science (an NIH-funded CTSA) since 2010.

3. The Department of Dermatology (Craig A. Elmets, MD, Chair) (Nabiha Yusuf, PhD*) - The Department of Dermatology has been a part of the School of Medicine since its inception in 1945. At a time when few dermatology departments were conducting serious basic research, the UAB Dermatology Department already had a research presence. The Department of Dermatology has made impressive gains over the past five years in the development and expansion of its basic and clinical research capabilities. There are seven faculty members who are actively engaged in NIH-funded research. Annual government funding in 2013 was over $2,250,000. The Department has major research programs in immunodermatology (including vaccine development, allergic contact hypersensitivity, Langerhans cell immunobiology, and photoimmunology) and chemoprevention. The Skin Diseases Research Center (SDRC) is an interdisciplinary center of excellence in investigative dermatology and cutaneous biology at UAB which is funded by the National Institutes of Arthritis, Musculoskeletal and Skin Diseases of the NIH.

4. The Department of Neurology (David G. Standaert, MD, PhD*, Chair) - The nationally-ranked UAB Department of Neurology is home to eight comprehensive divisions and seven centers (Alzheimer's Disease Center, Bachmann-Strauss Dystonia and Parkinson’s Disease Program of Excellence, Center for

Neurodegeneration & Experimental Therapeutics, Center for Neuroimmunology, Comprehensive Stroke Research Center, Epilepsy Center, Multiple Sclerosis Center, Parkinson's Disease Information and Referral Center) offering an array of clinical activities. We offer research opportunities in various fields at both the basic science and clinical levels. Clinical trials of new agents for epilepsy, multiple sclerosis, motor neuron disease and brain tumors enroll large numbers of patients. We sponsor travel for our faculty, residents, fellows, nursing staff, and laboratory personnel to attend medical meetings where they present their research findings. Residents are encouraged to obtain technical expertise in cerebrovascular ultrasound as well as in neuroimaging and neuro-interventional procedures.

5. The Department of Pediatrics (Mitchell B. Cohen, MD, Chair) - The 170 faculty members of the Department of Pediatrics provide a full spectrum of medical expertise, from primary care to subspecialty services. The research enterprise is substantial - ranked in the top 10 in funding from the National Institutes of Health (NIH) and the commitment to education and training have brought national recognition to the department. The department's vision is to be among the leaders in improving child health through research and innovation and promoting the well-being of children. Over the last decade, the department has experienced enormous growth, and with the support of the UAB Health System, the School of Medicine, and the Children's Health System, it is strengthening the academic medical center to meet the pediatric challenges of the 21st century.

i. **Division of Pediatric Allergy & Immunology** (T. Prescott Atkinson, MD, PhD*, Director) - Board-certified pediatric allergist/immunologists in the Division of Allergy, Asthma & Immunology specialize in the treatment of patients with IgE mediated diseases including asthma, allergic rhinitis, atopic dermatitis, food allergy, urticaria, angioedema, and stinging insect and drug allergy. In collaboration with physicians from the Division of Gastroenterology and Nutrition, allergists in the Division assist in the evaluation of patients with eosinophilic gastrointestinal diseases such as Eosinophilic Esophagitis (EoE). Division clinical immunologists diagnose and treat children with primary immune deficiencies including Severe Combined Immune Deficiency (SCID), primary antibody deficiencies, phagocyte deficiencies and complement deficiencies. Research interests include studies of T and B cell differentiation, mechanisms underlying immune deficiency syndromes, and immunologic abnormalities leading to autoimmunity. Division faculty are engaged in research in the pathophysiology of asthma and allergic disease as well as primary immune deficiency and autoimmunity.

ii. **Division of Pediatric Rheumatology** (R. Q. Cron, MD, PhD*, Director; Timothy Beukelman, MD*; Matthew Stoll, MD*) - Pediatric Rheumatology diagnoses and treats children with autoimmune disorders, including juvenile arthritis, lupus, myositis, scleroderma, and various vasculitides. A variety of treatment options are available from intraarticular corticosteroid joint injections to newer biologic agents that target inflammatory cytokines. Research in the division covers basic mechanisms of T lymphocyte function , clinical studies of temporomandibular joint arthritis and macrophage activation syndrome , and several projects aimed at optimizing the treatment of juvenile idiopathic arthritis (JIA). Established by the partnership of the Department of Pediatrics, the Arthritis Foundation and the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center, the Division's research interests include studies of T and B cell differentiation, mechanisms underlying immune deficiency syndromes, studies of the oncogenic events which results in B cell malignancies and investigations into the regulation of the immune response.

iii. **Division of General Pediatrics & Adolescent Medicine** (Carolyn S. Ashworth, MD, Director) (Krista R. Casazza, PhD*)- The UAB Division of General Pediatrics and Adolescent Medicine at Children's of Alabama has excelled in each of its unique roles of teaching, research, and clinical care responsibilities of the medical center. Faculty in General Pediatrics and Adolescent Medicine supervise care provided by residents and students in a variety of clinics ranging from primary care to specialty services through UAB and Children's of Alabama. (https://www.uab.edu/medicine/peds/gpam)

6. The Department of Physical Medicine and Rehabilitation (Amie McLain, MD*, Chair) (Candace Floyd, PhD*) - The UAB Department of Physical Medicine and Rehabilitation (PM&R) has been one of the Southeast's foremost providers of comprehensive rehabilitation care since 1964. Spain Rehabilitation Center is the hub of activities for the Department. As an integral part of UAB Health System, Spain Rehabilitation Center offers a level of care that is unsurpassed in Alabama. Spain Rehab is a 49-bed rehabilitation hospital featuring advanced, individualized care for adolescents and adult patients recovering from a broad variety of health problems.

PM&R currently holds ~$2.8 million in annual grant funding with around $7.1 million pending. . Our scientists conduct experimental non-human and non-clinical (basic science) laboratory studies with the specific intent to discover mechanisms, biomarkers, pathogenesis and treatments for central nervous system conditions such as brain injury, spinal cord injury, spina bifida, and multiple sclerosis. PM&R established the Functional Neuro-Recovery Program to accelerate the flow from basic scientific discoveries to clinical practice while, at the same time, provide hands-on training for the next generation of researchers at the undergraduate, doctoral, and postdoctoral levels. Here, scientists and clinicians work under one roof to share information at each stage of the process to better ensure that work in the laboratory translates to effective therapeutic strategies. Neuroscience Research is the foundation of our Functional Neuro-Recovery Program (http://www.uab.edu/medicine/physicalmedicine/research/functional-neuro-recovery-program)

In addition to basic science research, the PM&R is home to the UAB Spinal Cord Injury Model System (UAB-SCIMS) (http://www.uab.edu/medicine/sci/), one of 14 national Spinal Cord Injury Model System and the longest continually recognized Model System since funding began in the early 1970s. We also house the UAB Traumatic Brain Injury Model System (UAB-TBIMS) (http://www.uab.edu/medicine/tbi/), which has been continually funded since 1998, and it is currently one of 16 national Traumatic Brain Injury Model Systems. Ongoing funded research projects in PM&R include:

Spinal Cord Injury Neuropathic Pain: Identifying Biopsychosocial Predictors. PI: Elizabeth Richardson, PhD. Funding Source: NIH.

Virtual Walking for Reducing Spinal Cord Injury-Related Neuropathic Pain. PI: Elizabeth Richardson, PhD. Funding Source: NIDRR.

Pregnancy, Labor, Delivery and Post-Partum Outcomes of Women with and without SCI: An Observational Study. PI: Amie McLain, MD. Funding Source: NIDRR.

A Six Month Randomized Open-Label Trial of Pressure Ulcer Healing with Microcyn® Skin and Wound Care with Preservatives Versus Sterile Saline in Adult Spinal Cord Injury Subjects. PI: Yuying Chen, MD, PhD. Funding Source: Oculus Innovative Sciences, Inc.

Role of dentate gyrus gating and neurogenesis in the pathophysiology of mild TBI. PI: Candace Floyd, PhD. Funding Source: NIH (NINDS).

Opioid Abuse after Traumatic Brain Injury. PI: Candace Floyd, PhD. Funding Source: DoD/CDMRP.

Treatment of Neuropathic Pain after SCI with a catalytic oxidoreductant. PI: Candace Floyd, PhD. Funding Source: DoD/CDMRP.

Lifestyle Intervention for TBI (LIFT study). PIs: Laura Dreer, PhD and Tom Novack, PhD Funding Source: NIDRR.

Harnessing Neuroplasticity to Promote Rehabilitation: CI Therapy for TBI. PI: Edward Taub, PhD (CoPIs: Victor Mark, MD and Thomas Novack, PhD). Funding Source: DoD.

Post-stroke Aphasia and rTMS Treatment (PART) Study. PI: Jerzy Szflarski MD (CoPI: Victor Mark, MD). Funding Source: NIH.

Dose-Response Effects of Transformative Exercise in Improving Health and Function in Adults with Spinal Cord Injury and Multiple Sclerosis. PI: James Rimmer PhD (CoPI: Victor Mark, MD). Funding Source: NIDDR.

7. The Department of Surgery (Kirby I. Bland, MD, Chair; est. 1945) - UAB Department of Surgery has earned a national and international reputation for its unique blending of advanced medicine, excellent patient care and research. In fact, some of our innovative surgical programs are among the largest in the country. We have performed more than 8,500 kidney transplants and have completed more than 500 heart transplants. Many of our experienced physicians have earned a prestigious listing in the book, The Best Doctors in America as well as recognition in *U.S. News & World Report*.

i. **The Division of Cardiothoracic Surgery** (James K. Kirklin, MD, Director) (James George, PhD*) - A wide range of surgical procedures involving the heart and thoracic area are performed through the Division of Cardiovascular Surgery. It performs about 2,000 open heart procedures each year and has performed about 30,000 such operations since 1966. The Division's mission is to improve patient care and quality of life through careful scientific investigation of clinical outcomes, the discovery of novel therapies, and the investigation of the basic mechanisms of diseases that make cardiothoracic surgical interventions necessary. To support these goals, a world-class clinical and research enterprise has been built over the last three decades, attracting over 2 million dollars in extramural funding.

ii. **The Division of Orthopaedic Surgery** (Steven M. Theiss, MD*, Director) (Shawn Gilbert, MD*; Brent Ponce, MD*) - Extensive resources are available on campus for musculoskeletal and bone research, experimental biomechanics, and animal resources. Strong collaborations are in place with investigators in rheumatology, pathology, microbiology and biomedical engineering.

Members in the seven sections that comprise UAB's Division of Orthopaedic Surgery are active in basic, translational, and clinical research. They understand that as physicians practicing in a specialty with a strong clinical focus, their true value to this research university is the correct application of scientific discoveries in the treatment of patients with musculoskeletal disorders and then critical assessment of the outcomes following those interventions. Orthopaedics benefits from a large patient base with diverse pathology, excellent clinical care facilities and a collaborative environment. Faculty, residents and fellows regularly publish their findings in peer-reviewed journals and present their results at national and international meetings. Members of the division have been successful in obtaining research funding from industry, university sources, foundations, and federal agencies such as the National Institutes of Health, Department of Defense, and Pediatric Orthopedics Society of North America. The Division of Orthopaedic Surgery at UAB is focused on enhancing interactions with other investigators in the UAB research community, recruiting additional orthopaedic faculty with a commitment to research, and growing clinical programs to support translational research. This proposed T32 Training Program in Rheumatic and Musculoskeletal Disease will greatly help these efforts.

Clinical research in the Division includes prospective randomized trials, registries, retrospective chart reviews, and systematic reviews. The most prominent clinical research emphasizes evaluation of patient outcomes through randomized trials and assessment of the impact of disease. Additionally, a substantial number of recent publications have focused on using large nationwide databases (such as the Nationwide Inpatient Sample [NIS] database and the National Surgical Quality Improvement Program [NSQIP]) to more powerfully analyze risk factors for complications and mortality. Successful collaboration with the scientists in those centers listed above as well as with members of center for clinical and translational studies is key to maintaining and increasing these efforts. Orthopedists at Childrens of Alabama are leading a local randomized trial (comparison of soft vs traditional fiberglass casting) and participating in two international trials SBoCK (Simple Bone Cysts in Kids, led in Toronto) and a neurofibromatosis NF trial using bone morphogenetic protein (BMP) in congenital pseudarthrosis of the tibia (led by Dr. Bruce Korf of the Department of Genetics). In addition, the orthopaedics trauma group is participating in several clinical trials. Dr. Theiss, Division Director, currently has two clinical research projects funded by pharmaceutical companies: has a clinical trial funded through Pfizer, and a study of the output of a suction filtration device used during surgery.

Basic science research efforts in the Division revolve around skeletal development, biology and repair, analysis of retrieved orthopaedic implants, cadaver studies, use of animal models, biomechanical modeling, and testing geared toward the design of novel orthopaedic implants. Success of these efforts is highly dependent on the overall collaborative research environment at the UAB that fosters interaction across departments and between schools, including medicine, engineering and dental. Interactions with basic science research groups in the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC) are particularly critical to the success of this component of the orthopaedic research program.

The Residency Review Committee (RRC) for Orthopaedic Surgery requires that all orthopaedics residents are complete a substantial research project of publishable quality. To facilitate that, the Division has established a seminar for orthopaedic interns to provide training in research methods, compliance, and scientific writing. Additionally, a two-month research block free of clinical duties is provided in the PGY-4 year for study completion and manuscript preparation. Finally, the Division has established a resident research grant program to provide funding for resident projects and provide feedback and support for development of external funding. Resident research can be within any field with a direct or indirect relationship to orthopaedic surgery.

UAB Orthopaedics residents recently took the first, second, and third place awards for resident research at the Alabama Orthopedics Society meeting. Many of the residents present their research findings at the annual meeting of the American Academy of Orthopedic Surgery (AAOS). Representative examples of research projects resulting in publicatiosn from senior Orthopedics residents are listed below:

Comparison of outcomes and in-hospital measures for reverse total shoulder arthroplasty (TSA) versus anatomic TSA.

Return to play following metacarpal fracture in football players.

Infection rates and the continuance of incision in treatment of tibial plateau fractures with compartment syndrome.

Osteoporotic distal femur fractures treated with modular oncologic replacement prostheses.

Anatomic analysis of structures in proximity to distal femoral and proximal tibial traction pins.

Flexor Tendon Repair with a Knotless, Bidirectional Barbed Suture: An In Vivo biomechanical analysis.

In addition to required research, Dr. Brent Ponce has developed a mechanism of industry funding to support one-year terms of orthopedics research among medical students. Three of these research trainees (Lasun Oladeji, Evan Sheppard, and Dustin K Baker) have published papers under the mentorship of Dr. Ponce. A representative sample of these is listed below:

Risk factors for in-hospital myocardial infarction after shoulder arthroplasty. Oladeji LO, Raley JA, Menendez ME, Ponce BA. Am J Orthop (Belle Mead NJ). 2015 May;44(5):E142-7.

Outcomes of augmented allograft figure-of-eight sternoclavicular joint reconstruction. Sabatini JB, Shung JR, Clay TB, Oladeji LO, Minnich DJ, Ponce BA. J Shoulder Elbow Surg. 2015 Jun;24(6):902-7.

Comparative analysis of anatomic and reverse total shoulder arthroplasty: in-hospital outcomes and costs. Ponce BA, Oladeji LO, Rogers ME, Menendez ME. J Shoulder Elbow Surg. 2015 Mar;24(3):460-7.

Analysis of perioperative morbidity and mortality in shoulder arthroplasty patients with preexisting alcohol use disorders. Ponce BA, Oladeji LO, Raley JA, Menendez ME. J Shoulder Elbow Surg. 2015 Feb;24(2):167-73.

Diabetes as a risk factor for poorer early postoperative outcomes after shoulder arthroplasty. Ponce BA, Menendez ME, Oladeji LO, Soldado F. J Shoulder Elbow Surg. 2014 May;23(5):671-8.

A biomechanical analysis of controllable intraoperative variables affecting the strength of rotator cuff repairs at the suture-tendon interface. Ponce BA, Hosemann CD, Raghava P, Tate JP, Sheppard ED, Eberhardt AW. Am J Sports Med. 2013 Oct;41(10):2256-61.

Factors associated with in-hospital pulmonary embolism after shoulder arthroplasty. Young BL, Menendez ME, Baker DK, Ponce BA. J Shoulder Elbow Surg. 2015 May 11. pii: S1058-2746(15)00181-0.

Predictors of extended length of stay after elective shoulder arthroplasty. Menendez ME, Baker DK, Fryberger CT, Ponce BA. J Shoulder Elbow Surg. 2015 Apr 10. pii: S1058-2746(15)00087-7.

C. The School of Joint Health Sciences

1. The Department of Biochemistry and Molecular Genetics (Tim M. Townes, PhD*, Chair) - The Department of Biochemistry and Molecular Genetics has assembled a faculty dedicated to quality

education and enthusiastically focused on cutting-edge research and discovery. Under their watchful eye, students learn to think creatively and work independently. The faculty's diverse research interests give solid breadth to our department. Research programs include Drosophilia development, yeast genetics and transcription, genetic engineering of transgenic mice, RNA processing, glycobiology, enzymology, thermodynamics, macromolecular structure and metabolism. Faculty members are also associated with a number of large research centers including the Comprehensive Arthritis, Musculoskeletal, Bone & Autoimmunity Center, Comprehensive Cancer Center, AIDS Center, Cystic Fibrosis Research Center, Neurosciences Program, Macromolecular Crystallography Center and Atherosclerosis Research Unit. One primary indicator of a superior staff is the extent of outside funding the department receives. UAB ranks among the top public institutions in terms of research and training awards from the National Institutes of Health. In addition to funds from the State of Alabama, the members of the Biochemistry and Molecular Genetics faculty receive a total of $7 million in outside investigator-initiated grants.

2. The Department of Cell, Developmental, and Integrative Biology (Etty 'Tika' Benveniste, PhD, Chair) (Marcus Bamman, PhD*; Susan Bellis, PhD*; Sasanka Ramanadham, PhD*; Lisa M. Schwiebert, PhD*; Rosa Serra, PhD*) – Formed from the merger of the Departments of Cell Biology and Physiology & Biophysics, the Department of Cell, Developmental and Integrative Biology enables the rapid translation of laboratory discoveries into new therapies and better patient care. As natural partners in the integrated study of biological systems, the two departments have longstanding, shared expertise in areas ranging from cancer biology to neurodegenerative disease to inflammation to developmental biology. Having a larger, more diverse faculty will yield closer interactions, more joint research projects and more interdisciplinary grants.

3. The Department of Genetics (Bruce Korf, MD, PhD*, Chair) (Devin Absher, PhD*; Richard Myers, PhD*; Daniel Bullard, PhD*; Lizhong Wang, PhD*) - The Department of Genetics is a Joint Health Sciences (basic science) and a clinical department. It is comprised of an interdisciplinary group of faculty focused on performing basic laboratory and clinical research, providing inpatient and outpatient consultation services, and offering state-of-the-art genetic diagnostic testing. Through laboratory and clinical research, we seek to expand knowledge and create new applications along the continuum from fundamental studies to preclinical investigations, to bench-to bedside translation, to clinical practice and community implementation.

4. The Department of Microbiology (Frances E. Lund, PhD*, Chair) (David Chaplin, MD, PhD*; John F. Kearney, PhD*; Elliot J. Lefkowitz, PhD*; Beatriz Leon-Ruiz, PhD*; Jan Novak, PhD*; Hubert Tse, PhD*; Mark Walter, PhD*; Amy Weinmann, PhD*) - Research in the department is multidisciplinary and spans structural and molecular virology, microbial and viral pathogenesis, microbial genetics, pathogen evolution, host-pathogen interactions, cellular and molecular immunology, molecular biology, autoimmunity and cancer. We study fundamental mechanisms of cell biology, structural biology, transcription, translation, replication and genetics and determine how processes affect the development and progression of infectious disease as well as chronic diseases. We examine how the immune system controls or – as is often the case – fails to control infections with these pathogens and we design and test vaccines against these pathogens. We study pathogens that are the causative agents of human diseases like HIV, tuberculosis, hepatitis, encephalomyelitis, anthrax, flu, pneumonia and tooth decay.

5. The Department of Pathology (Kevin Roth, MD, PhD, Chair) - The UAB Department of Pathology provides extensive clinical services and teaching while maintaining large and productive research programs. Currently, the Department has over $20 million per year in extramural research funding (approximately $12 million per year from the NIH. Its clinical services, including inpatient, outpatient and outreach, completes over 6 million procedures per year. The UAB Department of Pathology employs 72 full-time faculty of which 60 are involved with disease research in AIDS, cancer biology, cardiovascular disease, diabetes, gene therapy, immunopathology, infectious diseases, matrix biology, metabolic bone diseases, neuropathology, and obesity.

i. **The Division of Molecular & Cellular Pathology** (John C. Chatham, D.Phil, Director) (Elizabeth E. Brown, PhD*; Yabing Chen, PhD*; Xu Feng, PhD*; Yi-Ping Li, PhD*; Joanne Murphy-Ullrich, PhD*; Selvarangan Ponnazhagan, PhD*; Yang Yang, PhD*; Majd Zayzafoon, MD, PhD*) - Pathology's Division of Molecular and Cellular Pathology has 16 full-time faculty members with a diverse range of interests encompassing bone metabolism, free radical biology, cardiovascular biology, cancer metastasis and gene therapy. The research seeks to determine the molecular events that lead to change in cell function during the pathophysiology of disease.

ii. **The Division of Anatomic Pathology** (Gene Siegal, MD, PhD, Director) (Casey Weaver, MD*) – The Division of Anatomic Pathology conducts basic and translational research with the goal of increasing our understanding of the mechanisms driving organ-directed disease processes and of furthering diagnostic techniques such as immunohistochemistry and molecular diagnostics. Special interests and expertise include: heart, lung, GI, liver, breast, kidney, genitourinary tract, ENT, non-neoplastic and neoplastic bone and skin disease, as well as specialized investigations of embryo and fetal disease.

iii. **The Division of Laboratory Medicine** (X. Long Zheng, MD, PhD, Director) (Robinna Lorenz, MD, PhD*) – The Division of Laboratory Medicine engages in clinical service, medical research, and teaching. It oversees the analysis of components of blood, urine, body fluids, and tissue used for the diagnosis and management of disease. Special expertise includes: clinical chemistry, toxicology, endocrinology, clinical microbiology, parasitology, mycology, clinical immunology, clinical hematology, coagulation, immune cytopenia, molecular diagnosis, transfusion medicine/blood banking, therapeutic apheresis, flow cytometry, and molecular genetics (in collaboration with the Department of Genetics at UAB).

D. The UAB School of Public Health (Max Michael, III MD, Dean; est. 1981) – Recognizing that public health challenges are global, involving diseases that must be understood at the cellular level and addressed at the community level, the UAB School of Public Health (SOPH) focus on creating a community of outstanding scholars and professionals leading innovation in public health, recognized for improving the health of the citizens of Alabama and the world. These challenges require the development of new interventions, the implementation of new models, and the emergence of new systems. They demand educated professionals, well versed in the multiple disciplines of public health, to forge the best solutions. Located in the heart of the largest academic health center in the Southeast, the SOPH is embracing these challenges, creating a uniquely innovative public health curriculum and foster a dynamic and timely research agenda critical to the health of the nation. The diversity of disciplines, interests, faculty and students encourages an unparalleled intellectual vitality within a university heralded for its research capabilities. (http://www.soph.uab.edu/)

1.The Department of Biostatistics (David Redden, PhD*, Chair) (Xiangqin Cui, PhD*; Gary Cutter, PhD*; George Howard, PhD*; Nianjun Liu, PhD*; Hemant Tiwari, PhD*) – Biostatistics is the field of statistical methods related to biological research in areas such as public health, medicine, dentistry, and nursing. At UAB, the Department of Biostatistics focuses on the application of existing statistical techniques to studies in these health related fields and development of new statistical techniques. Our department includes a Section on Statistical Genetics and a Section on Research Methods and Clinical Trials. We offer training both at the graduate and post-doctoral level.

2. The Department of Epidemiology (Donna Arnett, PhD*, Chair) (Stella Asklibekyan, PhD*; Paul Muntner, PhD*) – Epidemiology has been a central part of medicine and public health at UAB from the early 1970's. Since the founding of the SOPH, Epidemiology has been the largest department in terms of the number of faculty, number of students, and extramural research support. In 1998, the Departments of Epidemiology and International Health were combined. The Epidemiology Ph.D. Program Faculty include faculty who are in the International Health Unit. Our twenty-six full-time Epidemiology Program faculty have active research grants totalling over $15M for research in Alabama, the United States, and around the world. (http://www.soph.uab.edu/epi)

3.The Department of Health Behavior (Kevin Fontaine, PhD*, Chair) – The study of Health Behavior in public health address the behavioral, social, and cultural factors related to individual and population health

and health disparities over the life course. Research and practice in this area contribute to the development, administration, and evaluation of programs and policies in public health and health services to promote and sustain healthy environments and healthy lives for individuals and populations. (http://www.soph.uab.edu/hb)

E. The UAB School of Dentistry (Michael Reddy, DMD*, Dean) - At UAB's School of Dentistry, we have strong dedication to imparting the next generation of dentist practitioners with knowledge, the kind of knowledge that empowers the brightest minds to provide the most powerful dental care. Our vast collection of great knowledge allows us to innovate and create breakthroughs. Since our founding in 1948, we have developed a rich history of healthcare innovation and gained a national reputation for excellence. The UAB School of Dentistry continues to supply the community with nothing but the world's most equipped and knowledgeable dentists with our accredited predoctoral and 8 accredited postdoctoral areas of study.(http://www.uab.edu/dentistry/home/)

1. **The Department of Oral & Maxillofacial Surgery** (Peter D. Waite, DDS, MD*, Chair) (Amjad Javed, PhD*; Dobrawa Napierala, PhD*) - The Department of Oral and Maxillofacial Surgery optimizes oral health through specializing in developmental and congenital facial deformities, reconstructive surgery of the face, restoration of the edentulous patients, implants, and extensive facial infections. In addition to these highly specialized procedures we also provide more general services to the patient population. Including extraction of teeth and impacted wisdom teeth, laser surgery, management of TMJ disorders, facial pain, oral cancer, facial trauma, facial cosmetic surgery, and obstructive sleep apnea. (http://www.uab.edu/dentistry/home/departments-programs/oral-and-maxillofacial-surgery)

2. **The Department of Pediatric Dentistry** (Noel Childers, DMD, PhD, Chair) (Ping Zhang, PhD*) - The Department of Pediatric Dentistry faculty includes 7 full-time and 9 part-time members, as well as 12 adjunct faculty. It offers an Advanced Educational Program in Pediatric Dentistry, which is designed to provide the educational background and atmosphere necessary for training future clinical and academic leaders in Pediatric Dentistry. Advanced education provides students with an in-depth understanding of, and clinical expertise in, the practice of dentistry for children and others with developmental disabilities. (http://www.uab.edu/dentistry/home/departments-programs/pediatric-dentistry)

3. **The Department of Periodontology** (Nicolas Geurs, DDS, Chair) (Michael Reddy, DMD*)- We are committed to optimize the overall health of our patients and the community through superior periodontal care. We provide therapy at various levels to a large group of patients. Our dental students learn to diagnose periodontal diseases and treat basic periodontal conditions. In our state-of-the-art facility, our residents provide diverse and comprehensive treatment for periodontal diseases and replace missing teeth with dental implants. Our faculty are active participants within the UAB Dental Group and deliver specialty care in periodontics and implant dentistry. (http://www.uab.edu/dentistry/home/departments-programs/periodontology)

F. The School of Engineering (J. Iwan D. Alexander, PhD, Dean) - The UAB School of Engineering is comprised of 1,200 students. Roughly 70 percent are undergraduate and 30 percent are graduate students. (http://www.uab.edu/engineering/home/)

1. **The Department of Biomedical Engineering** (Timothy Wick, PhD*, Chair) - The BME faculty has developed an outstanding interdisciplinary curriculum to train students to solve health-care related problems using advanced quantitative and analytical techniques. All of our courses are taught by full-time BME faculty members, who also maintain an active research program. A strength of the BME faculty is their research productivity; faculty members in BME bring expertise from their discipline into the classroom.

G.. College of Arts and Sciences (Robert E. Palazzo, PhD, Dean) – Our 19 departments — home to over 300 faculty and more than 40 baccalaureate, master's, and doctoral degrees — make us the largest academic entity in the UAB academic enterprise. The College is home to several interdisciplinary research, education, and community outreach centers. Our faculty and students (undergraduate, graduate, and post-doctoral) collaborate with those in the schools of Business, Engineering, Health Professions, Medicine, Optometry, and Public Health. Several of our centers have industrial partners and engage in

commercialization activities. Centers also support seeding of pilot research projects in emerging areas of research and education. (http://www.uab.edu/cas/home/)

1. The Department of Biology (Steven Austad, PhD, Chair) (Trygve Tollefsbol, PhD*) – Our world-class scientists provide world-class training. We place more undergraduates in health-related professional schools and in nationwide PhD programs than any department in any university in Alabama. We provide a wide range of hands-on research activities for our students, including a broad range of laboratory opportunities as well as the possibility of fieldwork at remote sites such as the Bahamas, Costa Rica, the Galápagos Islands, and Antarctica. Our graduate students go on to distinguished careers in many fields and win national prizes for their research.

2. The Department of Psychology (Karlene K. Ball, PhD, Chair) (Jarred Younger, PhD*) – Our department has a young, but solid history of growth and accomplishment. We attribute this to faculty members that have continuously represented the cutting edge of teaching and research. For example, the UAB Psychology Department has consistently ranked within the top departments nationally in terms of federal (NIH, NSF) research support. In addition to its regular faculty, the department has approximately 75 secondary, adjunct, and clinical faculty members who provide academic and research opportunities and clinical supervision in a wide variety of settings.

H. The UAB Graduate School (Jeffrey A. Engler, PhD, Interim Dean) - We offer doctoral programs in 37 areas, post-masters education specialist programs in 8 areas, and master's level programs in 50 areas, spanning across the disciplines. The University of Alabama at Birmingham ranks among the top 20 institutions receiving federal research funding. With more than $433 million dollars in funding, UAB is home to more than 100 research centers. The UAB Graduate School seeks to nurture skills that transcend disciplinary boundaries, preparing graduate students to participate successfully in professional and academic arenas. With coordinated and interdisciplinary degree programs available, the UAB Graduate School offers students an opportunity to tailor their educational experience to their own career objective. (https://www.uab.edu/graduate/)

I. UAB Clinical and Translational Research Facilities

1. Clinical care facilities - Partnering with UAB and the School of Medicine to provide avenues for clinical care and training for medical professionals, the entities listed below are part of a broad and diverse medical network on the UAB campus. UAB is the only medical center in Alabama listed in the *U.S. News & World Report* "Best Hospitals" issue for 21 straight years (every year from the issue's inception). Among the specialty rankings, Rheumatology has been UAB's highest ranked program for many years, presently #11 in the nation.

i. **The Kirklin Clinic at UAB** (TKC) - The Kirklin Clinic® opened in 1992 as a premier outpatient facility to provide examination and treatment rooms for physicians representing almost every specialty in adult medicine. The five-story facility covers a full city block with 454,000 square feet, more than 30 distinct clinical units of multidisciplinary teams, and an adjacent covered parking deck that accommodates 1,450 vehicles. The Kirklin Clinic® at Acton Road provides a wide array of patient care services south of Birmingham, established in the suburban community. (http://www.health.uab.edu/11263/TKC/)

ii. **UAB Highlands** - This general acute care facility located in the Medical Center District of Birmingham is a campus of University Hospital. In addition to many other outpatient facilities, it is home to the UAB Orthopaedics Specialties Clinic; the UAB Pain Treatment Clinic; and the UAB Multispecialty Clinic, which houses two clinical faculty members in the Division of Clinical Immunology and Rheumatology, and one full-time nurse practitioner, all three of whom are full-time clinicians with thriving practices centered on arthritis and musculoskeletal diseases. (http://uabmedicine.org/locations/uab-hospital-highlands)

iii. **University Hospital** - Established in 1945 as the teaching hospital for the School of Medicine, UAB University Hospital is licensed for over 900 beds and is dedicated to top quality patient care. The 885,000 square-foot, 11-story North Pavilion opened in 2004 and has 37 operating

suites, 3 medical surgical units, 4 intensive care units (trauma and burn, surgical, neuroscience, and cardiovascular), and a 44,000 square-foot Emergency Department. (http://www.uabmedicine.org)

iv. **Children's of Alabama** - In addition to the health system components listed above, three independent hospitals surround UAB's main campus in Birmingham, and UAB physicians may collaborate and share information with their specialists on some diagnoses and treatments. In some cases, knowledge and skill are combined for joint programs in certain medical specialties. Established in 1911, The Children's Hospital of Alabama, part of the Children's Health System, provides pediatric care while serving as the primary site for pediatric education at UAB. The 275-bed, private, not-for-profit hospital is home to a vast array of specialists and has one of the largest pediatric outpatient centers in the United States. (http://www.chsys.org/)

v. **Birmingham VA Medical Center** - Partnering with UAB since 1975, the Birmingham Veterans Affairs Medical Center (BVAMC) is an acute care facility with 138 beds currently in operation. The facility has strong programs in both medicine and surgery and serves as the primary referral center for the state. (http://www.birmingham.va.gov/)

2. Clinical Core Facilities

i. **Clinical Research Unit** (Burt Nabors, MD, Jeffrey Edberg, PhD*, Co-Directors) – the Clinical Research Unit of the CCTS is enhancing UAB's research culture by providing a highly efficient and flexible resource that participates in study development, implementation, and outreach and is sustainable through a comprehensive cost-recovery mechanism. The CRU is committed to providing investigators and their research team with a research environment and broad range of services guided by good clinical practice, which contributes to the conduct of excellence in clinical and translational research. The CRU equips the investigator with essential tools and critical resources and provides a highly efficient and flexible infrastructure that is sustainable through a comprehensive cost-recovery system. (http://www.ccts.uab.edu/pages/pcir.aspx)

ii. **Methodology Core** (Xiangqin Cui, PhD*, Director) - The mission of the MCRC Methodology Core is to establish the infrastructure for a broad spectrum of clinical and translational research using state-of-the-art tools in statistics, epidemiology, outcomes, health services, and behavioral research. The Core also provides assistance as it pertains to data collection, management, and computational needs of existing projects, as well as promotion of new investigation. To achieve this, the Core seeks to evaluate new evaluative, analytical, and translational methods of research. It also maintains a commitment to the continued education of new and established clinical researchers in the most recent advances of methodology. The Core assembles experts in statistics, statistical genetics, epidemiology, quality of life assessment, quality of care measurement, and economic evaluation in an effort to assess complex experimental data. (http://main.uab.edu/uasom/2/show.asp?durki=117644)

iii. **Sample Processing and Analytic Nexus** (Jeffrey Edberg, PhD*, Director) - The SPAN of the CCTS has two coordinated facilities for processing research samples and for preparing patient specimens for genetic studies with specimen banking. The facility is available to work with the CRU patient facilities to facilitate "bedside-to-bench" research. Processing activities available from the Core include preparation of specimens (including sample handing in a laminar flow hood), sample centrifugation, preparation of aliquots, labeling and short term storage. Specimen processing in the genetics study lab, located in the Shelby building, also provides services including preparation of mononuclear cells (MNC), EBV-immortalized lymphoblastoid cell lines, buffy coats, Cryopreservation of cell lines and fresh MNC, DNA extractions, banking of DNA/cell lines, access to SNP genotyping technology together with the Heflin Genomics Core (Pyrosequencing, TaqMan, SNPlex assays), and consultation in study design and genotyping approaches. (http://www.ccts.uab.edu/pages/SPAN-TTNM.aspx)

iv. **Tissue Procurement Shared Facility** (William E. Grizzle, MD, PhD, Director) - The Tissue Procurement Shared Facility (TPSF) operates as a prospective service to collect, from UAB associated hospitals, normal, malignant, benign, and diseased fresh human tissues and fluids

which are then preserved appropriate to protocol. This preservation can include fresh storage in media or saline, snap-frozen storage in liquid nitrogen, freezing in OCT for frozen section preparation, or preservation in a fixative of choice. The TPSF can also provide procurement of control tissues including uninvolved tissues or matched tissues from patients with benign disease processes. The histology laboratory can provide paraffin blocks and/or stained or unstained slides. In addition, investigators can obtain access to rare tissues through the national Cooperative Human Tissue Network (CHTN). All samples are identified by control numbers to protect patient confidentiality. A copy of the surgical pathology report from which all patient identifiers have been removed will be provided to the researcher. If requested, the TPSF will attempt to obtain additional information such as follow-up, clinic-pathologic, and demographic features. The facility is regulated by the UAB Institutional Review Board (IRB) regarding human use approval for use of human tissues. (http://www3.ccc.uab.edu/index.php?option=com_content&view=article&id=165%3Atissue-procurement&catid=35&Itemid=90)

J. UAB Fundamental Science Core Facilities

1. Core Facilities

i. **Analytic and Preparative Flow Cytometry Core Facility** (John D. Mountz, MD, PhD*, Director) - The Analytic and Preparative Core Facility (APFC) provides resources, educational opportunities, and technical expertise for ongoing disease research. It assists with the design and execution of experiments using flow cytometry and cell sorting. The Core also educates users through informal tutorials, formal courses, and web-based information on existing and new technologies. The Core has a constant commitment to optimize the efficiency and efficacy of protocols and strategies, as well as the development of new applications in response to user need and field advancement. In addition to technical support, the core offers informal and formal seminars, as well as personal consultation, to address topics ranging from experimental design to data analysis. The Core also aim to develop new and enhance existing protocols and technologies in response to user needs. (http://www.medicine.uab.edu/rheum/APCF/)

ii. **Epitope Recognition and Immunoreagent Core** (Mary Ann Accavitti-Loper, PhD, Director) - The primary focus of the Epitope Recognition and Immunoreagent Core (ERIC) is the timely and economically reasonable production of hybridomas and monoclonal antibodies (MAbs). It also provides state-of-the-art phage display technology and assists investigators in the utilization of single chain (scFv) antibody reagents. The Core offers novel and efficient immunization strategies that facilitate the production of MAbs to problematic antigens. Additionally, it stores and distributes MAbs that are frequently utilized by university researchers. The ERIC is equipped with all the necessary equipment required for production and purification of hybridoma and single chain antibodies. The laboratory aims for a 100% success rate for the production of solicited antibodies. To this end, the facility participates in research to enhance existing and promote new technologies and strategies for the production of efficient antibody reagents. The Core also makes available common antibody reagents at lower cost to the researcher. (http://www.eric.uab.edu/)

iii. **High Resolution Imaging Facility** (Kent T. Keyser, PhD, Director) - The High-Resolution Imaging Core facility (HRIF) provides investigators with access to state-of-the-art Confocal laser scanning microscopy, Multiphoton laser scanning microscopy, digital imaging equipment, and electron microscopy, as well as the technical expertise to use them effectively. The facility was established with the goals of: Providing biomedical researchers at UAB with access to state-of-the-art Confocal laser scanning microscopy and Multiphoton laser scanning microscopy imaging instrumentation; providing both the technical resources and expertise for the application of specialized imaging techniques including high resolution 3-dimensional fluorescence imaging of intra- or extracellular constituents such as Ca2+, intracellular trafficking of molecules or organelles, and subsequent image analysis and interpretation to problems in biomedical research; and fostering more interdisciplinary research including the development of new imaging applications and modalities for biomedical research. The facility supports research projects including the visualization of organelles or proteins in living cells, trafficking of labeled proteins within cells and translocation to the nucleus or cell surface, three dimensional

reconstruction of tissue samples, fluorescence recovery after photobleaching (FRAP), and high temporal resolution of changes in intracellular Ca2+. In addition, an EM facility with a full time staff member is available for assistance with ultrastructural studies. For more information, please contact the director or a facility manager. (http://main.uab.edu/show.asp?durki=34926)

iv. **Gene Targeting Core Facility** (Robert A. Kesterson, PhD, Director) - The Resource is a centralized facility for the efficient production of transgenic animal models for UAB investigators. Genetically engineered mice are produced by trained professionals, at high standards of quality, and with excellent efficiency in terms of Resource utilization (costs, space, personnel, etc.). For the investigator, this approach means availability of highly specialized services at a reasonable cost. Additional services include cryopreservation of embryos and sperm, embryo rederivation to produce pathogen-free mice, and assisted reproduction techniques (in vitro fertilization [IVF], superovulation, and embryo transfer). Perhaps the greatest resource currently available to researchers for the creation of "knockout" mouse models is the generation of libraries of random "genetrap" ES cell clones. Gene trapping is a cost effective method for producing ES cells harboring insertional mutations, most often into introns, which typically leads to a null allele of the "trapped" gene. An additional advantage of gene trap vectors is that they incorporate the use of selectable reporter genes (e.g. lacZ gene), which aid in characterizing the tissue-specific expression of the trapped gene. (http://medicine.uab.edu/genetics/83856/)

v. **Heflin Genomics Core Laboratory** (Michael Crowley, PhD, Director) – The Genomics Core Laboratory comprises a comprehensive resource for molecular analysis designed to facilitate and enhance the research of UAB investigators. It provides whole genome and targeted gene expression analysis, high- and low-throughput whole genome and custom genotyping, whole genome methylation analysis, and targeted sequencing analysis to university investigators as well as individuals outside of the UAB system. The facility has recently been expanded to include the iScan and BeadXpress systems from Illumina in order to complement the existing Affymetrix GeneChip system, which is comprised of the Affymetrix 3000 7G scanner with an autoloader, two FS450 fluidics stations and two Hyb 640 hybridization ovens. The laboratory also includes an ABI 3730 system for targeted DNA sequencing, along with Bio-Rad Experion and Agilent 2100 Bioanalyzer systems for the determination of RNA/DNA quality prior to processing and for quality control during chip processing. The facility has the capacity to perform whole genome genotyping, copy number variation analysis, and gene expression microarrays on multiple systems in order to accommodate the needs of investigators who may have committed to working with one platform or another in previous studies. In addition, we can perform microRNA profiling and whole genome methylation profiling using a Chromatin-IP protocol followed by hybridization on the human or mouse promoter chip (ChIP-Chip) (http://www.heflingenetics.uab.edu/GenomicCore.html)

vi. **Multidisciplinary Molecular Interactions Core** (Randall S. Davis, MD, PhD*, Director) The Multidisciplinary Molecular Interactions Core provides use of a Biacore T100 biosensor that is capable of determining the binding kinetics, specificities, and thermodynamics of biomolecular interactions. The Biacore T100 uses surface plasmon resonance (SPR) technology to precisely monitor label-free binding activity between proteins, peptides, nucleic acids, carbohydrates, lipids or small drugs (200-1000 Daltons) in real-time. The SPR-based biosensors can be used in determination of active concentration as well as characterization of molecular interactions in terms of both affinity and chemical kinetics. Located conveniently in the Shelby Interdisciplinary Biomedical Research Building, the MMIC provides access to state-of-the-art technology and represents an essential application in ligand-receptor life science disciplines including fundamental immunology and autoimmunity research.

vii. **Mass Spectrometry / Proteomics Shared Facility** (James A. Mobley, PhD, Director) - The Shared Facility is organized into four modules (1) Bioanalytical Separation and Sample Preparation, (2) Proteomics, (3) Small Molecule Analytics, and (4) Data Analysis and Bioinformatics that are supported by a team of scientists who are experts in mass spectrometry, bioanalytical chemistry, statistics, systems biology, and information handling. The goal of the MSP Shared Facility is to provide state-of-the-art capabilities and training in mass

spectrometry, proteomics, and bioanalytic technologies to support the research needs at UAB. Dr. Mobley directs the shared facility. He provides initial consultation with new users, with continuing assistance in developing appropriate experimental design and use of technology, and data analysis and interpretation. He also ensures that the shared facility provides cutting edge mass spectrometry and proteomics support for pilot and extramurally supported projects. In consultation with the oversight committee and the Co-Director, he oversees utilization of space, instrumentation, and expertise to meet current needs and to anticipate technological advances necessary for future needs.(http://www.uab.edu/bmsf/)

viii. **Additional core facilities are described at (**http://www.uab.edu/home/images/research/documents/core_day_booklet_nov10.pdf)

K. UAB Informatics and Computing

1. Molecular and Genetic Bioinformatics Facility (Elliot J. Lefkowitz, PhD*, Director) - The Molecular and Genetic Bioinformatics Facility (MGBF) comprises a total of over 1,350 sq. ft. of space in the Bevill Biomedical Research Building (BBRB), affiliated with the Shelby building by a covered bridge.. All Offices are equipped with multiple gigabit and 100 megabit switched fast Ethernet connections to the building and campus network backbone. The campus network backbone consists of gigabit fiber connections linking each campus building to the campus computing center. UAB maintains OC-3 connections to the commodity Internet (I1). UAB is also a member of the Internet 2 (I2) consortium and maintains OC-12 connectivity to the Abilene network through Georgia Tech in Atlanta. I2 connectivity provides fast links to most major research universities in the country along with a number of government institutions including the National Center for Biotechnology Information (NCBI). The MGBF maintains two computer server rooms, which contain multiple 20 and 30 amp 115 volt electrical feeds, as well as 30 amp, 220 volt outlets. Uninterruptible Power Supplies with battery backups are used between each of the electrical feeds and the server power supplies for every electrical connection. Each server room contains its own Foundry Gigabit switch servicing all network connections. Each server is connected to an Avocent A2000R KVM over IP switch that allows for remote monitoring and control of all servers over a TCP/IP internet connection. The UAB MGBF maintains a Sun quad-processor E450 Solaris server with 4 Gb of RAM and over 600Gb of disk storage, and a Sun quad-processor V880 Solaris Server with 8 Gb of RAM and over 200Gb of storage to support the various programs, databases, and analytical tools available to all UAB investigators. The MGBF provides UAB with the Genetics Computer Group's (now Accelrys) Wisconsin package of sequence analysis software tools. Our site-license for Accelrys includes access to the command-line, Xwindows-based (SeqLab), and web browser-based (SeqWeb) interfaces to these sequence analysis programs. Dr. Lefkowitz also maintains over 20 other servers and workstations to support facility personnel including Dell PC servers, workstations, and laptops; Macintosh workstations; and Linux servers. All servers and workstations use either gigabit or 100 Mb cards for connection to the campus network. In addition, a Dell/EMC AX100 Storage Area Network with over 3 Terabytes of disk storage is used for file storage. Finally, the MGBF facility maintains a Dell PowerVault 132T tape library with two Quantum SDLT 320 drives for tape backups of all server, workstation, and database data. For computationally intensive problems, including large database searches, several Linux-based computer clusters are available on campus that are available to support the needs of facility users. These include a 64 node, 128 processor cluster in the School of Engineering, and a 32 node, 64 processor cluster in the Department of Computer and Information Sciences. (http://www.genome.uab.edu/)

2. High Performance Computing (B. Soni, PhD, Director) **-** The High Performance Computing capacity at UAB, largely available through the Computer Science Department and the School of Public Health, is an important additional resource for intensive computing needs. Fields of specialization that reflect the interests of the faculty include design and analysis of algorithms, software development techniques, compilers, distributed computing, programming languages, database systems, artificial intelligence, computer graphics and vision, neural networks, large-scale simulation, biomedical computing applications, and bioinformatics. The department's research facilities include many Sun and Silicon Graphics workstations, file servers, five networked PC clusters, and a Beowulf cluster. All faculty members have access to the Alabama Supercomputer Center (http://www.asc.edu) which is located in the Alabama Supercomputer Authority's 24,000 ft2 building in Huntsville, Alabama. The center houses the Cray SV1 supercomputer. A StorageTek 4400 Automated Cartridge System provides a 2.4 terabyte long-term data storage capacity. Scientific workstations provide visualization and interactive graphics capabilities at the

center and on the research campuses across the state. Several software packages are installed and maintained. Access is provided by dial-up facilities at network node points and at the center. Statistical software available on the analysis server includes SAS version 8 and S+. In addition, through a grant on which we collaborate with the University of Alaska (P20RR016430), we have access to supercomputers at the Arctic Region Supercomputing Center (http://www.arsc.edu/) including two Cray systems, if necessary. Currently, across the Beowulf clusters, IBM BG supercomputer, SGI Altix supercomputer, DMC, and other HPC resources, a total of 4,228 processors are in place and available to UAB investigators. For parallel programming, there are three Beowulf-style clusters: (1) a 128-node Linux Beowulf cluster with each node configured with two Intel EM64T 3.6 GHz processors and up to 6 GB of memory, (2) a 64-node Linux Beowulf cluster with each node configured with two Pentium 4 Xeon 2.4 GHz processors and up to 4 GB of memory, and (3) a Linux Beowulf cluster with 192 cores (based on Intel quad-core E5450 processors), 120 cores (based on AMD Opteron 242 processors), and 43 TB of disk storage. We also have access to an IBM Blue Gene supercomputer, purchased through a joint collaboration and investment of $750,000 by a number of groups across UAB. This will allow us to tackle parallel programming on a larger scale than the Beowulf-style clusters described above have allowed in the past. It is configured with 2,048 processors, 1 TB of RAM, and 13 TB of disk storage. The hardware and software will be maintained by the system administrators of the Mechanical Engineering department, chaired by Dr. Bharat Soni. This same team currently manages the Beowulf clusters and we expect that their expertise in managing these kinds of parallel computers will be a critical part of our continued success in high performance computing.

L. UAB Graduate and Post-Graduate Training

1. UAB Graduate School - The Graduate School, established in 1970, offers competitive annual recruitment funding awards to PhD entry programs to be used for enhancement of recruitment practices, including recruitment advertising, website upgrades, support of head-start summer programs, participation in diversity recruiting events, interview visit support and others. The Graduate School also hosts the annual Opportunity Zone recruitment event for regional undergraduates, collaborates with the UAB Office of Undergraduate Research to sponsor an annual Undergraduate Research Day and summer research intern events, and liaises with various departmental honors programs as well as the university-wide Science and Technology Honors Program. It also hosts the UAB McNair Scholars Program and the NIH-funded UAB PREP post baccalaureate program, and provides recruitment and ongoing mentoring programs for minority graduate students. (http://www.uab.edu/gradschool)

i. **Graduate Program in Biological Sciences** (S. Rich, PhD, Director) **-** The Graduate Biomedical Sciences (GBS) community at UAB encompasses approximately 475 graduate students and 350 faculty. They participate in multiple interdisciplinary thematic programs that integrate more than 25 departments and 20 research Centers in the School of Medicine, partner Schools throughout the university and Southern Research, an affiliated drug discovery and development institute.UAB is consistently among the top 25 institutions in the US for NIH research funding. It provides its graduate students the flexibility, guidance, resources and training to become highly competitive for outstanding postdoctoral and professional positions. UAB offers NEW interdisciplinary training pathways in the Graduate Biomedical Sciences, including Biochemistry & Structural Biology, Cancer Biology, Cell, Molecular and Developmental Biology, Genetics and Genomic Sciences, Immunology, Microbiology, Neuroscience, and Pathobiology & Molecular Medicine. (http://www.uab.edu/gbs/)

2. Office of Postdoctoral Education (L. Schwiebert, PhD*, Director) **-** The UAB Office of Postdoctoral Education (OPE) was established in 1999 and was one of the first Postdoctoral offices in the country. Since its inception, the OPE has been instrumental in establishing and maintaining competitive terms, benefits and training programs for all postdoctoral fellows. It works closely with the University's academic administration, the UAB Council on Postdoctoral Education and the UAB Postdoctoral Association to address the needs and concerns of postdoctoral fellows in a timely and professional manner. The goal of the OPE is to provide postdoctoral fellows with the opportunities and skills they need to be successful in their chosen careers. The possibilities for academic and research-related careers are ever changing; as such, we strive to prepare postdoctoral fellows for these possibilities. In doing so, the OPE is dedicated to making UAB the first choice among postdoctoral fellows as a place to work, live and succeed. (http://www.postdocs.uab.edu/)

EQUIPMENT

Not Applicable.

Research Training Program (RTP) Advisory Committees

RTP Internal Advisory Committee

An Internal Advisory Committee will meet annually to review progress and make recommendations to the Program Director, Associate Program Directors, and the Executive Committee. The Research Training Program Internal Advisory Committee will be comprised of five permanent members, including the following:

Laura B. Hughes, MD, MSPH - Associate Professor, UAB Division of Clinical Immunology and Rheumatology. Director, Rheumatology Fellowship Training Program

Randy Q. Cron, MD, PhD – Professor and Director, Division of Pediatric Rheumatology, UAB Department of Pediatrics. Director of Pediatric Rheumatology Fellowship Training Program

Robin G. Lorenz, MD, PhD – Professor of Pathology. Director, Medical Scientist Training (MD/PhD) Program

Lisa M. Schwiebert, PhD - Professor of Cell, Developmental, and Integrative Biology. Associate Dean for Postdoctoral Education, UAB School of Medicine, Director, UAB Office of Postdoctoral Education

Robert P. Kimberly, MD – Howard Holley Professor of Medicine, UAB Division of Clinical Immunology and Rheumatology. Senior Associate Dean, Clinical and Translational Research. Director, Center for Clinical and Translational Science

In addition, there will be a set of rotating members, each serving a two year term on the IAC. These members will be chosen from among the following faculty members:

Majd Zayzafoon, MD, PhD – Associate Professor of Pathology. Former Director of the UAB Center for Metabolic Bone Disease.

Amie Brown McLain, MD – Professor and Chair, Department of Physical Medicine & Rehabilitation

Frances E. Lund, PhD - Charles H. McCauley Professor and Chair, UAB Department of Microbiology

Shawn R. Gilbert, MD – Associate Professor, Division of Orthopaedic Surgery. Chair, Orthopaedic Research Committee

Donna K. Arnett, PhD, MSPH – Professor and Chair, Department of Epidemiology, UAB School of Public Health

Mona Fouad, MD – Professor and Director, Division of Preventive Medicine; Director, UAB Minority Health & Health Disparities Research Center; Senior Associate Dean for Diversity and Inclusion, School of Medicine

At the annual meeting of the Internal Advisory Committee, there will be presentations from the Director and other members of the Executive Committee on the applicant pool, selection process (including success at recruiting underrepresented minorities), review of feedback from participants, review of progress, publications, and other benchmarks and milestones of success. The IAC will provide a brief written report to the Program Director which outlines perceived strengths, weaknesses, and suggestions for improvements to the Research Training Plan.

RTP External Advisory Committee

We propose a separate External Advisory Committee and will constitute that committee at the appropriate time. The External Advisory Committee will be constituted from PIs of other

longstanding T32 programs focused on rheumatic and musculoskeletal diseases, such as those at Yale University; Hospital for Special Surgery; Washington University; University of Colorado; or Johns Hopkins University. We anticipate the External Advisory Committee would be composed of ~4 members and would meet three times during the proposed project period. The first meeting, occurring ~6-12 months after the start of the project period, will review the UAB T32 proposal that was submitted, including the critique of the application by the study section.

The goal of this meeting is to seek EAC counsel in identifying key issues and opportunities for the entire project period and in formulating a plan to address them. The second meeting, occurring ~24-30 months after the start of the project period, will review progress in implementing the overall plan for the entire project period. A third meeting, occurring ~42-48 months after the start of the project period, will again review progress and identify the areas of greatest opportunity for future activities and in positioning the training program for its next round of competitive extramural review.

OMB Number: 4040-0001
Expiration Date: 06/30/2016

RESEARCH & RELATED Senior/Key Person Profile (Expanded)

PROFILE - Project Director/Principal Investigator

Prefix:	First Name*: S. Louis	Middle Name	Last Name*: Bridges, Jr.	Suffix: MD, PhD

Position/Title*:	Professor
Organization Name*:	University of Alabama at Birmingham
Department:	Clin Immunology/Rheumatology
Division:	Medicine
Street1*:	1720 2nd Avenue South
Street2:	SHEL 176
City*:	Birmingham
County:	Jefferson
State*:	AL: Alabama
Province:	
Country*:	USA: UNITED STATES
Zip / Postal Code*:	352942182

Phone Number*: 2059344616 Fax Number: 2059341564 E-Mail*: lbridges@uab.edu

Credential, e.g., agency login: BRIDGESL

Project Role*: PD/PI Other Project Role Category:

Degree Type: MD, PhD Degree Year: 1984, 1995

	File Name
Attach Biographical Sketch*:	1234-Bridges, S. Louis.pdf
Attach Current & Pending Support:	

Funding Opportunity Number: PA-14-015 . Received Date: 2015-05-26T10:25:26.000-04:00

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Bridges, Stanley Louis (Jr.)

eRA COMMONS USER NAME (credential, e.g., agency login): BRIDGESL

POSITION TITLE: *Anna Lois Waters* Professor of Medicine and Microbiology; Director, Division of Clinical Immunology and Rheumatology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Notre Dame, Notre Dame, IN	B.S.	05/80	Pre-Professional Studies
LSU School of Medicine, New Orleans, LA	M.D.	05/84	Medicine
Univ Texas Medical Branch, Galveston, TX	Residency	06/88	Internal Medicine
Univ Alabama at Birmingham, Birmingham, AL	Fellowship	06/91	Rheumatology
Univ Alabama at Birmingham, Birmingham, AL	Ph.D.	12/95	Microbiology

A. Personal Statement

I have the training, expertise, and motivation needed to successfully lead the training grant proposed in this application. My training includes clinical medicine, rheumatology, and immunology. My research experience includes lab-based research (immunoglobulin gene expression and autoantibodies in rheumatoid arthritis [RA]); observational clinical studies/clinical trials; genetics and pharmacogenetics; and biomarkers and biorepositories. My research program focuses on pathogenesis and treatment of RA, including immunogenetics, autoantibodies, and biomarkers of treatment response. I have had active NIH support throughout my career. My broad experience and expertise has enabled me to serve as PI of NIH program grants such as the UAB Multidisciplinary Clinical Research Center, and the UAB Center of Research Translation. I lead the pilot and feasibility (P&F) studies of the UAB Rheumatic Diseases Cores Center, which reviews and oversees competitive applications for Pilot & Feasibility studies. I have extensive experience in peer review, project administration, budget management, and multi-investigator collaborative studies. The current application builds logically on my prior work and current leadership position, as I direct the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center. I serve as Chair of the American College of Rheumatology's Committee on Research and Chair of the NIH Arthritis, Musculoskeletal, and Skin (AMS) Study Section. I am a member of the Board of Directors of the Rheumatology Research Foundation, and the Arthritis Foundation's Scientific Discovery Advisory Committee. Since joining the UAB faculty, I have served on the qualifying exam or PhD committees of 15 graduate students, and have mentored or co-mentored over 50 trainees, including undergraduate, medical, PhD, and MD/PhD students, postdoctoral fellows, medical residents, rheumatology fellows, and visiting research scholars. I have played an important role in development of faculty at UAB. My considerable experience and expertise in clinical and translational research in rheumatic diseases, in mentoring trainees and junior faculty, including those in pediatrics, have helped me to be very well prepared to serve as Director of this T32 training grant entitled, "Training Program in Rheumatic and Musculoskeletal Diseases Research."

B. Positions and Honors

Positions and Employment

1991-1995 Assistant Professor (non-tenure track), Department of Medicine, UAB, Birmingham, AL
1995-2000 Assistant Professor, Departments of Medicine and Microbiology, UAB, Birmingham
2000-2007 Associate Professor, Departments of Medicine and Microbiology, UAB, Birmingham
2007-present Professor, Departments of Medicine and Microbiology, UAB, Birmingham, AL
2008-present Director, UAB Division of Clinical Immunology and Rheumatology, Birmingham
2009-2014 *Marguerite Jones Harbert-Gene V. Ball, MD* Endowed Chair in Rheumatology
2013-present Director, UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
2014-present *Anna Lois Waters* Endowed Chair in Rheumatology

Other Experience and Professional Memberships

1995 - President, Alabama Society for Rheumatic Diseases. 2000 - Southern Society for Clinical Investigation. 2004 - Fellow, American College of Physicians. 2006-2010 - Member, NIH Arthritis, Connective Tissue, and Skin (ACTS) Study Section. 2005-2007 - National Medical and Scientific Advisory Council, Arthritis Foundation. 2010-present - Co-Editor, *Arthritis & Rheumatology*. 2013-2014 - Chair, American College of Rheumatology Division Directors Task Force. 2013-2016 - Chair, NIH Arthritis, Musculoskeletal and Skin (AMS) Diseases Study Section. 2014-2017 - Chair, American College of Rheumatology Committee on Research. 2014-present - Member, Biorepositories Task Force, Patient Centered Outcomes Research Institute (PCORI) National Clinical Research Network. 2015-2016 – Member, Arthritis Foundation Scientific Discovery Advisory Committee. 2015 – Ad hoc member, NIAMS Board of Scientific Counselors

Honors

1976 - Notre Dame Scholar, University of Notre Dame. 1982 - Aesculapian Medical Honor Society. 1990 - Upjohn Young Investigator Award. 1991 - Henry Christian Award, American Federation for Clinical Research. 1994, 1995, 1996 - Young Faculty Award, Southern Section, American Federation for Clinical Research. 1998 - Outstanding Teacher in Rheumatology, UAB Department of Medicine. 2003-present - Best Doctors in America. 2008 - Max Cooper Award for Research Excellence, UAB Department of Medicine. 2009 - Henry Kunkel Society. 2012 - Sam Brown Bridge Builder Award, UAB School of Public Health. 2014-present - Castle Connolly Top Doctors.

C. Contributions to Science

In the publications below, trainees I mentored are indicated in italics and underlined font.

1. My early research efforts sought to answer the question of whether B lymphocytes infiltrating synovial tissue of rheumatoid arthritis (RA) were polyclonal or antigen-specific. Through detailed analysis of immunoglobulin genes expressed in RA synovial tissue of affected patients, my colleagues and I found clonal expansion of kappa light chains with long CDR3 regions, suggesting antigen-specific selection. During this time, I was a rheumatology fellow and graduate student, and these findings were the basis of my PhD thesis. As I transitioned this work to independence, I reported findings in the lambda light chain repertoire suggesting systemic antigen selection. I then went on to analyze ectopic germinal center like structures in RA synovium and found expression of recombination activating genes and terminal deoxynucleotidyl transferase, along with evidence of secondary immunoglobulin gene rearrangements, suggesting receptor revision locally to either generate, or attempt to avoid, autoreactive antibodies.
    a. Lee SK, **Bridges SL Jr.**, Koopman WJ, and Schroeder HW Jr. Evidence of antigen receptor-influenced oligoclonal B lymphocyte expansion in the synovium of a patient with longstanding rheumatoid arthritis. *Journal of Clinical Investigation* 93:361-70, 1994. PMCID: PMC293784.
    b. **Bridges SL Jr.**, Lee SK, Johnson ML, Lavelle JC, Fowler PG, Koopman WJ, and Schroeder HW Jr. Somatic mutation and CDR3 lengths of immunoglobulin kappa light chains expressed in patients with RA and normal individuals. *J Clin Invest* 96:831-41, 1995. PMCID: PMC185269.
    c. **Bridges SL Jr.** Frequent N addition and clonal relatedness among immunoglobulin lambda light chains expressed in rheumatoid arthritis synovia and PBL, and the influence of Vlambda gene segment utilization on CDR3 length. *Molecular Medicine* 4:525-53, 1998. PMCID: PMC2230400.
    d. *Zhang Z*, Wu X, *Limbaugh BH*, and **Bridges SL Jr.** Expression of recombination activating genes and terminal deoxynucleotidyl transferase, and secondary rearrangement of immunoglobulin kappa light chains in rheumatoid arthritis synovial tissue. *Arthritis & Rheumatism* 44:2275-84, 2001.

2. In addition to the B lymphocyte work above, I led major efforts to understand the role of genetics in susceptibility to RA in African-Americans, a large minority group underrepresented in clinical research. As PI and Director of the NIH-funded CLEAR (Consortium for the Longitudinal Evaluation of African-Americans with RA) Registry, I oversaw enrollment, data and sample collection from 1,100 African-Americans with RA and 550 controls at 5 sites in the southeastern US. This effort has led to >30 papers on RA in African-Americans, many focused on genetics. We reported that RA is associated with the HLA- DRB1 locus through genetic admixture with individuals with individuals of European ancestry. Unlike the European population, amino acid position 57 of HLA-DRB1 alleles was associated with RA in African Americans, but positions 71 and 74 were not. We also discovered that Asp11 (which is not associated with RA in European ancestry) corresponding to the classical allele *09:01, confers risk for

RA in African- Americans. We have also shown that most non-HLA polymorphisms associated with RA in other ethnicities contribute to susceptibility to RA in African-Americans, but PTPN22 is a notable exception. We have shown association of a variant in RANKL with age of onset. Data and samples are shared with multiple investigators not affiliated with CLEAR, leading to additional insights on RA.

a. *Hughes LB, Morrison D, Kelley JM, Padilla MA, Vaughan LK*, . . . , Patterson N, Reich D, **Bridges SL Jr.** The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African-Americans through European genetic admixture. *Arthritis Rheum* 58:349-58, 2008.
b. *Hughes LB, Reynolds RJ*, . . . Plenge RM, **Bridges SL Jr.** Most common SNPs associated with rheumatoid arthritis in subjects of European ancestry confer risk of rheumatoid arthritis in African- Americans. *Arthritis Rheum* 2010 Dec;62(12):3547-53. PMCID: PMC3030622.
c. Tan W, Wu H, Zhao J, Derber LA, . . . Jonas BL, Holers VM, Glass DN, Chen PP, **Bridges SL Jr.**, Weinblatt ME, Paulus HE, Tsao BP. A functional RANKL polymorphism associated with younger age at onset of rheumatoid arthritis. *Arthritis Rheum*. 62, 2864-75, 2010. PMCID: PMC2944013.
d. *Reynolds RJ, Ahmed AF, Danila MI, Hughes LB*, CLEAR Investigators, Gregersen PK, Raychaudhuri S, Plenge RM, **Bridges SL Jr.** HLA-DRB1 rheumatoid arthritis risk in African Americans at multiple levels: Hierarchical classification systems, amino acid positions and residues. *Arthritis Rheumatol* 2014 Dec; 66(12):3274-82. PMCID: PMC4273668

3. In addition to studying the genetic influences on susceptibility, we have also studied in detail clinical phenotypes such as radiographic severity and extra-articular manifestations of RA in African-Americans. We made the novel observations that generalized bone loss; carboxypeptidase B; and expression of genes encoding receptors for interferon-gamma are associated with radiographic severity of RA, and that SNPs in the IL-4 receptor gene are associated with the presence of rheumatoid nodules.
    a. *Zhang J*, Redden DT, . . . , Mikuls TR, **Bridges SL Jr.** Generalized bone loss as a predictor of 3- year radiographic damage in African American patients with recent-onset rheumatoid arthritis. *Arthritis Rheum*, 62:2219-26, 2010. PMCID: PMC2922001.
    b. *Burgos PI*, Causey ZL, . . ., van der Heijde DM, Alarcón GS, **Bridges SL Jr.** Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Res Ther*, 2010 May 5;12(3):R75. PMCID: PMC2911851.
    c. Song JJ, Hwang I, Cho KH,. . ., Lee DM, **Bridges SL Jr.**, Gregersen PK, Leung LL, Robinson WH. Plasma carboxypeptidase B downregulates inflammatory responses in autoimmune arthritis. *J Clin Invest*, 121(9):3517-27, 2011. PMCID: PMC3163960.
    d. *Tang Q, Danila MI, Parks L, Baker B*, . . . ,van der Heijde DM, Conn DL, Jonas BL, Callahan LF, Moreland LW, Cui X, **Bridges SL Jr.** Expression levels of interferon-gamma receptor genes in peripheral blood cells are associated with rheumatoid arthritis and its radiographic severity in African Americans. *Arthritis Rheumatol*, 2015 Feb 23. doi: 10.1002/art.39056.

4. In addition to these contributions related to RA in African-Americans, my research efforts have contributed substantially to large national and international collaborative efforts to understand RA genetics. I led UAB's efforts to recruit patients into the North American Rheumatoid Arthritis Consortium. Through the biorepository created for the TEAR trial, we have contributed to larger efforts which identified associations of RA with REL, and a seminal paper in *Nature*, which identified 42 novel RA risk loci. This analysis also identified 98 biological candidate genes and suggested that drugs approved for other indications may be repurposed for the treatment of RA.
    a. Jawaheer D, Seldin MF, Amos CI, . . . **Bridges SL Jr.**, Pisetsky DS, Ward R, Kastner DL, Wilder RL, Pincus T, Callahan LF, Flemming D, Wener MH, and Gregersen PK for NARAC. A genome- wide screen in multiplex rheumatoid arthritis families suggests genetic overlap with other autoimmune diseases. *Am J Hum Genet* 68:927-36, 2001. PMCID: PMC1275647.
    b. Gregersen PK, Amos CI, Lee AT, Lu E, Remmers EF, Kastner DL, Seldin MF, Criswell LA, Plenge RM, Holers VM, Mikuls T, Sokka T, Moreland LW, **Bridges SL Jr.**, Xie G, Begovich AB, Siminovitch KA. REL, encoding a member of the NF-kappaB family of transcription factors, is a newly defined risk locus for rheumatoid arthritis. *Nature Genetics*, 41(7):820-3, 2009. PMCID: PMC2705058.
    c. *Govind N*, Choudhury A, Hodkinson B, Ickinger C, *Frost J*, Lee A, Gregersen PK, *Reynolds RJ*, **Bridges SL Jr.**, Hazelhurst S, Ramsay M, Tikly M. Immunochip identifies novel and replicates known genetic risk loci for rheumatoid arthritis in black South Africans. Mol Med.

2014 Aug 14;20:341-9. PMCID: PMC4153842

d. Okada Y, Wu D, Trynka G, . . . , **Bridges SL Jr.**, . . . , Momohara S, Matsuda F, Yamamoto K, Plenge RM. Genetics of rheumatoid arthritis contributes to biology and drug discovery. *Nature*, 2014 Feb 20;506(7488):376-81. PMCID: PMC3944098.

5. I have also led multi-investigator efforts to identify pharmacogenetic and other biomarkers of response to treatment to methotrexate and biologic agents in RA. We reported a role for HLA-DRB1 and genetic variants in treatment response, an influence of MTHFR variants. More recently, using data from the Treatment of Early Aggressive RA (TEAR) Trial, we identified variants in CD84 and eight other genetic loci associated with response to anti-TNF treatment. Network analysis indicated strong involvement of biological processes underlying inflammatory response and cell morphology. These findings are the underpinnings of personalized, precision medicine in RA.
    a. Criswell LA, Lum RF, Turner KN, Woehl B, Zhu Y, Wang J, Tiwari HK, Edberg JC, Kimberly RP, Moreland LW, Seldin MF, **Bridges SL Jr.** The influence of genetic variation in the HLA-DRB1 and TNF-LTA regions on response to treatment of early rheumatoid arthritis with methotrexate or etanercept. *Arthritis Rheum* 50: 2750-6, 2004.
    b. *Hughes LB*, Beasley TM, Patel H, . . . , Alarcón GS, **Bridges SL Jr.** Racial or ethnic differences in allele frequencies of single nucleotide polymorphisms in the methylenetetrahydrofolate reductase gene and their influence on response to methotrexate in rheumatoid arthritis. *Ann Rheum Dis* 65:1213-8, 2006. PMCID: PMC1798268.
    c. Cui J, Stahl E, Saevarsdottir S, . . . , **Bridges SL Jr.**, . . . ,Coenen MJH, Karlson EW, Plenge RM. Genome-wide association study and gene expression analysis identifies CD84 as a predictor of response to etanercept therapy in rheumatoid arthritis. *PLoS Genetics*, 2013 Mar;9(3):e1003394. PMCID: PMC3610685.
    d. Umicevic Mirkov M, Cui J, Vermeulen SH, . . ., **Bridges SL Jr.**, . . . ,Radstake TR, van Riel PL, Scheffer H, Franke B, Brunner HG, Plenge RM, Gregersen PK, Guchelaar HJ, Coenen MJ. Genome-wide association analysis of anti-TNF drug response in patients with rheumatoid arthritis. *Ann Rheum Dis*. 2013 Aug;72(8):1375-81. PMCID: PMC4169706.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/s.bridges.1/bibliography/40809066/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

NIH R01 HD084124 MM Bamman (Contact PI); SL Bridges, Jr. PI (Multiple PI) 04/15/15 - 02/28/20
Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement. Goals: Aim 1: To determine the effects of 16 week of progressive resistance exercise training plus adjunctive functional mobility training (PRT+FM) vs. usual care after elective total hip (THA) or knee (TKA) arthroplasty on muscle mass, performance, and mobility function. Aim 2: To determine whether muscle inflammation susceptibility status modifies the effects of these rehabilitation regiments after THA/TKA. Aim 3. To determine the long-term impact of 16 week PRT+FM by re-assessing outcomes at 6 months and 1 year.

NIH R01 AR062376 SL Bridges, Jr. (PI) 09/01/11 - 08/31/15
Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis. Goals: 1) To examine associations of serum ACPA to a variety of specific citrullinated epitopes and of serum anti-PAD4 Abs with clinical, genetic, and radiographic features in Af-Amer with anti-CCP+ RA. 2) To examine associations of periodontitis and exposure to *P. gingivalis* with serum ACPA profiles and anti-PAD4 Abs in Af-Amer with anti-CCP+ and anti-CCP-neg RA. 3) To compare the degree of clonality and mutation patterns of peripheral blood B cells from Af-Amer with and without anti-CCP Ab, ACPA, anti-PAD4 Abs; and to assess the reactivity of antibodies from citrullinated protein-specific and PAD4-specific B lymphocytes in RA.

NIH P50 AR060772-01A1 KG Saag (Contact PI); SL Bridges, Jr., PI (Multiple PI) 09/01/12 - 08/31/17
Center of Research Translation (CORT) in Gout and Hyperuricemia - Administrative Core
The overall goal of our CORT is to improve the health of patients with gout and hyperuricemia by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in translational investigation and to educate clinical investigators through an enrichment program. Our 3 innovative projects hold the promise of significant improvements in our understanding of the pathogenesis of gout, hyperuricemia, and co-morbid conditions, and better ways to treat or prevent gout and hyperuricemia.

CORT Project 2: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments JA Singh, PI, SL Bridges, Jr., Investigator. Specific Aim 1: To identify key patient, provider, and health system factors associated with achieving and maintaining serum urate below 6 mg/dl ("target") in gout patients taking allopurinol. Specific Aim 2: To characterize the epidemiology and risk factors for major adverse events (AEs) associated with the use of allopurinol and colchicine for treatment of gout.

NIH P30 AR048311JD Mountz, PI, SL Bridges, Jr., Investigator and Associate Director 09/01/12 - 08/31/17
NIH/NIAMS Rheumatic Diseases Core Center: Administrative Core. Goals: The overall goal of the UAB-RDCC is to stimulate collaborative and innovative interdisciplinary research to enhance our understanding of rheumatic diseases. Our specific aims are 1) to facilitate rheumatic disease research through Research Core facilities; 2) to support outstanding P&F projects drawing on the RDCC research base and using innovative tools and approaches; and 3) to provide career development and career enrichment activities for our investigators.

NIH P60 AR064172 SL Bridges, Jr., Contact PI, KG Saag, PI (Multiple PI) 09/16/13 - 07/31/18
NIH/NIAMS Multidisciplinary Clinical Research Center. Role: Program Director/PI
The UAB MCRC promotes research related to arthritis and musculoskeletal diseases. A Methodology Core is comprised of experts in biostatistics, statistical genetics and bioinformatics. An Administrative Core promotes scientific development through new techniques and nurtures new faculty in arthritis research. There are 2 projects: 1. Facilitating Treat-to-Target Strategies Using Novel Health Technology with Decision Support (Curtis); 2. Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis (Elson).

PCORI S Ginsburg, PI, JR Curtis, Site PI; SL Bridges, Jr., Investigator 03/12/14 - 09/11/15
ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)
We are testing methods for collecting biological specimens to create a biorepository for patient-centered outcomes research. In a pilot study, 50 participants will be assigned to have blood samples obtained using one of the four methods, for a total of 200 participants.

NIH UM1 AR065705 (JR Curtis, PI, SL Bridges, Jr. - Investigator) 09/01/14 - 08/30/19
NIH/NIAMS Safety and Effectiveness of Live Zoster Vaccine in Anti-TNF Users (VERVE)
A live attenuated vaccine reduces herpes zoster (HZ) morbidity, but is contraindicated in patients on immunosuppressive drugs. We will conduct the Varicella zostER VaccinE (VERVE) trial, a randomized, double-blind, placebo-controlled large pragmatic trial to evaluate the immunogenicity, safety, and effectiveness of the live HZ vaccine in patients receiving anti-TNF therapy.

NIH UH2 AR067687 - RM Pope, PI, SL Bridges, Jr. – Investigator and Site PI 09/26/14 - 08/31/15
NIH/NIAMS Rheumatoid Arthritis Synovial Tissue Network (REASON)
We have assembled a consortium of leading academic rheumatology groups which includes UAB, Columbia, Mayo Clinic, Washington University, Michigan, and Northwestern to form the REASON Network. We will create a new generation of US rheumatologists who will perform ultrasound guided synovial biopsies from RA patients, with tissues used to identify novel pathways and biomarkers that might predict therapeutic response.

Completed Research Support (within the past three years)

NIH/NIAMS R01 AR057202 SL Bridges, Jr. (PI) 09/25/2009 - 07/31/2014 NCE
Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis. Goals: 1) to perform a GWAS in 800 African-Americans (Afr-Am) with anti-CCP + RA and 800 controls to identify novel genetic associations; 2) to replicate these putative associations susceptibility to CCP+ RA among Afr-Am in independent set of 800 African-American CCP+ RA patients and 800 matched controls; and 4) To further characterize genetic regions associated RA in African-Americans and to analyze genome-wide associations with radiographic severity; BMD in early RA and healthy controls; and eQTLs of genes expressed in PBMC, particularly those associated with radiographic severity.

NIH/NIAMS P60 AR048095 RP Kimberly, PI, SL Bridges, Jr., Investigator 09/01/08 - 06/30/13
Multidisciplinary Clinical Research Center (MCRC) Administrative Core. The UAB MCRC promotes research related to the causes, diagnoses, treatments and care of patients with arthritis and musculoskeletal diseases. Project 1: Genetic and Molecular Markers of Methotrexate Efficacy and Toxicity in Early RA. (DK Arnett, PI, SL Bridges, Jr., Investigator).

MCRC Project 3: Predictors of RA Severity in African-Americans. (SL Bridges, Jr., PI)

OMB Number: 0925-0001

PHS 398 TRAINING BUDGET, Period 1

Organizational DUNS: 0636907050000 Budget Type: ● Project ❍ Subaward/Consortium

Organization Name: University of Alabama at Birmingham

Start Date: 04-01-2016 End Date: 03-31-2017

A. Stipends, Tuition/Fees

Number of Trainees

Full Time	Short Term		Stipends Requested ($)	Tuition/Fees Requested ($)
		Undergraduate:		
		Number Per Stipend Level: First-Year/Soph. / Junior/Senior		
2		Predoctoral: Single Degree		
		Dual Degree		
2		Total Predoctoral		
		Postdoctoral: Number Per Stipend Level: 0 1 2 3 4 5 6 7		
2		Non-degree Seeking: 1 1		
		Degree Seeking		
2		Total Postdoctoral: 1 1		
		Other:		
		Totals		
		Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
1. MTDC	8.00		
2.			
		Total Indirect Costs Requested	

E. Total Direct and Indirect Costs Requested (C + D)

F. Budget Justification 1258-BUDGETJUSTIFICATION.pdf

Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

PHS 398 TRAINING BUDGET, Period 2

Organizational DUNS: 0636907050000 Budget Type: ● Project ❍ Subaward/Consortium

Organization Name: University of Alabama at Birmingham

Start Date: 04-01-2017 End Date: 03-31-2018

A. Stipends, Tuition/Fees

Number of Trainees

Full Time	Short Term		Stipends Requested ($)	Tuition/Fees Requested ($)
		Undergraduate:		
		Number Per Stipend Level: First-Year/Soph. / Junior/Senior		
2		Predoctoral: Single Degree		
		Dual Degree		
2		Total Predoctoral		
		Postdoctoral: Number Per Stipend Level: 0 1 2 3 4 5 6 7		
2		Non-degree Seeking: 1 1		
		Degree Seeking		
2		Total Postdoctoral: 1 1		
		Other:		
		Totals		
		Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
1. MTDC	8.00		
2.			
		Total Indirect Costs Requested	

E. Total Direct and Indirect Costs Requested (C + D)

F. Budget Justification 1258-BUDGETJUSTIFICATION.pdf

Tracking Number: GRANT11914170 Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

PHS 398 TRAINING BUDGET, Period 3

Organizational DUNS: 0636907050000 Budget Type: ● Project ❍ Subaward/Consortium

Organization Name: University of Alabama at Birmingham

Start Date: 04-01-2018 End Date: 03-31-2019

A. Stipends, Tuition/Fees

Number of Trainees

Full Time	Short Term		Stipends Requested ($)	Tuition/Fees Requested ($)
		Undergraduate:		
		Number Per Stipend Level: First-Year/Soph. / Junior/Senior		
3		Predoctoral: Single Degree		
		Dual Degree		
3		Total Predoctoral		
		Postdoctoral: Number Per Stipend Level: 0 1 2 3 4 5 6 7		
3		Non-degree Seeking: 1 / 3 / 6		
		Degree Seeking		
3		Total Postdoctoral: 1 / 3 / 6		
		Other:		
		Totals		
		Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
1. MTDC	8.00		
2.			
		Total Indirect Costs Requested	

E. Total Direct and Indirect Costs Requested (C + D)

F. Budget Justification 1258-BUDGETJUSTIFICATION.pdf

Tracking Number: GRANT11914170 Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

PHS 398 TRAINING BUDGET, Period 4

Organizational DUNS: 0636907050000 Budget Type: ● Project ❍ Subaward/Consortium

Organization Name: University of Alabama at Birmingham

Start Date: 04-01-2019 End Date: 03-31-2020

A. Stipends, Tuition/Fees

Number of Trainees

Full Time	Short Term		Stipends Requested ($)	Tuition/Fees Requested ($)
		Undergraduate:		
		Number Per Stipend Level: First-Year/Soph. / Junior/Senior		
3		Predoctoral: Single Degree		
		Dual Degree		
3		Total Predoctoral		
		Postdoctoral: Number Per Stipend Level: 0 1 2 3 4 5 6 7		
3		Non-degree Seeking: 1 1 1		
		Degree Seeking		
3		Total Postdoctoral: 1 1 1		
		Other:		
		Totals		
		Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
1. MTDC	8.00		
2.			
		Total Indirect Costs Requested	

E. Total Direct and Indirect Costs Requested (C + D)

F. Budget Justification 1258-BUDGETJUSTIFICATION.pdf

PHS 398 TRAINING BUDGET, Period 5

Organizational DUNS: 0636907050000 Budget Type: ● Project ❍ Subaward/Consortium

Organization Name: University of Alabama at Birmingham

Start Date: 04-01-2020 End Date: 03-31-2021

A. Stipends, Tuition/Fees

Number of Trainees

Full Time	Short Term		Stipends Requested ($)	Tuition/Fees Requested ($)
		Undergraduate:		
		Number Per Stipend Level: First-Year/Soph. / Junior/Senior		
3		Predoctoral: Single Degree		
		Dual Degree		
3		Total Predoctoral		
		Postdoctoral: Number Per Stipend Level: 0 1 2 3 4 5 6 7		
3		Non-degree Seeking: 1 1 1		
		Degree Seeking		
3		Total Postdoctoral: 1 1 1		
		Other:		
		Totals		
		Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Indirect Costs

Indirect Cost Type	Indirect Cost Rate (%)	Indirect Cost Base ($)	Funds Requested ($)
1. MTDC	8.00		
2.			
		Total Indirect Costs Requested	

E. Total Direct and Indirect Costs Requested (C + D)

F. Budget Justification 1258-BUDGETJUSTIFICATION.pdf

Tracking Number: GRANT11914170 Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

BUDGET JUSTIFICATION

With guidance from **NOT-OD-15-048** on stipend, tuition/fees and other budgetary levels, the following budget justification is provided:

A. STIPENDS, TUITION/FEES

Undergraduate

None

Predoctoral

Three predoctoral candidates will be competitively identified and appointed on an annual basis:

	Number Requested	Stipend (each)	Total Stipends	Total Tuition / Fees
Year 1	2			
Year 2	2			
Year 3	3			
Year 4	3			
Year 5	3			

Graduate School (9 semester hours per semester; 27 credit hrs/academic year); 2016 – 2017
1st semester hour:
Additional semester hours:
Fees:
Total per Year:

Per NIH guidelines, 60% of this cost equates to $ per student.

Postdoctoral

Stipend

Year 1 PGY	Stipend	Year 2 PGY	Stipend	Year 3 PGY	Stipend	Year 4 PGY	Stipend	Year 5 PGY	Stipend
1		2		3					
4		5		6					
				0		1		2	
						3		4	
						5		6	
TOTAL									

Tuition and Fees

The Post-Doctoral Candidates receiving a training grant appointment will be expected to enroll in a T32 specific curriculum in addition to Bioinformatics, Statistical Genetics, and Scientific Integrity coursework. Examples of possible courses are below:

Courses in the Graduate School, Joint Health Sciences and School of Public Health tuition and course fees (4 semester hours per academic year); 2016 – 2017

1st semester hour:	$614
Additional semester hours:	$389 each
Fees:	$50 in course/laboratory fees/semester
Total per Year:	$1,831/year

Per NIH guidelines, 60% of this cost equates to $1,099 per student; $2,198/year for Years 1-2; $3,297/year for Years 3-5.

Advanced Special Topics Course in Metabolomics (GBSC 724/748.): 4 hours – Joint Health Sciences

The goal of the course is to provide training on (1) the new vision of the chemical composition of the metabolome, (2) its impact on phenotypes in normal health and disease, (3) how to design experiments that (a)reduce systematic variation and (b) deal with the effects of the microbiome, (4) recovery of the metabolome from body fluids/excreta, cells and tissues, (5) analytical methods used in metabolomics, (6) post-acquisition data processing and univariate and multivariate statistical analysis, (7) metabolite confirmation, (8) unknown (new) metabolite identification, (9) pathway analysis, (10) targeted quantitative analysis of specific pathways, (11) use of stable-isotopically labeled precursors to measure pathway dynamics, (12) metabolomics in human and animal models of disease (atherosclerosis, cancer, diabetes, eye diseases, immune diseases and neurodegeneration), (13) metabolomics in situ (imaging mass spectrometry and direct analysis in the clinic and the operating room) and (14) integration of metabolomics with other 'Omics (genomics, transcriptomics and proteomics).

The course will have practical aspects (students will be given metabolic data sets to process) as well as an appreciation of the literature on metabolomics. The latter will involve presentation of papers by the participating students. The last part of the course will involve the use of metabolomics by UAB investigators. I plan to take this course in Year 2 (Activities Planned Under this Grant) as this will be prior to my metabolomics studies and thus will provide essential skills and knowledge in setting up these experiments.

Principles of Scientific Integrity (GRD 717) 3 hours – Graduate School

Format: The organization of the course is through a new pedagogic approach, called “Team Based Learning.” Team based learning organizes the course so that the materials that normally would be presented in a lecture format are made available approximately one week before the class meeting. Class time is spent in teams of 6 to 7 students each who will meet each week to discuss the course materials.

Subject Matter: Includes the nature, extent and causes of fraud in science; UAB policies on fraud; ideals of good science; the responsibilities of authorship and peer review; conflict of interest; mentor/mentee relationships; bias and sloppy practices; responsible use of the press; potential problems raised by the commercialization of research; scientists as public policy advisors; and ethical issues involved in animal experimentation and in clinical trials. Famous cases from the history of science as well as fictional case studies are used to involve students in discussion of the above issues. Readings come from multiple different scientific publications, as well as selected cases from “Classic Cases in Medical Ethics” by UAB faculty member Gregory Pence.

Faculty Participation: The primary instructor is Jeff Engler, PhD, and Associate Dean for Academic Affairs, and UAB’s Research Integrity Office. Other faculty members provide content specific contributions as in-class guest facilitators.

Frequency and Duration of Instruction: This course is over the course of a semester offering 48 contact hours of instruction. Attendance is required weekly over the course of the semester for 2.5 hours at each class meeting to discuss assigned course work.

BST 626L Data Management and Reporting with SAS - 3.0hrs – School of Public Health

BST 626L Data Management and Reporting with SAS Laboratory - 0hrs

This course is a hands-on exposure to data management and report generation with one of the most popular statistical software packages. Concurrent registration in BST 626 and BST 626L is required.

B. OTHER DIRECT COSTS

Trainee Travel

Trainee travel is budgeted @ $1,500 per year, per candidate, for a total of $6,000/year for Years 1-2; $9,000/year for Years 3-5.

Training Related Expenses

Training Related Expenses to help defray the costs of other research training expenses, such as health insurance, staff salaries, consultant costs, equipment, research supplies, seminars, and faculty/staff travel directly related to the research training program are requested in the amount of $4,200 per pre-doctoral trainee per year ($8,400/year for Years 1-2; $12,600/ year for Years 3-5) and $7,850 per post-doctoral trainee per year ($15,700/year for Years 1-2; $23,550/year for Years 3-5).

Indirect costs

Indirect Costs (also known as Facilities & Administrative [F&A] Costs) are reimbursed at 8% of modified total direct costs (exclusive of tuition and fees, consortium costs in excess of $25,000, and expenditures for equipment), rather than on the basis of a negotiated rate agreement.

PHS 398 TRAINING BUDGET, Cumulative Budget

A. Stipends, Tuition/Fees

		Stipends Requested ($)	Tuition/Fees Requested ($)
Undergraduate:			
Predoctoral:	Single Degree		
	Dual Degree		
	Total Predoctoral		
Postdoctoral:	Non-Degree Seeking		
	Degree Seeking		
	Total Postdoctoral		
Other:			
	Totals		
	Total Stipends + Tuition/Fees Requested		

B. Other Direct Costs

	Funds Requested ($)
Trainee Travel	
Training Related Expenses	
Total Direct Costs from R&R Budget Form (if applicable)	
Consortium Training Costs (if applicable)	
Total Other Direct Costs Requested	

C. Total Direct Costs Requested (A + B)

D. Total Indirect Costs Requested

E. Total Direct and Indirect Costs Requested (C + D)

Tracking Number: GRANT11914170 Funding Opportunity Number: PA-14-015. Received Date: 2015-05-26T10:25:26.000-04:00

PHS 398 Cover Page Supplement

OMB Number: 0925-0001

1. Project Director / Principal Investigator (PD/PI)

Prefix:
First Name*: S. Louis
Middle Name:
Last Name*: Bridges, Jr.
Suffix: MD, PhD

2. Human Subjects

Clinical Trial? ● No ○ Yes
Agency-Defined Phase III Clinical Trial?* ○ No ○ Yes

3. Permission Statement*

If this application does not result in an award, is the Government permitted to disclose the title of your proposed project, and the name, address, telephone number and e-mail address of the official signing for the applicant organization, to organizations that may be interested in contacting you for further information (e.g., possible collaborations, investment)?

● Yes ○ No

4. Program Income*

Is program income anticipated during the periods for which the grant support is requested? ○ Yes ● No

If you checked "yes" above (indicating that program income is anticipated), then use the format below to reflect the amount and source(s). Otherwise, leave this section blank.

Budget Period*	Anticipated Amount ($)*	Source(s)*

PHS 398 Cover Page Supplement

5. Human Embryonic Stem Cells

Does the proposed project involve human embryonic stem cells?* ● No ❍ Yes

If the proposed project involves human embryonic stem cells, list below the registration number of the specific cell line(s) from the following list: http://grants.nih.gov/stem_cells/registry/current.htm. Or, if a specific stem cell line cannot be referenced at this time, please check the box indicating that one from the registry will be used:

Cell Line(s): Specific stem cell line cannot be referenced at this time. One from the registry will be used.

6. Inventions and Patents (For renewal applications only)

Inventions and Patents*: ❍ Yes ❍ No

If the answer is "Yes" then please answer the following:

Previously Reported*: ❍ Yes ❍ No

7. Change of Investigator / Change of Institution Questions

❑ Change of principal investigator / program director

Name of former principal investigator / program director:

Prefix:

First Name*:

Middle Name:

Last Name*:

Suffix:

❑ Change of Grantee Institution

Name of former institution*:

PHS 398 Research Training Program Plan

OMB Number: 0925-0001

1. Introduction to Application (for RESUBMISSION or REVISION only)	
2. Background	1241-Background.pdf
3. Program Plan	1242-Program Plan.pdf
4. Recruitment and Retention Plan to Enhance Diversity	1243-Recruitment and Retention Plan to Enhance Diversity.pdf
5. Plan for Instruction in the Responsible Conduct of Research	1244-Plan for the Responsible Conduct of Research.pdf
6. Progress Report (for RENEWAL applications only)	
7. Human Subjects	1245-Human Subjects.pdf
8. Vertebrate Animals	1246-Vertebrate Animals.pdf
9. Select Agent Research	1247-Select Agent Research.pdf
10. Multiple PD/PI Leadership Plan (if applicable)	
11. Consortium/Contractual Arrangements	
12. Participating Faculty Biosketches	1248-PARTICIPATING FACULTY BIOSKETCHES.pdf
13. Data Tables	1249-DATA TABLES.pdf
14. Letters of Support	1250-Letters of Support.pdf
15. Appendix	1251-APPENDIX A.pdf 1252-APPENDIX B.pdf 1253-APPENDIX C.pdf 1254-APPENDIX D.pdf 1255-APPENDIX E.pdf 1256-APPENDIX F.pdf 1257-APPENDIX G.pdf

RESEARCH TRAINING PROGRAM PLAN

2. BACKGROUND

2A. Rationale

Emphasizing rheumatic and musculoskeletal diseases research, this program will train investigators in the basic mechanisms of disease pathology and in the translation of these insights to application at the bedside. To provide an effective interdisciplinary training environment, this program builds on a large infrastructure with established research programs and a longstanding history of outstanding basic, translational, and clinical research, and multidisciplinary training programs in research. See **Figure 1** for the organizational structure and support for this proposed T32 Research Training Program. Specifically, this program builds on the following:

a) the interdisciplinary translational investigative efforts supported by the University of Alabama at Birmingham (UAB) Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC), a university-wide interdisciplinary research center (UWIRC) chartered by the Board of Trustees, with a large membership of accomplished, well-funded investigators across a variety of disciplines directly relevant to rheumatic and musculoskeletal diseases;

b) the UAB Division of Clinical Immunology and Rheumatology, a strong, internationally renowned unit with substantial investigative, clinical, and educational resources within the UAB Department of Medicine/School of Medicine;

c) the UAB Division of Pediatric Rheumatology, a young but vibrant division with burgeoning investigative, clinical, and educational resources and a recently established fellowship program in Pediatric Rheumatology to provide a pipeline of academic researchers in pediatric rheumatic and musculoskeletal diseases;

d) the interdisciplinary investigative efforts supported by other UAB UWIRCs, such as the Center for Outcomes and Effectiveness Research and Education (COERE), the Center for Exercise Medicine (UCEM), and others; and other academic units and programs such as the Program in Immunology, the Department of Physical Medicine & Rehabilitation, the Division of Orthopaedic Surgery, and others;

e) the established strengths in immunology; genetics and genomics; and pathobiology and molecular medicine; within the thematically based Graduate Biomedical Sciences (GBS) program at UAB, and

f) a nationally recognized commitment to training, exemplified by our Office of Postdoctoral Education.

This training program also builds on trans-departmental initiatives in mechanisms of arthritis, autoimmunity, inflammation, bone, and musculoskeletal diseases, and state of the art translational clinical and outcomes research. An effective interdisciplinary training program requires faculty with collaborative and synergistic scientific interests and projects, as well as systematic coordination of training opportunities. There are a large number of faculty members from a diverse set of Departments and Programs (see **Table 1** and **Table 2**). Tables 7A/B show admissions and completion records for the participating departments and programs. The Research Training Program is organized into three groups of mentors: a cadre of established, extramurally (primarily NIH) funded investigators with programs focused on rheumatic and musculoskeletal diseases committed to training the next generation of rheumatic and musculoskeletal disease researchers, referred to as **Core Mentors**. The second group **Content Mentors**, defined as either: a) clinicians or researchers with expertise in rheumatic and musculoskeletal diseases but whose role is primarily supportive rather than as a primary research mentor; or b) researchers with research funding in areas complementary to, or synergistic with, rheumatic and musculoskeletal disease. The third group, **Mentors in Training**, is composed of young faculty who will be developed into outstanding research mentors to further strengthen the research environment and to promote development of this training program.

The collaborative environment at UAB, embodied in the UWIRC program and the multiple longstanding research programs spanning Divisions, Departments, and Schools, provides a strong research foundation. The committed training environment afforded by the thematically organized graduate program (http://www.uab.edu/gbs/) and an outstanding Office of Postdoctoral Education (http://www.uab.edu/postdocs/), provides an ideal setting for the implementation of interdisciplinary research and training in rheumatic and musculoskeletal disease research. A list of the training grant support available to the participating faculty is shown in **Table 3** and research grant and contract support of the participating faculty members is shown in **Table 4.**

2B. Historical Background. While many academic units and programs will contribute to the success of this T32 research training program, the heart of this application lies mainly in the faculty, programs, collaborations,

and infrastructure provided by the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC), and the UAB Division of Clinical Immunology and Rheumatology and the affiliated UAB Division of Pediatric Rheumatology. These entities have outstanding reputations for excellence in research and research training, whose histories are summarized below.

The UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC)

Established in 1977, the UAB Arthritis and Musculoskeletal Diseases Center (the forerunner of the CAMBAC) was one of the first arthritis research centers in the nation supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). Over the years, Center faculty members have developed many collaborative programs involving multiple schools at UAB and throughout the US. The Center has been federally funded since its establishment, and UAB is the only institution in the nation that is currently supported by arthritis-focused P30 (Rheumatic Diseases Cores Center), P50 (Center of Research Translation), and P60 (Multidisciplinary Clinical Research Center) grants from NIAMS, which will provide superb infrastructure for training in rheumatic and musculoskeletal diseases research. In the 2014 intramural competitive renewal of the UWIRC, we proposed an exciting change to continue to build on previous successes and create new opportunities, namely alignment with the bone community at UAB, through a collaborative merger of the Comprehensive Arthritis, Musculoskeletal, and Autoimmunity Center (CAMAC – the forerunner of the CAMBAC) with UAB Center for Metabolic Bone Disease (CMBD). This application was very favorably reviewed (one of the top 5 priority scores on campus). In late 2014, the University of Alabama Board of Trustees approved the merger of the CAMAC and the CMBD, which was renamed the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC) to reflect its breadth of research, clinical, educational, and other activities. A sustained, broad base of funding for interdisciplinary, multi-investigator awards from federal and other sources has greatly enhanced the vibrancy of the research environment and contributed to the spirit of innovation at UAB.

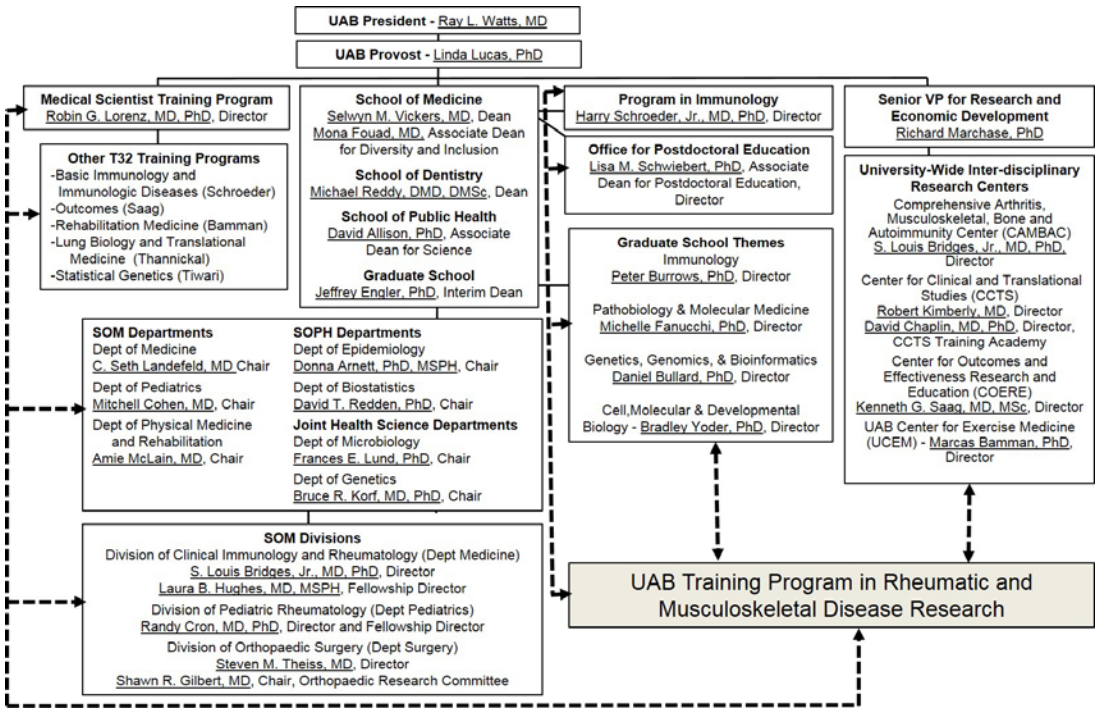


Figure 1. Institutional Infrastructure and Support for the UAB Training Program in Rheumatic and Musculoskeletal Disease Research. Solids lines are reporting structure and dotted lines are research and training collaborations and interactions. See letters of support from individuals whose names are underlined.

The reasons for the enthusiasm for the new merged center are many, and include: 1) Increased collaborations in the context of existing program grants (P30, P50, P60, etc.); 2) fostering innovative collaborations and ideas spanning the spectrum of arthritis, bone, musculoskeletal, and autoimmune disease in order to create new research opportunities at the intersection of the content areas (e.g. osteoimmunology,); 3) Better alignment of the center with the core mission of the NIAMS, which includes a focus on bone biology and bone disease; 4) Better alignment of clinical activities such as the Musculoskeletal Screening Clinic (a clinical collaboration of rheumatology, rehabilitation medicine, and orthopaedics); the multidisciplinary Osteoporosis Clinic; and the UAB Bone Dysplasia and Connective Tissue Disorder Clinic; and perhaps most relevant to this application: 5) improved alignment of educational and training activities such as this proposal. The previously funded (1981 to 2012) T32 in Rheumatic Disease Research Training is thus strengthened by the addition of bone and musculoskeletal disease researchers to generate the current application for a T32 Research Training Program in Rheumatic and Musculoskeletal Research.

The goals of the CAMBAC are: 1) To generate new understanding of the mechanisms of arthritis, musculoskeletal, bone, and autoimmune diseases and apply this knowledge to improve the diagnosis, treatment, and prevention of these conditions; 2) To promote and integrate fundamental, translational, and clinical research with clinical care of patients with these diseases; 3) To educate the public about these diseases and how they can partner with us to achieve our goals of better ways to diagnose, treat, and prevent these conditions; and 4) to train future investigators and health care professionals in these diseases.

There are currently 166 faculty members in the UAB CAMBAC, representing nine Schools within UAB (see Figure 2) and many Departments and Divisions within those schools. The faculty have a broad spectrum of research, clinical, and educational interests, either directly aligned with rheumatic or musculoskeletal disease, or with direct or indirect relevance to those content areas. Approximately 60% of the CAMBAC faculty are Professors, with the remaining 40% approximately divided equally among Associate Professors and Assistant Professors. CAMBAC membership is organized into 6 thematic work groups, including: 1) *Bone, Cartilage, Muscle and Connective Tissue*; 2) *Epidemiology, Outcomes and Prevention*; 3) *Experimental Therapeutics and Biomarkers*; 4) *Genetics and Functional Genomics*; 5) *Immunology, Autoimmunity and Inflammation*; and 6) *Neurobehavioral Medicine*.

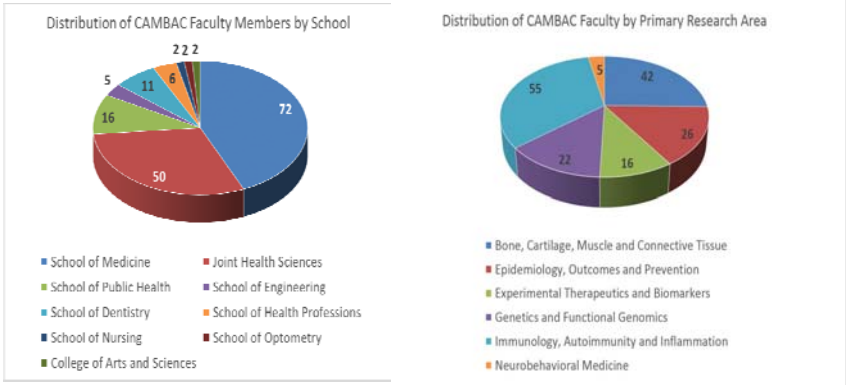


Figure 2. Faculty membership of the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC)

The CAMBAC sponsors a weekly rheumatology journal club (Fridays at noon); frequent visits from prominent outside speakers; methodology workshops (largely through the MCRC Methodology Core and the RDCC Cores; and an Annual Research Day. These activities are designed to promote arthritis, musculoskeletal, bone, and autoimmunity research at UAB, and to encourage the cross-fertilization of ideas. Our first Osteoimmunology Symposium will be held later this year. Vision for the future of musculoskeletal research include cartilage biology/regenerative medicine; bioinformatics/systems biology; precision medicine, and other areas.

The UAB Center for Outcomes and Effectiveness Research and Education (COERE)

The COERE (K. Saag, MD, MSc, Director; M. Morrisey, PhD Co-Director; M. Safford, MD Associate Director) is a multidisciplinary UWIRC established in 1998 and focused on a program of research to improve the quality and outcomes of health care in Alabama and across the nation. The COERE's scientific strengths are focused in health services and outcomes research including: patient safety in the use of therapeutics, health care economics, systematic literature review/guideline development, and translating research into practice. In these areas, COERE scientists apply methodological expertise in epidemiology, pharmacoepidemiology, health economics, economic evaluation and modeling, biostatistics, health informatics and behavioral sciences. COERE has growing strength in the use of large administrative data-bases. In collaboration with the Department of Epidemiology, a university-wide resource for Medicare and Medicaid claims data was established within the COERE, called the Pharmacoepidemiology and Economics Research (PEER) Group. The PEER unit has addressed questions on the economic and disease burden of osteoporosis, the longitudinal comparative effectiveness and safety of biologic medicines and recently expanded into the area of cardiovascular diseases.

The COERE hosts focused Work Groups in methodological areas of expertise and interest (community engagement; healthcare organizations and systems) and disease focused areas of interest (diabetes and diabetes prevention, musculoskeletal disorders, HIV-AIDS, cardiovascular disease). The COERE sponsors monthly seminars, epidemiology book reviews, outcomes research breakfast discussion groups, frequent visits by outside speakers, bi-monthly biostatistics rounds, and an annual intermediate methods workshop co-sponsored with other UAB Centers. These activities are designed to promote outcomes and effectiveness research and education at UAB, and to encourage the cross-fertilization of ideas. Multiple other UAB UWIRCs will contribute to the rich academic training environment on rheumatic and musculoskeletal diseases at UAB. For example, the UAB Center for Exercise Medicine, established in 2011 and directed by M. Bamman, brings

together ~116 investigators in 32 departments and 10 schools for a multi-disciplinary approach to establishing UAB as a national leader in exercise medicine research and education. Information on the other UWIRCs that make UAB a wonderful environment for this proposed T32 application are included in **10. Facilities & Other Resources.**

The UAB Division of Clinical Immunology and Rheumatology

The Division of UAB Rheumatology was organized in the 1950s by Howard L. Holley, MD. In 1966, J. Claude Bennett, MD joined the faculty and soon succeeded Dr. Holley as Division Director. Under Dr. Bennett's leadership, the Division flourished, with significant increases in the number of faculty and research funding. Dr. Bennett became the Editor-in-Chief of *Arthritis & Rheumatism*, and later served as a President of the American College of Rheumatology. He went on to become the Chairman of the Department of Medicine and then President of the University of Alabama at Birmingham. Dr. William J. Koopman succeeded Dr. Bennett as Division Director; he also became Editor-in-Chief of *Arthritis & Rheumatism* and President of the American College of Rheumatology. Dr. Koopman became Chair of the Department of Medicine upon Dr. Bennett's assumption of the Presidency of UAB. In 1996, Dr. Robert Kimberly became the fourth Division Director, a position he relinquished in 2007 to focus on his role as Senior Associate Dean for Clinical Research in the UAB School of Medicine. He is now also PI and Director of the NIH-funded Center for Clinical and Translational Science. Dr. Kimberly's successor as Division Director, Dr. Robert Carter, was subsequently recruited as Deputy Director of the NIAMS in 2008. In 2009, after a national search, Dr. Bridges, PI of this T32 application, was named Division Director.

The Division's past research trainees include a list of well-respected academic researchers and national leaders in rheumatic and musculoskeletal diseases (Graciela S. Alarcón – winner of the Evelyn Hess Award and the ACR Distinguished Clinical Investigator; Jeffrey Curtis – winner of the 2013 ACR Henry Kunkel Award for Outstanding Young Investigator, Ted Mikuls - Professor of Medicine at the University of Nebraska Medical Center and Chief of Rheumatology at Omaha VA Medical Center; and others). Current Division Directors of Rheumatology who trained at UAB include Dr. Bridges, Dr. Percio Gulko (Icahn School of Medicine at Mount Sinai, New York), Dr. Larry Moreland (University of Pittsburgh) and others.

Built on the success of our predecessors, the Division is currently ranked 12th in the nation by *US News & World Report* Best Hospitals. At present, the Division has 31 full time, 3 part time, and 6 emeritus faculty. We have a robust clinical program, an active training program, and a large research portfolio. Our research budget of ~$15 million per year includes multiple program grants, such as an NIH Center of Research Translation (CORT) in Gout and Hyperuricemia, an NIH Multidisciplinary Clinical Research Center (MCRC), an NIH Rheumatic Diseases Cores Center (RDCC), and many other extramurally funded programs. Our division faculty have considerable experience and expertise in clinical, laboratory-based, and translational research. We work closely with experts in a variety of disciplines, including outcomes/health services research, immunology, genetics, epidemiology, pharmacovigilance, bioinformatics, biostatistics, clinical trials, and database/biorepository management. Major collaborations of Division investigators span the medical center, and include the Schools of Medicine (and the Joint Health Sciences), Dentistry, Public Health, and Health Related Professions, among others. A long-standing training grant focused exclusively on rheumatic diseases, led by Drs. Bennett, Koopman, and Kimberly (in succession) was highly successful for 31 years (1981-2012) and will form the basis for this proposal, in conjunction with the added expertise of investigators in musculoskeletal disease outside the direct purview of rheumatic disease (e.g. bone biology).

The proposed research training program is well-positioned in the context of the latest iteration of the Research Strategic Plan of the UAB School of Medicine. Dr. Selwyn Vickers, Dean of the SOM, has identified five cross-cutting core research areas that will concentrated upon. These include: Inflammation, Infection and Immunity (I3); Population Health, Health Disparities and Outcomes Effectiveness Research; Personalized Medicine; Bioinformatics; and Fundamentals of Basic Science Discovery. In particular, the I3 and Disparities/Outcomes areas are high relevant to this proposal, with substantial leadership from faculty on this proposed training grant.

The UAB Division of Pediatric Rheumatology

Pediatric rheumatology was established as an academic unit at UAB on August 1, 2007, with the arrival of Dr. Randy Cron as Director of the Division of Rheumatology in the Department of Pediatrics. Dr. Tim Beukelman was co-recruited to UAB as a junior faculty member. With sustained effort and support from many stakeholders, there are now six faculty members (including Drs. Peter Weiser, Matt Stoll, Robert Lowe, and Melissa Mannion) in the Division, making it the largest pediatric rheumatology program in the southeastern US.

The program is highly academic/research based. A significant milestone was the successful establishment of a pediatric rheumatology fellowship in 2011 by Dr. Cron, who serves as the Fellowship Director. The first UAB pediatric rheumatology fellow, Dr. Melissa Mannion, completed her fellowship and a Masters degree in Public Health joined the faculty in 2014. Dr. Lauren Shipman joined the three year fellowship program in July 2014. The UAB Division of Pediatric Rheumatology has quickly become well respected and draws clinical referrals from Alabama, Mississippi, Tennessee, Georgia, and Florida. Research activities in the division have been highly productive in 2014 with 30 articles published in high ranking peer-reviewed journals and 4 invited textbook chapters. Drs. Cron, Beukelman, and Stoll have also each been successful at garnering additional funding via various granting organizations, including the NIH, in 2014.

There are substantial research efforts in the *Division of Orthopaedic Surgery* and the *Department of Physical Medicine and Rehabilitation (PM&R)*, and many other Divisions and Departments contribute to the superb environment to train investigators in rheumatic and musculoskeletal disease research. Supplemental information is included in **10. Facilities & Other Resources.**

2C. Need for Training

The American College of Rheumatology, American Society for Bone and Mineral Research, the American Academy of Orthopedic Surgeons, and other organizations have identified the training of investigators prepared for the rapid advances in biomedical knowledge and health care delivery as one of the highest priorities for the research mission in the rheumatic and musculoskeletal diseases. Rigorous training in research methods and a strong appreciation for interdisciplinary challenges and opportunities are critical for a career in academia and biomedical investigation. The training program faculty and the interdisciplinary environment fostered by the University-wide Interdisciplinary Research Centers Program at UAB positions our trainees at the intersection between mechanism-based research, its application to clinical medicine, and its impact on disease outcomes. Furthermore, the new opportunities developed within the School of Medicine Strategic Plan, and embodied in new initiatives within the GBS Program have underscored the critical role of training positions for pre-doctoral candidates and postdoctoral trainees. In this application, therefore, we are requesting funds to support two pre-doctoral and two postdoctoral training positions. With the institution's support through CAMBAC, we do not request any administrative staff support.

2D. Relationship of the Proposed Program to Current UAB Activities

The translational emphasis of this T32 training program is strongly supported by the institution in several ways, providing ample opportunities for translational research. See detailed discussion of CAMBAC, COERE, and other UWIRCs; the Division of Clinical Immunology and Rheumatology and the Division of Pediatric Rheumatology above. In addition to the activities of these entities, trainees will have access to training, educational, and research activities of the programs below.

- **Graduate Biomedical Sciences.** Within the UAB Graduate School, the Graduate Biomedical Sciences community participates in eight interdisciplinary themes that integrate more than 33 departments, 20 university research centers and the affiliated drug-discovery and biotechnology institutes Southern Research Institute and the HudsonAlpha Institute for Biotechnology. The graduate themes most applicable to this T32 application are Immunology; Genetics, Genomics, and Bioinformatics; Pathobiology and Molecular Medicine; and Cell, Molecular, and Developmental Biology (see **Appendix A**). The remaining themes are Biochemistry, Structural and Stem Cell Biology; Cancer Biology; Neuroscience; and Microbiology.
- **Office of Postdoctoral Education.** The UAB Office of Postdoctoral Education (OPE) was established in 1999 and was one of the first postdoctoral offices in the country. The OPE has been instrumental in establishing and maintaining career development opportunities, including instructional workshops and courses, career counseling, monetary awards and certificate programs, for all postdoctoral scholars at UAB (see **Appendix B**). Opportunities to enhance and define the postdoctoral training experience are available to all postdocs at UAB. In March 2013, UAB was ranked #1 as the Best Place to Work as a Postdoc among all US academic institutions by *The Scientist*. Past and continuing events include the 'Transition to Independence Seminar Series' and 'Postdoc Research Day'. In addition, the OPE offers courses in grant writing, laboratory management, translational medicine, and job skills, funds tuition for other career-related courses offered at UAB, and provides one-on-one career counseling. The OPE also sponsors award mechanisms that allow postdoctoral scholars to further their education within and outside of UAB. These mechanisms include: OPE Scholars' Award; OPE Career Enhancement Award; OPE Internship Award; and OPE Travel Award.
- **Program in Immunology.** The multi-disciplinary Program in Immunology consists of over 100 UAB Faculty who identify themselves as basic or clinical immunologists and are members of multiple units at UAB.

A desire for excellence on the part of the UAB faculty has promoted a collective attitude of interdepartmental cooperation and collegiality. The Program in Immunology was created to enhance the wide distribution of immunology-related research at UAB. This trans-departmental program seeks to enhance communication among faculty in order to identify and stimulate additional synergies across campus. The Program in Immunology organizes an annual Spring Immunology Symposium for the past three years, in collaboration with Immunology faculty from Emory University and Vanderbilt University. In addition, there is a weekly Seminar Series (Thursdays at 4 pm) which features prominent immunologists from throughout the country and abroad. See **Appendix D** for details.

- **HHMI-sponsored "Med-Grad" Program**. Designed to provide Ph.D. students with a more targeted exposure to human biology and disease, we leverage coursework developed for this program (**Appendix A**)
- **MD/PhD training through the MSTP Program**. We recruit pre-doctoral students from our MD/PhD program which is funded by an NIH Medical Scientist Training Program grant (**Appendix A**).
- **Masters of Science in Public Health in Clinical Investigation.** Many of our physician trainees in clinical research (Danila, Mannion, and others) have obtained a Masters of Science in Public Health degree in Clinical Investigation. This degree may be focused on specialization in one of four areas of public health: Clinical and Translational Science; Outcomes Research; Environmental Health and Toxicology and Industrial Hygiene; or Applied Epidemiology and Pharmacoepidemiology. See **Appendix C3** for details.
- **Certificate Program in Translational and Molecular Sciences.** This program is open to all students in a MS, PhD, or MD/PhD program who commit to coursework particularly relevant to Translational Science as part of their degree program. This program enhances their competitiveness in the workplace, including obtaining extramural fellowships and for the next steps of their careers that may include postdoctoral training in academia, industry or government. A description of this proposed program is in **Appendix C4**. A Master of Science in Translational Research is also available. This program focuses on medical students funded through a TL1 program within the CCTS, but the curriculum can be accessed by other students within a PhD or post-doctoral program.
- **Technology Commercialization and Entrepreneurship Certificate.** The Graduate Certificate in Technology Commercialization and Entrepreneurship is designed to expose students (MBA and non-MBA) and scientists to the business foundations of entrepreneurship and technology commercialization. The program is designed to blend knowledge and experiential learning to help move scientific discovery and inventions out of the lab and into the marketplace. Unless otherwise approved by the student's mentor, the student will be responsible for this certificate program's tuition costs.
- **Enrichment with off campus coursework**. Over the last five years, we have placed additional emphasis on off-campus educational opportunities. We have had trainees participate in the FOCiS Trainee Satellite Symposium (sponsored by CAMBAC), AAI Immunology courses, courses on bioinformatics and computational biology; and local, regional and national meetings to present research findings. These experiences will complement on campus coursework tailored to each trainee's individual interests.

3. PROGRAM PLAN

3A. Program Administration

Program Director. S. Louis Bridges, Jr., MD, PhD, *Anna Lois Waters* Endowed Professor of Medicine and Microbiology, Director of the UAB Division of Clinical Immunology and Rheumatology, and Director of the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC) will serve as PI and Director of this T32 research training program. Dr. Bridges has the clinical, investigative, mentoring, and administrative skills and experience to lead this program. He is experienced in multicenter, multidisciplinary collaborative clinical and translational research and has assumed increasingly important leadership roles in research locally and nationally. His current work is focused on the genetics of RA in African-Americans; autoantibodies; biomarkers of radiographic severity; and predictors of treatment response. He also plays a leadership role in an NIH R01 grant evaluating TWEAK signaling in muscle and its relation to successful rehabilitation after joint replacement in osteoarthritis. He has served on the NIH Arthritis, Connective Tissue, and Skin (ACTS) Study Section (2006-10), and is current Chair (2014-16) of the NIH Arthritis and Musculoskeletal and Skin (AMS) Diseases Special Grants Review Committee. He is a member of the Scientific Discovery Committee of the Arthritis Foundation, and is Chair (2014-2017) of the American College of Rheumatology (ACR) Committee on Research. Dr. Bridges is PI and Director of the UAB MCRC; PI (multiple PI) of the UAB CORT (K Saag, Contact PI), and Associate Director of the UAB Rheumatic Diseases Core Center (JD Mountz, PI). He is a current Co-Editor of *Arthritis & Rheumatology*, a position he has held since 2010. He has mentored more than 50 trainees at many levels of training and is currently primary mentor to two NIAMS K grant awardees. He has published more than 120 articles, book chapters, reviews, and 3 books. He has given multiple mentoring talks at the ACR Annual Session and Rheumatology Research Workshop. Dr. Bridges will allocate 10% of his time, supported by the CAMBAC and the Division, to this T32.

Associate Program Directors. Associate Directors of the program will be Kenneth G. Saag, MD, MSc, *Jane Knight Lowe* Professor of Medicine in the Division of Clinical Immunology and Rheumatology, and Yi-Ping Li, PhD, *Jay M. McDonald* Endowed Professor in Bone Biology in the Department of Pathology.

Dr. Saag serves as Vice Chair for Faculty Development of the UAB Department of Medicine; Director of the AHRQ-funded UAB Center for Education and Research on Therapeutics (CERTs); and Director of the Center for Outcomes and Effectiveness Research and Education (COERE). He has devoted his career to outcomes and epidemiologic research with a focus on musculoskeletal diseases. Under the guidance of Dr. Saag, the UAB CERTs has successfully identified, funded and conducted more than 50 projects investigating and disseminating knowledge about safe and effective use of therapeutics. Dr. Saag is also PI of a NIAMS-funded P50 Center of Research Translation (CORT) in Gout and Hyperuricemia, and is Associate Director the NIAMS funded P60 Multi-disciplinary Clinical Research Center. Since 2009, he has led the KL2 program of the CCTS. Dr. Saag also serves as PI of the AHRQ-funded T32 and K12 in Comparative Effectiveness Research and the K12 in Patient Centered Outcomes Research. Dr. Saag has mentored 35 trainees and has published over 220 original reports and over 100 reviews, chapters, or editorials.

Dr. Li is an established researcher and educator in the fields of bone biology, oral biology, and molecular biology. He previously served as Vice Director of the UAB Center for Metabolic Bone Disease prior to the merger of CMBD to form CAMBAC. Dr. Li is a leader in the field of osteoclast biology, osteoblast differentiation, and cartilage and bone formation. Over the years, Dr. Li has mentored and supervised numerous PhD students and postdoctoral fellows who have left his lab well-prepared for the next stage of career development and a future of success. Students or post-docs in Dr. Li's lab have been awarded the American Society for Bone and Mineral Research (ASBMR) Most Outstanding Abstract Award, ASBMR President's Award, ASBMR Young Investigator Award, and ASBMR Young Investigator Travel Grant Award. Thus, Dr. Li's seminal work in bone biology, oral biology, and osteoimmunology, his innovative translational research, and his outstanding track record as a mentor make him an ideal Associate Program Director.

Research Training Program (RTP) Executive Committee. Dr. Bridges is joined by Program Associate Directors, Drs. Saag (an expert in outcomes research) and Li (an expert in bone research). Other members of the RTP Executive Committee will be Dr. Harry Schroeder (Director of the UAB Program in Immunology); Dr. David Chaplin (Chair of the UAB Graduate Biomedical Sciences Steering and Oversight Committee, and Director of the Education and Career Development component of the UAB CCTS); Dr. Marcas Bamman (Director of the UAB Center for Exercise Medicine). Each brings substantial experience and expertise, both in research and in research training, especially as it applies to the rheumatic and musculoskeletal diseases. Three of these members (Drs. Saag, Schroeder, and Bamman) serve as Directors of T32 grants (focused on

outcomes, immunology, and rehabilitation, respectively) that will be highly complementary and synergistic with the proposed T32. The RTP Executive Committee also overlaps substantially with the Executive Committee of the CAMBAC (Drs. Bridges, Saag, and Schroeder), which will facilitate the coordination of Center activities for maximum benefit of trainees involved in this program. The responsibilities of the Executive Committee include (a) guiding the program in applicant selection, (b) reviewing the Individual Development Program (IDP) for each trainee, including didactic course work, (c) evaluate opportunities for improved effectiveness, (d) guiding the mentoring of mentors, and (e) evaluating progress on the individual mentored research project, (e) overseeing the composition of the training faculty, and (f) evaluating the interaction of the training program with other such programs at UAB.

Administrative Structure and Responsibilities. Dr. Bridges will be responsible for the overall direction of this training program. He will work on a regular basis with other members of the RTP Executive Committee, the program faculty, and others in the recruitment of candidates for the training program, and all other aspects of the management of the program. Dr. Bridges will lead meetings of the Executive Committee and the Advisory Committees (see separate section). He will prepare the annual report for the RTP Internal Advisory Committee and work with his administrative staff to fulfill all reporting responsibilities of the program. Dr. Carol Ballinger (supported in part by funds from CAMBAC) is responsible for assistance in the administration of the training program and in the preparation of the annual reports. She is assisted by Ms. Judy Thomas (financial officer) in the fiscal management and by Ms. Paula Kiley (administrative assistant to the Director) in the coordination of meetings both for trainees and for program faculty. Both of these staff members are supported in part by CAMBAC funds.

3B. Program Faculty

As noted above, the training faculty is organized into three groups of mentors: **Core Mentors**; **Content Mentors**; **Mentors in Training**. The RTP will use a model of one primary mentor from the Core Mentor pool, and 1-2 co-mentors from the Core, Content, or Mentor in Training pool. Based on their research interests, trainees may have mentors with primarily lab-based, clinical, or translationally-oriented research programs. Core Mentors are those with research interests and expertise related to rheumatic and musculoskeletal diseases and robust extramural grant support, which allows them to serve as either primary or co-mentors for research trainees. Each of the program faculty has an appointment in one of the UAB Schools (e.g. Medicine, Public Health, etc. – see Figure 1), and typically an appointment in one or more of the themes in the Graduate Biomedical Sciences program.

The training program has a strong emphasis on an interdisciplinary didactic curriculum, on professional development (including a graduate course [MIC 741 – Topics in Professional Development] **Appendix C1**) and on the process of mentoring both mentors and trainees. This emphasis is embodied in the participation of the program faculty as course masters, module leaders and lecturers in the GBS themes of Genetics and Genomic Sciences, Immunology, Pathobiology & Molecular Medicine, and Cell, Molecular, and Developmental Biology.

The training faculty members, their Departmental and Divisional affiliation and their general area of research interest are listed in **Table 2**. Reflecting the organization of the thematic workgroups within the CAMBAC, the faculty represents strong investigative interests in: Bone, cartilage, muscle and connective tissue; 2) Epidemiology, outcomes and prevention; 3) Experimental therapeutics and biomarkers; 4) Genetics and functional genomics; 5) Immunology, autoimmunity and inflammation; and 6) Neurobehavioral medicine (**Figure 2**). The role of the Program Faculty is (a) to assist in the recruitment of pre-doctoral students and postdoctoral fellows, (b) to discuss their research at the CAMBAC Research Day to be held each fall, designed for both pre- and postdoctoral trainees, (c) to make their laboratories and research teams available for rotations, (d) to serve as a mentor and preceptor for research projects, (e) to provide timely feedback about progress to the Program Director and RTP Executive Committee, and (f) to assist trainees in planning for their future career. **Table 1** and **Table 2** summarizes the critical breadth and mass of faculty by scientific discipline available to this training program. The research interests, extramural grant support, training grant participation, training records of the Program Faculty are provided in **Tables 2-5A/B**, respectively. Below is a brief description of the current funding (as PI) and research areas of each of the program faculty (33 Core Mentors; 51 Content Mentors; 11 Mentors in Training).

<u>Core Mentors</u>

S. Louis Bridges, Jr., MD, PhD (Dept Medicine/Clinical Immunology and Rheumatology). Program Director. Funding Sources: NIH/NIAMS, NIH/NICHD. ***Genetic Influences on Susceptibility, Severity in RA; Biomarkers of Treatment Response in RA.*** Dr. Bridges' research is focused on genetic and non-

genetic influences on RA susceptibility and severity in African-Americans; biomarkers of treatment response; and autoantibodies to citrullinated peptides in RA. He also has research interests in gout, and in improving functional status of arthritis patients after joint replacement. He serves as Director of the Biorepository for a PCORI-funded project, and for a large pragmatic trial to evaluate the safety and effectiveness of the herpes zoster vaccine in patients on anti-TNF therapy. He is site PI of the Rheumatoid Arthritis Synovial Tissue Network (REASON) Study, a network of investigators who lead efforts to train rheumatologists to perform ultrasound guided RA synovial biopsies for translational studies.

Kenneth G. Saag, MD, MSc (Dept Medicine/Clinical Immunology and Rheumatology). Associate Program Director. Funding Sources: NIH/NIAMS, AHRQ, NIH/NCATS. ***Outcomes and Quality of Life Research in Arthritis and Osteoporosis.*** Dr. Saag is an outcomes researcher with particular expertise in rheumatoid arthritis, pharmacoepidemiology osteoporosis, and population-based investigations, working with large databases, survey research and quality indicator development. He also has interests in pragmatic clinical trials, and comparative effectiveness research in musculoskeletal disorders such as RA and gout. Dr. Saag is Director of the UAB Center of Research Translation in Gout and Hyperuricemia, Co-Director of the UAB Multidisciplinary Clinical Research Center, and an Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center. Additionally, he serves as PI of the AHRQ-funded UAB Deep South Center for Education and Research in Therapeutics (CERTs), UAB Health Services, Outcomes, and Effectiveness Research T32 Training Program and the UAB K12 in Patient Centered Outcomes Research.

Yi-Ping Li, PhD (Dept Pathology). Associate Program Director. Funding Sources: NIH/NIAMS, NIH/NIDCR. ***Osteoclast Function, Skeletal Development and Osteoporosis.*** Dr. Li's research interests include investigations of bone formation and resorption, brain and craniofacial development, skeleto-muscular development, and their related diseases (osteoporosis, osteopetrosis, Paget's disease, bone metastases, periodontitis, RA). Dr. Li's group published seminal work on the cloning and characterization of genes critical to osteoclast function, including cathepsin K, ATP6i, and RGS10A.

Donna K. Arnett, PhD, MSPH (Dept Epidemiology, SOPH); Funding Sources: NIH/NHLBI, Robert Wood Johnson Foundation, AHA. ***Pharmacogenetics of Methotrexate Response; Genetics of RA in African-Americans.*** A genetic epidemiologist with a primary interest in cardiovascular disease, Dr. Arnett leads multiple observation and interventional family-based studies, the prime focus of which is to identify genetic and genomic determinants of drug responsiveness. She and Dr. Bridges have a long term collaboration to characterize genetic loci that determine efficacy of and toxicity to methotrexate in RA, and to understand the role of genetic influences on susceptibility and severity of RA.

Marcas M. Bamman, PhD (Dept of Cell, Developmental, & Integrative Biology); Funding Sources: NIH/NICHD, NIH/NIA. ***Skeletal muscle mass regulation in aging, arthritis, and exercise medicine; rehabilitation after joint replacement.*** The focus of Dr. Bamman's research is mechanisms of skeletal muscle atrophy and dysfunction in disease states (aging sarcopenia, joint arthroplasty, spinal cord injury, disuse), and restoration of muscle mass and mobility function using exercise as regenerative medicine. He has an R01 will examine interventions to overcome TWEAK signaling to restore muscle mass and mobility after hip or knee replacement in OA. He leads the National Exercise Clinical Trials Network (NExTNet) and the T32 Training Program in Pathobiology and Rehabilitation Medicine, which supports trainees in medicine, neurology, physical therapy, cardiovascular disease, physical medicine and rehabilitation, and endocrinology.

Susan L. Bellis, PhD (Dept of Cell, Developmental, & Integrative Biology); Funding Sources: NIH/NIGMS, NIH/NIDCR, NIH/NCI, AHA. ***Adhesion Receptors in Immunity.*** Dr. Bellis' research seeks to understand the role of cell-extracellular matrix interactions in normal physiology and pathophysiologic conditions including autoimmune disease. She explores the role that altered glycosylation of receptors plays in the maintenance of normal cellular behavior, as well as in the development of diseases such as arthritis and cancer. Recent studies have focused on the development of biomimicking synthetic extracellular matrices with the goal of engineering implantable substrates that stimulate regeneration of tissues, i.e. soft tissue and bone.

Timothy G. Beukelman, MD (Dept Pediatrics/Rheumatology); Funding Sources: NIH/NIAMS, AHRQ, CARRA, PCORI, Arthritis Foundation. ***Optimization of treatment of juvenile idiopathic arthritis (JIA).*** Dr. Beukelmann's research focus is the optimization and safety of treatment methods of juvenile idiopathic arthritis (JIA). He has led numerous high-impact studies of the risks of serious infection and malignancy associated with JIA. He has received an NIH clinical trial planning grant to study whether methotrexate can prevent worsening of arthritis among children who initially present with a less severe phenotype.

Elizabeth E. Brown, MPH, PhD (Dept Pathology); Funding Sources: NIH/NIAMS, NIH/NCI. ***Genetics and Autoantibodies in the Clinical Course of Systemic Lupus Erythematosus.*** Dr. Brown is a molecular/genetic epidemiologist with interest in the study of aberrant immune function common to inflammatory-mediated chronic disease. She is funded by NIAMS to delineate the effects of genetic variants and autoantibody profiles relative to the rate of progression and severity of lupus nephritis and severe organ damage among patients with SLE.

Yabing Chen, PhD (Dept Pathology); Funding Sources: NIH/NIDDK, NIH/NHLBI, VA. ***Gene Regulation and Function in the Pathogenesis of Vasculopathy and Vascular Calcification.*** Dr. Chen has two NIH R01 grants, focused on the role of O-Glcnacylation on the regulation of vascular smooth muscle in diabetic vasculopathy, and on molecular signaling in oxidative stress-induced vascular calcification.

Jeffrey R. Curtis, MD, MS, MPH (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, AHRQ, Rheumatology Research Foundation, PCORI, Amgen, CORRONA, Pfizer. ***Safety, Efficacy and Outcomes of Biologic Agents in Inflammatory Arthritis.*** The evaluation of the efficacy, effectiveness, and safety of the medications used to treat RA and other inflammatory arthritis are Dr. Curtis' main research interests. He also studies risk factors for and outcomes of osteoporosis, and ways to improve treatment outcomes in gout. He is PI of a project in the UAB Multidisciplinary Clinical Research Center and of a project in the UAB Center of Research Translation in Gout and Hyperuricemia.

Randall S. Davis, MD (Dept Medicine/Hematology-Oncology); Funding Sources: NIH/NCI, NIH/NIAID, Lupus Research Institute. ***Developmental Immunology of Lymphocytes and Immunoreceptor Biology.*** Dr. Davis's research focus is the cellular and molecular immunobiology of lymphocytes in normal and diseased conditions, as well as B cell chronic lymphocytic leukemia (CLL) and lymphoproliferative disorders. His seminal discovery of a family of Fc receptor-like (FCRL) genes has led to many studies of their function in humans and mice and roles in autoimmune diseases such as systemic lupus erythematosus.

Charles O. Elson, III, MD (Dept. Medicine/Gastroenterology); Funding Sources: NIH/NIDDK, NIH/NIAMS. ***Mucosal Immunity in Response to Microbiota.*** A world expert on the pathogenesis of inflammatory bowel disease, Dr. Elson's research focus is on the regulation of mucosal immune responses and how deregulation of the normal homeostasis contributes to chronic intestinal inflammation. As PI of a project in the UAB Multidisciplinary Clinical Research Center, in collaboration with Dr. Matt Stoll of Pediatric Rheumatology, they study the role of microbiota and immune response to commensal bacteria in juvenile and adult spondyloarthritis.

Xu Feng, PhD (Dept of Pathology); Funding Sources: NIH/NIAMS. ***The RANKL/RANK/ OPG System in Bone Health and Disease.*** Dr. Feng's primary research focus is the molecular mechanisms of osteoclast formation and function and the pathogenesis of bone loss in the various pathological disorders. He is currently trying to understand whether any of the RANK motifs can server as good therapeutic targets for bone erosion in rheumatoid arthritis.

Orlando M. Gutierrez, MD, MMSc (Dept. of Medicine/Nephrology); Funding Sources: NIH/NINDS, NIH/NIDDK. ***Mineral Metabolism and Outcomes.*** The focus of Dr. Gutiérrez's research is the characterization of bone and mineral metabolism in the pathophysiology of cardiovascular disease and kidney disease. This includes studies of the associations of disorders of phosphorus and vitamin D metabolism with adverse outcomes in kidney disease.

Hui-Chen Hsu, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Development of Autoantibodies and Autoimmunity in Mouse Models.*** Dr. Hsu's lab studies the regulation of immune cells in aging and autoimmune diseases, such as SLE. Dr. Hsu has developed a two-tiered peptide microarray approach, coupled with epitope mapping of known autoantigens, to identify and characterize autoepitopes recognized by BXD2 autoreactive B cells and actively pursues the mechanisms involved in the IL-17-mediated B cell tolerance loss in BXD2 mice.

Amjad Javed, PhD (Dept Oral and Maxillofacial Surgery, School of Dentistry); Funding Sources: NIH/NIAMS, NIH/NIDCR. ***Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis.*** The central focus is the molecular mechanisms that govern the formation and remodeling of skeletal tissues. This includes the role of runt related transcription factor (Runx), in the coordinated regulation of chondrocyte, osteoblast, and odontoblast during skeletogenesis.

Ho-Wook Jun, PhD (Dept. of Biomedical Engineering, School of Engineering); Funding Sources: NIH/NHLBI, NSF, NIH/NIBIB, NuTech Medical. ***Nanostructured Biomaterials, Stem Cells, Tissue Engineering.*** Dr. Jun's multidisciplinary research focuses on tissue regeneration (cardiac, bone, and

musculoskeletal tissues) using stem cells and biomimetic nanomatrices. He has significant experience in developing bioactive materials modified by functional peptide sequences. He and his colleagues have successfully constructed extracellular matrix (ECM) mimicking self-assembled nanomatrix directing osteogenic differentiation of human bone marrow mesenchymal stem cells and cardiovascular cellular responses.

John F. Kearney, PhD (Dept Microbiology); Funding Sources: NIH/NIAID, Juvenile Diabetes Research Foundation, AHA. ***Lymphocyte Development and B Cell Clonal Diversity.*** Dr. Kearney's interests are discovering fundamental cellular and molecular mechanisms involved in the development of T and B lymphocytes. In collaboration with Dr. Bridges, Dr. Kearney's lab is analyzing antigen-specific B cells from peripheral blood of RA patients with antibodies to citrullinated peptides.

Frances E. Lund, PhD (Dept Microbiology); Funding Sources: NIH/NIAID. ***Immune Responses to Pathogens, Autoantigens and Allergens.*** Dr. Lund, Chair of the Department of Microbiology, studies functional roles of B cells in infection and autoimmune disease, and mechanisms that control the migration of immune cells to sites of inflammation and infection.

John D. Mountz, MD, PhD (Dept. Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, NIH/NIAID. ***Lymphocyte Development in Autoimmunity and Inflammation.*** Dr. Mountz' lab currently studies the role that defects of marginal zone macrophages (MZ) in the clearance of apoptotic autoantigens plays in the development of lupus and antibody-mediated autoimmune diseases. He and his colleagues have developed a novel hypothesis to explain the apoptotic cell clearance defects in autoimmune BXD2 mice related to defective expression of MKL1 and mechanosensing signaling pathway in MZMs.

Joanne Murphy-Ullrich, PhD (Dept Pathology); Funding Sources: NIH/NCI, DOD, NIH/NIDDK. ***Extracellular Matrix Control of Cell and Growth Factor Function.*** Dr. Murphy-Ullrich's research focus is extracellular matrix remodeling in disease. Her lab discovered that the matricellular protein, thrombospondin1 (TSP1), is a major regulator of latent TGF-β activation and established a critical role for TSP1 in osteoblast differentiation/osteoclast inhibition in a number of disease processes. They have recently proven the efficacy of the TSP1 antagonist in reducing myeloma tumor burden and osteolytic bone disease, and identified new compounds with significantly improved pharmacokinetic profiles to block TSP1-dependent TGF-β activation.

Dobrawa Napierala, PhD (Dept Oral and Maxillofacial Surgery, School of Dentistry). Funding Sources: NIH/NIDCR. ***Molecular Mechanisms of Skeletal Development.*** Dr. Napierala's research focus is molecular determinants of disturbed development and homeostasis of skeletal and dental tissues. Her lab studies diseases associated with defective endochondral ossification, reduced bone mineral density, and abnormal mineralization. The goal of her research is to find therapeutic approaches that target key molecular abnormalities underlying the pathology of mineralization and homeostasis of skeletal tissues.

Selvarangan Ponnazhagan, PhD (Dept Pathology); Funding Sources: NIH/NIAMS, NIH/NCI. ***Adeno-Associated Virus Gene Therapy/Experimental Therapeutics of Breast and Prostate Cancers.*** Dr. Ponnazhagan's research is in the area of experimental therapeutics of bone metastasis in breast and prostate cancers. His lab focuses on determination of immune mechanisms of osteolytic bone metastasis and development of interventional strategies that would help both long-term survival and bone repair.

Chander Raman, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Lymphocyte Differentiation, Activation, Immune Tolerance and Autoimmunity.*** Dr. Raman's research interest is the molecular mechanisms by which lymphocytes play a role in autoimmunity. He recently showed that TGFβR3 expression in thymocytes is developmentally regulated, and interruption of its signaling leads to inhibition of T-cell maturation. Efforts are underway to determine the role of TGFβR3 in T cell development and selection. He is also studying the role of signaling pathways in RA lymphocytes.

Troy D. Randall, PhD (Dept. Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, NIH/NIAID, NIH/NHLBI. ***Immune Responses to Pathogens, and Allergens, Immune Tolerance, Autoimmunity.*** Dr. Randall's laboratory studies all aspects of the immune response to influenza, particularly how T and B Cell responses are generated and maintained. He also has an interest in the development and function of local (tertiary) lymphoid tissues in a variety of inflammatory diseases such as RA and whether they contribute to disease or ameliorate pathology.

Harry W. Schroeder, Jr., MD, PhD (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAID. ***Genetics of Immune Dysfunction (Immune Deficiency and Autoimmunity).*** Dr. Schroeder's laboratory is interested in the development of the B cell and antibody repertoire. In collaboration with Dr. Bridges, his lab is analyzing repertoires of antigen-specific B cells from peripheral blood of RA patients with antibodies to citrullinated peptides. He also studies the role of the HLA region and KIR genomics in

common variable immune deficiency, and the role of genetics and autoantibodies in mouse models of SLE. He serves as Director of the Immunologic Diseases and Basic Immunology T32, the Program in Immunology, and as an Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center.

Rosa Serra, PhD (Dept of Cell, Molecular, and Developmental Biology); Funding Sources: NIH/NIAMS. ***Mechanism of TGF-ß Action in Developmental and Disease Processes.*** Dr. Serra's research focus is the role and mechanism of embryonic and post-natal skeletal development and to apply this knowledge to the understanding and treatment of human degenerative skeletal disorders.

Jasvinder A. Singh, MD, MPH (Dept Medicine/Clinical Immunology and Rheumatology); Funding Sources: NIH/NIAMS, PCORI, AHRQ. ***Patient Outcomes in Gout and Other Rheumatic Diseases*****.** Dr. Singh's research focus is patient-reported outcomes in various forms of rheumatic diseases, in particular osteoarthritis, joint replacement and gout. He performs studies of comparative effectiveness of treatments used in gout and joint replacement patients and communication of medication risk in minority SLE patients.

Matthew Stoll, MD, PhD, MSCS (Dept Pediatrics/Rheumatology); Funding Sources: NIH/NIEHS, Friends of CARRA, NIH/NIAMS, ACR/RRF, Kaul Pediatric Research Institute. ***Mucosal Immunity and Spondyloarthritis.*** Dr. Stoll's primary research focus is the humoral response to enteric organisms and the nature of the fecal flora in patients with spondyloarthritis. His current work focuses on the role of the intestinal microbiota in children with ERA. His lab is working towards generating a biorepository of fecal microbiota, and planning collaborative studies evaluating the role of immunity directed against the fecal microbiota in children with spondyloarthritis, as well as understanding the role of dysbiosis.

Alexander J. Szalai, PhD (Dept Medicine/Clinical Immunology and Rheumatology). Funding Sources: NIH/NIDDK. ***C-reactive protein in Inflammation and Autoimmunity.*** The goals of Dr. Szalai's research are to understand the biological role of C-reactive protein (CRP) in maintenance of health, tissue response to injury, and propagation of disease, including SLE, RA, and infection.

Victor Thannickal, MD (Dept Medicine/Pulmonary); Funding Sources: NIH/NHLBI, NIH/NIA, Biogen IDEC, Inc. ***Mechanisms of Cellular Senescence, Oxidative Stress and Aging Associated with Chronic Lung Disease.*** Dr. Thannickal' s research focus is in cellular/molecular mechanisms of lung injury-repair, with a focus on the differentiation and fates of mesenchymal stem/progenitor cells; transforming growth factor-β signaling; and the biology of reactive oxygen species. His laboratory has also been active in the development of experimental therapeutics and biomarker discovery in complex lung diseases.

Casey T. Weaver, MD (Dept Pathology); Funding Resources: NIH/NIAID, NIDDK. ***Adaptive Immune Regulation by CD4 T cells*****.** Dr. Weaver's laboratory focus is on the mechanisms by which CD4 T cells control adaptive immunity: mechanisms that induce development of the Th17 effector lineage; characterization of mechanisms by which dysregulation of CD4 T cells leads to inflammatory bowel disease; delineation of the adhesion pathways that control effector T cell trafficking; and characterization of the genetic elements that regulate cytokine gene expression in Th1 and Th17 cells.

Jarred Younger, PhD (Dept Psychology, College of Arts and Sciences); Funding Sources: NIH/NIAID, IASP, Fetzer Institute. ***Immune Contributions in Chronic Pain and Fatigue.*** Dr. Younger's research focus is the use of pharmaceutical, psychophysical, neuroimaging, and immune monitoring approaches to develop new diagnostic tools and treatments for pain and fatigue in conditions such as fibromyalgia, chronic fatigue syndrome, and Gulf War Illness.

Content Mentors

Devin Absher, PhD (Dept Genetics/ HudsonAlpha Institute of Biotechnology). ***Genetics and Epigenetics of Rheumatic Diseases.*** Dr. Absher lab uses high-throughput technologies to study the genetics and traits of common diseases, including rheumatic diseases. He is a frequent collaborator with CAMBAC investigators: genome-wide association study in RA; genetic and epigenetic analyses of lupus; genome-wide methylation study in myeloma; epigenetic determinants of lipid response; integrative genomics of CHD.

David B. Allison, PhD (Dept Biostatistics, School of Public Health). ***Admixture Mapping of Human Traits and Conditions, including Obesity.*** Dr. Allison's interests include development and evaluation of statistical genetic methodology. His main content area is obesity and its role in human disease.

T. Prescott Atkinson, MD, PhD (Dept Pediatrics, Allergy/Immunology). ***Primary Immunodeficiency.*** Dr. Prescott's research focus is on the etiology and clinical characteristics of disorders related to primary immunodeficiency. His laboratory has also investigated the role of Mycoplasma in chronic diseases, such as asthma and different types of arthritis, and other humoral immunodeficiency. His lab is examining the role of urogenital mycoplasmas in JIA.

Laurence Bradley, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Measurement of Pain and Psychological Variables.*** Dr. Bradley's research focus is on the interplay between biological and behavioral factors that influence persistent pain in persons with rheumatic diseases. His group studies ethnic differences in pain among persons with knee osteoarthritis (OA) through the UPLOAD Study (R Fillingim, PI).

Daniel C. Bullard, PhD (Dept Genetics). ***Roles of Adhesion Molecules in the Pathogenesis of SLE, Psoriasis, and Vasculitic Disorders.*** Dr. Bullard's research interests are centered on defining the cellular and genetic mechanisms by which adhesion molecules, such as the β2 integrins, ICAM-1, and the selectins regulate immune and inflammatory processes, especially during the development of diseases such as systemic lupus erythematosus, vasculitis disorders, rheumatoid arthritis, and multiple sclerosis.

David Chaplin, MD, PhD (Dept Microbiology). ***Interplay Between Innate and Adaptive Immunity in Asthmatic Inflammation.*** Dr Chaplin's former research focused on mechanisms governing the interactions of the innate and adaptive immune responses, with a special interest in the mechanisms of asthmatic inflammation. Dr. Chaplin brings a career-long commitment to the training and career development of scientists in both basic and translational research, and currently serves as Director of the Training Academy of the NCATS-funded UAB Clinical and Translational Science Award, and he will be instrumental in establishing UAB's new Certificate Program in Translational and Molecular Sciences.

W. Winn Chatham, MD (Dept Medicine/Clinical Immunology and Rheumatology). ***Clinical Trials of Investigational New Drugs in SLE.*** In collaboration with clinical trial investigators in the US and other countries, Dr. Chatham is involved in Phase II and Phase III clinical trials of investigational new drugs for systemic lupus erythematosus. He was involved in the pivotal clinical trials of belimumab (Benlysta) for SLE, and is an active collaborator in clinical and translational studies in SLE.

Randy Q. Cron, MD, PhD (Dept Pediatrics/Rheumatology). ***Pediatric rheumatology and macrophage activation syndrome (MAS).*** Dr. Cron's laboratory studies CD4 T cell gene transcription in primary human CD4 T cells: 1) defining the hCD154 cis-elements and epigenetic changes responsible for CD154 hyper-expression in lupus CD4 T cells; 2) studying the role of the gut microbiota, and the associated host adaptive immune response (both B cells and T cells) in patients with spondyloarthritis; 3) studying macrophage activation syndrome (MAS) patient mutations for their ability to decrease perforin-mediated cytolytic activity in NK cells, and examining the role of MUNC13-4 SNPs, sIL2Ra and sCD163 in distinguishing patients with overt and subclinical MAS from patients with flare of systemic juvenile idiopathic arthritis (sJIA).

Xiangqin Cui, PhD (Dept Biostatistics /School of Public Health). ***Statistical Genetics Methodologies.*** Dr. Cui's research focus is in the field of statistical genetics; specifically in genome-wide studies, such as gene expression (arrays and next-generation sequencing), DNA methylation, metabolomics, and microbiome. She is PI of the Methodology Core of the NIH-funded Multidisciplinary Clinical Research Center and leads efforts in study design, data analysis, investigator development, and education of investigators in statistical methods.

Gary Cutter, PhD (Dept Biostatistics, School of Public Health). ***Clinical Trials and Biostatistics.*** Dr. Cutter's major research interest is in design, analysis and interpretation of clinical trials, epidemiologic studies and evaluation research. As a collaborative biostatistician, his contributions span multiple diseases, including, but not limited to cardiovascular disease, osteoporosis, and multiple sclerosis.

Alan W Eberhardt, PhD (Dept Biomedical Engineering, School of Engineering). ***Orthopedic and Injury Biomechanics.*** Dr. Eberhardt's research focuses on orthopedic and injury biomechanics, related to total joint replacements involving biomechanics and biomaterials (surface treatments, implant tribology, implant design, forensic analysis); biomechanical response of the pelvis in automotive side impacts and metastatic bone lesions; and design for people with disabilities. Dr. Eberhardt is the Director of the Experimental Biomechanics Core at UAB, which contains all the modern tools for characterizing bone and soft tissues at the macro-level (MTS systems, drop tower impactor) to the micro-level (Bose Low-force Testbench, Nano-indenter).

Jeffrey C. Edberg, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Genetic and Epigenetic Influences in Lupus; Biomarkers of Pain Perception in OA.*** Dr. Edberg's research focus is on the role of genetic and epigenetic variation in B and T lymphocytes in susceptibility to SLE; understanding the functional consequences of genetic variation in genes encoding immune response proteins implicated through genome-wide association studies; identification and ethnic variation of biomarkers of pain perception in OA.

Candace Floyd, PhD (Dept Physical Medicine and Rehabilitation). ***Neuronal-Glial Interactions in Traumatic Brain and Spinal Cord Injury.*** Dr. Floyd's lab investigates pathophysiological mechanisms, novel therapeutic targets, and intervention strategies to promote repair and recovery after CNS injury.

Kevin Fontaine, PhD (Dept Health Behavior, School of Public Health). ***Outcomes of Dietary and Physical Activity Intervention.*** Dr. Fontaine's research focuses primarily on clinical obesity treatment and evaluating the effects of various dietary and physical activity interventions on body composition and quality of life in both children and adults with physical disabilities and chronic disease, such as RA.

Mona Fouad, MD (Dept Medicine/Preventive Medicine). ***Primary Disease Prevention in Minorities.*** Dr. Fouad's research focus is in minority health and health disparities. Dr. Fouad has played a prominent leadership role in training minority researchers and leaders in the national effort to eliminate health disparities. She has a strong interest in mentoring minority investigators, fellows, and young faculty.

Angelo Gaffo, MD, MSPH (Dept Medicine, Clinical Immunology and Rheumatology). ***Crystal-Induced Arthritis and Systemic Vasculitis.*** Dr. Gaffo's expertise in research lies in gout, as an investigator in the UAB Center of Research Translation in Gout and Hyperuricemia; and systemic vasculitis and other complex autoimmune conditions. Dr. Gaffo serves as a mentor for undergraduate Hispanic and Latino students at UAB, and is actively involved in educational and academic initiatives at UAB such as the Kaizen-IM program.

James F. George, PhD (**Dept Surgery/Cardiothoracic).** ***Immune Regulation of Post-transplant Vascular Disease and Allograft Rejection.*** Dr. George's research is concentrated in transplantation immunobiology, particularly in relation to allograft vascular disease, immune regulation, and the role of heme oxygenase-1.

Shawn Gilbert, MD (Dept Surgery/Orthopaedic Surgery). ***Bone and Blood Vessel Development and Repair in the Skeleton.*** Dr. Gilbert's principal interest has been investigating the role of the hypoxia inducible factor (HIF) pathway and angiogenesis in the skeleton. Dr. Gilbert has developed an interest in obesity and musculoskeletal health. Additional clinical research interests include limb and spine deformity, fractures, skeletal maturation, and musculoskeletal infections.

Paul Goepfert, MD (Dept Medicine/Infectious Diseases). ***Mechanisms Allowing T cells to Control HIV Replication In Vivo.*** The ultimate goal of Dr. Goepfert's research is to aid development of an effective HIV vaccine to prevent infection and disease progression by more fully understanding the correlates of protection against HIV with a focus on cell-mediated immune responses (CD4 and CD8 T cells).

George Howard, PhD (Dept Biostatistics, School of Public Health). ***Biostatistics, Clinical Trial Design, and Clinical Studies of Stroke, and RA.*** Dr. Howard's primary research focus is geographic and racial differences in stroke risk. He is PI of the REasons for Geographic And Racial Differences in Stroke (REGARDS) Study, a longitudinal cohort of 30,239 African American and Caucasian participants. He is a long time investigator in RA, having led the statistical center for the Consortium for the Longitudinal Analysis of African-Americans with RA (CLEAR) Registry, and for the Treatment of Early Aggressive RA (TEAR) Trial.

Laura B. Hughes, MD, MSPH (Dept Medicine/Clinical Immunology and Rheumatology). ***Biomarkers of Treatment Response in RA; Musculoskeletal Ultrasound.*** In addition to serving as Director of the Rheumatology Fellowship Program, Dr. Hughes directs the UAB Rheumatology-Radiology collaborative effort in musculoskeletal ultrasound. She is a collaborative researcher with Dr. Bridges in the Rheumatoid Arthritis Synovial Tissue Network (REASON) Study, a network of investigators who will perform ultrasound guided RA synovial biopsies for translational studies.

Robert P. Kimberly, MD (Dept Medicine/Clinical Immunology and Rheumatology). ***Functional Significance of Genetic Variants in Autoimmune and Immune-Mediated Inflammatory Diseases.*** Dr. Kimberly's laboratory is interested in the role of genetic and epigenetic factors in the development of autoimmune and immune-mediated inflammatory diseases such as SLE and systemic vasculitis. His group's approach has focused on molecular mechanisms of receptor signaling. In his role as Director of the UAB Center for Clinical and Translational Science, he is a leader in facilitation of trans-disciplinary research at UAB.

Bruce Korf, MD, PhD (Dept Genetics). ***Genetics and Management of Neurofibromatosis, and Personalized Medicine for Human Diseases.*** Dr. Korf's research focus is genotype-phenotype correlations and the role of genetic modifiers in neurofibromatosis type 1 (NF1). As director of the Heflin Center for Genomic Sciences at UAB, and Co-Director of the UAB-HudsonAlpha Center for Genomic Medicine, he is involved in the integration of genomics into medical practice, and using exome and genome sequencing to solve complex chronic genetic disorders. Dr. Korf has established a genetic counseling training program.

Elliot Lefkowitz, PhD (Dept Microbiology). ***Microbial Genomics and Evolution; Bioinformatics, and Clinical Informatics.*** Dr. Lefkowitz's research interests are directed at developing and utilizing computational tools and bioinformatics techniques to mine sequence and other data for significant patterns characteristic of function and/or evolution. He has been pivotal in developing analytic techniques and approaches to microbiome data and analysis and interpretation of next generation sequencing data.

Robinna Lorenz, MD, PhD (Dept Pathology). ***Mucosal and Systemic Immune Systems Response to Gastrointestinal Microbiota.*** Dr. Lorenz studies the cellular components of the mucosal immune system and their interactions with the gastrointestinal epithelium, the GI microbiome, and the systemic immune response.

Nianjun Liu, PhD (Dept Biostatistics, School of Public Health). ***Statistical Genetics.*** Dr. Liu's research focus is methodology development and data analysis. His collaborative work includes development of novel statistical methods for haplotype analysis of data from various genetic association studies, such as candidate gene, genome-wide, and next-generation sequence studies, and haplotype and linkage disequilibrium.

Peter Mannon, MD, MPH (Dept Medicine/GI and Hepatology). ***Endotypes of Inflammatory Bowel Disease.*** Dr. Mannon investigates the endotypes of IBD as well as the development of novel therapies to improve outcomes for defined subsets of patients.

Amie Brown McLain, MD (Dept Physical Medicine and Rehabilitation). ***Health Outcomes in Spinal Cord Injury and Neurological Disorders.*** Chair of the Physical Medicine and Rehabilitation Department, Dr. McLain's research and clinical focus is spinal cord injuries and other neurological disabilities, assessing and improving health outcomes in individuals with disabilities.

Sarah Morgan, MD, RD (Dept Medicine/Clinical Immunology and Rheumatology). ***Nutrition and Arthritis, Nutritional Support, Osteoporosis and Bone Densitometry.*** Dr. Morgan has extensively studied arthritis, nutrition, folate supplementation and methotrexate (MTX) metabolism in RA. She was co-leader of a pivotal randomized controlled trial showing folic acid supplements during low dose MTX therapy for RA do not alter the efficacy of therapy. She is Director of the UAB Osteoporosis Clinic and serves as clinical mentor on osteoporosis and metabolic bone diseases for rheumatology fellows and other trainees.

Paul Muntner, PhD (Dept Epidemiology, School of Public Health). ***Epidemiology of Renal and Cardiovascular Disease; Outcomes in Musculoskeletal Diseases.*** Dr. Muntner is an epidemiologist with interest in renal and cardiovascular diseases, and Project Leader on the AHRQ-funded UAB Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs) to investigate a novel tool and multi-modal intervention for improving osteoporosis treatment adherence.

Richard Myers, PhD (HudsonAlpha; Dept Genetics). ***Human Genetics and Genomics in Inflammatory Disease.*** Dr. Myers' research is focused on human genetics and genomics. His specific areas include human population genetics; the genomic basis of vertebrate diversity; and the use of genomics tools and genetics to understand how genes interacting with the environment contribute to human disease phenotypes.

Jan Novak, PhD (Dept Microbiology). ***Pathogenesis and Treatment of Chronic and Autoimmune Diseases.*** Dr. Novak's research is glycoimmunobiology and proteomic and genetic studies relevant to human health and disease, namely in relevance to renal diseases, particularly IgA nephropathy. He has a long track record of investigation in glycosylation of IgA1 and IgG and the changes associated with autoimmune diseases, such as IgA nephropathy, periodontal disease, inflammatory bowel disease and rheumatoid arthritis.

Brent Ponce, MD (Dept. Surgery/Orthopaedic Surgery). ***Biomechanics of the Shoulder***. Dr. Ponce's research and clinical focus is on the biomechanics of the shoulder. He is an active participant in the Orthopaedic Research Committee and actively mentors research projects of orthopaedics residents.

Sasanka Ramanadham, PhD (Dept. Cell, Developmental, & Integrative Biology). ***Role of Lipid Mediators in Signal Transduction.*** Dr. Ramanadham's research focus is lipid signaling in beta-cell biology. His lab demonstrated that activation a calcium-independent phospholipase A_2beta ($iPLA_2\beta$) contributes to beta-cell apoptosis. He also studies the contribution of $iPLA_2\beta$ derived lipids for optimal bone formation, as its deficiency leads to compromises bone integrity.

David Redden, PhD (Dept Biostatistics; Section of Statistical Genetics). ***Statistical Methodologies.*** Chair of the Department of Biostatistics, Dr. Redden's expertise is on design and analysis of group randomized trials, adaptive randomization for clinical trials, estimation and control of admixture within genetic association studies, and application of the sequential probability ratio test to clinical trials and genetic association studies.

Monika Safford, MD (Dept. Medicine/Preventive Medicine). ***Eliminating Health Disparities in Disease Outcomes.*** Dr. Safford is a health disparities researcher primarily focused on eliminating disparities in cardiovascular outcomes in vulnerable and high risk populations. Studies include REGARDS-MI study (cardiovascular epidemiology), UAB's Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs) as well as the Encourage program (community health worker delivered interventions to improve diabetes outcomes in the Alabama Black Belt).

Isabel Scarinci-Searles, PhD (Dept Medicine/Preventive Medicine). ***Cancer Disparities Associated with Socioeconomic Status and Race/Ethnicity.*** Dr. Scarinci-Searles' primary area of interest is cancer prevention among low-income, racial/ethnic minorities, and immigrant populations (particularly Latinos and African Americans), with a focus on the development of community-based programs that are theoretically based and culturally relevant to these populations relating to breast and cervical cancer and tobacco control.

Lisa Schwiebert, PhD (Dept Cell, Developmental, & Integrative Biology). ***Airway inflammation; Lung Function; Asthma and Exercise.*** Dr. Schwiebert's research focus is to understand the physiologic mechanisms that underlie lung immunity through molecular and translational approaches.

David Standaert, MD, PhD (Dept Neurology). ***Innate immunity and Parkinson's Disease.*** Dr. Standaert is interested in the mechanisms of Parkinson's Disease (PD) and other conditions which produce abnormalities of movement. Recent findings suggest a fundamental role for immune receptors (FcγRs) in neuronal degeneration in a model of PD, implicating innate immunity involvement in disease progression.

Chad Steele, PhD (Dept Medicine/Pulmonary). ***Immune Responses to Fungal Pathogens of the Lung.*** Dr. Steele's research focus is in immunity against fungal infections. Currently, his lab is studying lung host defense mechanisms against fungal infections and how immunoprotective responses required for pathogen elimination may paradoxically result in immunopathogenic responses that culminate in lung function decline.

Steven M. Theiss, MD (Dept Surgery/Orthopaedic Surgery). ***Outcomes and Treatment of Spine Trauma and Deformity.*** Dr. Theiss, Director of the Division of Orthopaedic Surgery, has led studies focused on the enhancement and inhibition of bone healing during spine fusion. He has shown that nicotine inhibited the sequential gene expression of cytokines critical in successful arthrodesis, even as early as several hours after the fusion procedure.

Hemant Tiwari, PhD (Dept Biostatistics, School of Public Health). ***Genetic Linkage Analysis in Autoimmunity and Inflammation.*** Dr. Tiwari's research interests include genetic linkage analysis, disequilibrium mapping, population genetics, molecular evolution, and bioinformatics. He serves as Director of the Section on Statistical Genetics, and is a long standing and frequent collaborator with rheumatology faculty on genetic association studies in SLE and RA.

Trygve Tollefsbol, PhD, DO, (Dept Biology, College of Arts and Sciences). ***Role of Epigenetics in Cancer, Aging and Nutrition.*** Dr. Tollefsbol has contributed numerous novel findings in the molecular mechanisms of epigenetic and epigenomic gene control in nutrition and cancer; as well as, numerous mechanisms for control of methylation spreading that play important roles in gene silencing in cancer, aging and nutrition.

Tim Townes, PhD (Dept Biochemistry and Molecular Genetics). ***Developmental Regulation of Gene Expression.*** Dr. Townes' research focus is gene regulation in hemoglobinopathies such as beta-thalassemia and sickle cell disease. His lab seeks to define the basic mechanisms that control globin gene regulation and to use these discoveries to develop novel strategies to cure hemoglobinopathies.

Hubert Tse, PhD (Dept Microbiology). ***The Role of Oxidative Stress in Autoimmunity.*** Dr. Tse's research focus is the synergy of oxidative stress and autoimmune destruction of insulin-secreting pancreatic beta-cells in Type 1 diabetes. His lab has focused on dissipating free radicals as a potential target to preserve pancreatic beta-cells and to mediate immune tolerance and suppression of autoreactive T cell responses.

Peter Waite, DDS, MD, MPH (Dept Oral & Maxillofacial Surgery, School of Dentistry). ***Musculoskeletal Function of the Jaw.*** Dr. Waite's research focuses on the temporomandibular joint (TMJ), a frequent target in juvenile idiopathic arthritis.

Mark Walter, PhD (Dept Microbiology). ***Structure and Function of Cytokines Involved in Viral Pathogenesis and Autoimmune Diseases.*** Dr. Walter studies interferons and their role in viral infection and in autoimmune diseases such as systemic lupus erythematosus. These studies provide the framework for detailed biochemical and cellular characterization of how cytokines lead to cellular activation and thus trigger autoimmunity.

Amy Warriner, MD (Dept Medicine/Endocrinology). ***Treatment and Outcomes in Osteoporosis.*** Dr. Warriner's research focus is osteoporosis and other disease-related bone changes. She studies bone mineral density changes and the prevalence of fracture in HIV-positive persons through the use of Medicare and Medicaid data. In collaboration with others, Dr. Warriner is leading studies aimed at patient-centered initiatives to improve diagnosis and treatment of osteoporosis.

Timothy Wick, PhD (Dept Biomedical Engineering, School of Engineering). ***Orthopaedic and Cardiovascular Tissue Engineering and Regenerative Medicine***. Dr. Wicks' research is focused on bioreactors and bioprocessing technologies to manufacture musculoskeletal and cardiovascular 3-D tissue constructs. These may ultimately lead to repair or replacement of diseased or damaged organs or joints.

Yang Yang, PhD (Dept Pathology). ***Translational Research in Bone and Multiple Myeloma.*** Dr. Yang's research focuses on bone microenvironment and cancer, specifically, multiple myeloma bone metastasis. His lab investigates the role of Syndecan-1 heparan sulfate proteoglycan, Heparanase, and, most recently, Runx2.

Majd Zayzafoon, MD, PhD (Dept Pathology). ***Tumor-stroma Interaction and Regulation of Tumor Microenvironment.*** Dr. Zayzafoon's research expertise is molecular mechanisms of prostate cancer bone metastases and osteosarcoma. His lab focuses on understanding tumor-stroma interaction with the goals of defining its pathobiology and discovering novel targets that regulate tumor microenvironment for the treatment of cancer. He is an Associate Director of the CAMBAC, and former Director of the Center for Metabolic Bone Diseases.

Mentors in Training

Stella Aslibekyan, PhD (Dept Epidemiology, School of Public Health). ***Epidemiology of Chronic Disease.*** Dr. Aslibekyan's research focus is on the intersection of environmental factors and the use of -omics systems biology (i.e. genomics, epigenomics, transcriptomics) to determine their role on chronic disease; specifically, how genes interact with treatment and lifestyle variables in the etiology of rheumatoid arthritis.

Andre Ballesteros-Tato, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Therapeutic use of IL-2 in SLE.*** One of Dr. Ballesteros' research areas is the potential therapeutic use of low doses of IL-2 in systemic lupus erythematosus. His recent findings indicate that exogenous IL-2 administration prevents aberrant accumulation of follicular helper T cells (Tfh) and germinal center B cells in lupus-prone mice. He has an NIH R01 to examine the T-Cell-dependent B Cell response to influenza.

Krista R. Casazza, PhD, RD (Dept Pediatrics). ***Optimization of Musculoskeletal System During Puberty.*** Dr. Casazza's training and expertise lie in the intersection of nutrient delivery and utilization and the musculoskeletal system in pediatrics. She is interested in the relationship between fat and bone, and cross-talk between tissues during pubertal transition. She is PI of a K99/R00 grant from NIH.

Maria Danila, MD, MSc, MSPH (Dept Medicine/Clinical Immunology and Rheumatology). ***Personalized Medicine/Outcomes in Rheumatoid Arthritis.*** Dr. Danila's research focus is personalizing the care of patients with rheumatic diseases. She is interested in developing prediction models for disease outcomes in rheumatoid arthritis and other rheumatic diseases using clinical, proteomic and genetic data. She is PI of an NIH K23 grant.

Beatriz León-Ruiz, PhD (Dept. Microbiology). ***In Vivo Regulation of T cell and B cell Responses in Rheumatoid Arthritis.*** One of Dr. Leon's research interests is new methods to identify autoreactive B cells with the long-term goal of using these reagents to determine how autoreactive B cell develop and cause pathology in RA. She is exploring mechanisms to either improve antigen presentation by dendritic cells to elicit extensive T-cell responses with therapeutic effects. She has an NIH R01 to examine the regulation of T cell responses to allergens and environmental microbes.

Iris Y. Navarro-Millán, MD (Dept Medicine/Clinical Immunology and Rheumatology). ***Cardiovascular Outcomes Among Patients with RA.*** Dr. Navarro's research focus is on improving cardiovascular (CV) outcomes among patients with RA, developing and testing patient-centered interventions to be used in real-world settings and designed to reduce CV risk in RA patients. She has research funding from the RRF.

Richard J. Reynolds, PhD (Dept Medicine/Clinical Immunology and Rheumatology). ***Genetics of Inflammatory Diseases.*** Dr. Reynold's research focus includes the association of HLA DRB1 with RA in African Americans, and gene-environment interactions in gout and hyperuricemia. He is PI of an NIH K01.

Lizhong Wang, PhD (Dept Genetics). ***Genetics and Epigenetics of Cancer.*** Dr. Wang's research focus is on cancer genetics and molecular epidemiology. Dr. Wang has a broad background in cancer and autoimmune genetics and genomics.

Amy Weinmann, PhD (Dept Microbiology). ***Regulation of Immune Cell Fate.*** Dr. Weinmann's research is focused on the T-box and BTB-ZF transcription factor families, which are required to promote cellular transitions in numerous developmental systems. Dr. Weinmann and colleagues have defined a novel role for the T-box transcription factor family in establishing the epigenetic states that are required for cellular transition.

Nabiha Yusuf, PhD (Dept Dermatology). ***Mechanisms Involved in Regulation of Cytokine Genes in Psoriasis***. Dr. Yusuf's research is the mechanism of gene regulation in psoriasis. The ultimate goal of these studies is to define the role of TLR4 in the development of immune suppression after UV radiation, and to identify genetic loci that are involved in these processes and to develop immune-preventive and immunotherapeutic approaches toward them.

Ping Zhang, PhD (Dept Pediatric Dentistry, School of Dentistry). ***Mechanisms of Periodontal Bone Loss.*** Dr. Zhang's primary interest lies in understanding the innate regulation of inflammation and bone loss in the pathogenesis of periodontitis. Her current research focus is on the underlying signaling events regulating the functional interactions between inflammation and osteoclastogenesis in the context of infection with periodontal pathogens.

Collaborations and Interactions. The Program Faculty has been selected based on their interests in topics relevant to rheumatic and musculoskeletal disease research. Interactions and collaborations are facilitated by an ongoing series of weekly research-in-progress conferences (Thursday at noon for rheumatic diseases; Friday morning for methodology and outcomes research); weekly seminars (Rheumatology Grand Rounds Thursdays at 8:00 AM [**Appendix F6**], Program in Immunology Seminar Series Thursdays at 4:00 PM [**Appendix D2**]) and Methodology workshops led by faculty in COERE/CERTs, CAMBAC/MCRC Methodology Core, etc. There are also multiple Journal Clubs held weekly (e.g. Rheumatology Journal Club Fridays at noon [**Appendix F7**]). In addition, there are CAMBAC sponsored symposia and workshops, and the Annual CAMBAC Research Day (see **Appendix F5 and F6**).

Opportunities for Training Junior Faculty in Research Mentoring; and for Improving Mentoring Skills of Established Mentors. This T32 training program includes both established (Core and Content) Mentors and Mentors in Training (junior faculty with limited experience in mentoring). UAB has invested substantial effort and resources to promote and develop research mentorship, in large part due to recommendations in a Mentoring White Paper that examined the state of mentoring at UAB (**Appendix G1**).

Many of these efforts are led through the UAB Center for Clinical and Translational Science (CCTS) Training Academy (**Appendix C5**). Our experience in guiding the development of academic physicians through the early portions of their careers has underscored the exceptional value of a well-conceived mentor-mentee relationship. Recognizing that few mid- and senior-level faculty have specific training in mentoring, and in order to enhance the effectiveness of mentor-mentee interactions, we strongly encourage mentors to take advantage of one or more mechanisms to develop competencies in this area. In additional to on-line mentor training programs such as those offered by the University of Minnesota (Optimizing the Practice of Mentoring: an online curriculum for the professional development of research mentors; the UAB CCTS offers short, but intensive workshops on mentoring drawing from components of the University of Wisconsin Entering Mentorship sessions.

A novel component of this T32 is a Mentors in Training component, where experienced mentors partner with promising junior faculty on mentoring teams for fellows with the purpose of developing the mentoring skills of the junior faculty. Mentoring skills of our Mentors in Training will be enhanced by the CCTS mentoring initiative and the UAB Mentoring Academy (**Appendix C5** and **G4**). The CCTS initiative has resulted in the development of a mentoring "tool box," which provides both mentors and mentees with access to guidance and resources such as mentoring contracts, definitions of "best practices" for mentoring, and case study mechanisms for facilitating mentoring when hurdles are encountered. Mentors also participate in a monthly forum that provides them an opportunity to talk over mentoring challenges they have encountered and for sharing approaches to solving problems encountered in the mentoring process. Furthermore, regularly scheduled seminars and presentations on mentorship by internally recognized mentors and external experts provide our mentor faculty, other junior investigators, and their mentees multiple venues for optimizing mentoring skills.

The CCTS offers twice a year mentor training that is based on the Entering Mentoring curriculum developed by faculty at the University of Wisconsin with support from the Howard Hughes Medical Institute. The training is provided in two 3-hour workshops that aim to develop competencies in key areas essential for development of effective mentor-mentee relationships. These include maintaining effective communication, aligning expectations for the mentoring relationship, assessing mentee understanding, addressing equity and inclusion, fostering mentee independence, fostering professional development, and articulating a mentoring philosophy and plan. Additional sessions can be provided for groups of 6-12 faculty on a schedule that meets their needs. The CCTS also provides a monthly forum for faculty to discuss mentoring issues, to obtain

updates on specific mentoring competencies, and to share mentoring experiences or challenges with other concerned faculty. These Mentoring Lunches are scheduled on the first Friday of each month.

The CCTS provides a consultation service to help mentors and/or mentees to develop individual development plans (IDP) (**Appendix G2**). The Center offers support for IDPs under a variety of formats, including the CCTS Mentoring Contract, the AAMC Careers in Medicine on-line resource (https://www.aamc.org/cim/), and the Science Careers myIDP website (http://myidp.sciencecareers.org/). Finally, for faculty or mentees that have limited time to devote to obtaining mentor/mentee competencies, the CCTS will help these individuals to access the University of Minnesota "Optimizing the Practice of Mentoring" on-line curriculum or the Brigham and Women's Hospital Mentoring Tool Kit.

3C. Proposed Training

Overview. The overall training program is comprised of a didactic curriculum, an intensive clinical experience (for physician investigators), and a mentored research project. Additional training elements appropriate to each pre-doctoral and post-doctoral trainee are selected according to their training goals and research interests (overviews of the pre-doctoral and post-doctoral training are shown in **Figure 3**). The didactic curriculum is built upon the programs in the Graduate Biomedical Sciences (GBS) themes, particularly Immunology; Genetics and Genomics Sciences; Pathobiology and Molecular Medicine; and Cell, Molecular, and Developmental Biology (**Appendix A**); and the MSPH in Clinical Research (**Appendix C3**). In addition, UAB has a graduate level Certificate Program in Translational and Molecular Sciences (**Appendix C4**).

Pre-doctoral students, accepted by GBS, rotate through laboratories during their first graduate year with the goal of selecting a mentor and laboratory by the first quarter of the second graduate year. Each of these programs provides extensive training in the scientific method and exposes trainees to a range of current approaches used in modern biomedical and translational sciences. The curricula for these programs also provide the framework for formal instruction for postdoctoral trainees wishing to expand their knowledge base in the biomedical sciences pertinent to rheumatic and musculoskeletal disease research.

All postdoctoral trainees will participate in the interdisciplinary enrichment program experience comprised of monthly luncheons with visiting scholars, appropriate conferences and elective modules, and the activities of the CAMBAC (**Appendix F**). Each trainee and his/her mentor are asked to agree upon written goals as part of an Individual Development Plan (IDP) as recommended by NIH (see **Appendix G2**). Furthermore, trainees are asked to evaluate their mentors as part of the ongoing facilitation of the overall training program, to formally evaluate and improve our training efforts through the use of established metrics.

For post-doctoral candidates seeking clinical training in the rheumatic diseases (typically adult or pediatric rheumatology fellows), the first clinical year of the program, paid for by institutional funds, focuses on an intensive clinical experience based on outpatient, in-patient, and consultative evaluation and management of patients with immunologic and rheumatic diseases. Following the clinical experience, trainees devote two to three years to intensive research training, structured around a mentored research project and a didactic curriculum. For candidates without clinical training (PhD postdoctoral fellows), the program consists of three to four years of intensive research training in rheumatic or musculoskeletal disease. To extend the impact of our training support, we have encouraged all trainees to seek extramural support in an appropriate and timely fashion and have had success with various foundations and associations. This T32 program typically provides two years of support, contingent on adequate progress.

In developing the proposed program, the Program Director, the Executive Committee and the Program Faculty have carefully considered guidelines for graduate students and postdoctoral trainees, including reports of the National Academy of Sciences and the National Institutes of Health. We feel strongly that clear training goals and benchmarks for progress and success are an essential component of our responsibility for effective mentoring of trainees and support of career development. In addition, the program and its faculty have incorporated and will enhance the following initiatives in the next several years.

Clinical Training Experience (Physician Investigators). The research training program for physician scientists is preceded by an intensive clinical year, funded by institutional sources. An important goal of this training program is to develop physician scientists with interests in fundamental and in clinical research as it relates to rheumatic and musculoskeletal diseases. We anticipate that physician investigators will be predominantly drawn from the highly competitive pool of applicants for the fellowship in rheumatology and fellowship in pediatric rheumatology. Although other clinical trainees (PM&R residents; orthopedics residents,

etc.) are eligible, the two year commitment, along with protected research time will be most well suited to subspecialty fellows such as those in rheumatology or pediatric rheumatology.

Adult Rheumatology. The outpatient experience in adult rheumatology is based on very active outpatient rheumatology clinics led by a leading rheumatology division. With faculty supervision, trainees in adult rheumatology evaluate new patients and participate in longitudinal clinical experiences under the rotating mentorship of the clinical practice faculty in outpatient departments at The Kirklin Clinic and at UAB Highlands (several blocks from The Kirklin Clinic – see **10. Facilities & Resources**) serve the faculty practice where all adult rheumatology patients are seen. In addition, all trainees in adult rheumatology rotate through the Birmingham Veterans Administration Rheumatology Clinic, the Cooper Green Rheumatology Clinic, and the each of which is held weekly. These combined experiences provide an exceptional range of diagnostic problems and management opportunities in the rheumatic disease with more than 17,000 visits annually. The inpatient clinical experience includes evaluation and management of rheumatology patients admitted to University Hospital, Birmingham VA Hospital and Cooper Green Hospital in addition to providing consultative services in Rheumatology to all services within each of these institutions. More than 700 consultations annually, as well as management of all rheumatology patients, provides an extensive experience in both the acute presentations of rheumatic diseases, as well as in the medical co-morbidities found in such patients.

Pediatric Rheumatology. A fellowship program in Pediatric Rheumatology at UAB/Children's of Alabama was approved in 2009, with the program's first candidate (Dr. Melissa Mannion, now a faculty member) beginning in 2011. In 2014, the Division of Pediatric Rheumatology was responsible for ~2,000 outpatient clinic visits, and a similar number of infusion visits (children receiving mostly novel biologic therapies) in the Children's Park Place infusion center. The Division of Pediatric Rheumatology at CHA/UAB has become well respected and not only treats children with rheumatic disorders in Alabama but serves much of Mississippi and significant numbers of children in Tennessee, Georgia, and Florida through a large referral base. There is also has a strong consult presence on the inpatient side at Children's of Alabama with over 100 consults in 2014.

During the first year, pediatric rheumatology fellows receive formal lectures pertaining to experimental design, statistics and research ethics. Some of these lectures are given as a part of the division's didactic lecture series. In addition to these lectures, courses on Biostatistics, Epidemiology, and Population Medicine are available as electives each spring through the UAB School of Public Health. Moreover, there are basic courses in research which cover topics such as experimental design, data collection and analysis, and outcome analysis. The first year pediatric rheumatology trainee will also attend the 6-month Biostatistics course offered to all pediatric fellows. Topics covered include: overview of experimental design, clinical trials, clinical epidemiology, data management, file management, describing and tabulating data, graphic examination of data, theoretical distributions, one-sample tests, two-sample tests, survival analysis, decision statistics, and cost-benefit analysis. The first year fellow participates in clinical research projects which are ongoing in the Division, including diagnosis and treatment of TMJ arthritis, recognition of and therapy for macrophage activation syndrome, treatment guidelines for JIA, and IL-1 inhibition in systemic JIA.

Didactic Clinical Instruction. As part of the first clinical year, and ongoing throughout the training program, trainees participate in a structured curriculum, including the fundamentals of rheumatology/pediatric rheumatology, as well as in clinical case management conferences every other week (see **Appendix F7**). Clinical trainees mentor medical residents and students through ongoing review and discussion of the clinical literature pertinent to rheumatology. They present Clinical Portfolio cases to the faculty as part of case management conferences and also participate in the weekly adult/pediatric Rheumatology Journal Club (see **Appendix F8**), combining clinical and biomedical science and designed to heighten awareness of the interaction and interdependence between clinical and mechanistic research.

Clinical and Translational Research Projects. During the clinical year, adult rheumatology fellows are encouraged to participate in a clinical research projects, either by assisting with ongoing projects or defining their own projects. A diverse portfolio of clinical research projects are available within the Division. While the mentored research project may spring from this research experience in the first year, trainees are encouraged to consider projects tailored to their own interests and drawing on the breadth of the entire Program Faculty.

Evaluation of Clinical Training. *Adult rheumatology.* As required by the ABIM, regular evaluations of trainees by faculty are provided to the Clinical Training Director (Dr. Hughes) and to the Division Director (Dr. Bridges). In addition, trainees are asked to evaluate the faculty in terms of the effectiveness of their performance as teachers and role models. During the first year, Dr. Hughes meets regularly with the Fellows

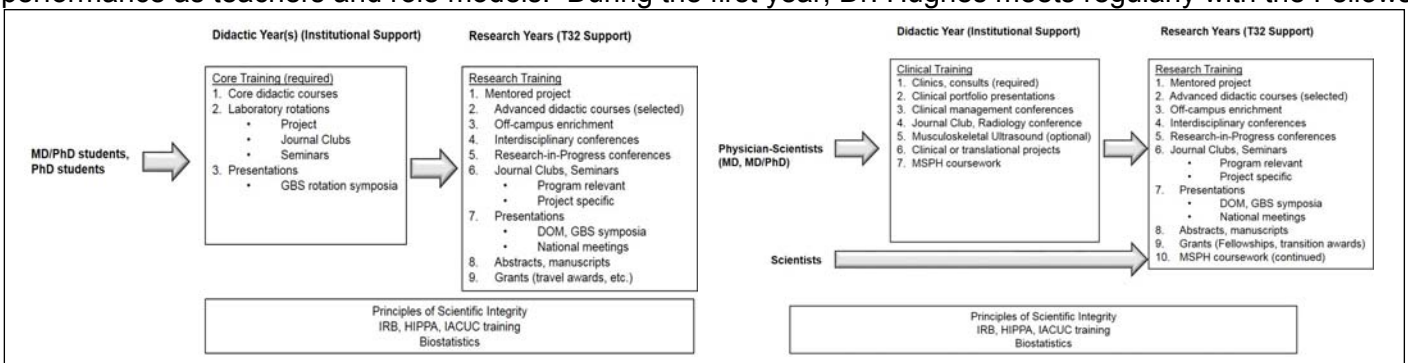


Figure 3. Pre-doctoral Student (left panel) and Postdoctoral Fellow (right panel) Training Programs

in clinical training and provides summary comments to Dr. Bridges. In addition, the performance of the Fellows is discussed on a monthly basis during the Division's Clinical Faculty meetings chaired by Dr. Bridges.

Pediatric rheumatology. A scholarship oversight committee for each fellow will be established according to the recommendations of the American Board of Pediatrics (ABP). Members of the Oversight Committee will include the fellow's research mentor(s) and select UAB faculty with expertise relevant to the fellow's research project and who meet the ABP Guidelines. The committee will consist of 3 more members, including at least one faculty member outside of Pediatric Rheumatology. The committee meets with the fellow every 6 months to ensure that the project will appropriately meet the requirement for scholarly activity set forth by the ABP. The final committee meeting prior to the fellow's graduation occurs in May and requires the fellow to present his/her research (during the weekly Department of Pediatrics' Children's Health Investigative Forum lecture series) and defend the conclusions reached.

Research Instruction and Training. Postdoctoral Fellows, with or without clinical training, will select a mentored research project and advanced coursework that complements that project. Pre-doctoral students select their thesis project and laboratory based on their rotation experience with guidance from GBS advisors. Admission into the GBS is determined by the theme-based Admissions Committees and is based on GPA, GRE scores and other considerations (see **Tables 5A/B and 8A/B**). Recruitment is facilitated by Summer Internship Programs for undergraduates considering careers in medical research. Each of the academic departments at the University is actively involved in the recruitment of minority trainees through programs, including McNair summer students, coordinated by the Vice President for Equity and Diversity.

Didactic Coursework (Postdoctoral trainees, required). During the first and second research years, postdoctoral trainees interested in biomedical science will be expected to participate in those modules of the graduate curricula pertinent to their mentored project and research interests. In addition, they will be expected to take the graduate course in biostatistics (BY 755), and when pertinent, an instructional practicum in statistical genetics and the Vocabulary of Clinical and Translational Science. Similarly, postdoctoral trainees interested in clinical research will participate in the Masters in Public Health in Clinical Research (**Appendix C3)**. Students with a particularly strong interest in pursuing clinical or translational research careers may elect to enroll in the Certificate Program in Translational and Medical Sciences (**Appendix C4**). All trainees (pre- and postdoctoral) will take GRD 717, Principles of Scientific Integrity (**Appendix C2**), as well as a rigorous curriculum in the responsible conduct of research, with fundamental requirements in human subjects, vertebrate animal and laboratory research.

Interdisciplinary Enrichment Program (Postdoctoral trainees, required). To facilitate interaction among trainees and to promote interdisciplinary discussion, trainees participate in a monthly luncheon with visiting scholars. A vigorous program of visiting scientists is well established within the CAMBAC (**Appendix F6**), the Program in Immunology (**Appendix D2**) and the Division of Clinical Immunology and Rheumatology (**Appendix F7**). This series of visiting professors provides an important opportunity for informal exchange of research ideas and questions.

Research in Progress (Pre-doctoral and postdoctoral trainees, required). Trainees will be required to participate in the weekly Research in Progress series held every Thursday at noon under the aegis of the CAMBAC. This is a forum for review of data and for the gathering of suggestions to facilitate research, as well

as a forum to develop skills in effective scientific communication. The broad range of interests of the attending Faculty, Fellows, and students provides an ideal interdisciplinary format.

Journal Clubs, Seminars, and Conferences (Pre-doctoral and postdoctoral trainees, encouraged). Throughout the year there is a robust program of seminars sponsored both by the CAMBAC, the Division, and other Centers and Departments within the University. These provide an important intellectual milieu for the development of trainees and faculty alike. In addition, a weekly Journal Club designed to bring clinicians and investigators together (see **Appendix F8**) supplements individual laboratory journal clubs as well as specific topically focused journal clubs in such areas as Cellular and Molecular Immunology, Neuroimmunology and Mucosal Immunology. The Division sponsors the Lowe Conference, an annual fall retreat. Trainees are also encouraged to attend regional and national scientific meetings, including the American College of Rheumatology Annual Session, the AAI meeting, ASBMR, the Federation of Clinical Immunology Societies meeting or other meetings.

Mentored Research Experience. During the first clinical year, each physician/investigator will have the opportunity to become familiar with areas of research of members of the training faculty through seminars, informal discussions, and reading. Fellows are invited to visit with program faculty members and become familiar with available research projects. The choice of research mentor is based on the Fellows' research interests and the mutual consent of both mentor and trainee. This choice is reviewed by the Program Faculty, and the mentor and trainee are asked to develop a written set of goals for the training experience, including both the didactic curriculum and the research project, through the Individual Development Plan (IDP – see **Appendix G2**). The Executive Committee believes that physician/scientists and PhD scientists, working together in the same environment, are strongly synergistic. Therefore, we have had a focused effort to recruit PhD investigators to our program. An important element for PhD postdoctoral trainees is to deepen their knowledge in areas of investigation pertinent to rheumatologic disease through co-mentorship, journal clubs and seminars.

Mentored Research Project. Having selected a research project, the trainee will work in the laboratory of the mentor/co-mentor, who will assume responsibility for the research plan and training plan. Each student or fellow will have projects which are related to, but distinguishable from, those of his/her mentor. This will facilitate assessment of progress and the development of an individual research program. During the laboratory experience, trainees are expected to acquire skills and techniques consonant with their future career plans. The research program of each mentor has regular meetings for review of experimental design, techniques and data assessment and interpretation. Trainees present their results at the Research in Progress series at which other Program Faculty and trainees participate in review of experimental results and discussion of results in the context of current investigations in the field. The Research in Progress conference is designed to encourage collegial discussion and to generate additional assistance and collaborations. Thus, through individual mentor/trainee meetings to review methodologies, results and to trouble shoot problems, through regular laboratory-based research meetings and through the program-wide weekly conferences, there are multiple avenues for mentors and trainees to seek input to optimize both the training experience and the progress on the individual research projects.

Formal Presentation of Results. In addition to semi-formal presentation of research results, trainees are strongly encouraged to present their findings at local, regional, and national meetings. For example, the UAB Department of Medicine holds an Annual Trainee Research Symposium (TRS) for the presentation of projects in poster format and for the formal review of projects involving Department of Medicine faculty members. This forum provides the opportunity for trainees to organize and present their research to individuals, both within and outside of their primary field of interest. As part of the TRS, posters are formally evaluated and prizes awarded for excellence on a competitive basis. The TRS provides an excellent experience in preparation for presentation at regional and national scientific meetings including the American College of Rheumatology, the American Association of Immunology, etc. Trainees will also be expected to present their research findings, either as a poster or as a talk at the annual CAMBAC Research Day (see **Appendix F5**).

Preparation of Manuscripts and Grants. All trainees are expected to publish their results in peer-reviewed journals as part of their training (**Tables 6A/B**). Continuous review and evaluation of the literature in their specific area is an essential element of the training experience. This is accomplished through extensive reading, laboratory-based journal clubs, and attendance at seminars and lectures. Given the vigorous research environment at UAB, there is exceptional access to advice, as well as to invited speakers, in all areas of rheumatic disease research. In addition to manuscripts, fellows are encouraged to work with their mentors

to submit grants for research support. When appropriate, these grants will provide fellowship training support and/or transition to Junior Faculty status. The Program Directors and Executive Committee assist the research mentors/co-mentors in identifying the best sources of potential funding and in developing grant applications. As part of this process, trainees review previous grants, submitted by Program Faculty, critique grants being written either by other trainees or by Program Faculty, and write their own grant applications as part of the Professional Development curriculum.

Mentoring of Trainees for the Future. Trainees are encouraged to attend local, regional, and national scientific meetings, not only for scientific interchange but also for networking and career visibility. Trainees are encouraged to interact directly with faculty at other institutions, as well as with trainees at other institutions. The Department of Medicine, through its Research Advisory Group, has a regular seminar program discussing research opportunities and expectations of individuals as they assume faculty positions. All trainees are encouraged to attend such seminars. Additional mentoring training is available through the CCTS and the UAB Mentoring Academy (see **Appendix C5 and Appendix G4)**.

Individualized Development Plans. In accordance with recommendations on the Use of Individual Development Plans (IDPs) for Graduate Students and Postdoctoral Researchers outlined in NIH Notice Number: NOT-OD-13-093 and NOT-OD-14-113, individual development plans (IDPs) will be used to identify and promote the career goals of graduate students and postdoctoral researchers associated with this research training program. The UAB Graduate School, working with the GBS theme directors, the MSTP, and the Office of Postdoctoral Education, has organized training sessions for graduate students, postdocs and other trainees to begin an IDP, using the MyIDP website (https://myidp.sciencecareers.org) (see **Appendix G2**). In Fall 2014, several IDP training sessions for graduate students and postdocs were held. Theme and program directors are responsible for assuring and documenting IDP instruction and participation. Evidence of IDP use includes documented attendance at IDP training sessions or provision of a screenshot of a myIDP Summary Personal Information page. As of October 1, 2014, IDP training was incorporated into all trainee orientations. We encourage the use of Developing SMART (Specific, Measurable, Attainable, Relevant, Time-bound) goals (Meyer, Paul J. 2003. "What would you do if you knew you couldn't fail? Creating S.M.A.R.T. Goals". Attitude Is Everything: If You Want to Succeed Above and Beyond. Meyer Resource Group, Incorporated).

3D. Program Evaluation

At the beginning of the research training period, through the IDP mechanism described above, mentors and trainees develop a written set of activities and goals including didactic courses, ongoing conferences and seminars, as well as the mentored research project. These goals provide the framework for periodic assessment of progress in the training relationship and, in conjunction with written feedback provided by trainees, they are reviewed at least annually with the Program Directors and Executive Committee. Annual evaluation forms and the form used for the Exit Interview of trainees completing the program are shown in **Appendix G3**.

Over the longer term, the evaluation of the overall program will be the outcomes reflected in the percent of trainees remaining in research and academic medicine and in the number of trainees pursuing interdisciplinary research related to the rheumatic diseases. An interview and feedback session with the Program Directors every 6 months will also have an interview guide and feedback form to use to provide feedback to the mentor(s) and mentee. Our approach is summarized in the following T32 Evaluation Matrix:

T32 Evaluation Matrix

Data Sources (Inputs)	Indicators (Outputs)	Programmatic Objective	Feedback	Frequency
Recruitment reports	-% accepted who matriculate -% minority applied, accepted and matriculated	-Assess program desirability -Increase minority recruitment	To Program Director (PD) /Exec Comm	Annually
Mentoring Plan	- Training goals - Mentor/mentee expectations - Research project identification - Productivity (expected) - Research project completion	Baseline for assessment of individual trainee's progress and success of mentoring.	To mentor-mentee team by PD/Assoc PDs	Annually (at the beginning of each training year)

Data Sources (Inputs)	Indicators (Outputs)	Programmatic Objective	Feedback	Frequency
Trainee Progress Reports	- Progress on research - Abstracts, Publications & impact - Participation in career development activities	Provide ongoing feedback on - Trainee engagement -Overall progress - Effectiveness of mentoring relationship.	To mentor-mentee team by PD/Assoc PDs	Twice a year
Trainee Assessments of T32 Program	- Quality of mentoring - Barriers to success - Trainee satisfaction w/ mentor - Trainee satisfaction w/program	-Identify strengths and weaknesses in program -identify early need for intervention	To Executive Committee	Twice a year
Mentor's Evaluation of Trainee	- Trainee progress to goals and productivity - Quality of mentor's relationship with mentee - Areas of strength - Areas for improvement	Provide ongoing advice from mentor to mentee	Mentor to Trainee (each meeting)	Ongoing with annual reports to Executive Committee
Interviews of Trainee; Online evaluation	- Satisfaction with the overall program and with the mentored research experience; - Self-assessment of degree to which the program helped the Trainee meet their career goals	Identify barriers to success, patterns in program weakness in order to establish areas for improvement.	Trainee to PDs and Executive Committee	Every 6 months and when Trainee exits program
Alumni Survey and CV; Pubmed searches, etc.	- Current position/career satisfaction - Independent research funding - Publications	Long-term evaluation of program	To SC from Trainee	Annual (for 10 years)

Formal External Evaluation of the Research Training Program

In order to identify the factors that associated with success and improve outcomes of future trainees, we will utilize an innovative approach to evaluation, which focuses on three primary objectives: 1) assessing the overall impact of program effectiveness and progress toward increasing the number of predoctoral and post-doctoral scientists in rheumatic and musculoskeletal disease research; 2) determining the contribution of program elements toward achieving program outcomes; and 3) identifying program changes/adjustments to improve program outcomes, as needed.

Outcome evaluation will be guided by Kirkpatrick's four level hierarchy of behavioral change (Kirkpatrick, DL. 1996. Program Design and Development: Evaluation. In Craig, R.L. ed., The ASTD Training and Development Handbook, 4th ed., New York: McGraw-Hill, p. 294-312). These levels are: 1) Participation, reaction and satisfaction – how participants feel about aspects of the program; 2) Learning (knowledge and skills) – knowledge acquired, skills improved, and/or attitudes changed due to training; 3) Application and implementation (behavior) – the measure of the extent to which participants who complete the training change teaching or practice behaviors; and 4) Impact – how and who benefits from a specific program.

Program staff will perform this evaluation within the first year of funding and provide a written evaluation to the Executive Committee. Evaluation of mentors by trainees will be included, and specific feedback given to the mentors. Improvements will be implemented in consultation with current mentors/mentees, the program faculty, and the Internal Advisory Committee. This plan is further evidence of our commitment to do all that is possible to help each of our trainees to generate high-quality publications and have independently funded high-impact research careers focused on rheumatic diseases.

3E. Trainee Candidates: Recruitment, Qualifications and Selection

Applicant Recruitment and Selection. Physicians and physician scientists wishing to obtain both clinical and research post-doctoral training are recruited nationally through the ERAS fellowship application and matching process. Applicants express interest through ERAS and applications are reviewed in a two–step process: Drs. Hughes and Cron, Directors of the Adult and Pediatric Training Programs, respectively, screen all applications and select candidates to be reviewed by Research Training Executive Committee to determine the interview roster. ERAS applications include personal information, education history, descriptions of research experiences, test scores and letters of recommendation. All T32 eligible candidates are interviewed by at least three members of the Research Training Program Executive Committee. Final rankings for the ERAS match are based on group discussion and consensus of the clinical and research faculty.

As is the case with many training programs, many highly qualified applicants are not permanent residents of the US, and thus are not training grant eligible. Dr. Bridges and other leaders of this training program will

continue to work closely with Dr. Hughes and Dr. Cron to ensure that the highest quality applicants who are training grant eligible and with potential for research careers in rheumatic disease are heavily recruited to UAB.

Scientists interested in post-doctoral training are recruited by several complementary mechanisms: (1) the Office of Postdoctoral Education maintains an active web site, complementing the School of Medicine's research portal and a listing of positions. (2) Underrepresented minorities will be recruited in collaboration with Dr. Mona Fouad, Associate Dean for Diversity and Inclusion, who will facilitate advertisement of trainee positions through the established collaborations of UAB with Historically Black Colleges and Universities/Minority Institutions (see Appendix E2). (3) Traditional recruitment of postdoctoral fellows is investigator-driven and based on networking among colleagues and contacts at scientific meetings. From within the pool of postdoctoral fellows training, or considering training, with Program Faculty, faculty-wide announcements of available training slots make faculty aware of openings. Applications for available positions, (consisting of biosketches, recommendations of the thesis mentor and the postdoctoral mentor, a preliminary outline of the proposed training plan and an interview with at least one member of the Executive Committee) are reviewed and assessed by the Executive Committee. Selections are made on the basis of the candidate's potential to develop as an independent investigator as judged by publications and mentors' evaluations.

Pre-doctoral students are drawn from the graduate thematic programs in GBS and the MSTP. Applications for students in the laboratories / research settings of Program Faculty are solicited from all Program Faculty and reviewed for programmatic relevance, for performance in the core curriculum and for assessment of potential by the mentor. The Executive Committee reviews each appointment. The Program Faculty actively participates in the recruitment of students to UAB and subsequently into the areas of interest outlined in this T32 application. Recognizing the opportunity to enhance recruitment to rheumatic and musculoskeletal disease research, Program Faculty have developed new thematically oriented graduate courses and journal clubs embracing translational research.

3F. Institutional Environment and Commitment to Training.

In addition to providing support for training in the first clinical year, the University, School and Medical Center have provided substantial support for the development of a research training infrastructure as exemplified in the new Graduate Biomedical Sciences programs, in the Office of Postdoctoral Education and in the activities of the Department of Medicine's Mentors' Advisory Committee. Each of these efforts provides complementary support for research career development.

Importantly, the UAB School of Medicine has recently instituted a program to provide $30,000 to the Program Director of each new (or competitively renewed) T32 training grant (see Letter of Support from Dr. Selwyn Vickers, Dean of the UAB School of Medicine). In addition, the UAB Division of Clinical Immunology and Rheumatology/Department of Medicine has provided substantially support for educational activities of faculty through state funds, endowments, and other sources (see Letter of Support from Dr. Seth Landefeld, Chair, UAB Department of Medicine).

The CAMBAC has used its institutional funds to support matching funds travel awards for trainees to attend meetings of the ACR, American Association of Immunologists, and the FOCiS Trainee Satellite Symposium, as well as courses and workshops. Trainees are encouraged to attend on campus enrichment workshops and seminars in immunology, rheumatology, genetics, and other related areas. Furthermore, for postdoctoral trainees with clinical credentials (MD and MD/PhD), the UAB CCTS, in partnership with the CAMBAC, has provided competitive funding for pilot research grants by physician/investigators to facilitate the transition to junior faculty positions. The Department of Medicine supports at least two physician/scientists each year, again on a competitive basis, through the Frommeyer Program which also helps in the transition to junior faculty positions.

4. RECRUITMENT AND RETENTION PLAN TO ENHANCE DIVERSITY

The training program leadership is committed to enhancing the ethnic and gender diversity of the investigators engaged in biomedical research and will be proactive in recruiting qualified applicants from under-represented populations through outreach in student and trainee oriented initiatives. UAB continues to take aggressive steps to recruit from underrepresented groups. Efforts to enhance diversity in education and training programs by UAB and the state of Alabama are shown in **Appendix E**. Several such programs are highlighted below. Dr. Mona Fouad, Associate Dean for Diversity and Inclusion of the School of Medicine will help the training program leaders to identify, recruit, develop, and retain the best and brightest scientists and clinicians from underrepresented minority populations.

Office for Equity and Diversity (Vice President for Equity and Diversity) –Louis Dale, PhD, has announced his retirement, and a new VP search is underway. This position is responsible for providing effective leadership in the development, coordination, implementation and assessment of a comprehensive array of programs to promote diversity and understanding of differences at UAB. The mission of the OED is to increase, retain and enhance faculty, student and staff diversity at all levels of the University and to ensure equity. Dr. Dale reports directly to the President on matters related to policy and vision and to the Provost on matters related to the management of programs.

Ronald E. McNair Post-Baccalaureate Achievement Program - The McNair Scholars Program is an academic enrichment program which provides effective preparation for doctoral study to TRIO eligible college students, and students from groups underrepresented in graduate education. The McNair scholars benefit from a strong committed faculty who are experienced in mentoring undergraduates, outstanding research programs and facilities, a full range of support programs and educational enhancement opportunities, and a population of graduate students to serve as role models and mentors.

Post-Baccalaureate Research Education Program (PREP) - A unique training opportunity for graduate degrees in biomedical or behavioral science, this program is for students who received their undergraduate degree in the previous three years and are not enrolled in graduate school. The program gives instruction and mentoring in research, academic writing, and test-taking, which can provide the extra experience students need to gain acceptance into science programs in leading graduate schools. During the PREP training period students receive a $21,000 stipend, plus health insurance and tuition for up to 10 credit hours of academic instruction. Students are individual paired with faculty for hands-on research projects.

UAB Mentored Experiences in Research, Instruction and Teaching Program (MERIT) – This NIH sponsored program is to support postdocs interested in combining research and teaching experiences. As a partnership with historically black institutions to help developing scientists conduct high-quality research in an academic environment, the long-term objectives are to enhance research-oriented teaching at minority-serving institutions, to promote interactions between research-intensive universities such as UAB and minority-serving institutions that lead to collaborations in research and teaching, and to increase the number of well qualified, under-represented minority students entering competitive careers in biomedical research.

5. PLAN FOR INSTRUCTION IN THE RESPONSIBLE CONDUCT OF RESEARCH

5A. Overview

UAB has a strong and ongoing commitment to the responsible conduct of research. The campus offers many opportunities for initial and annual training including formal courses through the Center for Ethics and Values in the Sciences, the Graduate School, the Office of Postdoctoral Education (OPE), and through programs and training sponsored on a regular, ongoing basis by the Institutional Review Board (IRB), Conflict of Interest Review Board (CIRB), Institutional Animal Care and Use Committee (IACUC), Occupational Health and Safety (OHS), and the UAB Center for Clinical and Translational Science (CCTS). All entering biomedical sciences students are educated during orientation about requirements to complete human subjects and animal use and care training programs; completion of requisite training is arranged and documented by their specific graduate programs.

All trainees will be are required to participate in, and satisfactorily complete **Principles of Scientific Integrity (GRD 717)** (see below, and **Appendix C2**) **within the first year of training**. Additionally yearly refresher RCR activities will be required for trainees that include additional ethics courses and/or utilizing Institutional resources such as the new training videos developed by the UAB Center for Ethics and Values in Sciences ((http://www.uab.edu/images/gradsil/rcr/index.html). These include “Teaching Research Integrity in Analysis and Reporting”, “Image Manipulation”, “In the Lab: Mentors and Students Behind the Scenes”, “Ethical issues in Underpowered Clinical Trials”, and “The Lab: Avoiding Research Misconduct” (Descriptions follow; Section 5A3). UAB has also recently developed a new scholarly integrity workshop “Ethics for Authors”, which is organized around interactive and facilitator-led discussions and exercises (www.uab.edu/ethicsforauthors/).

In addition, all mentors are advised and encouraged to include and document discussions regarding RCR during their one-on-one interactions with their students during mentor/student meetings, lab meetings, and during discussions of authorship on papers, how to handle various types of data, etc. As an example, when manuscripts are written, authorship and peer review are discussed. These recommendations will be disseminated to all training faculty by email on an annual basis at the time trainee applications are solicited.

Finally, we note that UAB is one of eight institutions recently awarded funding by the Council of Graduate Schools and the Office of Research Integrity to develop strategies to integrate RCR educational materials into the graduate curriculum, for use by faculty and graduate students in discussion of scholarly integrity. UAB’s national and international leadership in the area of ethics training was reflected by presentations at the 2010 Project for Scholarly Integrity Capstone Conference and the 2012 ORI conference “Quest for Research Excellence” and were highlighted in the book, “ Research and Scholarly Integrity in Graduate Education: A Comprehensive Approach,” published in 2012 by the Council of Graduate Schools.

5A1. Coursework – Year 1 REQUIRED of all Trainees

Principles of Scientific Integrity (GRD 717; 3 credit hours)

Format: This three-credit hour course provides systematic instruction on ethical issues and principles in the practice of science through reading, case discussions and lecture. The textbook is Introduction to the Responsible Conduct of Research by Nicholas H. Steneck, modified to reflect more recent changes in rules and regulations, and is available as a free download at http://ori.hhs.gov/documents/rcrintro.pdf. The team based learning pedagogic approach is modeled after a course developed by Dr. Wayne McCormack at the University of Florida School of Medicine. Course material is made available online approximately one week before the class meeting. Students are expected to read the textbook, watch slide presentations and videos (when available) on the class web site, pull and review the lecture material before the class meets each week, and attend all course meetings. In-class time is spent in teams of 6 to 7 students, taking quizzes to measure comprehension of the course materials, followed by discussion of case studies.

Subject Matter: Topics covered in GRD 717 include the nature, extent, and causes of fraud in science; UAB policies on fraud; ideals of good science; the responsibilities of authorship and peer review; potential problems raised by the commercialization of research; scientists as public policy advisors; and ethical issues involved in animal experimentation and in clinical trials. Among the areas previously discussed are:

- Ethical Decision Making (Jeff Engler);
- UAB Policies on Research Misconduct (Charles Prince, Assistant VP for Research);
- Protection of Human Subjects in Research (Jonathan Miller, UAB IRB);
- Welfare of Laboratory Animals (J. Michael Wyss, former Chair, IACUC);
- Best Practices for Data Management (James Collawn);
- Identifying and Managing Conflicts of Interest (J. Michael Wyss, Chair, CIRB);

- Ethical Authorship and Avoiding Plagiarism Jeffrey Engler);
- Best Practices in Collaborative Research (Bryan Noe, Dean, UAB Graduate School);
- Mentor and Trainee Responsibilities (Lisa Schwiebert);
- Expectations of the Peer Review Process (David Bedwell).

Faculty Participation: GRD 717 is led by Jeffrey A. Engler, PhD, Interim Dean, UAB Graduate School, and Professor of Biochemistry and Molecular Genetics using a "Team Based Learning" approach, with the help of several faculty facilitators, including Drs. Jim Collawn, Michelle Fanucchi, Tom Ryan, Lisa Schwiebert, and Mike Wyss, to lead discussions with graduate students and postdoctoral fellows in the responsible conduct of research.

Duration of Instruction: This course is offered in the Fall and Spring semester of each year meeting weekly over the course of the semester.

Frequency of Instruction: The class meets weekly for 2.5 hours per class meeting for a semester term (40 contact hours).

5A2. Alternative Courses for Additional Future Training Years:

Research Writing and Style (GRD 712)

This course is designed for pre and postdoctoral trainees managing personal writing efforts (e.g., journal article for publication or dissertation), in which goals for effective strategies of successful writers are conveyed, with emphasis on ethical standards in publishing scientific literature, peer review, and techniques for efficient editing. Topics include the different types of writing that students and professionals do (such as abstracts, proposals, journal articles, progress reports, and correspondence), publishing, and ethical issues related to writing and publication.

The Power of Ethical Thinking (GRD 718)

This all-day workshop offers proactive strategies for avoiding pitfalls in authorship, co-authorship, and team leadership when disseminating and publishing research. The workshop is designed to raise research writers' awareness of critical ethical issues that can occur in the processes of deadline writing, shared authorship, peer review, copyright adherence, and faithful data/image representation. Students analyze published case studies for risky writing and publishing practices that lead to integrity breaches (including group, mosaic, and accidental plagiarism) and compromised scholarship. More importantly, they familiarize themselves with best ethical practices to apply to their own writing and publishing careers.

Biomedical Ethics (HA 616)

This course focuses on the examination of various faith traditions, theories, principles and methods that influence reasoning, analysis and argument in contemporary health care ethics. Investigation of notable cases, the application of Modern Moral Theory, and in depth discourse on current issues in health care ethics (including media) is the cornerstone of the course.

5A3. Institutional Resources

Center for Ethics and Values in the Sciences

Directed by Harold Kincaid and Sara Vollmer, the Center is committed to providing academic enrichment in the responsible conduct of research by overseeing a didactic curriculum, seminar series and workshops. The Center also hosts a national conference annually on topics related to ethics and values in the sciences and assists in the development of research integrity educational materials at UAB. In conjunction with the CCTS, the Center for Ethics and Values in the Sciences has developed training modules appropriate for self-directed or small group learning.

Ethics for Authors

The UAB Ethics for Authors website explores ethical issues for students, researchers and faculty writing who want to follow best practices while incorporating prior source work and writing for publication. The site includes FAQs on citing and writing for research, e-tools and activities, several handouts, presentations, and information on citing and referencing as well as research writing. http://www.uab.edu/ethicsforauthors/

Online Learning Tool for Research Integrity and Image Processing

UAB has a web-based learning tool featuring video illustrations of responsible conduct and best practices for presenting image data in research publications and grants. This site demonstrates issues in image processing for research publications and image-related issues regarding the detection of manipulated data. Users can learn about the boundary between questionable practices and practices that demonstrate research integrity and can improve their decision-making skills in analysis and reporting.

Ethical issues in Underpowered Clinical Trials

By George Howard, DrPH, Professor and Chair, UAB Department of Biostatistics, this presentation reviews the organizational needs of clinical trials from a statistical perspective and the possible implications as they may impact human subject research.

Center for Clinical and Translational Sciences (CCTS)

The Research Ethics, Education and Training Component of the UAB CCTS is helping to produce intellectually innovative and methodologically rigorous clinical and translational researchers. As part of this effort, this component has an ongoing commitment to the development of training tools in the Responsible Conduct of Research. In collaboration with the Center for Ethics and Values in the Sciences, the CCTS aids in promoting the research ethics training and development of research integrity educational materials at UAB.

Additionally, the CCTS provides a 20-hour survey course, the *Vocabulary of Clinical and Translational Science*, includes fundamental information on hypothesis generation and testing; informatics; biostatistics; epidemiology and population research; clinical trials; ethics; overviews of translational and outcomes research; accessing information; the IRB and oversight of research; and critical review of clinical and translational literature. The Vocabulary course is required for all School of Medicine fellows who are in fellowship programs longer than one year and serves as the introductory coursework for the Clinical and Translational Science Training Program. http://www.uab.edu/ccts/TrainingAcademy/Pages/Responsible-Conduct-of-Research-(RCR).aspx

Office of Postdoctoral Education (OPE; Lisa Schwiebert, PhD, Director*)*

The OPE, established in 1999 as one of the first Postdoctoral offices in the country, is instrumental in establishing and maintaining competitive terms, benefits and training programs for all postdoctoral fellows at UAB. It works closely with the University's academic administration, the UAB Council on Postdoctoral Education and the UAB Postdoctoral Association to address the needs and concerns of postdoctoral fellows in a timely and professional manner.

Financial Conflict of Interests in Research Training

Training program for UAB investigators who are responsible for the design, conduct, or reporting of research; Investigators are required by federal regulation and UAB Enterprise Policy to complete training on conflicts of interest prior to engaging in research, charging effort to a federally-sponsored program, and every four (4) years thereafter.

UAB Institutional Review Board for Human Use (IRB; Jonathan E. Miller, MPPA, CIP, Director*); Collaborative IRB Training Initiative (CITI)*

The CITI Courses in the Protection of Human Research Subjects generally provides the initial training opportunity for researches seeking to engage in human subjects research. Online training modules include information for biomedical and social-behavioral researchers in a myriad of areas, including defining research with human subjects, basic IRB regulations and review process, informed consent, social and behavioral research, regulations, assessing risk, records-based research, genetic Research, vulnerable subjects, FDA-regulated research., international research, internet research, HIPAA, and conflicts of interest.

Institutional Animal Care and Use Committee Training (IACUC; David G. Cannon, CPIA, Director*)*

Before a researcher or trainee may work with animals, he/she must complete IACUC training, which encompasses a set of online modules including an introduction to the IACUC, regulations, policies, and procedures, personnel health and safety, and chemical safety training. Additional species specific training courses are available, which may be customized to the research program.

Occupational Health and Safety Training (OHS; Max Richard, Asst. Vice President*)*

The OHS provides a myriad of training courses tailored to the research program needs. Some of these courses, based on their broad applicability to fundamental laboratory research, have become standard requirements of pre and postdoctoral training at UAB, including: Hazardous Waste Handling and Packing (CS055), Online Initial Radiation Safety Training (RS1001), Basic Biosafety Training (BIO303), Laboratory Safety Workshop (LSW2001) and Chemical Safety Training (CS101). Other specialized courses are also available, which may be customized to the research program.

5A4. Other Resources

RCR Resources - General RCR Training

Funded by a grant from the Office of Research Integrity (ORI) for the Department of Health and Human Services, this resource collates a myriad of html, pdf, and video files focusing on issues of mentoring, student conduct, and scientific integrity. The material is provided in complement to the didactic curriculum made available to our trainees. http://ori.hhs.gov/

7. HUMAN SUBJECTS

Trainee participation in research involving human subjects will occur solely as part of research projects that have received or will receive review and approval by the UAB Institutional Review Board or equivalent IRB. No portion of the Training Grant Award will be used to support this research. All projects supported within the auspices of this training program will be required to maintain appropriate human subjects regulatory approvals throughout their performance. In addition, all mentors and trainees involved in human subject research are required to maintain appropriate IRB training, as described in **Section 5. PLAN FOR INSTRUCTION IN THE RESPONSIBLE CONDUCT OF RESEARCH**. A list of IRB-approved human subjects protocols for the core mentors on this application is below.

APPROVED HUMAN SUBJECTS PROTOCOLS

Faculty Member	Title of Protocol	IRB Protocol Number	Approval Date
Arnett, Donna K	Study of Cardiac Mechanics in Systemic Hypertension	N110726005	8/26/2011
Arnett, Donna K	Prospective Meta-Analysis of Drug-Gene Interactions: Charge GWAS	N120217009	2/24/2012
Arnett, Donna K	Genetic Predictors of Methotrexate Efficacy and Toxicity in Rheumatoid Arthritis	N120221002	2/28/2012
Arnett, Donna K	Integration of Genomics and Metabolomics to Characterize Postprandial Lipemia	N120416003	6/15/2012
Arnett, Donna K	Genetic and Environmental Determinants of Triglycerides(GOLDN)	X040826013	7/2/2014
Arnett, Donna K	Genetics of Hypertensive Associated Treatments (GenHAT)	X050215001	7/2/2014
Arnett, Donna K	Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate (Genetic and Epigenetic Determinants of Trimethylamine-N	XI00806001	7/15/2014
Arnett, Donna K	Training Interventions and Genetics of Exercise Response (TIGER)	F090828001	7/30/2014
Arnett, Donna K	Population Genetics Analysis Program: Immunity to VaccinesllnfectionsII -Administrative Data and Specimen Analysis Core	X100813024	8/12/2014
Arnett, Donna K	Pretreatment Genotyping at APOA5 and GCKR Loci and Response to Fenofibrate Therapy	X091008008	9/22/2014
Arnett, Donna K	Prevention Research in Mood and Exercise (PRIME)	X130822014	10/29/2014
Arnett, Donna K	Genetic and Molecular Markers of Methotrexate Efficacy and Toxicity in Early RA	X080225013	12/19/2014
Arnett, Donna K	MESA Study	X060504013	1/27/2015
Arnett, Donna K	Epigenetic Determinants of Left Ventricular Structure and Function in Hypertensive African Americans	X150213006	2/26/2015
Arnett, Donna K	The NINDS International Stroke Genetics Consortium Study *Submit Date 5/10/2010 Renewal Period* Annual	X100527001	3/17/2015
Arnett, Donna K	Gestational Diabetes and Mother-Child Methylation Patterns in an Asian Indian Population	X150213005	3/24/2015
Arnett, Donna K	Hyper-GEN-Genetic Epidemiology of Left Ventricular Hypertrophy	X040826012	4/14/2015
Arnett, Donna	Genomewide Association: Triglyceride Response to	X080527004	6/10/2015

K	Fenofibrate		pending
Arnett, Donna K	Analysis of Exome Sequencing Data of GO-ESP Cardiovascular Disease Cohorts	X130430003	6/10/2015 (PENDING)
Bamman, Marcas, M	Effects of Strength Training on Muscle Function and Recovery in Head and Neck and Breast Cancer Patients	F 130919008	9/5/2014
Bamman, Marcas, M	Maximizing Mechanisms of Muscle Hypertrophy to Combat Sarcopenia	F080221002	12/17/2014
Bamman, Marcas, M	Novel Exercise Prescription to Improve Fatigability and Muscle Function in Parkinson's Disease	F111216007	1/6/2015
Bamman, Marcas, M	Novel Actions of Metformin to Augment Resistance Training Adaptation	F140722001	1/6/2015
Bamman, Marcas, M	Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement	F141204014	4/6/2015
Bellis, Susan L	Functionalizing Hydroxyapatite with Proadhesive Proteins	N060810001	8/11/2006
Bellis, Susan L	Role of sialylation in macrophage apoptosis	N090206001	2/9/2009
Bellis, Susan L	Cell and Molecular Analysis of Biomaterials Core	N090729004	9/23/2009
Bellis, Susan L	Role of Receptor Sialylation in the Ovarian Tumor Cell Phenotype	N101130007	12/8/2010
Bellis, Susan L	Novel Method for Anchoring Osteoinductive Factors to Bone Graft Materials to Enhance Osseointegration	N120113001	1/24/2012
Bellis, Susan L	Glycosylation-Dependent Mechanisms Regulating Ovarian Tumor Cell	N140123001	2/3/2014
Bellis, Susan L	Glycan Control of Stem Cell -Associated Pathways in Pancreatic Cancer	N140721007	7/24/2014
Bellis, Susan L.			8/11/2006
Bridges, S. Louis (Jr.)	Auto-antibodies and Periodontal Health Assessment in Rheumatoid Arthritis (APART), Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis)	F110826003	7/28/2014
Bridges, S. Louis (Jr.)	Predictors of Treatment Response in Early Aggressive Rheumatoid	X051014001	7/30/2014
Bridges, S. Louis (Jr.)	Treatment Efficacy and Toxicity in Rheumatoid Arthritis Database and Repository (TETRAD) (Coordinating Center)	X091007003	7/30/2014
Bridges, S. Louis (Jr.)	SEASCAPE Study (Serial Rheumatoid Arthritis Single Cell Network)	X140729002	9/10/2014
Bridges, S. Louis (Jr.)	Genetic and Ethnic Differences in C-Reactive Protein as a Biomarker in Rheumatoid Arthritis	X070820001	9/16/2014
Bridges, S. Louis (Jr.)	Establishing a Rheumatoid Arthritis Clinic, Database, and Sample Repository	X080317004	10/3/2014
Bridges, S. Louis (Jr.)	Treatment of Early Aggressive Rheumatoid Arthritis (TEAR) Trial	X040129014	10/6/2014
Bridges, S. Louis (Jr.)	Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis -Coordinating Center	X111006001	10/10/2014
Bridges, S. Louis (Jr.)	RhEumatoid Arthritis SynOvial Tissue Network (REASON)	F140827005	11/24/2014
Bridges, S. Louis (Jr.)	Cytokine Profiling in Early RA: Correlations with Inflammatory Markers	X090205001	12/2/2014

Bridges, S. Louis (Jr.)	UAB Multidisciplinary Clinical Research Center - Administrative Core	X130111003	1/7/2015
Bridges, S. Louis (Jr.)	Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis (Enrollment Site)	X120119004	1/14/2015
Bridges, S. Louis (Jr.)	Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis (Coordinating Center)	X090925002	1/26/2015
Bridges, S. Louis (Jr.)	Genetic Predictors of Response to Treatment in Early RA	X000818002	4/3/2015
Bridges, S. Louis (Jr.)	Continuation of the Consortium for the Longitudinal Evaluation of African-Americans with Rheumatoid Arthritis (CLEAR) -Coordinating Center	X061215004	4/3/2015
Bridges, S. Louis (Jr.)	Multidisciplinary Clinical Research Center Project No.3: Predictors of Rheumatoid Arthritis Severity in African-Americans (NIAMS Multidisciplinary Clinical Research Center 2 P60 AR048095-06A 1)	X080219016	4/14/2015
Brown, Elizabeth E	Toll-Like Receptors and SLE and JRA in a High-Risk Hispanic Population	N091211003	12/15/2009
Brown, Elizabeth E	Molecular Characterization of Plasma Cell Dyscrasias	X130425002	9/16/2014
Brown, Elizabeth E	OUTCOME OF SLE IN MINORITIES: NATURE VERSUS NURTURE (Lupus Study at UAB: A Genetic Risk Profile in Longitudinal SLE Cohorts - LUMINA)	X930422003	3/6/2015
Brown, Elizabeth E	Program Project in the Genetics of SLE: Project NO.4: A Genetic Risk PROFILE in Longitudinal Cohorts. Outcome of Systemic Lupus Erythemotosus in Minorities = Nature VS. Nurture	X020805005	3/6/2015
Brown, Elizabeth E	Molecular Characterization of Myeloma and Related Asymptomatic Precursor States	F140207008	3/11/2015
Brown, Elizabeth E	Molecular and Genetic Epidemiology (iMAGE) Study of Myeloma Retrospective Chart Review (Morehouse School of Medicine/Tuskegee University/Univ. of Alabama Cancer Center Partnership)	X090727007	3/18/2015
Brown, Elizabeth E	The Role of Exosome Heparanase and miRNAs as Biomarkers for Myeloma	X140220006	3/19/2015
Brown, Elizabeth E	A Genome-Wide Methylation Study of Epigenetic Contributions to Multiple Myeloma	X11061401 5	4/7/2015
Brown, Elizabeth E	Molecular and Genetic Epidemiology (iMAGE) Study of Myeloma	X071106009	4/8/2015
Brown, Elizabeth E	Association of Genetic and Autoantibody Signatures with SLE Clinical Course -Coordinating Center	X140604005	4/15/2015
Brown, Elizabeth E	Determinants of B Cell Homeostasis Related to the Risk of Lupus	X070418002	4/20/2015
Brown, Elizabeth E	Functional Genomic Determinants of B Cell Homeostasis and Susceptibility to SLE	X070423002	4/20/2015
Brown, Elizabeth E	Association of Genetic and Autoantibody Signatures with SLE Clinical Course-UAB Site Application	F140521004	4/22/2015
Chen, Yabing	Determine the Expression of Death Receptors in Human Pancreatic	N150504008	5/11/2015
Curtis, Jeffrey	Kaiser Permanente Autoimmune Disease Registry	N100304003	4/27/2010

R			
Curtis, Jeffrey R	Patient Survey to Evaluate Methotrexate Tolerability in RA	X131015003	10/11/2013
Curtis, Jeffrey R	Facilitating Treat-to-Target Using Novel Health Technology with Decision Support (Project 2: UAB Multidisciplinary Clinical Research Center (P60): Ohio State University	N140307001	3/7/2014
Curtis, Jeffrey R	Treatment Efficacy and Toxicity in Rheumatoid Arthritis Database and Repository (TETRAD)	F100103002	5/7/2014
Curtis, Jeffrey R	A Clinical Outcomes Study to Evaluate the Effects of IL-6 Receptor Blockade with Tocilizumab (TCA) in Comparison with Etanercept (ETA) on the Rate of Cardiovascular Events in Patients with Moderate to Severe Rheumatoid Arthritis (RA)	W111014001	7/7/2014
Curtis, Jeffrey R	A Multicenter, Randomized, Double-Blind, Placebo-Controlled, Parallel Group Study of CNTO 136 (Sirukumab), a Human Anti-IL-6 Monoclonal Antibody, Administered Subcutaneously, in Subjects with Active Rheumatoid Arthritis Despite Anti-TNF Therapy	W120904003	7/12/2014
Curtis, Jeffrey R	Extension Study: Evaluating Treatment with PF-05280586 versus Rituximab in Subjects with Active Rheumatoid Arthritis who have participated in Other PF-05280586 Clinical Trials	W121217003	7/12/2014
Curtis, Jeffrey R	A Multicenter, Parallel-group Study of Long-term Safety and Efficacy of CNT0136 (sirukumab) for Rheumatoid Arthritis in Subjects Completing Treatment in Studies CNT0136ARA3002 (SIRROUND-D)	W140718002	7/17/2014
Curtis, Jeffrey R	Multicenter, Open-Label, Randomized, Single-Dose Study Assessing the Pharmacodynamic Parameters of IL-6 Receptor Blockade with Sarilumab or Tocilizumab in Patients with Rheumatoid Arthritis on Stable Methotrexate Treatment	W140718005	8/5/2014
Curtis, Jeffrey R	A Phase 3, Multicenter, Randomized, Double-Blind, Placebo-Controlled, Parallel-Group, Efficacy and Safety Study of Two Doses of Apremilast (CC-1 0004) in Subjects with Active Psoriatic Arthritis and a Qualifying Psoriasis Lesion	W101104001	9/2/2014
Curtis, Jeffrey R	Psoriasis Standing Cohort Project (Pfizer Project)	X120814007	9/17/2014
Curtis, Jeffrey R	Longitudinal Comparative Effectiveness and Safety of Biologics in Autoimmunity	X090930002	9/22/2014
Curtis, Jeffrey R	The-Safety and Effectiveness of tt18 VaricElla zosteR VaccinE (VERVE) in Anti-TNF Users: A Pilot Study of the Safety and Effectiveness of the Live Zoster Vaccine in Anti-TNF Users-Coordinating Center	X130521004	10/2/2014
Curtis, Jeffrey R	The Safety and Effectiveness of the VaricElla zosteR VaccinE (VERVE) in Anti-TNF Users: A Pilot Study of the Safety and Effectiveness of the Live Zoster Vaccine in Anti-TNF Users	F130521005	10/2/2014
Curtis, Jeffrey R	Capturing Patient Reported Outcomes in RA to Improve Quality of Care & Outcomes in Real-World Settings	X131216001	10/6/2014

Curtis, Jeffrey R	Facilitating Treat-to-Target Using Novel Health Technology with Decision Support. (Project 2: UAB Multidisciplinary Clinical Research Center (P60))	X140604001	10/8/2014
Curtis, Jeffrey R	Cardiovascular Diseases in Patients with Rheumatoid Arthritis	X110906004	10/16/2014
Curtis, Jeffrey R	Geographic Distribution of Opportunistic Infections in a National Sample of Medicare Beneficiaries	X091026008	10/21/2014
Curtis, Jeffrey R	Enhancing Comparative Effectiveness and Health Outcomes Research Through Linkages between CMS Data and External Sources	X121029003	10/24/2014
Curtis, Jeffrey R	Long Term Risks and Extra-Skeletal Benefits of Biologics	X081110007	11/5/2014
Curtis, Jeffrey R	The CORRONA Effectiveness Registry to Study Therapies for Arthritis and Inflammatory Conditions (CORRONA CERTAIN) Sub-Study	X121008008	11/5/2014
Curtis, Jeffrey R	Arthritis Patient Partnership with Comparative Effectiveness Researchers (AR-PoWER)(Arthritis Power	X140911003	11/7/2014
Curtis, Jeffrey R	A Randomized, Double-blind Trial Assessing the Impact of Methotrexate Discontinuation on the Efficacy of Subcutaneous Tocilizumab with Methotrexate Therapy	W131025005	12/9/2014
Curtis, Jeffrey R	Evaluation of Innovative Technology to Capture Patient Reported Outcomes to Facilitate Treat to Target and Comparative Effectiveness Research in Rheumatoid Arthritis	X121127007	12/10/2014
Curtis, Jeffrey R	A Novel Centralized “Virtual” Gout Clinic for Chronic Gout Management (CoRT Project 4)	X121119002	1/21/2015
Curtis, Jeffrey R	A Long-Term, Open-Label Follow-up Study of CP-690,550, a Moderately Selective Janus-Kinase-3 Inhibitor, for Treatment of Rheumatoid Arthritis	W090924008	2/21/2015
Curtis, Jeffrey R	Patient Valued Comparative Effectiveness of Corticosteroids versus Anti-TNF Therapy for Inflammatory Bowel Disease	X140327005	4/3/2015
Curtis, Jeffrey R	Comparative Effectiveness and Safety of Biologic Therapies in Autoimmune Disease Using the MPCD	X130402002	4/8/2015
Curtis, Jeffrey R	Phase *3B/4* Randomized Safety Endpoint Study of 2 Doses of Tofacitinib in Comparison to a Tumor Necrosis Factor (TNF) Inhibitor in Subjects with Rheumatoid Arthritis	W140225001	5/2/2015
Curtis, Jeffrey R	Denosumab Global Safety Assessment Among Women with Postmenopausal Osteoporosis (PMO) Using Multiple Observational Databases (Risk of Secondary Fracture Among Post-Menopausal Women in the United States)(Assessment of Claims-Based Algorithms to Identify Recurrent Fractures)	X110523005	5/13/2015
Curtis, Jeffrey R	Rheumatology Informatics System for Effectiveness (RISE) Registry	X121127006	5/13/2015
Curtis, Jeffrey R	Improving Health Literacy	X150306001	5/15/2015
Curtis, Jeffrey R.	Improving Osteoporosis Care in High-Risk Home Health Patients	X080401004	12/5/2014
Elson, Charles O.(III)	Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis (UAB	X130507003	6/20/2014

	Multidisciplinary Clinical Research Center Project 3		
Elson, Charles O.(III)	Ulcerative Colitis Genetics Initiative	X140515004	8/5/2014
Elson, Charles O.(III)	Innate and Adaptive Microbial Immunity in IBD, Administrative	X100110009	2/10/2015
Elson, Charles O.(III)	Immunity to the Gut Microbiota in Humans	X050802008	4/9/2015
Feng, Xu	Role of CD68 in Prostate Cancer Bone Metastasis	N081016012	11/26/2008
Feng, Xu	Development of Therapeutics Targeting CD68 for Preventing and Treating Breast Cancer Bone Metastasis	N090611002	6/19/2009
Fouad, Mona N	Diabetes Research and Training Center Community Engagement Core *Submit*	X090518007	4/16/2014
Fouad, Mona N	Policy: System and Environmental Changes: A Comprehensive Approach to Reduce Obesity [Research Sub -Project 1 Under the Gulf States Collaborative Center for Health Policy Research (Gulf States CC)]	X130604008	6/20/2014
Fouad, Mona N	National Lung Screening Trial (NLST) (Prostate Lung Colorectal and Ovarian Cancer Screening Trial)	X020814018	7/28/2014
Fouad, Mona N	Enhancing Minority Participation in Clinical Trials (EM PaCT)	X100522019	7/31/2014
Fouad, Mona N	Racial and Ethnic Approaches to Community Health US (REACH US)	X07111200	8/5/2014
Fouad, Mona N	WALK! Feel Alive: REACHing the Entire Family	X120907008	9/30/2014
Fouad, Mona N	Comprehensive Minority and Health Disparities Research Center (MHDRC) -Phase III -Community Engagement Core (CEC)	X140922007	10/2/2014
Fouad, Mona N	Deep South CanCORS Colorectal and Lung	X030508006	10/28/2014
Fouad, Mona N	Mid-South Transdisciplinary Collaborative Center for Health Disparities Research (Administrative Core	X121212007	11/19/2014
Fouad, Mona N	Healthy Happy Kids Nutrition and Physical Activity Program	X140925001	12/15/2014
Fouad, Mona N	GO-ing Forward	X100409013	12/30/2014
Fouad, Mona N	Cancer Outreach Program (Morehouse School of Medicine Tuskegee University/UAB Comprehensive Cancer Center Partnership: Upender Manne, PhD - PI	X060406009	1/8/2015
Fouad, Mona N	Enhancing Minority Participation in Clinical Trials (EM PaCT): Phase	X120314008	1/8/2015
Fouad, Mona N	Etiologic Factors for Prostate Cancer Progression in the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial	X110127005	1/22/2015
Fouad, Mona N	Cancer Care Outcomes Research and Surveillance Consortium	X100222015	2/10/2015
Fouad, Mona N	Recruitment and Retention Shared Facility (RRSF) (Comprehensive Cancer Center Support Grant -Recruitment and Retention)	X980601004	3/2/2015

Fouad, Mona N	Alabama Breast and Cervical Cancer Control Coalition (Phase II) (REACH 2010)	X010124008	3/2/2015
Fouad, Mona N	Birmingham REACH for Better Health	E141202004	4/2/2015
Fouad, Mona N	Prostate, Lung, Colo-Rectal and Ovarian (PLCO) Cancer Screening Trial Expansion for Minority	X970626001	4/27/2015
Gutierrez, Orlando, M	Characterization of HDL Subfractions by APOL 1 Risk Status in African Americans	X150122002	3/212015
Gutierrez, Orlando, M	Dietary Patterns and Outcomes in the Reasons for Geographic and Regional Differences in Stroke Study	E110506011	6/24/2011
Gutierrez, Orlando, M	Impact of Disorders of Mineral Metabolism on Stroke and Cognitive	E120703007	8/3/2012
Gutierrez, Orlando, M	Brachial flow-mediated dilatation: training in healthy volunteers	N120829003	9/5/2012
Gutierrez, Orlando, M	Impact of Food Additives on Phosphorus Metabolism	F110118001	9/24/2014
Gutierrez, Orlando, M	Advanced Glycation End-Products, Inflammation and Vascular Health in Chronic Kidney Disease	F111220003	9/24/2014
Gutierrez, Orlando, M	Advanced Glycation End-Products, Inflammation and Vascular Health in Chronic Kidney Diseas	F111220003	9/24/2014
Gutierrez, Orlando, M	Effects of Vitamin D Supplementation on Bioavailable 25Hydroxyvitamin D in Healthy Individuals	F140605004	11/20/2014
Hsu, Hu-Chen	Deletion of Lupus Autoreactive Cells Using an Anti-hDR5 Antibody	X091215011	11/10/2014
Jun, Ho-Wook	ECM mimic organic/inorganic composite nano matrix for bone tissue regeneration	N080319010	3/21/2008
Jun, Ho-Wook	Biomimetic nano matrix for drug eluting stent application	N080319011	3/21/2008
Jun, Ho-Wook	Nanomaterials for Pulp Regeneration	N090519002	6/3/2009
Jun, Ho-Wook	Biochemical Characterization of Cells and Extracellular Matrix Components Derived from Human Amniotic Membrane, Amniotic Fluid, and Amniotic Fluid/Tissue Based Products	N120409004	4/20/2012
Jun, Ho-Wook	Isolation of Endothelial Progenitor Cells (Biomimetic Nano Matrix for a Drug Eluting Stent Application)	X100506011	6/6/2014
Jun, Ho-Wook	Evaluate Platelet Attachment on the Nanometrix Coated Lung Assistant Devices	X110504003	6/24/2014
Jun, Ho-Wook	Hemostatic Temperature Sensitive Gel	N140625001	6/25/2014
Jun, Ho-Wook	Bioengineered Nanosack to Enhance the Efficacy of Pancreatic Islet Transplantation	N140703002	7/10/2014
Jun, Ho-Wook	Evaluate platelet attachment on the nanomatrices	X080317002	7/15/2014
Jun, Ho-Wook	Evaluate Platelet Attachment on the Nanometrices (Prohealing Multifunctional Endothelium Nanomatrix Coated Stent)	X140813001	9/26/2014
Jun, Ho-Wook	Isolation of Endothelial Progenitor Cells (Prohealing Multifunctional Endothelium Nanomatrix Coated Stent)	X140813002	9/26/2014
Kearney, John F	Extra-Thymic and Extra Medullary Lymphopoiesis	E931008011	9/20/1993 (exempt)

Kearney, John F	Analysis of Human Pneumovax Antibodies	N140221 003	3/5/2014
Lund, Frances E.	Generation and Characterization of Human Cytokine Producing B Cell	N120216001	2/6/2012
Lund, Frances E.	Generation and characterization of human cytokine producing B cell effectors	N120806004	8/21/2012
Lund, Frances E.	Human Be1 and Be2 Frozen Samples (Generation and characterization of human cytokine producing B cell effectors	N121207004	1/4/2013
Lund, Frances E.	Control of Anti-Viral B Cell Responses by IFNg, Tbet, and Eomes	N140102003	1/2/2014
Lund, Frances E.	Molecular Characterization of Immune Signaling in the Reproductive System	X130719015	7/28/2014
Lund, Frances E.	Phenotypic Profiling of T-bet Expressing Human B Cells	X 140213002	2/19/2015
Lund, Frances E.	IFNg Dependent Vaccine Responses (Virus Induced Cell Fate Decisions in anti-viral Immunity, Project 3, Control of anti-viral B cell responses by IFNg, T-bet and Eomes	X140416012	5/5/2015
Mannon, Peter J.	Granulocyte-Colony Stimulating Factor (G-CSF) Treatment for Crohn's Disease: A Pilot Study Assessing Immune and Clinical Response (Induction of Regulatory T Cells in Crohn's Disease)	F091020003	9/30/2010
Mannon, Peter J.	A Phase 3 Multicenter, Randomized, Placebo-Controlled, Double-Blind Study to Evaluate the Safety and Efficacy of Golimumab Maintenance Therapy, Administered Subcutaneously, in Subjects with Moderately to Severely Active Ulcerative Colitis	W070731003	8/9/2013
Mannon, Peter J.	Study of the Immune Regulation of Idiopathic Inflammatory Bowel Disease: Crohn's Disease, Ulcerative Colitis, and Other Inflammatory Conditions of the Gut (NIH Substudy: Ulcerative Colitis -Regulation of the IL-13 Receptor System)	F081003001	8/29/2014
Mannon, Peter J.	Phase 3, Open Label Study to Determine the Long Term Safety and Efficacy of Vedolizumab (MLN0002) in Patients with Ulcerative Colitis and Crahn's Disease	W080916003	10/23/2014
Mannon, Peter J.	An Open-Label Extension and Safety Monitoring Study of Moderate to Severe Ulcerative Colitis Patients Previously Enrolled in Etrolizumab Phase III Studies	W140826002	4/28/2015
Mannon, Peter J.	Multi-Center African American IBD Study	X110829009	5/15/2015
Mountz, John D	UAB/Daiichi-Sankyo Program for Rheumatic Diseases and Cancer Research: Construction of a hDR5 Tg mouse for application of TRA-S for treatment of rheumatoid arthritis, Project 2	X051231007	11/05/2014
Mountz, John D	Optimal Approach to Block M1 Macrophages/TH17 Inflammation in Rheumatoid Arthritis	X120514002	6/10/2015 (pending)
Mountz, John D.	Determinants of Human Longevity and Healthy Aging	X020514002	5/13/2015
Napierala, Dobrawa	Molecular Determinants of Craniofacial and Skeletal Development and Mineralization	N120402001	4/2/2012

Napierala, Dobrawa	Pilot Analyses of Osteogenic Potential of Mesenchymal Stem Celis from Oral	X140925006	10/20/2014
Napierala, Dobrawa	A Pilot Investigation of Cellular Response after Cyclic Forces during Orthodontic Treatment *Submit Date 2/6/2014 Renewal Period* Annual	X140206007	3/9/2015
Ponnazhagan, Selvarangan	Immunohistochemical Localization of Anterior Gradient Protein in Prostate Cancer Metastases	N100729005	8/18/2010
Ponnazhagan, Selvarangan	The Role of 11-37 in Prostate Cancer and its Potential as a Therapeutic	N100407007	9/16/2010
Ponnazhagan, Selvarangan	Regenerative Stem Cell Therapy for Myeloma	N110831001	9/12/2011
Ponnazhagan, Selvarangan	Systemic Noggin Gene Therapy for the Treatment of Osteoblastic Prostate Cancer Bone Metastasis	N130208007	2/22/2013
Ponnazhagan, Selvarangan	The Role of Myeloid Derived Suppressor Cells in Multiple Myeloma Osteolysis	X130808007	9/9/2014
Ponnazhagan, Selvarangan	The Role of Myeloid Derived Suppressor Cells in Breast Cancer Osteolysis	X110708001	5/13/2015
Randall, Troy	Antiviral U 19 Administration and Biostatistics Core	X141009003	11/24/2014
Randall, Troy D	Tfh Responses in Patients receiving IL-2 Therapy	X141009002	11/24/2014
Saag, Kenneth G.	The Effectiveness of DiscontinuinG BisphosphonatEs Study (EDGE)	N130103002	1/17/2013
Saag, Kenneth G.	A Multicenter, Randomized, Active-Control, Phase 3B Study to Evaluate the Cardiovascular Safety of Febuxostat and Allopurinol in Subjects with Gout and Cardiovascular Comorbidities	W100415002	6/1/2014
Saag, Kenneth G.	Activating Patients to Reduce Osteoporosis (APROPOS): Coordinating Site	X110928001	8/27/2014
Saag, Kenneth G.	Activating Patients to Reduce Osteoporosis (APROPOS)	X110706002	9/8/2014
Saag, Kenneth G.	Project 2: Serum Uric Acid Reduction to Prevent HypERtension Study (NIAMS: CORT)	F130408004	9/17/2014
Saag, Kenneth G.	A Patient Activation Intervention to Enhance Bone Health in Older Adults	X100820012	9/29/2014
Saag, Kenneth G.	Effectiveness of DiscontinuinG bisphosphonatEs Study (EDGE) (Pilot Studies for the Active Comparator Osteoporosis Large Simple Trial (ATLAST))	F120404006	10/3/2014
Saag, Kenneth G.	A Phase 3, Randomized, Double Blind, Multicenter, Placebo Controlled Study to Evaluate the Efficacy and Safety of Febuxostat 40 mg XR, 80 mg XR, 40 mg IR and 80 mg IR in Subjects with Gout	W140808006	10/16/2014
Saag, Kenneth G.	UAB Deep South Arthritis and Musculoskeletal CERTs	X111004010	10/21/2014
Saag, Kenneth G.	Teriparatide and Risedronate in the Treatmnt of Patients with Severe Postmenopausal Osteoporosis: Comparative Effects on Vertebral	W131209001	11/2/2014
Saag, Kenneth G.	Improving Bone Health Among RA Patients on Chronic Glucocorticoids	X080529001	1/9/2015
Saag, Kenneth G.	Improving Care of Osteoporosis: Multi-Modal Intervention to Increase Testing and Treatment (ICOMMIITT)	X080219004	1/12/2015
Saag, Kenneth	Observational Study of the Use of KRYSTEXXA®	W111229001	2/7/2015

G.	(Pegloticase) in Adult Hyperuricemic Patients with Gout Refractory to Conventional Therapy		
Saag, Kenneth G.	Dexa Database	X030414003	2/16/2015
Saag, Kenneth G.	A Phase 2, Randomized, Double Blind, Multicenter, Placebo Controlled Study to Evaluation the Efficacy and Safety of Febuxostat 40 mg XR, 80 md IR in Subjects with Gout and Moderate Renal Impairment	W150316005	4/20/2015
Saag, Kenneth G.	Global Registry of Osteoporosis in Women (GLOW)	X060925009	4/22/2015
Saag, Kenneth G.	Randomized, Double-Blind, Active-Controlled Study to Evaluate the Efficacy and Safety of Denosumab Compared with Risedronate in Glucocorticoid-Treated Individuals	W120412005	5/17/2015
Saag, Kenneth G.	A Multicenter, International, Randomized, Double-Blind, Alendronate-Controlled Study to Determine the Efficacy and Safety of AMG785 in the Treatment of Postmenopausal Women with Osteoporosis	W120412004	5/17/2015
Schroeder, Harry W. (Jr.)	HLA Region and KIR Genomics in Common Variable Immune Deficiency	F100512003	3/23/2015
Schroeder, Harry W. (Jr.)	Biological Definition of Host Defense Defects in Man	F860730001	4/22/2015
Schroeder, Harry W. (Jr.)	The Pre-BCR CDR-H3 Sensing Site and H Chain Selection	F150512003	5/19/2015
Szalai, Alex J	UAB/SANKYO Program for Rheumatic Diseases and Cancer Research Project No.4: The Impact of Fc-Mediated Effector Pathways on the Therapeutic Action of Anti-Death Receptor Monoclonal Antibodies	N030612011	7/10/2003
Szalai, Alex J	Influence of FcyR on Anti-DR5 Antibody Mediated Apoptosis	N040920003	10/20/2004
Thannickal, Victor, J	Oxidants and TGF-Beta in Myofibroblasts Differentiation/Survival	N100222004	3/4/2010
Thannickal, Victor, J	Oxidants and TGF-Beta in Myofibroblast Differentiation/Survival	E090505004	3/11/2010
Thannickal, Victor, J	Oxidants and TGF-Beta in Myofibroblasts Differentiation/Survival	N100622011	8/27/2010
Thannickal, Victor, J	Oxidants and TGF-Beta in Myofibroblasts Differentiation/Survival	N110309002	4/18/2011
Thannickal, Victor, J	Characterization of BAL from Patients with Lung Diseases	X120606006	6/20/2014
Thannickal, Victor, J	Pre-Clinical Development of Nox4 Inhibitors for Pulmonary Fibrosis	N140717002	7/21/2014
Thannickal, Victor, J	Biogen-UAB Collaborative Study of Nrf2 Activators in Lung Fibrosis	X140625008	8/26/2014
Thannickal, Victor, J	Immunology of Chronic Lung Diseases	N140813005	8/26/2014
Thannickal, Victor, J	Mass Spectrometry-Based Biomarker Discovery	X090511006	9/15/2014
Thannickal, Victor, J	Myofibroblast Senescence in Pulmonary Fibrosis	N140903002	11/3/2014
Thannickal, Victor, J	Evaluation of Cysteine-Rich Protein-61 (CYR61) and Plasminogen Activator Inhibitors (PAI-1 & PAI-2) as Biomarker for Diagnosis and Progression of Idiopathic Pulmonary Fibrosis (IPF) and Chronic Obstructive Pulmonary Disease (COPD). (1 P01 HL	X120115007	1/28/2015

	114470-01A1 Nox4 as a Therapeutic Target in IPF - NIH		
Thannickal, Victor, J	Characteristics of Bronchoalveolar Mesenchymal Cells in Patients with Chronic Pulmonary Disease	X100921004	2/5/2015
Thannickal, Victor, J	Therapeutic of the Myofibroblast in Fibrotic Lung Disease	F130429005	2/20/2015
Younger, Jarred W	Peripheral Biomarkers of Chronic Multi-symptom Illnesses (Daily Immune Monitoring in Chronic Fatigue Syndrome) (Neuroimmodulatory Pharmacotherapy in Pain: Therapy and Outcomes)	F140620004	9/26/2014
Younger, Jarred W	Cytokines and Chemokines of Individuals with Chronic Pain	N140925004	10/7/2014
Younger, Jarred W	The Innate Immune Response to an Experimental Immune Challenge in People with Fibromyalgia and Healthy Controls	F140930002	12/30/2014
Younger, Jarred W	Neuroimaging of Pain	F141001001	1/16/2015
Younger, Jarred W	Adaptation to Pain and Interpersonal Stress in Fibromyalgia	N150224005	3/3/2015
Younger, Jarred W	The Effect of Acute Alcohol Ingestion on the Immune System in People with and without Fibromyalgia	F141028007	3/6/2015
Younger, Jarred W	Physiological Responses to Watching TV	F150116001	3/23/2015
Younger, Jarred W	Identifying Immune Drivers of Gulf War Illness Using a Novel Daily Sampling Approach	F150303004	4/27/2015
Younger, Jarred W	Effects of Botanical Microglia Modulators in Gulf War Illness (Treating Gulf War Illness with Novel Anti-Inflammatories: A Screening of Botanical Microglia Modulators)	F150318011	5/27/2015

8. VERTEBRATE ANIMALS

All trainees, staff, and faculty who use vertebrate animals as part of their research protocols are required to participate in training provided by the UAB Institutional Animal Care and Use Committee (IACUC). This includes instruction on applicable laws and regulations as well as hands-on training. All research protocols involving vertebrate animals must be reviewed and approved by IACUC prior to work being performed on the project. Additionally, the Training Program maintains an independent IACUC approval on record with the institution:

IACUC Animal Project Number 1204M0433, April 24, 2012
Animal Welfare Assurance Number: A3255-01

UAB's Animal Welfare Assurance is on file with the Office for Protection from Research Risks and is registered as a Research Facility with the United States Department of Agriculture. The animal care and use program is accredited by the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC International).

A list of active protocols of the core mentors is provided below.

APPROVED VERTEBRATE ANIMALS PROTOCOLS

Faculty Member	Title of Protocol	IRB Protocol Number	Approval Date
Bellis, Susan L	Glycosylation Dependent Control of TNFR1 Signaling in Macrophage Survival	IACUC10187	8/21/2014
Bellis, Susan L	Glycan Control of Stem Cell Associated Pathways in Pancreatic Cancer	IACUC10205	9/5/2014
Bellis, Susan L	Coupling Osteoinductive Factors to Graft Materials to Promote Osteoregeneration	IACUC10128	4/25/2014
Bellis, Susan L	Glycosylation Dependent Mechanisms Regulating Ovarian Tumor Cell Survival	IACUC10065	2/28/2014
Bellis, Susan L	Tumor Cell Glycosylation in Colitis and Carcinogenesis	IACUC09850	4/10/2013
Bellis, Susan L	UAB Skin Disease Research Center: Fibroblast Embedded Electrospun Matrices for Skin Regeneration	IACUC09448	9/1/2011
Bellis, Susan L	Role of ST6GalIIMediated Receptor Sialylation in Autoimmune Disease	IACUC09254	10/25/2010
Bellis, Susan L	Role of ST6GalIIMediated Receptor Sialylation in Autoimmune Disease	IACUC09254	10/25/2010
Bellis, Susan L	Role of Sialylation in Macrophage Apoptosis	IACUC08879	7/22/2009
Chen, Yabing	Function of STIM1 in Regulating Vascular Calcification	IACUC10177	9/05/2014
Chen, Yabing	Death Receptor Signaling in Pancreatic Cancer: Mechanisms and Therapeutic Targets	IACUC09951	9/03/2013
Chen, Yabing	O-GlcNAcylation Regulates Vascular Smooth Muscle Cells in Diabetic Vasculopathy	IACUC09947	9/09/2013
Chen, Yabing	Novel Regulators for Vascular Disease: Project 2 Molecular Mechanisms Underlying Arterial Stiffness	IACUC09646	5/14/2012
Chen, Yabing	The Role of Phospholipase Gamma1 in Bone Development and Remodeling	IACUC09540	12/28/2011
Chen, Yabing	Molecular Signaling of Oxidative Stress Induced Vascular Calcification	IACUC08579	9/17/2008
Davis, Randall	Roles of FCRL Molecules in Innate Immunity	IACUC10208	8/11/2014
Davis, Randall	Modeling FCRL6 Regulation and Function In	IACUC09877	4/30/2013

	Transgenic Mice		
Davis, Randall	Biological Role of FCRL Molecules in SLE Pathogenesis	IACUC09851	5/20/2013
Elson, Charles O, III	PPG: Innate and Adaptive Immunity in IBD Animal Model Core B	IACUC09404	7/8/2011
Elson, Charles O, III	PPG: Innate and Adaptive Immunity in IBD; Project # 1: Innate and Adaptive Immunity to Microbial Flagellins in IBD	IACUC09400	5/31/2011
Feng, Xu	RANK Signaling in Osteoclast Differentiation and Function	IACUC07854	4/26/2006
Feng, Xu	Molecular Mechanism of CD68 Mediated Osteoclast Differentiation and Function	IACUC09724	1/11/2013
Hsu, Hui-Chen	Entry of Antigen Presenting B Cells into the Follicle Directed by IFNa and IL17	IACUC09393	5/3/2011
Hsu, Hui-Chen	Follicular Exclusion of Self Antigens Prevents Development of Autoantibodies	IACUC10028	1/3/2014
Javed, Amjad	Zebrafish Craniofacial Development	IACUC09436	9/30/2011
Javed, Amjad	Sp7 Mediated Control of Runx2 Function for Osteoblast Differentiation	IACUC09468	9/1/2011
Javed, Amjad	Osteoblast and Odontoblast Specific Regulatory Action of RunX2 for Bone and Tooth Formation	IACUC09550	1/23/2015
Jun, Ho Wook	A Hybrid Nanosack for the Enhanced Islet Engraftment in the Omentum	IACUC09896	6/11/2013
Jun, Ho Wook	Pro-healing Multifunctional Endothelium Nanomatrix Coated Stent	IACUC10223	8/28/2014
Jun, Ho Wook	Controlled Drug Delivery via Bio-absorbable Stent in a Rabbit Sinusitis Model	IACUC20033	4/06/2015
Kearney, John F	Protective Effects of AntiBcIA Antibodies in Bacillus Anthracis Infection (	IACUC00413	3/11/2011
Kearney, John F	Regulation of B Cell Clonal Diversity and its Role in Disease	IACUC09372	4/5/2011
Kearney, John F	Effects of Neonatal Microbial Exposure on Anti-Polysaccharide B Cell Development	IACUC09576	1/27/2012
Kearney, John F	Antibodies to Beta Cell GlcNAc-Modified Autoantigens Block T1D in NOD Mice	IACUC09665	5/29/2012
Kearney, John F	Analysis of Human and Mouse Antibodies to Beta Cell Antigens Bearing N-Acetyl Glucosamine Post-Translational Modifications and Their Potential to Prevent Human Type1 Diabetes	IACUC10271	11/3/2014
Li, Yi-Ping	Inhibiting Periodontitis by Targeting Cathepsin K and Attenuating TLR Signaling	IACUC10137	7/9/2014
Li, Yi-Ping	Transcriptional Regulation of Osteoclast Lineage Commitment and Differentiation	IACUC09834	2/22/2013
Li, Yi-Ping	Molecular Mechanisms of Bone Formation	IACUC09238	9/17/2010
Li, Yi-Ping	The Role of AML1/RUNX1 in Osteoclastogenesis and Osteoclast Gene Expression	IACUC09237	9/17/2010
Li, Yi-Ping	Novel RNAi Inhibits Both Inflammation and Bone Resorption in Oral Diseases	IACUC09236	9/17/2010
Li, Yi-Ping	A Novel Antitumor Drug Targeting Breast Cancer Blood Vessels with Low Toxicity	IACUC09234	9/17/2010
Lund, Frances E	Novel Ab/Citrullination Dependent Mechanism of Vaccination to HIV	IACUC20072	4/28/2015
Lund, Frances E	Enhancement of Tumor Reactive CD8 T Cell	IACUC10290	1/22/2015

	Memory Antibody Based Immunotherapy		
Lund, Frances E	Regulation of T Cell Responses to Allergens and Environmental Microbes	IACUC10289	1/21/2015
Lund, Frances E	Regulation of T Cell Dependent B Cell Responses to Influenza	IACUC10288	1/13/2015
Lund, Frances E	Virus Induced Cell Fate Decisions in AntiViral Immunity: Core BViral Stocks and Reagents	IACUC10192	7/22/2014
Lund, Frances E	Virus Induced Cell Fate Decisions in Anti-Viral Immunity: Project3 Control Of Anti-Viral B Cell Responses by IFNg, TBet and Eomes	IACUC10191	7/22/2014
Lund, Frances E	Controlling Oxidative Stress in B Cells by Modulating NAD Metabolism	IACUC10142	5/29/2014
Lund, Frances E	Control of Anti-Viral B Cell Responses by IFNg, T Bet and Eomes	IACUC10053	2/4/2014
Lund, Frances E	Optimizing a Vaccine Strategy for Prostate Cancer	IACUC09972	10/1/2013
Lund, Frances E	Modulation of Autoimmune Disease by G Proteins	IACUC09863	5/16/2013
Lund, Frances E	Role of the Omentum in Peritoneal Immunity	IACUC09854	4/2/2013
Lund, Frances E	The Mechanism Whereby Cd38 Deficiency Inhibits Alzheimers Disease Pathology in a Mouse Model	IACUC09839	2/18/2013
Lund, Frances E	B Cells in Health and Disease Project3	IACUC09648	5/31/2012
Lund, Frances E	Unique Aspects of Respiratory Immunity	IACUC09630	4/27/2012
Lund, Frances E	Central and Effector Memory B Cells in the Lung	IACUC09627	4/27/2012
Lund, Frances E	Role of CCR1 in Cytokine Storm & Immunopathology After Influenza Infection	IACUC09626	4/27/2012
Lund, Frances E	Controlling Th2 Immunity by Tuning CXCL13Dependent DC Migration in Lymph Nodes	IACUC09599	3/20/2012
Lund, Frances E	Randall/Lund mouse breeding protocol	IACUC09597	6/4/2012
Lund, Frances E	Regulation of Innate and Adaptive Immunity by the S. Mansoni NAD Catabolizing Enzyme, SmNACE	IACUC09596	3/19/2012
Lund, Frances E	Characterization of the Role of TRPM2, an Ion Channel Gated by Oxidative Stress and ADPR, in Lung Inflammation and COPD	IACUC09595	3/19/2012
Mountz, John D.	DR5 Glycosylation Mediates Apoptosis Resistance in RA Synovial Fibroblasts	IACUC09175	7/7/2010
Mountz, John D.	Btk Breaks the Toleranceof Marginal Zone Macrophages to Apoptotic Antigens	IACUC09952	9/4/2013
Mountz, John D.	Follicular Exclusion of Self Antigens Prevents Development of Autoantibodies	IACUC10028	1/2/2014
Napierala, Dobrawa	Molecular Determinants of Craniofacial and Skeletal Development and Tissue Mineralization	IACUC09390	5/9/2011
Napierala, Dobrawa	Transcriptional Regulation of Dentin Mineralization	IACUC09971	9/24/2013
Ponnazhagan, Selvarangan	rAAV Vaccine Vector National Cancer Institute/NIH/DHHS	IACUC08435	4/30/2008
Ponnazhagan,	Targeted Therapy for Breast Cancer with Osteolytic Bone Damage	IACUC10209	9/16/2014
Selvarangan	Role of Innate and Adaptive Immunity in Breast Cancer Bone Metastasis	IACUC08764	6/25/2009
Ponnazhagan,	Gene Engineered and Targeted Stem Cell Therapy for Myeloma	IACUC08587	2/2/2009

Selvarangan	The Role of LL37/CRAMP in Prostate Cancer and its Potential as a Novel	IACUC08851	7/10/2009
Raman, Chander	Role of TGFBR3 in T Cell Development and Immune Response Therapeutic Target	IACUC10201	7/16/2014
Randall, Troy D	Characterization of the Role of TRPM2, an Ion Channel Gated by Oxidative Stress and ADPR, in Lung Inflammation and COPD	IACUC09595	3/19/2012
Randall, Troy D	Regulation of Innate and Adaptive Immunity by the S.Mansoni NAD Catabolizing Enzyme, SmNACE	IACUC09596	3/19/2012
Randall, Troy D	Randall/Lund mouse breeding protocol	IACUC09597	6/04/2012
Randall, Troy D	Controlling Th2 Immunity by Tuning CXCL13Dependent DC Migration in Lymph Nodes	IACUC09599	4/20/2012
Randall, Troy D	Role of CCR1 in Cytokine Storm & Immunopathology After Influenza Infection	IACUC09626	4/27/2012
Randall, Troy D	Central and Effector Memory B Cells in the Lung	IACUC09627	4/27/2012
Randall, Troy D	Unique Aspects of Respiratory Immunity	IACUC09630	4/27/2012
Randall, Troy D	B Cells in Health and Disease Project 3	IACUC09648	5/31/2012
Randall, Troy D	Pulmonary Immunity to Pathogens in Neonates	IACUC09710	6/8/2012
Randall, Troy D	The Mechanism Whereby Cd38 Deficiency Inhibits Alzheimers Disease Pathology in a Mouse Model	IACUC09839	2/18/2013
Randall, Troy D	Role of the Omentum in Peritoneal Immunity	IACUC09854	4/2/2013
Randall, Troy D	Modulation of Autoimmune Disease by G Proteins	IACUC09863	5/16/2013
Randall, Troy D	Control of Antiviral B Cell Responses by IFNg, TBet and Eomes	IACUC10053	2/4/2014
Randall, Troy D	Controlling Oxidative Stress in B Cells by Modulating NAD Metabolism	IACUC10142	5/29/2014
Randall, Troy D	Virus Induced Cell Fate Decisions in Anti-Viral Immunity (Randall): Project 1 Control of Anti-Viral Tfh Responses via IL2 Signaling and Availability	IACUC10188	7/16/2014
Randall, Troy D	Regulation of TCell Dependent B Cell Responses to Influenza	IACUC10288	1/13/2015
Randall, Troy D	Regulation of T Cell Responses to Allergens and Environmental Microbes	IACUC10289	1/21/2015
Randall, Troy D	Enhancement of Tumor Reactive CD8 TCell Memory y Antibody Based Immunotherapy	IACUC10290	1/22/2015
Randall, Troy D	Novel Ab/Citrullination Dependent Mechanism of Vaccination to HIV	IACUC20072	4/28/2015
Serra, Rosa A	Tgfb in the Pathology and Development of the Spine	IACUC09713	8/22/2012
Serra, Rosa A	Chondrocytic Cilia and Mechano-Sensation	IACUC09747	11/15/2012
Serra, Rosa A	Mechanism of Tgfbr2 in Chondro-protection	IACUC09811	12/18/2012
Schroeder, Harry W.	Role of IG CDRH3 in Responses to HIV Vaccines	IACUC09146	6/18/2010
Schroeder, Harry W.	Role of Immunoglobulin CDRH3 in Autoimmune Disease	IACUC09697	8/31/2012
Schroeder, Harry W.	The PreBCR CDRH3 Sensing Site and H Chain Selection	IACUC20103	5/8/2015
Szalai, Alexander J	C Reactive Protein, Autoimmunity, and Inflammation in the Central Nervous System	IACUC09700	8/23/2012
Szalai, Alexander J	CORE: Core Center for Acute Kidney Injury	IACUC10004	12/10/2013

	Research: C Reactive Protein in Acute Kidney Injury		
Thannickal, Victor John	Therapeutic Targeting of the Fibroblasts for Fibrotic Lung Diseases: Project 3 Nox4 as a Therapeutic Target in IPF	IACUC09899	6/10/2013
Thannickal, Victor John	Myofibroblast Senescence in Pulmonary Fibrosis	IACUC10105	4/02/2014
Thannickal, Victor John	Biogen UAB Collaborative Study of Nrf2 Activators in Lung Fibrosis	IACUC10180	8/06/2014
Weaver, Casey T	Role of Roryt positive Innate Lymphoid Cells in Neonatal Intestinal Barrier Development	IACUC00463	12/22/2014
Weaver, Casey T	UAB Gnotobiotic Facility	IACUC08756	5/5/2009
Weaver, Casey T	PPG: Innate and Adaptive Immunity in IBD Project 3: Effector vs Regulatory T Subset Response to the Microbiota	IACUC09352	7/26/2011
Weaver, Casey T	PPG: Innate and Adaptive Immunity in IBD Innate and Adaptive Immunity in IBD: Animal Model Core B	IACUC09404	7/8/2011
Weaver, Casey T	Factors Controlling Effector T Cell Maintenance in the Pathogenesis of Colitis	IACUC09491	12/8/2011
Weaver, Casey T	Factors Controlling Effector T Cell Maintenance in the Pathogenesis of Colitis	IACUC09491	12/8/2011
Weaver, Casey T	Molecular Basis of Pathogenicity of IgA1Containing Immune Complexes	IACUC09827	2/26/2013
Weaver, Casey T	JT Pharma (JTP)UAB Immune Mediated Disease Program	IACUC09881	6/21/2013
Weaver, Casey T	Molecular Regulation of MS Susceptibility Genes	IACUC09912	5/29/2013
Weaver, Casey T	Mouse Model for Neonatal Late-Onset Sepsis Using Klebsiella Pneumoniae	IACUC10106	6/25/2014
Weaver, Casey T	Interplay of T Cell Subsets in IBD Pathogenesis	IACUC10245	9/24/2014
Weaver, Casey T	Th17 Pathway Plasticity in the Pathogenesis of Inflammatory Bowel Disease	IACUC10246	9/23/2014

9. SELECT AGENT RESEARCH

Not Applicable

BIOSKETCHES of PARTICIPATING FACULTY

Director, and Associate Directors

S. Louis Bridges, Jr., MD, PhD	**Medicine/Clinical Immunology & Rheumatology**
Yi-Ping Li, PhD	**Medicine/JHS/Pathology**
Kenneth G. Saag, MD, MSc	**Medicine/Clinical Immunology & Rheumatology**

Core Faculty

Donna Arnett, PhD, MSPH	**Public Health/Epidemiology**
Marcas Bamman, PhD	**Medicine/JHS/Cell, Developmental, & Integrative Biology**
Susan L. Bellis, PhD	**Medicine/JHS/Cell, Developmental, & Integrative Biology**
Tim Beukelman, MD	**Medicine/Pediatrics/Rheumatology**
Elizabeth E. Brown, MPH, PhD	**Medicine/JHS/Pathology**
Yabing Chen, PhD	**Medicine/JHS/Pathology**
Jeffrey R. Curtis, MD, MS, MPH	**Medicine/Clinical Immunology & Rheumatology**
Randall Davis, MD	**Medicine/Hematology-Oncology**
Charles O. Elson, III, MD	**Medicine/Gastroenterology & Hepatology**
Xu Feng, PhD	**Medicine/JHS/Pathology**
Orlando M. Gutierrez, MD, MSc	**Medicine/Nephrology**
Hui-Chen Hsu, PhD	**Medicine/Clinical Immunology & Rheumatology**
Amjad Javed, PhD	**Dentistry/Oral & Maxillofacial Surgery**
Ho-Wook Jun, PhD	**Engineering/Biomedical Engineering**
John F. Kearney, PhD	**Medicine/JHS/Microbiology**
Frances E. Lund, PhD	**Medicine/JHS/Microbiology**
John D. Mountz, MD, PhD	**Medicine/Clinical Immunology & Rheumatology**
Joanne Murphy-Ullrich, PhD	**Medicine/JHS/Pathology**
Dobrawa Napierala, PhD	**Dentistry/Oral & Maxillofacial Surgery**
Selvarangan Ponnazhagan, PhD	**Medicine/JHS/Pathology**
Chander Raman, PhD	**Medicine/Clinical Immunology & Rheumatology**
Troy D. Randall, PhD	**Medicine/Clinical Immunology & Rheumatology**
Harry W. Schroeder, Jr., MD, PhD	**Medicine/Clinical Immunology & Rheumatology**
Rosa Serra, PhD	**Medicine/JHS/Cell, Developmental & Integrative Biology**
Jasvinder Singh, MD, MPH	**Medicine/Clinical Immunology & Rheumatology**
Matthew Stoll, MD, PhD, MSCS	**Medicine/Pediatrics/Rheumatology**
Alexander Szalai, PhD	**Medicine/Clinical Immunology & Rheumatology**
Victor Thannickal, MD	**Medicine/Pulmonary, Allergy & Critical Care Medicine**
Casey T. Weaver, MD	**Medicine/JHS/Pathology**
Jarred Younger, PhD	**Arts & Sciences/Psychology**

.

Content-Related Faculty

Devin Absher, PhD	**Medicine/JHS/Genetics/ HudsonAlpha Institute of Biotechnology**
David B. Allison, PhD	**Public Health/Dean's Office/Biostatistics**
T. Prescott Atkinson, MD, PhD	**Medicine/Pediatrics/Allergy**
Laurence Bradley, PhD	**Medicine/Clinical Immunology & Rheumatology**
Daniel Bullard, PhD	**Medicine/JHS/Genetics**
David Chaplin, MD, PhD	**Medicine/JHS/Microbiology**
W. Winn Chatham, MD	**Medicine/Clinical Immunology & Rheumatology**
Randy Q. Cron, MD, PhD	**Medicine/Pediatric Rheumatology**
Xiangqin Cui, PhD	**Public Health/Biostatistics**
Gary Cutter, PhD	**Public Health/Biostatistics**
Alan W Eberhardt, PhD	**Engineering/Biomedical Engineering**
Jeffrey C. Edberg, PhD	**Medicine/Clinical Immunology & Rheumatology**
Candace Floyd, PhD	**Medicine/Physical Medicine and Rehabilitation**
Kevin Fontaine, PhD	**Public Health/Health Behavior**
Mona Fouad, MD	**Medicine/Preventive Medicine**
Angelo Gaffo, MD, MSPH	**Medicine/Clinical Immunology & Rheumatology**
James F. George, PhD	**Medicine/Surgery/Cardiothoracic**
Shawn Gilbert, MD	**Medicine/Surgery/Orthopaedic Surgery**
Paul Goepfert, MD	**Medicine/Infectious Diseases**
George Howard, PhD	**Public Health/Biostatistics**
Laura B. Hughes, MD, MSPH	**Medicine/Clinical Immunology & Rheumatology**
Robert P. Kimberly, MD	**Medicine/Clinical Immunology & Rheumatology**
Bruce Korf, MD, PhD	**Medicine/JHS/Genetics**
Elliot Lefkowitz, PhD	**Medicine/JHS/Microbiology**
Nianjun Liu, PhD	**Public Health /Biostatistics**
Robinna Lorenz, MD, PhD	**Medicine/JHS/Pathology**
Peter Mannon, MD, MPH	**Medicine/Gastroenterology and Hepatology**
Amie Brown McLain, MD	**Medicine/Physical Medicine and Rehabilitation**
Sarah Morgan, MD, RD	**Medicine/Clinical Immunology & Rheumatology**
Paul Muntner, PhD	**Public Health/Epidemiology**
Richard Myers, PhD	**Medicine/JHS/Genetics/ HudsonAlpha Institute of Biotechnology**
Jan Novak, PhD	**Medicine/JHS/Microbiology**
Brent Ponce, MD	**Medicine/Surgery/Orthopaedic Surgery**
Sasanka Ramanadham, PhD	**Medicine/JHS/Cell, Developmental, & Integrative Biology**
David Redden, PhD	**Public Health/Biostatistics**
Monika Safford, MD	**Medicine/Preventive Medicine**
Isabel Scarinci-Searles, PhD	**Medicine/Preventive Medicine**
Lisa Schwiebert, PhD	**Medicine/JHS/Cell, Developmental, & Integrative Biology**

David Standaert, MD, PhD	**Medicine/Neurology**
Chad Steele, PhD	**Medicine/Pulmonary, Allergy & Critical Care Medicine**
S. Michael Theiss, MD	**Medicine/Surgery/Orthopaedic Surgery**
Hemant Tiwari, PhD	**Public Health /Biostatistics**
Trygve Tollefsbol, PhD, DO	**Arts & Sciences/Biology**
Tim Townes, PhD	**Medicine/JHS/Biochemistry and Molecular Genetics**
Hubert Tse, PhD	**Medicine/JHS/Microbiology**
Peter Waite, DDS, MD, MPH	**Dentistry/Oral & Maxillofacial Surgery**
Mark Walter, PhD	**Medicine/JHS/Microbiology**
Amy Warriner, MD	**Medicine/Endocrinology, Diabetes & Metabolism**
Timothy Wick, PhD	**Engineering/Biomedical Engineering**
Yang Yang, PhD	**Medicine/JHS/Pathology**
Majd Zayzafoon, MD, PhD	**Medicine/JHS/Pathology**

Mentors in Training

Stella Aslibekyan, PhD	**Public Health/Epidemiology**
Andre Ballesteros-Tato, PhD	**Medicine/Clinical Immunology & Rheumatology**
Krista R. Casazza, PhD, RD	**Medicine/Pediatrics/General Pediatrics & Adolescent Medicine**
Maria Danila, MD, MSc, MSPH	**Medicine/Clinical Immunology & Rheumatology**
Beatriz Leon, PhD	**Medicine/JHS/Microbiology**
Iris Y. Navarro-Millán, MD	**Medicine/Clinical Immunology & Rheumatology**
Richard J. Reynolds, PhD	**Medicine/Clinical Immunology & Rheumatology**
Lizhong Wang, PhD	**Medicine/JHS/Genetics**
Amy Weinmann, PhD	**Medicine/JHS/Microbiology**
Nabiha Yusuf, PhD	**Medicine/Dermatology**
Ping Zhang, PhD	**Dentistry/Pediatric Dentistry**

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Bridges, Stanley Louis (Jr.)

eRA COMMONS USER NAME (credential, e.g., agency login): BRIDGESL

POSITION TITLE: *Anna Lois Waters* Professor of Medicine and Microbiology; Director, Division of Clinical Immunology and Rheumatology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Notre Dame, Notre Dame, IN	B.S.	05/80	Pre-Professional Studies
LSU School of Medicine, New Orleans, LA	M.D.	05/84	Medicine
Univ Texas Medical Branch, Galveston, TX	Residency	06/88	Internal Medicine
Univ Alabama at Birmingham, Birmingham, AL	Fellowship	06/91	Rheumatology
Univ Alabama at Birmingham, Birmingham, AL	Ph.D.	12/95	Microbiology

A. Personal Statement

I have the training, expertise, and motivation needed to successfully lead the training grant proposed in this application. My training includes clinical medicine, rheumatology, and immunology. My research experience includes lab-based research (immunoglobulin gene expression and autoantibodies in rheumatoid arthritis [RA]); observational clinical studies/clinical trials; genetics and pharmacogenetics; and biomarkers and biorepositories. My research program focuses on pathogenesis and treatment of RA, including immunogenetics, autoantibodies, and biomarkers of treatment response. I have had active NIH support throughout my career. My broad experience and expertise has enabled me to serve as PI of NIH program grants such as the UAB Multidisciplinary Clinical Research Center, and the UAB Center of Research Translation. I lead the pilot and feasibility (P&F) studies of the UAB Rheumatic Diseases Cores Center, which reviews and oversees competitive applications for Pilot & Feasibility studies. I have extensive experience in peer review, project administration, budget management, and multi-investigator collaborative studies. The current application builds logically on my prior work and current leadership position, as I direct the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center. I serve as Chair of the American College of Rheumatology's Committee on Research and Chair of the NIH Arthritis, Musculoskeletal, and Skin (AMS) Study Section. I am a member of the Board of Directors of the Rheumatology Research Foundation, and the Arthritis Foundation's Scientific Discovery Advisory Committee. Since joining the UAB faculty, I have served on the qualifying exam or PhD committees of 15 graduate students, and have mentored or co-mentored over 50 trainees, including undergraduate, medical, PhD, and MD/PhD students, postdoctoral fellows, medical residents, rheumatology fellows, and visiting research scholars. I have played an important role in development of faculty at UAB. My considerable experience and expertise in clinical and translational research in rheumatic diseases, in mentoring trainees and junior faculty, including those in pediatrics, have helped me to be very well prepared to serve as Director of this T32 training grant entitled, "Training Program in Rheumatic and Musculoskeletal Diseases Research."

B. Positions and Honors

Positions and Employment

1991-1995 Assistant Professor (non-tenure track), Department of Medicine, UAB, Birmingham, AL
1995-2000 Assistant Professor, Departments of Medicine and Microbiology, UAB, Birmingham
2000-2007 Associate Professor, Departments of Medicine and Microbiology, UAB, Birmingham
2007-present Professor, Departments of Medicine and Microbiology, UAB, Birmingham, AL
2008-present Director, UAB Division of Clinical Immunology and Rheumatology, Birmingham
2009-2014 *Marguerite Jones Harbert-Gene V. Ball, MD* Endowed Chair in Rheumatology
2013-present Director, UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
2014-present *Anna Lois Waters* Endowed Chair in Rheumatology

Other Experience and Professional Memberships

1995 - President, Alabama Society for Rheumatic Diseases. 2000 - Southern Society for Clinical Investigation. 2004 - Fellow, American College of Physicians. 2006-2010 - Member, NIH Arthritis, Connective Tissue, and Skin (ACTS) Study Section. 2005-2007 - National Medical and Scientific Advisory Council, Arthritis Foundation. 2010-present - Co-Editor, *Arthritis & Rheumatology*. 2013-2014 - Chair, American College of Rheumatology Division Directors Task Force. 2013-2016 - Chair, NIH Arthritis, Musculoskeletal and Skin (AMS) Diseases Study Section. 2014-2017 - Chair, American College of Rheumatology Committee on Research. 2014-present - Member, Biorepositories Task Force, Patient Centered Outcomes Research Institute (PCORI) National Clinical Research Network. 2015-2016 – Member, Arthritis Foundation Scientific Discovery Advisory Committee. 2015 – Ad hoc member, NIAMS Board of Scientific Counselors

Honors

1976 - Notre Dame Scholar, University of Notre Dame. 1982 - Aesculapian Medical Honor Society. 1990 - Upjohn Young Investigator Award. 1991 - Henry Christian Award, American Federation for Clinical Research. 1994, 1995, 1996 - Young Faculty Award, Southern Section, American Federation for Clinical Research. 1998 - Outstanding Teacher in Rheumatology, UAB Department of Medicine. 2003-present - Best Doctors in America. 2008 - Max Cooper Award for Research Excellence, UAB Department of Medicine. 2009 - Henry Kunkel Society. 2012 - Sam Brown Bridge Builder Award, UAB School of Public Health. 2014-present - Castle Connolly Top Doctors.

C. Contributions to Science

In the publications below, trainees I mentored are indicated in italics and underlined font.

1. My early research efforts sought to answer the question of whether B lymphocytes infiltrating synovial tissue of rheumatoid arthritis (RA) were polyclonal or antigen-specific. Through detailed analysis of immunoglobulin genes expressed in RA synovial tissue of affected patients, my colleagues and I found clonal expansion of kappa light chains with long CDR3 regions, suggesting antigen-specific selection. During this time, I was a rheumatology fellow and graduate student, and these findings were the basis of my PhD thesis. As I transitioned this work to independence, I reported findings in the lambda light chain repertoire suggesting systemic antigen selection. I then went on to analyze ectopic germinal center like structures in RA synovium and found expression of recombination activating genes and terminal deoxynucleotidyl transferase, along with evidence of secondary immunoglobulin gene rearrangements, suggesting receptor revision locally to either generate, or attempt to avoid, autoreactive antibodies.
    a. Lee SK, **Bridges SL Jr.**, Koopman WJ, and Schroeder HW Jr. Evidence of antigen receptor-influenced oligoclonal B lymphocyte expansion in the synovium of a patient with longstanding rheumatoid arthritis. *Journal of Clinical Investigation* 93:361-70, 1994. PMCID: PMC293784.
    b. **Bridges SL Jr.**, Lee SK, Johnson ML, Lavelle JC, Fowler PG, Koopman WJ, and Schroeder HW Jr. Somatic mutation and CDR3 lengths of immunoglobulin kappa light chains expressed in patients with RA and normal individuals. *J Clin Invest* 96:831-41, 1995. PMCID: PMC185269.
    c. **Bridges SL Jr.** Frequent N addition and clonal relatedness among immunoglobulin lambda light chains expressed in rheumatoid arthritis synovia and PBL, and the influence of Vlambda gene segment utilization on CDR3 length. *Molecular Medicine* 4:525-53, 1998. PMCID: PMC2230400.
    d. *Zhang Z*, Wu X, *Limbaugh BH*, and **Bridges SL Jr.** Expression of recombination activating genes and terminal deoxynucleotidyl transferase, and secondary rearrangement of immunoglobulin kappa light chains in rheumatoid arthritis synovial tissue. *Arthritis & Rheumatism* 44:2275-84, 2001.

2. In addition to the B lymphocyte work above, I led major efforts to understand the role of genetics in susceptibility to RA in African-Americans, a large minority group underrepresented in clinical research. As PI and Director of the NIH-funded CLEAR (Consortium for the Longitudinal Evaluation of African-Americans with RA) Registry, I oversaw enrollment, data and sample collection from 1,100 African-Americans with RA and 550 controls at 5 sites in the southeastern US. This effort has led to >30 papers on RA in African-Americans, many focused on genetics. We reported that RA is associated with the HLA- DRB1 locus through genetic admixture with individuals with individuals of European ancestry. Unlike the European population, amino acid position 57 of HLA-DRB1 alleles was associated with RA in African Americans, but positions 71 and 74 were not. We also discovered that Asp11 (which is not associated with RA in European ancestry) corresponding to the classical allele *09:01, confers risk for

RA in African- Americans. We have also shown that most non-HLA polymorphisms associated with RA in other ethnicities contribute to susceptibility to RA in African-Americans, but PTPN22 is a notable exception. We have shown association of a variant in RANKL with age of onset. Data and samples are shared with multiple investigators not affiliated with CLEAR, leading to additional insights on RA.

a. *Hughes LB, Morrison D, Kelley JM, Padilla MA, Vaughan LK*, . . . , Patterson N, Reich D, **Bridges SL Jr.** The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African-Americans through European genetic admixture. *Arthritis Rheum* 58:349-58, 2008.
b. *Hughes LB, Reynolds RJ*, . . . Plenge RM, **Bridges SL Jr.** Most common SNPs associated with rheumatoid arthritis in subjects of European ancestry confer risk of rheumatoid arthritis in African- Americans. *Arthritis Rheum* 2010 Dec;62(12):3547-53. PMCID: PMC3030622.
c. Tan W, Wu H, Zhao J, Derber LA, . . . Jonas BL, Holers VM, Glass DN, Chen PP, **Bridges SL Jr.**, Weinblatt ME, Paulus HE, Tsao BP. A functional RANKL polymorphism associated with younger age at onset of rheumatoid arthritis. *Arthritis Rheum*. 62, 2864-75, 2010. PMCID: PMC2944013.
d. *Reynolds RJ, Ahmed AF, Danila MI, Hughes LB*, CLEAR Investigators, Gregersen PK, Raychaudhuri S, Plenge RM, **Bridges SL Jr.** HLA-DRB1 rheumatoid arthritis risk in African Americans at multiple levels: Hierarchical classification systems, amino acid positions and residues. *Arthritis Rheumatol* 2014 Dec; 66(12):3274-82. PMCID: PMC4273668

3. In addition to studying the genetic influences on susceptibility, we have also studied in detail clinical phenotypes such as radiographic severity and extra-articular manifestations of RA in African-Americans. We made the novel observations that generalized bone loss; carboxypeptidase B; and expression of genes encoding receptors for interferon-gamma are associated with radiographic severity of RA, and that SNPs in the IL-4 receptor gene are associated with the presence of rheumatoid nodules.
    a. *Zhang J*, Redden DT, . . . , Mikuls TR, **Bridges SL Jr.** Generalized bone loss as a predictor of 3- year radiographic damage in African American patients with recent-onset rheumatoid arthritis. *Arthritis Rheum*, 62:2219-26, 2010. PMCID: PMC2922001.
    b. *Burgos PI*, Causey ZL, . . ., van der Heijde DM, Alarcón GS, **Bridges SL Jr.** Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Res Ther*, 2010 May 5;12(3):R75. PMCID: PMC2911851.
    c. Song JJ, Hwang I, Cho KH,. . ., Lee DM, **Bridges SL Jr.**, Gregersen PK, Leung LL, Robinson WH. Plasma carboxypeptidase B downregulates inflammatory responses in autoimmune arthritis. *J Clin Invest*, 121(9):3517-27, 2011. PMCID: PMC3163960.
    d. *Tang Q, Danila MI, Parks L, Baker B*, . . . ,van der Heijde DM, Conn DL, Jonas BL, Callahan LF, Moreland LW, Cui X, **Bridges SL Jr.** Expression levels of interferon-gamma receptor genes in peripheral blood cells are associated with rheumatoid arthritis and its radiographic severity in African Americans. *Arthritis Rheumatol*, 2015 Feb 23. doi: 10.1002/art.39056.

4. In addition to these contributions related to RA in African-Americans, my research efforts have contributed substantially to large national and international collaborative efforts to understand RA genetics. I led UAB's efforts to recruit patients into the North American Rheumatoid Arthritis Consortium. Through the biorepository created for the TEAR trial, we have contributed to larger efforts which identified associations of RA with REL, and a seminal paper in *Nature*, which identified 42 novel RA risk loci. This analysis also identified 98 biological candidate genes and suggested that drugs approved for other indications may be repurposed for the treatment of RA.
    a. Jawaheer D, Seldin MF, Amos CI, . . . **Bridges SL Jr.**, Pisetsky DS, Ward R, Kastner DL, Wilder RL, Pincus T, Callahan LF, Flemming D, Wener MH, and Gregersen PK for NARAC. A genome- wide screen in multiplex rheumatoid arthritis families suggests genetic overlap with other autoimmune diseases. *Am J Hum Genet* 68:927-36, 2001. PMCID: PMC1275647.
    b. Gregersen PK, Amos CI, Lee AT, Lu E, Remmers EF, Kastner DL, Seldin MF, Criswell LA, Plenge RM, Holers VM, Mikuls T, Sokka T, Moreland LW, **Bridges SL Jr.**, Xie G, Begovich AB, Siminovitch KA. REL, encoding a member of the NF-kappaB family of transcription factors, is a newly defined risk locus for rheumatoid arthritis. *Nature Genetics*, 41(7):820-3, 2009. PMCID: PMC2705058.
    c. *Govind N*, Choudhury A, Hodkinson B, Ickinger C, *Frost J*, Lee A, Gregersen PK, *Reynolds RJ*, **Bridges SL Jr.**, Hazelhurst S, Ramsay M, Tikly M. Immunochip identifies novel and replicates known genetic risk loci for rheumatoid arthritis in black South Africans. Mol Med.

2014 Aug 14;20:341-9. PMCID: PMC4153842

d. Okada Y, Wu D, Trynka G, . . . , **Bridges SL Jr.**, . . . , Momohara S, Matsuda F, Yamamoto K, Plenge RM. Genetics of rheumatoid arthritis contributes to biology and drug discovery. *Nature*, 2014 Feb 20;506(7488):376-81. PMCID: PMC3944098.

5. I have also led multi-investigator efforts to identify pharmacogenetic and other biomarkers of response to treatment to methotrexate and biologic agents in RA. We reported a role for HLA-DRB1 and genetic variants in treatment response, an influence of MTHFR variants. More recently, using data from the Treatment of Early Aggressive RA (TEAR) Trial, we identified variants in CD84 and eight other genetic loci associated with response to anti-TNF treatment. Network analysis indicated strong involvement of biological processes underlying inflammatory response and cell morphology. These findings are the underpinnings of personalized, precision medicine in RA.

   a. Criswell LA, Lum RF, Turner KN, Woehl B, Zhu Y, Wang J, Tiwari HK, Edberg JC, Kimberly RP, Moreland LW, Seldin MF, **Bridges SL Jr.** The influence of genetic variation in the HLA-DRB1 and TNF-LTA regions on response to treatment of early rheumatoid arthritis with methotrexate or etanercept. *Arthritis Rheum* 50: 2750-6, 2004.
   b. *Hughes LB*, Beasley TM, Patel H, . . . , Alarcón GS, **Bridges SL Jr.** Racial or ethnic differences in allele frequencies of single nucleotide polymorphisms in the methylenetetrahydrofolate reductase gene and their influence on response to methotrexate in rheumatoid arthritis. *Ann Rheum Dis* 65:1213-8, 2006. PMCID: PMC1798268.
   c. Cui J, Stahl E, Saevarsdottir S, . . . , **Bridges SL Jr.**, . . . ,Coenen MJH, Karlson EW, Plenge RM. Genome-wide association study and gene expression analysis identifies CD84 as a predictor of response to etanercept therapy in rheumatoid arthritis. *PLoS Genetics*, 2013 Mar;9(3):e1003394. PMCID: PMC3610685.
   d. Umicevic Mirkov M, Cui J, Vermeulen SH, . . ., **Bridges SL Jr.**, . . . ,Radstake TR, van Riel PL, Scheffer H, Franke B, Brunner HG, Plenge RM, Gregersen PK, Guchelaar HJ, Coenen MJ. Genome-wide association analysis of anti-TNF drug response in patients with rheumatoid arthritis. *Ann Rheum Dis*. 2013 Aug;72(8):1375-81. PMCID: PMC4169706.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/s.bridges.1/bibliography/40809066/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

NIH R01 HD084124 MM Bamman (Contact PI); SL Bridges, Jr. PI (Multiple PI) 04/15/15 - 02/28/20
Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement. Goals: Aim 1: To determine the effects of 16 week of progressive resistance exercise training plus adjunctive functional mobility training (PRT+FM) vs. usual care after elective total hip (THA) or knee (TKA) arthroplasty on muscle mass, performance, and mobility function. Aim 2: To determine whether muscle inflammation susceptibility status modifies the effects of these rehabilitation regiments after THA/TKA. Aim 3. To determine the long-term impact of 16 week PRT+FM by re-assessing outcomes at 6 months and 1 year.

NIH R01 AR062376 SL Bridges, Jr. (PI) 09/01/11 - 08/31/15
Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis. Goals: 1) To examine associations of serum ACPA to a variety of specific citrullinated epitopes and of serum anti-PAD4 Abs with clinical, genetic, and radiographic features in Af-Amer with anti-CCP+ RA. 2) To examine associations of periodontitis and exposure to *P. gingivalis* with serum ACPA profiles and anti-PAD4 Abs in Af-Amer with anti-CCP+ and anti-CCP-neg RA. 3) To compare the degree of clonality and mutation patterns of peripheral blood B cells from Af-Amer with and without anti-CCP Ab, ACPA, anti-PAD4 Abs; and to assess the reactivity of antibodies from citrullinated protein-specific and PAD4-specific B lymphocytes in RA.

NIH P50 AR060772-01A1 KG Saag (Contact PI); SL Bridges, Jr., PI (Multiple PI) 09/01/12 - 08/31/17
Center of Research Translation (CORT) in Gout and Hyperuricemia - Administrative Core
The overall goal of our CORT is to improve the health of patients with gout and hyperuricemia by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in translational investigation and to educate clinical investigators through an enrichment program. Our 3 innovative projects hold the promise of significant improvements in our understanding of the pathogenesis of gout, hyperuricemia, and co-morbid conditions, and better ways to treat or prevent gout and hyperuricemia.

CORT Project 2: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments JA Singh, PI, SL Bridges, Jr., Investigator. Specific Aim 1: To identify key patient, provider, and health system factors associated with achieving and maintaining serum urate below 6 mg/dl ("target") in gout patients taking allopurinol. Specific Aim 2: To characterize the epidemiology and risk factors for major adverse events (AEs) associated with the use of allopurinol and colchicine for treatment of gout.

NIH P30 AR048311JD Mountz, PI, SL Bridges, Jr., Investigator and Associate Director 09/01/12 - 08/31/17
NIH/NIAMS Rheumatic Diseases Core Center: Administrative Core. Goals: The overall goal of the UAB-RDCC is to stimulate collaborative and innovative interdisciplinary research to enhance our understanding of rheumatic diseases. Our specific aims are 1) to facilitate rheumatic disease research through Research Core facilities; 2) to support outstanding P&F projects drawing on the RDCC research base and using innovative tools and approaches; and 3) to provide career development and career enrichment activities for our investigators.

NIH P60 AR064172 SL Bridges, Jr., Contact PI, KG Saag, PI (Multiple PI) 09/16/13 - 07/31/18
NIH/NIAMS Multidisciplinary Clinical Research Center. Role: Program Director/PI
The UAB MCRC promotes research related to arthritis and musculoskeletal diseases. A Methodology Core is comprised of experts in biostatistics, statistical genetics and bioinformatics. An Administrative Core promotes scientific development through new techniques and nurtures new faculty in arthritis research. There are 2 projects: 1. Facilitating Treat-to-Target Strategies Using Novel Health Technology with Decision Support (Curtis); 2. Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis (Elson).

PCORI S Ginsburg, PI, JR Curtis, Site PI; SL Bridges, Jr., Investigator 03/12/14 - 09/11/15
ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)
We are testing methods for collecting biological specimens to create a biorepository for patient-centered outcomes research. In a pilot study, 50 participants will be assigned to have blood samples obtained using one of the four methods, for a total of 200 participants.

NIH UM1 AR065705 (JR Curtis, PI, SL Bridges, Jr. - Investigator) 09/01/14 - 08/30/19
NIH/NIAMS Safety and Effectiveness of Live Zoster Vaccine in Anti-TNF Users (VERVE)
A live attenuated vaccine reduces herpes zoster (HZ) morbidity, but is contraindicated in patients on immunosuppressive drugs. We will conduct the Varicella zostER VaccinE (VERVE) trial, a randomized, double-blind, placebo-controlled large pragmatic trial to evaluate the immunogenicity, safety, and effectiveness of the live HZ vaccine in patients receiving anti-TNF therapy.

NIH UH2 AR067687 - RM Pope, PI, SL Bridges, Jr. – Investigator and Site PI 09/26/14 - 08/31/15
NIH/NIAMS Rheumatoid Arthritis Synovial Tissue Network (REASON)
We have assembled a consortium of leading academic rheumatology groups which includes UAB, Columbia, Mayo Clinic, Washington University, Michigan, and Northwestern to form the REASON Network. We will create a new generation of US rheumatologists who will perform ultrasound guided synovial biopsies from RA patients, with tissues used to identify novel pathways and biomarkers that might predict therapeutic response.

Completed Research Support (within the past three years)

NIH/NIAMS R01 AR057202 SL Bridges, Jr. (PI) 09/25/2009 - 07/31/2014 NCE
Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis. Goals: 1) to perform a GWAS in 800 African-Americans (Afr-Am) with anti-CCP + RA and 800 controls to identify novel genetic associations; 2) to replicate these putative associations susceptibility to CCP+ RA among Afr-Am in independent set of 800 African-American CCP+ RA patients and 800 matched controls; and 4) To further characterize genetic regions associated RA in African-Americans and to analyze genome-wide associations with radiographic severity; BMD in early RA and healthy controls; and eQTLs of genes expressed in PBMC, particularly those associated with radiographic severity.

NIH/NIAMS P60 AR048095 RP Kimberly, PI, SL Bridges, Jr., Investigator 09/01/08 - 06/30/13
Multidisciplinary Clinical Research Center (MCRC) Administrative Core. The UAB MCRC promotes research related to the causes, diagnoses, treatments and care of patients with arthritis and musculoskeletal diseases. Project 1: Genetic and Molecular Markers of Methotrexate Efficacy and Toxicity in Early RA. (DK Arnett, PI, SL Bridges, Jr., Investigator).

MCRC Project 3: Predictors of RA Severity in African-Americans. (SL Bridges, Jr., PI)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Li, Yi-Ping

eRA COMMONS USER NAME (credential, e.g., agency login): YIPINGL

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Zhejiang University, China	B.S.	07/79	Chemistry
Shanghai Institute of Biochemistry, Chinese Academy of Sciences, Shanghai, China	Ph.D.	10/88	Molecular Genetics
Ctr. Biomedical Res, Rockefeller University, NY	Postdoctoral Fellow	02/89 - 04/90	Molecular Biology
The Forsyth Institute; Harvard School of Dental Medicine, Boston	Postdoctoral Fellow	05/90 – 05/93	Bone and Cell Biology

A. Personal Statement

My research includes investigations of bone formation and resorption, brain and craniofacial development, skeleto-muscular development, and their related diseases. I am a member of the NIAMS-funded Rheumatic Diseases Core Center at UAB and am an adjunct Professor at the UAB Dental School. My work has resulted in the publication of a number of seminal papers on the cloning and characterization of genes critical to osteoclast function, including cathepsin K, ATP6i, and RGS10A. We also determined that null mutation of CNBP is embryonically lethal and results in defects in anterior patterning, that CNBP may control forebrain induction through Myc, and that CNBP knockdown during early organogenesis resulted in forebrain truncation (The zinc-finger protein, CNBP, is required for forebrain formation in the mouse, *Development* 2003). Overall, this research promises to provide deeper insight into the mechanisms of embryonic development, a prerequisite for the eventual diagnosis and treatment of human craniofacial developmental defects. In recognition of my research success and contributions to the field of bone biology, I was appointed the inaugural Jay M. McDonald Endowed Professor in Bone Biology in 2010 by the University of Alabama at Birmingham (UAB). The University provides a rich environment for my research, with ample laboratory space, equipment, and institutional resources available. Evidence of the success, insight, and productivity of my laboratory in the interdisciplinary fields of bone biology, immunology, and oncology is shown by my publication record. In the past ten years, I have mentored 10 pre-doctoral students and 14 post-doctoral students in my laboratory. These trainees have left my lab well-prepared for the next stage of career development as exemplified by the recent success of two of my trainees, including Dr. Shuying Yang, who is now Associate Professor of Oral Biology at State University of New York at Buffalo. Dr. Kalu Ogbureke is Chair of the Department of Diagnostic and Biomedical Sciences at The University of Texas School of Dentistry at Houston. Under my tutelage, fellows in my lab presented posters at conferences, including my students Mengrui Wu, who was the 2012 ASBMR President's Award Recipient at the Annual Meeting of the American Society of Bone and Mineral Research; Guochun Zhu, who received the 2013 ASBMR Travel Award at the ASBMR (Senior Author); Yun Lu, who received a 2014 ASBMR Young Investigator Travel Grant (Senior Author); and Liang Hao, (post-doc) who was selected to receive a 2014 ASBMR Young Investigator Travel Grant (Senior Author). I have previously taught courses in skeletal development and disease, and have been invited to speak at numerous seminars such as Molecular and Cellular Pathology Seminar and the Program in Immunology Series. One of my post-docs, Joel Jules, is currently working in my lab under a Research Supplement to Promote Diversity in Health-Related Research grant (Deletion of Core-binding factor beta; (Cbfb) in mesenchymal progenitor cells provides new insights into Cbfb/Runxs complex function in cartilage and bone development, Bone 2014). In 2013 Dr. Jules received the ASBMR Felix Bronner Young Investigator Award as the highest ranking abstract submitted by a young investigator at the Annual Meeting of the

American Society of Bone and Mineral Research. One of my pre-doctoral trainees, Matthew McConnell, is studying the immune system in breast cancer (Silencing of Atp6v1c1 Prevents Breast Cancer Growth and Bone Metastasis. Int J Biol Sci). I have been training graduate students for many years and have been pleased to watch my students develop and obtain great success. I am confident in my ability to help graduate students select research topics that will be impactful and achievable. The graduate students seem to thrive in my lab's culture of high expectations, understanding, adaptability, and commitment. My years of successful experience in mentoring researchers and their numerous publications demonstrate my capacity to effectively and synergistically serve as Associate Director and a Core mentor for trainees in the proposed T32 training grant.

B. Positions and Honors

Professional Positions:

1989 - 1990 Assistant Professor, Shanghai Institute of Biochemistry, The Academy of Sciences of China.
1990 – 1993 Staff Associate, Cytokine Biology Department, Forsyth Dental Center (now The Forsyth Institute), Harvard School of Dental Medicine, Boston, MA.
1993 - 1994 Research Associate, Cytokine Biology Department, The Forsyth Institute, Harvard School of Dental Medicine Boston, MA.
1994 - 1995 Assistant Member of the Staff, Cytokine Biology Department, The Forsyth Institute. Harvard School of Dental Medicine
1994 – 1999 Lecturer, Oral Biology and Pathophysiology, Harvard School of Dental Medicine, Boston, MA.
1995 – 1998 Assistant Member of the Staff II (equivalent to Assistant Professor), Cytokine Biology Department, The Forsyth Institute, Harvard School of Dental Medicine
1999 -2010 Assistant Professor, Developmental Biology Department, Harvard School of Dental Medicine.
1999 - 2007 Associate Member of the Staff (equivalent to Associate Professor), Cytokine Biology Department, The Forsyth Institute, Harvard School of Dental Medicine, Boston, MA.
2007 -2010 Senior Member of the Staff (equivalent to Tenured Professor), Cytokine Biology Department, The Forsyth Institute, Harvard School of Dental Medicine, Boston, MA.
2010- Adjunct Senior Research Investigator, Cytokine Biology Department, The Forsyth Institute, Harvard School of Dental Medicine, Boston, MA
2010- Jay M. McDonald Endowed Professor in Bone Biology, University of Alabama at Birmingham, Birmingham, AL.
2010- Senior Vice Director for Research, Center for Metabolic Bone Disease, University of Alabama at Birmingham, Birmingham, AL.
2013- Adjunct Professor, UAB Dental School Secondary Appointment

Awards/Honors:

1989 Outstanding Young Investigator Award, National Meeting of Biochemistry, China.
1998 Travel Award Recipient, Oral Presentations at the 23rd Annual Meeting of the American Society of Bone and Mineral Research.
2001 Pretdoc. K. Shimizu as Young Investigator Award Recipient at the 23rd Annual Meeting of the American Society of Bone and Mineral Research (Senior Author)..
2006 Postdoc. S. Yang as Most Outstanding Abstract Award Recipient at the 28th Annual Meeting of the American Society of Bone and Mineral ResearchSenior Author)..
2010- Honorable endowed Jay M. McDonald Professorship in Bone Biology, University of at Birmingham, Birmingham, AL.
2012 Predoctoral student Mengrui Wu was awarded the 2012 ASBMR President's Award Recipient at the Annual Meeting of the American Society of Bone and Mineral Research (Senior Author).
2013 Postdoc. Joel Jules received the 2013 ASBMR Felix Bronner Young Investigator Award as the highest ranking abstract submitted by a young investigator at the Annual Meeting of the American Society of Bone and Mineral Research (Senior Author).
2013 Predoctoral student Mengrui Wu was the 2013 ASBMR Travel Award Recipient at the Annual Meeting of the American Society of Bone and Mineral Research (Senior Author).
2013 Visiting scholar Guochun Zhu was the 2013 ASBMR Travel Award Recipient at the Annual Meeting of the American Society of Bone and Mineral Research (Senior Author).
2014 Yun Lu (student) has been selected to receive a 2014 The *American Society for Bone and Mineral Research* (*ASBMR*) Young Investigator Travel Grant (Senior Author).

2014 Liang Hao (post-doc) has been selected to receive a 2014 ASBMR Young Investigator Travel Grant (Senior Author).
2014 Mengrui Wu (post-docs) was selected to receive a 2014 ASBMR Young Investigator Travel Grant (Senior Author).
2014 *Int J Biol Sci* Journal Most cited paper Award in 2014.(Senior Author).

C. Contribution to Science

I. Dr. Li's research was the first to identify Znf9/Cnbp as a key gene in Myotonic dystrophy type II disease and craniofacial development. Dr. Li's research has had a major impact on the field of muscle disease and has expanded our understanding of the pathogenesis of myotonic dystrophy type II (DM2) disease. Prior to Dr. Li's findings, it was unknown that Znf9 haploinsufficiency was related to the pathogenesis of DM2 *(Chen et al, JMB, 2007)*. The novel discovery of Dr. Li's study has now been confirmed by several other labs. Cnbp was also identified for the first time to be related to craniofacial development. Dr. Li found that the zinc-finger protein, CNBP, is required for forebrain formation in the mouse (Chen *et al Development 2003)*, and that CNBP regulates forebrain formation at the organogenesis stage (Abe *et al*, *Dev Biol* 2006). Dr. Li's research has had a major impact on the field of craniofacial development, has expanded our understanding of the biological and molecular basis of craniofacial morphogenesis, and has provided much needed insight into human congenital birth defects which affect the development of the head, face, and neck. This research provides deeper understanding of the mechanisms of embryonic development, a prerequisite for the eventual diagnosis and treatment of human craniofacial developmental defects.

References:

1. Chen W, Liang Y, Deng W, Shimizu K, Ashique AM, Li E, **Li Y-P**. The zinc-finger protein, CNBP, is required for forebrain formation in the mouse. *Development* 2003;130:1367-79.
2. Abe Y[#], Chen W[#], Huang W, **Li Y-P**. CNBP regulates forebrain formation at organogenesis stage in chick embryos. *Dev Biol* 2006;295:116-27.
3. Chen W, Wang Y, Abe Y, Cheney L, Udd B, **Li Y-P**. Haploinsuffciency for Znf9 in Znf9$^{+/-}$ mice is associated with multiorgan abnormalities resembling myotonic dystrophy. *J Mol Biol* 2007;368(1):8-17.
4. Shimizu K, Chen W, Ashique AM, Moroi R, **Li Y-P**. Molecular cloning, developmental expression, promoter analysis and functional characterization of the mouse CNBP gene. *Gene* 2003;307:51-62.

II. Dr. Yi-Ping Li has made great contributions to the science of bone gene transcription regulation and promoter analysis:

Dr. Li was the first to provide insight into how IL-6 and TNFα down-regulated osteoblast gene expression (Li YP *et al., J. Imm,* 1992;). Dr. Li was also the first to provide insight into how the tumor necrosis factor alpha (TNFα) -responsive element downregulates the human osteocalcin gene and bone formation (Li YP *et al.*, *MCB*, 1993). Dr. Li first characterized the two major osteoclast function gene promoters and their regulation of gene expression. These studies significantly translate the findings from basic research to clinical applications and uniquely combine the issues of bone resorption and bone formation immune cytokines in potential gene therapy. Through his leadership, Dr. Li's lab has significantly advanced the knowledge of osteoblast genes in bone diseases (*e.g.* osteoarthritis, and osteoporosis) and developed promising new treatment approaches for these diseases.

References:

1. **Li Y-P**, Stashenko P. Proinflammatory cytokines tumor necrosis factor-α and IL-6, but not IL-1, down-regulate the osteocalcin gene promoter. *J Immunol* 1992;148:788-94.
2. **Li Y-P**, Stashenko P. Characterization of a tumor necrosis factor-responsive element which downregulates the human osteocalcin gene. *Mol Cell Biol* 1993;3:3714-21. PMCID: PMC359846.
3. **Li Y-P**, Chen W, Stashenko P. Characterization of a silencer element in the first exon of the human osteocalcin gene. *Nucleic Acids Res* 1995; 23:5064-72. PMCID: PMC307514
4. Deng W, Stashenko P, Chen W, Liang Y, Shimizu K, **Li Y-P**. Characterization of mouse Atp6i gene, the gene promoter, and the gene expression. *J Bone Miner Res* 2001;16:1136-46.

III. Dr. Yi-Ping Li has made great contributions to the science of bone gene cloning and functional studies, which have become the basis of drug discovery for bone diseases.

Dr. Yi-Ping Li's expertise in the field of osteoclast biology is shown through his numerous seminal papers on the cloning and characterization of genes critical to osteoclast function (Wucherpfenning et al, JBMR 1994).

Dr. Li was one of the first scientists to apply molecular biology approaches to the study of osteoclasts, and as a result his lab is among those that laid the foundation of modern molecular osteoclast biology (*Li et al, JBMR 1995; Li et al, BBRC, 1996; Yang et al, JBMR 2012*). These important osteoclast genes have become the basis of bone disease discovery, including the osteoporosis drug discovery, catheads K inhibitor, the MMP9 inhibitor, and the ATP6i inhibitor. Some of these have been in phase III clinic trials.

References:

1. Wucherpfennig AL, **Li Y-P**, Stetler-Stevenson WG, Rosenberg AE, Stashenko P. Expression of 92-kDa type IV collagenase/gelatinase B in human osteoclasts. *J Bone Miner Res* 1994;9:549-56.
2. **Li Y-P**, Alexander M, Wucherpfennig AL, Yelick P, Chen W, Stashenko P. Cloning and complete coding sequence of a novel human cathepsin expressed in giant cells of osteoclastomas. *J Bone Miner Res* 1995;10:1197-1202.
3. Yang DQ, Feng S, Chen W, Zhao H, Paulson C, **Li Y-P**. V-ATPase subunit ATP6AP1 (Ac45) regulates osteoclast differentiation, extracellular acidification, lysosomal trafficking, and protease exocytosis in osteoclast-mediated bone resorption. *J Bone Miner Res.* 2012 Aug;27(8):1695-707. PMCID: PMC3951719.
4. Shimizu K, Chen W, Ashique AM, Moroi R, **Li Y-P**. Molecular cloning, developmental expression, promoter analysis and functional characterization of the mouse CNBP gene. *Gene* 2003;307:51-62.

IV. Dr. Yi-Ping Li has made great contributions to the science of osteoclast gene function, which has made significant progress in the field of osteoclast biology.

Dr. Li has proved key osteoclast function genes' functions *in vivo* by establishing knockout mouse models, which have led to several presentations and published papers on this groundbreaking work (*Li's et al, Nature Genetics, 1999*). Dr. Li's research has focused on the function of osteoclast-specific genes (*e.g. Cathepsin K*, *ATP6i*, D2, and, RGS12 and RGS10) at a time when the role of osteoclasts in bone resorption and the mechanism of action of proton pumps was still largely unknown (*Wu et al, JBMR, 2009; Yang et al, 2007*). Dr. Li's lab has also characterized how RGS10 transduces RANKL signaling to control osteoclast differentiation by regulating [Ca2+]i oscillation and the activation of NFATc1. (*Yang and Li Genes Dev, 2007*). These works have led to significant progress in the field of osteoclast biology. Some of the works have led to the discovery of human disease genes.

References:

1. **Li Y-P**, Chen W, Liang Y, Li E, Stashenko P. Atp6i-deficient mice exhibit severe osteopetrosis due to loss of osteoclast-mediated extracellular acidification. *Nat Genet* 1999;23:447-51.
2. Yang S, **Li Y-P**. RGS10 null mutation impairs osteoclast differentiation resulting from the loss of [Ca2+]i oscillation regulation. *Genes Dev* 2007;21:1803-16. PMCID: PMC1920174.
3. Yang S, **Li Y-P**. RGS12 is essential for RANKL-evoked signaling for terminal differentiation of osteoclasts. *J Bone Miner Res* 2007;22:45-54. PMCID: PMC3559086.
4. Wu, H; Xu, G; **Li Y-P**. Atp6v0d2 is an essential component of the osteoclast-specific proton pump and has a function in extracellular acidification. *J Bone Miner Res* 2009.24:1–15. PMCID: PMC2672205.

V . Osteoimmunology and translational medicine research in Bone disease.

Dr. Li's lab was one of the earliest labs to provide insight as to how Interferon-γ and IL-1α regulate osteoclast gene expression (Kamolmatyakul S *et al., JDR,* 2001; Kamolmatyakul S *et al*., *JDR,* 2004). Dr. Li's lab uses basic scientific lab discoveries of osteoclast genes and functions and applies them to translational medicine study. Dr. Li's Lab was the earliest lab to treat oral diseases by silencing osteoblast genes mediated by AAVs as a powerful gene therapy tool. His lab has found that gene silencing inhibits osteoclast function indirectly through the inhibition of inflammation and the subsequent decrease in osteoclast bone resorption and inflammation (Bo G *et al.*, *JDR*, 2013, Ma J *et al. IAI*, 2013; *Jiang H et al, PLOS ONE, 2013*). This groundbreaking work that is investigating the therapeutic potential of targeting *ATP6i* and *RGS10* as treatments for immune-mediated oral inflammatory diseases, has led to numerous insights about the role of these genes in osteoimmunology. Dr. Li's work has demonstrated the important finding that a number of genes critical to osteoclasts also have an important role in the immune system. This work represents a great impact on the medical community that is dedicated to reducing the inflammation associated with oral diseases, which can affect up to half of the adult population. These studies significantly translate findings from basic research to clinical applications and uniquely combine the issues of bone resorption and immune response in periodontitis with the approach of AAV-mediated gene therapy. AAV-mediated gene therapy has

been successfully used clinically, making this research directly applicable to future clinical trials. Through his leadership, Dr. Li's lab has significantly advanced the knowledge of osteoclast genes in bone diseases (*e.g.* osteoarthritis, rheumatoid arthritis, osteoporosis, and periodontal diseases) and developed promising new treatment approaches for these diseases.

References:

1. Bo Gao, Wei Chen, Liang Hao, Guochun Zhu, Shengmei Feng, Hongliang Ci, Xuedong Zhou, Philip Stashenko and **Li Y-P.** Inhibiting periapical lesions through AAV-RNAi silencing of Cathepsin K. J Dent Res 2013; 92 (2): 180 - 186. PMCID: PMC3545691.
2. Ma, J, Chen W, Zhang L, Tucker B, Zhu G, Sasaki H, Hao L, Wang L, Ci H, Jiang H, Stashenko P, and **Li Y-P**. RNAi mediated silencing of Atp6i prevents both periapical bone erosion and periapical inflammation in the mouse model of endodontic disease. Infection and Immunity. 2013; 81 (4): 1021–1030. PMCID: PMC3639609.
3. Kamolmatyakul S, Chen W, **Li Y-P**. Interferon-γ down-regulates gene expression of cathepsin K in osteoclasts and inhibits osteoclast formation. *J Dent Res* 2001;80:351-5.
4. Kamolmatyakul S, Chen W, Yang S, Abe Y, Moroi R, Ashique AM, **Li Y-P**. IL-1α stimulates cathepsin K expression in osteoclasts via the tyrosine kinase-NF-κB pathway. *J Dent Res* 2004;83:791-6. PMCID: PMC3966556.

D. Research Support

Ongoing Research Support

R01 DE023813 Li (PI) 01/01/2014 - 12/30/2018
Inhibiting Periodontitis by Targeting Cathepsin K and Attenuating TLR Signaling.
This study endeavors to develop a new treatment for periodontal disease (periodontitis) by simultaneously inhibiting oral infection-induced gum inflammation and oral bone resorption. Since 75% of American adults have periodontitis, which is a risk factor for several pathological disorders including cardiovascular disease, diabetes, atherosclerosis and arthritis, this novel gene therapy approach would vastly improve the health of millions who suffer from periodontitis, and the consequent loss of teeth. Once the goal of the proposal is reached, the fruits of the study will be moved forward into translational/pre-clinical research
Role: PI

R01 AR044741 Li (PI) 04/01/12-03/31/17
NIH; NIAMS
Transcription Regulation of Osteoclast Lineage Commitment and Differentiation
This study endeavors to increase our understanding of the mechanisms underlying the transcription factors that regulate osteoclast lineage commitment and differentiation. In so doing, this study will elucidate how transcription factors specify osteoclast cell lineage commitment and differentiation.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Saag, Kenneth G

eRA COMMONS USER NAME (agency login): KENSAAG

POSITION TITLE: Professor of Medicine and Epidemiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Universtiy of Michigan	BS	01/1982	Bioengineering
Northwestern University	MD	01/1986	Medicine
University of Iowa	MS	01/1994	Epidemiology

A. PERSONAL STATEMENT

I am a practicing rheumatologist, epidemiologist, and outcomes researcher with over 20 years of experience in conducting patient-oriented, clinical trial, pharmacoepidemiologic, and comparative effectiveness research in musculoskeletal disorders. I am the founding Director of the AHRQ funded U18 UAB Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs) and Director of the NIAMS funded UAB Center of Research Translation (CORT) in Gout and Hyperuricemia. I am Director of the UAB Center for Outcomes and Effectiveness Research (COERE), a University-Wide supported Interdisciplinary Research Center. I am PI of AHRQ funded T32 in Health Services, Outcomes, and Effectiveness Research and PI of AHRQ funded K12 in Patient Centered Outcomes Research. I recently completed my second 5 year funding cycle of a K24 Mid-Career Award in Patient Oriented Research. I have been primary or secondary mentor for 35 trainees. I also am Project Principal Director for a NIH/NIAMS R01, P50, U34, and R21. I am the recipient of the American College of Rheumatology (ACR) 2013 Excellence in Investigative Mentoring Award. These grants and experiences position me well to serve as Associate Director and as a member of the Research Training Program (RTP) Executive Committee in the current proposal “Training Program in Rheumatic and Musculoskeletal Diseases Research.”

B. POSITIONS AND HONORS

Positions and Employment

1986 - 1989 Resident, Internal Medicine, Northwestern University, Evanston Hospital, Evanston, IL
1989 - 1990 Chief Resident, Internal Medicine and Instructor in Medicine, Northwestern University, Evanston Hospital, Evanston, IL
1990 - 1993 Fellow, Division of Rheumatology, Department of Internal Medicine, University of Iowa Hospitals College of Medicine, Iowa City, IA
1993 - 1994 Associate, University of Iowa
1994 - 1998 Assistant Professor, University of Iowa
1997 - 1998 Assistant Professor, Division of Epidemiology, Department of Preventive Medicine and Environmental Health, University of Iowa
1998 - 2006 Associate Professor, Department of Medicine, University of Alabama at Birmingham (UAB) School of Medicine, Birmingham, AL
2001 - present Director, Center for Education and Research on Therapeutics (CERTs) of Musculoskeletal Disorders, UAB
2002 - present Co-Director, Multidisciplinary Clinical Research Center, UAB
2006 - present Professor, Departments of Medicine and Epidemiology (Secondary appointment), UAB

2009 - present Director, Center for Outcomes Effectiveness Research and Education, UAB
2009 - present Jane Knight Lowe Endowed Chair in Medicine, UAB
2015 - present Vice Chair, Faculty Development, Department of Medicine, UAB

Other Experience and Professional Memberships

1997 - 2009 Editorial Board, Arthritis Care and Research
2004 - 2005 Chair, Clinical Outcomes and Therapeutics Study Section, Arthritis Foundation
2005 - 2005 Board of Directors, American Gout Society
2006 - 2006 Chair, AMA Consortium on Osteoporosis Clinical Guidelines
2006 - 2010 Member, FDA Arthritis Advisory Committee
2007 - 2010 Editorial Board, Archives Internal Medicine
2007 - 2012 Associate Editor, Outcomes Section, Arthritis, Research & Therapy
2008 - 2013 Chair, Quality of Care Committee, American College of Rheumatology
2010 - 2013 Editorial Board, Annals of Internal Medicine
2013- present Member, Board of Directors, American College of Rheumatology
2014 - present Vice President, Board of Trustees, National Osteoporosis Foundation

Honors

1981 Tau Beta Pi Engineering Honor Society, Northwestern University
1987 Outstanding Intern of the Year, Northwestern University
2001 Department of Medicine Division Teacher Award, University of Alabama at Birmingham
2005 Max Cooper Research Award, University of Alabama at Birmingham
2011 Research Excellence Award, University of Alabama at Birmingham
2013 Annual Award for Distinction for Investigative Mentoring, American College of Rheumatology
2015 Association of American Physicians

C. CONTRIBUTIONS TO SCIENCE

In the publications below, trainees I mentored are indicated in *italics* and underlined font.

1. **Osteoporosis evidence generation and implementation-** My career has advanced the field of epidemiology and implementation science in the area of osteoporosis with a focus on glucocorticoid-induced osteoporosis (GIOP). My publications have included two landmark clinical trials that have changed GIOP prevention. More recent work has focused on methods to implement osteoporosis evidence into practice in osteoporosis.
   a. **Saag KG**, Emkey R, Schnitzer TJ, Brown JP, Hawkins F, Goemaere S, Thamsborg G, Liberman UA, Delmas PD, Malice MP, Czachur M, Daifotis AG. Alendronate for the prevention and treatment of glucocorticoid-induced osteoporosis. Glucocorticoid-Induced Osteoporosis Intervention Study Group. N Engl J Med. 1998 Jul 30;339(5):292-9. PubMed PMID: 9682041.
   b. **Saag KG**, Shane E, Boonen S, Marín F, Donley DW, Taylor KA, Dalsky GP, Marcus R. Teriparatide or alendronate in glucocorticoid-induced osteoporosis. N Engl J Med. 2007 Nov 15;357(20):2028-39. PubMed PMID: 18003959.
   c. *Curtis JR*, Westfall AO, Allison J, Becker A, Melton ME, Freeman A, Kiefe CI, MacArthur M, Ockershausen T, Stewart E, Weissman N, **Saag KG**: Challenges in improving the quality of osteoporosis care for long-term glucocorticoid users: a prospective, randomized trial. Arch Intern Med, 2007; 167(6):591-6. PMID: 17389291.
   d. *Warriner AH*, Outman RC, Feldstein AC, Roblin DW, Allison JJ, *Curtis JR*, Redden DT, Rix MM, Robinson BE, Rosales AG, Safford MM, **Saag KG**. Effect of Self-Referral on Bone Mineral Density Testing and Osteoporosis Treatment: A Randomized Trial. Medical Care. 2014; 52(8):743-50. PMID: 24984211. PMCID: PMC4101066.

2. **Population-based epidemiology and pharmacoepidemiology.** I have directly conducted or mentored trainees generating evidence on the safety and comparative effectiveness of drugs and biologics in rheumatic disease using national data sources. This work has informed use of these drugs in clinical practice.

a. **Saag K**, Koehnke R, Caldwell J, Brasington R, Burmeister L, Zimerman B, Kohler J, Furst D: Low Dose Long-term Corticosteroid Therapy in Rheumatoid Arthritis: An Analysis of Serious Adverse Events. Am J Med. 1994; 96(2):115-123. PMID: 8109596. (Comments in American Journal of Medicine, 1995; 99:692-94.)
b. Merlino LA, *Curtis J*, *Mikuls TR*, Cerhan JR, Criswell LA, **Saag KG**. Vitamin D intake is inversely associated with rheumatoid arthritis: results from the Iowa Women's Health Study. Arthritis Rheum. 2004 Jan;50(1):72-7. PubMed PMID: 14730601.
c. Grijalva CG, Chen L, Delzell E, Baddley JW, *Beukelman T*, Winthrop KL, Griffin MR, Herrinton LJ, Liu L, Ouellet-Hellstrom R, Patkar NM, Solomon DH, Lewis JD, Xie F, **Saag KG**, *Curtis JR*. Initiation of tumor necrosis factor-alpha antagonists and the risk of hospitalization for infection in patients with autoimmune diseases. JAMA 2011;306(21):2331-9. PMID: 22056398. No direct NIH funding acknowledged.
d. *Zhang J*, Xie F, Delzell E, Chen L, Winthrop KL, Lewis JD, **Saag KG**, Baddley JW, Curtis JR. Association between vaccination for herpes zoster and risk of herpes zoster infection among older patients with selected immune-mediated diseases. JAMA, 2012;308(1):43-9. PMID: 22760290.

3. **Gout epidemiology and quality of care.** In collaboration with mentees, I have used national databases and cohorts to conduct several pivotal gout epidemiologic studies. I have helped define gout quality of care and disease activity.
   a. *Mikuls TR*, Allison J, Patino F, Olivieri J, MacLean CH, **Saag KG**: Quality of care indicators for gout management.. Arthritis Rheum, 2004; 50(3):937-943. PMID: 15022337.
   b. *Mikuls TR*, Farrar JT, Bilker WB, Fernandes S, **Saag KG**: Gout epidemiology: results from the UK General Practice Research Database, 1990–1999. Ann Rheum Dis, 2005; 64:267-272. PMID: 15647434. PMCID: PMC1755343.
   c. *Gaffo AL*, Roseman JM, Jacobs DR, Jr., Lewis CE, Shikany JM, Mikuls TR, Jolly PE, **Saag KG**. Serum urate and its relationship with alcoholic beverage intake in men and women: findings from the Coronary Artery Risk Development in Young Adults (CARDIA) cohort. Ann Rheum Dis. 2010;69(11):1965-70. PMID20525839.
   d. *Gaffo AL*, Jacobs DR Jr, Sijtsma F, Lewis CE, Mikuls TR, **Saag KG**: Serum urate association with hypertension in young adults: analysis from the Coronary Artery Risk Development in Young Adults cohort. Ann Rheum Dis, 2013; 72(8):1321-7. PMID: 22984170.

4. **Evidence synthesis and guideline development** - As a member of American College of Rheumatology (ACR) Board of Directors and past Chairman of the ACR Quality of Care Committee, I have led or been a key architect of the ACR Guidelines and their associated methodology.
   a. American College of Rheumatology Ad Hoc Committee on Glucocorticoid-Induced Osteoporosis (**Saag, KS**, Committee member): Recommendations for the prevention and treatment of glucocorticoid-induced osteoporosis: 2001 Update. Arthritis Rheum, 2001; 44(7):1496-503. PMID: 11465699.
   b. **Saag KG**, *Teng GG*, *Patkar NM*, Anuntiyo J, Finney C, *Curtis JR*, Paulus HE, Mudano A, Pisu M, Elkins-Melton M, Outman R, Allison JJ, Suarez Almazor M, Bridges SL Jr, Chatham WW, Hochberg M, MacLean C, Mikuls T, Moreland LW, O'Dell J, Turkiewicz AM, Furst DE. American College of Rheumatology 2008 recommendations for the use of nonbiologic and biologic disease-modifying antirheumatic drugs in rheumatoid arthritis. Arthritis Rheum. 2008 Jun 15;59(6):762-84. PubMed PMID: 18512708.
   c. *Beukelman T*, *Patkar NM*, **Saag KG**, Tolleson-Rinehart S, Cron RQ, DeWitt EM, Ilowite NT, Kimura Y, Laxer RM, Lovell DJ, Martini A, Rabinovich CE, Ruperto N. 2011 American College of Rheumatology recommendations for the treatment of juvenile idiopathic arthritis: initiation and safety monitoring of therapeutic agents for the treatment of arthritis and systemic features. Arthritis Care Res, 2011;63(4):465-82. PMID 21452260. PMCID 3222233
   d. *Singh JA*, Furst DE, Bharat A, Curtis JR, Kavanaugh AF, Kremer JM, Moreland LW, O'Dell J, Winthrop KL, Beukelman T, Bridges SL, Jr., Chatham WW, Paulus HE, Suarez-Almazor M, Bombardier C, Dougados M, Khanna D, King CM, Leong AL, Matteson EL, Schousboe JT, Moynihan E, Kolba KS, Jain A, Volkmann ER, Agrawal H, Bae S, Mudano AS, Patkar NM, **Saag KG**. 2012 update of the 2008 American College of Rheumatology recommendations for the use of disease-modifying antirheumatic

drugs and biologic agents in the treatment of rheumatoid arthritis. Arthritis Care Res (Hoboken) 2012;64:625-39. PMID: 22473917.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1B7mmSYAmcrA6/bibliography/40691256/public/?sort=date&direction=ascending.

D. RESEARCH SUPPORT

Ongoing Research Support

K24 AR052361 (Saag) 06/01/05 – 05/31/15
NIH/NIAMS
Midcareer Investigator Award in Patient-Oriented Research K24
The goal of this project is to allow Dr. Saag to continue mentoring trainees and conducting research in the pharmacoepidemiology of the rheumatic diseases.

U19 HS021110 (Saag) 09/30/11 – 08/31/16
AHRQ
UAB Deep South Arthritis and Musculoskeletal CERTs
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders.

P50 AR060772 (Saag/Bridges, MPI) 09/01/12 – 08/31/17
NIH/NIAMS
A UAB CoRT will support the conduct of innovative translation research and the training of clinical investigators in gout and hyperuricemia. The overall goal of the UAB CORT is to improve the health care of patients with gout and hyperuricemia by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in translational investigation.
CoRT Project 2: The Effects of Urate Lowering Therapy on Inflammation, Endothelial function, and Blood Pressure
This project will confirm the usefulness and elucidate the mechanisms for a novel approach for hypertension prevention and control, relevant in individuals with hyperuricemia and gout and that can greatly improve cardiovascular outcomes in diverse populations.

R01 AR060240 (Saag) 09/01/11 – 08/31/16
NIH
Activating Patients to Reduce Osteoporosis (APROPOS)
Examine changes in osteoporosis-related health beliefs, greater levels of doctor-patient communication, and changes in possible concerns about osteoporosis medication safety and efficacy.

R01 AG033035 (Cram PI, Saag Subcontract PI) 04/01/11 – 03/31/15 NCE
National Institutes of Health (NIH)
A Patient Activation Intervention to Improve Bone Health in Older Adults
The aim of this study is to improve healthcare and enhance bone-related health by mailing patients their DXA scan results.

P60 AR064172 (Bridges) 09/16/13 – 07/31/18
NIH/NIAMS
UAB Multidisciplinary Clinical Research Center: Administrative Core
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.
Project 2: Facilitating Treat-to-Target Using Novel Health Technology with Decision Support
A systematic collection of PRO in clinical practice, using novel health technology to review therapies for RA patients and determine health outcomes.

UL1TR000165 (Kimberly) 05/19/08 – 04/30/15 NCE
National Institutes of Health (NIH) Clinical and Translational Science Award (CTSA) program
UAB Center for Clinical and Translational Science (CCTS)
The UAB Center for Clinical and Translational Science (CCTS) is making the research process more efficient – to improve human health.

CE-1304-6631 (Singh) 10/01/13-12/31/16
PCORI - Assessment of Prevention, Diagnosis, and Treatment Options
Individualized Patient Decision Making for Treatment Choices among Minorities with Lupus
This study will focus on developing and testing the effectiveness of decision aids tool in helping decision making in racial/ethnic minority patients with lupus kidney disease.

PPRN-1306-04811 (Curtis, Ginsberg, MPI) 03/12/14 – 09/11/15
Patient Centered Outcomes Research Institute (PCORI)
The AR-PoWER PPRN is a patient advocacy and education-focused high-impact patient-centered network able to support conduct of RA research

R21 AR062300 Saag (PI) 06/01/11 – 05/31/15
National Institutes of Health (NIH)/NIAMS
Pilot Studies for the Active Comparator Osteoporosis Large Simple Trial (ATLAST)
To develop materials and pilot test methods necessary to determine feasibility and future completion of The Active comparaTor osteoporosis LArge Simple Trial (ATLAST).

K12 HS023009 (Saag) 08/01/14 – 07/31/19
AHRQ
UAB K12 in Patient Centered Outcomes Research
AHRQ Patient Centered Outcomes Research Institutional Award (K12), for a career development program to train junior faculty and to expand training capacity at UAB.

UM1 AR065705 (Curtis) 07/01/14 – 05/31/19
National Institutes of Health (NIH)/NIAMS
Safety and Effectiveness of Live Zoster Vaccine in Anti- TNF Users (VERVE)
The Varicella zostER VaccinE (VERVE) trial is a 2-arm, double-blinded, multicenter randomized pragmatic clinical trial designed to determine whether the currently licensed zoster vaccine is immunogenic, safe, and effective in patients with inflammatory arthritis using anti-TNF therapies.

No Number Assigned (Navarro-Millán) 07/01/14 – 06/30/16
Rheumatology Research Foundation
PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes
A systematic collection of PRO in clinical practice, using novel health technology for patients to determine health outcomes.

Completed Research Support

U34 AR062891 (Saag) 04/01/13 – 03/31/15
National Institutes of Health (NIH)/NIAMS
Effectiveness of DiscontinuinG bisphosphonatEs Study (EDGE)
Planning grant for a Pragmatic Clinical Trial (PCT), "Effectiveness of DiscontinuinG bisphosphonatEs (EDGE) Study", a "real world" effectiveness trial of an initially estimated 4100 patients randomized to continuation or discontinuation of prior alendronate therapy.

P60 AR48095 (Kimberly) 09/01/08 – 06/30/13
National Institutes of Health/NIAMS
Multidisciplinary Clinical Research Center
Project 4: Improving Care of Osteoporosis: Multi-Modal Intervention to Increase Testing and Treatment (ICOMMITT)
The major goal of this project is to rigorously test the incremental impact of simple, generalizable interventions to improve healthcare among older women at high risk for osteoporosis.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

NAME: Donna K. Arnett

eRA COMMONS USER NAME: darnett

POSITION TITLE: Professor and Chair

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of South Florida, Tampa FL	BSN	03/1981	Nursing
University of South Florida, Tampa FL	MSPH	12/1987	Epidemiology
University of North Carolina, Chapel Hill, NC	PhD	05/1992	Epidemiology
University of North Carolina, Chapel Hill, NC	(Post-doc)	06/1994	Epidemiology

A. Personal Statement

I am a cardiovascular genetic epidemiologist with nearly 20 years of continuous NIH funding in this area. I developed a keen interest in understanding the variable phenotypic expression of severe target organ damage from hypertension. This provided the nidus for my first R01, “The Genetics of Left Ventricular Hypertrophy: The HyperGEN Study.” I am also PI of the Genetics of Hypertension Associated Treatments (GenHAT) study (an ancillary study of ALLHAT, Antihypertensive and Lipid Lowering Heart Attack Trial) which is determining whether genetic variation within BP-regulating genes interacts with type of antihypertensive therapy (diuretic, ACE inhibitor, calcium antagonist, or alpha blocker) to modify the occurrence of fatal and non-fatal MI in over 40,000 high-risk hypertensive participants followed for over 6 years. GenHAT remains the largest pharmacogenetic study of antihypertensive agents to date and includes the largest number of African Americans (~35%). I am PI of the large NIH-sponsored clinical study, the Genetics of Lipid Lowering and Diet Network (GOLDN, both a U01 and R01). This is a gene-environmental interaction study conducted in families where two interventions, one to raise lipids and one to lower lipids, were performed. Genome--wide association, whole-exome sequencing, epigenetic, and metabolomic phenotype studies are currently underway in this cohort as well. I have over 400 peer-reviewed publications. I have served as Chair of the NIH Cardiovascular and Sleep Epidemiology study section, and I have served as Editor for the American Journal of Epidemiology. I am a past president of the American Heart Association (AHA), and have led the AHA's Research Committee and Scientific Publishing Committee. I am an elected fellow of the American College of Epidemiology, the American Epidemiological Society, and the AHA. My mentoring experience includes pre- and post-doctoral students from diverse educational and ethnic backgrounds. I served as Principal Investigator for the T32 Training Grant in Cardiovascular Genetic Epidemiology while at the University of Minnesota. I have been mentoring in the Washington University’s SIPID program since its inception.

a. Do AN, Irvin MR, Lynch AI, Claas SA, Boerwinkle E, Davis BR, Ford CE, Eckfeldt JH, Tiwari HK, Limdi NA, **Arnett DK**. The effects of angiotensinogen gene polymorphisms on cardiovascular disease outcomes during antihypertensivetreatment in the GenHAT study. Front Pharmacol. 2014;5:210. PMC4165277.

b. Frazier-Wood AC, Wojczynski MK, Borecki IB, Hopkins PN, Lai CQ, Ordovas JM, Straka RJ, Tsai MY, Tiwari HK, **Arnett DK**. Genetic risk scores associated with baseline lipoprotein subfraction concentrations do not associate with their responses to fenofibrate. Biology (Basel). 2014;3:536-50. PMC4192626.

c. Irvin MR, Zhi D, Joehanes R, Mendelson M, Aslibekyan S, Claas SA, Thibeault KS, Patel N, Day K,

Jones LW, Liang L, Chen BH, Yao C, Tiwari HK, Ordovas JM, Levy D, Absher D, **Arnett DK**. Epigenome-wide association study of fasting blood lipids in the Genetics of Lipid-lowering Drugs and Diet Network study. Circulation. 2014;130:565-72. PMC4209699.

d. Lynch AI, Boerwinkle E, Davis BR, Ford CE, Eckfeldt JH, Leiendecker-Foster C, **Arnett DK**. Pharmacogenetic association of the NPPA T2238C genetic variant with cardiovascular disease outcomes in patients with hypertension. JAMA. 2008;299:296-307.

B. Positions and Honors

Employment

1994-98 Assistant Professor, Division of Epidemiology, School of Public Health, University of Minnesota, Minneapolis, MN
1998-03 Associate Professor with tenure, Division of Epidemiology, School of Public Health, University of Minnesota, Minneapolis, MN
2003-04 Mayo Professor, Division of Epidemiology, School of Public Health, University of Minnesota, Minneapolis, MN
2004- Chair and Professor (tenured), Department of Epidemiology, School of Public Health, University of Alabama at Birmingham
2014- Associate Dean of Academic and Strategic Programs, School of Public Health, University of Alabama at Birmingham

Other Experience and Professional Memberships

1996-97 National Heart, Lung, and Blood Institute, Planning Committee, Conference on Electrocardiography in Epidemiologic Studies
1997-99 American Heart Association, Council on Epidemiology and Prevention, Executive Committee
1997- National Heart, Lung, and Blood Institute, Program Project Reviewer (numerous PPGs)
1998 National Heart, Lung, and Blood Institute, Special Emphasis Panel, Workshop on Genetic Basis of Variability of Progression and Outcome in Heart, Lung, and Blood Diseases
1998-01 American Heart Association, Behavioral Science, Epidemiology and Prevention Peer Review Committee, Vice-chair (1998-2000), Chair (2001)
1998- American Heart association, Council on Epidemiology and Prevention, Program Committee, Vice-chair (1998-2000), Chair (2001-2004), Member (present)
1999-00 Member, American Heart Association Affiliate Behavioral Science, Epidemiology and Prevention Research Committee
2002- National Institutes of Health, CASE Study Section, Chartered Member
2002- Chair, American Heart Association Functional Genomics Interdisciplinary Working Group
2003-06 Member, American Heart Association Committee of Scientific Sessions Program (CSSP)
2003- Member, American Heart Association Scientific Advisory Committee (SACC)
2004- Senior Scientist, Clinical Nutrition Research Center, Comprehensive Cancer Center, Center for AIDS Research, University of Alabama at Birmingham
2004- Editor, American Journal of Epidemiology
2006- Member, American Heart Association Board of Directors, Greater Southeast Affiliate
2007-09 Chair, American Heart Association, Research Committee
2007- Member, American Heart Association National Board of Directors
2007-09 Chair, National Institutes of Health, CASE Study Section
2009- Associate Editor-in-Chief, International Journal of Molecular Epidemiology and Genetics
2009- Board of Directors, American College of Epidemiology
2009-11 Chair, American Heart Association Scientific Publishing Committee
2010- President, American Heart Association, Greater Southeast Affiliate
2010- NIH Center for Scientific Review College of Reviewers
2011-14 President Elect, President, and Immediate-Past-President, American Heart Association

Honors

1981 Graduated magna cum laude
1992- Delta Omega, Honor Society for Public Health, Theta Chapter
1999 Fellow, American Heart Association, Council on Epidemiology and Prevention
2006-07 Fellow, Executive Leadership in Academic Medicine
2008 Distinguished Faculty Investigator, UAB School of Public Health
2009 Outstanding Woman UAB Faculty Member
2010 H.A. Tyroler Distinguished Alumni Award
2010 American Heart Association Distinguished Achievement Award

C. Contribution to Science

1) My research group has considerable expertise in pharmacogenomics, an area of study that concerns itself with discovering how genes influence response to drugs. Of particular relevance to the current application is the work that I and my mentees and collaborators have done in developing response phenotypes to methotrexate treatment in rheumatoid arthritis patients and subsequent genetic association studies of efficacy and toxicity. Our findings could inform future development of personalized therapeutic approaches for rheumatoid arthritis.

a. Aslibekyan S, Brown EE, Reynolds RJ, Redden DT, Morgan S, Baggott JE, Sha J, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Bridges SL Jr, **Arnett DK**. Genetic variants associated with methotrexate efficacy and toxicity in early rheumatoid arthritis: results from the treatment of early aggressive rheumatoid arthritis trial. *Pharmacogenomics J*. 2014;14:48-53. PMC3701736.
b. Halilova KI, Brown EE, Morgan SL, Bridges SL Jr, Hwang MH, **Arnett DK**, Danila MI. Markers of treatment response to methotrexate in rheumatoid arthritis: where do we stand? *Int J Rheumatol*. 2012;2012:978396. PMC3400362.
c. Danila MI, Hughes LB, Brown EE, Morgan SL, Baggott JE, **Arnett DK**, Bridges SL Jr. Measurement of erythrocyte methotrexate polyglutamate levels: ready for clinical use in rheumatoid arthritis? *Curr Rheumatol Rep*. 2010;12:342-7. PMC3769795.
d. Zhang J, Redden DT, McGwin G Jr, Callahan LF, Smith EA, Alarcón GS, Moreland LW, van der Heijde DM, Brown EE, **Arnett DK**, Mikuls TR, Bridges SL Jr; Consortium for the Longitudinal Evaluations of African Americans with Early Rheumatoid Arthritis Investigators. Generalized bone loss as a predictor of three-year radiographic damage in African American patients with recent-onset rheumatoid arthritis. *Arthritis Rheum*. 2010;62:2219-26. PMC2922001.

2) From early population-based studies on arterial stiffness to my more recent research on other cardiovascular disease (CVD) risk factors, a significant portion of my career has been spent advancing our understanding of cardiovascular health and disease. CVD is the leading cause of death globally, responsible for 17.3 million deaths in 2013. Research studies for which I have served as principal investigator or co-investigator have not only characterized risk of CVD in specific populations (e.g., Minnesotans, African Americans), they have also refined our understanding of risk factors such as hypertension, left ventricular hypertrophy, and dyslipidemia. My epidemiological research has directly informed my leadership roles in cardiovascular public health, culminating in my 2012-2013 Presidency of the American Heart Association and continuing with public health agenda-setting initiatives, both national and global.

a**. Arnett DK**, Boland LL, Evans GW, et al. Hypertension and arterial stiffness: the Atherosclerosis Risk in Communities Study. ARIC Investigators. *Am J Hypertens*. 2000;13:317-23.
b. **Arnett DK**, Jacobs DR Jr, Luepker RV, et al. Twenty-year trends in serum cholesterol, hypercholesterolemia, and cholesterol medication use: the Minnesota Heart Survey, 1980-1982 to 2000-2002. *Circulation*. 2005;112:3884-91.
c. Hlatky MA, Greenland P, **Arnett DK**, et al. Criteria for evaluation of novel markers of cardiovascular risk: a scientific statement from the American Heart Association. *Circulation*. 2009;119:2408-16. PMC2956982.
d. Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and setting national goals for cardiovascular health promotion and disease reduction: the American Heart Association's strategic Impact Goal

through 2020 and beyond. *Circulation*. 2010;121:586-613.

3) The bulk of my research has investigated the influence of genetic and genomic factrors on CVD-related phenotypes. Although environmental factors play a critical role in the development of CVD, most CVD phenotypes (including risk factors, disease markers, and responses to drug therapies) have a heritable component. Family-based studies have been integral to knowledge discovery in this domain; these studies place special demands on investigators, particularly in the areas of participant recruitment and data analysis. I have been principal investigator and co-investigator for numerous family-based studies, including the HyperGEN: Genetics of Left Ventricular Hypertrophy Study (HyperGEN LVH), the Genetics of Lipid-lowering Drugs and Diet Network Study (GOLDN), the MESA Family Study, and others. From early linkage to current sequencing studies, this work has identified genetic loci associated with important CVD phenotypes.

a. **Arnett DK**, Hong Y, Bella JN, et al. Sibling correlation of left ventricular mass and geometry in hypertensive African Americans and whites: the HyperGEN study. Hypertension Genetic Epidemiology Network. *Am J Hypertens*. 2001;14:1226-30.
b. Tang W, Devereux RB, Rao DC, et al. Associations between angiotensinogen gene variants and left ventricular mass and function in the HyperGEN study. *Am Heart J*. 2002;143:854-60.
c. Rasmussen-Torvik LJ, Pankow JS, Peacock JM, et al. Suggestion for linkage of chromosome 1p35.2 and 3q28 to plasma adiponectin concentrations in the GOLDN Study. *BMC Med Genet*. 2009;10:39. PMC2691741.
d. **Arnett DK**, McClelland RL, Bank A, et al. Biomarkers of inflammation and hemostasis associated with left ventricular mass: The Multiethnic Study of Atherosclerosis (MESA). *Int J Mol Epidemiol Genet*. 2011;2:391-400. PMC3243453.

4) Genome-wide association studies (GWAS) were conceived to test the "common disease, common variant" hypothesis. Both my HyperGEN LVH and GOLDN Studies have had GWAS components, and both have made significant contributions to their respective fields. For example, in HyperGEN we discovered associations between echocardiographic phenotypes and variants in the NCAM1 gene, a finding that has (in part) motivated further functional studies of this gene in the context of hypertrophy and cardiomyopathies.

a**. Arnett DK**, Li N, Tang W, et al. Genome-wide association study identifies single-nucleotide polymorphism in KCNB1 associated with left ventricular mass in humans: the HyperGEN Study. *BMC Med Genet*. 2009;10:43. PMC2692849.
b. **Arnett DK**, Meyers KJ, Devereux RB, et al. Genetic variation in NCAM1 contributes to left ventricular wall thickness in hypertensive families. *Circ Res*. 2011;108:279-83. PMC3328104.
c. Aslibekyan S, Goodarzi MO, Frazier-Wood AC, et al. Variants identified in a GWAS meta-analysis for blood lipids are associated with the lipid response to fenofibrate. *PLoS One*. 2012;7:e48663. PMC3485381.
d. Irvin MR, Zhi D, Aslibekyan et al. Genomics of post-prandial lipidomic phenotypes in the Genetics of Lipid lowering Drugs and Diet Network (GOLDN) study. *PLoS One*. 2014;9:e99509. PMC4048279.

Complete list of published work can be found at:
http://www.ncbi.nlm.nih.gov/sites/myncbi/donna.arnett.1/collections/47701429/public/

D. Research Support

Ongoing Research Support

HyperGEN: Genetics of Left Ventricular Hypertrophy
NIH/NHLBI R01 HL055673 (PI: Arnett) 08/10/96 – 04/30/17
This project extends the genetic analysis of previously collected hypertension pedigrees with echocardiographic measures. We are conducting a genome-wide association study to identify genomic regions contributing to variation in cardiac size and structure.

Functional GWAS for LVH Using iPS-Derived Cardiomyocytes: The HyperGEN-CipS Study
NIH/NHLBI U01 HL107437 (PI: Broeckel) 07/05/11 – 06/30/16
This study uses a cell model to investigate the genetic basis of left ventricular hypertrophy.

Genomewide Association of Study of Lipid Response to Fenofibrate Therapy and Dietary Fat
NIH/NHLBI R01 HL091357 (PI: Arnett) R01 renewal pending
This study identifies genetic variants that influence fat and cholesterol's response to diet and drugs.

Study of Cardiac Mechanics in Systematic Hypertension
NIH/NHLBI R01 HL107577, Northwestern University (Subproject PI: Arnett) 05/21/11 – 03/31/15
This study will use tracking analysis to quantify cardiac mechanisms in the HyperGEN Study of FBPP.

Genetic and Clinical Predictors of Response to Warfarin and Novel Anticoagulants
NIH/NHLBI R01HL092173 (PI: Limdi) 05/20/08 - 01/31/15
To define genetic and environmental predictors of warfarin dose, anticoagulation attainment and maintenance and risk of over-anticoagulation and hemorrhagic complications and to develop and validate dosing algorithms, separately in Caucasians and African Americans, which can be used to predict warfarin dose requirements.

Genome Wide Haplotype Association Analysis
NIH/NIGMS R01GM081488 (PI: Liu) 04/01/08 – 03/31/15
To develop novel statistical and computational methods and software tools for the analysis of haplotypes in mapping of complex human disease genes.

Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis
NIH/NIAMS R01AR057202 (PI: Bridges) 09/25/09 - 07/31/15 NCE
To perform a genome-wide association study (GWAS) in both African-Americans with anti-CCP antibody positive RA and controls to identify novel genetic associations.

Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate
NIH/NHLBI R01 HL104135 (PI: Arnett) 08/15/10 - 05/31/14 NCE
Identify epigenetic loci that determine gene-environment interactions that predict TG response to two interventions, one to raise TGs (intake of a high-fat meal), and one to lower TGs (treatment with fenofibrate).

Genome-Wide Association Studies: Using Integrated CNV and SNP Information
NIH/NIGMS R01 GM088566, University of Pennsylvania (Subproject PI: Arnett) 05/07/10 - 03/31/15
This research aims to develop novel ways to integrate single-nucleotide polymorphism and copy number variation data in genome-wide association studies.

The NINDS International Stroke Genetics Consortium Study
NIH/NINDS U01 NS069208, University of Maryland Baltimore (Subproject PI: Arnett) 07/01/10-06/30/15 NCE
The goal of this genome-wide association study is to research the genetics of stroke, identify genes that influence stroke risk, and contribute de-identified phenotype and genetic data.

Prospective Meta-Analyses of Drug-Gene Interactions: CHARGE GWAS Consortium
NIH/NHLBI R01 HL103612, University of Washington (Subproject PI: Arnett) 08/10/11 - 05/31/15
This broad-based discovery effort may help to illuminate biologic mechanisms, affect how some drugs are prescribed, or identify novel targets for new therapies.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Bamman, Marcas M

eRA COMMONS USER NAME (credential, e.g., agency login): BAMMAN

POSITION TITLE: Professor, Dept of Cell, Developmental, & Integrative Biology; Director, UAB Center for Exercise Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Kansas State University, Manhattan, KS	BS	05/1989	Exercise Science
University of Alabama at Birmingham, Birmingham, AL	MA	08/1990	Exercise Physiology
University of Florida College of Medicine, Gainesville, FL	PhD	08/1996	Physiology

A. Personal Statement

Based on my expertise, leadership, and passion for mentoring, I am ideally suited to serve as a core mentor on this T32 training program led by the UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center. As Director of the UAB Center for Exercise Medicine (UCEM, 166 members), I have been devoted to clinical and translational research and training throughout my career. I am deeply invested in the research training of pre- and postdoctoral scholars, and serve as Program Director of T32HD071866 (Interdisciplinary Training in Pathobiology and Rehabilitation Medicine). This mixed pre- (n=3) and post- (n=4) doctoral training program is a University-wide training program, currently supporting trainees in medicine, neurology, physical therapy, cardiovascular disease, physical medicine and rehabilitation, and endocrinology. Over the years I have mentored numerous postdoctoral trainees, predoctoral trainees, clinical fellows, masters students, medical students, and undergraduate interns. All of my prior postdoctoral trainees have attained tenure-track faculty positions at respected institutions, and all eligible trainees in my laboratory have been awarded NRSA funding.

My research focuses on mechanisms of skeletal muscle atrophy and dysfunction in disease states (aging sarcopenia, joint arthroplasty, spinal cord injury, Parkinson's disease, burns, disuse), and restoration of muscle mass and mobility function using exercise as regenerative medicine. I have significant experience leading large, multi-investigator research and training programs. In addition to the UCEM, I direct the 59-site National Exercise Clinical Trials Network (NExTNet), two UAB core facilities (Core Muscle Research Laboratory, Clinical Exercise Facility), and two multi-PI R01 clinical trials in medical rehabilitation. I have long-standing research and training collaborations with several members of the team assembled for this proposed T32 program, and I look forward to contributing.

Recent Publications with Bamman Trainees in **Bold**

1. Bamman MM, Ferrando AA, Evans RP, **Stec MJ, Kelly NA**, Gruenwald JM, **Corrick KL, Trump JR**, Singh JA. Muscle inflammation susceptibility: a prognostic index of recovery potential after hip arthroplasty? *Am J Physiol Endocrinol Metab*. 2015 Feb 10:ajpendo.00576.2014. doi: 10.1152/ajpendo.00576.2014. [Epub ahead of print] [PMCID in Process].
2. **Kelly NA**, Ford MP, Standaert DG, Watts RL, Bickel CS, Moellering DR, **Tuggle SC**, Williams JY, Lieb L, Windham ST, Bamman MM. Novel, high-intensity exercise prescription improves muscle mass, mitochondrial function, and physical capacity in individuals with Parkinson's disease. *J Appl Physiol*. 2014 Mar 1;116(5):582-92. PMCID: PMC4073951.
3. **Merritt EK, Stec MJ, Thalacker-Mercer A**, Windham ST, Cross JM, **Shelley DP, Tuggle SC, Kosek DJ, Kim JS**, Bamman MM. Heightened muscle inflammation susceptibility may impair regenerative capacity in aging humans. *J Appl Physiol*. 2013 Sep;115(6):937-48. PMCID: PMC3764621.

4. **Thalacker-Mercer A, Stec M**, Cui X, Cross J, Windham ST, Bamman MM. Cluster analysis reveals differential transcript profiles associated with resistance training-induced human skeletal muscle hypertrophy. *Physiol Genomics*. 2013 Jun 17;45(12):499-507. PMCID: PMC3680779.

B. Positions and Honors

Positions and Employment

1993-96 Research Physiologist, Exercise Countermeasures Project, NASA Johnson Space Center
1996-2001 Assistant Professor, Exercise Physiology, Department of Human Studies, UAB
1997-2001 Director, Exercise Science Internship Program, UAB
2001-05 Assistant Professor, Department of Physiology and Biophysics, UAB
2001- Investigator, Birmingham/Atlanta VA Geriatric Research, Education, and Clinical Center, Birmingham VA Medical Center
2001- Director, Clinical Exercise Facility and Core Muscle Research Laboratory
2005-10 Associate Professor with tenure, Department of Physiology and Biophysics, UAB
2010- Professor, Department of Cell, Developmental, and Integrative Biology (formerly Physiology and Biophysics)
2011- Director, UAB Center for Exercise Medicine

UAB Center Memberships

UAB Center for Exercise Medicine (Director); Center for Clinical and Translational Science; Comprehensive Center for Healthy Aging (Steering Committee); Comprehensive Cardiovascular Center (Steering Committee); Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center; Comprehensive Neuroscience Center; Comprehensive Diabetes Center; Nutrition Obesity Research Center; Vision Science Research Center; Diabetes Research and Training Center; Center for Biophysical Sciences and Engineering.

Other Experience and Professional Memberships

1990- American College of Sports Medicine
1994- Certified Strength & Conditioning Specialist (National Strength & Conditioning Association)
1994-2003 National Strength & Conditioning Association
1995-96 American Society for Gravitational and Space Biology
1996- Regular reviewer for more than 20 scientific journals
1997- Southeast Center for Excellence in Geriatric Medicine
1998- American Physiological Society
1999-2007 Gerontological Society of America
2002- Numerous NIH, VA, and NASA Grant Review Panels
2003- Editorial Board, *J Appl Physiol*
2010- Associate Editor, *Frontiers in Striated Muscle Physiology*
2009-13 NIH CSR Skeletal Muscle and Exercise Physiology (SMEP) Study Section

Honors

1985-6 Gwendolyn L. Tinklin Academic Scholarship, Kansas State University
1989 Professionals in Human Movement Honorary, Kansas State University
1995 Outstanding Achievement Award, American College of Sports Medicine Texas Chapter
1996 Excellence in Science Award, KRUG Life Sciences, NASA Johnson Space Center
1998-2000 Named New Investigator Award, Obesity Research Center, UAB
1999 Outstanding Alumnus, Kinesiology Program, UAB
2002- Fellow, American College of Sports Medicine
2004-2007 UAB Argus Awards, Best Course Director (Medical Physiology 2004, 2005, 2006, 2007) and Best Course (Medical Physiology 2004, 2005, 2006)
2005 President's Award for Excellence in Teaching, UAB
2010-2011 Member, UAB Healthcare Leadership Academy
2013 Graduate Dean's Mentorship Award, UAB

C. Contribution to Science

1. Early in my training I became quite interested in the mechanism(s) underlying muscle atrophy caused by disuse or lack of sufficient loading, and in developing interventions to prevent atrophy during a period of unloading (e.g., extended bed rest). This was of great interest to NASA as well, because astronauts suffered significant declines in muscle mass and function during even short duration (10-17 day) shuttle missions at that time (early 1990s). As PI of 14-day sustained bed rest studies at NASA Johnson Space Center and UTMB-Galveston, I was the first to demonstrate that substantial myofiber atrophy (~20%) and reductions in muscle function could be completely abrogated with brief exposures to high-intensity contractions (resistance training) every other day, apparently by preventing a decline in muscle protein synthesis rate. This work provided much of the basis for NASA's resistance training hardware development and current inflight exercise countermeasures on the space station. A few of these papers are listed here:
   - **Bamman MM**, MSF Clarke, DL Feeback, RJ Talmadge, BR Stevens, SA Lieberman, and MC Greenisen. Impact of resistance exercise during bed rest on skeletal muscle sarcopenia and myosin isoform distribution. *J Appl Physiol.* 84(1):157-163, 1998.
   - Clarke MSF, **MM Bamman**, and DL Feeback. Decreased incidence of load-induced myofiber wounding and consequent wound-mediated FGF release during bed rest. *J Appl Physiol.* 85(2):593-600, 1998.
   - **Bamman MM**, GR Hunter, BR Stevens, ME Guilliams, and MC Greenisen. Resistance exercise prevents plantar flexor deconditioning during bed rest. *Med Sci Sports Exerc*. 29(11):1462-1468, 1997.
   - Ferrando A., K Tipton, **M Bamman**, and R Wolfe. Resistance exercise maintains skeletal muscle protein synthesis during bed rest. *J Appl Physiol.* 82(3):807-810, 1997.

2. In the 2000s I transitioned my interest and expertise in muscle atrophy and exercise rehabilitation to human aging, and to mechanisms regulating muscle mass. By integrating exercise clinical trials with cellular and molecular studies, we investigated differential adaptations to resistance training in young and older adults, and we were the first to apply K-means cluster analysis as a means of revealing genomic and phenotypic differences to explain inter-individual response heterogeneity. These studies focused largely on mechanisms of muscle regrowth (i.e. hypertrophy following atrophy) involving the regulation of two key processes: translation initiation signaling regulating muscle protein synthesis, and myonuclear addition via muscle stem (satellite) cell activation. A few of these papers are highlighted below.
   - Thalacker-Mercer A, Stec M, Cui X, Cross J, Windham ST, **Bamman MM**. Cluster analysis reveals differential transcript profiles associated with resistance training-induced human skeletal muscle hypertrophy. *Physiol Genomics*. 2013 Jun 17;45(12):499-507. [PMCID in Process]
   - Mayhew DL, TA Hornberger, HC Lincoln, and **MM Bamman**. Eukaryotic initiation factor 2Bε induces cap-dependent translation and skeletal muscle hypertrophy. *J Physiol*. 589(Pt 12):3023-37, 2011. PMC3139084.
   - Petrella JK, JS Kim, DL Mayhew, and **MM Bamman**. Potent myofiber hypertrophy during resistance training in humans is associated with satellite cell-mediated myonuclear addition: a cluster analysis. *J Appl Physiol.* 104(6):1736-42, 2008. PMID:18436694.
   - **Bamman MM**, JK Petrella, JS Kim, DL Mayhew, and JM Cross. Cluster analysis tests the importance of myogenic gene expression during myofiber hypertrophy in humans. *J Appl Physiol*. 102:2232-9, 2007. PMID:17395765.

3. In pursuit of mechanisms regulating muscle mass and exercise adaptation, my laboratory was the first to discover and characterize a hyper-inflammatory state in the skeletal muscle of some individuals that likely plays a key role in muscle atrophy must be overcome to induce effective muscle regrowth. Because it is noted independent of circulating inflammatory cytokine levels, and it is present in vitro in muscle satellite cells isolated from affected individuals, we named this condition *muscle inflammation susceptibility* (MuIS). We first noted MuIS in aging human muscle via genomic microarrays, and have since noted MuIS independent of age in some, but not all, total joint arthroplasty patients with end-stage osteoarthritis. This recent scientific advance focuses largely on TWEAK signaling in human muscle, as we find TWEAK up-regulation in individuals with MuIS mimics our findings in trauma and burn patients, and appears prognostic for long-term recovery. MuIS provides the scientific basis for two current R01 exercise clinical trials – one in aging and one in total hip or knee arthroplasty.

- Thalacker-Mercer A, LJ Dell'Italia, X Cui, JM Cross, and **MM Bamman**. Differential genomic responses in old vs. young humans despite similar levels of modest muscle damage after resistance loading. *Physiological Genomics*. 2010 Feb 4;40(3):141-9. PMCID: PMC2825766.
- Merritt EK, Stec MJ, Thalacker-Mercer A, Windham ST, Cross JM, Shelley DP, Tuggle SC, Kosek DJ, Kim JS, **Bamman MM**. Heightened muscle inflammation susceptibility may impair regenerative capacity in aging humans. *J Appl Physiol*. 2013 Sep;115(6):937-48. PMCID: PMC3764621.
- **Bamman MM**, Ferrando AA, Evans RP, Stec MJ, Kelly NA, Gruenwald JM, Corrick KL, Trump JR, Singh JA. Muscle inflammation susceptibility: a prognostic index of recovery potential after hip arthroplasty? *Am J Physiol Endocrinol Metab*. 2015 Feb 10:ajpendo.00576.2014. doi: 10.1152/ajpendo.00576.2014. [Epub ahead of print] [PMCID in Process].
- Merritt EK, A Thalacker-Mercer, JM Cross, ST Windham, S Thomas, and **MM Bamman**. Increased expression of atrogenes and TWEAK family members after severe burn injury in non-burned human skeletal muscle. *J Burn Care Res*. 2013 Sep-Oct;34(5):e297-304. PMCID: PMC3770758.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/marcas.bamman.1/bibliography/41141751/public/?sort=date&direction=ascending

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D. Research Support

Ongoing Research Support

R01 HD084124 — Bamman, Bridges (MPI) — 04.15.2015 – 03.31.2020
NIH NICHD/NCMRR
Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement
The proposed, randomized clinical trial is designed to test the central hypothesis that progressive resistance training plus adjunctive functional mobility training after THA/TKA will more effectively restore muscle mass and mobility function to healthy standards than usual care and, because individuals with abnormally high muscle TWEAK signaling are predicted to suffer failed muscle recovery and persistent dismobility under usual care, the impact of the intervention will be greatest among these patients.
Role: Contact PI

R01 AG046920 (MPI) — Bamman (PI) — 09.30.2014 – 05.31.2019
NIH NIA with additional support from NIGMS
Novel Actions of Metformin to Augment Resistance Training Adaptations in Older Adults
The primary aim of this 2-site, randomized clinical trial is to determine if repurposing metformin (to reduce muscle inflammation susceptibility) will enhance the muscle regrowth adaptation to resistance training among older adults (65-80 y) with moderate mobility dysfunction.
Role: UAB Principal Investigator (Multi-PI: CA Peterson, P Kern, University of Kentucky)

R01 DK096388 — Gower (PI) — 09.19.2013 – 06.30.2018
NIH NIDDK
Race - Adiposity Interactions Regulate Mechanisms Determining Insulin Sensitivity
The aims of this human research project are to understand racial differences in the regulation of insulin sensitivity and its interactions with body fat distribution.
Role: Co-Investigator

T32 HD071866 (Bamman) — Bamman (PI) — 09.04.2012 – 04.30.2017
NIH NCMRR
Interdisciplinary Training in Pathobiology and Rehabilitation Medicine
The overarching goal of this mixed predoctoral and postdoctoral training program is to develop burgeoning scientists into future leaders in translational rehabilitation research who are specifically equipped to test and disseminate novel rehabilitative strategies that will alleviate functional impairment and compromised life quality in the face of chronic disease management.
Role: Program Director

UAB center grant — Bamman (PI) — 10.01.2014 – 09.30.2019
University-Wide Interdisciplinary Research Centers
UAB Center for Exercise Medicine
The mission of the center is to promote the health and well-being of children and adults of all ages by: (i) Cultivating interdisciplinary research approaches that will form the biological basis underlying exercise

treatment strategies; (ii) Training and educating scientists and healthcare professionals at all levels on the physiology and clinical applicability of exercise treatments; (iii) Fostering community education and implementation programs on healthy lifestyles and disease prevention; and (iv) Recruiting leading scientists and clinicians into exercise-based research programs.
Role: Center Director

R01 DK049779 Hunter (PI) 09.30.2010 – 07.31.2015 (NCE)
NIH/NIDDK
Exercise Intensity, Metabolic Rate, and Insulin Sensitivity
The major goal of this project is to determine the optimal intensity dose of endurance exercise that results in prolonged elevation of post-exercise metabolism and enhanced insulin sensitivity.
Role: Co-Investigator

F31 AG044109 Stec (PI) 09.01.2012 – 08.31.2015
NIH NIAMS
Using In Vitro Approaches to Improve Muscle Regrowth in Atrophied Older Humans
Role: Mentor

Switzer Merit Research Fellowship Yarar (PI) 10.01.2013 – 09.30.2014
DoE NIDRR
Novel Exercise and Diet Prescription to Improve Body Composition and Metabolic Health in Individuals with Long-Standing Spinal Cord Injury
Role: Mentor

Completed Research Support (within the last 3 years)

Pilot Exercise Trial Bamman (PI) 01.01.2012 – 04.30.2014
UAB School of Medicine
Novel Exercise Prescription to Improve Fatigability and Muscle Function in Parkinson's Disease
The aims of this human research project are to determine if intensive exercise training induces the neuromuscular adaptations in Parkinson's disease necessary to improve muscle mass, fatigability, motor performance, and mobility.
Role: Principal Investigator

R01 AG017896 Bamman (PI) 04.01.2007 – 03.31.2013
NIH/NIA
Maximizing Mechanisms of Muscle Hypertrophy in Sarcopenic Older Adults
The aims of this project are to determine which of four resistance exercise training prescriptions maximizes muscle re-growth by activating the signaling processes driving net muscle protein synthesis and stem cell activation leading to myonuclear addition in 60-75 year old adults suffering from muscle atrophy and functional decline.
Role: Principal Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Susan L. Bellis

eRA COMMONS USER NAME (credential, e.g., agency login): bellis

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Calif. State Univ. Long Beach, Long Beach, CA	B.A.	1982	Music
University of Calif., Irvine, Irvine, CA	B.S.	1986	Biology
University of Rhode Island, Kingston, RI	Ph.D.	1993	Biochemistry
SUNY Health Science Center, Syracuse, NY	Postdoc	1993-1998	Cell Biology

A. Personal Statement

The focus of my research is on understanding the role of cell-extracellular matrix (ECM) interactions in normal physiology, as well as pathophysiologic conditions such as cancer and autoimmune disease. Our work has shown that altered glycosylation of selected receptors including integrins and death receptors regulates downstream signaling from these receptors and correspondingly, the response of cells to the microenvironment. Variant glycosylation of integrins in tumor and immune cells modulates cell adhesion and migration on ECM components, and also protects against apoptosis mediated by matrix-associated galectins. On the other hand, variant glycosylation of death receptors protects tumor cells from death-inducing stimuli expressed by immune cells such as TNFα and FasL. These glycosylation pathways have been elucidated through the use of cell and animal model systems, as well as analyses of human tissues, and the collective results implicate a specific glycosyltransferase, ST6Gal-I, as a prognostic biomarker for both human epithelial cancers and selected immune-related disorders. In tandem with our work regarding glycosylation-dependent pathways, we are also developing biomimicking synthetic extracellular matrices, with the goal of engineering implantable substrates that can stimulate regeneration of tissues such as soft tissue and bone. Using electrospinning technology, nanofibrous matrices are generated that have comparable biochemistry, architecture and mechanical properties as native ECM. These substrates serve as cell-instructive platforms for mesenchymal stem cell growth and induced differentiation along specified lineages.

My training background is very broad and encompasses expertise in both translational medicine and fundamental cell biology. I received a Ph.D. in biochemistry and performed postdoctoral research in the areas of cell biology and pathology. In addition, I have worked in the biomaterials field for more than a decade, and have collaborated extensively with material scientists, bioengineers, and clinicians. I have a strong mentoring/teaching record. In the 16 years I have been on the UAB faculty, I have graduated 14 Ph.D. students, served on more than 50 dissertation committees, and am currently mentoring 6 new Ph.D. students. I have also mentored 9 postdoctoral fellows, many of whom are now in academic faculty positions or in senior research positions in the biotech industry. Additionally, I have trained undergraduates and medical students. My prior trainees have been very successful, as evidenced by highly-cited peer-reviewed manuscripts, receipt of extramural fellowships, oral presentations at national/international meetings, etc. In addition to mentoring, I actively participate in teaching many different classes on a range of topics, and have served as Coursemaster for five different courses, and as Co-Director of the Howard Hughes Med-into-Grad PhD program.

B. Positions and Honors

Positions and Employment

1998-1999 Instructor, Dept of Physiology and Biophysics, Univ. of Alabama at Birmingham (UAB)
1999-2006 Assistant Professor, Department of Physiology and Biophysics, UAB (primary)
1999-2006 Assistant Professor, Department of Biomedical Engineering, UAB (secondary)

2006-2010	Associate Professor, Depts. of Physiology and Biophysics, and Biomed. Engineering, UAB
2010-2012	Professor, Depts. of Physiology and Biophysics, and Biomed. Engineering, UAB
2012-present	Professor, Dept. of Cell. Developmental, and Integrative Biology, UAB (this is a new dept. formed from a merger between the Depts. of Physiology and Cell Biology)
2005-2008	Director, Interdisciplinary Molecular Biology Lab Training Program, UAB
2005-2009	Director, Biologics and Translational Research Facility, Center for Nanoscale Materials and Biointegration, UAB
2005-present	Executive Member, Center for Nanoscale Materials and Biointegration, UAB
2007-2012	Director, Cell and Molecular Analysis of Biomaterials Core Facility, UAB
2009-2012	Co-Director, Howard Hughes Med-to-Grad Ph.D. program

Other Experience and Professional Memberships

2001-2004	"Molecular Signaling I" study section, American Heart Association
2004	Grant reviewer, Philip Morris External Research Program
2004-2006	"Oncology A" study section, Dept. of Veterans Affairs Merit Review Board
2006	Grant reviewer for: **(1)** Science, Tech. and Research's Biomedical Research Council, government of Singapore, and **(2)** "Atherosclerosis and Inflammation of the Cardiovascular System" study section, NIH
2007	Grant reviewer for: **(1)** Dutch National Research Council, Netherlands, and **(2)** Special Emphasis Panel, Bioengineering Sciences & Tech IRG, NIH
2008	Grant reviewer for: **(1)**"Tumor Progression" study section, Calif. Breast Cancer Research Program, **(2)** National Science Foundation, **(3)** Special Emphasis Panel, Cell Biology IRG, NIH, and **(4)** National Center for Medical Rehabilitation Research, NICHD/NIH
2008	Co-Chair, NHLBI Workshop, "The Role of Glycans in Hemostasis, Inflammation and Vascular Biology"
2009	Grant Reviewer for: **(1)** National Institute of Standards and Technology (NIST), **(2)** Challenge grants, NIGMS, and **(3)** Special Emphasis Panel, Cell Biology IRG, NIH
2009-2010	Ad hoc member, "Intercellular Interactions" study section, NIH
2010	Grant Reviewer, Special Emphasis Panel, Cell Biology IRG, NIH
2012	Grant Reviewer for: **(1)** Dutch National Technology Foundation, Netherlands, and **(2)** Austrian Science Fund (FWF), Austria
2013	Grant Reviewer for Special Emphasis Panel, Cell Biology IRG NIH
2010-2014	Co-Chair and Charter Member, "Intercellular Interactions" study section, NIH
2014	**(1)** Ad hoc Member, "Tumor Progression and Metastasis" study section, NIH, and **(2)** Grant Reviewer for Kentucky Lung Cancer Research Program.
2015	**(1)** Chair, NIH Special Emphasis Panel, "Biomechanical Aspects of Embryonic Development", and **(2)** Co-Chair, NIH Special Emphasis Panel, "Development of Glycoscience Tools" (U01)

Editorial Board Memberships: *Biomaterials* (since 2008) and *J Ovarian Research* (since 2009)
ad hoc reviewer for more than 50 journals including *Nature, Blood, J Clin Invest, FASEB, J Biol Chem*, etc.

C. Contribution to Science

1. Glycosylation-dependent regulation of integrin function. In early studies we identified a critical role for integrin N-linked glycans in regulating integrin-mediated cell adhesion, migration and invasion. Our interest in integrin glycosylation was initially prompted by the finding that oncogenic forms of ras caused a major change in the composition of integrin glycans, which we later learned was due to the ras-induced upregulation of a tumor-associated glycosyltransferase called ST6Gal-I. ST6Gal-I adds a special type of sugar structure, α2-6-linked sialic acid, onto integrin glycans. The addition of the negatively-charged, α2-6 sialic acid, to integrin glycans causes a change in integrin conformation, leading to differences in coupling to the cytoskeletal machinery. These events in turn regulate cell adhesion and migration. We established the importance of integrin glycosylation in two distinct cellular processes: (1) integrin sialylation is reduced during monocyte differentiation along the macrophage lineage, due to ST6Gal-I downregulation, which correspondingly regulates adhesion to fibronectin and VCAM1; and (2) integrin sialylation is increased during tumorigenic transformation due to ST6Gal-I upregulation, which leads to enhanced tumor cell migration and invasion.

a) Seales, EC, Jurado, GA, Singhal, A, and **Bellis, SL** (2003) The ras oncogene directs the expression of a differentially-sialylated, functionally-altered β1 integrin. *Oncogene* 22, 7137-7145

b) Semel, AC, Seales, EC, Singhal, A, Eklund, EA, Colley, KJ, and **Bellis, SL** (2002) Hyposialylation of integrins stimulates the activity of myeloid fibronectin receptors. *J. Biol. Chem*. 277, 32830-32836

c) Seales, EC, Jurado, GA, Brunson, BA, Wakefield, JK, Frost, AR, and **Bellis, SL** (2005) Hypersialylation of β1 integrins, observed in colon adenocarcinoma, may contribute to cancer progression by upregulating cell motility. *Cancer Res* 65, 4645-4652

d) Woodard-Grice AV, McBrayer, AC, Wakefield, J, Zhuo Y, and **Bellis, SL**. (2008) Proteolytic shedding of ST6Gal-I by BACE1 regulates the glycosylation and function of α4β1 integrins. *J Biol Chem*, 283, 26364-26373 (PMCID:PMC2546544)

2. ST6Gal-I glycosyltransferase activity protects against multiple cell death pathways. During our studies of integrin signaling, we generated numerous cell model systems with forced ST6Gal-I overexpression or knockdown. It soon became apparent that ST6Gal-I activity functioned to protect cells against cell death. There was substantial evidence that ST6Gal-I-mediated sialylation of cell surface receptors could block the binding of extracellular galectins, which are galactose-binding lectins. With this in mind, we examined the function of pro-apoptotic galectins, and found that receptor modification with ST6Gal-I-elaborated α2-6 sialylation prevented galectin-induced cell death. We then proceeded to investigate the effects of α2-6 sialylation on death receptor signaling. Our results showed that the TNFR1 and Fas death receptors, but not DR5, are substrates for ST6Gal-I. The addition of α2-6 sialic acid to TNFR1 and Fas prevents receptor internalization following ligand-induced receptor activation, and thereby blocks apoptosis (as receptor internalization is required for apoptotic signaling). The importance of sialylation-dependent death receptor regulation was established in two systems: (1) ST6Gal-I downregulation during monocyte differentiation causes a loss in TNFR1 sialylation, which sensitizes cells to TNF-induced apoptosis, and (2) α2-6 sialylation of Fas is elevated in tumor cells, due to upregulated ST6Gal-I, which then protects cells from Fas-mediated apoptosis.

a) Zhuo, Y, Chammas, R and **Bellis, SL**. (2008) Sialylation of β1 integrins blocks cell adhesion to galectin-3 and protects cells against galectin-3 induced apoptosis. *J Biol Chem*, 283, 22177-22185 (PMCID:PMC2494929)
   * selected as a "Research Highlight" by *Nature Glycomics Gateway*

b) Zhuo, Y. and **Bellis, SL** (2011) Emerging role of α2-6 sialic acid as a negative regulator of galectin binding and function. *J Biol Chem*, 286: 5935-5941 (PMCID: PMC3057866)

c) Liu, Z, Swindall, AF, Kesterson, RA, Schoeb, TR, Bullard, DC, and **Bellis, SL** (2011) ST6Gal-I regulates macrophage apoptosis via α2-6 sialylation of the TNFR1 death receptor, *J Biol Chem* 286: 39654-39662 (PMCID: PMC3234788)

d) Swindall, AF and **Bellis, SL** (2011) Sialylation of the Fas death receptor by ST6Gal-I provides protection against Fas-mediated apoptosis in colon carcinoma cells. *J Biol Chem*, 286: 22982-22990 (PMCID: PMC4038408)
   * selected as an "Editor's Choice" manuscript by *Science Signaling*

3) ST6Gal-I glycosyltransferase maintains cells in an undifferentiated, stem-like state. Our recent studies suggest that ST6Gal-I activity endows cells with several stem-like properties including self-renewal potential, anchorage-independent spheroid cell growth, and resistance to many death-inducing stimuli. In the case of immune cells, ST6Gal-I activity prevents monocyte differentiation. With regard to epithelial cells, ST6Gal-I activity confers a metastatic, Cancer Stem Cell (CSC) phenotype, characterized by resistance to chemotherapeutic agents. ST6Gal-I expression also correlates with the expression of other key CSC markers including CD133 and ALDH1. In unpublished studies, we find that ST6Gal-I activity is necessary for tumor spheroid growth, self-renewal, and tumor-initiating potential (manuscript in preparation).

a) Schultz, M.J., Swindall, A.F., and **Bellis, SL** (2012) Regulation of the metastatic cell phenotype by sialylated glycans, *Cancer Metastasis Rev*, 31: 501-518 (PMCID: PMC4079276)

b) Schultz, MJ, Swindall, AF, Wright, JW, Sztul, ES, Landen, CN**, Bellis, SL**. (2013) ST6Gal-I sialyltransferase confers cisplatin resistance in ovarian tumor cells. *J Ovarian Res*, 6: 25 (PMCID: PMC PMC3637436)
   * Highly accessed manuscript

c) Swindall, AF, Londono-Joshi, AI, Schultz, MJ, Fineberg, N, Buchsbaum, DJ, **Bellis, SL** (2013) ST6Gal-I protein expression is upregulated in human epithelial tumors and correlates with stem cell markers in normal tissues and colon cancer cell lines. *Cancer Res*, 73: 2368-2378 (PMCID: PMC4038408)
* Featured manuscript, *Cancer Stem Cell News*

D. Research Support

Active

R01 DE024670 (Multi-PI: Bellis; Reddy) 08/01/14-07/31/19
NIH/NIDCR
Coupling osteoinductive factors to graft materials to promote osteoregeneration
The goal of this project is to engineer osteoinductive factors onto commercial graft materials to enhance regenerative potential.

R01 GM111093 (PI: Bellis) 05/15/14-03/31/17
NIH/NIGMS
Glycosylation-dependent mechanisms regulating ovarian tumor cell survival
The goal of this grant is to elucidate the role of receptor glycosylation in promoting ovarian tumor cell survival within the inflammatory peritoneal microenvironment.

R21 CA192629 (PI: Bellis) 01/01/14-12/31/16
NIH/NCI
Glycan control of stem cell-associated pathways in pancreatic cancer
The goal of this grant is to elucidate the role of receptor glycosylation in promoting a cancer stem cell phenotype.

14GRNT 20380114 Grant-in-Aid (PI: Bellis) 07/01/14-06/30/16
American Heart Association
Glycosylation-dependent control of TNFR1 signaling in macrophage survival
This proposal will establish a role for TNFR1 glycosylation in regulating the balance between macrophage survival and cell death.

R01 AR053860 (PI: Serra, Co-I: Bellis) 04/01/13-03/31/17
NIH/NIAMS
TGF-β in the Pathology and Development of the Spine
Dr. Bellis' role (salary support only) is to provide expertise in tissue engineering of the intervertebral disk.

Recently Completed Research Support (last 3 years)

OC100141 Pilot Award (PI: Bellis) 05/01/11-04/30/13
Department of Defense
Role of receptor sialylation in the ovarian tumor cell phenotype
The goal of this proposal is to determine the role of integrin receptor sialylation in regulating ovarian tumor cell adhesion to omental tissues (a common metastatic target) and resistance to galectin-mediated cell death.

GRNT7710013 Grant in Aid (PI: Bellis) 07/01/11-06/30/13
American Heart Association
TNFR1 death receptor glycosylation in macrophage apoptosis
In this study we are examining the role of TNFR1 glycosylation in regulating progression of atherosclerosis.

Bioeng. Res. Partnership (PI: Vohra, Co-I: Bellis) 07/01/09-06/30/14
NIH/NIBIB
Bioengineering Research Partnership in Total Joint Replacements
This is a multidisciplinary endeavor aimed at developing novel joint prosthetics.

R01 CA84248 (PI: Bellis) 07/01/02-05/31/12
NIH/NCI
Regulation of β1 integrin glycosylation by ras

The central hypothesis of this study is that oncogenic ras contributes to cancer progression by modulating the glycosylation and function of the β1 integrin receptor.

Research Grant (Multi-PIs: Bellis and Reddy) 06/01/12 - 05/31/13
Osseointegration Foundation
Novel method for anchoring osteoinductive factors to bone graft materials to enhance osseointegration.
In this project osteinductive factors will be modified with hydroxyapatite-binding domains to achieve directed coupling to bone graft materials.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Timothy Beukelman, MD, MSCE

POSITION TITLE: Associate Professor of Pediatrics

eRA COMMONS USER NAME (credential, e.g., agency login): beukelman

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Illinois, Urbana-Champaign, IL	B.S.	05/1997	Biochemistry
Washington University, Saint Louis, MO	M.D.	05/2001	Medicine
Cincinnati Children's Hospital, Cincinnati, OH		06/2002	Internship in Pediatrics
Cincinnati Children's Hospital, Cincinnati, OH		06/2004	Residency in Pediatrics
Children's Hospital of Philadelphia, Philadelphia, PA		06/2007	Fellowship in Pediatric Rheumatology
University of Pennsylvania, Philadelphia, PA	M.S.C.E.	08/2008	Clinical Epidemiology

A. Personal Statement

I am a pediatric rheumatologist and an accomplished pharmacoepidemiologist. My overall research goal is to optimize the treatment of juvenile idiopathic arthritis (JIA) using various clinical research methods including retrospective analysis of administrative claims data, prospective observational data collection and analysis, quality improvement, decision analysis, and clinical trials. I have published high-impact studies of the associations between incident malignancy and serious infection and JIA and its treatment. I have received a clinical trial planning grant from the NIH/NIAMS to study whether methotrexate can prevent worsening of arthritis among children who initially present with a less severe phenotype. I am the Chair of the JIA Research Committee of the Childhood Arthritis and Rheumatology Research Alliance (CARRA) and the Scientific Director of the CARRA Registry. I am eager to serve as a research mentor for junior investigators studying pediatric rheumatic disease or utilizing administrative claims data. I have experience mentoring medical students, residents, fellows, and junior faculty on several successful research projects.

B. Positions and Honors

Positions and Employment

2001-02 Pediatric Internship. Cincinnati Children's Hospital Medical Center, OH
2002-04 Pediatric Residency. Cincinnati Children's Hospital Medical Center, OH
2004-07 Pediatric Rheumatology Fellowship. The Children's Hospital of Philadelphia, PA
2007-11 Assistant Professor, Department of Pediatrics, Division of Rheumatology, University of Alabama at Birmingham, AL
2011- Associate Professor, Department of Pediatrics, Division of Rheumatology, University of Alabama at Birmingham, AL

Professional Memberships

2004-07 Tri-State (PA, DE, NJ) Pediatric Rheumatology Study Group
2004-07 Philadelphia Rheumatism Society
2005- Childhood Arthritis & Rheumatology Research Alliance (CARRA)
Juvenile Idiopathic Arthritis Registry Workgroup, 2009
CARRAnet Data/Sample Share Committee Member, 2012 –
Vice Chair, Juvenile Idiopathic Arthritis Research Committee, 2012 – 2013

Chair, Juvenile Idiopathic Arthritis Protocol Evaluation Subcommittee, 2012 – 2013
Chair, Juvenile Idiopathic Arthritis Research Committee, 2013 –
Scientific Director, CARRA Registry, 2014 –

2007- Alabama Society for the Rheumatic Diseases
2007- American College of Rheumatology, Fellow
Practice Guidelines Subcommittee Member, 2010 –
Chair, Practice Guidelines Subcommittee, 2013 –
2020 Task Force Member, 2011 – 2013
Pediatric Rheumatology Symposium (PRSYM) Planning Committee, 2012 – 2014
Strategic Planning Task Force, 2013
ACR/EULAR Exchange, Early Career Investigator Delegate, 2013
Quality of Care Committee, Member, 2013 –
2007- UAB Deep South Musculoskeletal Center for Education and Research on Therapeutics (CERTs), Investigator
2008-12 Pediatric Rheumatology Care and Outcome Improvement Network (PR COIN), Steering committee
2008-10 Juvenile Idiopathic Arthritis Quality Measures Workgroup
2011- International Society for Pharmacoepidemiology
Pediatric Special Interest Group
2012- Pediatric Rheumatology Collaborative Study Group (PRCSG)
2012- UAB Center for Outcomes and Effectiveness Research (COERE)
2012- Editorial Board, Journal of Rheumatology

Honors

1997 Summa Cum Laude, Highest Distinction for Senior Thesis, University of Illinois
1998 Dr. Lee B. and Virginia G. Harrison Scholars Program, Washington University
2002 Pediatric Rheumatology Residents Program, American College of Rheumatology
2005 Ruth L. Kirschstein National Research Service Award, National Institutes of Health
2005, 06 Fellows Scholarship Travel Fund, American College of Rheumatology
2007 University of Alabama Health Services Foundation General Endowment Fund Scholar Award
2008-14 National Institute of Health (NIH) Clinical Loan Repayment Program Award
2013 ACR/EULAR International Academic Rheumatology Exchange, Early Career Investigator Delegate

C. Contribution to Science

1. I have led high-impact studies of the risks of serious infection and malignancy associated with juvenile idiopathic arthritis (JIA) and its treatment using administrative claims data. Highly effective biologic agents have transformed the treatment and expected outcomes for children with JIA, but the risks of infection and malignancy are not fully understood. My work demonstrates that being diagnosed with JIA increases the risk of infection and malignancy and must be considered when evaluating the risks associated with new therapies. In addition, the risk of serious infection associated with tumor necrosis factor inhibitors appears to be comparable to that of methotrexate among children with JIA.

a. **Beukelman T**, Haynes K, Curtis JR, Xie F, Chen L, Bemrich-Stolz CJ, Delzell E, Saag KG, Solomon DH, Lewis JD. Rates of malignancy associated with juvenile idiopathic arthritis and its treatment. Arthritis Rheum 2012; 64:1263-7.
b. **Beukelman T**, Xie F, Chen L, Baddley JW, Delzell E, Grijalva CG, Patkar NM, Saag KG, Winthrop KL, Curtis JR. Rates of hospitalized bacterial infection in juvenile idiopathic arthritis and its treatment. Arthritis Rheum 2012; 64:2773-80.
c. **Beukelman T**, Xie R, Baddley JW, Chen L, Delzell E, Grijalva CG, Mannion ML, Patkar NM, Saag KG, Winthrop KL, Curtis JR. Incidence of selected opportunistic infections among children with juvenile idiopathic arthritis. Arthritis Rheum 2013; 65:1384-9.

2. I was the Principal Investigator and lead author of the first American College of Rheumatology (ACR) Recommendations for the Treatment of JIA. With rapid advances in the use of biologic agents to treat JIA, these Recommendations were a significant contribution to the field. This project positioned me as a leader in JIA treatment early in my career and the resulting publication has been referenced more than 185 times. I have remained involved in the development of treatment recommendations, as a key member of team to update the JIA Recommendations and now serving as the Chair of the ACR Clinical Guidelines Subcommittee.

a. **Beukelman T**, Patkar NM, Saag KG, Tolleson-Rinehart S, Cron RQ, DeWitt EM, Ilowite NT, Kimura Y, Laxer RM, Lovell DJ, Martini A, Rabinovich CE, Ruperto N. 2011 American College of Rheumatology recommendations for the treatment of juvenile idiopathic arthritis: initiation and safety monitoring of therapeutic agents for the treatment of arthritis and systemic features. Arthritis Care Res 2011; 63:465-82.
b. Ringold S, Weiss PF, **Beukelman T**, DeWitt EM, Ilowite NT, Kimura Y, Laxer RM, Lovell DJ, Nigrovic PA, Robinson AB, Vehe RK. 2013 update of the 2011 American College of Rheumatology recommendations for the treatment of juvenile idiopathic arthritis: Recommendations for the medical therapy of children with systemic juvenile idiopathic arthritis and tuberculosis screening among children receiving biologic medications. Arthritis Care Res 2013; 65:1551-63.

3. I have conducted retrospective studies of the use and effectiveness of biologic agents in the treatment of JIA. Data sources have included administrative claims data, local medical records, and the CARRA Legacy Registry. Key findings include the possible diminished effectiveness of tumor necrosis factor inhibitors among children with the enthesitis-related arthritis category of JIA (a finding subsequently confirmed by other authors) and the observation that many children with JIA are being treated with tumor necrosis factor inhibitors without first being treated with methotrexate, in contrast to existing treatment guidelines.

a. Mannion ML, Xie F, Curtis JR, **Beukelman T**. Recent trends in medication usage for the treatment of juvenile idiopathic arthritis and the influence of tumor necrosis factor inhibitors. J Rheumatol 2014; 41:2078-84.
b. **Beukelman T**, Ringold S, Davis TE, Morgan DeWitt E, Pelajo CF, Weiss PF, Kimura Y. Disease modifying anti-rheumatic drug use in the treatment of juvenile idiopathic arthritis: A cross-sectional analysis of the CARRA Registry. J Rheumatol 2012; 39:1867-74.
c. Weiss PF, **Beukelman T**, Schanberg LE, Kimura Y, Colbert RA. Enthesitis-related arthritis is associated with higher pain intensity and poorer health status in comparison to other categories of juvenile idiopathic arthritis: The Childhood Arthritis and Rheumatology Research Alliance Registry. J Rheumatol 2012; 39:2341-51.
d. Donnithorne KJ, Cron RQ, **Beukelman T**. Attainment of inactive disease status following initiation of TNFα inhibitor therapy for juvenile idiopathic arthritis: Enthesitis-related arthritis predicts persistent active disease. J Rheumatol 2011; 38:2675-81.

4. Within the Childhood Arthritis and Rheumatology Research Alliance (CARRA), I am a leader to develop and implement an improved incarnation of the CARRA Registry, a national observational registry of children with rheumatologic diseases that includes over 60 pediatric rheumatology centers. The CARRA Legacy Registry was funded by the NIH and established the feasibility of data capture. The improved Registry will focus on enrolling cohorts of children who are newly diagnosed or newly starting a systemic immunosuppressive therapy and will enable the long-term evaluation of disease outcomes and drug safety. I was recently named the Scientific Director of the Registry.

a. Lionetti G, Kimura Y, Schanberg LE, **Beukelman T**, Wallace C, Ilowite N, Winsor J, Fox K, Natter M, Sundy JS, Brodsky E, Curtis JR, Del Gaizo V, Iyasu S, Jahreis A, Meeker-O'Connell A, Mittleman BB, Murphy BM, Peterson ED, Raymond SC, Setoguchi S, Siegel JN, Sobel RE, Solomon D, Southwood TR, Vesely R, White PH, Wulfraat NM, Sandborg CI. Using registries to identify adverse events in rheumatic diseases. Pediatrics 2013; 132:e1384-94.

5. I was a collaborator and co-author on numerous high-impact pharmacoepidemiology studies of the safety of biologic agents in the treatment of adults with autoimmune disease. Many of these studies utilized innovative data sharing and analytic methods. These studies continue to refine our understanding of the best use of new therapeutic agents and remain a critical component of post-marketing safety evaluations.

a. Grijalva CG, Chen L, Delzell E, Baddley JW, **Beukelman T**, Winthrop KL, Griffin MR, Herrinton LJ, Liu L, Ouellet-Hellstrom R, Patkar NM, Solomon DH, Lewis JD, Xie F, Saag KG, Curtis JR. Initiation of tumor necrosis factor-α antagonists and the risk of hospitalization for infection in patients with autoimmune diseases. JAMA 2011; 306:2331-9.
b. Winthrop KL, Baddley JW, Chen L, Liu L, Grijalva CG, Delzell E, **Beukelman T**, Patkar NM, Xie F, Saag KG, Herrinton LJ, Solomon DH, Lewis JD, Curtis JR. Association between the initiation of anti-tumor necrosis factor therapy and the risk of herpes zoster. JAMA 2013; 309:887-95.
c. Curtis JR, Xie F, Chen L, Munter P, Grijalva CG, Spettell C, Fernandes J, McMahan RM, Baddley JW, Saag KG, **Beukelman T**, Delzell E. Use of a disease risk score to compare serious infections associated with anti-tumor necrosis factor therapy among high- versus lower-risk rheumatoid arthritis patients. Arthritis Care Res 2012; 64:1480-9.
d. Herrinton LJ, Curtis JR, Chen L, Liu L, Delzell E, Lewis JD, Solomon DH, Griffin MR, Ouellet-Hellstom R, **Beukelman T,** Grijalva CG, Haynes K, Kuriya B, Lii J, Mitchel E Patkar NM, Rassen J, Winthrop KL, Nourjah P, Saag KG. Study design for a comprehensive assessment of biologic safety using multiple healthcare data systems. Pharmacoepidemiol Drug Saf 2011; 20:1199-209.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1tGofJ8nEFjQk/bibliography/47785910/public/?sort=date&direction=ascending

D. Research Support

Ongoing

Service Agreement (Beukelman) 10/01/2014 – 09/30/2017
Childhood Arthritis and Rheumatology Research Alliance
Scientific Director of CARRA Registry
The Childhood Arthritis and Rheumatology Research Alliance (CARRA) Registry aims to prospectively collect data from children, adolescents, and young adults with pediatric-onset rheumatic diseases to evaluate the safety of therapeutic agents, assess clinical outcomes, document treatment patterns, and identify predictors of outcome.

U34 AR064496 (Beukelman) 09/01/14 – 08/31/15
NIH/NIAMS
The Effectiveness of Methotrexate to Prevent Extension of Early Limited JIA
The goal of this grant is to finalize the preparation and planning sufficient to conduct a successful randomized, placebo-controlled, blinded clinical trial to test the hypothesis that methotrexate plus usual care is more effective than usual care alone in reducing the proportion of children who subsequently experience extension of their limited JIA, as manifested by the development of polyarthritis or uveitis.
Role: Principal Investigator

Patient Powered Research Networks (Schanberg) 03/01/14 – 07/31/15
PCORI
The Patients, Advocates, and Rheumatology Teams Network for Research and Service (PARTNERS)
This project brings together children with Juvenile Idiopathic Arthritis and childhood-onset Systemic Lupus Erythematosus, their family members, and other key stakeholders in a new patient-centric model of collaboration which fully engages patients and families in decision making and governance to optimize the relevance and significance of research outcomes.
Role: Investigator

U19 HS021110 (Saag) 09/01/11 – 08/31/16
AHRQ
UAB Deep South Arthritis and Musculoskeletal CERTs
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders.
Role: Investigator

Completed

No number assigned (Beukelman) 05/01/12 – 04/30/13
Pfizer Inc
Usage of NSAIDs, Glucocorticoids, and DMARDs in the Treatment of Juvenile Idiopathic Arthritis in the United States
The goal of this project is to characterize medication use in JIA and determine factors associated with particular medication usage patterns.
Role: Principal Investigator

5KL2RR025776 (Guay-Woodford/Beukelman) 04/01/09 – 04/30/13
NIH/UAB Center for Clinical and Translational Science KL2 Career Development Award
The Risk of Serious Infection in Juvenile Idiopathic Arthritis
The goals of this project are to define the rate of and risk factors for serious infections in juvenile idiopathic arthritis using Medicaid administrative claims data and to provide protected time for career development.
Role: Principal Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Elizabeth Eileen Brown

eRA COMMONS USER NAME (credential, e.g., agency login): ELBROWN1

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE	Completion Date *(MM/YYYY)*	FIELD OF STUDY
Oregon Health Sciences University	MPH	06/2003	Epidemiology & Biostatistics
Johns Hopkins University	PhD	05/2004	Epidemiology
National Institutes of Health	Post-doctoral	06/2006	Epidemiology & Genetics

A. Personal Statement

As a molecular and genetic epidemiologist, my research is targeted toward understanding aberrant immune function common to inflammatory-mediated chronic diseases, such as multiple myeloma (MM) and systemic lupus erythematosus (SLE), and fosters a multidisciplinary approach that can be used to characterize pathways involved in plasma cell activation and homeostasis, chronic immune perturbation, and inflammation as modifiers of disease. The primary objective of this research is to identify and validate molecular biomarkers of relevant outcomes to target high-risk populations in order to reduce disease burden or modify disease surveillance and therapeutic intervention. My experience as Principal Investigator of the Molecular and Genetic Epidemiology Study of Multiple Myeloma (iMAGE) and the PROFILE III Cohort Study laid the groundwork for the translational population-based component of the research, which could support trainees. Under my leadership since 2009, we constituted these study populations, which include ~2,000 MM and SLE cases and controls with corresponding demographic and clinical phenotyping data as well as a wide spectrum of banked biospecimens. In addition, my previous role as Chair of the International Multiple Myeloma Consortium (IMMC) and my membership in the International SLE Genetics Consortium (SLEGEN), coupled with my long-term relationships with these investigators makes me uniquely well-poised to facilitate networking for trainees and to rapidly translate findings forthcoming from trainees to a larger replication population. My experience pertaining to the translation of myelomagenesis as well as SLE genetics, from the bench, to the population and back again (e.g., study design, biostatistics, clinical phenotyping, high-throughput -omics, immunology, biomarker discovery and myelomagenesis including the roles of heparanase and syndecan-1) makes me uniquely qualified to advance research plans, goals and objectives for trainees as well as to facilitate the analysis and interpretation of their results. In addition, I have mentored over 50 master-, doctoral- and medical- trainees and clinical fellows and junior faculty, which, so far, has led to a total of 15 publications. My wet and dry laboratories, coupled with the translational research conducted in these laboratories, is ideal for trainees with an interest in molecular and genetic epidemiology or translational research.

B. Positions and Honors

Positions and Employment

1995 - 1996 Interim Director, Clinical Research, Oregon Cancer Center, Oregon Health Sciences University (OHSU)
1996 - 1999 Assistant Director, Clinical Research, Oregon Cancer Center, OHSU
1999 - 2004 Doctoral Candidate, Johns Hopkins University Bloomberg School of Public Health (BSPH)
1999 - 2001 Cancer Epidemiology Training Fellow, Johns Hopkins University BSPH
2001 - 2004 Pre-doctoral Fellow, Division of Cancer Epidemiology and Genetics (DCEG), NCI, NIH, DHHS
2004 - 2006 Post-doctoral, Research Fellow, DCEG, NCI, NIH, DHHS
2005 - 2006 Research Fellow, Molecular Epidemiology and Immunogenetics Laboratory, Laboratory of Genomic Diversity (LGD), Center for Cancer Research, NCI, NIH, DHHS
2006 - 2010 Adjunct Scientist, Division of Cancer Epidemiology and Genetics, NCI, NIH, DHHS
2006 - 2010 Assistant Professor, Departments of Epidemiology, Microbiology and Medicine, University of Alabama at Birmingham (UAB)
2010 - 2014 Associate Professor, Departments of Epidemiology, Microbiology and Medicine, UAB
2014 - Professor, Departments of Pathology, Microbiology and Medicine, UAB

Other Experience and Professional Memberships

2002 - Member, Society for Epidemiology Research (SER)
2002 - Member, International Lymphoma Consortium (Interlymph)
2003 - Member, American Association for Cancer Research (AACR)
2004 - 2005 Representative, Division of Cancer Epidemiology & Genetics, Fellows Committee, NIH, DHHS
2005 - Member, American Society of Human Genetics (ASHG)
2005 - Women in Cancer Research (WICR), American Association for Cancer Research
2005 - Molecular Epidemiology Group (MEG), American Association for Cancer Research
2005 - Member, Immunology Working Group, International Lymphoma Consortium
2005 - Member, Hodgkin Lymphoma Working Group, International Lymphoma Consortium
2005 - 2007 Member, Multiple Myeloma Working Group, International Lymphoma Consortium
2007- Member, International Multiple Myeloma Consortium
2007- 2010 Co-Leader, Genetics Working Group, International Multiple Myeloma Consortium
2007 Chair, Genetics of Myeloma, International Multiple Myeloma Consortium, Barcelona, Spain
2008 - Associate Member, International Systemic Lupus Erythematosus & Genetics Consortium
2008 Chair, Genetics of Myeloma, International Multiple Myeloma Consortium, Sydney, Australia
2009 Chair, Gene-Environment Interactions, International Lymphoma Consortium, Vancouver, BC
2009 Chair, Genetics of Multiple Myeloma, International Multiple Myeloma Consortium, Vancouver, BC
2009 - Cancer Immunology (CIMM) Scientific Working Group
2009 - American Association of Immunologists (AAI)
2010 Chair, Genetics of Multiple Myeloma, International Multiple Myeloma Consortium, Bethesda, MD
2010 - Member, HLA Region Genomics Consortium
2010 - 2014 Elected Member of the Coordinating Committee, International Multiple Myeloma Consortium
2011 Special Emphasis Panel/Scientific Review Group ZCA1GRBIM1, NCI, NIH
2011 Temporary Member, Neurological, Aging and Musculoskeletal Epidemiology Study Section (NIH)
2012, 2014 Special Emphasis Panel/Scientific Review Group ZMD1MLS(02)-R**,** Basic and Applied Biomedical Research on Minority Health and Health Disparities, NIMHD, NIH
2012 - 2014 Chair, Research Committee, Faculty Senate Executive Committee and Senator, UAB
2013 Special Emphasis Panel/Scientific Research Group, ZCA1SRLB-2 (M1)-R, NCI, NIH, Cancer Causation and Emergence, Underlying Risk Factors and Prevention Mechanisms
2013 Special Emphasis Panel/Scientific Review Group, ZRG1BDCN-A (40)-P, CSR, NIH, Tobacco Centers of Regulatory Science for Research Relevant to the Smoking Prevention and Tobacco Control Act
2012 - 2014 Member, International Lymphoma Consortium Coordinating Committee
2012 - 2013 Chair, International Multiple Myeloma Consortium Coordinating Committee
2013 - 2014 Immediate Past Chair, International Multiple Myeloma Consortium Coordinating Committee

Honors

Johns Hopkins University Cancer Epidemiology Training Award (CA-09314-23; 1999-2001); Cancer Epidemiology Training Award, DCEG, NCI, NIH, DHHS (2001-2004); Johns Hopkins University Epidemiology Tuition Grant (2001-2004); Outstanding Performance Award, NIH, DHHS (2004); Fellow Award for Research Excellence (FARE), NIH, DHHS (2004); Delta Omega First Place Scientific Competition Award Johns Hopkins University, Alpha Chapter (2004); Outstanding Performance Award, NIH, DHHS (2006); Distinguished Investigator Travel Award, NCI, NIH, DHHS (International Lymphoma Consortium, York, UK 2006); UAB Arthritis and Musculoskeletal Research Center Research Award (2006); UAB Center for Women's Reproductive Health Research Award (2007); Distinguished Investigator Travel Award, NCI, NIH (International Lymphoma Consortium, Barcelona, Spain 2007); UAB Office of the Vice President for Research and Development & Comprehensive Cancer Center Research Award (2007); Distinguished Investigator Travel Award, NCI, NIH (International Lymphoma Consortium, Sydney, Australia 2008); Charles Barkley Health Disparities Research Award (2008); American Cancer Society-UABCCC Research Award (2010); Center to Reduce Cancer Health Disparities (CRCHD) Professional Development Award, NCI, NIH (2010); AAMC Mid-Career Women Faculty Professional Development Leadership Award (2012); President's Award for Excellence in Teaching Finalist (2013); UAB Comprehensive Cancer Center Research Award (2013).

C. Contributions to Science

1. Advancing the Epidemiology of Multiple Myeloma – Shared Population Resource. As Principal Investigator of the Molecular and Genetic Epidemiology (iMAGE) study of myeloma and as former chair of the International Multiple Myeloma Consortium, I fostered several new and ongoing large genomics and non-genomics projects, which in time, should significantly improve in our understanding of myeloma epidemiology. Together, I anticipate that these efforts will result in a high level of productivity and contribute significantly to the epidemiology and molecular characterization of multiple myeloma, its related precursor states (i.e., MGUS and SMM) and differences by ancestry. iMAGE participants were included in several large genomics and non-

genomics initiatives including the African American and European American GWAS, genome-wide DNA methylation and genome-wide miRNA sequencing studies as well as family history of cancer, occupational exposure and reproductive factor pooled analyses. Thus, the iMAGE study serves as a valuable population resource to support investigators interested in improving our understanding of MGUS-SMM-MM etiology, myelomagenesis and biomarker discovery. Work resulting exclusively from the iMAGE study is imminent as recruitment for iMAGE I is closed and quality control and data preparation measures are complete. iMAGE II is ongoing. Under my leadership since 2009, the iMAGE team constituted the study, which includes ~1,000 MGUS/SMM/MM patients and controls with corresponding demographic, past exposures and clinical phenotyping data as well as a wide spectrum of banked biospecimens. To date, the iMAGE population resource supports several concurrent research initiatives from investigators affiliated with a wide spectrum of UAB departments and schools as well as other institutions nationwide. As our primary findings become publically available, we anticipate that iMAGE will be more widely utilized to advance the field of myeloma. This body of work reflects my expertise in genetic and molecular epidemiology and ability to establish the infrastructure required to expand and sustain large population resources, such as iMAGE, which include large and extensive clinical data and biospecimen repositories that can be used to improve our understanding of disease etiology and underlying mechanism.

a. Rand KA, Song C, Dean E, Serie D, Curtin K, Hazelett D, Sheng X, Hu D, Huff CA, Bernal-Mizrachi L,Tomasson MH, Ailawadhi S, Singhal S, Pawlish K, Peters E, Bock CH, Stram A, Van Den Berg DJ, Edlund CK, Conti DV, Zimmerman T, Hwang AE, Huntsman S, Graff J, Nooka A, Pregja S, Berndt SI, Blot WJ, Carpten J, Casey G, Chu L, Diver WR, Stevens VL, Lieber M, Goodman P, Hennis AJM, Hsing AW, Mehta J, Kittles RA, Kolb S, Klein EA, Leske C, Murphy AB, Nemesure B, Neslund-Dudas C,Pettaway C, Vij R, Rodriguez-Gil JL, Rybicki BA, Stanford JL, Signorello LB, Nooka A**,** Strom SS, Witte JS, Xu J, Zheng SL, Wu SY, Yamamura Y, Gebregziabher M, Ambrosone CB, Bhatti P, John EM, Bernstein L, Zheng W, Olshan AF, Hu JJ, Ziegler RG, Nyante S, Bandera EV, Birmann BM, Ingles SA, Press MF, Zangari M, Martin T,Tricot G, Kumar S, Wolf J, Deming SL, Severson RK, Rothman N, Brooks-Wilson AR, Rajkumar V, Kolonel LN, Chanock SJ, Slager S, Janakiraman N, Tolebero H, **Brown EE**, DeRoos AJ, Mohrbacher A, Colditz GA, Henderson BE, Giles GG, Spinelli JJ, Chiu B, Munshi N, Anderson KC, Zonder J, Orlowski RZ, Lonial S, Camp N, Vachon C, Ziv E, Stram DO, Haiman CA, Cozen W. Multiple myeloma susceptibility loci examined in African and European ancestry populations. *Cancer Epidemiol Prev and Biomarkers*.. Submitted.

b. VanValkenburg, ME., Pruitt, GI., Brill, IK., Costa, L., Ehtsham, M., Justement, IT., Innis-Shelton, RD., Salzman, D., Reddy, ESP., Godby, KN., Mikhail, FM., Carroll, AJ., Reddy, VB., Sanderson, RD., Justement, LB., Sanders, PW and **Brown, EE**. Family history of hematologic malignancies and risk of multiple myeloma: differences by ancestry and clinical features. *Cancer Epidemiol Prev and Biomarkers*. Submitted.

2. Population-Based Genomics. As Principal Investigator of the PROFILE cohort and member of the International Systemic Lupus Erythematosus (SLE) Genetics Consortium (SLEGEN), I contributed substantially to improve our understanding of the genetics of SLE and among patients with SLE, lupus nephritis, which accounts for severe morbidity and mortality particularly among patients of African-American and Amerindian ancestries. In addition, significant efforts are ongoing to characterize the shared etiology of select predominantly B cell-medicated autoimmune diseases (e.g., SLE) and multiple myeloma and B cell lymphomas. Under my leadership since 2008, the PROFILE team recruited 3,050 participants to the cohort and produced a total of 65 original articles either published or in press and 76 abstracts. PROFILE participants were included in several large genomics initiatives, which significantly expanded the repertoire of established SLE susceptibility loci from 7 genes in the pre-genomic era to >35 loci. These genomics initiatives include the SLEGEN GWAS of European American women with SLE, two replication, Large Lupus Association Studies (LLAS-1 and 2) and the first Lupus Nephritis GWAS, respectively; as well as the ongoing African American, Amerindian and Asian GWAS, End-Stage Renal Disease GWAS and the Immunochip Consortium studies. PROFILE candidate gene studies, too, have uncovered plausible genetic associations with both SLE and LN susceptibility loci. Other lupus genomics initiatives and high throughput proteomic profiling of novel antibody specificities (which may be relevant to MGUS, SMM and MM) involving PROFILE are currently ongoing.

a. International Consortium for Systemic Lupus Erythematosus Genetics (SLEGEN)**,** Harley JB, Alarcón-Riquelme ME, Criswell LA, Jacob CO, Kimberly RP, Moser KL, Tsao BP, Vyse TJ, Langefeld CD, Nath SK, Guthridge JM, Cobb BL, Mirel DB, Marion MC, Williams AH, Divers J, Wang W, Frank SG, Namjou B, Gabriel SB, Lee AT, Gregersen PK, Behrens TW, Taylor KE, Fernando M, Zidovetzki R, Gaffney PM, Edberg JC, Rioux JD, Ojwang JO, James JA, Merrill JT, Gilkeson GS, Seldin MF, Yin H, Baechler EC, Li QZ, Wakeland EK, Bruner GR, Kaufman KM, Kelly JA. Genome-wide association scan in women with systemic lupus erythematosus identifies susceptibility variants in *ITGAM, PXK, KIAA1542* and other loci. *Nat Genet.* 2008 Feb;40(2):204-10. PMID: 18204446

b. Gateva, V., Sandling, J., Hom, G., Taylor, K., Chung, S., Sun, X., Ortmann, W., Ferreira, R., Nordmark, G., Gunnarsson, I., Svenungsson, E., Padyukov, L., Sturfelt, G., Jönsen, A., Bengtsson, A., Rantapää-

Dahlqvist, S., Kimberly, RP., **Brown, EE.,** Manzi, S., Petri, MA., Lee, A., Seldin, M., Gregersen, P., Rönnblom, L., Criswell, L., Syvänen, AC., Behrens, TW and Graham, RR. A Large-Scale Replication Study Identifies Novel Risk Loci for Systemic Lupus Erythematosus. *Nat Genet.* Nov;41(11):1228-33, 2009. PMCID: PMC2925843

c. Adrianto, I., Wen, F., Templeton, A., Wiley, G., King, JB., Lessard, CJ., Bates, JS., Hu, Y., Kelly, JA., Kaufman, KM., Guthridge, JM., Alarcón-Riquelme, ME. on behalf of the BIOLUPUS and GENLES Networks, Anaya, JM., Bae, SC., Bang, SY., Boackle, SA., **Brown, EE**., Petri, MA., Gallant, C., Ramsey-Goldman, R., Reveille, JD., Vila, LM., Criswell, LA., Edberg, JC., Freedman, BI., Gregersen, PK., Gilkeson, GS., Jacob, CO., James, JA., Kamen, DL., Kimberly, RP., Martin, J., Merrill, JT., Niewold, TB., Park, SY., Pons-Estel, BA., Scofield, RH., Stevens, AM., Tsao, BP., Vyse, TJ., Langefeld, CD., Harley, JB., Moser, KL., Webb, CF., Humphrey. MB., Gray, C., Gaffney, PM. Association Between Functional Tandem Variants Downstream of *TNFAIP3* and Systemic Lupus Erythematosus. ***Nat Genet.*** 2011 Mar;43(3):253-8. PMCID: PMC3103780

d. Chung, S. and **Brown, EE**. (co-first authors), Alarcon-Riquelme, M., Criswell, L., Edberg,, JC., Freedman, B., Gaffney, PM., Graham, RR., Harley, JB., Jacob, CO., Kimberly, RP., Moser, K., Pajewski, NM., Ramos, P., Tsao. BP., Vyse, TJ., Ziegler, J. and Langefeld, C. for the International Consortium for Systemic Lupus Erythematosus Genetics (SLEGEN). Lupus Nephritis Susceptibility Markers in *PDGRFA-GSX2, SLC5A11, ID4, and HAS2-SNTB1* Regions Identified from a Genome Wide Association Study of Women with Systemic Lupus Erythematosus**.** *JASN*. 2014 June 12. PMCID: PMC1879794

3. Identification of Complex Pathways in Molecular and Genetic Epidemiology. A central goal of complex disease genetics is to discover not only the at-risk loci but the pathways perturbed in disease and expose the underlying cellular processes. This approach is significantly more powerful than a single- or single candidate-gene approach, in that multiple genes from interactive pathways can be identified from large population-based studies and used to inform the underlying mechanism. With the iMAGE study firmly in place, coupled with several collaborations forged between my laboratory and others, we are uniquely well-poised to rapidly translate findings from the bench, to the population level and back again. Findings from the citations listed below are among the first to identify susceptibility loci for MM, describe approaches to complex pathway analysis and complex interactions between known susceptibility loci and autoimmune disease with risk of NHL.

a. **Brown, EE.,** Lan, Q., Zheng, T., Zhang, Y., Wang, SS., Hoar-Zahm, S., Chanock, SJ., Rothman, N. and Baris, D. Common variants in genes that mediate immunity and risk of multiple myeloma*.* ***Int J Cancer****,* Jun 15;120(12):2715-22, 2007. PMID 17315188

b. Gold, LS., De Roos AJ., **Brown EE.,** Lan Q., Milliken K., Davis S., Chanock SJ., Zhang, Y., Severson, R., Zahm, SH., Zheng T., Rothman, N., and Baris, D. Associations of common variants in genes involved in metabolism and response to exogenous chemicals with risk of multiple myeloma. ***Cancer Epidemiol*****.** Oct; 33(3-4):276-80, 2009. PMCID: PMC2808169

c. Wang, SS., Vajdic, CM., Linet, MS., Slager, SL., Voutsinas, J., Nieters, A., Cozen, W., Alarcon, GS., de Sanjose, S., **Brown, EE.,** Martinez-Maza, O., Turner, J., Hjalgrim, H., Bracci, PM., Holly, EA., Kane, E., Spinelli, JJ., Zheng, T., Becker, N., Morton, LM., Weisenburger, D., Bernstein, L., Maynadie, M., Foretove, L., Staines, A., Davis, S., Severson, R., Cerhan, JR., Breen, EC., Birmann, B., Flowers, C., Paltiel, O., Lan, Q., Brooks-Wilson, A., DeRoos, A., Smith, MT., Roman, E., Boffetta, P., Kricker, A., Lightfoot, T., Benavente, Y., Zhang, Y., Armstrong, B., Chanock, SJ., Rothman, N., Skibola, C., Hartge, P., Ekstrom Smedby, K. Variation in non-Hodgkin lymphoma (NHL) risk associated with autoimmune conditions by implicated NHL genotypes. ***Am J Epidemiol*****.** In press.

d. Thomas, DC, Baurley J, **Brown EE.,** Figueiredo J, Goldstein A, Hazra A, Wilson RT, Rothman, N. Approaches to Complex Pathways in Molecular Epidemiology: Summary of an AACR Special Conference. ***Cancer Res*****.** Dec 15;68(24):10028-30, 2008. PMID: 19074865

4. Advancing Understanding of Viral Etiology of Cancer. My early work was central to advancing our understanding of the genetic susceptibility to virally-mediated cancers, including the classic form of Kaposi sarcoma. Findings from these studies suggested that genes involved in host immunity and the partnership between select HLA alleles and KIR subtypes were instrumental in altering viral susceptibility and maintenance (in the case of gammaherpesviruses), and ensuing risk of associated cancers. The central focus of this body of work, to improve our understanding of aberrant immune function common to inflammatory-mediated chronic diseases while fostering a population-based multidisciplinary approach, is common to my past and current work.

a. **Brown, EE.,** Fallin, MD., Staats, B., Chatterjee, N., Hutchinson, A., Vitale, F., Lauria, C., Marshall, V., Gamache, C., Rezza, G., Serraino, D., Messina, A., Whitby, D., Goedert, JJ. and Chanock, SJ. Host immunogenetics and control of Human Herpesvirus-8 infection. ***J Inf Dis*****.** Apr 15; 193(8):1054-1062, 2006*.* PMID: 16544245

b. **Brown, EE.**, Fallin, MD., Ruczinski, I., Hutchinson, A., Staats, B., Vitale, F., Lauria, C., Serraino, D., Rezza, G., Whitby, D., Messina, A., Goedert, JJ. and Chanock, SJ. Associations of classic Kaposi sarcoma with common variants in genes that modulate host immunity. ***CEBP*****,** 15(5): 926-34, 2006. PMID: 16702372
c. **Brown, EE.,** Whitby, D., Vitale, F., Marshall, V., Mbisa, G., Gamache, C., Lauria, C., Alberg, AJ., Serriano, D., Cordiali-Fei, P., Messina, A. and Goedert, JJ. Virologic, hematologic and immunologic risk factors for classic Kaposi sarcoma. ***Cancer****,* Sep 22;:107(9):2282-2290, 2006. PMID 16998933
d. Martin MP, Qi Y, Gao X, Yamada E, Martin JN, Pereyra F, Colombo S, **Brown EE**, Shupert WL, Phair J, Goedert JJ, Buchbinder S, Kirk GD, Telenti A, Connors M, O'Brien SJ, Walker BD, Parham P, Deeks SG, McVicar DW and Carrington M. Innate partnership of HLA-B and *KIR3DL1* subtypes against HIV-1. ***Nat Genet*****,** Jun;39(6)733-40, 2007. PMID 17496894

For a complete list of publications, please view MyPublications:
http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/public/1tSI5ryOqvj3enQjcdh_16rAe/?sort=date&direction=ascending

D. Research Support
Ongoing Research Support

U01 A109030 (Schroeder) 08/01/2010 – 07/31/2015
NIH/NIAID: HLA region and KIR genomics in common variable immune deficiency

R21 CA155951 (Brown) 07/07/2011 – 06/30/2015
NIH/NCI: Genome-wide methylation study of epigenetic contributions to multiple myeloma

No number assigned (Brown, Sanderson) 11/30/2013 – 03/31/2015
UABCCC: Transcriptome analysis of myeloma and asymptomatic plasma cell dyscrasias

R21 CA182861 (Brown/Sanderson) 07/01/2014 – 06/30/2016
NIH/NCI: The Role of Exosome Heparanase and miRNAs as Biomarkers for Myeloma

R01 CA138340 (Sanderson) 05/01/2014 – 04/30/2019
NIH/NCI: Heparanase regulation of myeloma metastasis: mechanism and therapy

1R01 CA186646 (Brown) 07/01/2014 – 05/31/2019
NIH/NCI: Molecular characterization of myeloma and related asymptomatic precursor states

R01 AR064820 (Brown) 08/26/2014 – 06/30/2019
NIH/NIAMS: Association of genetic and autoantibody signatures with SLE clinical course

P30 CA13148 (Partridge) 09/01/2011 – 03/31/2016
NIH/NCI: Comprehensive Cancer Center Core Support Grant- Major Program Leaders
Role: Co-Leader, Cancer Control and Population Sciences Program

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Chen, Yabing

eRA COMMONS USER NAME (credential, e.g., agency login): CHENYA

POSITION TITLE: Professor, Molecular and Cellular Pathology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Fudan University, Shanghai, P.R. China	B.Sc.	1988	Biochemistry
Xiamen University, Xiamen, P.R. China	Ph.D.	1996	Cell & Molecular Biology
University of Vermont, Burlington, VT	M.B.A.	2001	Business Administration

A. Personal Statement

I have demonstrated track record experience and strengths in teaching and mentoring, particularly at the graduate and postgraduate levels, since I joined the faculty of Department of Pathology in 2004. I have been actively and effectively teaching 5 graduate courses and developing curriculum as a course director for “Molecular Basis of Disease”. In addition to serving on many graduate student thesis committee, I have been chairing graduate student admissions committee for the UAB graduate school PBMM theme since 2011. Currently, I am a faculty mentor on 6 NIH-funded training programs for pre- or post-doctoral students at UAB. I have mentored 3 graduate students and 9 postdoctoral fellows at UAB. My teaching endeavors are highly recognized by my students and peers. I have consistently received outstanding student evaluations as an instructor and a course director; and my trainees have succeeded in competing and receiving national awards. Past students’ accomplishments include Young Investigator Awards, a Scholar-in-Training Award, and Travel Awards related to research at national and international meetings as well as an award for Best Oral Presentation and a first place presentation award at the Graduate Student Research Days. Two of my graduate students have been selected as pre-doctoral fellows on the NIH funded T32 Cardiovascular Pathophysiology Training Grant; and one of my postdoctoral fellows was selected as a post-doctoral fellow on an NIH funded Hypertension and Vascular Biology Program. My graduate student and postdoctoral fellow have also been received for AHA pre- or postdoctoral fellowship awards from the American Heart Association. Three of my postdoctoral trainees have now hold faculty positions, at the assistant/associate/full professor, at University/Medical Schools in China.

My research programs are focused on studying the molecular and cellular mechanisms underlying phenotypic modulation and osteogenic differentiation of vascular smooth muscle cells (VSMC), a process resembling embryonic bone formation, and their contributions to the pathogenesis of vascular calcification in atherosclerosis and diabetes. I have 15-years’ experience in vascular biology with a focus of vascular/bone axis and have expertise in using genetically modified mouse models to study vascular diseases. Over the years, my laboratory has generated novel mouse models with SMC-specific gene ablations and accumulated experience using cutting-edge technologies to evaluate vascular cells and their function during development and in disease. My combined expertise in vascular biology and bone biology as well as the synergetic expertise from my collaborators has placed our group in a unique position to investigate the molecular mechanisms of VSMC modulation in vascular disease. Our research in vascular smooth muscle regulation and vascular calcification has been well recognized, as manifested by citations, highlights and editorials of our publications and invited talks in other national/international institutes, as well as invite to chair and speak at the AHA scientific sessions. I have continuously contributed to the research and education missions by serving on editorial board of the AHA journals, *Circulation Research* and *Arteriosclerosis Thrombosis and Vascular Biology*, as well as the *Journal of Biological Chemistry*. I am currently serving as vice chair of the Scientific Sessions Program Committee of the AHA/ATVB council, as

well as review committees on cardiovascular research for AHA and NIH study sections, including AICS and VCMB, and recently became a chartered member of the NIH VCMB study section.

My research and mentoring record has well supported my position as a mentor for this application.

B. Positions and Honors

Professional Positions

1988-1992	Assistant Engineer and Team Leader, Fuzhou Pharmaceutical Factory, JX, P.R.China.
1992-1996	Research Fellow, State Lab at Xiamen University. Xiamen, P.R.China.
1997-1998	Postdoctoral Research Associate, Department of Botany and Agricultural Biochemistry, The University of Vermont (UVM), Burlington, VT.
1998-2001	Research Associate, Center for Cardiovascular Research, Department of Medicine, UVM
2001-2004	Instructor, Center for Cardiovascular Research, Department of Medicine, UVM
2004-2010	Assistant Professor, Department of Pathology, The University of Alabama at Birmingham (UAB), Birmingham, AL.
2005-Present	Scientist, UAB Center for Aging, Birmingham, AL.
2005-Present	Scientist, UAB Comprehensive Diabetes Center, Birmingham, AL.
2005-Present	Scientist, UAB Center for Metabolic Bone Disease, Birmingham, AL.
2007-Present	Scientist, UAB Center for Free Radical Biology, Birmingham, AL.
2008-present	Scientist, UAB Nephrology Research Training Center, Birmingham, AL.
2010-2014	Associate Professor, Department of Pathology, The University of Alabama at Birmingham
2014-present	Professor, Department of Pathology, The University of Alabama at Birmingham

Awards and Honors

1992	Excellent New Product Awards (Jiangxi Province)
1993	The Guanghua Prize (1st Prize), Xiamen University
1994	The 1st Prize, Graduate Research Papers of Natural Sciences
1995	The Guanghua Prize (1st Prize), Xiamen University
1995	Excellent Research Paper of Young Scientists, Fujian Science & Technology Asso.
1996	The Guanghua Prize (1st Prize), Xiamen University
1997	Outstanding Thesis of the Year, Fujian Province
2008	American Heart Association Grant Review Committee (Vascular Biology)
2009-10	American Heart Association Grant Review Committee (Vascular Wall Biology)
2009	NIH Grant Review Study Section, special panel for vascular biology (ZRG1 VH-D8)
2009-present	Editorial Board Member, *Atherosclerosis Thrombosis and Vascular Biology*
2009	Fellow of American Heart Association
2009-2010	AHA/ATVB Early Career Committee, Member and Editor for Newsletter
2010-2012	NIH Grant Review Study Sections (AICS and VCMB), *Ad Hoc* Reviewer
2011, 2012	NIH Grant Review Study Section, Special Panel for P01 on vascular and bone biology
2012-present	AHA Committee on Scientific Sessions Program, Representative of ATVB council
2013-present	Editorial Board Member, *Journal of Biological Chemistry*
2013-present	NIH Grant Review Study Sections (VCMB), regular member
2014-present	Editorial Board Member, *Circulation Research*

C. Contribution to Science

My major scientific discoveries, since I joined Department of Pathology at the University of Alabama at Birmingham as Assistant Professor in 2004, have enhanced our understanding of “Molecular Mechanisms of Vascular Calcification”. My group has determined an integrate role of the osteogenic transcription factor Runx2 and Runx2 regulation in pathogenesis of vascular calcification in atherosclerosis and diabetes. These studies have not only revealed novel molecular insights into vascular calcification, but also indicated that signals that upregulate Runx2 are potential new targets amenable to drug discovery. This body of research has been highly regarded by my peers at the national and international level, as evident by continuous grant support (NIH, AHA, VA), citations, commentaries and highlights for our papers, invited talks and chair scientific

sessions at national and international conferences, elected as the Fellow of American Heart Association and selected as a Regular Member on NIH vascular biology study section (VCMB) and editorial boards (*Circ Res*, *ATVB* and *JBC*), as well as Vice Chair of the ATVB/AHA scientific sessions program committee.

Below is a brief summary of my major scientific contribution in molecular mechanisms of vascular calcification.

C.1 *Elucidate an essential role of oxidative stress-induced Runx2 in regulating vascular smooth muscle cell dedifferentiation and osteogenic differentiation*

VSMC exhibit an extraordinary capacity to undergo phenotypic change during development, in cultures and in association with diseases. Previously considered as passive calcium deposition, vascular calcification is now well established as an osteogenic differentiation process, resembling mineralization of bones and teeth. The expression of the key osteoblast transcription factor, Runx2, has been identified in atherosclerotic calcified lesions of human and mice but not in normal vessels, supporting a role for Runx2 in vascular calcification. However, it was not known whether the increased expression of Runx2 is a result of VSMC calcification or it causes VSMC calcification. Our group was the first one to establish a mouse primary VSMC calcification model induced by oxidative stress, a key inducer for atherosclerosis and diabetes. We found that oxidative stress induces Runx2 expression via the PI3K/AKT signaling pathways. With gene knockout and gain-of-function system, we demonstrated an essential and sufficient role of Runx2 in oxidative stress-induced VSMC calcification (*JBC* 2008, PMC2397455). Our report was selected as a featured article by the North American Vascular Biology Society in 2008 and has been cited over 190 times, indicating significant impact in the field. This work laid the foundation for the research programs to further characterize the function of Runx2 in regulating vascular calcification in atherosclerosis *in vivo* (AHA/BGIA, 2008-2010; NIH/NHLBI R01, 2009-2014). Furthermore, we demonstrated that Runx2 deficiency in VSMC does not result in a compensatory increase in expression of SMC markers but dramatically inhibits oxidative stress-induced decrease in SMC markers (*Circ Res* 2012, PMC3678289), indicating the role of Runx2 in regulating SMC de-differentiation in response to oxidative stress. We identified a direct interaction between Runx2 and serum response factor, a key SMC transcription regulator (*JBMR* 2012, PMC3977219). These studies uncover a novel function of Runx2 in regulating SMC phenotype (de-differentiation), another testimony for my continuous effort in scientific discovery and innovation. We are now actively pursuing the novel mechanisms underlying Runx2 regulation of smooth muscle cells function through a VA program project (2012-2016).

C.2 *Determine a definitive role of SMC-specific Runx2 in regulating vascular calcification in atherosclerosis*

Based on our in vitro finding of an essential role of Runx2 in VSMC calcification (*JBC* 2008, PMC2397455), we further investigated the contribution of SMC-expressed Runx2 in the pathogenesis of vascular calcification in atherosclerosis *in vivo*. We have validated that high-fat diet-induced oxidative stress and calcification was associated with elevation of Runx2 in the calcified atherosclerotic lesions in $ApoE^{-/-}$ mice (*ATVB* 2011, PMC3098301). By generating a new SMC-specific Runx2 deficient mouse model, we have determined that SMC-specific Runx2 deficiency inhibits high fat diet-induced atherosclerotic calcification (*Circ Res* 2012, PMC3678289). Our study was the first one to offer genetic proof for the definitive role and importance of Runx2-regulated osteogenic differentiation of VSMC in atherosclerotic calcification *in vivo,* which have been well received as evident by a top downloaded article in 2012 and selected in the journal highlights. These studies in a preclinical atherosclerotic model clearly indicated that Runx2 and Runx2-regulated signals are potential new targets amenable to drug discovery.

C.3 *Discover the novel mechanisms underlying vascular osteoclasts in atherosclerotic vascular calcification*

One of the most intriguing discoveries we have made during these investigations is the identification of a positive correlation of vascular osteoclasts with vascular calcification in atherosclerosis (*ATVB* 2011, PMC3098301 *&* *Circ Res* 2012, PMC3678289), representing a novel paradigm that atherosclerotic calcification resembles bone remodeling. Vascular osteoclast-like cells were observed in atherosclerotic lesions of human and mouse arteries. However, the regulation and origin of the vascular osteoclast-like cells were unknown. We found that calcified SMC Runx2- dependently increased the expression of receptor activator for nuclear factor κB ligand (RANKL) (*ATVB* 2011, PMC3098301), the key osteoclast inducer that we have reported (*JBC* 2008, PMC2570883 *&* *JBC* 2010, PMC2978559). RANKL has also been shown to promote VSMC calcification but VSMC from RANKL deficient mice still undergo calcification, suggesting that RANKL is not essential for VSMC calcification and it plays more complex role in regulating vascular calcification. We discovered that VSMC-derived RANKL promoted macrophage migration and differentiation into osteoclasts (*ATVB 2011,* PMC3098301 *& Circ Res 2012,* PMC3678289). As highlighted by the accompanying editorial on our report (*ATVB* 2011, PMC3098301)*,* our work "*suggests that macrophage biologists interested in atherosclerotic*

plaque should expand beyond the paradigm and routinely add osteoclasts to the list of plaque macrophage phenotypes studied", demonstrating that the impact of these findings is beyond our research field. These findings lead to a new direction for us to investigate the Runx2/RANKL-dependent formation of vascular osteoclasts and their function as an emerging novel mechanism of vascular calcification in atherosclerosis (NIH R01 application, received a priority score of 12, ranking 2%).

C.4 *Discover an important role of protein O-GlcNAcylation in regulating vascular calcification in diabetes*

Our effort in uncovering molecular mechanisms underlying diabetic vascular calcification has led to the discovery of the function of protein O-GlcNAcylation in regulating Runx2 upregulation in vascular calcification. This effort was initially supported by a pilot project from the comprehensive Diabetes Center (2012). We have made paradigm-shifting novel observation that chronic protein O-GlcNAcylation enhances vascular calcification by enhancing AKT activation through O-GlcNAcylation that lead to enhanced Runx2 transactivity (*Circ Res* 2014, PMC4030422). Using constitutively activated AKT, we further demonstrated that AKT activation regulated FOXO1/3-mediated Runx2 ubiquitination that upregulates Runx2 and promotes VSMC calcification (*ATVB 2015,* PMID:25378413). This line of research has been highly recognized in the field as manifested by accompanying editorial, selected as a best basic science paper in the 2013 AHA scientific sessions and a most-often read paper in *Circ Res* (August 2014), invited talk in AHA 2014 scientific sessions, as well as grant support by NIH/NIDDK (R01, 2014-2018).

1. Deng L*, Huang L*, Sun Y*, Heath JM, Wu H and **Chen Y**. Inhibition of FOXO1/3 promotes vascular calcification. *equal contribution. *Arterioscle Thromb Vasc Biol.* (2015) 35(1):175-83. PMID:25378413.
2. Heath J, Sun Y, Yuan K, Bradley WE, Litovsky S, Dell'Italia LJ, Chatham JC, Wu H and **Chen Y**. O-GlcNAc modification and activation of AKT induces diabetic vascular calcification. *Circulation Research.* (2014) 28;114(7):1094-102. PMID: 24526702. PMCID: PMC4030422. (*published with accompanying editorial; Editor's pick of the March 28, 2014 issue; a most often read paper in Circ Res in August 2014)*
3. Sun Y, Byon CB, Yuan K, Chen JF, Mao X, heath JM, Javed A, Zhang, K, Anderson PG, and **Chen Y**. Smooth muscle cell-specific Runx2 deficiency inhibits vascular calcification. *Circulation Research.* (2012) 111(5):543-52. PMID:22773442. PMCID:PMC3678289 *(a top downloaded paper in Circ Res in July 2012; highlighted in Kidney International and Circ Res Thematic Synopsis: Atherosclerosis)*
4. Chen JF, Yuan K, Mao X, Miano JM, Wu H and **Chen Y**. Serum response factor regulates bone formation by IGF-1 and Runx2 axis. *J. Bone and Mineral Research.* (2012) Aug 27;(8):1659-68. PMID:22434656. PMCID: PMC3977219

D. Research Support

Ongoing Research support

1I01BX002296-01 (Chen, PI) 04/01/14-3/31/18
VA merit review
Death Receptor Signaling in Pancreatic Cancer: Mechanisms and Therapeutic Targets
The aims are to characterize the function of PARP1 in 1) regulating death receptor-mediated apoptotic signals; 2) regulating death receptor- mediated survival signals; and 3) TRA-8 therapy in mouse models of pancreatic cancer.

R01 DK100847 (Chen, PI) 04/01/14-02/28/18
NIH/NIDDK
O-GlcNAcylation regulates vascular smooth muscle cells in diabetic vasculopathy
The specific aims are to 1) determine the role of OGT-mediated protein O-GlcNAcylation in arterial calcification in diabetes; and 2) determine O-GlcNAcylation-dependent molecular signals that regulate medial calcification.

1IP1BX001595 (Sanders, PPA director) 10/01/12-09/30/16
VA Program Projects Award (Chen, PI of Project 2 & Director of Molecular Pathology Core)
Novel regulators for vascular disease
The program projects include a series of 3 inter-related projects and a state-of-the-art animal vascular phenotyping core facility. The PPA will focus on the common theme of vascular dysfunction associated with

matrix protein and medial calcification, two factors known to increase arterial stiffness. The objective of Project 2 is to determine the role of Runx2 in regulating extracellular matrix composition and stiffness.

14POST204501417 (Yang, Awardee) 07/01/14-06/30/16
AHA Postdoctoral Fellowship Award (Chen, Mentor)
Function of STIM1 in Vascular Calcification
The specific aims of this project are to determine the function of STIM1 in regulating calcification of 1) vascular smooth muscle cells; and 2) in mouse arteries.

R01 HL092215 (Chen, PI) 04/01/09-03/31/16 (NCE)
NIH/NHLBI
Molecular Signaling in Oxidative Stress-Induced Vascular Calcification
The specific aims are to: 1) characterize Runx2 dependent vascular calcification in atherosclerosis *in vivo*; and 2) define Runx2 dependent signals in oxidative stress-induced VSMC calcification.

Competing renewal application on vascular osteoclast in calcification received priority score of 12, ranking 2%tile

Completed Research Support (last three years)

12PRE11840009 (Heath, Awardee) 07/01/12-06/30/14
AHA Pre-doctoral Fellowship Award (Chen, Mentor)
O-GlcNAc Modification in Diabetic Vascular Calcification
The specific aims of this project are to determine the association of O-GlcNAc modification with vascular calcification in 1) vascular smooth muscle cells; and 2) in diabetic arteries.

1I01BX000369 (Chen, PI) 10/01/09-09/30/13
VA Merit Review Award
Toll-like Receptor Signaling in Pathogenesis of Pulmonary Hypertension
The specific aims of this project are to: 1) characterize the functional role of TLR4 signals in regulation of PAH in mice; and 2) delineate the molecular mechanisms responsible for TLR4 regulation of PAH.

1I01BX000311 (McDonald, PI) 10/01/09-09/30/13
VA Merit Review Award (Chen, Co-Investigator)
Calmodulin Regulates Fas-Mediated Apoptosis: A Target for Cancer Therapy
The major goals of this project are to: 1) Characterize the function of CaM in regulating Fas signaling pathways in cholangiocarcinoma cells; and 2) Characterize the role of the CaM/Fas/Flip interaction in regulating cholangiocarcinoma tumorigenesis in mice.

No Assigned Number (Shalev, Center Director) 01/01/12-12/31/12
NIH/UAB Diabetes Center Pilot Award (Chen, PI of Pilot Award on Glucose Homeostasis)
Function of hyperglycemia in regulating vascular calcification
The objective of this project is to determine the function of hyperglycemia in regulating Runx2 expression and vascular smooth muscle cell calcification.

R01 HL092215-S1 (Chen, PI) 07/15/09-06/30/12
NIH/NHLBI, ARRA
Molecular Signaling in Oxidative Stress-Induced Vascular Calcification
The specific aims of this project are to: 1) characterize Runx2 dependent vascular calcification in atherosclerosis; and 2) define Runx2 dependent signals in oxidative stress-induced VSMC calcification.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: CURTIS, JEFFREY R.

eRA COMMONS USER NAME (agency login): JCURTIS

POSITION TITLE: William J. Koopman Endowed Professor in Clinical Immunology and Rheumatology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of California San Diego, San Diego, CA	BS	12/1992	Biology
Oregon Health Sciences Univ. OR	MD	06/1999	Medicine
Oregon Health Sciences Univ. OR	MPH	06/1999	Epidemiology
Harvard School of Public Health, Boston, MA	MS	11/2009	Epidemiology

A. Personal Statement

Dr. Jeffrey Curtis is a Professor of Medicine in the Division of Clinical Immunology and Rheumatology at the University of Alabama at Birmingham (UAB). He is the Co-Director of the UAB Center for Education and Research on Therapeutics (CERTs) of Musculoskeletal Disorders, which has a major emphasis on evaluating the safety and comparative effectiveness of medications for rheumatic diseases. Additionally, as the Director of the UAB Arthritis Clinical Intervention Program, he leads the clinical trials unit for the rheumatology division at UAB, with a particular focus on rheumatoid arthritis (RA) and psoriatic arthritis (PsA). He is the Co-Director of the UAB Pharmacoepidemiology and Pharmacoeconomics Research (PEER) Unit. PEER uses multiple large data sources to study comparative effectiveness questions across multiple chronic diseases. These data sources include national administrative data from Medicare and commercial health plans, electronic health record data, and large registries. He has been awarded the William J. Koopman Endowed Professorship in Rheumatology and Immunology.

Dr. Curtis received a Medical Degree (MD) and a Master of Public Health (MPH) degree from Oregon Health & Sciences University in Portland, OR. He subsequently completed a residency in internal medicine at Oregon Health & Science University and a fellowship in rheumatology at UAB. He received his Master of Science (MS) degree in epidemiology at the Harvard School of Public Health. His subsequent work in Clinical Informatics was done at Stanford University. He is board-certified in rheumatology.

The evaluation of the efficacy, comparative effectiveness, and safety of the medications used to treat rheumatoid arthritis and spondyloarthritis are among Dr. Curtis's research interests. He served on the Core Expert Panel for the ACR's 2008 and 2012 Recommendations for the Use of Nonbiologic and Biologic Disease Modifying Antirheumatic Drugs in RA and is part of the forthcoming 2015 ACR Recommendations. He was the Deputy Director for a collaborative project between the FDA, the Agency for Healthcare Research and Quality (AHRQ), and a number of academic centers studying the safety of biologic agents using multiple, pooled national data sources. He is the Co-PI of the PCORI-funded Patient Powered Research Network focused on RA, psoriasis, and PsA.

Dr. Curtis also studies risk factors for and outcomes of osteoporosis. He was a member of the ACR's task force to update recommendations for the management of glucocorticoid induced osteoporosis (GIOP). He also served on the ASBMR Task Force on Atypical Subtrochanteric and Diaphyseal Fractures.

He has a successful track record of mentoring both predoctoral and postdoctoral trainees; publications included below and in Contributions to Science (trainees underlined):

a. Zhang J, Saag KG, **Curtis JR**. Long-term safety concerns of antiresorptive therapy. *Rheum Dis Clin North Am*. 2011; 37(3):387-400. Review. PMID: 22023898; PMCID: PMC4420195.

b. Yun H, **Curtis JR**, Saag K, Kilgore M, Muntner P, Smith W, Matthews R, Wright N, Morrisey MA, Delzell E. Generic alendronate use among Medicare beneficiaries: are Part D data complete? *Pharmacoepidemiol Drug Saf*. 2013; 22(1):55-63. PMID: 23135758; PMCID: PMC4052770.

c. Navarro-Millán I, Charles-Schoeman C, Yang S, Bathon JM, Bridges SL Jr, Chen L, Cofield SS, Dell'Italia LJ, Moreland LW, O'Dell JR, Paulus HE, **Curtis JR**. Changes in lipoproteins associated with methotrexate or combination therapy in early rheumatoid arthritis: results from the treatment of early rheumatoid arthritis trial. *Arthritis Rheum*. 2013; 65(6):1430-8. PMID: 23460074; PMCID: PMC3672346.

d. Beukelman T, Xie F, Baddley JW, Chen L, Delzell E, Grijalva CG, Mannion ML, Patkar NM, Saag KG, Winthrop KL, **Curtis JR**; SABER Collaboration. Brief report: incidence of selected opportunistic infections among children with juvenile idiopathic arthritis. *Arthritis Rheum*. 2013; 65(5):1384-9. PMID: 23460423; PMCID: PMC3636167.

B. POSITIONS AND HONORS

Positions and Employment

1999 - 2002	Resident, Internal Medicine, Oregon Health Sciences University, Portland, OR
2002 - 2005	Fellow, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL
2005 -	Associate Director, UAB Center for Education and Research on Therapeutics of Musculoskeletal Disorders, University of Alabama at Birmingham, Birmingham, AL
2005 -	Associate Scientist, UAB Center for Education and Research on Therapeutics of Musculoskeletal Disorders, University of Alabama at Birmingham, Birmingham, AL
2005 - 2009	Assistant Professor of Medicine, Division of Clinical Immunology and Rheumatology, UNIVERSITY OF ALABAMA AT BIRMINGHAM, Birmingham, AL
2007 -	Director, UAB Arthritis Clinical Intervention Program (ACIP), University of Alabama at Birmingham, Birmingham, AL
2009 - 2013	Associate Professor of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL
2013 -	William J. Koopman Endowed Professor in Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

Member, American College of Physicians
Member, American College of Rheumatology (ACR)
Member, International Society for Pharmacoepidemiology (ISPE)
Member, American Society of Bone and Mineral Research (ASBMR)
Editorial Board, Arthritis & Rheumatism
Editorial Board , Pharmacoepidemiology and Drug Safety (PDS)
Editorial Board, Arthritis Care and Research (AC&R)

Honors

1992	B.S. Biology conferred summa cum laude, University of California San Diego
1999	Medical Degree (M.D.) conferred cum laude, Oregon Health Sciences University
2003	Clinical Investigator Fellowship Award , ACR Research and Education Foundation
2003	Clinical Investigator Loan Repayment Award, National Institute of Health
2004	Scholar in Pain Management, Pfizer
2004	Senior Fellow Award, American College of Rheumatology
2005	Frommeyer Award in Investigative Medicine, University of Alabama, Depart of Medicine
2005	National Institute of Health, Loan Repayment Award (competitive renewal)
2006	Health Outcomes Research Award, PhRMA Foundation
2006	Decade Young Investigator, U.S. Bone and Joint
2007	EULAR Junior Investigator Exchange Program, American College of Rheumatology

2008	Young Investigator Award, International Society of clinical Densitometry
2008	Young Investigator Award, American Society for Bone and Mineral Research
2010	Max Cooper Award for Research Excellence, University of Alabama at Birmingham
2012	Henry Kunkel Young Investigator Award, American College of Rheumatology

C. Contribution to Science

1. Research interests include: The evaluation of the efficacy, comparative effectiveness, and safety of the medications used to treat rheumatoid arthritis and spondyloarthritis. Dr. Curtis uses large administrative databases, registries and links between them. He is also the Co-PI for a PCORI-funded Patient Powered Research Network "Arthritis-Power" registry, focused on RA, psoriasis, and psoriatic arthritis.

a. **Curtis JR**, Yun H, Matthews R, Saag KG, Delzell E. Adherence with intravenous zoledronate and intravenous ibandronate in the United States Medicare population. *Arthritis Care Res (Hoboken*). 2012; 64(7):1054-60. PMID: 22328117; PMCID: PMC3355221.

b. **Curtis JR**, Sharma P, Arora T, Bharat A, Barnes I, Morrisey MA, Kilgore M, Saag KG, Wright NC, Yun HG, Delzell E. Physicians' explanations for apparent gaps in the quality of rheumatology care: results from the US Medicare Physician Quality Reporting System. *Arthritis Care Res (Hoboken*). 2013; 65(2):235-43. PMID: 22556118; PMCID: PMC3414685.

c. **Curtis JR**, Chastek B, Becker L, Harrison DJ, Collier D, Yun H, Joseph GJ. Further evaluation of a claims-based algorithm to determine the effectiveness of biologics for rheumatoid arthritis using commercial claims data. *Arthritis Res Ther*. 2013; 15(2):404. PMID: 23472737; PMCID: PMC3672715.

d. Dewitt EM, Li Y, **Curtis JR**, Glick HA, Greenberg JD, Anstrom KJ, Kremer JM, Reed G, Schulman KA, Reed SD. Comparative effectiveness of nonbiologic versus biologic disease-modifying antirheumatic drugs for rheumatoid arthritis. *J Rheumatol*. 2013; 40(2):127-36. PMID: 23322461.

2. Additionally, he leads the multi-center NIH-funded large pragmatic randomized controlled trial studying the safety and effectiveness of the live herpes zoster vaccine in patients receiving biologic agents.

a. Zhang J, Delzell E, Xie F, Baddley JW, Spettell C, McMahan RM, Fernandes J, Chen L, Winthrop K, **Curtis JR**. The use, safety, and effectiveness of herpes zoster vaccination in individuals with inflammatory and autoimmune diseases: a longitudinal observational study. *Arthritis Res Ther*. 2011; 13(5):R174. PMID: 22024532; PMCID: PMC3308109.

b. Zhang J, Xie F, Delzell E, Chen L, Winthrop KL, Lewis JD, Saag KG, Baddley JW, **Curtis JR**. Association between vaccination for herpes zoster and risk of herpes zoster infection among older patients with selected immune-mediated diseases*. JAMA*. 2012; 308(1):43-9. PMID: 22760290; PMCID: PMC3683869.

c. Winthrop KL, Baddley JW, Chen L, Liu L, Grijalva CG, Delzell E, Beukelman T, Patkar NM, Xie F, Saag KG, Herrinton LJ, Solomon DH, Lewis JD, **Curtis JR**. Association between the initiation of anti-tumor necrosis factor therapy and the risk of herpes zoster. *JAMA*. 2013 309(9):887-95. PMID: 23462785; PMCID: PMC3773213.

3. He is also interested in the study of risk factors for and outcomes of osteoporosis and fracture.

a. Warriner AH, Patkar NM, **Curtis JR**, Delzell E, Gary L, Kilgore M, Saag K. Which fractures are most attributable to osteoporosis? *J Clin Epidemiol*. 2011; 64(1):46-53. PMID: 21130353..

b. Cauley JA, El-Hajj Fuleihan G, Arabi A, Fujiwara S, Ragi-Eis S, Calderon A, Chionh SB, Chen Z, **Curtis JR**, Danielson ME, Hanley DA, Kroger H, Kung AW, Lesnyak O, Nieves J, Pluskiewicz W, El Rassi R, Silverman S, Schott AM, Rizzoli R, Luckey M; FRAX(®) Position Conference Members. Official Positions for FRAX® clinical regarding international differences from Joint Official Positions

Development Conference of the International Society for Clinical Densitometry and International Osteoporosis Foundation on FRAX®. *J Clin Densitom*. 2011; 14(3):240-62. PMID: 21810532.

c. Viswanathan HN, **Curtis JR**, Yu J, White J, Stolshek BS, Merinar C, Balasubramanian A, Kallich JD, Adams JL, Wade SW. Direct healthcare costs of osteoporosis-related fractures in managed care patients receiving pharmacological osteoporosis therapy. *Appl Health Econ Health Policy*. 2012; 10(3):163-73. PMID: 22510025.

d. Kilgore ML, Outman R, Locher JL, Allison JJ, Mudano A, Kitchin B, Saag KG, **Curtis JR**. Multimodal intervention to improve osteoporosis care in home health settings: results from a cluster randomized trial. *Osteoporos Int*. 2013; 24(10):2555-60. PMID: 23536256; PMCID: PMC4089895.

D. RESEARCH SUPPORT

Ongoing Research Support

UM1 AR065705, NIH/NIAMS 2014/09/01-2019/08/31
Curtis, Jeffrey R., Winthrop, Kevin Loring (MPI)
Safety and Effectiveness of Live Zoster Vaccine in Anti-TNF Users (VERVE Trial)
Role: PI

P60 AR064172, NIH/NIAMS 2013/09/16-2018/07/31
CURTIS, JEFFREY R. (PI)
Facilitating Treat-to-Target Using Novel Health Technology with Decision support
Role: PI

University of Pennsylvania/PCORI 2013/09/30-2016/09/29
James Lewis (PI)
Patient Valued Comparative Effectiveness of Corticosteroids Versus Anit-TNF Alpha Therapy for Inflammatory Bowel Disease
Role: Site PII

U19 HS021110 2011/09/30-2016/08/31
Kenneth G. Saag (PI)
Deep South Arthritis and Musculoskeletal CERTs
Role: CPI

Disease Targeted Innovative Research, Rheumatology Research Foundation 2014/09/01-2016/08/31
Iris Navarro-Millán (PI)
PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes
This pilot study will facilitate the parent trial and change RA management by demonstrating the clinical safety and immunogenicity of the live zoster vaccine among current anti-TNF users. Rheumatologists and other providers will be able to improve the care, outcomes, and quality of life for RA patients, substantially decreasing the morbidity of herpes zoster and its complications over a lifetime
Role: CPI

Research Agreement, Pfizer, Inc 2014/01/01-2016/06/30
Jeffrey R. Curtis (PI)
Capturing Patient Reported Outcomes in RA to Improve Quality of Care & Outcomes in Real-World Settings
Role: PI

CORRONA Cohort- Amendment 4, CORRONA 2010/05/10-2016/05/12
Jeffrey R. Curtis (PI)
The Long Term Safety and Efficacy of Anti-Rheumatic Disease Therapies in the CORRONA Cohort
Role: PI

P50 AR060772 - Project 4, NIH/NIAMS 2012/09/01-2016/03/31
Kenneth G. Saag (PI)
Centers of Research Translation - Gout and Hyperuricemia: from Bench to Bedside to Backyard
This P50 CORT grant includes three projects that will explore translational research questions I gout. Project 4, co-led by Dr. Mikuls, will examine the use of a novel centralized virtual gout clinic in the management of chronic gout by optimizing the use of urate lowering therapy
Role: PI

Research Agreement, Pfizer 2012/07/15-2016/03/31
Jeffrey R. Curtis (PI)
Psoriasis Standing Cohort
This project is part of an initiative to engage independent and external databases to establish a standing cohort in support of the tofacitinib (CP 690,550) clinical programs. Databases will be queried to enable efficient provision of epidemiologic data related to safety events, disease severity, or particular products of interest among adults with psoriasis
Role: PI

Research Agreement, Amgen 2014/08/01-2015/12/31
Jeffrey R. Curtis (PI)
Risk of secondary fracture among post-menopausal women in the United States
This will be a retrospective database analysis in a cohort of post-menopausal women using Medicare claims data. The objectives will include estimating the incidence and timing of secondary fracture following an initial fracture, and characterizing risk factors for secondary fracture.
Role: PI

Global Healthy Living Foundation/PCORI 2014/03/12-2015/09/11
Seth Ginsberg, Jeffrey R. Curtis (MPI)
ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)
Role: PI

Rheumatology Research Foundation 2013/09/01-2015/08/31
Jeffrey R. Curtis (PI)
A Pilot Study of the Safety and Effectiveness of the Live Zoster Vaccine in Anti-TNF Users.
This pilot study will facilitate the parent trial and change RA management by demonstrating the clinical safety and immunogenicity of the live zoster vaccine among current anti-TNF users. Rheumatologists and other providers will be able to improve the care, outcomes, and quality of life for RA patients, substantially decreasing the morbidity of herpes zoster and its complications over a lifetime.
Role: PI

20090522, Amgen 2011/02/21-2022/12/31
Jeffrey R. Curtis (PI)
Denosumab Global Safety Assessment among Women with Postmenopausal Osteoporosis (PMO) Using Multiple Observational Databases
Determine incidence rates of adverse events of special interest (AESI) in women with PMO exposed to denosumab, women with PMO exposed to other osteoporosis medications, and women with PMO not exposed to any osteoporosis medications.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: DAVIS, RANDALL

eRA COMMONS USER NAME (agency login): RANDALLD

POSITION TITLE: Professor of Medicine, Microbiology, and Molecular Genetics, & Biochemistry

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Boston University, Boston, MA	BS	1992	Biology
University of Alabama at Birmingham	MD	1997	Medicine
University of Alabama at Birmingham	Resident	1999	Internship - Internal Medicine
University of Alabama at Birmingham	Fellow	2001	Walter B. Frommeyer, Jr., Fellowship in Investigative Medicine
University of Alabama at Birmingham	Fellow	2003	ABIM Subspecialty Research Fellowship/Clinical Investigator Pathway

A. PERSONAL STATEMENT

The goal of this proposal is to establish a training program in Rheumatic and Musculoskeletal Diseases Research at UAB. My laboratory is focused on the cellular and molecular immunobiology of lymphocytes in normal and diseased conditions. I have been broadly trained as a physician-scientist with a background in basic lymphocyte development and receptor biology. My clinical expertise is in Hematology/Oncology with a specific focus on B cell chronic lymphocytic leukemia (CLL) and lymphoproliferative disorders. As a postdoctoral fellow I co-discovered a family of Fc receptor-like (FCRL) genes encoding molecules with tyrosine-based regulatory potential that are expressed by subpopulations of lymphocytes in normal and diseased states. Current work involves investigating FCRL members in humans and mice to define their functional roles. Work by my group and through productive collaborations has provided better biological understanding of these receptors in basic immunology as well as in clinically important autoimmune and malignant conditions. As part of this work we are exploring affinity and structure/function relationships employing Biacore T200 surface plasmon resonance technology. This instrument is supported by a core facility that I direct and is an outstanding resource for related studies in fundamental and translational immunology. My background as a physician-scientist, experience as a mentor, and the achievement of my prior trainees are all valuable indicators of my qualifications. I have served as a mentor for undergraduate, graduate, and medical trainees, as well as postgraduate residents and postdoctoral fellows. Examples of publications from prior and current mentees (highlighted in bold) are listed below. The T32 mechanism has previously supported a very successful MSTP graduate student who successfully completed his PhD thesis in my laboratory. The assembled group of experienced investigators and environment at UAB are highly relevant to this T32 proposal. In summary, my expertise, experience, and record of productivity as an investigator and mentor have prepared me to be a successful co-Investigator on this proposal.

1. **Schreeder DM**, Pan J, **Li FJ**, Vivier E, Davis RS. FCRL6 distinguishes mature cytotoxic lymphocytes and is upregulated in patients with B-cell chronic lymphocytic leukemia. Eur J Immunol. 2008 Nov;38(11):3159-66. PubMed PMID: 18991291; PubMed Central PMCID: PMC2742621.
2. **Schreeder DM**, Cannon JP, Wu J, Li R, Shakhmatov MA, and Davis RS. Cutting edge: FcR-like 6 is an MHC class II receptor. J Immunol. 2010 Jul 1;185(1):23-7. PubMed PMID: 20519654.
3. **Zhu Z**, Li R, Li H, Zhou T, Davis RS. FCRL5 exerts binary and compartment-specific influence on innate-like B-cell receptor signaling. Proc Natl Acad Sci U S A. 2013 Apr 2;110(14):E1282-90. PubMed PMID: 23509253; PubMed Central PMCID: PMC3619311.
4. **Li FJ**, Won WJ, **Becker EJ Jr**, Easlick JL, Tabengwa EM, Li R, Shakhmatov M, Honjo K, Burrows PD, and Davis RS. Emerging roles for the FCRL family members in lymphocyte biology and disease. Curr Top Microbiol Immunol. 2014;382:29-50. PubMed PMID: 25116094; PubMed Central PMCID: PMC4242170.

B. POSITIONS AND HONORS

Positions and Employment

1991 - 1992	Research Assistant, Massachusetts General Hospital, Department of Surgery, Boston, MA
2001 - 2011	Board Certification in Internal Medicine, American Board of Internal Medicine
2003 -	Senior Scientist, University of Alabama at Birmingham (UAB), Comprehensive Cancer Center, Birmingham, AL
2003 - 2008	Assistant Professor of Medicine, UAB, Divisions of Developmental and Clinical Immunology and Hematology/Oncology, Birmingham, AL
2004 -	Faculty Member, UAB, Graduate Biomedical Sciences (GBS), Birmingham, AL
2004 -	Graduate Faculty Member, UAB, School of Joint Health Sciences, Birmingham, AL
2004 - 2024	Board Certification in Hematology, American Board of Internal Medicine
2005 - 2008	Assistant Professor of Microbiology, UAB, Birmingham, AL
2006 -	Faculty Member, UAB, Medical Scientist Training Program (MSTP), Birmingham, AL
2006 - 2008	Assistant Professor of Biochemistry and Molecular Genetics, UAB, Birmingham, AL
2008 - 2013	Associate Professor of Medicine (with award of tenure), Microbiology, and Biochemistry & Molecular Genetics, UAB, Birmingham, AL
2009 -	Scientist, UAB, Comprehensive Arthritis, Musculoskeletal, and Autoimmunity Center, Birmingham, AL
2010 -	Director, UAB, Multidisciplinary Molecular Interaction Core, Birmingham, AL
2013 -	Professor of Medicine, Microbiology, and Molecular Genetics & Biochemistry, UAB, Birmingham, AL
2013 -	Director, UAB, Chronic Lymphocytic Leukemia (CLL) Program, Birmingham, AL
2013 -	Scientist, UAB, Comprehensive Diabetes Center, Birmingham, AL

Other Experience and Professional Memberships

1991	Summer Research Fellow, Massachusetts General Hospital, Dept. of Neurology, Boston, MA
1993	Medical Student Summer Research Fellowship, Howard Hughes Medical Institute (HHMI), University of Alabama School of Medicine
1995	Medical Student Research Fellowship, Developmental & Clinical Immunology, UAB
2000	The Federation of the European Biological Societies International Summer School in Immunology, The Immune System: Genes, Receptors, and Regulation. Ionian Village, Greece
2003 -	Member, American Association of Immunologists
2003 -	Member, American Society of Hematology
2006 -	Member, Henry Kunkel Society
2012 -	Member, Southern Society for Clinical Investigation

Honors

1995	Medical Student Research Competition Semifinalist, University of Alabama School of Medicine
2000	Walter B. Frommeyer, Jr., Fellowship in Investigative Medicine Physician Scientist Award, UAB, Department of Medicine
2001	J. Claude Bennett Award for Excellence in Research by an Associate Fellow Finalist, UAB
2002	J. Claude Bennett Award for Excellence in Research by an Associate Fellow Semifinalist, UAB
2002	Division of Hematology/Oncology Award for Best Research Fellow, UAB
2003	Special Fellow Career Development Award, Leukemia and Lymphoma Society
2003	K08 Mentored Clinical Scientist Development Award, NIH-NIAID
2005	Human Immunology Program Award, Dana Foundation
2005	V Foundation for Cancer Research Scholar Award
2006	Cancer Research Institute Investigator Award
2008	American Cancer Society Research Scholar Grant
2008	CLL Global Research Foundation Award
2013	Lupus Research Institute Novel Research Grant

C. Contribution to Science

1. My initial contribution to science was the co-discovery of the Fc receptor-like (FCRL) multigene family during my postdoctoral fellowship. Following the identification of a large number of IgA Fc receptor (FCAR/CD89)-related killer Ig-like receptor (KIR) and leukocyte Ig-like receptor (LILR) genes in the leukocyte receptor complex at human chromosome 19q13.4, I postulated that a similar expansion of genes homologous to the classical FCR for IgG and IgE at 1q21-23 might exist. Using a bioinformatics approach, eight novel relatives in humans and six in mice were found. These studies also uncovered a fourth FCR for IgG (FcgammaRIV) in mice. FCRLs are phylogenetically-conserved in vertebrates and first evident in bony fish. They generally encode type I transmembrane glycoproteins with variable numbers of Ig-like extracellular domains (2-9) and cytoplasmic tyrosine-based signaling motifs. FCRL transcript expression is primarily restricted to lymphoid tissues and B cells. The generation of receptor-specific monoclonal antibodies (mAbs) has enabled analysis of their protein distribution on subpopulations of B lineage cells in humans and mice.
   a. **Davis RS**, Wang YH, Kubagawa H, Cooper MD. Identification of a family of Fc receptor homologs with preferential B cell expression. Proc Natl Acad Sci U S A. 2001 Aug 14;98(17):9772-7. PubMed PMID: 11493702; PubMed Central PMCID: PMC55528.
   b. Won WJ, Foote JB, Odom MR, Pan J, Kearney JF, and **Davis RS.** Fc receptor homolog 3 is a novel immunoregulatory marker of marginal zone and B1 B cells. J Immunol. 2006 Nov 15;177(10):6815-23. PubMed PMID: 17082595.
   c. **Davis RS**. Fc receptor-like molecules. Annu Rev Immunol. 2007;25:525-60. PubMed PMID: 17201682.
   d. Hirano M, **Davis RS**, Fine WD, Nakamura S, Shimizu K, et al. IgEb immune complexes activate macrophages through FcgammaRIV binding. Nat Immunol. 2007 Jul;8(7):762-71. PubMed PMID: 17558411.

2. Work by our group and in collaboration has investigated the regulatory properties of FCRLs. Because these proteins have cytoplasmic immunoreceptor tyrosine-based inhibition motifs (ITIM) and/or sequences that resemble immunoreceptor tyrosine-based activation motifs (ITAM), they are predicted to modulate B cell receptor (BCR)-mediated signaling and function. These features have been explored for both human and mouse FCRLs. Intriguingly, while the ITAM-bearing human FCRL1 molecule can augment BCR function, by contrast FCRL5, which has two ITIM, can recruit the SHP-1 and SHP-2 phosphatases to suppress BCR activation. However, the possession of both types of intracellular motifs in most FCRL tails suggests these proteins have complex dual-regulation. Recent studies of FCRL5 in mice support this hypothesis and have shown its capacity to recruit the Lyn Src family kinase as well as the SHP-1 phosphatase.
   a. Ehrhardt GR, **Davis RS**, Hsu JT, Leu CM, Ehrhardt A, et al. The inhibitory potential of Fc receptor homolog 4 on memory B cells. Proc Natl Acad Sci U S A. 2003 Nov 11;100(23):13489-94. PubMed PMID: 14597715; PubMed Central PMCID: PMC263841.
   b. Leu CM, **Davis RS**, Gartland LA, Fine WD, Cooper MD. FcRH1: an activation coreceptor on human B cells. Blood. 2005 Feb 1;105(3):1121-6. PubMed PMID: 15479727.
   c. Haga CL, Ehrhardt GR, Boohaker RJ, **Davis RS**, Cooper MD. Fc receptor-like 5 inhibits B cell activation via SHP-1 tyrosine phosphatase recruitment. Proc Natl Acad Sci U S A. 2007 Jun 5;104(23):9770-5. PubMed PMID: 17522256; PubMed Central PMCID: PMC1887609.
   d. Zhu Z, Li R, Li H, Zhou T, **Davis RS**. FCRL5 exerts binary and compartment-specific influence on innate-like B-cell receptor signaling. Proc Natl Acad Sci U S A. 2013 Apr 2;110(14):E1282-90. PubMed PMID: 23509253; PubMed Central PMCID: PMC3619311.

3. A hurdle for understanding their biological roles in normal and disease states has been the enigmatic nature of FCRL ligands. We have used different strategies to pursue this aspect of their function. Recent work has uncovered MHC-related molecules as interacting counterparts for two FCRLs and Ig for other members. Using a cell-based reporter system we found that human FCRL6, which is expressed by cytotoxic NK and T cells, interacts with HLA-DR proteins. Notably, FCRL6 appeared to vary in its binding affinity according to the DR beta-chain allotype. This finding suggests that cytotoxic lymphocytes that are classically known to associate through MHC class I can also interact via MHCII. Discovery of this

association is expected to provide new insight into MHC II-related disorders and has disclosed that long-known conserved structural relationships for Ig and MHC also extend to FCR and FCRL receptors that they interact with.

a. Campbell JA, **Davis RS**, Lilly LM, Fremont DH, French AR, et al. Cutting edge: FcR-like 5 on innate B cells is targeted by a poxvirus MHC class I-like immunoevasin. J Immunol. 2010 Jul 1;185(1):28-32. PubMed PMID: 20519648; PubMed Central PMCID: PMC3321838.

b. Schreeder DM, Cannon JP, Wu J, Li R, Shakhmatov MA, and **Davis RS.** Cutting edge: FcR-like 6 is an MHC class II receptor. J Immunol. 2010 Jul 1;185(1):23-7. PubMed PMID: 20519654.

c. Santiago T, Kulemzin SV, Reshetnikova ES, Chikaev NA, Volkova OY, Mechetina LV, Zhao M, **Davis RS**, et al. FCRLA is a resident endoplasmic reticulum protein that associates with intracellular Igs, IgM, IgG and IgA. Int Immunol. 2011 Jan;23(1):43-53. PubMed PMID: 21149418; PubMed Central PMCID: PMC3003704.

4. As a physician-scientist my clinical focus is treating patients with lymphoproliferative disorders and in particular, the most common leukemia in Western countries, B cell chronic lymphocytic leukemia (CLL). For more than a decade I have enrolled CLL patients and donors with related immune-disorders for blood specimen collection with IRB-approval. These cryopreserved samples (~300) have been a valuable resource for my program's studies as well as that of our collaborators. To initiate examination of their roles in B cell malignancies, we phenotyped well-characterized CLL samples with a panel of FCRL1-5 specific mAbs and analyzed the results in relation to clinical and standard prognostic factors. FCRL2 emerged as the most robust marker of the indolent disease subtype (mutated IGHV) and was superior in predicting IGHV status and time to first therapy compared to currently employed factors (CD38/ZAP-70). Validation of FCRL2 as a new clinical diagnostic marker and its use as a fundamental tool to unearth the pre-transformed CLL counterpart in the healthy polyclonal B cell repertoire are ongoing.

   a. Li FJ, Ding S, Pan J, Shakhmatov MA, Kashentseva E, Wu J, Li YF, Soong SJ, Chiorazzi N, and **Davis RS.** FCRL2 expression predicts IGHV mutation status and clinical progression in chronic lymphocytic leukemia. Blood. 2008 Jul 1;112(1):179-87. PubMed PMID: 18314442; PubMed Central PMCID: PMC2435687.

   b. Schreeder DM, Pan J, Li FJ, Vivier E, **Davis RS**. FCRL6 distinguishes mature cytotoxic lymphocytes and is upregulated in patients with B-cell chronic lymphocytic leukemia. Eur J Immunol. 2008 Nov;38(11):3159-66. PubMed PMID: 18991291; PubMed Central PMCID: PMC2742621.

   c. Xiao W, Hong H, Kawakami Y, Kato Y, Wu D, Yasudo H, Kimura A, Kubagawa H., Bertoli LF, **Davis RS,** et al. Tumor suppression by phospholipase C-beta3 via SHP-1-mediated dephosphorylation of Stat5. Cancer Cell. 2009 Aug 4;16(2):161-71. PubMed PMID: 19647226; PubMed Central PMCID: PMC2744338.

   d. Allendorf DJ, **Davis RS**. Unraveling the molecular pathogenesis of chronic lymphocytic leukemia: dissecting a microRNA regulatory network. JAMA. 2011 Jan 5;305(1):95-7. PubMed PMID: 21205973.

5. Associations for the FCRLs with humoral immune disorders and autoimmunity (AI) have been growing. A seminal paper by Kochi et al. (Nat Genetics 37:478-85; 2005) surveyed 41 single nucleotide polymorphisms (SNP) encompassing the FCRL1-5 locus at 1q21 in a large Japanese cohort of rheumatoid arthritis and lupus patients. A SNP in the FCRL3 gene promoter (-169) that confers a more orthodox NF-kappaB consensus binding site strongly correlated with AI disease risk, auto-antibody production, and FCRL3 transcript expression. Subsequent studies (>90 publications) have validated the significance of this SNP and its potential as a general AI susceptibility factor. However, the mechanistic basis for these observations remains undefined. With healthy and lupus donor blood samples we first confirmed that FCRL3 protein expression correlates with the -169 SNP genotype. More recently we found that FCRL3 ligation promotes CPG/TLR9-mediated B cell activation, proliferation, and survival, but halts the differentiation of antibody secreting cells by an ERK and BLIMP1-depedent mechanism. These findings indicate an important role for the disease-related FCRL3 receptor in modulating B cell function and antibody production.

   a. Gibson AW, Li FJ, Wu J, Edberg JC, Su K, Cafardi J, Kimberly RP, and **Davis RS.** The FCRL3-169CT promoter single-nucleotide polymorphism, which is associated with systemic lupus erythematosus in a

Japanese population, predicts expression of receptor protein on CD19+ B cells. Arthritis Rheum. 2009 Nov;60(11):3510-2. PubMed PMID: 19877046; PubMed Central PMCID: PMC2784265.

b. Li FJ, Schreeder DM, Li R, Wu J, **Davis RS**. FCRL3 promotes TLR9-induced B-cell activation and suppresses plasma cell differentiation. Eur J Immunol. 2013 Nov;43(11):2980-92. PubMed PMID: 23857366; PubMed Central PMCID: PMC3838486.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/myncbi/randall.davis.1/bibliography/41154921/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

2014/01/01-2015/12/31
R21 CA175912, National Cancer Institute (NCI) DAVIS,
RANDALL S (PI)
Cellular and Biologic Origins of CLL
The major goal of this project is to investigate the potential of FCRL2 as an etiologic factor in CLL disease pathogenesis.

2012/12/01-2015/11/30
Novel Research Grant Program, Lupus Research Institute
DAVIS, RANDALL S (PI)
Biological Role of FCRL Molecules in SLE Pathogenesis
The major goal of this project is to examine the impact of novel protein interactions involving well-recognized genetic risk factors for lupus and FCRL molecules on B cell biology.

2012/08/21-2015/07/31
R21 AI097729, National Institute of Allergy and Infectious Diseases (NIAID) DAVIS,
RANDALL S (PI)
Modeling FCRL6 regulation and function in transgenic mice
Major goal of this project is to generate and characterize FCRL6 transgenic mice.

2011/08/19-2015/07/31
R33 CA161731, National Cancer Institute (NCI) DAVIS,
RANDALL S (PI)
Validating a novel biomarker of clinical progression and survival in CLL
Major goals of this project are to optimize the detection of FCRL2 on CLL cells and validate and qualify the prognostic importance of FCRL2 in predicting CLL aggression.

2014/07/18-2015/06/30
R56 AI110553, National Institute of Allergy and Infectious Diseases (NIAID) DAVIS,
RANDALL S (PI)
Roles of FCRL Molecules in Innate Immunity
The major goal of this project is to investigate the roles of FCRL molecules in innate biological responses.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Elson, Charles O.

eRA COMMONS USER NAME (credential, e.g., agency login): coelson

POSITION TITLE: Professor of Medicine and Microbiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Notre Dame, South Bend, IN	B.A.	06/1964	Pre-Med/Gen. Science
Washington University, St. Louis, MO	M.D.	06/1968	Medicine

A. Personal Statement

I have been an active investigator in biomedical research in the area of mucosal immunology and inflammation for 30 years. I am a Founder and Past President of the Society for Mucosal Immunology. I have been very active working with and have served as Chairman of the National Scientific Advisory Committee of the Crohn's and Colitis Foundation of America. I have served as a member of the Advisory Council of the National Institutes of Diabetes, Digestive, and Kidney Diseases. I have direct experience with many animal models of inflammatory bowel disease and have been the principal investigator for a Program Project Grant that has pioneered the use of experimental mouse models of inflammatory bowel disease to study pathogenesis and therapy.

I have mentored many trainees over the years, including pre-doctoral Ph.D. students, post-doctoral Ph.D. trainees, and M.D. trainees, both Residents and Fellows. I currently have two pre-doctoral Ph.D. students, one post-doctoral Fellow, and an M.D. Resident working in the laboratory here at U.A.B. I am currently mentoring a Pediatric Rheumatologist who is interested in the role of the microbiota in pediatric spondyloarthropathy. I have been studying the immune response to the microbiota in experimental models and patients with IBD, and have cloned a number of microbiota antigens that drive disease. I have interacted with members of the Division of Rheumatology and Clinical Immunology for many years and have been a P.I. on multi-investigator grants with these faculty. We hold a weekly seminar series of work-in-progress in mucosal immunology at which trainees present and get constructive feedback. This series is used also for presentation of potential grant applications for review and feedback, which provides trainees exposure to this aspect of research. My colleagues and I share expertise, techniques, and lab equipment and our trainees are able to utilize resources in the other labs. This provides a very collegial environment for training. I participate in the Mucosal Immunology Course that's given yearly in the Graduate School and trainees in my lab all take this course. Our trainees also mingle with students in other labs in the Shelby Building, in which there are 5 floors dedicated to immunology. There is a weekly Immunology Seminar that is given either by U.A.B. faculty or outside speakers and the trainees are all expected to attend these seminars. There is also a regular Journal Club in mucosal immunology that is widely attended.

B. Positions and Honors

Positions and Employment

1968-1969 Intern in Medicine, Cornell University Hospital
1969-1970 Assistant Resident in Medicine, Cornell University Hospitals
1970-1972 Major, Medical Corps, United States Army
1972-1973 Senior Resident in Medicine, University of Chicago Hospitals
1973-1975 N.I.H. Fellow in Gastroenterology, University of Chicago
1975-1976 Instructor in Medicine, The University of Chicago
1976-1978 Assistant Professor of Medicine, The University of Chicago
1976-1980 Expert, Immunophysiology Section, Metabolism Branch, National Cancer Institutes, Bethesda, MD

1980-1986	Associate Professor of Medicine, Medical College of Virginia, Richmond, VA
1982-1986	Associate Professor of Microbiology and Immunology, Medical College of Virginia, Richmond, VA
1986-1987	Professor of Medicine and of Microbiology and Immunology, Medical College of Virginia, Richmond, VA
1987-present	Professor of Medicine, University of Alabama at Birmingham, Birmingham, AL
1987-2001	Director, Division of Gastroenterology, University of Alabama at Birmingham, Birmingham, AL
1989-2002	President, Society for Mucosal Immunology
2001-2009	Vice Chair of Research, Department of Medicine, University of Alabama at Birmingham, Birmingham, AL
1990-present	Professor of Microbiology, University of Alabama at Birmingham
1997-present	Basil I. Hirschowitz Chair in Gastroenterology

Other Experience and Professional Memberships

1968-	Alpha Omega Alpha
1976-	American Gastroenterological Association
1975-	American College of Physicians
1976-	American Federation for Clinical Research
1983-	American Association of Immunologists
1983-	Gastroenterology Research Group
1987-	Society for Mucosal Immunology
1988-	Clinical Immunology Society
1988	NIH Alumni Association
1988-1993	Member of Editorial Board, *Gastroenterology*
1988-1993	Member of Editorial Board, *Infection and Immunity*
1985-1989	Member, Subcommittee C, NIDDK Special Grants Review Committee
1987-1989	Chairman, Subcommittee C, NIDDK Special Grants Review Committee
1990-	American Society for Microbiology
1992-	Southern Society for Clinical Investigation
1994-	Association of Subspecialty Professors
1995-	New York Academy of Sciences
1998-	Association of American Physicians
1999-2002	Chairman, National Scientific Advisory Committee, CCFA
2002-	American Academy of Microbiology
2007-2010	Member, Advisory Council, National Institutes of Diabetes, Digestive, and Kidney Diseases, NIH
2013-	National Academy of Inventors

Honors

1998	Elected to Membership, Association of American Physicians
2002	Elected to Fellowship, American Academy of Microbiology
2008	Alumni Achievement Award, Washington University School of Medicine
2011	Scientific Achievement Award for IBD Basic Research, Crohn's and Colitis Foundation of America
2013	Elected to Membership, National Academy of Inventors

C. Contributions to Science

1. Discovery of cholera toxin as a mucosal adjuvant. At the time these studies were done, it was known that feeding protein antigens to mice resulted in a state of tolerance rather than immunity with the one exception being cholera toxin. In a series of studies I showed that administering an experimental antigen, KLH, along with cholera toxin intragastrically abrogated oral tolerance to the KLH and, instead, induced mucosal tolerance. These studies were the subject of my first NIH grant and were performed by myself and a technician. They were soon widely replicated and today cholera toxin has become the mucosal equivalent of Freund's adjuvant, enabling numerous studies in mucosal immunology. We went on to show that the immunogenicity and adjuvanticity of cholera toxin were linked and both were genetically regulated by the MHC class II gene. We also determined that upregulation of co-stimulatory molecules on antigen presenting cells was at least one of the mechanisms of cholera toxin's effects.

a. **Elson, C.O.** and Ealding, W. Generalized systemic and mucosal immunity in mice after mucosal stimulation with cholera toxin. J. Immunol. 132:2736, 1984.
b. **Elson, C.O.** and Ealding, W. Cholera toxin feeding did not induce oral tolerance in mice and abrogated oral tolerance to an unrelated protein antigen. J. Immunol. 133:2982, 1984.
c. **Elson, C.O.** and Ealding, W. Genetic control of the murine immune response to cholera toxin. J. Immunol. 135:930-932, 1985.
d. Cong, Y., Weaver, C.T., and **Elson, C.O.** The mucosal adjuvanticity of cholera toxin involves enhancement of costimulatory activity by selective upregulation of B7.2 expression. J Immunol. 159:5301-5308, 1997.

2. Development of mouse models of colitis. I am clinical gastroenterologist and consultant and mainly treat patients with inflammatory bowel disease. In the 1980s there were a variety of autoimmune models in mice, but none in inflammatory bowel disease. My group published one of the earliest papers on dextran sulfate sodium-induced colitis, showing that it occurred in mice lacking an adaptive immune system, and thus was an innate immune model. We were also the first to adapt the trinitrobenzene sulfonic acid enema model to mice, which had previously only been done only in rats. These two models have become widely used since then. On behalf of the Crohn's and Colitis Foundation, I visited the Jackson Laboratory and established a collaboration with Drs. Edward Birkenmeier, John Sundberg, and Edward Leiter. This collaboration resulted in the discovery of a spontaneous model of colitis, C3H/HeJBir, which at the time was the only spontaneous model of colitis. This model and the others became the subject of a Program Project Grant, which I have held for the past 20 years. In collaborations with Dr. Ed Leiter we later established that such colitis was under genetic control and using the C3H/HeJBir mouse, identified a major locus on chromosome 3, Cdcs1, which regulates the innate and adaptive immune response to the microbiota.

a. Dieleman, L.A., Ridwan, B.U., Tennyson, G.S., Beagley, K.W., Bucy, R.P., **Elson, C.O.** Dextran sulfate sodium (DSS)-induced colitis occurs in severe combined immunodeficient (SCID) mice. Gastroenterology 1994;107:1643-1652.
b. **Elson, C.O.**, Beagley, K.W., Sharmanov, A.T., Fujihashi, K., Kiyono, H., Tennyson, G.S., Cong, Y., Black, C.A., Ridwan, B.W. and McGhee, J.R. Hapten-induced model of murine inflammatory bowel disease. Mucosal immune responses and protection by tolerance. J. Immunol. 1996; 157:2174-2185.
c. Sundberg, J.P., **Elson, C.O.**, Bedegian, H. and Birkenmeier, E.H. Spontaneous heritable colitis in a new substrain of C3H/HeJ mice. Gastroenterology 1994;107:1726-1735.
d. Farmer, M.A., Sundberg, J.P., Bristol, I.J., Churchill, G.A., Li, R., **Elson, C.O.**, Leiter, E.H. A major quantitative trait locus on chromosome 3 controls colitis severity in IL-10-deficient mice.. Proc. Natl. Acad. Sci. U.S.A. 2001; 98: 13820-13825.

3. Regulation of the CD4 T cell response to the microbiota. At the time that we began our studies on the mechanism of colitis in C3H/HeJBir mice, the CD45RB^{hi} transfer model had been published by Phil Morrissey and then by Fiona Powrie. The CD45RB transfer model showed that among CD4 T cells, there were some that could cause colitis in mice when transferred into immunodeficient mice and others that can prevent such colitis. We determined that the C3H/HeJBir mice had serum IgG antibodies to a limited number of bands on Western Blots of the cecal bacteria. This led to the identification of CD4 T cells with the Th1 phenotype that were reactive to enteric bacterial antigens in the C3H/HeJBir mouse, which could transfer colitis to immunodeficient recipients. Thus, in the C3H/HeJBir mouse model, transfer of memory CD4 T cells caused colitis. We went on to show that interactions between CD40 and CD40 ligand were required for sustained release of IL-12 that maintained pathogenicity. In addition, T regulatory cells specific for enteric bacterial antigens were able to inhibit colitigenic CD4 T cell pathology. At the time these studies were done, the Th17 subset was not known. We went on to show that neutralization of IL-23p19 was able to prevent and treat colitis in this model, indicating an important role for the Th17 subset.

a. Cong, Y., Brandwein, S.L., McCabe, R.P., Lazenby, A., Birkenmeier, E.H., Sundberg, J.P. and **Elson, C.O.** CD4+ T cells reactive to enteric bacterial antigens in spontaneously colitic C3H/HeJBir mice. Increased Th1 response and ability to transfer disease. J. Exp. Med. 1998; 187:855-864.

b. Cong, Y., Weaver, C.T., Lazenby, A., **Elson, C.O.** Colitis induced by enteric bacterial antigen-specific CD4+ T cells requires CD40-CD40 ligand interactions for a sustained increase in mucosal IL-12. Journal of Immunology 2000; 165:2173-82.

c. Cong, Y., Weaver, C.T., Lazenby, A., **Elson, C.O.** Bacterial-reactive T regulatory cells inhibit pathogenic immune responses to the enteric flora. J Immunol 2002; 169:6112-6119.

d. **Elson CO**, Cong Y, Weaver CT, McClanahan TK, Fick RB, and Kastelein RA. Monoclonal anti-interleukin-23 reverses active colitis in a T cell-mediated model in mice. Gastroenterology. 2007; 132:2359-70.

4. Identification of flagellin as an immunodominant antigen in experimental colitis and in Crohn's disease. The limited number of bands we saw on the Western blots of C3H/HeJBir serum IgG indicated that the number of antigens driving colitis in this model was fairly limited. This led to a collaboration with Robert Hershberg, who was then at the Corixa Corporation in Seattle, an antigen discovery company. Using serologic expression cloning, we identified the bacterial antigens that were being recognized by serum IgG from C3H/HeJBir mice. Among these 60 antigens previously unknown flagellin molecules were identified. A CD4 T cell line specific for one of these flagellins, CBir1, induced colitis in immunodeficient recipients. About half of patients with Crohn's disease also had serum IgG to these flagellins. Patients with flagellin reactivity were shown to have a more complicated course with stricturing and fistulization of the small bowel and surgery. A number of the bacteria producing these flagellins were identified as predominantly coming from *Lachnospiraceae* of the Firmicute phylum. CD4 T cells reactive to these flagellins were identified in the lesions of Crohn's disease.

   a. Lodes MJ, Cong Y, **Elson CO**, Mohamath R, Landers CJ, Targan SR, Fort M, Hershberg RM. Bacterial flagellin is a dominant antigen in Crohn's disease. J Clin Invest 2004; 113:1296-1306.

   b. Targan SR, Landers CJ, Yang H, Lodes MJ, Cong Y, Papadakis KA, Vasiliauskas E, **Elson CO**, Hershberg RM. Antibodies to CBir1 flagellin define a unique response that is associated independently with complicated Crohn's disease. Gastroenterology. 2005;128:2020-8.

   c. Duck LW, Walter MR, Novak J, Kelly D, Tomasi M, Cong Y, and **Elson CO**. Isolation of flagellated bacteria implicated in Crohn's disease. Inflammatory Bowel Diseases. 2007; 10:1191-201.

   d. Shen, C., Landers, C.J., Derkowski, C., **Elson, C.O.**, Targan, S.R. Enhanced CBir1-specific innate and adaptive immune responses in Crohn's disease. Inflamm Bowel Dis 2008; 14:1641-51.

5. Identification of novel mechanisms of mucosal homeostasis using a CBir1 flagellin-specific CD4 TCR transgenic mouse. My colleague and collaborator, Yingzi Cong, and I generated clones specific for CBir1 flagellin in C57BL6 mice. We then used the TCR α and β sequence to generate a TCR transgenic mouse specific for this enteric bacterial protein. Interestingly, the CBir1 TCR transgenic mouse does not develop any intestinal inflammation. We demonstrated that this is due in part to a novel CD4 Treg-IgA pathway that had been previously unrecognized. IgA blocks the uptake of CBir1 flagellin into the host and this IgA is dependent on T regulatory cells in that their depletion results in a dramatic drop within days of IgA anti-flagellin and, in fact, total IgA in the pellets. We also showed that the CBir1 TCR Tg transfer model of colitis is highly dependent on innate immune stimulation by the microbiota. In collaborations with Yasmine Belkaid and Tim Hand at the NIH, CBir1 TCR transgenic cells were used as a reporter to show that an acute infection with toxoplasma gondii induces CD4 T cell responses to this gut bacterial flagellin and that long-lived memory CD4 T cells are generated during infection. In another collaboration with Greg Sonnenberg and Matthew Hepworth it was shown that MHC class II expressing innate lymphoid cells of the type 3 subset downregulate enteric bacterial CD4 T cells.

   a. Cong Y, Feng T, Fujihashi K, Schoeb TR, and **Elson CO**. Dominant, coordinated T regulatory cell-IgA response to the intestinal microbiota. PNAS USA. 2009; 106:19256-61.

   b. Feng T, Wang L, Schoeb TR, **Elson CO**, Cong Y. Microbiota innate stimulation is a prerequisite for T cell spontaneous proliferation and induction of experimental colitis. J Exp Med. 2010; 6:1321-32.

   c. Hand, T. W., Santos, Dos, L. M., Bouladoux, N., Molloy, M. J., Pagán, A. J., Pepper, M., et al. Acute Gastrointestinal Infection Induces Long-Lived Microbiota-Specific T Cell Responses. Science. 2012; *337*, 1553–1556.

d. Hepworth, M. R., Monticelli, L. A., Fung, T. C., Ziegler, C. G. K., Grunberg, S., Sinha, R., et al. (2013). Innate lymphoid cells regulate CD4(+) T-cell responses to intestinal commensal bacteria. Nature. 2013; 498:113–117.

Completed List of Published Work in MyBibliography
http://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/41161840/

D. Research Support

Ongoing Research Support

P01 DK01071176 (Elson, PI) 08/17/10-07/31/15
NIH/NIDDK
Innate and Adaptive Microbial Immunity in IBD
The goal of this project is to define the innate and adaptive immune response to the microbial flora and how that is altered in inflammatory bowel disease.

P60 AR048095 (Bridges, PI; Elson, PI, Project 3) 09/16/13 – 07/31/18
NIH/NIAMS
UAB Multidisciplinary Clinical Research Center – Project 3
Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.
Role: Project PI

ACR Grant #500680 (Stoll, P) 07/01/13 – 06/30/15
American College of Rheumatology
Exploration of the Gut Microbiome in Spondyloarthritis

CCFA 326556 (Virgin, HW, PI; Elson, CO, PI Proj 4) 10/01/14-09/30/17
Crohn's and Colitis Foundation of America
Ulcerative Colitis Genetics Initiative

R21 ES024413 (Stoll, PI) 08/01/14-07/31/16
NIEHS/NIH/DHHS
Interactions Between AHR Ligands and the Gut Microbiota in Murine Arthritis

Completed Research Support:

NIH R21 AI083484- (Cong, Y., PI) 07/01/09-06/30/11
NIH/NIDDK
Th17 cell regulation of intestinal IgA production

R24 DK064400 (Smith, PD) 06/01/03-05/31/13
NIH/NIDDK
Mucosal HIV and Immunobiology Center

R01 DK093015 (Weaver, PI) 12/01/11-11/30/14
Factors controlling effector T cell maintenance in the pathogenesis of colitis
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Feng, Xu

eRA COMMONS USER NAME (credential, e.g., agency login): fengxu

POSITION TITLE: Professor of Pathology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Fudan University, Shanghai, China	B.S.	07/1987	Biology
University of Vermont, Burlington, VT	Ph.D.	10/1994	Zoology/Molecular Biology
Washington University, St. Louis, MO	Postdoctoral	07/1999	Bone Biology

A Personal Statement

I have proven track record of prior success in training/mentoring predoctoral students and postdoctoral fellows. I have trained 6 graduate students in my laboratory. I consider graduate student training one of my important duties as a faculty member. As such, I am very devoted to graduate student training. First, I carefully choose hypothesis-driven research projects for my graduate students, and these projects are not only aimed at addressing important biological questions but also require the use of molecular and cell biology techniques. This will provide my graduate students an opportunity to learn key biomedical research technologies to carry out hypothesis-driven research. Moreover, I also place a special focus on encouraging my graduate students to improve their critical thinking and logical reasoning skills in the course of their graduate training. Finally, given the importance of communication and writing skills to a research career, I also try to work with my graduate students to improve their oral presentation and writing skills. My former graduate students all had a very successful training as evidenced by the quantity and quality of the papers they published as well as awards which they received during their graduate straining. Moreover, I have also trained more than 8 postdoctoral fellows and many of my former postdoctoral trainees have developed a successful academic career. The publications of my former trainees are provided below.

1. **Xu D**, Wang S, Liu W, Liu J, Feng X (2006) A novel receptor activator of NF-kappaB (RANK) cytoplasmic motif plays an essential role in osteoclastogenesis by committing macrophages to the osteoclast lineage. J Biol Chem. 281(8):4678-90. PMID: 16373338

2. **Wang S**, Shi Z, Liu W, Jules J, Feng X (2006) Development and validation of vectors containing multiple siRNA expression cassettes for maximizing the efficiency of gene silencing. BMC Biotechnol. 6:50. PMID: 17187675

3. **Jules J**, Shi Z, Liu J, Xu D, Wang S, Feng X (2010) Receptor activator of NF-{kappa}B (RANK) cytoplasmic IVVY535-538 motif plays an essential role in tumor necrosis factor-{alpha} (TNF)-mediated osteoclastogenesis. J Biol Chem. 285(48):37427-35. Epub 2010 Sep 24. PMID: 20870724; PMCID: PMC2988348

4. **Ashley JW**, Shi Z, Zhao H, Li X, Kesterson RA, Feng X (2011) Genetic ablation of CD68 results in mice with increased bone and dysfunctional osteoclasts. PLoS One. 6(10):e25838. PMID: 21991369; PMCID: PMC3185056

B. Positions and Honors

Positions and Employment:

1999-2000 Research Instructor, Dept of Pathology, Washington University School of Medicine, St. Louis, MO
2000-2005 Assistant Professor, Dept of Pathology, Univ of Alabama at Birmingham (UAB), Birmingham, AL
2000-pre Associate Scientist/Scientist, Center for Metabolic Bone Disease, UAB, Birmingham, AL
2001-pre Scientist, Center for Aging, UAB, Birmingham, AL
2005-pre Associate Scientist, Comprehensive Cancer Center, UAB, AL
2005-2012 Associate Professor, Dept of Pathology, UAB, Birmingham, AL
2012-pre Professor, Dept of Pathology, UAB, Birmingham, AL

Honors:

1997-1999 Individual National Research Service Award (NRSA), National Institutes of Health
2000 John Haddad Young Investigator Award, ASMBR/Advances in Mineral Metabolism
2004 Chair, Osteoclast session III, the 26th Annual meeting of ASBMR, October 1-5, 2004
2006 Chair, Osteoclast session II, the 28th Annual meeting of ASBMR, Sept 15-19, 2006

C. Contribution to Science

1. I have more than 21 years of research experience in bone biology with a primary focus on osteoclast biology. Thus, my major and long-term goals are to elucidate the molecular mechanism of osteoclast formation and function and also to delineate the molecular and cellular mechanism underlying the pathogenesis of bone loss in the various pathological disorders. One of our research objectives has been to investigate the regulatory role and signaling mechanism of the receptor activator of nuclear factor kappa B (RANK) and its cognate ligand (RANKL) in osteoclasts. The RANKL/RANK system plays a pivotal role in mediating the formation, function and survival. We have identified numerous RANK cytoplasmic motifs that mediate osteoclast formation, function and survival in vitro assays. We have also delineated the downstream signaling pathways activated by these functional RANK motifs and generated knockin mice to confirm the role of these RANK motifs in osteoclast biology in vivo. These studies have advanced our understanding of the molecular mechanism of osteoclast formation and function.

   a) Liu W, Xu D, Yang H, Xu H, Shi Z, Cao X, Takeshita S, Liu J, Teale M, **Feng X** (2004) Functional identification of three receptor activator of NF-kappa B cytoplasmic motifs mediating osteoclast differentiation and function. J Biol Chem. 279(52):54759-69. PMID: 15485878

   b) Liu W, Wang S, Wei S, Sun L, **Feng X** (2005) Receptor activator of NF-kappaB (RANK) cytoplasmic motif, 369PFQEP373, plays a predominant role in osteoclast survival in part by activating Akt/PKB and its downstream effector AFX/FOXO4. J Biol Chem. 280(52):43064-72. PMID: 16260781.

   c) Xu D, Wang S, Liu W, Liu J, **Feng X** (2006) A novel receptor activator of NF-kappaB (RANK) cytoplasmic motif plays an essential role in osteoclastogenesis by committing macrophages to the osteoclast lineage. J Biol Chem. 281(8):4678-90. PMID: 16373338.

   d) Cheng J, Liu J, Shi Z, Jules J, Xu D, Luo S, Wei S, **Feng X** (2012) Molecular mechanisms of the biphasic effects of interferon-γ on osteoclastogenesis. J Interferon Cytokine Res. 32(1):34-45. PMID: 22142221; PMCID: PMC3255520

2. Osteoclasts, our body's sole bone-resorbing cells, play a pivotal role in skeletal development and adult skeletal maintenance (bone remodeling). Nonetheless, abnormal elevation in osteoclast formation and function is implicated in the pathogenesis of various diseases including osteoporosis, bone erosion in rheumatoid arthritis, bone loss in periodontal disease and tumor (breast and prostate) skeletal metastasis. Thus, another objective is to delineate the molecular and cellular mechanism underlying the pathogenesis of bone loss in the various pathological disorders including bone erosion in rheumatoid arthritis. We have demonstrated that RANKL plays a crucial role in osteoclast formation mediated by proinflammatory cytokines such as TNF-α and IL-1. We are currently trying to understand whether any

of these RANK motifs can server as good therapeutic targets for bone erosion in rheumatoid arthritis. Thus, my ongoing research is highly relevant to rheumatic and musculoskeletal diseases.

a) Jules J, Shi Z, Liu J, Xu D, Wang S, **Feng X** (2010) Receptor activator of NF-{kappa}B (RANK) cytoplasmic IVVY535-538 motif plays an essential role in tumor necrosis factor-{alpha} (TNF)-mediated osteoclastogenesis. J Biol Chem. 285(48):37427-35. Epub 2010 Sep 24. PMID: 20870724; PMCID: PMC2988348

b) Jules J, Zhang P, Ashley JW, Wei S, Shi Z, Liu J, Michalek SM, **Feng X** (2012) Molecular basis of requirement of receptor activator of nuclear factor κB signaling for interleukin 1-mediated osteoclastogenesis. J Biol Chem. 287(19):15728-38. PMID: 22416138; PMCID: PMC3346127

c) Jules J, **Feng X** (2014) In vitro Investigation of the Role of Proinflammatory Cytokines Tumor Necrosis Factor-α and Interleukin-1 in Murine Osteoclastogenesis**.** Methods in Molecular Biology. 1155:109-23. PMID: 24788177. PMC-In Progress

Complete List of Published Work in MyBibiography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/xu.feng.1/bibliography/41144127/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

R01 AR47830 (Feng) 04/01/2001-03/31/2017
NIH/NIAMS
Role: Principal Investigator
Title: RANK Signaling in Osteoclast Formation and Function
The major goals of this project are to: 1) Delineate the molecular mechanism by which the IVVY motif regulates osteoclast formation; 2) Investigate the molecular mechanism of the dependence of the IVVY motif function on the two TRAF-binding sites; and 3) Investigate the role of the IVVY motif-binding protein in osteoclast formation in vivo.

R01 AR0560948 (Ponnazhagan) 09/01/2011-08/31/2016
NIH/NIAMS
Role: Collaborator
Title: Skeletal regeneration for non-union bone defect coupling angiogenesis and osteogenesis
The major goal of this project is to develop and test genetically-modified adult stem cells co-expressing angiogenic and osteogenic factors for non-union bone defect in a mouse model.

Completed Research Support

Predoctoral Fellowship (Feng/McCoy) 01/01/2011-12/31/2012
DoD Breast Cancer Program
Role: Mentor (Graduate student – Erin McCoy)
Title: Potential Role of CD68 in Breast Cancer Bone Metastasis
The objective of this training grant is to test the hypothesis that extracellular expression of CD68 plays an important role in BC bone metastasis by mediating BC cell attachment on bone. Specific Aims are 1) Further characterize the role of CD68 in BC cell attachment on bone *in vitro*; and 2) Investigate if CD68 is involved in BC bone metastasis in vivo using animal models

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Orlando M. Gutierrez, MD, MMSc

eRA COMMONS USER NAME (credential, e.g., agency login):ogutierrez

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Columbia University, New York, NY			Classics
John Carroll University, University Heights, OH	BS	06/1998	Biology
University of Toledo College of Medicine	MD	06/2002	Medicine
Harvard Medical School, Boston, MA	MMSc	07/2008	Clinical Research

A. Personal Statement

The focus of Dr. Gutiérrez's research efforts has been characterizing the role of disorders of bone and mineral metabolism and nutrition in the pathophysiology of cardiovascular disease, kidney disease progression, and death in patients with chronic kidney disease and in persons in the general population. This includes high-impact studies that have demonstrated the associations of disorders of phosphorus and vitamin D metabolism with adverse outcomes in individuals across the spectrum of kidney function. Dr. Gutiérrez has extensive experience in designing and completing both patient-oriented research studies and large epidemiological studies, including nested case-control and case-cohort studies in established cohorts such as the Accelerated Mortality on Renal Replacement (ArMORR) Study and the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study. He also actively participates in the mentoring of young clinical investigators, including medical students, residents, fellows and pre- and post-doctoral investigators, as highlighted in the following publications (* indicates trainee):

a. Hanks LJ*, Tanner RM, Muntner P, Kramer H, McClellan WM, Warnock DG, Judd SE, **Gutiérrez OM**. Metabolic subtypes and risk of mortality in normal weight, overweight and obese individuals with CKD. *Clin J Am Soc Nephrol* 2013; 8(12): 2064-71. PMC3848389

b. Hanks LJ*, Casazza K, Ashraf AP, Wallace S, **Gutiérrez OM**. Fibroblast growth factor 21, body composition, and insulin resistance in pre-pubertal and early pubertal males and females. *Clin Endocrinol* (Oxf.); 2015;82(4):550-6. PMC4289452

c. Panwar B*, Hanks LJ, Tanner RM, Muntner P, Kramer H, McClellan WM, Warnock DG, Judd SE, **Gutiérrez OM**. Obesity, metabolic health and risk of end-stage renal disease. *Kidney Int.* 2014; [Epub ahead of print] NIHMS643859

d. Panwar B*, Jenny NS, Howard VJ, Wadley WG, Muntner P, Kissela BM, Judd SE, **Gutiérrez OM**. Fibroblast growth factor 23 and risk of incident stroke in community-dwelling adults. *Stroke* 2015; 46(2):322-8. PMC4308535

These experiences position Dr. Gutiérrez to successfully serve as a mentor on this T32 training grant application.

B. Positions and Honors

2002-2003 Intern in Internal Medicine, Massachusetts General Hospital, Boston, MA
2003-2004 Assistant Resident in Internal Medicine, Massachusetts General Hospital
2004-2005 Senior Resident in Internal Medicine, Massachusetts General Hospital

2005-2008	Clinical and Research Fellow in Medicine (Nephrology), Massachusetts General Hospital, Brigham and Women's Hospital
2008-2010	Assistant Professor of Medicine, University of Miami Miller School of Medicine
2011-2013	Assistant Professor of Medicine, University of Alabama at Birmingham
2013-	Associate Professor of Medicine, University of Alabama at Birmingham
2011-	Assistant Professor of Epidemiology, University of Alabama at Birmingham
2011-	Section Head, Outcomes and Epidemiology Research, Division of Nephrology, UAB
2011-	Scientist, UAB Diabetes Research and Training Center
2011-	Associate Scientist, UAB Nutrition Obesity Research Center
2012-	Associate Scientist, Center for Metabolic Bone Disease, UAB

Honors

1997	Howard Hughes Summer Research Fellow (Case Western Reserve University)
1999	Donald H. Clifford Memorial Scholarship (Medical College of Ohio)
2001	Medical College of Ohio Satellites Scholarship for Academic Achievement
2002	Medical College of Ohio Microbiology and Immunology Award
2002	Alpha Omega Alpha Honor Medical Society Induction
2002	ACP Outstanding Student Entering Internal Medicine
2002	Medical College of Ohio Dean's Award
2005	1st Place Resident Clinical Research Award, Department of Medicine (abstract)
2005	Massachusetts General Hospital Clinical Research Award (abstract)
2006-2008	American Kidney Fund Clinical Scientist in Nephrology Fellowship
2007	NIH Clinical Loan Repayment Program Award Recipient
2008	Valedictorian, Scholars in Clinical Science Program (MMSc program)
2014	Education Supplemental Award (in recognition of outstanding evaluations by medical students and residents)

Editorial Boards and Peer Review

- *Ad hoc* reviewer for the Journal of the American Society of Nephrology, the American Journal of Kidney Disease, Kidney International, Nephrology Dialysis and Transplantation, Clinical Journal of the American Society of Nephrology.
- Abstract reviewer, American Society of Nephrology (2009, 2011, 2012, 2013, 2014)
- *Ad Hoc* Reviewer, National Institutes of Health; Kidney, Nutrition, Obesity and Diabetes (KNOD) Study Section (October, 2012; June, 2014)
- *Ad Hoc* Reviewer, National Institutes of Health; NIDDK Intramural grant program (March, 2014)
- *Ad Hoc* Reviewer, National Institutes of Health; Neurological, Aging and Musculoskeletal Epidemiology (NAME) Study Section (February, 2015)
- Chair, American Kidney Fund Clinical Scientist in Nephrology Committee

C. Contributions to Science

1. Our group has primarily focused on elucidating the relationships between disturbances in mineral metabolism and clinical outcomes, with a special interest in behavioral and environmental exposures that may modulate this pathways. Within this area of interest, we have primarily focused on the connections between disturbances in phosphorus metabolism and cardio- and cerebrovascular morbidity and mortality, including the emerging role of fibroblast growth factor 23 (FGF23). We were among the first to show that higher FGF23 concentrations were associated with adverse outcomes, including mortality on dialysis and greater prevalence of left ventricular hypertrophy. Important publications which have been generated from this work are highlighted below:

    a. **Gutiérrez O**, Isakova T, Rhee E, Holmes J, Collerone G, Jueppner H, Wolf M. Fibroblast Growth Factor 23 Mitigates Hyperphosphatemia but Accentuates Calcitriol Deficiency in Chronic Kidney Disease. *J Am Soc Nephrol* 2005; 16:2205-15.

    b. **Gutiérrez OM**, Mannstadt M, Isakova T, Rauh-Hain JA, Tamez H, Shah A, Smith K, Lee H, Thadhani R, Jüppner H, Wolf M. Fibroblast Growth Factor

23 and Mortality among Hemodialysis Patients. *N Engl J Med* 2008; 359:584-592. PMC2890264

c. **Gutiérrez OM**, Januzzi JL, Isakova T, Laliberte K, Smith K, Collerone G, Sarwar A, Hoffmann U, Coglianese E, Christenson R, Wang TJ, DeFilippi C, Wolf M. Fibroblast Growth Factor 23 and Left Ventricular Hypertrophy in Chronic Kidney Disease. *Circulation*, 2009; 119:2545-2552. PMC2740903

2. We have also had a special focus on factors which contribute to racial disparities in renal and cardiovascular outcomes. Within this area of interest, we have focused on how disparities in mineral metabolism impact key factors related to adverse outcomes in kidney disease. To this end, we were the first group to document that disparities in socioeconomic status partly underlie the higher prevalence and severity of disorders of mineral metabolism in African Americans as compared to European Americans. Further, we were among the first groups to characterize the role of racial differences in vascular injury in the etiology of disparities of cardiovascular outcomes by race.

   a. **Gutiérrez OM**, Anderson C, Isakova T, Scialla J, Negrea L, Anderson AH, Bellovich K, Chen J, Robinson N, Ojo A, Lash J, Feldman HI, Wolf M. Low Socioeconomic Status Associates with Higher Serum Phosphate Irrespective of Race. *J Am Soc Nephrol*. 2010; 21: 1953-1960. PMC3014009

   b. **Gutiérrez OM**, Judd SE, Muntner P, Rizk DV, McClellan WM, Safford MM, Cushman M, Kissela BM, Howard VJ, Warnock DG. Racial differences in albuminuria, kidney function and risk of stroke. *Neurology*. 2012; 79(16):1686-92. PMC3468778

   c. **Gutiérrez OM**, Khodneva YA, Muntner P, Rizk DV, McClellan WM, Cushman M, Warnock DG, Safford MM. Association between urinary albumin excretion and coronary heart disease in black versus white adults. *JAMA* 2013; 310(7):706-713. PMC3837520

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/12kY7ws2mgf/bibliography/40542341/public/?sort=date&direction=ascending

D. Research Support:

Active

R01 NS080850 (Gutiérrez) NIH/NINDS 10/01/2012 – 09/30/2017
Impact of disordered mineral metabolism on stroke and cognitive impairment.
The goal of this project is to prospectively examine the associations of vitamin D deficiency and excess fibroblast growth factor 23 concentrations with incident stroke and cognitive impairment in participants of the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study.

R03 DK095005 (Gutiérrez) NIH/NIDDK 6/01/2012 - 5/30/2015
Phosphorus-based Food Additives, Mineral Metabolism and Cardiovascular Health.
The goal of this project is to examine the impact of phosphorus-based food additives in commercially processed foods on mineral metabolism, inflammation, and vascular function in healthy volunteers.

P30 DK079337 (Agarwal) NIH/NIDDK 07/01/2013 – 06/30/2018
UAB-UCSD O'Brien core center for acute kidney injury research
The main objective of this core center is to provide scientifically rigorous, state-of-the-art methodologies in a cost-effective manner to address experimental questions that will advance our understanding of the pathophysiology of acute kidney injury, enhance our diagnostic specificity and expand our therapeutic and preventive approaches for acute kidney injury, specifically in the intensive care unit and in the setting of kidney transplantation.

No Number Assigned (Gutiérrez) 02/01/2015-12/31/2015

NRTC Anderson Innovation Grant
Characterization of HDL subfractions by *APOL1* risk status in African Americans
The main goal of this project is to examine potential functional and structural differences in small HDL particles by *APOL1* nephropathy risk status in African Americans.

Pending

No Number Assigned (Muntner) 04/01/2015-03/31/2019
American Heart Association
University of Alabama at Birmingham Strategically Focused Hypertension Research Center.
Role: co-investigator

Completed

K23 DK081673 (Gutiérrez) NIH/NIDDK 08/01/2008-06/30/2013
Racial Differences in Phosphorus Metabolism in Health and in Kidney Disease
The goal of this project is to examine racial differences in the metabolism of phosphorus in health and chronic kidney disease in the effort to identify novel risk factors for racial disparities in cardiovascular and kidney disease progression.

No Number Assigned (Warnock) Amgen 12/22/2003 – 4/30/2014
Renal Ancillary Study of the REGARDS Study (Renal REGARDS)
The objectives of this investigator-initiated study is to determine if anemia and chronic kidney disease are important variables that contribute to the incidence of new cerebrovascular events during the 10 years of the follow-up of the REGARDS cohort.

No Number Assigned (Gutiérrez) UAB DRTC 02/15/2012 – 02/14/2013
Advanced glycation end-products, inflammation and insulin resistance in chronic kidney disease
The objectives of this pilot/feasibility study are to examine the impact of diet-derived advanced glycation end-products on inflammation, insulin resistance and vascular reactivity in patients with chronic kidney disease.

American Kidney Fund Clinical Scientist in Nephrology Fellowship – (Gutiérrez) 07/01/2006 – 06/30/2008
Title: “Assessment of phosphorus intake and vitamin D deficiency in non-invasive measurements of cardiovascular disease in chronic kidney disease.”

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Hsu, Hui-Chen

eRA COMMONS USER NAME (credential, e.g., agency login): HSUHUI

POSITION TITLE: Associate Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Chinese Culture University, Taipei, Taiwan	B.S.	06/1986	Nutritional Sciences
Rutgers University	M.S.	01/1990	Nutritional Sciences
Rutgers University	Ph.D.	05/1995	Nutritional Sciences

A. Personal Statement

Dr. Hsu's laboratory provides a unique opportunity to study the regulation of multiple types of immune cells in both humans and mice. Dr. Hsu has many years of interest and experience in studying mechanisms of aging and autoimmune disease. Dr. Hsu is the investigator who identified that autoimmune BXD2 mice exhibit unique features, including spontaneous formation of germinal centers, increased expression of activation-induced cytidine deaminase (AID), increased production of pathogenic autoantibodies that are polyreactive, significantly increased percentage of IL-17^{high} CD4 T_H cells (T_H-17) and IL-$17R^{high}$ B cells, and significantly increased numbers of type I interferon producing plasmacytoid dendritic cells in the spleens of these mice.

Recently, Dr. Hsu has developed a two-tiered peptide microarray approach, coupled with epitope mapping of known autoantigens, to identify and characterize autoepitopes recognized by BXD2 autoreactive B cells. Using this method, tetramers were prepared from two linear peptides derived from two ribonucleic acid binding proteins (RBP): lupus La and 70 kDa U1 small nuclear ribonucleoprotein (snRNP). Dr. Hsu and colleagues have subsequently identified that there was reduction of transitional T1 B cells associated with a significantly higher frequency and greater numbers of RBP-reactive marginal zone precursor (MZ-P), transitional T3 and PDL-$2^{+}CD80^{+}$ memory B cells in BXD2 mice, compared to B6 mice. Interestingly, a deficiency of IL-17RA in BXD2 mice normalized these phenotypes. The results suggest that the enhanced IL-17RA signaling in BXD2 mice is associated with a general B-cell tolerance defect. Dr. Hsu currently actively pursues the mechanisms leading to IL-17 mediated B-cell tolerance loss in BXD2 mice.

1. **Hsu H-C***, Yang PA, Wu Q, Riley M, Wang J, Chen J, Tousson A, Stanus AA, Le TV, Xu H, Lorenz RG, Kolls J, Carter RH, Chaplin D, Lu L, Williams RW and Mountz JD*. 2008. Interleukin 17–producing T helper cells and interleukin 17 orchestrate autoreactive germinal center development in autoimmune BXD2 mice. *Nature Immunol* 9:166-175 (* corresponding author). PMID:18157131 [PMCID – in process]
2. Wang JH, Li J, Wu Q, Yang P, Pawar RD, Xie S, Timares L, Raman C, Chaplin DD, Lu L, Mountz JD, **Hsu HC**. 2010. Marginal zone precursor B cells as cellular agents for Type I IFN-promoted antigen transport in autoimmunity. *The Journal of Immunology* 184: 442 -451. PMC2830207.
3. Hamilton JA, Li J, Wu Q, Yang PA, Luo B, Li H, Bradley JE, Taylor JE, Randall TD, Mountz JD, and **Hsu H-C**. General Approach for Tetramer Based Identification of Autoantigen Reactive B Cells: Characterization of La and snRNP Reactive B Cells in Autoimmune BXD2 Mice. J Immunol, April 17, 2015 1402335. 2015. NIHMS 674165 [In Process].

B. Positions and Honors

Positions:

1991-1995 Graduate Assistant, Program in Clinical Pharmacology, Department of Medicine, University of Medicine & Dentistry of New Jersey-Robert Wood Johnson Medical School, New Brunswick, NJ.
1995-1999 Postdoctoral Fellow, Department of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL.
1999-2001 Instructor, Department of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL.
1999-present Associate, Center for Aging, University of Alabama at Birmingham, Birmingham, AL.
2001-2008 Assistant Professor, Department of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL.
2002-present Assistant Director, Center for Aging, Biology Section, University of Alabama at Birmingham, Birmingham, AL.
2008-present Associate Professor, Department of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL.

Honors and Awards:

1992 Clinical Immunology Society Science Recognition Award for New Investigator in the 7th Annual Conference of Clinical Immunology.
1992 First Place for Excellence in Inflammation Research in C. Gordon Van Armon Award competition in the 6th International Inflammation Research Association Conference.
1992 Gina Finzi Memorial Student Summer Fellowship; Lupus Foundation of America, Inc.
1992 Second Prize Award for Excellence in Research in the Department of Medicine Annual Poster Symposium, UMDNJ-Robert Wood Johnson Medical School.
1993 Student Travel Award at the National Meeting of the American College of Rheumatology.
1994 Trainee Investigator Award for Excellence in Scientific Research in the National Meeting of American Federation of Clinical Research
1995 Chapter Grant Recipient from Arthritis Foundation New Jersey Chapter.
1997 Post-postdoctoral Fellowship from Arthritis Foundation.
1999 Huang Foundation Trainee Award from American Association of Immunologists.
2001 Young Faculty Research Award from Southern Society for Clinical Investigation.
2003 First Place for UAB Center for Aging Scientific Program Abstract Competition: Biology of Aging Area.
2009-11 UAB Department of Medicine, Research Excellence Supplementary Award.
2013 UAB Department of Medicine, Research Excellence Supplementary Award.

C. Contribution to Science

1. Dr. Hsu initially studied activation and activation-induced cell death (AICD) of T cells and has utilized inbred strains, transgenic, as well as knockout mice extensively to study the immune mechanisms associated with T-cell senescence and other immune defects. Dr. Hsu is the investigator to observe that increased serum amyloid A deposit in the glomeruli is associated with renal amylodosis and increased acute immune responses in aged CD2-Fas transgenic mice. Dr. Hsu also used a cell tracker dye labeling and an *in vivo* adoptive transfer strategy to demonstrate that CD8 T cells from aged mice exhibited defective activation-induced cell death both *in vitro* and *in vivo*. Dr. Hsu and Dr. Mountz have co-established BXD recombinant inbred strain mouse colony to facilitate the genetic linkage analysis T-cell senescence at UAB. Dr. Hsu also is the investigator to notice the strong negative correlation of $CD28^{+}CD95^{-}$ T cells with the chronologic age of the subjects from the Louisiana Study Cohort.

a. **Hsu H-C**, Zhou T, Yang P-A, Herrera GA and Mountz JD. CD2-*fas* transgene increases T cell immune response and elevates AA amyloidosis in the kidney of aged CD-1 mice. *J Immunol* 158:5988-5996, 1997.
b. **Hsu H-C**, Zhou T, Wang Z, Liu D, Yang P, Zhang H-G, Bluethmann H and Mountz JD. Aged mice exhibit *in vivo* defective deletion of D^{b}/H-Y autoreactive $CD8^{+}$ T cells*. Mech Aging Dev*. 122:305-326, 2001.

c. **Hsu H-C**, Zhang H-G, Li L, Yi N, Yang P-A, Wu Q, Wu Y, Renda J, Xu X, Yang X-W, Lu L, Van Zant G, Williams RW, Allison DB and Mountz JD. Age-related thymic involution in C57BL/6J X DBA/2J recombinant inbred mice maps to chromosomes 9 and 10. Genes & Immunity 4(6):402-410, 2003.

2. Dr. Hsu is the investigator who initially noticed the development of spontaneous systemic autoimmunity in the BXD2 recombinant inbred mouse strain. Dr. Hsu and colleagues have subsequently generated numerous strains of genetic knockout BXD2 mice. Dr. Hsu has identified that BXD2 mice develop spontaneous formation of germinal centers (GCs) and increased production of pathogenic autoantibodies that are polyreactive. Dr. Hsu is the first investigator to report that increased expression of activation-induced cytidine deaminase (AID) in the GC is an important mechanism leading to somatic hypermutation and class switch recombination of pathogenic autoantibodies in autoimmune conditions.

a. Mountz JD, Yang PA, Wu Q, Zhou J, Tousson A, Fitzgerald A, Allen J, Wang X, Cartner S, Grizzle WE, Yi N, Lu L, Williams RW and **Hsu H-C**. Genetic segregation of spontaneous erosive arthritis and generalized autoimmune disease in BXD2 recombinant inbred strain of mice. Scan J Immunol 61:128-138, 2005.

b. **Hsu H-C**, Zhou T, Kim H, Barnes S, Yang P-A, Wu Q, Zhou J, Freeman BA, Luo M and Mountz, JD. Production of a novel class of polyreactive pathogenic autoantibodies in BXD2 mice causes glomerulonephritis and arthritis. *Arthritis Rheum* 54:343-355, 2006.

c. **Hsu H-C**, Wu Y, Yang P, Wu Q, Fitzgerald A, Chen J, Job G, Wang J, Accatitti-Loper MA, Grizzle WE, Carter RH and Mountz JD. Over-expression of AID in B cells is associated with production of highly pathogenic autoantibodies. J Immunol 178:5357-5365, 2007.

d. **Hsu H-C**, Yang PA, Wu Q, Wang J, Godwin J, Guentert T, Li J, Stockard CR, Le T, Chaplin DD, Grizzle WE, and Mountz, JD. Inhibition of the catalytic function of activation-induced cytidine deaminase (AICDA) promotes apoptosis of germinal center B cells. Arthritis Rheum 63(7):2038-48, 2011, PMC3379710.

3. In a series of publications, Dr. Hsu and colleagues identified unique cytokines mediated autoreactive B cell and T cell migration responses leading to development of pathogenic autoantibodies in BXD2 mice. Dr. Hsu and colleagues identified that in the spleen marginal zone (MZ), type I interferon (IFN) can stimulate follicular translocation of innate like B cells, and thereby break immune tolerance to apoptotic cell autoantigens (AC-Ags). First, Dr. Hsu and colleagues showed that these innate like B cells can capture AC-Ags and co-stimulate CD4 T cells near the spleen GCs. Second, loss of these B cells in the spleen MZ undesirably lead to severe dissipation of a critical barrier of MZ macrophages that play a key role in phagocytosing apoptotic debris and providing immune tolerizing signaling to AC-Ags. In the spleen GCs, Dr. Hsu and colleagues have further identified the important effects of IL-17 in regulating the retention behavior of both B cells and Tfh in GC vicinity. Such behavior prolonged the interactions of B cells and Tfh and thereby promoted the expression of AID and generation of pathogenic autoreactive B cells. These findings together provide an important clue to understanding of the high tendency of developing autoantibodies to nuclear and ribonuclear protein derived autoAgs in BXD2 mice and potentially SLE patients.

a. Wang JH, New JS, Xie S, Yang PA, Wu Q, Li J, Luo B, Ding Y, Druey KM, **Hsu H-C***, and Mountz JD. Extension of the germinal center stage of B-cell development promotes autoantibodies in BXD2 mice. Arthritis & Rheum 65(10), 2703-2712, 2013; PMC3979745 (* co-senior author).

b. Li H, Wu Q, Li J, Yang PA, Zhu Z, Buo B, **Hsu H-C***, Mountz JD. Defective follicular exclusion of apoptotic antigens due to marginal zone macrophage defects in autoimmune BXD2 mice. J Immunol (Cutting Edge) 190(9):4465-9, 2013, PMC3656168 (* co-senior author).

c. Ding Y, Li J, Wu Q, Yang P, Luo B, Xie S, Druey KM, Zajac AJ, **Hsu H-C***, and Mountz JD. IL-17RA is essential for optimal localization of follicular T helper cells in the germinal center light zone to promote autoantibody-producing B cells. *J Immunol* 191:1614-1624, 2013; PMC3819396 (* co-senior author).

d. Li H, Fu Y-X, Wu Q, Zhou Y, Crossman DK, Yang PA, Li J, Luo B, Morel LM, Kabarowski JH, Yagita H, Ware C, **Hsu H-C***, Mountz JD. Interferon-induced defective mechanosensing impedes apoptotic cell clearance in lupus. In press, J Clin Investigation. (* co-senior author).

D. Research Support

Ongoing Research Support

R01 AI083705 (Hsu) 05/15/11 – 04/30/16
NIH
Entry of antigen-presenting B cells into the follicle directed by IFN-α and IL-17
The overall goal of this proposal is to use unspecific as well as antigen specific BCR transgenic mice and TCR transgenic mice to identify: (1) if IL-17 and type I IFN act in concert to promote the follicular delivery of antigens by a unique antigen-presenting cell like B cells; and (2) if this provides the necessary signal to stimulate cognate CD4 T cell activation in the spleen of BXD2 model of autoimmunity.

R01 AI071110 (Mountz) 04/01/08 – 01/31/19
NIH
Follicular Exclusion of Self Antigens Prevents Development of Autoantibodies
The purpose of this project is to determine: (i) if follicular translocation of membrane lymphotoxin^{+} B cells induced by type I interferon is a common cause of lupus; and (ii) Lymphotoxin acts through mechanosensing MKL1 to regulate mobility and elasticity, thereby the survival, the phagocytic function and tolerogenic function of marginal zone macrophages to apoptotic self antigens.

OVERLAP

There is no scientific overlap. Should these studies be funded, adjustments will be made to the investigator's effort on currently active grants after consultation with the appropriate agencies.

Completed Research Support

Lupus Research Institute (Hsu) 12/01/09 – 11/30/13
No Number Assigned
Deletion of Lupus Autoreactive Cells Using an Anti-hDR5 antibody
We have found that TRA-8, a unique antibody that binds to death receptor (DR)5 and triggers the suicide of activated cells eliminates cultured disease-causing lymphocytes from lupus patients. The purpose of this study is to test the method of action and effectiveness of TRA-8 in depleting lupus-causing cells, and its safety, in a special humanized mouse model, to determine its potential utility as a therapy for patients with lupus.

R01 AI071110 (Mountz) 04/15/08 – 03/31/14
NIH
Suppression of Pathogenic Autoantibodies in Lupus by Inhibition of AID
The goal of this project is to devise strategies to block the expression and function of activation-induced cytidine deaminase (AID) in B cells and to suppress the pathways leading to the formation of pathogenic autoantibodies in unimmunized BXD2 mice and in collagen II immunized BXD2 mice.

No Number (Mountz) 07/01/12 – 06/30/14
Rheumatology Research Foundation
Optimal Approach to Block M1 Macrophages/Th17 Inflammation in Rheumatoid Arthritis
The overall goal of this proposal is to determine the optimal therapy to inhibit the positive interaction loop between inflammatory M1 macrophages and effector IL-17 producing CD4 T cells obtained from human arthritis patients and mouse models of arthritis.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Javed, Amjad

eRA COMMONS USER NAME (credential, e.g., agency login): AJAVED

POSITION TITLE: Professor & Director Post-graduate Education

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date	FIELD OF STUDY
Bahauddin Zakariya University, Multan	B.Sc.	1987	Biology, Chemistry
University of the Punjab, Lahore	M.Sc.	1990	Zoology
University of the Punjab, Lahore and UMASS Medical School, Worcester, MA	Ph.D.	2000	Cell & Molecular Biology
UMASS Medical School, Worcester	Post-doc	2000-2003	Cell Biology (Gary Stein)

A. Personal Statement

The goal of this T32 grant application is to provide pre- and post-doctoral training in the Rheumatic and Musculoskeletal Diseases Research. As a mentor and preceptor, I have the expertise, leadership and motivation necessary to generate cadre of well-trained future academic scientist.

I have been engaged in teaching/training students for the past 21 years. For eight years, I had a rewarding experience of active involvement with NSF/NIH funded community outreach program at UMASS. This nation-wide program is designed to promote science, research and medicine profession in women and minority students. Five of my undergraduate student trainees have gone through Medical Schools at University of Rochester, University of Illinois at Chicago and University of Oregon and are currently completing their residency training. Two additional students are currently in private practice. One is currently pursuing his PhD work at UMASS Graduate School. Couple of former graduate students, are now junior faculty members or post-docs at various universities. I have continued this tradition at UAB by mentoring undergraduates from inner-city and historically black colleges through my involvement with center for community outreach development Birmingham Southern College and Auburn University. Majority of those students are currently pursuing their MD, DMD, DMD/PhD and PhD training at UAB. Five of my summer research trainee has completed Dental School, two are completing their advance training in Periodontics and three are in private practice. My student trainees have consistently won awards both at UAB and nationally with multiple oral presentations at the AADR/IADR, ICCBMT, ADA, GRC and ASBMR meetings. Over the years, I have mentored more than 50 students at different levels, ranging from undergraduates, medical and dental residents and fellows to post-docs. Thus, I have an established history of mentorship that is an integral component for successful outcome of K-awards.

My longstanding research interest has been osteoblast biology and skeletal development. For the past 15 years, I have studied Runx family of transcription factors and their roles in cancer metastasis, skeletogenesis and hematopoiesis using biochemical, genetic, cellular and molecular approaches. These studies are documented in over 100 publications and numerous book chapters. Over last 4 years, our research has been molded into a more focused interest of identifying molecular mechanism underlying the post-natal lineage commitment and differentiation switch of mesenchymal cells during obesity, diabetes and aging. Reciprocal relationship between decreased osteoblast and increased adipocyte activity are associated with obesity, diabetes and aging, and culminate in bone loss and enhanced marrow adiposity. However, the molecular mechanisms and signal accounting for this adipocyte-osteoblast imbalance remain largely unknown. In my laboratory, we use Runx2, an essential transcription factor for osteoblast differentiation and bone formation, as a paradigm to study the above question.

I serve as a senior scientist in the UAB Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center, Comprehensive Diabetes Center, Nutrition Obesity Research Center, and Center for Aging. I am well experienced in the application of the biological models related to adipogenesis, skeletogenesis and ex-vivo cell

differentiation. In summary, I have a demonstrated record of successful and productive research projects in an area of high clinical relevance, and my expertise and experience have prepared me to contribute to the training and mentoring of future academic scientist.

B. Positions and Honors

Professional Positions

1991-1994 Lecturer in Biology Cadet College Hasan Abdal.
1994-1995 Lecturer in Biology Crescent College Lahore.
1995 Lecturer in Zoology Government College Okara.
1997-2005 Mentor Undergraduate, Master and Graduate Student Dept. Cell Biology UMASS Medical School
2000-2002 Post-doc Department of Cell Biology UMASS Medical School Worcester, MA, USA.
2002-2003 Instructor Department of Cell Biology UMASS Medical School Worcester, MA, USA.
2004-2005 Assistant Professor, Department of Cell Biology, UMASS Medical School Worcester, MA, USA.
2005-2008 Assistant Professor, Department of Oral & Maxillofacial Surgery, Cell Biology, Molecular Pathology, School of Dentistry, University of Alabama at Birmingham, Birmingham, AL
2008-2011 Associate Professor, Department of Oral & Maxillofacial Surgery, Cell Biology, Molecular Pathology, Biomedical Engineering, University of Alabama at Birmingham, Birmingham, AL
2008-present Director, Postgraduate education programs, UAB-School of Dentistry, Birmingham, AL
2011-present Professor, Department of Oral & Maxillofacial Surgery, Cell, Developmental and Integrative Biology, Molecular Pathology, University of Alabama at Birmingham, Birmingham, AL

Honors and Awards

1987 First position in Botany and Zoology, Bahauddin Zakariya University, Multan.
1990 First position in Zoology and Gold Medal, Punjab University, Lahore.
1995 Young Investigator Award 15th Pakistan Congress of Zoology.
ASBMR Oral Platform Presentations 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2009, 2012
2003 AIMM-ASBMR John Haddad Young Investigator Award.
2004 8th-ICCBMT New Investigator Award Alberta, Canada.
2006 A. R. Shakoori Gold Medal for outstanding Research in Biological Sciences.
2007 9th-ICCBMT New Investigator Award Austin, TX.
2004-present Associate Editor Journal of Cellular Biochemistry.
2005-present Member Editorial Advisory Board of Critical Reviews in Eukaryotic Gene Expression.
2009-present Foreign Sub-Editor Pakistan Journal of Zoology
2011. Graduate Dean's Excellence in Mentorship Award.
2012-2015 Treasurer/Secretary Mineralized Tissue Group of The American Association for Dental Research (AADR).

C. Contribution to Science (Peer-Reviewed Publications: Total 100)

1. During my graduate training with Dr. Gary Stein, I focused on transcriptional regulation of bone marker genes during osteoblast differentiation. I discovered that Runx2 (at the time known as AML3/Cbfa1/Osf2) function as both a transcriptional activator as well as transcriptional repressor. This differential role is highly promoter-context dependent and requires ability of Runx2 to induce chromatin remodeling by dynamic recruitment of co-regulatory proteins. These publications provided initial evidence of a multifunctional role for Runx2 in regulating gene expression, not only as simple transcriptional transactivator but also by facilitating modifications in promoter architecture and chromatin organization. This body of work also established that osteoblast restricted transcription of the OC gene, requires interactions of proximal and distal regulatory elements. This is facilitated through spatial constraints of the promoter imposed by the binding of the Runx2 to critically positioned recognition sequences. This regulatory mechanism was later confirmed by several investigator using BSP, MMP, Collagen type X and other skeletal genes.

   a. Javed A, Gutierrez S, Montecino M, van Wijnen AJ, Stein JL, Stein GS, Lian JB. “Multiple Cbfa/AML sites in the rat osteocalcin promoter are required for basal and vitamin D-responsive transcription and contribute to chromatin organization”. *Mol. Cell. Biol.* 1999 19:7491-7500. PMCID: PMC84749

   b. **Javed A,** Guo B, Hiebert S, Choi JY, Green J, Zhao SC, Osborne MA, Stifani S, Stein JL, Lian JB, van Wijnen AJ, Stein GS. “Groucho/TLE/R-esp proteins associate with the nuclear matrix and repress RUNX

(CBF(alpha) /AML /PEBP2 (alpha)) dependent activation of tissue-specific gene transcription". *J. Cell. Sci*. 2000 113 (Pt 12):2221-2231.

c. **Javed A**, Barnes GL, Jasanya BO, Stein JL, Gerstenfeld L, Lian JB, Stein GS. "runt homology domain transcription factors (Runx, Cbfa, and AML) mediate repression of the bone sialoprotein promoter: evidence for promoter context-dependent activity of Cbfa proteins". *Mol. Cell. Biol***.** 2001 (8):2891-2905. PMCID: PMC86918

d. Hassan MQ, **Javed A**, Morasso MI, Karlin J, Montecino M, van Wijnen AJ, Stein GS, Stein JL, Lian JB. "Dlx3 transcriptional regulation of osteoblast differentiation: temporal recruitment of Msx2, Dlx3, and Dlx5 homeodomain proteins to chromatin of the osteocalcin gene". *Mol. Cell. Bio*. 2004 Oct;24(20):9248-9261.

2. With a team of collaborators, I directly documented aberrant expression of Runx2 in highly aggressive breast, and prostate cancers. My work identified and described changes within the organization of proteins and genes in microenvironments of the cancer cell's nucleus and how those changes are associated with a tumor's ability to metastasize to bone. We showed for the first time that similar to osteoblasts, Runx2 control multiple genes that contribute to the metastatic properties of cancer cells and their activity in the bone microenvironment. Importantly, we demonstrated that Runx2-regulated MMP9 levels are functionally related to the invasive properties of cancer cells. These publications found that proper Runx2 subnuclear targeting is required for osteolytic lesions in bone. I identified point mutations in the Runx2 gene that block the invasive and osteolytic properties of breast cancer cells in vivo. A key paradigm that emerged from this body of work was that fidelity of Runx2 intranuclear organization is necessary for expression of target genes that mediate the osteolytic activity of metastatic breast cancer.

a. Barnes GL, **Javed A**, Waller SM, Kamal MH, Hebert KE, Hassan MQ, Bellahcene A, Van Wijnen AJ, Young MF, Lian JB, Stein GS, Gerstenfeld LC. "Osteoblast-related transcription factors Runx2 (Cbfa1/AML3) and MSX2 mediate the expression of bone sialo protein in human metastatic breast cancer cells". *Cancer Res*. 2003 May 15;63(10):2631-2637.

b. Kundu M, **Javed A**, Jeon JP, Horner A, Shum L, Eckhaus M, Muenke M, Lian JB, Yang Y, Nuckolls GH, Stein GS, Liu PP. "Cbfbeta interacts with Runx2 and has a critical role in bone development". *Nat. Genet***.** 2002 32(4):639-644.

c. **Javed A**, Barnes GL, Pratap J, Antkowiak T, Gerstenfeld LC, van Wijnen AJ, Stein JL, Lian JB, Stein GS. "Impaired intranuclear trafficking of Runx2 (AML3/CBFA1) transcription factor in breast cancer cells inhibits osteolysis in vivo". *Proc. Natl. Acad. Sci***.** USA 2005 Feb 1; 102(5):1454-1459.

d. Pratap J, **Javed A**, Languino RL, van Wijnen AJ, Stein JL, Stein GS, Lian JB. "The runx2 osteogenic transcription factor regulates matrix metalloproteinase 9 in bone metastatic cancer cells and controls cell invasion". *Mol. Cell. Bio***.** 2005 Oct;25(19):8581-8591

3. I led research that showed Runx2 protein is a common target of several regulatory pathways in osteoblast. We discovered execution and completion of TGFβ/BMP2 osteogenic signaling requires Runx2. BMP2 control osteoblastogenesis through a mechanism that requires post-translational modification and physical and functional interaction between Runx2 and SMAD transducer. I developed novel models with disrupted BMP signaling involving the Runx2 gene. This led to development of knock-in mouse models providing new insights into the regulation and contribution of multiple mesenchymal cell types and their obligatory dependency on Runx2 for bone synthesis and remodeling.

a. Chen H, Ghori-Javed FY, Rashid H, Serra R, Gutierrez S, **Javed A.** "Chondrocyte specific regulatory activity of Runx2 is essential for survival and skeletal development". *Cells Tissues Organs*. 2011 194(2-4):161-165.

b. Sun Y, Byon CH, Yuan K, Chen J, Mao X, Heath JM, **Javed A**, Zhang K, Anderson PG, Chen Y. Smooth muscle cell-specific Runx2 deficiency inhibits vascular calcification. *Circ Res***.** 2012 111(5):543-52.

c. Chen H, Ghori-Javed FY, Rashid H, Adhami MD, Serra R, Gutierrez S, **Javed A**. "Runx2 regulates endochondral ossification through control of chondrocyte proliferation and differentiation". *J Bone Miner Res***.** 2014. 29(12):2653-65.

d. Adhami MD, Rashid H, Chen H, Clarke JC, Yang Y, **Javed A**. "Loss of Runx2 in committed osteoblasts impairs postnatal skeletogenesis". *J Bone Miner Res***.** 2015. 30(1):71-82.

D. Research Support

Active

1. R01 AR062091, Javed A (PI) (03/01/2012-02/28/2017)
NIH/ National Institute of Arthritis and Musculoskeletal and Skin Diseases
Title: “Sp7 Mediated Control of Runx2 Function for Osteoblast Differentiation”
This project is to understand molecular synergy between Runx2 and Sp-7 protein during skeletal development.
Role: Principal Investigator

2. R01 CA151538, Yang, Yang (PI) (07/01/2011-06/30/2016)
NIH/ National Institute of Cancer
Title: “Heparanase Regulation of Osteolysis in Multiple Myeloma”
This project is focused on identifying Runx2 regulated expression of RANKL and heparanase in myeloma associated bone degradation.
Role: Co-Investigator

3. F30 DE022693, Adhami M (PI) (07/01/2012-06/30/2017)
NIH/ National Institute of Dental & Craniofacial Research
Title: “Osteoblast and Odontoblast Specific Regulatory Action of Runx2 for Bone and Tooth Formation”
This award support individual predoctoral fellowship for dual doctoral degree (DMD/PhD) student in the lab.
Role: Sponsor and Mentor

Completed

1. R01 R01HL092215, Chen Y (PI) (04/01/2009-03/31/2014)
NIH/National Heart, Lung and Blood Institute
Title: “Molecular Signaling in Oxidative Stress-Induced Vascular Calcification”
This grant focuses on oxidative stress induced molecular circuitry that results in vascular calcification.
Role: Co-Principal Investigator

2. R01 AG030228, Javed A (PI) (09/15/2006-07/31/2011)
NIH/National Institute of Aging
Title: “Runx2 Controlled Adipocytic Differentiation in Aging Musculoskeleton”
This grant focuses on characterization of regulatory circuitry under Runx2 control that blocks adipocyte differentiation.
Role: Principal Investigator

3. R01 AG030228S1, Javed A (PI) (08/06/2009 – 10/06/2012)
NIH/ National Institute on Aging
Title: “Runx2 Controlled Adipocytic Differentiation in Aging Musculoskeleton”
This supplement support summer research experience for 2 undergraduate students.
Role: Principal Investigator

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Ho-Wook Jun

eRA COMMONS USER NAME (credential, e.g., agency login): HOWJUN

POSITION TITLE: Associate Professor of Biomedical Engineering

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Hanyang University, Seoul, South Korea	B.S.	1996	Textile Engineering
Hanyang University, Seoul, South Korea	M.S.	1998	Polymer Engineering
Rice University, Houston, Texas	Ph.D.	2004	Bioengineering
Rice University, Houston, Texas	Post-Doc	2006	Nanobiotechnology

A. Personal Statement

Mimicking the essential principles of natural bone tissue formation has been a challenging pursuit, and much effort is still needed to achieve the ultimate goal of developing readily available regenerative medicine therapies. To undertake this endeavor, I have assembled an integrated multidisciplinary team with the requisite expertise needed to develop a bone analogous composite nanomatrix platform that captures the essential properties of natural bone tissue formation. I have significant experiences in developing a bioactive material modified by functional peptide sequences. My previous works demonstrated this bioactive material could enhance cellular behaviors as featured in *the New Eng J Med*. Toward the goal of the studies, we have successfully constructed extracellular matrix (ECM) mimicking self-assembled nanomatrix directing osteogenic differentiation of human bone marrow mesenchymal stem cells (hMSCs) and cardiovascular cellular responses. Our multidisciplinary team has worked together for several years and demonstrated critical findings via publications as following:

1. **Ho-Wook Jun**, Virany Yuwono, Sergey Paramonov, and Jeffrey Hartgerink. Enzyme-Mediated Degradation of Peptide-Amphiphile Nanofiber Networks. *Adv. Mater.* 2005, 17, 2612-2617.
2. Joel M. Anderson, Adinarayana Andukuri, Dongjin Lim, **Ho-Wook Jun**. Modulating the gelation properties of self-assembling peptide amphiphiles. *ACS Nano*, 2009, 3, 3447-3454, PMCID: PMC2787687
3. Joel M. Anderson, Jeremy B. Vines, Jessica L. Patterson, Haiyan Chen, Amjad Javed, **Ho-Wook Jun**. Osteogenic differentiation of human mesenchymal stem cells synergistically enhanced by biomimetic peptide amphiphiles combined with conditioned media. *Acta Biomaterialia,* 2011, 7, 675-682, PMCID: PMC2999640
4. Joel Anderson, Jessica Patterson, Jeremy Vines, Amjad Javed, Shawn Gilbert, **Ho-Wook Jun**. Biphasic Peptide Amphiphile Nanomatrix Embedded with Hydroxyapatite Nanoparticles for Stimulated Osteoinductive Response. *ACS Nano*, 2011, 5, 9463-9479, PMCID:PMC3691849 (***Featured as a Top Story by the Extracellular Matrix News, November 17, 2011***)

B. Positions and Honors

Professional Experiences

1997-99 Research Scientist, Biomaterials Research Center of Korea Institute of Science and Technology (KIST), Seoul, South Korea

2004-06 Peter and Ruth Nicholas Postdoctoral Fellow, The Richard Smalley Institute for Nanoscale Science and Technology, Department of Chemistry, Rice University

2006-2011 Assistant Professor, Department of Biomedical Engineering, U of Alabama at Birmingham
2006-present Associate Scientist, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
2007-present Faculty, Medical Scientist Training Program, School of Medicine, U of Alabama at Birmingham
2009-present Scientist, Comprehensive Diabetes Center, U of Alabama at Birmingham
2009-present Co-Founder & Chief Scientific Officer, Endomimetics, LLC
2011-present Scientist, Comprehensive Cardiovascular Center
2011-present Associate Professor with tenure, Dept. of Biomedical Engineering, U of Alabama at Birmingham
2012-present Editorial Board, Biomaterials Research
2013-present Vice Present, Korean American Biomedical Engineering Society

Awards and Honors

1990-1995 Merit-based University Scholarship, Hanyang University
1999 Korean Government Overseas Scholarship
2004-2006 Peter and Ruth Nicholas Postdoctoral Fellowship, The Richard Smalley Institute for Nanoscale Science and Technology, Rice University
2007-2011 Early Career Award, Wallace H. Coulter Foundation (Phase I and II)
2008 Featured as one of three selected at the News Conference on “High-Tech for the Heart”, America Heart Association (AHA) Scientific Session 2008
2009 Innovation Award, American Diabetes Association
2010 Dean’s Award for Excellence in Mentorship
2010 Finalist, Alabama Launchpad Governor's Business Plan Competition
Endomimetics, LLC (Drs. Brott, Jun, Barr, Schwiebert)
2010 Early Career Award, National Science Foundation
2011 Coulter Fellow, Wallace H. Coulter Foundation

Mentee Awards (Selected)

NIH-NIBIB T-32 predoctoral training fellowship (Nanotechnology in Biosensors and Bioengineering) (Joel Anderson, 2007), the Caroline P. Ireland Research Scholarship (Adinarayana Andukuri, 2008), the BERM Center Synthasome Student Travel Awards (Joel Anderson, 2008), the UAB Biomedical Engineering Graduate Student of the Year (Joel Anderson, 2009), the UAB Biomedical Engineering Undergraduate Student of the Year and the UAB School of Engineering Undergraduate Student of the Year (Adam Blakeney, 2009), The UAB Diabetes Research and Training Center Student Travel Awards (Dongjin Daniel Lim, 2010), 1st place, life Sciences Session in 2010 Graduate Student Research Days (Joel Anderson, 2010), NIH Ruth L. Kirschstein National Research Service Awards for Individual Predoctoral Fellows (F31) (Joel Anderson, 2010), American Heart Association Predoctoral Fellowship (Adinarayana Andukuri, 2010), 1st place in Mathematics Engineering and Technology of UAB summer research Expo (Chidinma Anakwenze, 2010), 1st place Ruth and William Silen, M.D. Award in the New England Science Symposium sponsored by the Harvard Medical School (Chidinma Anakwenze, 2011), the Outstanding Physics Graduate (Sergey Antipenko, 2011), 1st place in the Center for Cardiovascular Biology Research Retreat (Adinarayana Andukuri, 2011), the McNair Scholarship (Dhruv Patel, 2012), the American Heart Association Summer Fellowship in Cardiovascular Biology (George Waits, 2012), 1st place in UAB Undergraduate EXPO (Dhruv Patel, 2012), the Beckman Scholar by the Arnold and Mabel Beckman Foundation (Dhruv Patel, 2012), the Outstanding Undergraduate Student Engineer in Biomedical Engineering (Dhruv Patel, 2013), the Outstanding Graduate Student Engineer in Biomedical Engineering (Adinarayana Andukuri, 2013), the UAB Undergraduate Student Engineer of the year (Dhruv Patel, 2013), the UAB Graduate Student Engineer of the year (Adinarayana Andukuri, 2013), American Heart Association Health Science Fellowship (Austin Johnson, 2013), the Alabama EPSCoR GRSP Fellowship (Patrick Hwang, 2013), the Featheringill Young Investigator Award (Adinarayana Andukuri, 2013), Howard Hughes Medical Institute Med-Grad Fellow (Grant Alexander, 2013), the Beckman Scholar by the Arnold and Mabel Beckman Foundation (Lily Deng, 2014), the best poster award, the National Collegiate Honors Council Conference (Lily Deng, 2014),

Reviewer:

• **Journal**: More than 40 journals including ACS Nano, Small, Nanotechnology, Tissue Engineering, Journal of Dental Research, Biomacromolecules, Journal of Biomedical Materials Research, Nanomedicine: Nanotechnology, Biology, and Medicine, Nanotechnology, Molecular Pharmaceutics, Annals of Biomedical Engineering, Acta Biomaterialia, Langmuir, Osteoarthritis and Cartilage, Advanced Healthcare Materials, Biomaterials, J Am Chem Soc, Nature Communication

• **Grant**: NSF, NIH (study section, special emphasis group), Dutch Technology Foundation, BBSRC UK

C. Contribution to Science (Peer-reviewed publications: Selected from 40 publications)

1. We are the first to design the peptide amphiphile (PA) nanomatrix with various cell adhesive ligands and enzyme-mediated degradable sites as published in *Adv Mater* in 2005, demonstrating its importance for tissue regeneration. The PAs allow us to study the positive effects of cell adhesive ligands on osteogenic differentiation of hMSCs without osteogenic supplements (*Biomacromolecules,* 2009), along with synergistic enhancement of osteogenic differentiation in combination with conditioned osteogenic media (*Acta Biomaterialia,* 2011).

a. **Ho-Wook Jun**, Virany Yuwono, Sergey Paramonov, and Jeffrey Hartgerink. Enzyme-Mediated Degradation of Peptide-Amphiphile Nanofiber Networks. *Adv. Mater.* 2005, 17, 2612-2617.
b. Joel M. Anderson, Meenakshi Kushwaha, Ajay Tambralli, Susan L. Bellis, Renato P. Camata, **Ho-Wook Jun**. Osteogenic differentiation of human mesenchymal stem cells directed by extracellular matrix-mimicking ligands in a biomimetic self-assembled peptide amphiphile nanomatrix. *Biomacromolecules,* 2009, 10, 2935-2944, NIHMS145671
c. Joel M. Anderson, Jeremy B. Vines, Jessica L. Patterson, Haiyan Chen, Amjad Javed, **Ho-Wook Jun**. Osteogenic differentiation of human mesenchymal stem cells synergistically enhanced by biomimetic peptide amphiphiles combined with conditioned media. *Acta Biomaterialia,* 2011, 7, 675-682, PMCID: PMC2999640

2. The PA nanomatrix gel allows co-assembling two PAs to modulate gelation, leading to new tunable methods for ensuring stability across different PAs and providing an unbiased starting point for cellular evaluations despite differing cell adhesive ligands as published in *ACS Nano* in 2009. Hydroxyapatite (HA) nanoparticle reinforced PA nanomatrix enhances the osteogenic differentiation of hMSCs (*Acta Biomaterialia,* 2012). The composite PA nanomatrix gel consists of PAs endowed with various cell adhesive ligands and interspersed HA nanoparticles. The positive effects of organic PAs and reinforcing inorganic HA nanocrystals include improving viscoelasticity, stimulating osteoinduction of encapsulated hMSCs in the composite PA nanomatrix gels *in vitro*, and promoting bone tissue regeneration of a femoral defect *in vivo* as published in *ACS Nano* in 2011.

a. Joel M. Anderson, Adinarayana Andukuri, Dongjin Lim, **Ho-Wook Jun**. Modulating the gelation properties of self-assembling peptide amphiphiles. *ACS Nano*, 2009, 3, 3447-3454, PMCID: PMC2787687
b. Jeremy B Vines, Dong-Jin Lim, Joel M Anderson, **Ho-Wook Jun**. Hydroxyapatite Nanoparticle Reinforced Peptide Amphiphile Nanomatrix Enhances the Osteogenic Differentiation of Mesenchymal Stem Cells by Compositional Ratios. *Acta Biomaterialia,* 2012, 8, 4053-4063, PMCID:PMC3462224
c. Joel Anderson, Jessica Patterson, Jeremy Vines, Amjad Javed, Shawn Gilbert, **Ho-Wook Jun**. Biphasic Peptide Amphiphile Nanomatrix Embedded with Hydroxyapatite Nanoparticles for Stimulated Osteoinductive Response. *ACS Nano*, 2011, 5, 9463-9479, PMCID:PMC3691849 (***Featured as a Top Story by the Extracellular Matrix News, November 17, 2011***)

3. My previous research in cardiovascular tissue engineering focused on developing a bioactive peptide modified polyurethaneurea capable of controlling cellular behaviors of cardiovascular cells to enhance endothelialization. In particular diazeniumdiolate-modified nitric oxide (NO) producing polyurethanes demonstrated enhanced endothelial cell proliferation but reduced smooth muscle growth and platelet adhesion. This material has great potential for future small diameter vascular grafts as featured in the *New Eng J Med in 2005*.

a. **Ho-Wook Jun**, Lakeshia Taite, and Jennifer West. Nitric Oxide Producing Polyurethanes. *Biomacromolecules,* 2005, 6, 838-844. **(Featured *as the future of vascular grafts in the New England Journal of Medicine,*** 2005, 353, 730-731 ***(****clinical implications of basic research****))***

4. Native endothelium consists of a monolayer of endothelial cells that adhere to the underlying nanofibrillar basement membrane and modulate vascular tone by release of soluble factors, such as nitric oxide (NO). It plays a critical role in controlling the function of the cardiovascular system. I have developed the prohealing multifunctional endothelium nanomatrix that can restore the healthy endothelium on the surface of stents. This approach provides a paradigm changing coating material that addresses key unresolved problems with current

stents. It utilizes the synergistic effects of multiple bioactive functions along with nitric oxide (NO), a prohealing strategy for recruiting endothelial cells and endothelial progenitor cells (EPCs), minimizing inflammatory responses, and coating integrity. Notably, this nanomatrix differs from other NO releasing materials due to the fact that NO bound to lysine (K) peptides is entrapped within self-assembled PA-KKKKK nanofibers with diameters between 7-8 nm and several microns in length. Therefore, NO can be released by highly controlled long-term sustained release of NO. This unique NO release profile from the nanomatrix significantly enhances proliferation of endothelial cells but reduces proliferation of smooth muscle cells. There was also a striking 150-fold decrease in platelet attachment compared to a collagen-I coated control surface. Less neointimal thickness and no thrombosis was also found in rabbit iliac artery study after 4 weeks. Thus, the nanomatrix has potential to restore a healthy endothelium by limiting restenosis and thrombosis while enhancing endothelialization. Innovation of the prohealing multifunctional endothelium nanomatrix lies in 1) its composition of an exclusively biocompatible peptide-based material and 2) a self-assembled coating on stents by a water evaporation method without use of organic solvents. This may enhance structural integrity and eliminate concerns regarding inflammatory responses, and also exhibits potential for future bioabsorbable stent coating applications.

a. Adinarayana Andukuri, Meenakshi Kushwaha, Ajay Tambralli, Joel M Anderson, Derrick R Dean, Joel L Berry, YoungDoug Sohn, Young-Sup Yoon, Brigitta C. Brott, **Ho-Wook Jun**. A hybrid biomimetic nanomatrix composed of electrospun polycaprolactone and bioactive peptide amphiphiles for cardiovascular implants. *Acta Biomaterialia,* 2011*,* 7, 225-233, PMCID: PMC2967669
b. Adinarayana Andukuri, Young-Doug Sohn, Chidinma P Anakwenze, Dong-Jin Lim, Brigitta C Brott, Young-Sup Yoon, **Ho-Wook Jun**. Enhanced human endothelial progenitor cell adhesion and differentiation by a bioinspired multifunctional nanomatrix. *Tissue Engineering, Part C Methods*, 2013, 19, 375-385, PMCID: PMC 3603564
c. Adinarayana Andukuri, IlJae Min, Patrick Hwang, Grant Alexander, Lauren E Marshall, Joel L Berry, Timothy M Wick, Yoon Ki Joung, Young-Sup Yoon, Brigitta C Brott, Dong Keun Han, **Ho-Wook Jun**. Evaluation of the effect of expansion and shear stress on a self-assembled endothelium mimicking nanomatrix coating for drug eluting stents in vitro and in vivo. *Biofabrication*, 2014, 2014, 6, 035019
d. Kiwon Ban, Hun-Jun Park, Sangsung Kim, Adinarayana Andukuri, Kyu-Won Cho, Jung Wook Hwang, Ho Jin Cha, Matthew Kim, Woan-Sang Kim, **Ho-Wook Jun**, Young-Sup Yoon. Cell therapy with embryonic stem cell-derived cardiomyocytes encapsulated in injectable nanomatrix gel enhances cell engraftment and promotes cardiac repair. ACS Nano, 2014, 8, 10815-10825

D. Research Support

Current Research Support

•NIH 1R01HL125391-01 01/15/2015 – 12/31/2019
Jun (PI)
Prohealing multifunctional endothelium nanomatrix coated stent

• National Science Foundation, 07/15/2010 – 06/30/2015
Jun (PI)
CAREER: The Bioactive Hybrid Nanomatrix for Intervertebral Disk Regeneration

•NIH, 10/01/2011 – 09/30/2016
Yoon (PI), Jun (subcontract)
“Cell therapy for diabetic peripheral neurovascular complications”

• NuTech Medical Inc., 09/30/2011 – 09/29/2016
Jun (PI)
Biochemical Characterization of Cells and Extracellular Matrix Components Derived from Human Amniotic Membrane, Amniotic Fluid, and Amniotic Fluid/Tissue Based Products

•NIH 1R03EB017344-01 05/01/2013 – 04/30/2015
Jun (PI)
A hybrid nanosack for the enhanced islet engraftment in the omentum

• Pre-doctoral Fellowship (PI: Patrick Hwang, Sponsor: Jun) 08/15/2013 – 8/14/2014
Alabama EPSCoR GRSP Fellowship

Completed Research Support

• Predoctoral Fellows (F31) (PI: Joel Anderson, Sponsor: Jun) 07/01/2010 – 06/30/2012
NIH Ruth L. Kirschstein National Research Service Awards

• Predoctoral Fellowship (PI: Adinarayana Andukuri, Sponsor: Jun) 07/01/2010 – 06/30/2012
American Heart Association

•National Science Foundation, 08/01/2010 – 07/31/2013
Derrick Dean (PI), Jun (co-PI),
MRI: Acquisition of a High Resolution Scanning Electron Microscope for Materials Research and Education

• Center for Clinical Translational Science Pilot Grant, 05/01/2011- 04/30/2013
George El-Ferzli (PI), Jun (Co-PI),
“Development of A Nitric Oxide Releasing Matrix For Coating A Lung Assist Device”

• Cook/Endomimetics, Phase I/Phase II 04/01/2011 – 03/31/2013
Jun (PI)
Native endothelium mimicking multifunctional nanomatrix coating for vascular stents

• Wallace H. Coulter Foundation, Early Career Award, 08/01/2009 – 07/31/2011
Jun (PI)
“ Biomimetic nano matrix for drug eluting stent application”

• American Diabetes Association, Innovation Award 01/01/2009 – 12/31/2010
Jun (PI),
The Biomimetic nanomatrix to increase the efficacy of islet transplantation

•National Institute of Health, NIAMS BIRT 09/01/2008 – 08/31/2009
Rosa Serra (PI), Jun (co-Investigator)
TGF-beta in the pathology and development of the spine

•National Science Foundation, 08/01/2009 – 07/31/2011
Andrei Stanishevsky (PI), Jun (co-PI),
MRI: Acquisition of Imaging X-Ray Photoelectron Spectroscopy System for Interdisciplinary Research and Education in Multi-Scale Materials

• Biomatrix Engineering and Regenerative Medicine Center, 09/01/2010- 08/31/2011
UAB, Pilot Grant, Jun (PI),
“Bone mimetic biphasic nanomatrix for bone tissue regeneration”

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: John F. Kearney

eRA COMMONS USER NAME (credential, e.g., agency login): KEARNEY

POSITION TITLE: Professor of Microbiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Adelaide, South Australia	B.D.S. Hons	1969	Dental Science
University of Melbourne, Victoria, Australia	Ph.D.	1973	Immunology
University of Alabama at Birmingham Birmingham AL	Postdoctoral studies	1973-1975	Immunobiology

A. Personal Statement

The goal of my research is to provide new insight into the interaction of adaptive immunity with the innate immune system in response to highly conserved antigens expressed by commensal and pathogenic organisms of importance in human disease. In particular, the PI has tried to understand the factors that influence emerging B cell clones which express stereotypical germ-line encoded BCRs to epitopes often shared by microbial and self antigens. The PI has amassed a tool chest of antigen-specific hybridomas, anti-clonotype markers, transgenic and gene-targeted mice with B cells specific for epitopes targeted by the antibody responses to *Streptococcus pneumoniae*, *Enterobacter cloacae,* Groups A and B streptococci bacteria. In the process, he stimulated renewed interest in the development and function of innate-like Marginal Zone, B1a and B1b B cells and their secreted antibody products. After finding that many monoclonal antibodies (mAbs) to bacterial-associated epitopes also react with the fungus *Aspergillus fumigatus* (A.f.), and other allergen-bearing organisms, the PI showed that neonatal exposure to environmental bacterial antigens in mice dampened the development of allergic-airway disease. In the long-term he has demonstrated a continuum of successful and productive research projects built on those earlier investigations, and now extended into studies of allergy and inflammatory lung diseases, which are increasing major health problems in this westernized country. Dr. Kearney's experiences in these research areas and the training of 27 predoctoral students and 27 postdoctoral fellows have prepared him to lead this proposed project. In the Contributions to Science Section, **Trainee Predoctoral and Postdoctoral authors are in bold.**

1. Kearney JF, **Patel P, Stefanov EK, King RG**. Natural Antibody Repertoires: Development and Functional Role in Inhibiting Allergic Airway Disease. Annu Rev Immunol. 2015 Jan 22. [Epub ahead of print] PubMed PMID: 25622195.

B. Positions and Honors

Positions and Employment

1973-1974 Visiting Foreign Dental Scientist, Dept. Pediatrics, University of Alabama at Birmingham, AL
1974-1976 Research Associate, Dept. of Pediatrics, University of Alabama, Birmingham, AL
1976-1980 Assistant Professor, Dept. of Microbiology, University of Alabama, Birmingham, AL
1978 Visiting Senior EMBO Fellow, Department of Genetics, University of Cologne, Germany
1980-1983 Associate Professor, Department of Microbiology, University of Alabama, Birmingham,
1983-Present Distinguished Professor in Microbiology, University of Alabama at Birmingham
1983-Present Senior Scientist, Comprehensive Cancer Center, University of Alabama at Birmingham
1985-1986 Member, Basel Institute for Immunology, Basel, Switzerland

1986-1990 Member, NIH Allergy and Immunology Study Section
2008-2011 Senior Fellow of the American Asthma Foundation

Other Experience and Professional Memberships

Member of the American Association of Immunologists
Member of the Australasian Society for Immunology

C. Contributions to Science

1. The PI's early publications directly addressed B cell isotype switching. These studies were facilitated by the development of the first model in which mouse B cells could be induced to switch immunoglobulin isotypes. This model, dubbed by others as the "low-density LPS culture system", revealed new findings on cellular aspects of the switch of IgM-bearing adult and neonatal B cells to a variety of IgG isotypes, the effects of anti-IgM antibodies on plasma cell development, and the transient production of double IgM- and IgG-bearing B cells during isotype switching. This model was then widely used in the research community to study the modulation of B cell activation by B cell growth factors, specific cytokine-directed B isotype switching, and elucidation of the genetic mechanisms involved in isotype switching.

a**.** Kearney, J. F**.** and Lawton, A. R.: B lymphocyte differentiation induced by lipopolysaccharide: I. Generation of cells synthesizing four major immunoglobulin classes. *J. Immunol*. 115:671, 1975.

b. Kearney, J. F**.** and Lawton, A. R.: B lymphocyte differentiation induced by lipopolysaccharide: II. Response of fetal lymphocytes. *J. Immunol*. 115:677, 1975.

c. Kearney, J. F., Cooper, M. D. and Lawton, A. R.: B lymphocyte differentiation induced by lipopolysaccharide: III. Suppression of B cell maturation by anti-immunoglobulin antibodies. *J. Immunol*. 116:1664, 1976.

d**.** Kearney, J. F., Cooper, M. D. and Lawton, A. R.: B lymphocyte differentiation induced by lipopolysaccharide: IV. Development of immunoglobulin class restriction in precursors of IgG synthesizing cells. *J. Immunol*. 117:1567, 1976.

2. During an early-career sabbatical with Dr. Klaus Rajewsky, the PI isolated the first non-secreting plasmacytoma P3x63.Ag.653. This invaluable cell line was immediately released to investigators globally for hybridoma production. This line, without functional H+L antibody genes, facilitated the isolation of pre-B cell hybridomas providing the best evidence that mu chain synthesis preceded light chain synthesis at this stage of B cell development. These pre B cell hybridomas were then shared with multiple laboratories and helped establish the genetic mechanisms associated with the asynchronous expression of immunoglobulin μ heavy chains and of light chains. The isolation of μ-only hybridomas and production of a monoclonal antibody also lead directly to the isolation and functional definition of the first known ER-associated mammalian molecular chaperone, binding immunoglobulin protein (BiP) also known as 78-kDa glucose-regulated protein (GRP-78). These findings were greeted skeptically by reviewers (e.g. "*If this is so important why hasn't a lab more important than yours discovered it").* This publication went on to be chosen among the 50 most important papers in the first 50 years of *J. Cell. Biol*. This discovery and our early sharing of the monoclonal anti-BiP antibody helped pave the way for early investigations in the elucidation of molecular interactions in the unfolded protein (UPR) stress response.

a. Kearney, J. F**.**, Radbruch, A., Liesegang, B., and Rajewsky, K. A new mouse myeloma cell line which has lost immunoglobulin expression but permits the construction of antibody secreting hybrid cell lines*. J.Immunol*. 123:1548-1550, 1979.
b. **Burrows, P. D., LeJeune, M.** and Kearney, J. F.: Evidence that murine pre-B cells synthesize μ heavy chains but no light chains. *Nature* 280:838-841, 1979.
c. Perry, R. P., Kelley, D. E., Coleclough, c. and Kearney, J. F**.**: Organization and expression of immunoglobulin genes in fetal liver hybridomas. *Proc. Natl. Acad. Sci. USA* 78:247-251, 1981.
d. **Bole, D., Hendershot, L**. and Kearney, J. F.: Post-translational association of immunoglobulin heavy chain binding protein with nascent heavy chains in nonsecreting and secreting hybridomas. *J. Cell. Biol.* 102:1558-1566, 1986

3. After these studies on development of pre B cells lacking a conventional two-component BCR, the PI's interest shifted to studies on the molding and establishment of the neonatal and adult antibody repertoires after

conventional BCRs were expressed. P3X63Ag8.653 facilitated the construction of monoclonal anti-B cell idiotype (Id) antibodies panels to trace the development and functional activation of B cells responding to selected bacterial and self-associated antigens. These anti-Id reagents were shared with multiple investigators at the time and his lab still provides selected hybridomas to outside investigators. The use of anti-Id antibodies showed that there was an early flux of clonal development so that antigen-specific clones present early in life were replaced by alternate clones in the adult. Introduction of appropriate bacterial antigen early in life, but not later, could permanently alter these clonal profiles. Although our interpretation of these findings has altered, these results have been replicated 30 years later and are key to our hypothesis that neonatal exposure to bacteria in our environment can also affect allergic responses in the adult. These reagents are key to tracing and manipulating B clones in our experimental models and extending our studies into molecular analysis of B cell Ig repertoires at the single-cell level.

a. **Stohrer, R.**, Lee, M. C. and Kearney, J. F**.**: Analysis of the anti-α163 dextran response with monoclonal antiidiotype antibodies. *J. Immunol*. 131:1375-1379, 1983.
b. **Stohrer, R.** and Kearney, J. F**.**: Fine idiotype analysis of B cell precursors in the T-dependent and Tindependent responses to α-3 Dextran in BALB/c mice. *J. Exp. Med.* 158:2081-2094, 1983
c. **Stohrer, R.** and Kearney, J. F**.**: Ontogeny of B cell precursors responding to α163 dextran in BALB/c mice. *J. Immunol.* 133:2323-2326, 1984.
d. **Benedict, C. L.** and Kearney, J. F.: Increased junctional diversity in the fetal B cells results in a loss of protective anti-phosphorylcholine antibodies in adult mice. *Immunity* 10:607-617, 1999

4. Studies from the PI and others described in reference 2.a (above) showed that VH81x, the most DHproximal gene of the mouse immunoglobulin heavy-chain locus, was expressed at a high frequency in perinatal life, but later most VH81x rearrangements in the adult bone marrow were non-functional. Because IgM hybridomas from neonatal mice expressing rearranged VH81x genes were highly self-reactive to intracellular components, a VH81x Heavy-chain transgenic (tg) mouse was constructed. In this mouse, there was a remarkable enrichment of B cells expressing the transgene with an identical Vκ light chain in the spleen marginal zone (MZ). Hybridomas expressing this light chain from the VH81x transgenic mice were also highly reactive to self intracellular antigens. Based on this unexpected finding, transgenic mice expressing rearranged VH genes from anti-phosphorylcholine plasmacytomas and other VH transgenic mice were made in his laboratory from anti-α1-3 dextran, anti-GlcNAc, and anti-sialyl-lacto-N-tetraose hybridomas showed similar MZ enrichment. These unique findings were greeted by reviewers skeptically at first, but they eventually lead to a resurgence of interest in MZ B cells and their importance in handling blood-borne infections. In turn, MZ-like human B cell subsets were identified by other investigators and led to the defining of human IgM memory B cells which could have germline or somatically mutated immunoglobulin V genes.

a. **Chen, X., Martin, F.**, Forbush, K. A., Perlmutter, R. M., and Kearney, J. F**.**: Evidence for selection of a population of multi-reactive B cells into the splenic marginal zone. *Int. Immunol*. 9:27-41, 1997.
b. **Martin, F**. and Kearney, J. F.: Positive selection from newly-formed to marginal zone B cells depends on the rate of clonal production, CD19 and *btk*. *Immunity* 12:39-49, 2000.
c. **Martin, F., Oliver, A. M**., and Kearney, J. F**.**: Marginal zone B cells rapidly generate plasmablasts in Tindependent responses to blood-borne particulate antigens. *Immunity* 14:617-629, 2001.
d. **Balazs, M., Martin, F**., Zhou, T., and Kearney, J. F**.**: Blood dendritic cells interact with splenic marginal zone B cells to initiate T-independent immune responses. *Immunity* 17:341-352, 2002.

5. Many T-cell independent antibody responses to conserved antigens are considered Natural Antibodies. There is good evidence in mice that B1 and MZ B cell subsets with BCR VH rearrangements with little or no N additions and lacking somatic mutations contribute to the homeostatic levels of these antibodies. However, analysis of BCR-encoding genes in some responses revealed low TdT activity, whereas the dominant anti-PC antibody response was destroyed by fetal forced TdT expression. Results from the PI's lab have added to the growing evidence that B cell memory is generated by previous exposure to bacterial-associated polysaccharide and phospholipid antigens. This exposure is manifested by permanent increases in the frequency of such B cells, both in adult and neonate. More importantly, molecular analysis of antigen-specific B cells after perinatal, but not adult, exposure to bacterial antigens results in permanent alterations in clonotype expression. These and earlier studies from the PI provided reagents and background knowledge for the repeated demonstrations that antibodies to oxidized lipids can protect against atherosclerosis. In the PI's new

studies, a role for B cells and antibodies has been shown in dampening of allergic diseases and provides additional support for the Hygiene Hypothesis.

a. **Foote, J. B.**, and Kearney, J. F. Generation of B Cell memory to the bacterial polysaccharide alpha 1-3 dextran. *J. Immunol*. 183:6359-6368, 2009
b. **Benedict, C. L.** and Kearney, J. F**.** Increased junctional diversity in the fetal B cells results in a loss of protective anti-phosphorylcholine antibodies in adult mice. *Immunity* 10:607-617, 1999
c. **Mahmoud,T. I**., and Kearney, J. F. Terminal deoxynucleotidyl transferase is required for an optimal response to the polysaccharide alpha 1-3 dextran. *J. Immunol.* 184: 851-8. 2010
d. **Kin N. W., Stefanov E. K., Dizon B. L**., Kearney J. F**.** 2012. Antibodies generated against conserved antigens expressed by bacteria and allergen-bearing fungi suppress airway disease*. J Immunol.* 189:2246-56

Selected from 190 peer-reviewed publications, full Pubmed list:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1JUZdufYpWlQn/bibliography/47023064/public/?sort=date&direction=ascending

D. Research Support

Ongoing

Kearney (PI) 10/01/14 – 9/30/16
Juvenile Diabetes Research Foundation
Analysis of Human and Mouse antibodies to beta cell antigens bearing N-acetyl glucosamine post-translational modifications and their potential to prevent Human Type 1 Diabetes.
The goal of this study is to determine correlates of anti-GlcNAc antibodies detected in serum of children and the development of Type 1 diabetes.

R01 AI100005
Kearney (PI) 3/1/12 – 2/28/17
NIH/NIAID
Response *RFA-AI-11-010 The Infant Immune System: Implications for Vaccines and Response to Infections*.
Effects of neonatal microbial exposure on anti-polysaccharide B cell development and response to infections.
The goal of this study is to determine molecular and cellular aspects of B cell clonal repertoire changes induced by early exposure to bacterial antigens.

R01 AI014782
Kearney (PI) 3/1/011-2/28/16
NIAID
Regulation of B Cell Clonal Diversity and Its Role in Disease
The major goal of these studies is to study the environmental and genetic factors affecting the development of allergic airway disease in mice.

King (PI), Kearney (Co-PI) 6/1/14-5/30/15
UAB Immunology, Autoimmunity, and Transplantation Strategic Planning
To develop expression systems and amplification strategies for ligation-independent cloning and expression of IgV genes from single sorted antigen-specific cells.

Completed

Kearney (PI) 6/1/12 – 5/31/14
Juvenile Diabetes Research Foundation
Antibodies to beta cell GlcNAc-modified autoantigens blocks T1D in NOD mice

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: Lewis, Cora E.

eRA COMMONS USER NAME (credential, e.g., agency login): coralewis

POSITION TITLE: Professor of Medicine; Director, Preventive Medicine Research Clinic

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Miami, Miami, FL	B.S.	05/80	Chemistry
Indiana University, Indianapolis, IN	M.D.	04/84	Medicine
University of Alabama at Birmingham	M.S.P.H.	06/90	Epidemiology

A. Personal Statement

Dr. Lewis is Professor and Associate Director for Research of the Division of Preventive Medicine; she serves as Director of the Division's Preventive Medicine Clinic, a large, multidisciplinary research clinic. An internist and epidemiologist, she has considerable experience in long-term epidemiologic studies and clinical trials. She served for approximately a decade as the PI of the UAB center for the NIAMS funded Osteoporotic Fracture in Men Study (MrOS) and still is an investigator on that project; she also was PI of the Women's Health Initiative (WHI) site at UAB, one of the 3 sites focusing on bone outcomes. She was PI of the UAB center for several industry sponsored trials, including MORE and HORIZON. Additional experience includes serving as PI of the UAB center for the: NIDDK funded Look AHEAD: Health in Diabetes (LookAHEAD) trial; NIA funded Testosterone Trial (T Trial) and its cardiovascular and bone ancillary trials. Working with Dr. Suzanne Oparil in Cardiology, she served as part of the leadership team for southeast region of the ALLHAT trial, coordinating activities in over 100 clinical sites, and they lead a Clinical Center Network in the SPRINT trial, both sponsored by NHLBI. Dr. Lewis has served in leadership roles in many studies, for example chairing committees that developed trial measurement protocols and manuals of operation, data collection forms, quality assurance methods, safety monitoring forms and procedures, and outcomes ascertainment and adjudication forms and protocols. As a clinical center PI, she has experience with recruitment, retention, adherence, data collection and quality assurance schemes, and outcomes ascertainment.

B. Positions and Honors

07/87 - 06/88	MetroHealth - General Internal Medicine, Dept of Adult Medicine, Indianapolis, Indiana
07/88 - 02/90	Fellow, University of Alabama at Birmingham, Dept of Med, Div of Gen & Prev Med
03/90 - 12/91	Instructor, University of Alabama at Birmingham, Dept of Med, Div of Gen & Prev Med
01/91 - 10/97	Assistant Professor, University of Alabama at Birmingham, Dept of Med, Div of Prev Med
10/97 - 10/02	Associate Professor, University of Alabama at Birmingham, Dept of Med, Div of Prev Med
10/02 - Present	Professor, University of Alabama at Birmingham, Dept of Med, Div of Prev Med
02/12 – Present	Associate Director for Research, Division of Preventive Medicine

Other Experience and Professional Memberships

Executive Committee, AHA Council on Epidemiology & Prevention, at-large member, 1996-99; Vice-Chair, Program Committee, AHA Council on Epidemiology & Prevention; 1999-2000; Chair, Spring Program, 2000-02; Vice chair, AHA Council on Epidemiology & Prevention, 2004-6; Council Chair, 2006-8; Member, Science Advisory and Coordinating Committee; American Heart Association 2006-8; Chair, Nominating Committee, AHA Council on Epidemiology & Prevention, 2008-10; Member, Nominating Committee, AHA Council on Epidemiology & Prevention, 2012-14; Assistant Editor, Annals of Epidemiology, 1995-2000; Ad Hoc reviewer, NIAMS, NHLBI, NIA, NIDDK; Chair, NHLBI Weight Loss Maintenance Trial - DSMB; faculty, AHA/NHLBI 10-

Day Seminar on Epidemiology & Prevention of CVD 1997-present; Co-chair, NHLBI Workshop on Predictors of Obesity, Weight Gain & Physical Activity; Member, Clinical Trials Review Committee, NHLBI, 2005-8 presenter/discussant, NHLBI Workshop on Embedding Clinical Interventions into Observational Studies, 2013.

C. Contribution to Science

1. I have been the lead PI on multiple large cohort studies, including the UAB center for the NIAMS funded Osteoporotic Fracture in Men Study (MrOS), the Women's Health Initiative (WHI) site at UAB, one of the 3 sites focusing on bone outcomes. I was PI of the UAB center for several industry sponsored trials, including MORE and HORIZON. Working with Dr. Suzanne Oparil in Cardiology, I served as part of the leadership team for the southeast region of the ALLHAT trial, coordinating activities in over 100 clinical sites, and we led a Clinical Center Network in the SPRINT trial, both sponsored by NHLBI.

a. Mackey RH, McTigue KM, Chang YF, Barinas-Mitchell E, Evans RW, Tinker LF, **Lewis CE**, Manson JE, Stefanick ML, Howard BV, Phillips LS, Liu S, Kulick D, Kuller LH. Lipoprotein particles and size, total and high molecular weight adiponectin, and leptin in relation to incident coronary heart disease among severely obese postmenopausal women: The Women's Health Initiative Observational Study. BBA Clin. 2015; 3:243-250. PMID: 25825692; PMCID: PMC4375554

b. Espeland MA, Probstfield J, Hire D, Redmon JB, Evans GW, Coday M, **Lewis CE**, Johnson KC, Wilmoth S, Bahnson J, Dulin MF, Green JB, Knowler WC, Kitabchi A, Murillo AL, Osei K, Rehman SU, Cushman WC; the Look AHEAD Research Group; the ACCORD Study Group. Systolic Blood Pressure Control Among Individuals With Type 2 Diabetes: A Comparative Effectiveness Analysis of Three Interventions. Am J Hypertens. 2015 Feb 9. pii: hpu292. [Epub ahead of print]. PMID: 25666468

c. Ambrosius WT, Sink KM, Foy CG, Berlowitz DR, Cheung AK, Cushman WC, Fine LJ, Goff DC Jr, Johnson KC, Killeen AA, **Lewis CE**, Oparil S, Reboussin DM, Rocco MV, Snyder JK, Williamson JD2, Wright JT Jr, Whelton PK; SPRINT Study Research Group. The design and rationale of a multicenter clinical trial comparing two strategies for control of systolic blood pressure: the Systolic Blood Pressure Intervention Trial (SPRINT). Clin Trials. 2014 Oct;11(5):532-46. doi: 10.1177/1740774514537404. Epub 2014 Jun 5. PMID: 24902920 PMCID: PMC4156910

d. Dauriz M, Porneala BC, Guo X, Bielak LF, Peyser PA, Durant NH, Carnethon MR, Bonadonna RC, Bonora E, Bowden DW, Florez JC, Fornage M, Hivert MF, Jacobs DR Jr, Kabagambe EK, **Lewis CE**, Murabito JM, Rasmussen-Torvik LJ, Rich SS, Vassy JL, Yao J, Carr JJ, Kardia SL, Siscovick D, O'Donnell CJ, Rotter JI, Dupuis J, Meigs JB. Association of a 62 Variant Type 2 Diabetes Genetic Risk Score with Markers of Subclinical Atherosclerosis: A Transethnic, Multicenter Study. Circ Cardiovasc Genet. 2015 Mar 24. pii: CIRCGENETICS.114.000740. [Epub ahead of print]. PMID: 25805414

2. MOST Study

a. Guermazi A, Hayashi D, Roemer F, Felson DT, Wang K, Lynch J, Amin S, Torner J, **Lewis CE**, Nevitt MC. Severe radiographic knee osteoarthritis - does Kellgren and Lawrence grade 4 represent end stage disease? - the MOST study. Osteoarthritis Cartilage. 2015 Apr 28. pii: S1063-4584(15)01138-3. doi: 10.1016/j.joca.2015.04.018. [Epub ahead of print]. PMID: 25929973

b. Wise BL, Niu J, Felson DT, Hietpas J, Sadosky A, Torner J, **Lewis CE**, Nevitt M. Functional Impairment Is a Risk Factor for Knee Replacement in the Multicenter Osteoarthritis Study. Clin Orthop Relat Res. 2015 Mar 10. [Epub ahead of print]. PMID: 25754756

c. Stefanik JJ, Gross KD, Guermazi A, Felson DT, Roemer FW, Zhang Y, Niu J, Segal NA, **Lewis CE**, Nevitt M, Neogi T. The relation of MRI-detected structural damage in the medial and lateral patellofemoral joint to knee pain: the Multicenter and Framingham Osteoarthritis Studies. Osteoarthritis Cartilage. 2015 Apr;23(4):565-70. doi: 10.1016/j.joca.2014.12.023. Epub 2015 Jan 7. PMID: 25575967

d. Crema MD, Nevitt MC, Guermazi A, Felson DT, Wang K, Lynch JA, Marra MD, Torner J, **Lewis CE**, Roemer FW. Progression of cartilage damage and meniscal pathology over 30 months is associated with an increase in radiographic tibiofemoral joint space narrowing in persons with knee OA--the MOST study. Osteoarthritis Cartilage. 2014 Oct;22(10):1743-7. doi: 10.1016/j.joca.2014.07.008. PMID: 25278083

3. Additional experience include serving as PI of the UAB center for the NIDDK-funded Look AHEAD: Health in Diabetes (LookAHEAD) trial; NIA funded Testosterone Trial (T Trial) and its cardiovascular and bone ancillary trials.

a. Dutton GR**, Lewis CE**. The Look AHEAD Trial: Implications for Lifestyle Intervention in Type 2 Diabetes Mellitus. Prog Cardiovasc Dis. 2015 Apr 30. pii: S0033-0620(15)00027-4. PMID: 25936906

b. Pownall HJ, Bray GA, Wagenknecht LE, Walkup MP, Heshka S, Hubbard VS, Hill J, Kahn SE, Nathan DM, Schwartz AV, Johnson KC; Look AHEAD Research Group. Changes in body composition over 8 years in a randomized trial of a lifestyle intervention: the look AHEAD study. Obesity (Silver Spring). 2015 Mar;23(3):565-72. doi: 10.1002/oby.21005. PMID: 25707379

c. Cunningham GR, Stephens-Shields AJ, Rosen RC, Wang C, Ellenberg SS, Matsumoto AM, Bhasin S, Molitch ME, Farrar JT, Cella D, Barrett-Connor E, Cauley JA, Cifelli D, Crandall JP, Ensrud KE, Fluharty L, Gill TM, **Lewis CE**, Pahor M, Resnick SM, Storer TW, Swerdloff RS, Anton S, Basaria S, Diem S, Tabatabaie V, Hou X, Snyder PJ. Association of sex hormones with sexual function, vitality, and physical function of symptomatic older men with low testosterone levels at baseline in the testosterone trials. J Clin Endocrinol Metab. 2015 Mar;100(3):1146-55. doi: 10.1210/jc.2014-3818. Epub 2014 Dec 30. PMID: 25548978; PMCID: PMC4333035

d. Cauley JA, Fluharty L, Ellenberg SS, Gill TM, Ensrud KE, Barrett-Connor E, Cifelli D, Cunningham GR, Matsumoto AM, Bhasin S, Pahor M, Farrar JT, Cella D, Rosen RC, Resnick SM, Swerdloff RS, **Lewis CE**, Molitch ME, Crandall JP, Stephens-Shields AJ, Strorer TW, Wang C, Anton S, Basaria S, Diem S, Tabatabaie V, Dougar D, Hou X, Snyder PJ. Recruitment and Screening for the Testosterone Trials. J Gerontol A Biol Sci Med Sci. 2015 Apr 15. pii: glv031. [Epub ahead of print]. PMID: 25878029

4. CARDIA Study - Coronary Artery Risk Development in Young Adults Study

a. Teixido-Tura G, Almeida AL, Choi EY, Gjesdal O, Jacobs DR Jr, Dietz HC, Liu K, Sidney S, **Lewis CE**, Garcia-Dorado D, Evangelista A, Gidding S, Lima JA. Determinants of Aortic Root Dilatation and Reference Values Among Young Adults Over a 20-Year Period: Coronary Artery Risk Development in Young Adults Study. Hypertension. 2015 May 4. pii: HYPERTENSIONAHA.115.05156. [Epub ahead of print. PMID: 25941347

b. Launer LJ, **Lewis CE**, Schreiner PJ, Sidney S, Battapady H, Jacobs DR, Lim KO, D'Esposito M, Zhang Q, Reis J, Davatzikos C, Bryan RN. Vascular factors and multiple measures of early brain health: CARDIA brain MRI study. PLoS One. 2015; 10(3):e0122138. PMID: 25812012

c. White DK, Gabriel KP, Kim Y, **Lewis CE**, Sternfeld B. Do Short Spurts of Physical Activity Benefit Cardiovascular Health? The CARDIA Study. Med Sci Sports Exerc. 2015 Mar 17. [Epub ahead of print]. PMID: 25785930

d. Armstrong AC, Ricketts EP, Cox C, Adler P, Arynchyn A, Liu K, Stengel E, Sidney S, **Lewis CE**, Schreiner PJ, Shikany JM, Keck K, Merlo J, Gidding SS, Lima JA. Quality Control and Reproducibility in M-Mode, Two-Dimensional, and Speckle Tracking Echocardiography Acquisition and Analysis: The CARDIA Study, Year 25 Examination Experience. Echocardiography. 2014 Nov 9. doi: 10.1111/echo.12832. [Epub ahead of print]. PMID: 25382818

D. Research Support

Ongoing Research Support

HHSN26820130026C (PI) 12/30/83 - 06/30/18
Coronary Artery Risk Development in Young Adults (CARDIA): Field Center
CARDIA is part of a four-center Clinical Study. The purpose of the study is to assess coronary artery risk factors in healthy 18-30 year old men and women.

U01 DK 57008 (PI) 09/30/99 - 07/31/15
Clinical Center for Look AHEAD: Health in Diabetes
This study is a randomized clinical trial (16 sites) in overweight/obese type 2 diabetics examining the long-term effects of an intensive lifestyle intervention program designed to achieve and maintain weight loss by decreased caloric intake and increased physical activity compared to a control condition involving a diabetes support and education program.

U01 AG18947 (PI) 01/01/01 - 12/31/15
Multicenter Osteoarthritis Study (MOST) Renewal
This study will examine questions representing mechanical risk factors, knee symptom causes and long term disease trajectory in an established cohort with or at risk of knee OA.

N01 HC95256 (Oparil, PI) 08/31/09 - 08/30/18
Systolic Blood Pressure Intervention Trial (SPRINT) Clinical Center Networks
This trial will determine whether treating SBP to a lower goal (<120mmHg) than currently recommended (<140mmHg) will reduce CVD in patients (55 & older) with hypertension or pre-hypertension and additional CVD risk factors other than diabetes.
Role: Lewis, Co-PI

R01 HL071194 (Stone, PI) 07/01/02 - 04/30/15
Outcomes of Sleep Disorders in Older Men
This MrOS ancillary study will characterize the consequences of sleep disorders in older men, including possible effects on risk for CVD, mortality, physical & cognitive decline and risk for osteoporosis and fractures.
Role: Lewis, Subcontract PI

U01 AG030644 (Synder, PI) 02/01/08 - 07/31/15
The Testosterone Trial
This study should determine if testosterone treatment in older men with low testosterone will improve their physical, vitality, sexual and cognitive function.
Role: Lewis, subcontract PI

R01 DK084997/115-9107-01(Van Den Eeden, PI) 09/15/10 - 08/31/15
Adult Life Predictors of Genitourinary Disorders
This CARDIA ancillary study is to understand how genitourinary conditions (conditions related to urinary & genital, sexual system function), and risk factors for these disorders, develop in adults.
Role: Lewis, Subcontract PI

D43 TW009125 (Williams, PI) 05/01/12 - 06/30/16
Strengthening Indian NCD Clinical Research and Training Capacity
India's NCD burden is increasing, but can be lessened by research and prevention programs. This proposal targets this burden with an institution and individual capacity building and training program developed under ICOHRTA by a collaboration between UAB and the MDRF in Chennai. Role: Lewis, Subcontract PI

R01HL05065 (LaCroix, PI) 05/01/12 - 04/30/15
Objective Physical Activity and Cardiovascular Health in Women Aged 80 and Older
An important component of the ancillary study is to conduct a calibration study to aid in distinguishing light from moderate/vigorous activity in women ages 80 and older. Role: Lewis, Subcontract PI

U01 HL107437 (Broeckel, PI) 07/01/11 - 03/31/16
Functional Association Study for LVH using iPS-derived Cardiomycytes: the Hypergen-CiPS Study
This project follow-ups findings from one of the largest multi-ethnic GWAS for Left Ventricular Mass (LVM) and LV Hypertrophy (LVH). We will use human induced pluripotent stem-cell (iPSC) technology to the complex molecular mechanisms and pathways underlying the genetic basis of an LVM. Role: Lewis, Subcontract PI

R01AR062506 (Neogi, PI) 09/01/12 - 08/31/17
Central sensitization in post-knee replacement and relation to OA pathology
The goal of this study is to evaluate the association between sensitization and post-knee replacement pain, as well as between sensitization and OA pathology. Role: Lewis, Subcontract PI

U01 AG042140 (Shikany, PI) 09/30/99 - 07/31/18
Osteoporotic Fractures in Men – MrOS Renewal – Birmingham
The primary goals of the current phase of MrOS (2013-8) are to identify the determinants and characteristics of musculoskeletal aging trajectories; identify men at increased risk of adverse outcomes; improve our

understanding of optimal; and discover new targets for preventing fractures, declines in activity, disability, increases in health care utilization, and placement in long-term care. Role: Investigator

P30 DK079626 (Garvey, PI) 04/01/13 - 03/31/18
UAB Diabetes Research Center
The immediate goal of the center is to promote excellence in diabetes research, ultimately to decrease diabetes morbidity/mortality, and to provide an outstanding environment for training and career development in diabetes research. Role: Lewis Co-Director, Intervention and Translation Core

U34 AR062891 (Saag, PI) 04/01/13 - 03/31/15
Effectiveness of DiscontinuinG bisphosphonatEs Study (EDGE)
A NIAMS planning grant to finalize study design and procedures for EDGE an open-label, randomized, clinical trial to test the effectiveness and safety of continuing or discontinuing alendronate therapy in postmenopausal women with osteoporosis. Role: Investigator

U19 HS021110 (Saag, PI) 09/30/11 - 08/31/16
UAB Deep South Arthritis and Musculoskeletal CERTs
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders. Role: Investigator

Completed Research support

N01 WH 32105 (PI) 03/15/93 - 09/14/10
NHLBI
Vanguard Clinical Centers for the Clinical Trial & Observational Study of WHI
The overall objective of the clinical Trial and Observational Study is to ascertain the determinants and prevention of disease in post-menopausal women.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

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NAME: Lund, Frances E.

eRA COMMONS USER NAME (agency login): FELUND

POSITION TITLE: Professor and Chair, Department of Microbiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Notre Dame	BS	05/1987	Microbiology
Duke University	PHD	05/1992	Immunology
DNAX Research Institute	Postdoctoral Fellow	04/1997	Molecular Immunology

A. PERSONAL STATEMENT

I have more than 20 yrs experience studying immune responses to pathogens, autoantigens, allergens and tumors. In the course of our studies we have gained considerable expertise using in vivo mouse models to study the molecular mechanisms that control cell trafficking, humoral immune responses, CD4 T cell responses and DC development, migration and function. In addition, we have expertise in the field of mucosal immunology and routinely study local immune responses to pathogens that specifically infect the lung or small intestine. We are funded to phenotypically and functionally characterize human effector B cell subsets in healthy individuals, in patients with respiratory infections and in autoimmune mice and humans. Importantly for this T32 application, we have considerable experience evaluating mouse models of rheumatoid arthritis and SLE and over the last two years have shifted a significant number of these studies into human RA and Lupus patients. We collaborate with many of the clinicians at UAB on these projects and are well-suited to provide the basic science expertise that is needed to study these complex diseases in humans. *Listed below are four references that highlight some of our specific contributions to studies of rheumatic disease.*

Much of my scientific career was spent at Trudeau Institute, a basic science immunology and infectious disease research organization that does not grant degrees. During this period my training of graduate students was limited to international graduate students who came to my lab for a period of 1 to 2 years to work on collaborative projects. These students have all continued their careers in science and one of them is currently a post-doctoral fellow in my lab. Upon joining the University of Rochester, I mentored a graduate student who was awarded a slot on the Univ. of Rochester T32 Pulmonary biology training grant. She successfully defended her thesis in June 2014 and is now a post-doctoral fellow in the Cancer Metabolism Division, Berg Health LLC in Framingham MA. Importantly, throughout my career at Trudeau Institute, the University of Rochester and UAB, I trained post-doctoral fellows, including one fellow who was awarded a F32 fellowship while in my lab and is now an Asst. Professor at the University of Rochester. Several of my other post-doctoral fellows have also gone on to careers in academic science (2 Professors, 1 Associate Professor and 2 Assistant Professors). In my lab at UAB, I currently mentor two graduate students, three post-doctoral fellows (including a medical fellow in the ABIM fellowship program) and two Asst. Professors. Collectively, given my laboratory's successful immunology research program and my proven ability to mentor trainees at every level of experience *(see references in contributions to science)*, I believe that I am qualified to act as an effective co-mentor to trainees who are supported on this proposed T32 training grant.

Finally, in my current position as Chair of the Department of Microbiology, I serve on a number of advisory committees associated with T32, P50 and P60 grants. I am also the director of the Inflammation, Infection and Immunity (I3) focus area at UAB and, in this capacity, play an important role in shaping the research priorities for the entire institution in the area of immunology and autoimmunity. Given my research background and my administrative responsibilities, I believe that I bring a university-wide perspective to this training grant. As a T32 internal advisory committee member, I will provide guidance for the scientific direction of the program and can help to identify the university resources that will be needed to make this training grant highly successful.

1. Avalos, A.M., Latz, E., Mousseau, B., Christensen, S.R., Shlomchik, M.J., **Lund, F.E.**, Marshak-Rothstein, A. Differential cytokine production and bystander activation of autoreactive B cells in response to CpG-A and CpG-B oligonucleotides. J Immunol. 2009 Nov 15;183(10):6262-8. PubMed PMID: 19864612; PubMed Central PMCID: PMC3426913.
2. **Lund FE,** Randall TD. Effector and regulatory B cells: modulators of CD4+ T cell immunity. Nat Rev Immunol. 2010 Apr;10(4):236-47. PubMed PMID: 20224569; PubMed Central PMCID: PMC3038334.
3. Misra, R.S., Shi, G., Moreno-Garcia, M.E., Thankappan, A., Tighe, M., Kusser, K., Becker-Herman, S., Hudkins Loya, K.L., Dunn, R., Kehry, M.R., Migone, T-S., Marshak-Rothstein, A., Simon, M., Randall, T.D., Alpers, C.E., Liggitt, D. Rawlings, D.J., **Lund, F.E**. G alpha q-containing G proteins regulate B cell selection and survival and are required to prevent B cell-dependent autoimmunity. J Exp Med. 2010 Aug 2;207(8):1775-89. PubMed PMID: 20624888; PubMed Central PMCID: PMC2916136.
4. Oleksyn, D., Pulvino, M., Zhao, J., Misra, R., Vosoughi, A., Jenks, S., Tipton, C. **Lund, F.**, Schwartz, G., Goldman, B., Mohan, C., Mehta, K., Mehta, M. Leitgets, M., Sanz, I., Chen, L. I. Protein kinase Cβ is required for lupus development in Sle mice. Arthritis Rheum. 2013 Apr;65(4):1022-31. PubMed PMID: 23280626; PubMed Central PMCID: PMC3762702.

B. POSITIONS AND HONORS

Positions and Employment

1997 - 2001	Assistant Member, Trudeau Institute, Inc
1998 - 2008	Adjunct Associate Professor of Microbiology, Immunology, Molecular Genetics, Albany Medical College
2001 - 2006	Associate Member, Trudeau Institute, Inc
2002 - 2008	Adjunct Associate Professor of Medicine, University of Vermont
2006 - 2008	Member, Trudeau Institute, Inc
2008 - 2012	Professor, Department of Medicine, University of Rochester, URMC, Rochester, NY
2012 -	Professor and Chair, Department of Microbiology, University of Alabama at Birmingham, Birmingham, AL
2012 -	Professor, Dept of Medicine, Div of Clinical Immunol and Rheumatology, UAB, Birmingham, AL

Other Experience and Professional Memberships

2004 - 2007	Member, AAI Education Advisory Committee
2007 - 2012	Associate Editor, The Journal of Immunology
2009 - 2012	Member, URMC DOM Tenure and Promotions Committee
2009 - 2012	Member, URMC University Core Oversight Committee
2010 - 2012	Member, URMC Dept. Microbiology & Immunology Graduate Student Selection Committee
2012 -	Member, and Senior Scientist UAB Comprehensive Cancer Center Steering Committee
2012 -	Member, UAB Executive Council Steering Committee
2012 -	Member, UAB Rheumatic Diseases Core Center Internal Advisory Committee
2012 -	Senior Scientist, UAB Comprehensive Diabetes Research Center
2012 -	Senior Scientist, UAB Center for AIDS Research (CFAR)
2013 - 2014	Co-Director, UAB Immunology, Autoimmunity & Transplantation Steering Committee
2013 -	Member and Senior Scientist, UAB UAB Comprehensive Arthritis, Musculoskeletal, Bone & Autoimmunity Center Steering Committee
2014 -	Member, UAB SOM Executive Research Steering Committee
2014 -	Director, Inflammation, Infection, Immunity, UAB SOM AMC21 Research Pillar

Honors

1987	Recipient, Senior Scientist Service Award, Department of Biological Sciences/Microbiology, University of Notre Dame
1991	Recipient, The Norman Francis Conant Research Award, Department of Microbiology and Immunology, Duke University
2011	Organizer; “New Insights into Normal vs. Dysregulated B Cell Function” , Keystone Symposium
2011	Organizer; NAD Metabolism and Disease, FASEB Summer Conference
2012	Charles H. McCauley Endowed Chair in Microbiology, University of Alabama at Birmingham

C. Contribution to Science

1. Antibody independent functions for B cells in immune and autoimmune responses. My lab is probably best known for our work evaluating the different mechanisms by which B cells modulate cellular and humoral immune responses. Although we were certainly not the first group to show that B cells can produce cytokines, we were the first group to show that cytokine production by B cells is modulated by the microenvironment in which B cells are activated and by the types of stimuli that are used to activate B cells. We popularized the concept that B cells, activated in different ways, will produce distinct and non-overlapping arrays of cytokines. We and others went on to show that the cytokines made by B cells can modulate innate immune responses as well as the quality and magnitude of CD4 T cell responses. There is now a robust data set to support the still emerging field of B cells functioning to regulate immune responses by producing cytokines, by presenting antigen to T cells, and by modulating innate cells including dendritic cells. My lab continues to be a leader in this area and many of our NIH funded grants focus on identifying the molecular and cellular mechanisms that control the development and function of "effector" B cells. Importantly, for this T32 application, we are funded to examine the role that effector B cells play in the setting of autoimmune disease (Lupus and RA) in both mice and humans.
    a. Harris, D.P., Haynes, L., Sayles, P.C., Duso, D.K., Eaton, S.M. Lepak, L.M., Johnson, L.L., Swain, S.L. and **Lund, F.E**. Reciprocal regulation of polarized cytokine production by effector B and T cells. Nat Immunol. 2000 Dec;1(6):475-82. PubMed PMID: 11101868.
    b. Harris DP, Goodrich S, Mohrs K, Mohrs M, Lund FE. Cutting edge: the development of IL-4-producing B cells (B effector 2 cells) is controlled by IL-4, IL-4 receptor alpha, and Th2 cells. J Immunol. 2005 Dec 1;175(11):7103-7. PubMed PMID: 16301612.
    c. Wojciechowski, W., Harris, D.P., Sprague, F., Mousseau, B., Makris, M., Kusser, K., Honjo, T., Mohrs, K., Mohrs, M., Randall, T.D., and **Lund, F.E**. Cytokine-producing effector B cells regulate type 2 immunity to H. polygyrus. Immunity. 2009 Mar 20;30(3):421-33. PubMed PMID: 19249230; PubMed Central PMCID: PMC2745290.
    d. León, B., Ballesteros-Tato, A., Browning, J.L., Dunn, R., Randall, T.D., **Lund, F.E.** 2012. Regulation of T_H2 development by $CXCR5^+$ dendritic cells and lymphotoxin-expressing B cells. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.
2. B cell activation, selection and differentiation in immune and autoimmune settings. As a graduate student at Duke University, my project focused on the signals that control the terminal differentiation of B cells into plasma cells. In the course of these studies, we identified the elusive endogenous retrovirus encoded superantigens and spent considerable effort determining how the cytokine signals that initiate plasma cell differentiation also controlled superantigen expression and the capacity of the B cells to activate CD4 T cells. I've continued my interest in B cell activation and differentiation throughout my entire career and have published extensively in this area. We showed that CD40 signals, while required for B cell activation, actively suppress B cell differentiation and that termination of this signal is required for final commitment to the differentiation pathway. We have also focused on other signals that control B cell selection and differentiation in the germinal center and have evaluated the role that cytokines (IL-2) and signaling molecules (i.e. G proteins, CD38) play in regulating B cell selection and commitment to the plasma cell fate in settings of both infection and autoimmune disease (rheumatoid arthritis). Importantly, for this T32 application, we are funded to examine the role that T-box transcription factors play in regulating B cell differentiation in the context of infection and autoimmune disease (Lupus).
    a. **Lund FE**, Corley RB. Regulated expression of mouse mammary tumor proviral genes in cells of the B lineage. J Exp Med. 1991 Dec 1;174(6):1439-50. PubMed PMID: 1660524; PubMed Central PMCID: PMC2119027.
    b. Randall T.D., A.W. Heath, L. Santos-Argumedo, M.C. Howard, I.L. Weissman and **F.E. Lund**. Arrest of B lymphocyte terminal differentiation by CD40 signaling: mechanism for lack of antibody-secreting cells in germinal centers. Immunity. 1998 Jun;8(6):733-42. PubMed PMID: 9655487.
    c. Partida-Sanchez, S., Goodrich, S., Kusser, K., Randall, T.D., **Lund, F.E.** Regulation of dendritic cell trafficking by the ADP-ribosyl cyclase CD38: impact on the development of humoral immunity. Immunity. 2004 Mar;20(3):279-91. PubMed PMID: 15030772.
    d. Misra, R.S., Shi, G., Moreno-Garcia, M.E., Thankappan, A., Tighe, M., Kusser, K., Becker-Herman, S., Hudkins Loya, K.L., Dunn, R., Kehry, M.R., Migone, T-S., Marshak-Rothstein, A., Simon, M., Randall, T.D., Alpers, C.E., Liggitt, D. Rawlings, D.J., **Lund, F.E**. G alpha q-containing G proteins regulate B cell selection and survival and are required to prevent B cell-dependent autoimmunity. J Exp Med. 2010

Aug 2;207(8):1775-89. PubMed PMID: 20624888; PubMed Central PMCID: PMC2916136.

3. NAD Metabolism and immunity. Since beginning my independent research career more than 20 years ago, I have studied the role of the NAD glycohydrolase CD38 in inflammation and immunity. My lab showed that CD38 catabolizes extracellular NAD and catalyzes the formation of three metabolites that each mobilize calcium and modulate signal transduction. We found that cADPR and ADPR, two of the metabolites produced by CD38, regulate calcium signaling in granulocytes, monocytes and dendritic cells that are responding to particular chemokines and chemoattractants. We further showed that competitive antagonists to cADPR and ADPR can block the migration of these cells both in vitro and in vivo. We have publications demonstrating the important role that this enzyme plays in multiple disease settings including, most recently, Alzheimer's Disease. We also identified, cloned and functionally characterized a CD38 ortholog expressed by the parasite *Schistosoma mansoni*. Our most recent work focuses on the role that these CD38 family members play in regulating NAD biosynthesis. We determined that CD38 modulates intracellular NAD biosynthesis in eukaryotic cells and controls the capacity of primary cells (including B cell malignancies) to withstand oxidative stress. We are funded through the Alabama Drug Discovery Alliance to identify CD38 inhibitors and are currently testing these inhibitors in models of leukemia and lymphoma.

   a. Howard, M., J.C. Grimaldi, J.F. Bazan, **F.E. Lund**, L. Santos-Argumedo, R.M.E. Parkhouse, T.F. Walseth, and H.C. Lee. Formation and hydrolysis of cyclic ADP-ribose catalyzed by lymphocyte antigen CD38. Science. 1993 Nov 12;262(5136):1056-9. PubMed PMID: 8235624.

   b. Partida-Sanchez, S., Cockayne, D., Monard, S., Jacobson, E.L., Oppenheimer, N., Garvy, B.A., Kusser, K., Goodrich, S, Howard, M.C., Harmsen, A., Randall, T.D., **Lund, F.E.** Cyclic ADP-ribose production by CD38 regulates intracellular calcium release, extracellular calcium influx and chemotaxis in neutrophils and is required for bacterial clearance in vivo. Nat Med. 2001 Nov;7(11):1209-16. PubMed PMID: 11689885.

   c. Goodrich, S.P., Muller-Steffner, H., Osman, A., Moutin, M-J., Kusser, K., Roberts, A., Woodland, D.L., Randall, T.D., Kellenberger, E., LoVerde, P.T., Schuber, F., **Lund, F.E.** Production of calcium-mobilizing metabolites by a novel member of the ADP-ribosyl cyclase family expressed in Schistosoma mansoni. Biochemistry. 2005 Aug 23;44(33):11082-97. PubMed PMID: 16101292.

   d. Blacher, E, Dadali, T., Bespalko, A., Haupenthal, V.J., Grimm, M.O.W., Hartmann, T., **Lund, F.E.**, Stein, R., Levy, A., 2015. Alzheimer's disease pathology is attenuated in a CD38 deficient mouse model. Ann. Neurol. In press.

4. Mentoring trainees. Over the years, I have mentored graduate students, MSTP students, post-doctoral fellows and medical fellows. Although most of my students and post-doctoral fellows were not eligible for support on T or F series grants (not US citizens or permanent residents), one of my prior graduate students was supported on a pulmonary T32 training grant and one of my post-doctoral fellows had an individual NSRA award. The vast majority of my prior trainees have continued to use their scientific training in their careers. Many of my post-doctoral fellows have also gone on to careers in academic science (2 Professors, 1 Associate Professor and 2 Assistant Professors). Importantly, my trainees worked on projects resulting in publications in top journals. Many of my trainees' publications have been selected for Faculty of 1000 reviews and have been featured in the commentary and News and Views sections of immunology journals. Four of these articles that were first authored by my trainees are listed below.

   a. Harris, D.P., Haynes, L., Sayles, P.C., Duso, D.K., Eaton, S.M. Lepak, L.M., Johnson, L.L., Swain, S.L. and **Lund, F.E**. Reciprocal regulation of polarized cytokine production by effector B and T cells. Nat Immunol. 2000 Dec;1(6):475-82. PubMed PMID: 11101868.

   b. Partida-Sanchez, S., Cockayne, D., Monard, S., Jacobson, E.L., Oppenheimer, N., Garvy, B.A., Kusser, K., Goodrich, S, Howard, M.C., Harmsen, A., Randall, T.D., **Lund, F.E.** Cyclic ADP-ribose production by CD38 regulates intracellular calcium release, extracellular calcium influx and chemotaxis in neutrophils and is required for bacterial clearance in vivo. Nat Med. 2001 Nov;7(11):1209-16. PubMed PMID: 11689885.

   c. Wojciechowski, W., Harris, D.P., Sprague, F., Mousseau, B., Makris, M., Kusser, K., Honjo, T., Mohrs, K., Mohrs, M., Randall, T.D., **Lund, F.E**. Cytokine-producing effector B cells regulate type 2 immunity to H. polygyrus. Immunity. 2009 Mar 20;30(3):421-33. PubMed PMID: 19249230; PubMed Central PMCID: PMC2745290.

   d. León, B., Ballesteros-Tato, A., Browning, J.L., Dunn, R., Randall, T.D., **Lund, F.E**. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.

D. RESEARCH SUPPORT

Ongoing Research Support

2014/05/12-2019/04/30
U19 AI109962 , NIH/NIAID
Lund, Frances E. (PI)
Virus-induced cell fate decisions in anti-viral immunity - Core B: Viral Stocks and Reagents
To produce, titrate and characterize viral stocks, to produce and purify viral proteins and to produce and validate fluorochrome-labeled recombinant virus proteins (B cell tetramers) for use in flow cytometry.
Role: PI

2014/05/12-2019/04/30
U19 AI109962, NIH/NIAID
Lund, Frances E. (PI)
Virus-induced cell fate decisions in anti-viral immunity - Project 3: Control of anti-viral B cell responses by IFNgamma, T-bet and Eomes
To determine whether the T-box transcription factors, T-bet and Eomes, are required for the development or maintenance of Bmem cells following viral infection, to identify the signals that initiate and maintain the T-bet/Eomes pathway of B cell differentiation following virus infection and to determine whether the virus-induced T-bet and IFNγ-dependent B cell differentiation pathway is engaged following vaccination in humans.
Role: PI

2014/02/14-2019/01/31
R01 AI110508, National Institute of Allergy and Infectious Diseases (NIAID)
Lund, Frances E. (PI)
Control of anti-viral B cell responses by IFNg, T-bet and Eomes
To determine whether the T-box transcription factors, T-bet and Eomes, are required for the development of memory B cells following viral infection and vaccination. To identify the signals which initiate and maintain the T-bet/Eomes pathway of B cell differentiation following virus infection and vaccination.
Role: PI

2013/03/15-2018/02/28
R01 AI104725, National Institute of Allergy and Infectious Diseases (NIAID)
Lund, Frances E. (PI)
Controlling Th2 immunity by tuning CXCL13 dependent DC migration in lymph nodes
To identify the stimuli that program BALB/c DCs to upregulate CXCR5 following L. major infection, to identify the signals in the perifollicular microenvironment that condition DCs to support Th2 priming and to determine whether susceptibility to leishmaniasis can be reversed by modulating CXCL13 or lymphotoxin signaling.
Role: PI

2012/05/11-2017/04/30
R01 AI097357, NIH/NIAID
Randall, Troy D. (PI)
Central and Effector B Cells in the Lung
Identify and characterize central and effector memory B cells that reside in lymphoid organs or peripheral non-lymphoid tissues.
Role: Co-Investigator

2013/01/01-2015/12/31
ADDA, Alabama Drug Discovery Alliance
Lund, Frances E. (PI)
Treating B cell-derived neoplasms by targeting ectoenzyme CD38: a regulator of the NAD metabolic pathway
The specific goals of this proposal are to generate the reagents and cell lines necessary to develop a high throughput screen for CD38 inhibitors, to develop a HTS screen and counter-screens, to validate the screens and to perform proof of concept in vitro and in vivo studies in B cell neoplasm with the validated hits.
Role: PI

2013/08/01-2015/07/31
P01 AI078907, National Institute of Allergy and Infectious Diseases (NIAID)
Lund, Frances E. (PI)
Evaluation of IFNy - Producing Effector Cells in Infectious and Autoimmune Disease
The major goal is to better understand how cytokine-producing B cells contribute to autoimmune disease and to facilitate the functional and phenotypic identification of protective and pathologic effector B cells.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Mountz, John D.

eRA COMMONS USER NAME (credential, e.g., agency login): JDMOUN

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Wright State University	B.S.	05/1969	Physics
Michigan State University	M.S.	05/1971	Physics
Michigan State University	Ph.D.	05/1974	Physics
Ohio State University	MD	05/1978	Medicine

A. Personal Statement

Dr. John Mountz has a long history devoted to understanding how dysregulation in apoptosis affects the development of autoimmune diseases. Dr. Mountz combines his interests in apoptosis, macrophages, development of spontaneous germinal centers, and gene therapy and is currently studying if defects of marginal zone macrophages (MZ) in clearance of apoptotic autoantigens play an important role in development of lupus and antibody-mediated autoimmune diseases. Based on the knowledge that Dr. Mountz and colleagues has gained in the past few years in terms of how type I IFNs promotes follicular translocation of antigen-delivery B cells and how this affects the tolerogenic properties of both MZ B cells and MZ macrophages (MZMs), Dr. Mountz and colleagues have developed a novel hypothesis to explain the apoptotic cell clearance defects in autoimmune BXD2 mice related to defective expression of MKL1 and mechanosensing signaling pathway in MZMs. This new model of autoimmunity is further verified using B6.Sle1.Sle2.Sle3 mice and also human SLE spleen tissues.

Dr. Mountz is the recipient of the J. W. & Virginia Goodwin-Warren D. Blackburn, Jr. Research Chair in Rheumatology (2002) and recipient of the Max Cooper Award for Excellence in Research (2003). Dr. Mountz has successfully trained more than 30 trainees in the past 20 years and has published more than 80 original papers with trainees listed as the first author resulting from their period of training directly under his guidance. Under his leadership and sponsorship, two of the trainees received the Post-doctoral Fellowship Award from the Arthritis Foundation, and 3 junior faculty members received the Arthritis Investigator Award. Dr. Mountz received the UAB Dean's Award for Excellence in Mentorship in 2008 for his dedication in research training, and the 2014 Southern Society for Clinical Investigation Mentor of the Year Award on the Graduate Student Category. Dr. Mountz will continue to devote his time and efforts to educate younger generation of trainees.

1. Wu J, Zhou T, He J and **Mountz JD**: Autoimmune disease in mice due to integration of an endogenous retrovirus in an apoptosis gene. *J Exp Med* 178:461-468, 1993.
2. Li H, Wu Q, Li J, Yang P, Zhu Z, Luo B, Hsu H-C, and **Mountz JD**. Cutting Edge: Defective follicular exclusion of apoptotic antigens due to marginal zone macrophage defects in autoimmune BXD2 mice. *J Immunol* 190(9):4465-9, 2013. PMC3656168.
3. Li H, Fu Y-X, Wu Q, Zhou Y, Crossman DK, Yang PA, Li J, Luo B, Morel LM, Kabarowski JH, Yagita H, Ware C, Hsu H-C, **Mountz JD**. Interferon-induced Defective Mechanosensing Signaling in Lupus Spleen Marginal Zone Macrophages. In press by *J Clin Investigation*.

B. Positions and Honors

Positions and Employment

07/78-06/81	Internal Medicine Residency Program, North Carolina Baptist Hospital
07/81-07/82	Rheumatology Fellow, Bowman Gray School of Medicine
07/82-08/87	Medical Staff Fellowship, NIH; National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases
05/85-08/87	Research Assistant Professor of Medicine, Uniformed Services University of Health Sciences
07/86-08/87	Guest Researcher, NIH National Institute of Arthritis and Musculoskeletal and Skin Diseases
08/87-07/91	Assistant Professor of Medicine, Division of Clinical Immunology and Rheumatology, Department of Medicine, The University of Alabama at Birmingham
08/87-pres	Staff Physician, Birmingham, AL, VAMC
08/88-07/98	Director, VAMC Transgenic Mouse Facility
08/91-09/94	Associate Professor of Medicine, Division of Clinical Immunology and Rheumatology, Department of Medicine, The University of Alabama at Birmingham
09/91-pres	Associate Professor of Geriatrics, Department of Medicine, The University of Alabama at Birmingham
10/94-pres	Professor of Medicine, Division of Clinical Immunology and Rheumatology, Department of Medicine, The University of Alabama at Birmingham

Honors

William Craig-Orr and Mary Black-Orr Scholarship in Medicine; Kenneth Wiseman Scholarship in Medicine; Howard and Martha Holley Research Prize in Rheumatology, 1992; BS, Summa Cum Laude; MS, Summa Cum Laude; Phi Eta Tau-Scholastic Society; Senior Rheumatology Scholar Award-1986; ACR Research Comm.-1993-1996; Arthritis Foundation Research Comm.-1991-1994; Gordon Conf.-Apoptosis and Aging-1994; Keystone Conf.-Autoimmune Transgenic Mice-1992; Fas and Fas-ligand-1993; FASEB Symposium-Fas, Apoptosis and Autoimmunity-1993; Stanford RA 93 Symposium-1993; Geriatric Research Center Advisory Comm.-1994-1997; Keystone Symposia on RA-1993; "Autoimmunity, Apoptosis Defect & Retroviruses", 1st Intl Symp on HIV-1994; "Fas & Nur77 in Autoimmunity, Intl Conf on Allergy & Immunology, 1995; Gordon Conf on Biology of Aging, 1995; Biomedicine '96; Chairman, "Apoptosis & Autoimmune Disease" ASCI-1995, AAP-1997, Association of American Physicians (AAP) 1998; 2001, Arthritis Foundation Postdoctoral Fellowship “Hero”; 2002, One of 50 Arthritis Foundation “Heroes” to contribute outstandingly to Rheumatology in the past 50 years; 2002, J. W. & Virginia Goodwin-Warren D. Blackburn, Jr. Research Chair in Rheumatology; 2003, Max D. Cooper Award for Excellence in Research; 2008, Dean’s Award for Excellence in Mentorship. 2014, Southern Society of Clinical Investigation Excellent in Mentorship Award (graduate student category).

C. Contribution to Science

1. Dr. Mountz initially focused on analysis of defective regulation of apoptosis and the loss of tolerance that allows the emergence of the clones of autoreactive T cells. He was the first investigator to analyze T-cell receptor (TCR) β-chain expression and to produce $Fas^{lpr/lpr}$ mice bearing specific transgenic TCRs. Dr. Mountz showed that there is abnormal thymocyte development and increased production of autoreactive T cells in D^b/H-Y TCR transgenic (Tg) mice.

Dr. Mountz has contributed extensively to the elucidation of the roles of Fas-mediated apoptosis in autoimmune disease. Examples of seminal contributions in this field include his demonstration for the first time that the autoimmune disease in MRL-$Fas^{lpr/lpr}$ mice could be corrected when a normal *Fas* gene was expressed. He also was the first investigator to establish that the Fas mutation in the MRL-$Fas^{lpr/lpr}$ mice was due to the insertion of the Etn retrotransposon. Dr. Mountz demonstrated that in both mice and humans, alternative splicing of Fas results in non-functional Fas variants. The most common variant of Fas lacks the transmembrane region resulting in high levels of soluble Fas in humans with autoimmune disease. Dr. Mountz also demonstrated that this soluble Fas can block Fas-FasL mediated apoptosis. Dr. Mountz continues to identify TCR specific mechanisms in regulating both central and peripheral T-cell tolerance induction.

a. **Mountz JD**, Zhou T, Eldridge J, Berry K and Blüthmann H: Transgenic rearranged T-cell receptor gene inhibits lymphadenopathy and accumulation of $CD4^-CD8^-B220^+$ T cells in *lpr/lpr* mice. *J Exp Med* 172:1805-1817, 1990.

b. Wu J, Zhou T, Zhang J, He J, Gause WC and **Mountz J**: Correction of accelerated autoimmune disease by early replacement of the mutated *lpr* gene with the normal *Fas* apoptosis gene in the T cells of transgenic MRL-*lpr/lpr* mice. *Proc Natl Acad Sci USA* 91:2344-2348, 1994.
c. Cheng J, Zhou T, Liu C, Shapiro JP, Brauer MJ, Kiefer MC, Barr PJ and **Mountz JD**: Protection from *Fas*-mediated apoptosis by a soluble form of the *Fas* molecule. *Science* 263:1759-1762, 1994.
d. Li H, Hsu H-C, Wu Q, Yang PA, Li J, Luo B, Cua D, Oukka M, Steele III CH, Grizzle, WE, and **Mountz JD**. IL-23 promotes TCR-mediated negative selection of thymocytes through the upregulation of IL-23 receptor and RORγt. *Nat Commun*. Jul 8;5:4259, 2014. PMCID: PMC4136447

2. In parallel with his analyses of the pathogenesis of autoimmune disease, Dr. Mountz has made major contributions to the ongoing development of therapies with an emphasis on the development of gene therapies that target Fas and strategies that promote TNF-induced apoptosis. Using a binary adenovirus system with the Floxed-STOP Fas and an Ad-Cre, he clearly demonstrated that production of FasL inhibited Sjögren-like disease in mice after systemic cytomegalovirus administration. Dr. Mountz demonstrated that an Ad that produced sFas prevented FasL-mediated apoptosis of liver cells and also developed a therapeutic strategy in which FasL-producing APCs pulsed with different autoantigens, in combination with AdFasL transfection, could induce specific T-cell tolerance. This therapy reduces inflammation in several mouse models of autoimmune disease, including CII-induced arthritis, and reduces T cell infiltration of islets in the NOD diabetic mouse model. Most recently, Dr. Mountz has circumvented the problem inherent in analysis of humanized therapeutic agents in mouse models by developing a humanized death receptor (DR5) Tg expressing the extracellular domain of human DR5 and intracellular domain of mouse DR5.

a. Zhang H-G, Liu D, Heike Y, Yang P-A, Wang Z, Curiel DT, Wang X, Zhou T, and **Mountz JD**: Induction of specific T-cell tolerance by adenovirus-infected, Fas ligand producing antigen presenting cells. *Nature Biotechnol* 16: 1045-1049, 1998.
b. Liu Z, Xu X, Hsu H-C, Tousson A, Yang P-A, Wu Q, Liu C, Yu S, Zhang H-G and **Mountz JD**: CII-DC-AdTRAIL cell gene therapy inhibits infiltration of CII-reactive T cells and CII-induced arthritis. *J Clin Invest* 112(9):1332-1341, 2003.
c. Li J, Hsu HC, Yang P, Wu Q, Li H, Edgington LE, Bogyo M, Kimberly RP, **Mountz JD**. Treatment of arthritis by macrophage depletion and immunomodulation: Testing an apoptosis-mediated therapy in a humanized death receptor mouse model. *Arthritis Rheum*. 64(4): 1098–1109, 2012. PMC3596268

3. Dr Mountz' major achievements in the past nine years encompass demonstration of the roles of upregulation of activation-induced cytidine deaminase (AID), T-helper 17 cells (Th17) and interleukin 17 (IL-17), plasmacytoid dendritic cells (pDC), follicular T helper cells (Tfh), and marginal zone macrophages (MZM) in the development of germinal centers (GCs) engaged in the production of pathogenic IgG autoantibodies in the spontaneous autoimmune BXD2 model. The interrelationships delineated in these studies corroborate the importance of networking in this model and have provided strong rationale for such approaches in ultimately understanding the pathogenesis of human autoimmune diseases.

a. Hsu H-C, Yang PA, Wang J, Wu Q, Myers R, Chen J, Yi J, Guentert T, Tousson A, Stanus AL, Le TV, Lorenz RG, Xu H, Kolls JK, Carter RH, Chaplin DD, Lu L, Williams RW and **Mountz JD**. Interleukin 17–producing T helper cells and interleukin 17 orchestrate autoreactive germinal center development in autoimmune BXD2 mice. *Nature Immunol* 9:166-175, 2008. PMID: 18157131
b. Hsu H-C, Yang PA, Wu Q, Wang J, Godwin J, Guentert T, Li J, Stockard CR, Le T, Chaplin DD, Grizzle WE, and **Mountz, JD**. Inhibition of the catalytic function of activation-induced cytidine deaminase (AICDA) promotes apoptosis of germinal center B cells. *Arthritis Rheum* 63(7):2038-2048. 2011. PMC3379710
c. Ding Y, Li J, Wu Q, Yang P, Luo B, Xie S, Druey KM, Zajac AJ, Hsu H-C, and **Mountz JD**. IL-17RA is essential for optimal localization of follicular T helper cells in the germinal center light zone to promote autoantibody-producing B cells. *J Immunol* 191:1614-1624, 2013; PMC3819396

A. Research Support

Ongoing Research Support

P30 AR048311 (Mountz) 09/01/12 – 08/31/17
NIH / NIAMS
Rheumatic Disease Core Center - Administrative Core (Mountz)
Core B: Flow Cytometry Core (Mountz)
This is a multidisciplinary program designed enable application of innovative, scientifically rigorous approaches and state-of-the-art techniques to important questions in biomedical sciences, thereby laying the basis for advances in the diagnosis and treatment of patients with arthritis and musculoskeletal diseases.

R01 AI071110 (Mountz) 04/15/08 – 03/31/19
NIH
Follicular Exclusion 0f Self Antigens Prevents Development of Autoantibodies
The goal of this project is to how follicular exclusion of autoAntigens suppress the pathways leading to the formation of pathogenic autoantibodies in BXD2 mice and how the MKL1 mechanoreceptor enhances follicular exclusion.

201BX000600-01 (Mountz) 01/01/14 – 12/31/18
VA Merit Review
Btk breaks the tolerance of marginal zone macrophages to apoptotic antigens
The overall goal of this proposal is to identify the mechanisms by which Btk regulates the marginal zone macrophages and germinal center precursor B cells in both human and mouse that develop lupus

R01 DE023813 (Yi-Ping Li) 09/01/13-08/30/18
NIH/NIDCR
Title: Inhibiting Periodontitis by Targeting Cathepsin K and Attenuating TLR Signaling.
This study endeavors to Aim 1, To define the functional role of Ctsk in the TLRs signaling mediated immune response and bone resorption and Aim 2. To determine the therapeutic potential of AAV-shRNA-Ctsk as a means to reduce the progression and severity of periodontitis *in vivo* by attenuating TLRs signaling *and* Aim 3. To characterize the mechanism by which Ctsk mediates TLRs signaling in a mouse periodontitis model. The results will provide important insights into the prevention and treatment of periodontitis by targeting Ctsk to attenuate TLR signaling. Knowledge stem from this study will offers new opportunities to design effective therapies combating and preventing periodontitis and will revolutionize the current treatment options.

Completed Research Support in the past 3 years

No Number Mountz (PI) 02/15/08 – 02/14/11
Alliance for Lupus Research NCE
Disruption of Autoreactive Germinal Centers as a Novel Therapy for Lupus
The goal of this study is to investigate if disruption of the germinal center formation can prevent the production of the high affinity, autoreactive antibodies that cause tissue damage in lupus.

No Assigned Number Kimberly (PI) 10/01/08 – 09/30/11
UAB/Sankyo Program for Rheumatic
Diseases and Cancer Research
Project 2: Construction of a hDR5 Tg Mouse for Application of TRA-8 for Treatment of
Rheumatoid Arthritis (Mountz, PI)
The overall goal of this proposal is to develop a mouse model of arthritis that can be used to extend the sphere of application of CS-1008 to the treatment of arthritis.

P30 AR048311 Mountz (PI) 07/01/07 – 06/30/12
NIH / NIAMS
Rheumatic Disease Core Center
Administrative Core (Mountz)
Core C: Flow Cytometry Core (Mountz)

This is a multidisciplinary program designed enable application of innovative, scientifically rigorous approaches and state-of-the-art techniques to important questions in biomedical sciences, thereby laying the basis for advances in the diagnosis and treatment of patients with arthritis and musculoskeletal diseases.

No Number 07/01/12 – 06/30/14
ACR-Within Our Reach
Optimal Approach to Block M1 Macrophages/Th17 Inflammation in Rheumatoid Arthritis
The overall goal of this proposal is to determine the optimal therapy to inhibit the positive interaction loop between inflammatory M1 macrophages and effector IL-17 producing CD4 T cells obtained from human arthritis patients and mouse model of arthritis.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Joanne E. Murphy-Ullrich, PhD

eRA COMMONS USER NAME (credential, e.g., agency login): emurph

POSITION TITLE: Professor of Pathology, Cell Developmental and Integrative Biology, and Ophthalmology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Marquette University, Milwaukee, WI	BSMT (honors)	08/1976	Medical Technology
University of Wisconsin, Madison, WI	PhD	08/1983	Pathology
University of Wisconsin, Madison, WI (Deane F. Mosher, MD)	Post-doc	1983-1986	Biological Chemistry

A. Personal Statement

Dr. Murphy-Ullrich has expertise in the extracellular matrix with a focus on extracellular matrix remodeling in disease. She has extensively studied the matricellular protein thrombospondin1 (TSP1). Her lab made the important discovery that TSP1 is a major regulator of latent TGF-β activation and established TSP1 as a significant factor in regulating TGF-β activation in a number of disease processes, including diabetic complications such as cardiomyopathy and nephropathy. Her lab identified critical sites in TSP1 that induce TGF-β activation and also sites in latent TGF-β necessary for latency. Based on this work, she has developed tools to probe the involvement of TSP1 in regulation of latent TGF-β in various disease processes. She has been funded by the Alabama Drug Discovery Alliance (ADDA) to further the therapeutic development of small molecule antagonists based on a small 4 amino acid peptide that blocks TSP1-dependent TGF-beta activation in diabetic nephropathy, diabetic cardiomyopathy, and now in multiple myeloma. Her work on MSCs and in the osteolytic myeloma models has established the efficacy of the TSP1 antagonist in reducing myeloma tumor burden and osteolytic bone disease. These studies establish a critical role for TSP1 in osteoblast differentiation and osteoclast inhibition. [Bailey DuBose K, Zayzafoon M, Murphy-Ullrich JE (2012) Thrombospondin-1 inhibits osteogenic differentiation of human mesenchymal stem cells through latent TGF-β activation. Biochem Biophys Res Commun, 422: 488-493. PMC3372697]/ Importantly, this work has identified new lead compounds with significantly improved pharmacokinetic profiles.

Her lab is investigating the role of ER calreticulin in augmenting TGF-beta signaling through NFAT, linking ER stress and fibrosis. She showed that CRT knockdown attenuates TGF-β signaling in fibrotic lung fibroblasts. This work establishes a molecular link between ER stress and fibrosis. Her preliminary data now show that high glucose and TGF-beta stimulate CRT expression in proximal tubule cells and in the proximal tubules of Akita type I diabetic mice. siRNA knockdown of CRT attenuates the ability of glucose and TGF-beta to stimulate extracellular matrix production in human proximal tubule cells.

Dr. Murphy-Ullrich has held several leadership positions in the area of extracellular matrix biology. She was Director of the UAB Cell Adhesion and Matrix Research Center and co-Director of the BioMatrix Engineering and Regenerative Medicine Center. She was Secretary/Treasurer of the American Society for Matrix Biology (ASMB) and she is President-elect of the ASMB. She chaired the 2013 FASEB Scientific Conference on Matricellular Proteins in Development, Health, and Disease and guest edited a special issue of Matrix Biology on Matricellular Proteins. She is chair of the basic science peer review panel for the American Heart Association Established Investigator Award.

She has mentored women and minority trainees and was a co-mentor on K08 and K25 awards. She is on 13 active faculty mentoring committees and has trained 14 students and 9 post-doc fellows. She is active in graduate teaching, developed 2 courses, served on curricula committees and on T32 steering committees. Her past-trainees have gone on to success in research and in academic leadership positions.

B. Positions and Honors

1976-1979	Medical Technologist, Transfusion Service, University of Wisconsin Hospitals, Madison, WI
1986-1988	Senior Research Associate, Biochemistry, University of Alabama at Birmingham
1988-1990	Research Instructor, Department of Biochemistry, University of Alabama at Birmingham,
1990-1991	Research Assistant Professor, Depart of Biochemistry, University of Alabama at Birmingham
1991-1995	Assistant Professor, Department of Pathology, University of Alabama at Birmingham, AL
1995-2000	Associate Professor, Department of Pathology, University of Alabama at Birmingham, AL
2000-present	Professor, Department of Pathology, University of Alabama at Birmingham, AL Professor, Department of Cell Biology (now Cell, Developmental, and Integrative Biology) (secondary)
2000-2003	Interim Director, Cell Adhesion and Matrix Research Center, UAB
2003-2006	Director, Cell Adhesion and Matrix Research Center, UAB
2006-2014	Co-director, BioMatrix Engineering and Regenerative Medicine Center, UAB
2014	Professor, Department of Ophthalmology (secondary)
2015-16	President-elect, American Society for Matrix Biology (President 2017-18)

Awards and other professional activities:

Professional Honors and Leadership Roles: AHA Post-doctoral Fellowship; 1984-1985 NRSA, Post-doctoral Fellowship; Established Investigator, American Heart Association (AHA-Genentech Special Awardee in Thrombosis) 1997-2000; Secretary/Treasurer American Society for Matrix Biology, 2008-2011, 2012-2013, president-elect, American Society for Matrix Biology 2015-16. Co-Chair FASEB Summer Research Conference on Thrombospondins and other Matricellular Proteins July 2010; Chair, FASEB Summer Research Conference on Matricellular Proteins July 2013.

Editorial Boards: The Journal of Biological Chemistry (1996-2001 and 2010-2015); Calcium Binding Proteins (2006-2009), Associate Editor, Matrix Biology 2013-present; Guest Editor 2013-2014, Matrix Biology themed issue on Matricellular Proteins, Journal of Cell Communication and Signaling, 2014-present

Peer Review Councils: NIH Biol-2, *ad hoc*1994; Arthritis Foundation, Cell Biology study section member 1995-1996; NCI, Intramural Program Review 1996, American Cancer Society, Cell Structure and Metastasis Peer Review Committee member, 2001-2006; NIH Special Emphasis Panels, Gene Therapy and Diabetes, 2001; ICI 2005, Structural Biology 2005, Pulmonary Countermeasures (RFA-AI-07-040) 2008, JDRF Targets of ROS in T1D complications, April 2010, JDRF Translational grant supplements, August 2010, JDRF March 2011, AHA Established Investigator Award review panel, 2011, Co-Chair AHA EIA BSC 2012-2013, Chair AHA EIA BSC2 2014-15, NIH BMCT-C June 2014 ad hoc.

C. Contribution to Science (h-index 54, i10-index 102)

1. Activation of latent TGFβ by TSP1

My foremost contribution is the discovery that TSP1 binds to the latent TGF-β complex and converts it to a biologically active molecule through a proteolysis-independent mechanism that involves a conformational change in the latent complex. At the time of this discovery, TGF-β activation was thought to be solely through proteolysis by plasmin or by acidification. We were the first to show latent activation through conformation-dependent changes with a biological ligand. Indeed, our findings were the inspiration for Munger and Shepard's findings regarding αvβ6 integrin-mediated TGF-β activation. We mapped critical sites of interaction between TSP1 and latent TGF-β and used peptide mimetics of these sequences to either replace or antagonize TSP1 action in many biological systems and disease models. Importantly, our lab was the first to show the importance of the LSKL sequence (a TSP1 binding site) for maintenance of latency. This work has been substantiated by subsequent structural analysis of the latent TGF-β complex by other labs. Our lab and others have used the LSKL peptide as an antagonist of TSP1 binding and latent TGF-β activation to show the role of TSP1 in various disease processes including diabetic complications of the heart and kidney (see contribution 2). Current efforts are directed at development of high affinity, metabolically stable lead compounds based on LSKL for treatment of multiple myeloma, scleroderma, lung fibrosis, diabetic complications, and glaucoma.

a) Schultz-Cherry S., **Murphy-Ullrich J.E.** (1993) Thrombospondin causes activation of latent transforming growth factor-ß secreted by endothelial cells by a novel mechanism. J. Cell Biol. 122: 923-932. (402 citations)
b) Crawford S.E., Stellmach V., **Murphy-Ullrich, J.E.,** Ribeiro S.M.F., Lawler, J., Boivin, G.P., Hynes R.O., Bouck, N. (1998) Thrombospondin is a major activator of TGF-ß in vivo. Cell, 93: 1159-1170. (995 citations)

c) Ribeiro, S.M. and Poczatek,M., Schultz-Cherry S, Villain, M, **Murphy-Ullrich J.E**. (1999) The activation sequence of thrombospondin-1 interacts with the latency-associated peptide to regulate activation of latent TGF-β. J. Biol. Chem 274: 15386-15394. (258 citations)
d) Young GD, **Murphy-Ullrich JE**. (2004) Molecular interactions that confer latency to transforming growth factor-β. J Biol Chem, 279: 38032-38039. (76 citations)

2. TSP1 is a major regulator of latent TGF-β activation in diabetic complications

Our lab was the first to show that the increased TGF-β activity present under high glucose and high angiotensin II conditions was due to activation by TSP1. We have established a role for TSP1-dependent latent TGF-β activation under high glucose conditions in mesangial cells, vascular smooth muscle cells, and cardiac fibroblasts. We also elucidated the mechanism by which high glucose stimulates increased TSP1 transcription through attenuated repression of TSP1 transcription due to reduced nitric oxide/cGMP and through increased USF2-mediated transcription. Importantly, we have shown the effectiveness of the LSKL antagonist in preventing fibrosis and loss of function in diabetic rat cardiomyopathy and mouse diabetic nephropathy models. These models also showed that long-term treatment with LSKL did not induce tumors or inflammation, suggesting that use of LSKL to selectively target TSP1-activated TGF-β represents a safe strategy to control TGF-β activity in diabetes.

a) Poczatek M, Hugo C, Darley-Usmar V, **Murphy-Ullrich JE**. (2000) Glucose stimulation of transforming growth factor-β bioactivity in mesangial cells is mediated by thrombospondin-1. Am J. Pathol. 157: 1353-1363. (110 citations)
b) Wang S, Shiva S, Poczatek M, Darley-Usmar V, **Murphy-Ullrich, JE**. (2002) Nitric oxide and cGMP-dependent kinase regulation of glucose-mediated thrombospondin1-dependent TGF-beta activation in mesangial cells. J Biol Chem, 277:9880-88.
c) Belmadani S, Bernal J, Wei C-C, Pallero, MA, Dell Italia L, **Murphy-Ullrich JE***, Berecek KH. (2007) A thrombospondin-1 antagonist of TGF-ß activation blocks cardiomyopathy in rats with diabetes and elevated angiotensin II. Am J Pathol, 171(3):777-89. * **corresponding author**, (PMCID 1959499)
d) Lu A, Miao M, Schoeb TR, Agarwal A, **Murphy-Ullrich JE**. (2011) Blockade of TSP1-dependent TGF-beta activation in the Akita model of diabetic nephropathy improves renal function but does not impair wound healing, Amer J Pathol. 178: 2573-86, (PMC3124297).

3. Intermediate adhesion by matricellular proteins

In the late 1980's, all extracellular matrix (ECM) molecules were thought to support cell adhesion and the formation of focal adhesions. My work was the first to show that some extracellular matrix proteins are actually de-adhesive. I showed that thrombospondin 1 (TSP1) prevented focal adhesion formation by cells on a fibronectin substrate and that soluble TSP1 could disrupt pre-existing focal adhesions. We localized this activity to the N-terminal heparin binding domain of TSP1, specifically to amino acids 17-35, which we termed the "hep I" sequence. We next showed, in collaboration with Harold Erickson, that the large form of tenascin-C had similar de-adhesive properties and mapped the active site to the alternatively spliced domain and identified annexin II as the receptor for this site. Although both TSP1 and tenascin-C induce loss of focal adhesions, cells did not round and integrins did not disperse: these results suggested that stimulation of focal adhesion disassembly by these proteins occurs downstream of intracellular signaling events rather than by physical disruption of integrin-ECM binding at the cell membrane. In collaboration with Helene Sage, we showed similar activity for SPARC. These 3 de-adhesive ECM proteins also stimulated cell migration. Based on the observations that these 3 extracellular matrix proteins were de-adhesive and other observations regarding the subtle phenotypes in animals with genetic deletions of TSP1, TN-C, or SPARC, Paul Bornstein proposed the concept of the Matricellular ECM matrix protein in 1995. We termed the de-adhesive phenotype "Intermediate Cell Adhesion." The de-adhesive activity of matricellular proteins was the topic of my first R01 in 1991 and it is now a well-accepted principle.

a) **Murphy-Ullrich J.E**., Höök M. (1989) Thrombospondin modulates focal adhesions in endothelial cells. J. Cell Biol. 109: 1309-1319. (248 citations)
b) **Murphy-Ullrich J.E**., Pallero M.A., Greenwood J.A., Boerth N., Lincoln T. M., Cornwell T.L. (1996) cGMP-dependent protein kinase is required for thrombospondin and tenascin mediated focal adhesion disassembly. J. Cell Science 109:2499-2508.**(Corresponding author)**
c) **Murphy-Ullrich JE** (2001) Stimulation of intermediate cell adhesion by matricellular matrix proteins: what does it mean for cellular function? J. Clin. Invest. (Perspective series) 107: 785-790. (399 citations)
d) **Murphy-Ullrich, JE**, Sage EH. Revisiting the Matricellular Concept. Matrix Biol. 2014 37:1-14.

(PMC4379989) **(Corresponding author)**

4. Cell surface Calreticulin (CRT) as a receptor for TSP and co-receptor for LRP1

Calreticulin (CRT) was discovered in the sarcoplasmic reticulum of muscle cells and was initially studied for its role in regulating ER calcium signaling and its chaperone function in regulating protein folding. We identified CRT as a cell surface protein associated with endothelial membranes which served as a cell surface binding molecule for the N-terminal hep I sequence of TSP1 involved in focal adhesion disassembly/intermediate adhesion. Our lab was the first to provide definitive evidence for localization of CRT at the cell membrane and for its role in mediating ligand-dependent cell signaling. Furthermore, we provided evidence for CRT interactions with LRP1 to transmit intracellular signals as a consequence of TSP1 binding to CRT. LRP1 interactions with cell surface CRT have been shown to be critical for most cell surface functions of CRT. We showed that this interaction was important for focal adhesion disassembly, cell migration, anoikis resistance, and stimulation of collagen matrix formation. Our work provided the basis for our current understanding of the importance of CRT at the cell surface beyond its interactions with TSP1, including its role in tumor cell opsinization and clearance of apoptotic cells. We are continuing to characterize CRT-LRP1 interactions through NSF-funded studies with Dr. Yuhua Song using molecular modeling approaches.

a) Goicoechea S, Orr AW, Pallero MA, Eggleton P, **Murphy-Ullrich JE**. (2000) Thrombospondin stimulates focal adhesion disassembly through interactions with cell surface calreticulin. J. Biol. Chem 275:36358-36368. (133 citations)
b) Orr AW, Pedraza CE, Pallero MA, Elzie CA, Goicoechea S, Strickland DK, Murphy-Ullrich JE. (2003) Low density lipoprotein receptor related protein (LRP) is a co-receptor for cell surface calreticulin that signals focal adhesion disassembly by thrombospondin. J. Cell Biol 161: 1179-89. (PMC2172996) (115 citations)
c) Sweetwyne MT, Pallero MA, Lu A, Graham LV, **Murphy-Ullrich, JE**, (2010) Local expression of the N-terminal calreticulin binding sequence of thrombospondin in vivo stimulates tissue remodeling through upregulation of collagen. Am J Pathol, 177(4):1710-24.(PMC2947268)
d) Gold LI, Eggleton P, Sweetwyne MT, Van Duyn LB, Greives MR, Naylor SM,Michalak M, **Murphy-Ullrich JE**.(2010) Calreticulin: non-endoplasmic reticulum functions in physiology and disease. FASEB J. 24(3):665-83. (PMC2830142) (158 citations)

5. Role of intracellular CRT regulated calcium signaling in TGF-β dependent transcription of collagen

Using MEFs from CALR knockout mice and siRNA knockdown approaches, we showed that CRT in the ER regulates multiple steps critical for collagen processing. ER CRT acts as a collagen chaperone and regulates its transport from the ER to the golgi and it indirectly regulates collagen assembly into the extracellular matrix through its control of fibronectin matrix assembly. We also showed that CRT regulates collagen transcription in a calcium dependent manner. Interestingly, our work showed that TGF-β stimulation of collagen transcription is dependent on CRT-dependent calcium regulation and activation of NFAT. TGF-β fails to stimulate ER calcium release, NFAT activation, and collagen transcription in the absence of CRT. The role of calcium in regulating TGF-β signaling is poorly studied and our results suggest a novel interplay between ER stress conditions which increase CRT expression and TGF-β signaling that drives fibrosis. We are currently funded by the DoD to study this pathway in tubuluointerstitial fibrosis in diabetic nephropathy. In unpublished work, we have also shown that tissue selective knockdown of CRT in injured carotid arteries attenuated neointimal collagen expression and neointimal hyperplasia.

a) Van Duyn Graham L, Sweetwyne MT, Pallero MA, Murphy-Ullrich JE.(2010) Intracellular calreticulin regulates multiple steps in fibrillar collagen expression, trafficking, and processing into the extracellular matrix. J Biol Chem 5;285(10):7067-78. (PMC2844156).
b) Zimmerman KA, Graham LV, Pallero MA, Murphy-Ullrich (2013) Calreticulin regulates Transforming Growth Factor-β stimulated extracellular matrix production. J Biol Chem, 288: 14584-14598 (PMC3656311)

Complete List of Published Work in MyBibliography: http://www.ncbi.nlm.nih.gov/sites/myncbi/joanne.murphy-ullrich.1/bibliography/41144029/public/?sort=date&direction=ascending.

D. Research Support

NIH/NCI 1R01CA175012 (Murphy-Ullrich, PI) 08/01/14-07/31/19
The thrombospondin1-TGF-beta axis in multiple myeloma
To determine immune mechanisms, explore function of LSKL on TSP1 null background, compare LSKL active to

TGF-beta receptor kinase inhibitors, to determine possible drug synergies with TSP1 antagonists and advance identification and optimization of a lead compound blocking TSP1-TGF-beta activation in multiple myeloma.

Department of Defense, W81XWH-14-1-0203 (PI: Murphy-Ullrich) 07/01/14-06/30/17
The endoplasmic reticulum stress protein calreticulin in diabetic chronic kidney disease
To determine the impact of calreticulin regulation of TGF-beta signaling on tubular epithelial cell responses to glucose and TGF-beta and to determine the role of calreticulin in mouse models of diabetic nephropathy using ultrasound/microbubble mediated plasmid delivery.

Eyesight Foundation of Alabama (38-2009-633 12/31/13-12/30/15
(Murphy-Ullrich, PI subproject)
Role of TSP1-TGF-beta in biomechanical remodeling in glaucoma
Goals: To examine the role of TSP1 control of cell adhesion and TGF-beta activation in sclera remodeling under differing biomechanical forces in models of glaucoma.

NSF CBET-1159859 (Song, PI) 10/01/12-09/30/15
Thrombospondin-1/calreticulin binding in regulation cell intermediate adhesion and collagen expression
To use mathematic modeling and biochemical approaches to understand how TSP-1 induces calreticulin-LRP1 interactions

NIH/NIDDK P30 DK074038 (Yoder, PI) 10/01/10-06/30/15
UAB Hepatobiliary Fibrocystic Diseases Research and Translational Core Center
Dr. Murphy-Ullrich heads the pilot and feasibility grant program.

Department of Defense, Grant 11205398 (Berry, PI) 01/01/13-12/31/15
2012 Breast Cancer Research Program
Microvascularized 3D Breast Cancer Constructs for Drug Testing and Development
To develop cellular and extracellular matrix scaffolds with endothelialized microvascular channels for use in drug toxicity and screening assays

Completed

American Society for Hematology Bridge Grant 03/01/14-02/28/15
Thrombospondin-TGF-beta axis in multiple myeloma
To determine possible drug synergies with TSP1 antagonists and advance identification of lead compound blocking TSP1-TGF-beta activation in multiple myeloma

UAB Comprehensive Cancer Center (Murphy-Ullrich, PI) 12/01/12-7/31/14
The thrombospondin1-TGF-β in multiple myeloma
To investigate the mechanisms of TSP1 regulation of latent TGF-β activation on multiple myeloma progression

1R13DK100244-01 (Murphy-Ullrich, PI) 07/24/13- 06/30/14
Federation of American Society for Experimental Biology
FASEB SRC on Matricellular Proteins in Development, Health, and Disease
Conference support grant for FASEB Summer Research Conference July 28-Aug 2, 2013

12IRG9160008 (Murphy-Ullrich, PI) 01/01/12-12/31/13
American Heart Association Innovation Grant
Calreticulin in diabetic vascular disease
Determine the role of VSMC specific CRT expression in diabetic vascular injury and diabetic atherosclerosis.

Alabama Drug Discovery Alliance/UAB-SR (Murphy-Ullrich, PI) 01/01/11-04/30/13
Development of small molecule antagonists of TSP1-dependent TGF-beta activation for treatment of multiple myeloma
To establish proof of principle for role of TSP1-dependent TGF-beta activation in multiple myeloma and to develop HTS assays for LSKL mimetic small molecule identification.

NIH/NIDDK DK078038 (Murphy-Ullrich, PI) 04/01/07-03/31/13
Thrombospondin 1 antagonists and diabetic nephropathy
The goal is to test the hypothesis that LSKL peptide improved renal function and attenuates renal fibrosis in the 129//akita model of type 1 diabetes: to test effectiveness of the LSKL peptide; to determine whether a combined therapeutic approach that targets both the angiotensin II type 1 receptor and TSP1 has increased benefit and to will address whether blockade of TSP1-activated TGF-β has deleterious consequences.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Napierala, Dobrawa

eRA COMMONS USER NAME (credential, e.g., agency login): dobrawan

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
A. Mickiewicz University, Poznan, Poland	M. Sc.	06/1995	Biotechnology
Institute of Bioorganic Chemistry (IBCh), Polish Academy of Sciences, Poznan, Poland	Ph.D.	10/1999	Chemical Sciences, Biochemistry
Baylor College of Medicine, Houston TX	Postdoctoral	2008	Molecular Biology and Genetics

A. Personal Statement

I have received extensive training in molecular and developmental biology, and genetics of cartilage, bone and dentin. My long term research interest is in understanding molecular determinants of disturbed development and homeostasis of skeletal and dental tissues. In particular, I am interested in diseases associated with defective endochondral ossification, reduced bone mineral density, and abnormal mineralization. The approach I take to answer scientific questions related to molecular pathology underlying human disorders combines analyses of knock out and transgenic mice as disease models with in vitro studies of molecular interactions in a specific cellular context. The ultimate goal of my research is finding therapeutic approaches that target key molecular abnormalities underlying the pathology of mineralization and homeostasis of skeletal tissues.

I am actively engaged in mentoring and training of PhD students, dental students, undergraduate students and postdoctoral trainees. I am a co-director of the T90DE022736 Dental Academic Research Training (DART) Program (PhD track) at the University of Alabama at Birmingham School of Dentistry. I serve on thesis committees of PhD and Master level students in the UAB School of Dentistry and University-wide. Currently, my research team consists of a postdoctoral trainee, a graduate student in the Cell, Molecular and Developmental Biology Program, a candidate DMD/PhD student, and a MS student in the Oral Biology program. All trainees in my laboratory successfully compete at the local, national and international level.

Maria Kuzynski, UAB/GBS-CMDB student, PhD thesis mentor. Awards:

- 2013 International Association for Dental Research Bloc Travel Grant
- 2013 1st place in Basic Science DENTSPLY/Caulk Competition, International Association for Dental Research annual meeting
- F31DE024926

Morgan Goss, SOD Masters in Oral Biology Program, thesis mentor. Awards:

- 2013 DART Summer Research Training fellowship
- 2013-2014 UAB Graduate Program Fellowship
- 2014-2015 UAB Graduate Program Fellowship
- 2015 International Association for Dental Research Bloc Travel Grant
- 2015 2nd place in SOD Scholars' Day competition, pre-doctoral category

Sandeep Chaudhary, post-doctoral trainee. Awards:

- 2015 1st place in SOD Scholars' Day competition, post-doctoral category

Callie Mobley, undergraduate student. Awards:

- UAB Science and Technology Honors Program
- 2011 DART Summer Research Training fellowship
- 2012 2nd place in SOD Scholars' Day competition, undergraduate category

In addition, during my postdoctoral training and as a junior faculty at Baylor College of Medicine in Dr. Brendan Lee laboratory I trained and directly mentored PhD and MD/PhD students, medical students and residents, and undergraduate students. Dr. Lee has a large laboratory with over 30 members and many different lines of research. I directly supervised and had a leadership position in the "Osteogenesis Imperfecta Research" group within Dr. Lee's laboratory. This team consisted of 2 PhD students, 1 MD/PhD student, 1 medical student and 1 postdoctoral fellow. As a member of this team I co-authored 3 manuscripts:

a. Kelley BP, Malfait F, Bonafe L, Baldridge D, Homan E, Symoens S, Willaert A, Elcioglu N, Van Maldergem L, Verellen-Dumoulin C, Gillerot Y, **Napierala D**, Krakow D, Beighton P, Superti-Furga A, De Paepe A, Lee B. Mutations in FKBP10 cause recessive osteogenesis imperfecta and type 1 bruck syndrome. Journal of Bone and Mineral Research Mar;26(3):666-72 (2011) PMID: 20839288.

b. Homan EP, Rauch F, Grafe I, Lietman C, Doll JA, Dawson B, Bertin T, **Napierala D**, Morello R, Gibbs R, White L, Miki R, Cohn DH, Crawford S, Travers R, Glorieux FH, Lee B. Mutations in SERPINF1 cause Osteogenesis imperfecta type VI. Journal of Bone and Mineral Research Dec;26(12):2798-803 (2011). PMID:21826736.

c. Homan EP, Lietman C, Grafe I, Lennington J, Morello R, **Napierala D**, Jiang MM, Munivez EM, Dawson B, Bertin TK, Chen Y, Lua R, Lichtarge O, Hicks J, Weis MA, Eyre D, Lee BH. Differential effects of collagen prolyl 3-hydroxylation on skeletal tissues. PLoS Genetics 2014 Jan;10(1):e1004121. PMID: 24465224.

My didactic contributions are in the area of molecular and developmental biology and pathology of mineralizing tissues. These classes are taken by students and post-graduate trainees from School of Dentistry, Graduate School for Biomedical Sciences and School of Engineering. In addition, I have developed the "Research Skills Enhancement" course. The goals of this course are: 1) to provide trainees the opportunity to present their research, and 2) to improve the scientific presentation, discussion and public speaking skills. This is facilitated by written evaluations provided by attendees after each presentation, and by short presentations of specific topic related to public speaking and research presentation skills.

B. Positions and Honors

Positions and Employment

2008-2009	Instructor, Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX
2009-2011	Assistant Professor, Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX
2011-	Assistant Professor, Department of Oral & Maxillofacial Surgery, Institute of Oral Health Research, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2003-	Member, American Society for Bone and Mineral Research (ASBMR)
2010-	Member, International/American Association for Dental Research (IADR/AADR)
2013-	Member, American Dental Education Association (ADEA)
2013-	Member, Association for Women in Science (AWIS)
2015-	Member, International Society for Extracellular Vesicles (ISEV)

Honors

1995	Polish Biochemical Society, Poster Award for Undergraduate Students
1999	Foundation for Polish Science, Award for Young Scientists
2000	IBCh Award for the best Ph.D. thesis defended in 1999
2010	Bone Disease Program of Texas, Research Award
2010	American Society for Bone and Mineral Research, John Haddad Young Investigator Award

2015 Honorary Membership, Phi Phi Chapter of Omicron Kappa Upsilon, National Dental Honor Society

C. Contribution to Science

My major contributions to science are in the field of molecular mechanisms of skeletal development and molecular bases of human skeletal disorders. My studies on the regulation of RUNX2, the key transcription factor in skeletal formation and homeostasis, led to identification of the TRPS1 transcription factor as a novel repressor of RUNX2 during endochondral bone development. This finding fueled my interest in determining molecular networks of TRPS1 in skeletal and dental tissues, as TRPS1 was a new transcription factor with unknown target genes and interacting molecules. TRPS1 mutations cause tricho-rhino-phalangeal syndrome (TRPS) and Ambras syndrome. I studied a mouse model of TRPS to understand molecular abnormalities underlying skeletal dysplasia in TRPS. Using histological and molecular analyses, I uncovered that Trps1 is required for synchronized development of chondrocytes and perichondrium by regulating hedgehog signaling and Runx2 during endochondral bone formation. Furthermore, I discovered that *Trps1* is a regulator of mineralization, which acts in a context-dependent manner. I generated transgenic mice overexpressing *Trps1* specifically in osteoblasts and odontoblasts (*Col1a1-Trps1 mice*), and uncovered that *Trps1* represses the function of mature odontoblasts (cells that make dentin). Using the combination of in vivo and in vitro approaches I demonstrated that *Trps1* represses the major dentin gene, *Dspp* through direct interactions with its promoter, and the downregulation of *Dspp* contributes to defective dentinogenesis in *Co1a1-Trps1* transgenic mice. We uncovered that in mature odontoblasts *Trps1* represses a group of genes involved in phosphate metabolism, which are associated with hypophosphatemic rickets. This suggest that Trps1 is and inhibitor of mineralization. Interestingly, this function is restricted to mature cells only. We found that in progenitor cells, *Trps1* is required for expression of key osteogenic genes and the initiation of the mineralization process. The context-dependent role of *Trps1* in the differentiation and function of cells in the skeletal and dental tissues is the central theme of the research in my lab. These findings are highlighted in the following published manuscripts:

a. **Napierala D**, Garcia-Rojas X, Sam K, Wakui K, Chen C, Mendoza-Londono R, Zhou G, Zheng Q, Lee B. Mutations and promoter SNPs in RUNX2, a transcriptional regulator of bone formation. Molecular Genetics and Metabolism Sep-Oct;86(1-2):257-68 (2005). PMID16140555.
b. **Napierala D**, Sam K, Morello R, Zheng Q, Munivez E, Shivdasani R, Lee B. Uncoupling of chondrocyte differentiation and perichondrial mineralization underlies the skeletal dysplasia in tricho-rhino- phalangeal syndrome. Human Molecular Genetics Jul 15;17(14):2244-54 (2008) PMCID: PMC2710999.
c. **Napierala D***, Sun Y, Maciejewska I, Bertin TK, Dawson B, D'Souza R, Qin C, Lee B. Transcriptional Repression of the Dspp Gene Leads to Dentinogenesis Imperfecta Phenotype in Col1a1-Trps1 Transgenic Mice. Journal of Bone and Mineral Research Aug;27(8):1735-45 (2012). PMID:22508542. * Corresponding author
d. Kuzynski M, Goss M, Bottini M, Yadav MC, Mobley C, Winters T, Poliard A, Kellermann O, Lee B, Millan JL, **Napierala D**. Role of the Trps1 Transcription Factor in Dentin Mineralization. Journal of Biological Chemistry 2014 Oct 3;289(40):27481-93. PMID: 25128529.

D. Research Support

Ongoing Research Support

R01 DE023083 Napierala (PI) 04/10/14-03/31/19
Transcriptional Regulation of Dentin Mineralization.
The goal of this project is to define the molecular circuits involving the Trps1 transcription factor in odontoblast maturation and dentin formation.
Role: PI

OrthoAccell Technologies Inc. Napierala (PI) 03/01/14-02/28/16
A pilot investigation of cellular responses after cyclic forces during orthodontic treatment.
The goal of this project is to determine cellular and molecular characteristics of dental tissues and alveolar bone subjected to the cyclic forces during orthodontic treatment.
Role: PI

Completed Research Support

Center for Metabolic Bone Disease, UAB Napierala (PI) 01/08/13-07/31/14
Role of Trps1 in Bone Homeostasis
The goal of this pilot project is to identify cellular abnormalities leading to low bone mass phenotype in Trps1 deficiency and in Trps1 over-activation.
Role: PI

R03 AR057128 Napierala (PI) 06/01/09-05/31/13
Role of Trps1 in Endochondral Bone Formation
The major goal of this project is to understand the mechanisms whereby Trps1 regulates Ihh and BMP signaling during endochondral ossification in a mouse model of tricho-rhino-phalangeal syndrome.
Role: PI

UAB Faculty Development Grant Program Napierala (PI) 8/01/11-08/31/12
Identification of novel Trps1 target genes involved in dentin mineralization
The goal of this project is to identify genes regulated by Trps1 during mineralization of dentin.
Role: PI

Bone Disease Program of Texas Napierala (PI) 06/01/10-01/31/11
Identification of Trps1 Protein-Protein Interactions Regulating Mineralization
The major goal of this project is to understand a context-dependent inhibition of mineralization by the Trps1 transcription factor.
Role: PI

R21 DK082825 Oesterreich (PI) 05/01/10-04/30/11
A functional SRC1 SNP in bone biology
The goal of this project is analysis of functional non-synonymous variant in the nuclear receptor cofactor SRC1 in bone cells, and generation of the knock-in mouse.
Role: Collaborator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Selvarangan Ponnazhagan

eRA COMMONS USER NAME (credential, e.g., agency login): sponnazh

POSITION TITLE: Professor of Pathology - *Endowed Professor in Experimental Cancer Therapeutics*

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Madras	B.S.	1980	Biology
University of Madras	M.Phil.	1984	Genetics
University of Madras	Ph.D.	1989	Genetics
Indian University, Indianapolis	Postdoc	1996	Molecular Biology

A. PERSONAL STATEMENT

The major research area in my laboratory is experimental therapeutics of breast and prostate cancers. Two areas in breast cancer research that we focus are: *1)* To develop and test a unique combination therapy for osteolytic breast cancer bone metastasis. We have developed over the years strategies to utilize mesenchymal stem cells (MSC) as effective therapeutic vehicles for bone remodeling. We further identified signals that would result in bone-enriched homing of MSC and shown by targeting RANK activation using osteoprotegerin (OPG), a decoy receptor for RANK ligand, it is indeed possible to reverse bone damage following osteolytic damage in a localized model. In order to effectively utilize, OPG without interfering in tumor apoptosis, more recently by using homology modeling we developed a mutant OPG that lacks TRAIL binding affinity and validated in vitro and in vivo. We recently identified that the immature myeloid cells, known as myeloid-derived suppressor cells (MDSCs) in the tumor microenvironment (TME), within the bone, undergoes osteoclast differentiation and serve as osteoclast progenitors to enhance bone damage. This property was not seen in MDSCs found in other TME. Our recently published studies on this novel role of MDSCs also identified potential pathways through which MDSCs function to induce osteolysis. Our current focus is towards understanding the nature of interaction and influence of metastasizing cancer cells with cells of the skeletal system and the immune system within the TME towards designing therapeutic strategies for osteolytic bone metastasis, and *2)* to determine immune mechanisms of osteolytic bone metastasis and develop interventional strategies that would help both long-term survival and bone repair. We have recently identified that the immature myeloid cells, known as myeloid-derived suppressor cells (MDSCs) in the tumor microenvironment (TME), within the bone, undergoes osteoclast differentiation and serve as osteoclast progenitors to enhance bone damage. This property was not seen in MDSC found in other TME. Our recently published studies on this novel role of MDSCs also identified potential pathways through which MDSC function to induce osteolysis.

With reference to prostate cancer, my research focus is to evaluate the potential of endostatin as a novel combination to second-generation androgen receptor (AR) antagonists. Recent studies from our laboratory identified a novel function of endostatin in AR-positive prostate cancer (PCa) in the mouse and human cells. More interestingly, internalized endostatin was found to bind to AR, affecting downstream activation of AR target genes. By structural modeling and site-directed mutagenesis studies, we discovered that binding of endostatin with the AR ligand-binding domain (LBD) involves interaction of amino acids in the bulky side chain of endostatin with the co-activator binding interface (AF-2) in the AR-LBD. More interestingly, the LBD of closely similar steroid receptor family members including the glucocorticoid receptor (GR) share identical structural homology to AR-LBD and interact with respective ligands in an identical manner. Drug resistance to the second-generation ligand and AR antagonists in CRPC revealed mutations in the AR-LBD and activation of GR in the absence of AR functions, respectively. In these contexts, I intend to test the use of endostatin in combination with the ligand- and AR-targeted therapies to improve survival. The proposed study is likely to provide advantage in multiple ways including: ***a)*** endostatin can be recognized as an endogenous AR inhibitor where its molecular interaction with AR may prevent the agonistic switch of AR function by fully masking the

AF-2 subdomain, ***b)*** since the molecular structure of the LBD is homologous in AR and GR, endostatin binding to GR, when activated as a survival mechanism of PCa cells following treatment with AR antagonists like enzalutamide, can exert profound inhibition of resistance mechanisms as a combination therapy, and ***c)*** the anti-angiogenic function of endostatin, targeting the tumor vasculature can synergize with tumoricidal mechanisms of androgen and AR antagonists.

B. POSITIONS AND HONORS

Positions:

1997-1998	Assistant Scientist and Lecturer, Department of Microbiology and Immunology, Indiana University School of Medicine, Indianapolis, IN
1999-2003	Assistant Professor, Dept. of Pathology, University of Alabama at Birmingham, Birmingham, AL
2003-2007	Associate Professor, Dept. of Pathology, University of Alabama at Birmingham, Birmingham, AL
2007-Present	Professor, Dept. of Pathology, University of Alabama at Birmingham, Birmingham, AL
1999-Present	Associate Scientist, Scientist, Senior Scientist, Comprehensive Cancer Center, University of Alabama at Birmingham, AL
2000-Present	Associate Scientist, Scientist, Senior Scientist, Center for Metabolic Bone Diseases, University of Alabama at Birmingham

Honors and Awards:

Junior Research Fellowship of the Council for Scientific and Industrial Research (1983-1985)
Senior Research Fellowship of the Council for Scientific and Industrial Research (1985-1988)
Travel Grant, 1st Annual Meeting of the American Society of Gene Therapy, Seattle, Washington, 1998
Reviewer: **NIH Study sections** - Gene Delivery RFA July 2003; Developmental biol. subcommittee, October 2003; NCI IRG-CII, October 2003; NIH ZRG1 IDM-G (90) Innovative Research Topics in Virology, June 2004., NIH-GTIE, February 2006-2010, ZAR1 EHB-H M1, NIAMS Special Emphasis Panel, March 2007, Wellstone Muscular Dystrophy Cooperative Research Centers (U54) Review Board, March 2008, NIH Study section ZAR1 EHB-H M1, NIAMS Special Emphasis Panel, March 2008, TAG (Therapeutic Approaches to Genetic Diseases) - October 2009, NICHD Developmental Biology Subcommittee, October 2010, NICHD Developmental Biology Subcommittee, April 2011; TAG 2014; Developmental Therapeutics Study section – Feb. 2015.
Member, International Review Panel, Research Grants Council of Hong Kong, March 2004, Kentucky Science and Engineering Foundation, September 2005.
Expert Reviewer – Prostate Cancer Foundation of Australia, August 2008
Coordinating Reviewer – American Society of Gene Therapy, 12th Annual Meeting, San Diego, CA, 2009; Prostate Cancer Foundation of Australia, September 2009; Wellcome TrustResearch Grants, January 2010; James & Esther King Biomedical Research Program and the Bankhead-Coley Cancer Research Program, Florida Department of Health, February 2010
Prostate Cancer Foundation of Australia, September 2010
Coordinating Reviewer – American Society of Gene Therapy, 14th Annual Meeting, Seattle, WA, 2011
UAB Graduate School Dean's Excellence in Mentorship, 2012
Department of Pathology Faculty Leadership and Dedication Award 2012
Advisory Council Member – American Society for Gene and Cell Therapy – Cancer Cell and Gene Therapy Program – 2012, 2013, 2014, 2015

C. CONTRIBUTION TO SCIENCE (published 96 papers)

As a postdoctoral fellow, I published extensively on adeno-associated virus gene transfer/therapy. These studies have resulted in both the understanding of vector biology, development of novel, tropism-modified/enhanced AAV vectors and their utility in human diseases. In particular, my lead author paper was the first to recognize liver-tropism of rAAV[4]. Salient papers highlighting these contributions are:

1. **Ponnazhagan, S.**, Nallari , M.L. and Srivastava, A. Suppression of human -globin gene expression mediated by the recombinant adeno-associated virus 2 based anti-sense vectors. *J. Exp. Med*., 179:733-738, 1994.
2. **Ponnazhagan, S.** Wang, X-S., Woody, M.J., Luo, F., Kang, L.Y., Nallari, M.L., Munshi, N.C., Zhou, S.Z. and Srivastava, A. Differential expression in human cells from the p6 promoter of human parvovirus B19

following plasmid transfection and recombinant adeno-associated virus 2 (AAV) infection: Human megakaryocytic leukemia cells are non-permissive for AAV infection. *J. Gen. Virol*., 77: 1111-1122, 1996.
3. **Ponnazhagan, S.**, Mukherjee, P., Wang, X-S., Kurpad, C., Qing, K., Kube, D., Mah, C., Yoder, M., Srour, E.F. and Srivastava, A. Adeno-associated virus 2-mediated transduction of primary human bone marrow derived CD34+ hematopoietic progenitor cells: Donor variation and correlation of expression with cellular differentiation. *J. Virol.,* 71: 8262-8267, 1997.
4. **Ponnazhagan, S.**, Weigel, K.A., Raikwar, S.P., Mukherjee, P., Yoder, M.C. and Srivastava. A. Novel recombinant parvovirus B19-based vectors: erythroid cell-specific delivery and expression of transduced genes. *J. Virol*., 72: 5224-5230, 1998

When I started my **independent faculty position in UAB** as an Assistant Professor, the experience I have gained in gene therapy enabled me to expand the utility of this unique vector in cancer. Since rAAV does not transduce cancer cells efficiently and also that they are lowly-immunogenic, an undesirable feature for eliciting host immune response, I developed strategies to utilize long-term expression capabilities of rAAV that can potentially be sued for cancer therapy, targeting non-cancer cells that promote tumor growth. Until that time, rAAV vectors were being tested only for monogenic diseases that require life-time correction by long-term, sustained gene expression. We were the first group to test rAAV as a vaccine vector for cancer and to target tumor angiogenesis through sustained expression of anti-angiogenic genes. The following are representative publications that resulted from these studies;

Pertaining to tumor vaccines:

1. **Ponnazhagan, S.,** Mahendra, G., Curiel D.T., and Shaw, D.R. Adeno-associated virus-mediated transduction of human monocyte-derived dendritic cells: implications for ex vivo immunotherapy. J. Virol., 2001, 75:9493-9501.
2. **Ponnazhagan, S.,** Mahendra, G., Lima, J., Aldrich, W., Jenkins, C., Ren, C., Kallman, L., Strong, T., Shaw, D., and Triozzi, P. Augmentation of anti-tumor activity of a recombinant adeno-associated virus carcinoembryonic antigen vaccine with plasmid adjuvants Hum. Gene Ther. 2004, 15: 856-864.
3. Aldrich, W.A, Ren, C, White, A.F., Zhou, S-Z, Kumar, S., Jenkins, C.B., Shaw, D.R., Strong, T.V., Triozzi, P.L., and **Ponnazhagan, S.** Enhanced transduction of mouse bone marrow-derived dendritic cells by repetitive infection with self-complementary adeno-associated virus 6 combined with immunostimulatory ligands. Gene Therapy 2006, 13: 29-39.
4. Triozzi PL, Aldrich W, Achberger S, **Ponnazhagan** S, Alcazar O, Saunthararajah Y. Differential effects of low-dose decitabine on immune effector and suppressor responses in melanoma-bearing mice. Cancer Immunol. Immunother. 2012;61:1441-50.

In our efforts to utilize rAAV for **anti-angiogenic therapy**, we used pre-clinical mouse models and demonstrated its potential in tumor regression. Notable publications from these studies are:

1. **Ponnazhagan, S.** Mahendra, G., Kumar, S., Shaw, D., Meleth, S., Stockardt, R., and Grizzle, W.E. Adeno-associated virus-2-mediated anti-angiogenic gene therapy: long-term efficacy of a vector encoding angiostatin and endostatin over vectors encoding a single factor. Cancer Res. 2004, 64: 1781-1787.
2. Isayeva, T., and **Ponnazhagan, S.** Anti-angiogenic gene therapy for cancer. Int. J. Oncol. 2004, 25: 335-343.
3. Mahendra, G., Mahasreshti, P., Curiel, D.T., Stockardt, R., Grizzle, W.E., Alapati, V., Singh, R., Siegal, G.P., and **Ponnazhagan, S.** Anti-angiogenic gene therapy through adeno-associated virus 2-mediated stable expression of soluble Flt-1 receptor. Cancer Gene Ther. 2005, 12: 26-34.
4. Isayeva, T., Ren, C., and **Ponnazhagan, S.** Recombinant adeno-associated virus 2 -mediated anti-angiogenic prevention in a mouse model of intraperitoneal ovarian cancer. Clin. Cancer Res. 2005, 11:1342-1347.

Having realized the potential of endostatin in prostate cancer therapy and its possible role in androgen receptor (AR) signaling, we recently identified a novel function of endostatin in AR-positive prostate cancer (PCa) in the mouse and human cells. More interestingly, internalized endostatin was found to bind to AR, affecting downstream activation of AR target genes. By structural modeling and site-directed mutagenesis studies, we discovered that binding of endostatin with the AR ligand-binding domain (LBD) involves interaction of amino acids in the bulky side chain of endostatin with the co-activator binding interface (AF-2) in the AR-LBD. More interestingly, the LBD of closely similar steroid receptor family members including the glucocorticoid receptor

(GR) share identical structural homology to AR-LBD and interact with respective ligands in an identical manner. Drug resistance to the second-generation ligand and AR antagonists in CRPC revealed mutations in the AR-LBD and activation of GR in the absence of AR functions, respectively. This unique role of endostatin in targeting AR opens a new avenue for the treatment of castration resistant prostate cancers where AR functions independent of ligand requirement.

1. Isayeva, T., Moore, L.D., Chanda, D., Chen, D., and **Ponnazhagan, S.** Tumoristatic effects of endostatin in prostate cancer is dependent on androgen receptor status. The Prostate 2009 69:1055-66.
2. Lee JH, Isayeva T, Larson MR, Sawant A, Cha HR, Chanda D, Chesnokov IN, **Ponnazhagan S**. Endostatin: A novel inhibitor of androgen receptor function in prostate cancer. Proc Natl Acad Sci U S A. 2015 Feb 3;112(5):1392-7.

For cancer bone metastasis, my laboratory developed a unique bone-targeted mesenchymal stem cell (MSC) therapy, interfering with upregulated RANK-RANKL signaling by using recombinant osteoprotegerin. Since OPG also interferes with TRAIL binding, we developed a novel, OPG variant by identifying domains in the protein that bind to RANKL but not to TRAIL suing protein structural modeling methods and site-directed mutagenesis. The novel OPG was recently tested as genetically-engineered MSC therapy in osteolytic cancer models. Major publications that resulted in this area are:

1. Kumar, S., and **Ponnazhagan, S**. Bone homing of pluripotent mesenchymal stem cells by ectopic α4 integrin expression. FASEB J. 2007 2007, 21:3917-3927.
2. Moore, L.D, Isayeva, T., Siegal, G.P., and **Ponnazhagan, S.** Silencing of TGF-β1 in situ by RNA interference for breast cancer: Implications for proliferation and migration *in vitro* and metastasis *in vivo.* Clin. Cancer Res. 2008, 14: 4961-4970.
3. Chanda, D., Isayeva, T., Kumar, S., Szafran, A.A.., Zinn, K., and **Ponnazhagan, S.** Systemic osteoprotegerin gene therapy restores tumor-induced bone loss in a therapeutic model of breast cancer bone metastasis. Mol. Ther. 2008, 16:871-878.
4. Chanda D., Isayeva T., Kumar S., Hensel J.A., Sawant A., Ramaswamy G., Siegal G.P., Beatty M.S., **Ponnazhagan S**. Therapeutic potential of adult bone marrow-derived mesenchymal stem cells in prostate cancer bone metastasis. Clin Cancer Res. 2009, 15:7175-85. PMCID: PMC2943933.

Patents
U.S. Patent (# 6521225) entitled "Methods and compositions for generating recombinant adeno-associated virus vectors". Issued February 2003.

PUBMED LIST OF PUBLICATIONS:

http://www.ncbi.nlm.nih.gov/pubmed/?term=ponnazhagan

D. RESEARCH SUPPORT

Active

NIH-R01 CA133737 (Ponnazhagan) NCE 05/01/09-04/30/16
Gene-Engineered and Targeted Stem Cell Therapy for myeloma
The main aim of the project is to develop genetically-engineered mesenchymal stem cells expressing osteoprotegerin to reduce bone damage in an immnocompetent mouse model of myeloma.
Role: PI

R01 AR0560948 (Ponnazhagan) 09/01/11-08/31/16
Skeletal regeneration for non-union bone defect coupling angiogenesis and osteogenesis
The major goal of this project is to develop and test genetically-modified adult stem cells co-expressing angiogenic and osteogenic factors for non-union bone defect in a mouse model.

R01 CA184770 (Ponnazhagan) 03/01/15-02/28/20
Targeted therapy for breast cancer with osteolytic bone damage
The major goal of the project is to target breast cancer using a combination of cell therapy and depletion of immunosuppressive cell population in an immunocompetent mouse model.
Role: PI

Completed research support

P30 AR046031 (Ponnazhagan) 06/01/06-05/31/12
UAB Core Center for Basic Skeletal Research (CCBSR)
Role: PI

AHA 12IRG91600008 (Murphy-Ullrich) 01/01/12-12/31/13
Calreticulin in diabetic Vascular Disease
Role: co-investigator

NIH R01 CA132077 (Ponnazhagan) 09/01/08-08/30/14
rAAV Vaccine Vector
Role: PI

DoD-BC101411 (Ponnazhagan) 11/01/11-10/31/14
Regenerative stem cell therapy for breast cancer bone metastasis
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Raman, Chander

eRA COMMONS USER NAME (agency login): RAMANC

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Madras Christian College	BS	01/1980	Zoology
Idaho State University	MS	01/1984	Microbiology
Southern Illinois University	PHD	01/1989	Microbiology

A. Personal Statement

Trained as an immunologist, my research has focused on immunopathogenesis of autoimmune disease for the past 19 years. I primarily focus on multiple sclerosis (MS) and rheumatoid arthritis (RA). The research interest of my laboratory is the study of activation and differentiation of effector cells in the pathogenesis of these autoimmune disease. Our ongoing studies involve the human samples from patients with MS or RA as well mouse models to study these disease. The major areas of investigation are: (1) the mechanisms modulating the activation of T-cells and differentiation to pathogenic (Th1, Th17 and ThIFNγIL-17 –dual producers), regulatory (nTreg, iTreg) Th subsets and cells of the innate immune system (dendritic cells, macrophages and microglia). Within this area of study, we have special interest in type 1 and type 2 interferons, and TGFβ family proteins in the pathogenesis of MS, RA and the mouse model, experimental autoimmune encephalomyelitis (EAE). (2) Targeting GSK3 as therapy for MS. (3) Role of CD5 in T cell and B-1a B cell development, differentiation, immunity and pathogenesis - we focus on B-1a B cell-dependent T-independent antibody responses, T-dependent antibody responses, autoreactive B-cell generation and persistence and regulatory B-cells. (4) TGFβR3/betaglycan dependent regulation effector and regulatory cells in the pathogenesis of autoimmune diseases. In the past 19 years I have trained five graduate students and nine postdoctoral fellows. Of the graduate students two “oldest” now have independent laboratories. The other three are now in outstanding postdoctoral positions. Of the ten postdoctoral fellows, two are currently Assistant Professors with independent research/education programs; one fellow proceeded for residency and is now doing a fellowship in spinal cord injury at Stanford University. Currently I have one graduate student. I have served or currently serving as thesis committee member of 24 graduate (PhD. and MD/PhD) students. Importantly, all of my trainees previously funded by a T32 grant have remained in academia building their own research programs and or doing their postdoctoral training in exceptional laboratories. Thus I have played a very important role in training students and postdoctoral fellows to develop independent careers in science.

1. Greer SF, Wang Y, Raman C, Justement LB. CD45 function is regulated by an acidic 19-amino acid insert in domain II that serves as a binding and phosphoacceptor site for casein kinase 2. J Immunol. 2001 Jun 15;166(12):7208-18. PubMed PMID: 11390469.
2. Axtell RC, de Jong BA, Boniface K, van der Voort LF, Bhat R, De Sarno P, Naves R, Han M, Zhong F, Castellanos JG, Mair R, Christakos A, Kolkowitz I, Katz L, Killestein J, Polman CH, de Waal Malefyt R, Steinman L, Raman C. T helper type 1 and 17 cells determine efficacy of interferon-beta in multiple sclerosis and experimental encephalomyelitis. Nat Med. 2010 Apr;16(4):406-12. PubMed PMID: 20348925; PubMed Central PMCID: PMC3042885.
3. Rowse AL, Naves R, Cashman KS, McGuire DJ, Mbana T, Raman C, De Sarno P. Lithium controls central nervous system autoimmunity through modulation of IFN-γ signaling. PLoS One. 2012;7(12):e52658. PubMed PMID: 23285134; PubMed Central PMCID: PMC3532311.

4. McGuire DJ, Rowse AL, Li H, Peng BJ, Sestero CM, Cashman KS, De Sarno P, Raman C. CD5 enhances Th17-cell differentiation by regulating IFN-γ response and RORγt localization. Eur J Immunol. 2014 Apr;44(4):1137-42. PubMed PMID: 24356888; PubMed Central PMCID: PMC3984608.

B. Positions and Honors

Positions and Employment

1989 - 1994	Research Associate, Dept. of Microbiology and Immunology, Loyola University, Chicago, Stritch School of Medicine
1994 - 1996	Assistant Scientist and Director, Molecular Biology Core, Hospital for Special Surgery and Cornell Arthritis and Musculoskeletal Disease Center
1996 - 2007	Assistant Professor of Medicine and Microbiology, University of Alabama at Birmingham
1996 - 2007	Scientist, Comprehensive Arthritis, Musculoskeletal and Autoimmunity
2007 -	Senior Scientist, UAB Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center
2007 -	Senior Scientist, Comprehensive Neuroscience Center, University of Alabama at Birmingham
2007 - 2011	Associate Professor of Medicine, University of Alabama at Birmingham
2011 -	Professor of Medicine, University of Alabama at Birmingham
2011 -	Professor of Microbiology, University of Alabama at Birmingham

Other Experience and Professional Memberships

2006 - 2011	Member, Lupus Research Institute study section
2007 - 2012	Adhoc member, VA-Merit Review Immunology Study Section
2009 -	Adhoc reviewer, NIH ZRG1 MDCN-A (58) R
2009 -	Grant reviewer, Medical Research Council (MRC) UK
2010 -	Adhoc member, ACR Postdoctoral fellowship study section
2010 - 2012	Member, National Multiple Sclerosis Society Advisory Committee on Fellowship
2012 - 2013	Adhoc member, NIH-CSR – CMIB study section, Feb, May, Oct
2013 -	Adhoc member, NIH CSR ZRG1-IMM-C-02
2013 -	Grant reviewer, Arthritis Foundation, Innovative Research Grant and AF Investigator
2013 -	Member, NIH-CSR - CMIB Study Section
2013 - 2015	Chair, National Multiple Sclerosis Society Advisory

Honors

1997	Arthritis Investigator, Arthritis Foundation
2011	Max Cooper award for Research Excellence, University of Alabama at Birmingham

C. Contribution to Science

1. Early in my research career as a postdoctoral fellow I developed an interest in B lymphocytes with a particular interest in CD5 expressing B cells. During my postdoctoral fellowship, I discovered that almost all rabbit B cells express CD5. From my studies, I hypothesized that CD5 had a function in promoting survival in B cells and T cells. It was not until I had my own laboratory that we discovered that CD5 in T cells and B cells constitutively engaged CK2, a kinase that promotes survival. This was a novel discovery as until this time CK2 was considered to be a kinase that participates only in intermediate and distal cellular signaling even and not believed to be part of proximal signaling events directly associated with cell membrane proteins. This interest in CD5 therefore also led to new discoveries in defining the biology of CK2. In fact recent studies reveal that CK2 also regulated cytokine receptor signaling such as the activation of JAKs downstream of IL-6 receptor. The dogma that CD5 was primarily a regulator of antigen receptor activation was inconsistent with the observation that the CD5 null mouse did not develop spontaneous autoimmunity in spite of the presence of T cells and B-1a B cells (CD5+ B cells) that respond to very low concentrations of antigen. We determined that CD5 null T cells due to lack of ability to engage CK2 had poor survival and this prevented the persistence of autoreactive T cells. These studies were performed using the mouse model to study multiple sclerosis (MS), experimental autoimmune encephalomyelitis (EAE).

a. Raman C, Knight KL. CD5+ B cells predominate in peripheral tissues of rabbit. J Immunol. 1992 Dec 15;149(12):3858-64. PubMed PMID: 1281192.

b. Raman C, Kuo A, Deshane J, Litchfield DW, Kimberly RP. Regulation of casein kinase 2 by direct interaction with cell surface receptor CD5. J Biol Chem. 1998 Jul 24;273(30):19183-9. PubMed PMID: 9668105.

c. Raman C, Kimberly RP. Differential CD5-dependent regulation of CD5-associated CK2 activity in mature and immature T cells: implication on TCR/CD3-mediated activation. J Immunol. 1998 Dec 1;161(11):5817-20. PubMed PMID: 9834058.

d. Axtell RC, Webb MS, Barnum SR, Raman C. Cutting edge: critical role for CD5 in experimental autoimmune encephalomyelitis: inhibition of engagement reverses disease in mice. J Immunol. 2004 Sep 1;173(5):2928-32. PubMed PMID: 15322150.

2. We have made key contributions to understanding immunopathogenesis of MS. We were the first to provide evidence that a population of Th cells expressing both IFN-γ and Il-17 are likely to be the key effector population in EAE and by extension MS. This population is now described as dual producers (IL-17 + IFN-γ) and shown to develop from Th17 cells. In our efforts to determine why a third of MS patients treated with IFN-β fail or get worse, we discovered that preexisting elevated levels of IL-17F and IFN-β in serum predicts treatment non-responders. We proposed that MS patients who display a Th17 predominant disease are likely to respond to IFN-β therapy. In fact, neuromyelitis optica (NMO), is predominantly a Th17 disease and fail IFN-β treatment. Our discovery led to a string of publications, some in agreement and others unable to confirm our findings in independent cohorts. However, each study has led to new discoveries. We found that IFN-β treatment required functional IFN-γ signaling. Our ogoing studies reveal that IFN-α/β (type I IFNs) and IFN-γ (type 2 IFN) work cooperatively to regulate immune responses. Hyper-response of either cytokine signaling pathway promotes pathogenesis.

a. Axtell RC, Xu L, Barnum SR, Raman C. CD5-CK2 binding/activation-deficient mice are resistant to experimental autoimmune encephalomyelitis: protection is associated with diminished populations of IL-17-expressing T cells in the central nervous system. J Immunol. 2006 Dec 15;177(12):8542-9. PubMed PMID: 17142752; PubMed Central PMCID: PMC2744950.

b. Axtell RC, de Jong BA, Boniface K, van der Voort LF, Bhat R, De Sarno P, Naves R, Han M, Zhong F, Castellanos JG, Mair R, Christakos A, Kolkowitz I, Katz L, Killestein J, Polman CH, de Waal Malefyt R, Steinman L, Raman C. T helper type 1 and 17 cells determine efficacy of interferon-beta in multiple sclerosis and experimental encephalomyelitis. Nat Med. 2010 Apr;16(4):406-12. PubMed PMID: 20348925; PubMed Central PMCID: PMC3042885.

c. Rowse AL, Naves R, Cashman KS, McGuire DJ, Mbana T, Raman C, De Sarno P. Lithium controls central nervous system autoimmunity through modulation of IFN-γ signaling. PLoS One. 2012;7(12):e52658. PubMed PMID: 23285134; PubMed Central PMCID: PMC3532311.

d. Naves R, Singh SP, Cashman KS, Rowse AL, Axtell RC, Steinman L, Mountz JD, Steele C, De Sarno P, Raman C. The interdependent, overlapping, and differential roles of type I and II IFNs in the pathogenesis of experimental autoimmune encephalomyelitis. J Immunol. 2013 Sep 15;191(6):2967-77. PubMed PMID: 23960239; PubMed Central PMCID: PMC3779698.

3. Our interest in type I and 2 interferons in pathogenesis of autoimmunity has led to new studies in RA in collaboration with Dr. S. Louis Bridges. In a recent study we showed that RA associated with elevated expression of IFN-γ receptor (IFNGR). Of interest is our discovery that elevated expression of the β-chain of IFNGR, IFNGR2, associated with poor radiographic scores. Notably, a similar observation was previously reported in MS. Our current studies focuses on determining the underlying mechanism for this association and how it contributes to pathogenesis.

a. Tang Q, Danila MI, Cui X, Parks L, Baker BJ, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR, Bridges SL Jr. Brief Report: Expression of Interferon-γ Receptor Genes in Peripheral Blood Mononuclear Cells Is Associated With Rheumatoid Arthritis and Its Radiographic Severity in African Americans. Arthritis Rheumatol. 2015 May;67(5):1165-70. PubMed PMID: 25708927; PubMed Central PMCID: PMC4414815.

D. Research Support

Ongoing Research Support

Ongoing Research Support:

R21 AI107748 (Raman, C) 08/01/2014 – 07/31/2016 3.0 calendar
Role of TGFβRIII in T-cell development and immune responses
National Institutes of Health
The goal of the proposal is to determine the mechanistic role of TGFβRIII/betaglycan in development and maturation of T-cells in the thymus and regulation of immune responses in the periphery.

Recently Completed Research Support

R01 AI076562 (Raman) 06/01/08 – 05/31/14 (NCE)
NIH/NIAID
The Role of CD5 in B Cell Development and Autoimmunity

RG 4587-A-1 DeSilva (PI) 04/01/11 – 03/31/14
National Multiple Sclerosis Society
Role: Co-Investigator (effort: 1.2 calendar months).
Glutamatergic signaling in demyelination and remyelination in multiple sclerosis.

R01 NS064261 De Sarno (PI) 02/28/09 – 02/28/14 (NCE)
NIH/NINDS
GSK3: Immunoregulator in experimental autoimmune encephalomyelitis (EAE).
The goal of this study is to elucidate the inflammatory events that lead to neurological damage in EAE, and by extension in multiple sclerosis (MS) and identify the enzyme GSK3 as a central regulator of the inflammatory

R01 AI072647 Justement (PI) 03/05/07 – 2/28/12
NIH/NIAID
Regulation of B Lymphocyte Survival and Differentiation by HSH2
The major goals of studies proposed in this project are to define the functional role of the adaptor protein HSH2 in regulation of B cell survival and differentiation. Specific aims will be performed to: 1) Determine the physiological role of HSH2 in B cell development, homeostasis and immune function; 2) Determine the role that HSH2 plays in regulation of Bim expression in response to co-stimulation of B cells; and 3) Determine the functional importance of the interaction between HSH2 and HAX-1 in B cell survival.

R21 AR057163 Xu, H. (PI) 07/01/10 – 06/30/12
NIH/NIAMS
The role of CD5 in dendritic cell mediated immune suppression
The major objective of the proposed research is to test the hypothesis that CD5-CD5 interaction between DC and T-cells plays an important role in DC-mediated immune suppression. The two Aims of the proposal are: (1) To determine if CD5 is an inhibitory molecule for DC mediated activation of T-cells and induction of contact hypersensitivity responses (CHS) and (2) to test if CD5 is an inhibitory molecule intrinsic to DC in elicitation of CHS responses.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: RANDALL, TROY

eRA COMMONS USER NAME (agency login): trandall

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Denver, Denver, CO	BS	06/1987	Chemistry
Duke Univerrsity, Durham, NC	PHD	06/1992	Microbiology and Immunology
Stanford University, Stanford, CA	Postdoctoral Fellow	06/1996	Immunology

A. PERSONAL STATEMENT

My laboratory studies all aspects of the immune response to influenza virus. We have funded (past and present) projects concerning how functional memory CD8+ T cell responses to influenza are generated and maintained, how CD4+ effector and Tfh cell responses to influenza are controlled, how B cell responses to influenza are generated and how local lymphoid tissues like inducible Bronchus Associated Lymphoid Tissue (iBALT) control local immune responses to influenza in the lung. These studies began at the Trudeau Institute, where I supervised a handful of remarkable postdocs who defined the initial immunobiology of lymphoid tissues in the lung and determined the role of lymphoid chemokines in their development, organization and function. Many of these postdocs have now moved on to faculty positions at other universities or to similar positions in industry. Since Trudeau Institute was not a degree-granting institution, I did not have any graduate students in my laboratory for the first 12 years of my career as an independent investigator. However, upon moving to the University of Rochester and subsequently moving to the University of Alabama at Birmingham, I began to accept students into my lab and I am now mentoring two graduate students and an MSTP student. I train my students and postdocs how to design and perform experiments that test, in a physiological way, how immune responses work in vivo. These experiments are not always easy nor can they be performed in a short amount of time. Moreover, I also strive to have trainees complete an entire series of experiments and to get the entire story before publishing. Thus, my trainees often require a year or two before they publish their first papers. However, we try (and often succeed!) in publishing in high impact journals. As a result, our papers are often cited in Faculty of 1000 reviews as well as the commentary sections of the journals. Thus, I believe that I am training my students and postdoctoral fellows how to perform and publish insightful experiments that answer important questions and will allow them to succeed in their careers as independent investigators.

1. Lee BO, Haynes L, Eaton SM, Swain SL, Randall TD. The biological outcome of CD40 signaling is dependent on the duration of CD40 ligand expression: reciprocal regulation by interleukin (IL)-4 and IL-12. J Exp Med. 2002 Sep 2;196(5):693-704. PubMed PMID: 12208883; PubMed Central PMCID: PMC2194000.
2. Moyron-Quiroz JE, Rangel-Moreno J, Kusser K, Hartson L, Sprague F, et al. Role of inducible bronchus associated lymphoid tissue (iBALT) in respiratory immunity. Nat Med. 2004 Sep;10(9):927-34. PubMed PMID: 15311275.
3. Rangel-Moreno J, Carragher DM, de la Luz Garcia-Hernandez M, Hwang JY, Kusser K, et al. The development of inducible bronchus-associated lymphoid tissue depends on IL-17. Nat Immunol. 2011 Jun 12;12(7):639-46. PubMed PMID: 21666689; PubMed Central PMCID: PMC3520063.
4. Ballesteros-Tato A, León B, Lee BO, Lund FE, Randall TD. Epitope-specific regulation of memory programming by differential duration of antigen presentation to influenza-specific CD8(+) T cells. Immunity. 2014 Jul 17;41(1):127-40. PubMed PMID: 25035957; PubMed Central PMCID: PMC4233138.

B. POSITIONS AND HONORS

Positions and Employment

1996 - 1997	Visiting Scientist, DNAX Research Institute, Palo Alto, CA
1997 - 2001	Assistant Member, Trudeau Institute, Saranac Lake, NY
2001 - 2007	Associate Member, Trudeau Institute, Saranac Lake, NY
2007 - 2008	Member, Trudeau Institute, Saranac Lake, NY
2008 - 2012	Professor, University of Rochester, Rochester, NY
2012 -	Professor, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

1997 - 2008	Supervisor, Flow Cytometry Core, Trudeau Institute
1998 -	Member, American Association of Immunologists
1998 -	Member, American Association for the Advancement of Sciencee
1998 - 2008	Member, American Society of Hematology
2010 -	Faculty, Faculty of 1000
2010 - 2015	Academic Editor, PLOS ONE
2013 -	Associate Editor, Mucosal Immunology
2015 -	Member, LCMI study section
2015 -	Associate Editor, Journal of Immunology

Honors

1982	National Merit Scholar, National Merit Scholarship Program
1987	Predoctoral Training Fellowship in Genetics, NIH
1992	Postdoctoral Training Fellowship in Immunology, NIH
1993	Postdoctoral Training Fellowship, Helen Hay Whitney Foundation
2012	J Claude Bennett Professorship in Medicine, University of Alabama at Birmingham

C. Contribution to Science

1. Ectopic lymphoid tissues and local immunity. My lab is probably best known for our studies on the development and function of local lymphoid tissues, particularly in the respiratory tract. We showed that, although naïve mice lack detectable lymphoid areas in their lungs, "inducible Bronchus Associated Lymphoid Tissue" (iBALT) is formed in response to infection or inflammation (Moyron et al 2004). Importantly, we showed that immune responses to pulmonary pathogens, like influenza, SARS corona virus and M tuberculosis, are generated at sites of iBALT and that the presence of iBALT is associated with better clinical outcomes. Moreover, memory B and T cells are maintained in iBALT (Moyron et al 2006). Interestingly, we also found that there is a developmental window in neonatal mice during which iBALT is most easily formed (Rangel et al 2011). This window corresponds to a time when children are at risk of developing asthma in response to respiratory viruses, such as RSV. Again, the presence of iBALT correlates with reduced risk of pathology. On the other hand, we also showed that iBALT is generated in the lungs of humans with a wide variety of pulmonary diseases, particularly rheumatoid arthritis (Rangel et al 2006). We suspect that these local lymphoid tissues are responding to autoantigens and exacerbating pulmonary disease.

    a. Moyron-Quiroz JE, Rangel-Moreno J, Kusser K, Hartson L, Sprague F, et al. Role of inducible bronchus associated lymphoid tissue (iBALT) in respiratory immunity. Nat Med. 2004 Sep;10(9):927-34. PubMed PMID: 15311275.

    b. Moyron-Quiroz JE, Rangel-Moreno J, Hartson L, Kusser K, Tighe MP, et al. Persistence and responsiveness of immunologic memory in the absence of secondary lymphoid organs. Immunity. 2006 Oct;25(4):643-54. PubMed PMID: 17045819.

    c. Rangel-Moreno J, Hartson L, Navarro C, Gaxiola M, Selman M, et al. Inducible bronchus-associated lymphoid tissue (iBALT) in patients with pulmonary complications of rheumatoid arthritis. J Clin Invest. 2006 Dec;116(12):3183-94. PubMed PMID: 17143328; PubMed Central PMCID: PMC1678820.

d. Rangel-Moreno J, Carragher DM, de la Luz Garcia-Hernandez M, Hwang JY, Kusser K, et al. The development of inducible bronchus-associated lymphoid tissue depends on IL-17. Nat Immunol. 2011 Jun 12;12(7):639-46. PubMed PMID: 21666689; PubMed Central PMCID: PMC3520063.

2. My lab has also defined how CD8 T cell responses are regulated by CD40 and other factors. We initially refuted a prominent paper claiming that CD40 signaled directly to CD8 T cells to promote primary and secondary responses (Lee et al 2003). We also reconciled conflicting data suggesting that CD40L expressed by CD4 T cells provided help to influenza-specific CD8 T cells, but that influenza-specific CD8 T cell responses occurred independently of CD40L, by showing that CD4 effector T cells provide CD40L in order to counteract the activities of CD4 Tregs (Ballesteros et al 2013). These data suggest that there is a competition between CD4 effectors and Tregs to control the activity of APCs that regulate the priming, expansion and differentiation of CD8 T cells. We also identified the DC subsets that require CD40 signaling to properly activate CD8 T cells (Ballesteros et al 2010). Finally, we showed that CD8 T cells responding to different epitopes in the same virus have different costimulatory requirements, which depend on the duration of antigen presentation and the DCs that present antigen (Ballesteros et al 2014).

a. Lee BO, Hartson L, Randall TD. CD40-deficient, influenza-specific CD8 memory T cells develop and function normally in a CD40-sufficient environment. J Exp Med. 2003 Dec 1;198(11):1759-64. PubMed PMID: 14657225; PubMed Central PMCID: PMC2194135.

b. Ballesteros-Tato A, León B, Lund FE, Randall TD. Temporal changes in dendritic cell subsets, cross-priming and costimulation via CD70 control CD8(+) T cell responses to influenza. Nat Immunol. 2010 Mar;11(3):216-24. PubMed PMID: 20098442; PubMed Central PMCID: PMC2822886.

c. Ballesteros-Tato A, León B, Lund FE, Randall TD. CD4+ T helper cells use CD154-CD40 interactions to counteract T reg cell-mediated suppression of CD8+ T cell responses to influenza. J Exp Med. 2013 Jul 29;210(8):1591-601. PubMed PMID: 23835849; PubMed Central PMCID: PMC3727323.

d. Ballesteros-Tato A, León B, Lee BO, Lund FE, Randall TD. Epitope-specific regulation of memory programming by differential duration of antigen presentation to influenza-specific CD8(+) T cells. Immunity. 2014 Jul 17;41(1):127-40. PubMed PMID: 25035957; PubMed Central PMCID: PMC4233138.

3. Mentoring trainees. My independent career began at the Trudeau Institute, where I supervised a handful of remarkable postdocs who defined the initial immunobiology of lymphoid tissues in the lung and determined the role of lymphoid chemokines in their development, organization and function. Since Trudeau Institute was not a degree-granting institution, I did not have any graduate students in my laboratory. However, upon moving to the University of Rochester and then to UAB, I have acquired 3 graduate students, the first of whom will be graduating the summer of 2015. I train my students and postdocs how to design and perform experiments that test, in a physiological way, how immune responses work in vivo. These experiments are not easy nor can they be performed in a short amount of time. Moreover, I also strive to complete an entire series of experiments and to get the complete story before publishing. Thus, my trainees often require a year or two before they publish their first papers. However, we try (and often succeed!) in publishing in high impact journals. As a result, our papers are often cited in Faculty of 1000 reviews as well as the commentary sections of the journals. Thus, I believe that I am training my students and postdoctoral fellows how to perform and publish important experiments that will allow them to succeed in their careers as independent investigators.

a. Lee BO, Haynes L, Eaton SM, Swain SL, Randall TD. The biological outcome of CD40 signaling is dependent on the duration of CD40 ligand expression: reciprocal regulation by interleukin (IL)-4 and IL-12. J Exp Med. 2002 Sep 2;196(5):693-704. PubMed PMID: 12208883; PubMed Central PMCID: PMC2194000.

b. Partida-Sánchez S, Goodrich S, Kusser K, Oppenheimer N, Randall TD, et al. Regulation of dendritic cell trafficking by the ADP-ribosyl cyclase CD38: impact on the development of humoral immunity. Immunity. 2004 Mar;20(3):279-91. PubMed PMID: 15030772.

c. Rangel-Moreno J, Moyron-Quiroz JE, Hartson L, Kusser K, Randall TD. Pulmonary expression of CXC chemokine ligand 13, CC chemokine ligand 19, and CC chemokine ligand 21 is essential for local immunity to influenza. Proc Natl Acad Sci U S A. 2007 Jun 19;104(25):10577-82. PubMed PMID: 17563386; PubMed Central PMCID: PMC1965555.

d. León B, Ballesteros-Tato A, Browning JL, Dunn R, Randall TD, et al. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.

4. Regulation of humoral immunity. Although IgM is depicted in textbooks as a pentamer joined in a ring-like structure by J chain, I showed as a graduate student that, depending on how B cells are stimulated, they made more or less J chain and, as a result, made different forms of polymeric IgM (Randall et al 1992). In the presence of high amounts of J chain (driven by cytokines like IL-5 and IL-6), the canonical pentameric form of IgM is produced. However, when B cells differentiate without making J chain (driven by mitogens like LPS), IgM polymerizes as a hexamer that lacks J chain. Importantly, hexameric IgM is 20-fold better at fixing complement, but fails to bind the polymeric Ig receptor. Thus, B cells can control the functional activity of IgM depending on how they are stimulated. As an independent investigator, I showed that CD40 signaling negatively controls B cell differentiation and antibody secretion (Randall et al 1998). Moreover, the duration of CD40L expression on T cells (later known as Tfh cells) controlled CD40 signaling and determined whether they would became antibody secreting cells or stay as germinal center or memory B cells. More recently, we showed that Tfh differentiation (and antibody responses), is controlled by IL-2 (Ballesteros et al 2012), and that IL-2 availability can be controlled by CD25-expressing Tregs (Leon et al 2014). We have also developed reagents to identify and characterize influenza-specific B cells using B cell tetramers (recombinant influenza antigens) and we have most recently identified resident memory B cells (BRMs) in the lungs following influenza infection.

   a. Randall TD, Parkhouse RM, Corley RB. J chain synthesis and secretion of hexameric IgM is differentially regulated by lipopolysaccharide and interleukin 5. Proc Natl Acad Sci U S A. 1992 Feb 1;89(3):962-6. PubMed PMID: 1736312; PubMed Central PMCID: PMC48365.
   b. Randall TD, Heath AW, Santos-Argumedo L, Howard MC, Weissman IL, et al. Arrest of B lymphocyte terminal differentiation by CD40 signaling: mechanism for lack of antibody-secreting cells in germinal centers. Immunity. 1998 Jun;8(6):733-42. PubMed PMID: 9655487.
   c. Ballesteros-Tato A, León B, Graf BA, Moquin A, Adams PS, et al. Interleukin-2 inhibits germinal center formation by limiting T follicular helper cell differentiation. Immunity. 2012 May 25;36(5):847-56. PubMed PMID: 22464171; PubMed Central PMCID: PMC3361521.
   d. León B, Bradley JE, Lund FE, Randall TD, Ballesteros-Tato A. FoxP3+ regulatory T cells promote influenza-specific Tfh responses by controlling IL-2 availability. Nat Commun. 2014 Mar 17;5:3495. PubMed PMID: 24633065; PubMed Central PMCID: PMC4013682.

D. RESEARCH SUPPORT

Ongoing Research Support

2014/08/01-2019/07/31
U19 AI109962, National Institute of Allergy and Infectious Diseases (NIAID)
RANDALL, TROY D (PI)
Virus-induced Cell Fate Decisions in Anti-Viral Immunity
This U19 supports four projects that examine how viruses, including influenza, LCMV, measles and rabies, influence the cell fate decisions of responding B and T cells. I am the PI of the U19 and the leader of the Administration Core as well as the leader of Project 1. The goals of Project 1 are to determine how IL-2 prevents Tfh responses to influenza and other viruses, to determine when and where IL-2 is produced in lymphoid organs and to determine how Tregs and Tfr cells regulate IL-2 availability in germinal centers during influenza infection.
Role: PI

2001/09/28-2017/08/31
P30 AR048311, NIH/NIAMS
Mountz John D (PI)
Rheumatic Disease Core Center: Comprehensive Flow Cytometry Core (Co-DIrector)

A multidisciplinary program designed to enable application of innovative, scientifically rigorous approaches and state-of-the-art techniques to important questions in biomedical sciences, thereby laying the basis for advances in the diagnosis and treatment of patients with arthritis and musculoskeletal diseases
Role: OP

2012/05/11-2017/04/30
R01 AI097357, National Institute of Allergy and Infectious Diseases (NIAID)
RANDALL, TROY D (PI)
Central and Effector B cells in the Lung
The major goals of this project are to characterize the phenotype and function of central and effector memory B cells responding to influenza and to determine how the recirculation and homing of central and effector memory B cells is controlled, particularly in the lung.
Role: PI

2012/03/03-2017/02/28
R01 AI100127, National Institute of Allergy and Infectious Diseases (NIAID)
Randall, Troy D (PI)
Pulmonary Immunity To Pathogens In Neonates
Role: PI

2001/09/30-2016/05/31
R01 HL069409, National Heart, Lung and Blood Institute (NHLBI)
RANDALL, TROY D (PI)
Unique Aspects of Respiratory Immunity
Role: PI

2010/08/01-2015/07/01
P01 AI078907, NIH/NIAID
Sanz Inaki (PI)
B Cells in Health and Disease" Project 3: Evaluation of IFNgamma producing effector B cells in infectious and autoimmune disease (Lund, Project Lead)
The major goals of this project are to identify effector B cells using mouse models of infection and autoimmunity and to determine the role of B cell-produced IFNgamma
Role: Co-Investigator

Completed Research Support

2012/02/29-2014/01/31
R21 AI097876-03, National Institute of Allergy and Infectious Diseases (NIAID)
Randall, Troy D (PI)
Role of CCR1 in Cytokine Storm & Immunopathology after influenza infection
Role: PI

2007/06/15-2012/05/31
R01 AI072689-05, National Institute of Allergy and Infectious Diseases (NIAID)
Randall, Troy D (PI)
Function of NALT in nasal immunization to heterotypic strains of influenza
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Schroeder, Harry W Jr

eRA COMMONS USER NAME (credential, e.g., agency login): delaGarza9

POSITION TITLE: Professor of Medicine, Microbiology and Genetics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Texas A&M University, College Station, TX	BS	1974	Chemistry
Baylor College of Medicine, Houston, TX	PhD	1979	Cell Biology
Baylor College of Medicine, Houston, TX	MD	1981	Medicine
University of Kentucky, Lexington, KY	Intern	1982	Internal Medicine
University of Kentucky, Lexington, KY	Resident	1984	Internal Medicine
University of Washington, Seattle, WA	Fellow	1988	Medical Genetics
Howard Hughes Medical Institute, Seattle, WA	Postdoc	1988	Immunology

A. Personal Statement

My primary goals are the pursuit and dissemination of knowledge and the training of students who will carry this torch after me. I come from a multinational academic family and have had the fortune of training and/or working with five distinguished members of the National Academy of Sciences including Bert O'Malley, Frank Ruddle, Arno Motulsky, Max Cooper, and Klaus Rajewsky. I have been trained in multiple disciplines (Chemistry, Cell Biology, Molecular Biology, Internal Medicine, Medical Genetics, and Molecular Immunology). I have served as the editor for the three editions of the textbook *Clinical Immunology: Principles and Practices*. These experiences document a broad perspective on education, science, and training. Of the nine graduate students who have studied with me and who have completed their terminal degree, eight of them are still involved in academia including one full Professor, one Associate Professors (or equivalent), three Assistant Professors (or equivalent), two Research Associates, one post-doctoral fellow, and one student who is in an administrative position. (The remaining student held a tenured position as Associate Professor, but is now in private practice). Of the 18 trainees who have completed post-graduate training, two held PhDs alone, five held MD PhDs, and the eleven remaining held MDs. Of the two with PhDs, one holds the rank of Professor and the other of Vice President for Product Development. Of the five with MD PhDs, one is a Chair of Medicine, one is a Division Director, two are Assistant Professors or the equivalent, and one is a Research Fellow at the NIH. Of the eleven with medical training only; one is a Vice Chair of Anesthesiology, one is an Assistant Professor, one is an Instructor, two are pursuing further clinical training, and the remaining are in private practice. I have served as the Associate Director and then Director of the T32 training program in Immunologic Diseases and Basic Immunology from 1992 to 2008, and from 2008 to the present, respectively. As T32 director I have had the opportunity to support the training and development of 83 graduate students and 62 post-docs, the majority of which remain in academia. The first score I obtained in 1992 was 118; and the most recent score was a 10. My expertise as a mentor has thus been documented on a national level.

B. Positions and Honors:

Positions and Employment:

1988 - 1993 Assistant Professor of Medicine and Microbiology, University of Alabama at Birmingham, Birmingham, AL (UAB)

1993 – 1998 Associate Professor of Medicine and Microbiology, UAB

1995 – 1996 Fogarty International Scholar, Laboratory of Dr. Klaus Rajewsky, Institute for Genetics, University of Cologne, Cologne, Germany
1998 – Present Professor of Medicine and Microbiology, UAB
2003 – Present Professor of Genetics, UAB
2008 – Present Director, Program in Immunology, UAB

Other Experience and Professional Memberships:

Grant Reviews: 1991-2002, VA *ad hoc*; 1991, NIDDK *ad hoc*; 1992-1995, GMB, Arthritis Foundation; 1998-2001, SSS-J, NIAID; 1999-2001, CMB, NASA; 2001-2005, *Chair*, SSS-J, NIAID; 2003-2005, IIH, NASA; 2006, *Chair*, ZAI1, NIAID; 2008, ZRG1 HAI-G, NIH/CSR; 2008, BION M-1, NASA; 2009, ZAI-KS-1-J1, NIAID; 2009, *Chair*, ZAI-KS-I-J3 & ZAI-KS-I-J4, NIAID; 2010, SAI-BDP-I-M3, NIAID; 2010, AITRC, NIAID; 2011, SA-MFH-I (M2), NIAID; 2011, AITRC, NIAID; 2011, MIDRP, NIAID; 2012, ZAI1-JBSW-A-M1, NIAID; 2013, ZRG1_F07_K20 &ZRG1_IMM_K90, NIAID; 2013, *Co-Chair*, ZRG1_F07_K20L &ZRG1_IMM_K81A
Editorial Service: 2003–2007, Section Editor, *J Immunol;* 2011–, Assoc. Editor, *Frontiers in B cell Biology;* 2012–, Editor-in-Chief: *Am J Clin Exp Immunol; 2012-?* Assoc Editor: *Immunogenet;* 2013

Honors:

1989 RJR Nabisco Research Scholar in Immunology

C. Contribution to Science

1. During graduate school, I focused on the mechanisms regulating ribosomal recognition of mRNA. However, in reading broadly in the literature my interest was piqued by the central immunologic question of the time, the relative roles of genetic versus somatic mechanisms of diversity in immunoglobulin generation and the role that these mechanisms played in regulating self versus non-self discrimination. I heard Tonegawa speak at a FASEB meeting. His work and that of his contemporaries seemed to answer the question by emphasizing the role of somatic diversification by means of combinatorial gene rearrangement and the non-templated introduction of codons into the antibody binding site. This supported the Burnettian view of clonal selection as the primary force in regulating immune responses. Although initially satisfying, this view failed to the observation by Silverstein that the ability to respond to antigens developed in a controlled programmed fashion during ontogeny. How could a random, unstructured process yield a programmed, structured outcome? Roger Perlmutter was a new Assistant Professor at the University of Washington. As a post-doc he had demonstrated that in mice V gene rearrangement programmed and thus limited immunoglobulin diversity in fetal life. Working with Roger, the question that I sought to address was whether this also occurred in human. I found that the most commonly used V_H gene segments in the human fetus were structurally similar to those used in the mouse fetus. A comprehensive evaluation revealed unexpected structural conservation of immunoglobulin sequence from shark to human, with portions of the V_H more conserved than the constant domain. This created new insight into the molecular evolution of V gene segments and helped guide splicing mouse CDRs onto human V frameworks to make humanized monoclonal antibodies.
   a. **Schroeder HW Jr,** Hillson JL, Perlmutter RM. (1987) Early restriction of the human antibody repertoire. *Science* **238**,791-793. PMID: 3118465.
   b. **Schroeder HW Jr,** Hillson JL, Perlmutter RM. (1989) Structure and evolution of mammalian V_H families. *Int Immunol* **2**(1), 41-50. PMID: 2128464.
   c. Kirkham PM, Mortari F, Newton JA, **Schroeder HW Jr.** (1992) Immunoglobulin V_H clan and family identity predicts variable domain structure and may influence antigen binding. *EMBO J* **11**(2),603-609. PMID: 1537339.
2. As immunoglobulin sequence data accumulated, it became clear that the focus of developmental control of the antibody repertoire in human was not regulation of V gene sequence. It was regulation of CDR-H3 content. The human immune system controlled D_H and J_H usage patterns, D_H reading usage, and N addition as a function of ontogeny. This in turn controlled CDR3 structure (length) and amino acid content, which was distinctly non-random. The same proved true in T cells.
   a. George JF Jr, **Schroeder HW Jr.** (1992) Developmental regulation of Dβ reading frame and junctional diversity in T cell receptor-β transcripts from human thymus. *J Immunol* **148**(4),1230-1239. PMID: .

b. Bertrand FE III, Billips LG, Burrows PD, Gartland GL, Kubagawa H, **Schroeder HW Jr**. (1997) IgH gene segment transcription and rearrangement prior to CD19 expression in normal human bone marrow. *Blood* **90**(2),736-744. PMID: 9182895.

c. Shiokawa S, Mortari F, Lima JO, Zhu S, Nuñez C, Bertrand FE III, Kirkham PM, Zhu S, Dasanayake AP, **Schroeder HW Jr**. (1999) IgM HCDR3 diversity is constrained by genetic and somatic mechanisms until two months after birth. *J. Immunol.* **162**,6060-6070. PMID: .

d. **Schroeder HW Jr**, Zhang L, Philips J. (2001) Slow, programmed maturation of the immunoglobulin HCDR3 repertoire during the 3RD trimester of fetal life. *Blood* **98**,2745-2751. PMID: 11675347.

3. As a fellow, I became interested in the role of synovial immunoglobulin production in rheumatoid arthritis. The question he posed to me was whether these immunoglobulins were normal or abnormal. Upon my arrival at UAB, I started a collaboration with William (Bill) Koopman, then head of Rheumatology. I recruited two outstanding rheumatology fellows, Lou Bridges (the PI of this T32) and Soo Kon Lee (former Chair of Medicine at Yonsei University in Seoul, Korea), to answer this question. We found evidence of clonal selection and clonal outgrowths in rheumatoid synovium. More intriguing however was our finding that the CDR3s of the sequences that we obtained from the synovium in both light chain and heavy chain were enriched for longer sequences than in the normal repertoire. We thus set about to better define normal CDR-H3 repertoire composition in human and other species. Our comparative studies focused our attention on the unexpected conservation of D_H (diversity) gene segment sequence. We observed that each D_H reading frame exhibited a characteristic amino acid preference that was conserved from shark to human. Each jawed vertebrate species used an overlapping set of mechanisms to bias the repertoire for use of amino acids encoded by reading frame 1, which is enriched for tyrosine, serine and glycine; and against use of inverted reading frames that are enriched in one case for charged amino acids, especially arginine, and in the others for hydrophobic amino acids. A detailed analysis of CDR-H3 content in human and mouse became highly used by industry to help generate *in vitro* immunoglobulin libraries.

   a. Bridges SL Jr, Lee SK, Lavelle JC, Koopman WJ, **Schroeder HW Jr**. (1995) Somatic mutation and CDR3 lengths of immunoglobulin κ light chains expressed in patients with rheumatoid arthritis and normal individuals. *J Clin Invest* **96**,831-841. PMID: .

   b. Clausen BE, Bridges SL Jr, Lavelle JC, Fowler PG, Gay S, Koopman WJ, **Schroeder HW Jr.** (1998) Clonally-related immunoglobulin VH domains and nonrandom use of DH gene segments in rheumatoid arthritis synovium. *Mol Med* **4**(4),240-257. PMID: 9632065.

   c. Ivanov II, Link J, Ippolito GC, **Schroeder HW Jr.** (2002) Constraints on the hydropathicity and sequence composition of HCDR3 are conserved across evolution. In: *The Antibodies.* J.D. Capra and M. Zanetti, eds

   d. Zemlin M, Klinger M, Link J, Zemlin C, Bauer K, Engler JA, **Schroeder HW Jr**., Kirkham PM. (2004) Expressed Murine and Human CDR-H3 intervals of equal length exhibit distinct repertoires that differ in their amino acid composition and predicted range of structures. *J. Mol. Biol.* **334**(4): 733-49. (cover) PMID: 14636599

4. In order to test the role of CDR-H3 content in controlling the immune response, I arranged a sabbatical with Klaus Rajewsky in Cologne. With his help, I was able to generate a stable of mice with altered D_H loci. We used gene targeting to delete all but one D_H, DFL16.1. We then altered the sequence of DFL16.1 to force use of hydrophobic DFL16.1 reading frame 2 or DSP2.3 inverted reading frame 3, which was enriched for arginine. The mouse with the single, normal D_H gene segment generated a repertoire that matched that portion of the wild-type repertoire that uses DFL16.1, indicating that each D_H gene segment creates its own, distinct CDR-H3 repertoire. In this single D_H mouse, B cell numbers were normal. Mice forced to use altered D_H sequence, however, exhibited a decline in mature, recirculating B ells and in follicular B cell numbers. Among other B cell compartments, the effect of the altered D_H varied. Mice forced to use hydrophobic reading frame 2 exhibited normal numbers of marginal zone and B-1a B cells. In contrast, the mice forced to use charged, inverted reading frame 1, enriched for arginine, had elevated marginal zone B cell numbers and a nine-fold decline B-1a cell numbers. Responses to model antigens were altered, with the greatest alterations in the mice forced to use arginine-enriched CDR-H3s. Responses to infectious agents were also altered. For T independent antigens, the effect was recessive; whereas for T dependent antigens the effect was dominant. Finally, by altered the sequence of D_H we were able to sever the relationship between the anticipatory protection

offered by the natural antibody repertoire against a common pathogen and the acquired protection offered against oxidized self antigens. These studies conclusively demonstrated that germline sequence heavily dictates the composition of the antibody repertoire and response to antigen. I.e, there is a certain amount of predestination in the humoral antibody response to antigen. This has major implications for our understanding of the response to vaccines. This is not to say that natural selection reigns supreme. We also found evidence of CDR-H3 amino acid selection as developing B cells progress through sequential checkpoints. This suggested that repertoire alteration could also reflect checkpoint failure.

a. Ippolito, GC, Schelonka RL, Zemlin M, Ivanov II, Kobayashi R, Zemlin C, Gartland L, Nitschke L, Pelkonnen J, Fujihashi K, Rajewsky K, **Schroeder HW Jr.** (2006) Forced use of an immunoglobulin D_H encoding positively charged amino acids impairs B cell development and function. *J Exp Med.* **203**:1567-1578. PMID: 16754718

b. Schelonka RL, Zemlin M, Kobayashi R, Ippolito GC, Zhuang Y, Gartland GL, Fujihashi K, Rajewsky K, **Schroeder HW Jr**. (2008) Preferential use of D_H reading frame 2 alters B cell development and antigen-specific antibody production. *J Immunol* 181(12): 8409-8415. **PMCID: PMC2679994.**

c. Vale AM, Kapoor P, Skibinski G, Elgavish A, Mahmoud T, Zemlin C, Zemlin M, Burrows PD, Nobrega A, Kearney JF, Briles DE, **Schroeder HW Jr**. (2013) The link between antibodies to OxLDL and natural protection against pneumococci depends on D_H gene conservation. *J Exp Med* 210(5) 875-890. **PMCID: PMC3646500.**

d. Trad A, Tanasa RI, Lange H, Zemlin M, **Schroeder HW Jr**, Lemke H. (2014) Clonal progression during the T cell-dependent B cell antibody response depends on the immunoglobulin D_H gene segment repertoire. *Front Immunol* Aug 11;5:385. doi: 10.3389/fimmu.2014.00385. **PMCID: PMC4128299**

5. Having established that the response to exogenous antigens could be influenced by altering the composition of CDR3, we then turned to testing whether potentially pathogenic responses to self-antigens could be influenced similarly. First we tested for an association between CDR-H3 content and self-reactivity. We foudn that adult lupus-prone MRL/MpJ2+ mice express a primary antibody repertoire that differs in CDR-H3 length distribution and hydrophobicity from that expressed in the C3H parental strain. We then performed a prospective study. We prepared cohorts of 15 mice each that were homozygous or heterozygous for either the wild-type DH locus, the single normal D locus, or the single D forced to express arginine-enriched CDR-H3s. After one year, none of the mice expressed dsDNA binding IgM antibodies. However, more than 20% of mice with either one or two copies of the arginine-enriched D_H produced dsDNA-binding IgG. We were thus able to document that natural selection is playing a key role in suppressing potentially pathogenic self-reactivity. Our findings also suggest that one purpose of developmental B cell checkpoints is globally control CDR-H3 composition in a categorical fashion. This may be a key mechanism in suppressing self-reactivity after class switching and somatic hypermutation.

a. Zemlin M, Ippolito GC, Zemlin C, Link J, Monestier M**, Schroeder HW Jr.** (2005) Adult lupus-prone MRL/MpJ2+ mice express a primary antibody repertoire that differs in CDR-H3 length distribution and hydrophobicity from that expressed in the C3H parental strain. *Mol Immunol*. **42**:789-798. PMID: 15829267

b. Silva-Sanchez A, Liu C, Kapoor P, Vale AM, Khass M, Ivanov II, Zhuang Y, Schoeb TR, Burrows PD, **Schroeder HW Jr.** (2015) Violation of a conserved Ig DH sequence preference promotes production of dsDNA-specific IgG antibodies. *PLoS One*. Feb 23;10(2):e0118171. doi: 10.1371/journal.pone.0118171. eCollection 2015. **PMCID: PMC4338297**.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/harry.schroeder.1/bibliograpahy/40754695/public/?sort=date&direction=ascending

A. Research Support

Ongoing Research Support

T32 AI07051 Schroeder (PI) 07/01/76 - 08/31/18

"Immunologic Diseases and Basic Immunology"

The specific aim of this project is to train highly motivated predoctoral students and PhD and MD graduates in the field of immunology.

U01 AI090902 Schroeder (PI) 07/01/10 - 06/30/15
NIH/NIAID
"HLA Region and KIR Genomics in Common Variable Immune Deficiency"
The specific aims of this project are: 1) To fully characterize the HLA content of MHC alleles associated with susceptibility to CVID. 2) To characterize KIR and epistasis of KIR and MHC interactions with susceptibility of CVID. And, 3) To characterize T cell-NK cell TCR and B cell BCR profiles with putative CVID-causing KIR and MHC haplotypes.

Completed Research Support

R01 AI090742 Schroeder (PI) 07/01/10 - 06/30/14
"Role of IG CDR-H3 in Responses to HIV Vaccines"
The specific aims of this project are: 1) To create D-altered BALB/c, C57BL/6, C57BL/6 CD19ko, and single to triple congenic C57BL/6 *sle1/sle2/sle3/5* mice that will be genetically programmed to preferentially express antibodies with 2F5 (□D-2F5) and 4E10 (□D-4E10)-like CDR-H3s. 2) To test the hypothesis that B cells bearing BCRs with 2F5 and 4E10-like CDR-H3s are excluded from the splenic follicles and the mature recirculating B cell pool in wild-type BALB/c and C57BL/6 mice, but that alteration of BCR signaling (C57BL/6 CD19ko) or selection against altered antigen binding sites (single to triple congenic C57BL/6 *sle1/sle2/sle3/5)* will enhance the survival of B cells expressing 2F5 and 4E10-like CDR-H3s. And, 3) test the hypothesis that antibodies raised against HIV-1 gp41 MPER or HIV pseudovirions in □D-iD, ΔD-DμFS, □D-2F5 and □D-4E10 BALB/c, C57BL/6, C57BL/6 CD19ko, or C57BL/6 single to triple congenic *sle1/sle2/sle3/5* mice will be neutralizing and that MPER specific neutralization will be present in animals with 2F5 or 4E10 like CDR-H3s.

R56 AI48115 Schroeder (PI) 09/01/12 - 08/31/13
"The Role of Immunoglobulin CDRH3 in Autoimmune Disease"
The specific aims of this project are to introduce D_H loci that have been altered to promote production of charged or hydrophobic HCDR3 intervals into C57BL/6 mice bearing defined susceptibility loci for autoimmunity and to determine if enrichment for arginine in CDR-H3 will promote the expression of dsDNA binding IgG antibodies.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Rosa Serra

eRA COMMONS USER NAME (credential, e.g., agency login): rserra

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
St. Louis University, St. Louis, MO	BS	05/1986	Biology
The Pennsylvania State University, College of Medicine, Hershey, PA	Ph.D.	07/1992	Cell and Molecular Biology
Vanderbilt University School of Medicine, Nashville, TN	Post-doc	07/1995	Cell and Developmental Biology

A. Personal Statement

The overall goal of my laboratory is to understand the role and mechanism of embryonic and post-natal skeletal development and to apply this knowledge to the understanding and treatment of human degenerative skeletal disorders. Understanding how specific cellular differentiation pathways occur in development will provide a basis for prevention, repair, regeneration, and engineering strategies in the adult. I have the expertise, motivation, and leadership experience necessary to successfully carry out training in this and related areas. I have been working on TGF-ß signaling for about 25 years. I have been working on various aspects of skeletal development and maintenance for almost 20 years. I have been the PI on several NIH-funded grants aimed at understand how TGF-ß regulates various aspects of skeletal development. I have successfully administered several previous projects, collaborated with other researchers where appropriate, and produced several peer-reviewed publications from each project. I have also been invited to present the laboratory's work at numerous national and international forums in the past five years. Over the past ten years I have mentored ten graduate students and four post-doctoral fellows as well as numerous undergraduate and medical students. Currently, there are five graduate students and two post-doctoral fellows in my laboratory. The trainees in my laboratory have been very productive. I have a total of 72 published papers, most of which involve work by students and post-docs. My trainees are often invited to present their work at national and regional meetings. I was previously the co-Director of the Cell, Molecular, and Developmental Biology graduate program at UAB and then the Director of the Cancer Biology Theme within the Graduate Biomedical Science Program. I also won the Deans award for excellence in mentorship in 2011 demonstrating my commitment to excellence in research and training. In summary, I have a demonstrated a record of successful and productive research projects in areas of high relevance for skeletal biology, and my expertise and experience have prepared me to train students and post-docs in this and related areas.

B. Positions and Honors

Positions and Employment

1995 to 1999	Department of Cell Biology, Vanderbilt University School of Medicine, Nashville, Research Assistant Professor
1999-2002	Department of Molecular and Cellular Physiology, University of Cincinnati. Assistant Professor
2002-2008	Department of Cell Biology, the University of Alabama at Birmingham, Assistant/ Associate Professor
2008- present	Department of Cell, Developmental, and Integrative Biology, the University of Alabama at Birmingham, Professor
2008-2011	Co-Director, Cell, Molecular, and Developmental Biology theme, Graduate Biomedical Sciences Program

2011-2013	Director, Cancer Biology Theme, Graduate Biomedical Sciences Program
2013- present	Associate Director Global Center for Craniofacial, Oral and Dental Disorders

Current Membership on Federal Government Public Advisory Committees

Charter member SBSR study section NIH, Fall 2013 to 2017.

Honors

Graduate Dean's Excellence in Mentorship Award, University of Alabama at Birmingham, 2011

C. Contribution to Science

The main focus of my lab has been to understand the cell, molecular, and developmental mechanisms that regulate skeletal development. Our most significant contributions have been in the basic understanding of how TGF-ß regulates different aspects of skeletal development and maintenance. We have shown, using primarily complex mouse models, organ culture, and primary cells, that the response of cells to TGF-ß varies depending on the stage of development and the cellular environment. We have shown that TGF-ß promotes the differentiation of fibrous connective tissues, like the annulus of the intervertebral disc, the interzone in synovial joint development, and tendon, from early mesechymal progenitor cells. In contrast, once the cells are committed to the chondrogenic lineage TGF-ß is chondroprotective and promotes the cartilage phenotype by promoting and maintaining cartilage ECM and inhibiting hypertrophic differentiation. We have also identified some of the down stream targets of TGF-ß and the signaling mechanisms used to generate these connective tissues. This information will provide opportunities to generate therapies and strategies for regeneration or engineering of skeletal tissue.

Four Key Manuscripts:

1- **Serra R***, Johnson M, Filvaroff E, Laborde J, Sheehan D, Derynck R, Moses HL: Expression of a truncated kinase defective TGF-β type II receptor in mouse skeletal tissue results in defects in chondrocyte differentiation and an osteoarthritis-like phenotype. Journal of Cell Biology 139:541-552, 1997.

2- Baffi, MO, Slattery E, Sohn P, Moses HL, Chytil A, **Serra R** ,: Conditional Deletion of the TGF-β Type II Receptor in Col2a Expressing Cells Results in Defects in the Axial Skeleton Without Alterations in Chondrocyte Differentiation or Embryonic Development of Long Bones. Developmental Biology, 276:124-142, 2004.

3- Seo H-S, **Serra R** Deletion of Tgfbr2 in Prx1-cre expressing limb mesenchyme results in defects in the development of the long bone and joints. Developmental Biology 310:304-316, 2007. PMC2042108

4- Sohn P, Cox M, Chen D, **Serra R**. Molecular profiling of the developing mouse axial skeleton: A role for Tgfbr2 in the development of the intervertebral disc.
BMC Developmental Biology 10(1):29, 2010. PMC2848151

Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/rosa.serra.1/bibliography/41155740/public/?sort=date&direction=ascending

D. Research Support

Ongoing research support

"TGF-ß IN THE PATHOLOGY AND DEVELOPMENT OF THE SPINE"
PI Rosa Serra
Agency: NIH / NIAMS
Type: R01 AR053860
Period: 4/1/2007 to 3/31/2018

"MECHANISM OF TGFBR2 IN CHONDROPROTECTION"
PI Rosa Serra
Agency NIH / NIAMS
Type R01 AR062507
Period: 4/1/2013 to 3/31/2018

“CHONDROCYTIC CILIA AND MECHANO-SENSATION”
Co-PIs Serra and Ornan
Agency: US-Israel Bi-national Science Foundation
Period: 10/01/2012 to 9/30/2016

Completed in past three years

"TGF-ß AND WNT5A IN MAMMARY DEVELOPMENT AND CANCER"
PI Rosa Serra
Agency: NIH / NCI
Type: R01 CA126942
Period: 12/1/2008 to 11/30/2014

“SOX9 IN TGF-ß MEDIATED MAINTENANCE OF CHONDROCYTE PHENOTYPE”
PI Jessica Perez
Mentor Rosa Serra
Agency NIH / NIAMS
Type F32AR061246
Period: 7/1/2011 to 7/30/2014

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

NAME: Jasvinder Singh

eRA COMMONS USER NAME (credential, e.g., agency login): JasSingh

POSITION TITLE: Staff Rheumatologist, Birmingham VAMC & Professor of Medicine and Epidemiology, UAB

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University College of Medical Sciences New Delhi, India	Bachelor of Medicine & Bachelor of Surgery (MBBS)	12/1993	Medicine
All India Institute of Medical Sciences (AIIMS), New Delhi, India		12/1994	Psychiatry
State University of New York, Syracuse, NY		06/1998	Internal Medicine
Washington University School of Medicine, St. Louis, MO		08/2001	Rheumatology
University of Minnesota, Minneapolis, MN	Master of Public Heath (MPH)	05/2003	Epidemiology

A. Personal Statement

My passion in research is two-fold, (1) to generate evidence-based medicine by performing state-of-the-art Cochrane Systematic Reviews, Meta-analyses and Network Meta-analyses as well as development and dissemination of treatment guidelines that can change the way we practice medicine and provide the best care to patients with painful rheumatic conditions and (2) to improve our understanding of what impacts poor patient outcomes, such as moderate-severe pain and functional limitation in rheumatic diseases and design methods to improve these outcomes. As PI or co-Investigator on several previous and current federal and VA grants, I have performed and continue to perform several investigations focused on patient outcomes including pain, functional limitation and quality of life. As an international leader in evidence-based medicine, I have led key systematic reviews in Cochrane library (biologics in rheumatoid arthritis [RA]), the 2012 American College of Rheumatology Treatment Guidelines for RA and the methods stream in Outcomes in Rheumatology trials (OMERACT).

B. Positions and Honors

Positions and Employment

2006-2009 Visiting Scientist, Department of Health Sciences, Mayo Clinic, Rochester, MN
2007-2009 Visiting Scientist, Department of Orthopedics, Mayo Clinic College of Medicine, Rochester, MN
2001–2009 Assistant Professor, Department of Medicine, University of Minnesota, Minneapolis, MN
2009-2009 Associate Professor, Department of Medicine, University of Minnesota, Minneapolis, MN
2001-2009 Staff Rheumatologist, VA Medical Center, Minneapolis, MN
2009- Associate Professor, Dept. of Medicine & Epidemiology, University of Alabama, Birmingham, AL
2009- Staff Rheumatologist, VA Medical Center, Birmingham, AL
2009- Research Collaborator, Department of Orthopedics, Mayo Clinic College of Medicine, Rochester, MN
2010- Associate Professor, Department of Epidemiology, UAB, Birmingham, AL
2012- Associate Professor with Tenure, Dept. of Medicine, University of Alabama at Birmingham (UAB), Birmingham, AL
2012- Director, Rheumatology Research, Birmingham VA Medical Center, Birmingham, AL
2013- Director, Gout clinic, University of Alabama Health Services Foundation, Birmingham, AL
2014- Professor with Tenure, Dept. of Medicine, University of Alabama at Birmingham

(UAB), Birmingham, AL

Other Experience and Professional Memberships

2004-2009	Co-Chair, University of Minnesota Rheumatology Division Research Initiative, MN
2005	Human Studies Committee, Minneapolis VA Medical Center
2005-2007	VA Rheumatology Consortium's (VARC) Quality Indicator Committee
2005–now	Editorial Board, Journal of Clinical Rheumatology
2004-2007	Co-Chair, Subcommittee on Response and Classification Criteria (SRC) of the American College of Rheumatology Quality of Care Committee
2004-2008	American College of Rheumatology Standing Committee on Quality of Care (QoC)
2007-2008	ACR Liaison to the Outcome Measures in Rheumatology Clinical Trials (OMERACT)
2004-2008	American College of Rheumatology (ACR) Annual Meeting Planning Committee (APMC)
2007-now	Medical and Scientific Committee, North Central Chapter, Arthritis Foundation, St. Paul, MN
2008- 2012	Chair, American College of Rheumatology Fellow Selection Committee, OMERACT
2008-now	Co-chair, Outcomes Measures in Knee and Hip Replacement Trials Group for the Outcome Measures in Rheumatology Clinical Trials (OMERACT)
2009-now	Associate Editor, Biomedical Central Musculoskeletal Disorders
2009-now	Member, Rheumatology Field Advisory Committee, VA Central Office
2011-now	Member, American College of Rheumatology (ACR) Practice Guidelines Subcommittee
2011-	Member, ACR Guidelines Subcommittee
2012-	Ad hoc reviewer, Arthritis, Connective Tissue and Skin (ACTS) Study Section
2012-	Co-Chair, ACR Annual Meeting Abstract selection committee (Epidemiology & Health Services)
2013-	Chair, ACR Meet-the-Professor, Workshop and Study Group subcommittee
2013-	Director, UAB Cochrane Musculoskeletal Group Satellite Center

Honors and Awards

1991	3rd highest grade and honors in Pharmacology in professional second professional examination
2001	Awarded American College of Rheumatology (ACR) Rheumatology fellow award
2004-07	Clinical Scholar, Minneapolis VA Center for Epidemiological and Clinical Research, MN
2011	Elected Member, Southern Society of Clinical Investigation (SSCI)
2013	UAB Research Supplement Award for the 3rd rank at the Associate Professor level

C. Contribution to Science

In the publications below, trainees I mentored are indicated in italics and underlined font.

1. My early research efforts were focused on studying the predictors of health-related quality of life (HRQOL) in general cohorts and in patients with rheumatic diseases. With my colleagues, I found that quality of life was an independent predictor of future health care utilization. This was a new finding in the arena of health services research and highlighted the importance of knowing a patient's quality of life. This was topic of my thesis for my master's degree in public health (epidemiology) at University of Minnesota. I served as the PI on a VA-funded study to perform a follow-up study of quality of life. We have published more than 40 papers in this area.
    a. **Singh** J, Borowsky SJ, Nugent S, Murdoch M, Zhao Y, Nelson DB, Petzel R, Nichol KL. Health-Related Quality of Life, Functional Impairment and Health Care Utilization in Veterans: Veterans' Quality of Life Study (Vet-QOL Study). Journal of American Geriatrics Society 2005; 53(1): 108-13. [PMID: 15667386].
    b. **Singh** JA, Nelson D, Fink H, Nichol KL. Health related quality of life predicts future health care utilization and mortality in veterans with arthritis: The Veterans Arthritis Quality of life Study (VAQS). Seminars in Arthritis and Rheumatism 2005 Apr; 34(5):755-65. [PMID: 15846592].
    c. **Singh** JA, Murdoch M. Effect of Health-Related Quality of Life on Women and Men's Veterans Affairs (VA) Health Care Utilization and Mortality. Journal of General Internal Medicine. Journal of General Internal Medicine. 2007 Sep; 22(9):1260-7. [PMID: 17610020].
    d. **Singh** JA, Strand V. Health care utilization in patients with spondyloarthropathies. Rheumatology (Oxford). 2009 Mar;48(3):272-6. Epub 2009 Jan 16. [PMID: 19151035].

2. In addition to these studies, I led major efforts to understand the quality of care, quality of life and outcomes in gout. We described the quality care gaps and identify the areas for potential improvement. We published the first large US study of quality care gaps in gout care based on Arthritis Foundation gout quality indicators and the first large US study of quality of life in gout. We found a high physician non-adherence to gout quality indicators and described predictors of poor quality care. We found that gout impact physical HRQOL, but not mental/emotional HRQOL. I served as the PI on several investigator-initiated pharmaceutical company-funded studies and completed several database and cohort studies that have added new knowledge to the field of gout outcomes. I currently have NIAMS funded P60 project assessing outcomes in gout patients using the VA databases.
    a. **Singh** JA, Hodges J, Toscano J, Asch SA. Quality of Care for Gout in U.S. Needs Improvement. Arthritis and Rheumatism.2007 Jun 15; 57(5):822-9. [PMID: 17530682].
    b. **Singh** JA, Hodges JS, Asch SM. Opportunities for improving medication use and monitoring in gout. Ann Rheum Dis. 2009 Aug;68(8):1265-70. Epub 2008 Aug 13. [PMID: 18701554].
    c. **Singh** JA, Strand V. Gout is associated with more comorbidities, poorer health related quality of life and higher health care utilization in US veterans. Annals of the Rheumatic Diseases. 2008 Sep;67(9):1310-6. [PMID: 18178692].
    d. Hirsch JD, *Lee SJ*, Terkeltaub R, Khanna D, **Singh** JA, Sarkin A, Kavanaugh A. Evaluation of an Instrument Assessing Gout Impact on Health-Related Quality of Life. J Rheumatol. 2008 Dec;35(12):2406-2414. [PMID: 18925685].

3. I have made significant contributions to the development and validation of outcome measures and development of Classification criteria in rheumatology. I have led/co-led several methodological groups and serve as a steering committee member of the OMERACT (Outcome Measures in Rheumatology trials), an independent international organization that has played key role in development of outcome measures in rheumatology, including the ACR20 and other response criteria. I co-chaired the American College of Rheumatology (ACR) Classification and Response criteria subcommittee that oversaw the revision and updating of the existing criteria. A few examples include the validation of patient-reported outcomes (PROs) for chronic gout, developing provisional definition of gout flare, developing classification criteria for myositis and vasculitis.
    a. **Singh** JA, Solomon DH, Dougados M, Felson D, Hawker G, Katz P, Paulus H, Wallace C; Classification and Response Criteria Subcommittee of the Committee on Quality Measures, American College of Rheumatology. Development of classification and response criteria for rheumatic diseases. Arthritis and Rheumatism 2006 Jun 15; 55(3):348-52. [PMID: 16739201].
    b. *Johnson SR, Goek O, Singh-Grewal D*, Vlad SC, Feldman EM, Felson DT, Hawker GA, **Singh** JA, Solomon DH. Classification criteria in rheumatic diseases: A review of methodologic properties. Arthritis and Rheumatism. 2007 Sep 28; 57(7):1119-1133. [PMID: 17907227].
    c. *Gaffo AL*, Schumacher HR, Saag KG, Taylor WJ, Dinnella J, Outman R, Chen L, Dalbeth N, Sivera F, Vázquez-Mellado J, Chou CT, Zeng X, Perez-Ruiz F, Kowalski SC, Goldenstein-Schainberg C, Chen L, Bardin T, **Singh** JA. Developing a provisional definition of a flare in patients with established gout. Arthritis Rheum. 2012 May;64(5):1508-17. doi: 10.1002/art.33483 [PMID: 22083456
    d. **Singh** JA, Taylor WJ, Simon LS, Khanna PP, Stamp LK, McQueen FM, Neogi T, *Gaffo AL*, Becker MA, Macdonald PA, Dabbous O, Strand V, Dalbeth ND, Aletaha D, Edwards NL, Schumacher HR Jr. Patient-reported Outcomes in Chronic Gout: A Report from OMERACT 10. J Rheumatol. 2011 Jul;38(7):1452-7. [PMID: 21724715]

4. In addition to the work above, I have significant contributions to the generation of evidence-based medicine, by performing Cochrane Systematic Reviews and meta-analyses and development of treatment guidelines for the ACR. I serve as the Editor for Musculoskeletal Cochrane satellite on Network Meta-analyses and have served a member of the ACR treatment guidelines subcommittee. We have performed sentinel Cochrane reviews on therapies for RA and other conditions, and l led the development of 2012 and 2015 RA treatment guidelines (submitted for publication). We generated key

evidence on benefits and harms of biologics from trials. These systematic reviews and treatment guidelines have had a major impact on current practice and treatment of RA, worldwide.

a. **Singh** JA, Furst D, *Bharat A*, Curtis J, Kavanaugh A, Kremer J, Moreland L, O'Dell JR, Winthrop K, Beukelman T, Bridges SL, Chatham W, Paulus HE, Suarez-Almazor M, Bombardier C, Dougados M, Khanna D, King C, Leong A, Matteson E, Schousboe J, Moynihan E, Kolba K, *Jain A, Volkmann E, Agrawal H, Bae S, Mudano A, Patkar N*, Saag KG. 2012 Update of the 2008 American College of Rheumatology (ACR) Recommendations for the use of Disease-Modifying Anti-Rheumatic Drugs and Biologic agents in the treatment of Rheumatoid Arthritis. Arthritis Care Res (Hoboken). 2012 May;64(5):625-39. doi: 10.1002/acr.21641. [PMID: 22473917]
b. *Mertens M*, **Singh** JA. Anakinra for rheumatoid arthritis. Cochrane Database Syst Rev. 2009 Jan 21;(1):CD005121. [PMID: 19160248].
c. *Maxwell L*, **Singh** JA. Abatacept for rheumatoid arthritis. Cochrane Database Syst Rev. 2009 Oct 7;(4):CD007277. [PMID: 19821401].
d. **Singh** JA, Wells GA, Christensen R, Tanjong Ghogomu E, Maxwell L, Macdonald JK, Filippini G, Skoetz N, Francis D*, Lopes LC*, Guyatt GH, Schmitt J, La Mantia L, Weberschock T, Roos JF, Siebert H, Hershan S, Lunn MP, Tugwell P, Buchbinder R. Adverse effects of biologics: a network meta-analysis and Cochrane overview. Cochrane Database Syst Rev. 2011 Feb 16;2:CD008794. [PMID: 21328309].

5. In addition, I have made significant contributions to *understanding the predictors of pain, function and quality of life in cohorts of patients after joint replacement as well as other arthroplasty outcomes*. We have assessed prevalence, trends and predictors of pain, function, quality of life and postoperative complications following arthroplasty. We have conducted one of the few population-based studies examining utilization rates of these procedures as well as cardiopulmonary complications following arthroplasty.

a. *Khanna G*, **Singh** JA, Pomeroy DL, Gioe TJ. Comparison of Patient-Reported and Clinician-Assessed Outcomes Following total knee arthroplasty. J Bone Joint Surg Am. 2011 Oct 19;93(20):e1171-7. [PMID: 22012534].
b. **Singh** JA, *Jensen MR*, Harmsen W, Gabriel S, Lewallen DG. Cardiac and thromboembolic Complications and Mortality in Patients Undergoing Total Hip and Total Knee Arthroplasty. Ann Rheum Dis. 2011 Dec;70(12):2082-8. doi: 10.1136/ard.2010.148726. Epub 2011 Oct 21 [PMID: 22021865].
c. **Singh** JA, Vessely MB, Harmsen WS, Schleck CD, Melton LJ, Kurland RL, Berry DJ. A Population-Based Study of Trends in the Use of Total Hip and Total Knee Arthroplasty, 1969-2008.Mayo Clin Proc. 2010 Oct;85(10):898-904. Epub 2010 Sep 7 [PMID: 20823375].
d. **Singh** JA, Lewallen D. Predictors of Activity Limitation and Use of Walking Aids after Primary total hip arthroplasty. J Am Geriatr Soc. 2010 Dec;58(12):2387-93. doi: 10.1111/j.1532-5415.2010.03182.x.[PMID: 21143444].

MY NCBI link:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1dWPeHcC732QD/bibliography/43542450/public/?sort=date&direction=descending

D. Research Support

Ongoing Research Support

Patient-Centered Outcomes Research Institute (PCORI) 01/01/14-12/31/16
Assessment of Prevention, Diagnosis, and Treatment Options PFA
Individualized Patient Decision Making for Treatment Choices among Minorities with Lupus
This study will develop and test the efficacy of a decision aid for African-American and Hispanic women with lupus.
Role: PI

P50 AR060772 (Saag & Bridges, MPI) 09/01/12-08/31/17
NIAMS
Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard
Project 3: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments
This center includes four projects focused on gout and hyperuricemia. One study proposed to examine innovative technology to use VA databases to study factors associated with optimal treatment of gout and genetic, dietary and clinical correlates of optimal dose of allopurinol needed to achieve target serum urate in individual patient.
Role: PI of Project 3

P50 AR060772 (Saag & Bridges, MPI) 09/01/12-08/31/17
NIAMS
Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard
Gout and Hyperuricemia Center for Research and Translation (CoRT) Administrative Core
This center includes four projects focused on gout and hyperuricemia. One study proposed to examine innovative technology to use VA databases to study factors associated with optimal treatment of gout and genetic, dietary and clinical correlates of optimal dose of allopurinol needed to achieve target serum urate in individual patient.
Role: Associate Director

U19 HS021110 (Saag) 9/30/11-8/31/16
AHRQ
UAB Deep South Arthritis and Musculoskeletal CERTs Project 1: Comparative Effectiveness of NSAIDs versus Narcotics after Joint Replacement Surgery
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders.
Role: PI of Project 1

R01 HD084124 (Bamman & Bridges) 04/15/15-02/28/20
NIH/NICHD
Overcoming TWEAK Signaling to Fully Restore Muscle Mass and Mobility Function after Total Joint Arthroplasty
Role: Co-Investigator

U01 AG018947 (Lewis) 09/15/08-12/31/15
NIH/NIA
Multicenter Osteoarthritis Study (MOST)
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: Matthew Stoll

eRA COMMONS USER NAME (credential, e.g., agency login): MSTOLL

POSITION TITLE: Associate Professor of Pediatric Rheumatology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Wesleyan University (Middletown, CT)	BA	05/1994	Molecular biology
L	MD,PhD	06/2001	Microbiology / Immunol.
Long Island Jewish Med Ctr (New Hyde Park, NY)	Residency	06/2004	Pediatrics
Children's Hospital Boston (Boston, MA)	Fellowship	06/2007	Pediatric Rheumatology
UT Southwestern Medical Center (Dallas, TX)	MSCS	06/2011	Clinical Research

A. Personal Statement

My research training began in medical school, where I earned an MD and PhD in Immunology at SUNY Upstate Medical University, studying a murine model of lupus. I have since modified my interests to clinical and translational research, earning a MSCS at the UT Southwestern (UTSW) Medical Center. During my fellowship in pediatric rheumatology, I developed an interest in spondyloarthritis, where I characterized subgroups within juvenile psoriatic arthritis. My interests further evolved to the role of intestinal inflammation in the pathogenesis of spondyloarthritis, and as a faculty member at UTSW, I studied the use of non-invasive tools to identify intestinal inflammation in children with spondyloarthritis. I was the first to demonstrate the use of fecal calprotectin and intestinal MRI to evaluate for intestinal inflammation in children with spondyloarthritis. I am currently undertaking studies to explore the mechanism underlying the association. To that end, I am working towards generating a biorepository of fecal microbiota, and am planning collaborative studies evaluating the role of immunity directed against the fecal microbiota in children with spondyloarthritis, as well as understanding the role of dysbiosis in SpA. Specifically, I will use Next Generation Sequencing (NGS) technologies (16S ribosomal DNA analysis, metagenomics) to analyze the microbial content of the enteric microbiota in patients with SpA, and will also study the nature of the B and T cell immunologic responses to enteric bacteria.

In light of my expertise in the field of juvenile SpA, I was invited by Dr. Miika Arvonen MD,PhD to serve as an external advisor for his PhD defense at the University of Oulu (Finland) on intestinal immunologic activation in children with JIA. He is now a senior consultant pediatrician at the Kuopio University Hospital in Kuopio, Finland.

B. Positions and Honors

Positions

2001 – 2004 Residency in pediatrics, Long Island Jewish Medical Center, New Hyde Park NY
2004 – 2007 Fellowship in pediatric rheumatology, Childrens Hospital Boston, Boston MA
2007 – 2008 Instructor in pediatric rheumatology, UT Southwestern Medical Center, Dallas TX
2008 – 2011 Assistant Professor pediatric rheumatology, UT Southwestern Medical Center, Dallas TX
2011 – 2014 Assistant Professor pediatric rheumatology, University of Alabama Birmingham
2014 – present Associate Professor pediatric rheumatology, University of Alabama Birmingham

Honors

1994 Phi Beta Kappa
2000 Alpha Omega Alpha

Professional Memberships

2007 – Childhood Arthritis and Rheumatology Research Alliance (CARRA)
2007 – American College of Rheumatology (ACR)
2010 – Pediatric Rheumatology Collaborative Study Group (PRSCG)
2011 – Alabama Society for the Rheumatic Diseases
2012 – UAB Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center

C. Contribution to Science

Briefly describe up to five of your most significant contributions to science. For each contribution, indicate the historical background that frames the scientific problem; the central finding(s); the influence of the finding(s) on the progress of science or the application of those finding(s) to health or technology; and your specific role in the described work. For each of these contributions, reference up to four peer-reviewed publications or other non-publication research products (can include audio or video products; patents; data and research materials; databases; educational aids or curricula; instruments or equipment; models; protocols; and software or netware) that are relevant to the described contribution. The description of each contribution should be no longer than one half page including figures and citations. Also provide a URL to a full list of your published work as found in a publicly available digital database such as SciENcv or My Bibliography, which are maintained by the US National Library of Medicine.

1. My early publications focused on phenotypic descriptions of children with the two major subtypes of spondyloarthritis: psoriatic juvenile idiopathic arthritis (psJIA) and enthesitis-related arthritis (ERA). For years, studies of children with JIA as a group as well as the psoriatic subtype demonstrated a bi-modal age of onset distribution. Our contribution, in the largest description of psJIA published to date, was to confirm this age distribution and to show phenotypic differences between the categories. Specifically, we showed that children with an early age of onset (< age 5) were more likely to be female and carry a positive ANA, while children with an older age of onset had features more consistent with spondyloarthritis, including axial disease and enthesitis. I also published a retrospective study of children with ERA, analyzing risk factors for the development of sacroiliitis. Unlike in adults, most cases of sacroiliitis will be pre-radiographic, and history and even exam are insensitive markers for it; indeed, we identified 11 cases that were only detected by imaging in the absence of suggestive historical or physical exam features, underscoring the need for screening for involvement in at-risk children. Specifically, we identified hip arthritis is an important risk factor for the development of sacroiliitis among children with ERA.

a. **Stoll ML**, Zurakowski D, Nigrovic LE, Nichols DP, Sundel RP, and Nigrovic PA. Patients with juvenile psoriatic arthritis comprise two distinct populations. *Arthritis Rheum* 2006; 54: 3564-3572.

b**. Stoll ML,** Lio P, Sundel RP, Nigrovic PA. Comparison of Vancouver and International League of Associations for rheumatology classification criteria for juvenile psoriatic arthritis. *Arthritis Rheum* 2008; 59: 51-58.

c. **Stoll ML**, Bhore R, Dempsey-Robertson M, Punaro M. Spondyloarthritis in a pediatric population: risk factors for sacroiliitis. *J Rheumatol* 2010; 37: 2402 – 2408. PMCID: PMC3093157

2. My next goal was to look for evidence of sub-clinical intestinal inflammation in children with ERA, and to identify non-invasive means of detecting such. Multiple studies in adults had indicated that about two-thirds of adults with spondyloarthritis have intestinal inflammation identified by routine colonoscopy, with the presence of such predicting a more complicated course of the underlying arthritis as well as an increased risk of developing inflammatory bowel disease (IBD.) Because colonoscopy is an invasive and expensive tool, I sought to identify non-invasive markers that could be used to measure sub-clinical intestinal inflammation. Thus, I was the first to use fecal calprotectin as a biomarker in children with ERA, showing that in comparison to subjects with other forms of JIA, unrelated rheumatic diseases, and healthy controls, that children with ERA had higher fecal calprotectin levels. A subset of children with ERA and elevated fecal calprotectin levels underwent intestinal MRI, and this study showed that three of five also had subtle changes on MRI that can be seen in subjects with IBD.

a. **Stoll ML**, Patel AS, Punaro M. Fecal calprotectin in children with the enthesitis-related arthritis subtype of juvenile idiopathic arthritis. *J Rheumatol*, 2011; 38: 2274 - 2275. NIHMS352633.

b. **Stoll ML**, Patel AS, Punaro M, Dempsey-Robertson M. MR enterography to evaluate sub-clinical intestinal inflammation in children with spondyloarthritis. *Pediatric Rheumatology* 2012; 10:6. PMCID: PMC 3292457

3. My current work focuses on the role of the intestinal microbiota in children with ERA. Multiple studies in patients with IBD have demonstrated altered microbial contents and immunologic reactivity to commensal organisms. We were the first to evaluate the fecal microbiota in children with ERA. We obtained fecal specimens on children with ERA as well as healthy control subjects, identifying important differences between the groups including decreased *faecalibacterium prausnitzii*. Prior studies have shown this organism to be altered in subjects with IBD as well, and is thought to have a regulatory function. Additional studies are underway to evaluate the enteric microbiota in newly diagnosed ERA patients, to evaluate the metabolic function and genetic potential of the fecal microbiota in ERA, and also to evaluate for altered immunologic reactivity to commensal organisms in ERA.

a. **Stoll ML**, Kumar R, Morrow CD, Lefkowitz EJ, Cui X, Genin A, Cron RQ, Elson CO. Altered microbiota associated with abnormal humoral immune responses to commensal organisms in enthesitis-related arthritis. *Arthritis Research and Therapy* 2014; 16:486. PMC 4272554

4. An additional line of work is study of temporomandibular joint (TMJ) arthritis in children with JIA. Although not always evaluated in clinical practice, decades of scholarship have shown this joint to be involved in up to 80% of children with JIA, many of whom particularly in the pre-therapeutic era were at risk of developing substantial damage to the jaw resulting in functional and cosmetic deformities. Our work on risk factors for the development of TMJ arthritis confirmed altered physical exam findings as a risk factor, although one with unacceptably low sensitivity. We also showed that prolonged disease activity was protective; this is in contrast to previous studies in the field, and suggests that modern immunosuppressive therapies may be of benefit. Nevertheless, our work on risk factors identified 36 children with otherwise quiescent disease who nevertheless had an abnormal MRI of the TMJ. Thus, many of these children will require local therapy as well, and we have published on the safety and effectiveness of both intra-articular (IA) corticosteroids and IA infliximab in the management of TMJ arthritis.

a. **Stoll ML**, Good J, Sharpe T, Beukelman T, Young D, Waite PW, and Cron RQ. Intraarticular corticosteroid injections to the temporomandibular joints are safe and appear to be effective therapy in children with juvenile idiopathic arthritis. *Journal of Oral and Maxillofacial Surgery* 2012; 70: 1802 – 1807.

b. **Stoll ML**, Patel AS, Punaro M, Dempsey-Robertson M. MR enterography to evaluate sub-clinical intestinal inflammation in children with spondyloarthritis. *Pediatric Rheumatology* 2012; 10:6. PMCID: PMC 3292457

c. **Stoll ML**, Morlandt A, Teerawattanapong S, Young D, Waite PD, and Cron RQ. Safety and efficacy of intra-articular infliximab therapy for treatment resistant temporomandibular joint arthritis in children: a retrospective study. *Rheumatology* 2013; 52:554-559.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1nGF9pHi427kS/bibliography/42158384/public/?sort=date&direction=ascending

D. Research Support

Ongoing

R21 ES024413 8/1/2014 – 7/31/2016
NIH / NIEHS
Interactions between AHR ligands and the gut microbiota in murine arthritis
The major goals of this project are to evaluate the effects of environmental manipulation of the intestinal microbiota with AHR ligands and through adoptive transfer of microbiota from patients with arthritis, on the development of murine arthritis.
Role: Principal investigator

Friends of CARRA 10/1/13 – 9/30/15
Enteric Flora in newly diagnosed spondyloarthritis: a collaborative study
The major goals of this project are to evaluate the enteric flora of newly diagnosed juvenile spondyloarthritis patients at multiple sites around the country.

P60 AR064172 (Bridges, PI; Elson, PI, Project 3) 9/16/13 – 7/31/18
NIH / NIAMS
UAB Multidisciplinary Clinical Research Center – Project 3
Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.
Role: Co-investigator

American College of Rheumatology (Stoll, PI) 7/1/13 – 6/30/16
ACR / RRF
Exploration of the gut microbiome in spondyloarthris
The major goals of this project are to identify fecal bacterial flora that may contribute to spondyloarthritis.
Role: Principal Investigator

COMPLETED
Kaul Pediatric Research Institute 2/1/2013 – 1/31/2015
Children's Hospital of Alabama
Identification of target antigens in children with spondyloarthritis
The major goals of this project are to identify dysbiotic bacteria in the intestines of children with spondyloarthritis
Role: Principal investigator

UAB School of Medicine 12/5/2011 – 11/30/2012
Autoimmunity against enteric antigens in children with spondyloarthritis
The major goals of this project are to identify pathogenetic antibodies to intestinal flora in children with spondyloarthritis.
Role: PI

KL2 RR024983 Milton Packer (PI) 6/1/08 – 2/28/10
NIH / NCRR
Subgroups of juvenile psoriatic arthritis: a clinical and gene expression analysis
The major goals of this project are to understand age-based subgroups of juvenile psoriatic arthritis, and to understand potential differences between early-onset juvenile psoriatic arthritis and juvenile idiopathic arthritis.
Role: pilot award principal investigator

KL2 RR024983 Milton Packer (PI) 9/17/07 – 5/13/11
NIH / NCRR
North and Central Texas Clinical and Translational Sciences Initiative
The major goals of this project are to enhance the knowledge of and improve the skills required for the performance of high-quality innovative clinical and translational research in order to advance the development of trainees planning a career in or interested in contributing meaningfully to clinical or translational research.
Role: Clinical Research Scholar

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Szalai, Alexander J.

eRA COMMONS USER NAME (credential, e.g., agency login): szalai

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Manitoba, Winnipeg, Manitoba, Canada	BS	02/1984	Zoology
University of Manitoba, Winnipeg, Manitoba, Canada	MS	09/1986	Zoology
University of Manitoba, Winnipeg, Manitoba, Canada	PhD	02/1990	Parasitology

A. Personal Statement

The purpose of the current T32 Training Grant is to enable UAB to target National Research Service Awards to individuals selected by our Institution for predoctoral and postdoctoral research training in rheumatic and musculoskeletal diseases. I am participating in this effort as one of the Core Faculty, i.e. faculty whose research interests and expertise is related to rheumatic diseases and whose extramural grant support is robust, thus allowing them to serve as a primary mentor for T32 trainees. I believe I have the expertise, leadership/training/mentoring abilities, and motivation needed to help successfully carry out this mission. ***Research interests and expertise*:** For more than 25 years the main focus of my research has been inflammation and its contribution to the maintenance of health, the propagation of disease, and the tissue response to injury. In my studies I use a multi-faceted and translational approach that includes studies of transgenic/knockout mice and human cells/DNA aimed at revealing different causal genotype/phenotype relationships. The genes, proteins, and diseases of interest that I have studied are numerous and diverse but all share one thing in common - an underlying innate immunity/inflammatory process. This knowledge and expertise will be of direct benefit as we manage our training grant. Of direct relevance to the proposed T32, I have performed extensive investigations into the pathogenesis of many rheumatic and musculoskeletal diseases in both humans and in their animal model analogs. Importantly, for much of this time I relied heavily on my students/trainees, who have contributed immensely to my research output. Since C-reactive protein (CRP: the focus of much of my interest) activates the complement system and binds to Fc receptors, my research has necessarily involved a detailed interrogation of the role of these two effector arms in CRP driven processes known to participate in rheumatic and musculoskeletal diseases. Indeed, my most recent work is focused on defining the mechanism(s) of CRP mediated suppression of the autoimmune response; a function we think is driven by CRP's influence on dendritic cells. That work is perfectly aligned with the current proposed training grant. ***Leadership/training/mentoring:*** The NIH publication "Collaboration and Team Science: A Field Guide" (available at http://teamscience.nih.gov.) states *"today it is widely accepted that collaborations become necessary whenever researchers wish to take their research programs in new directions".* This is a philosophy I strongly believe in. I am adept at identifying collaborators, forming collaborative teams, and leading collaborative research. This is vital to the success of any training program. I have a strong history of extramural and institutional support, numerous excellent collaborations, access to excellent physical resources, and continuous stimulating intellectual rapport: all of this makes for a good training environment. In sum I have a demonstrated record of accomplishment, ample mentoring expertise and experience, and sufficient perseverance to greatly increase the likelihood of the training grant's success. ***Motivation:*** In 2003 my career was seriously challenged by my wife's illness, which left her permanently impaired until her death in 2011. During that 8-year period I was her primary caretaker. Nevertheless I managed still to publish ~50 various papers and reviews (on ~half I was lead/senior author and on ~one third I was project leader), to submit numerous grants (some were funded), to continue my mentoring activities, and I was promoted to Professor with tenure. However I did skip several NIH grant submission cycles. I have since fully resumed all of my research efforts.

B. Positions and Honors

Positions and Employment

1990-1992 Fellow, Dept. Microbiology, University of Mississippi Medical Center
1992-1993 Research Assistant, Dept. Biochemistry, Memorial University of Newfoundland
1993-1996 Research Instructor, Dept. Medicine, University of Alabama at Birmingham (UAB)
1996-2001 Research Assistant Professor, Dept. Medicine, UAB
2001-2004 Research Associate Professor, Dept. Medicine, UAB
2004-2010 Associate Professor, Dept. Medicine, UAB
2010- Professor with tenure, Dept. Medicine, UAB
1998- Associate Scientist, UAB Arthritis and Musculoskeletal Center
2004- Adjunct Faculty, Department of Microbiology, UAB
2009- Graduate Biomedical Sciences Faculty
2010- Scientist: UAB Center for Cardiovascular Biology
2011- Senior Scientist: UAB Diabetes Research Training Center
2013- Director: Musculoskeletal & Skin Module
2014- Member: Nephrology Research and Training Center
2014 Associate Scientist; Comprehensive Arthritis Musculoskeletal Bone and Autoimmunity Center

Other Experience and Professional Memberships

2003 Member: C-Reactive Protein (CRP) Pilot Study Planning Committee. NIH/NHLBI
2006 Member: Workshop on Research Needs for CRP: Basic and Clinical. NIH/NHLBI
2006-2010 Associate Editor: *The Journal of Immunology*
Grant Reviews/Study sections: NSERC, USDA, VA, AHA, NIH/(NIDDK, NIH/NHLBI,NIH/IMM, Meningitis Research Foundation, Wellcome Trust, Georgia Research Alliance, Oak Ridge Associated Universities, Lupus Research Institute, National Multiple Sclerosis Society
Editor/Editorial Boards: *Autoimmune Diseases,* T*he Open Atherosclerosis & Thrombosis Journal*, *Scientifica, OA Rheumatology, Rheumatology: Current Research, American Journal of Physiology – Regulatory, Integrative and Comparative Physiology, Mediators of Inflammation*

Honors

1986-1988 University of Manitoba Graduate Fellowship, Natural Sciences & Engineering Research Council of Canada (NSERC) Postgraduate Scholarship, George A. Lubinsky Memorial Scholarship
1989-1991 NSERC Postdoctoral Fellowship, International Society for Developmental and Comparative Immunology Travel Scholarship
2011-2014 Department of Medicine Research Excellence Award
Speaker: FASEB Science Research Conference on Immunoreceptors, 4th International Congress on Autoimmunity, Vascular Biology and Hypertension Symposia, American Heart Association Special Session on C-reactive protein and Mechanisms of Cardiovascular Disease
Highlighted papers: *Respiratory Reviews* (Vol. 7), *Arthritis & Rheumatism* (Vol. 48), *Circulation* (Vol. 108), *Journal of Molecular Medicine* (Vol. 83), *Journal of the American College of Cardiology* (Vol. 50), *The American Journal of Pathology* (Vol. 177), *Investigative Ophthalmology and Visual Science* (May 2014)
Teaching awards: 2014 Best MS2 Organ Module - 3rdplace 2014 Dale J Benos Award for Best MS2 Organ Module Director - 2nd place

C. Contributions to Science

I've been involved in CRP research for more than 25 years, and for the last 15 I've been one of the very few laboratory based investigators in the world truly dedicated to understanding the diverse biological role played by CRP. Rather than adding to the already huge amount of data associating CRP blood level with a host of maladies, I am deeply committed to identifying and understanding what CRP does and how it does what it does. I am interested in the functional biology of CRP, not its guilt by statistical association to any condition, whether in the pathological setting of disease or in the physiological setting of homeostasis. To accomplish this goal I became one of the CRP field's engineered mutant mouse pioneers, and I have used CRP transgenic/knockout mice in thoughtful translational studies that address genotype/phenotype relationships of CRP in human disease. Notably, I performed many studies of rheumatological/musculoskeletal relevance. I will

bring that fund of knowledge and those mutant mouse tactics to the current training grant. For more than half of my scientific career the research I have been engaged in was initiated by me and led by me, and I have been highly productive and, despite some meager times, well-funded throughout. I rely heavily on students/trainees and they have participated deeply in my research. I will bring that record of innovation, mentorship and success to the current training grant. To date I claim more than 100 peer-reviewed research papers published or in press. Notably I am first or last author on nearly 2/3 of that total and fortunately more than 10% of my papers to date have appeared as issue highlights and/or cover articles in Journals representing a diversity of fields (*Arthritis & Rheumatism, Circulation, Journal of Molecular Medicine, Nature Medicine,* etc.). I have also published 9 review articles, 5 book chapters, and 26 other pieces (letters to the editor, editorials, commentaries, etc.). On the majority of these published works one or more of my trainees is a co-author. I will bring that productivity to the current project. My reputation and respect in the local, national, and international scientific community is evidenced by the many speaking engagements I have had over the years, including invitations to national and international meetings/symposia and Grand Rounds. I have also been invited (twice) by the NIH to participate in planning meetings aimed at designing CRP-centric clinical trials (some now ongoing) and for many years I was part of a scientific advisory team that helped develop a CRP lowering drug (now in clinical trials). Below I highlight 5 of my most significant contributions to science, in order of their highest to lowest relevance to the current training grant.

1. I have made a significant contribution to trainee development

During my time at UAB I have contributed greatly to the development of our trainees, actively participating in their development at all stages.

a. UNDERGRADUATES: I have mentored several students during their undergraduate Honors Research experience, and regularly act as a judge for posters presented by high school students at the Central Alabama Regional Science and Engineering Fair.

b. GRADUATES: I am a member of two separate Graduate Biological Sciences (GBS) admissions committees, responsible for selecting potential pre-doc students for entry into our Immunology and Genetics graduate programs. I regularly participate as a lecturer in 4 different graduate level courses and direct an advanced course in Innate Immunity. I routinely act as a judge for posters presented by students during their “GBS poster days” and an annual Trainee Research Symposium. Since 2009 I have had 11 different pre-doc students rotate through my laboratory (not including my own students) and I have sat on 33 different thesis committees.

c. MEDICAL SCHOOL STUDENTS: in addition to the activities listed above I also participate in training of medical students. I am the Director of the Musculoskeletal and Skin module for 2nd year medical students.

d. POST-GRADUATE STUDENTS: I regularly judge posters for our annual Postdoc Association Research Day, I regularly interview applicants to our Rheumatology Fellowship Training Program, I regularly lecture in our Rheumatology Fellows’ Conferences, and I have mentored several Rheumatology Fellows during their research experiences. I am an active K award reviewer.

NOTE: in the publications listed below all trainees are underlined.

2. My research has revealed the consequences of CRP genetic variation in rheumatic disease

Data we generated using specimens obtained from lupus patients allowed us to publish one of the very first descriptions of a link between CRP genetic variation and CRP blood level variation (*a*). We were also the first to identify a single-nucleotide polymorphism (SNP) in the CRP gene promoter that was functional i.e., the SNP altered transcription factor binding and thereby modulated CRP gene expression (*b*). Both papers were featured by their respective journals. To date, that functional CRP promoter SNP remains the only CRP genetic variant with proven impact on CRP gene expression, and the SNP variant has now been linked to risk of cardiovascular disease (reviewed in *c*; also a journal issue highlight).

a. Szalai AJ, McCrory M, Cooper GS, Wu J, Kimberly RP. (2002) Association between baseline levels of C-reactive protein (CRP) and a dinucleotide repeat polymorphism in the intron of the CRP gene. *Genes and Immunity*, 3:14-19.

b. Szalai AJ, Wu J, Lange EM, McCrory MA, Langefeld CD, Williams A, Zakharkin SO, George V, Allison DB, Cooper GS, Xie F, Fan Z, Edberg JC, Kimberly RP. (2005). Single nucleotide polymorphisms in the C-reactive protein (CRP) gene promoter that affect transcription factor binding, alter transcriptional activity, and associate with differences in baseline serum CRP level. *J Molecular Medicine,* 83:440-447.

c. Hage FG, Szalai AJ. (2007) C-reactive protein (CRP) gene polymorphisms, CRP blood levels, and cardiovascular disease risk. *Journal of the American College of Cardiology.* 50:1115-1122.

3. My work led to the discovery that CRP modulates autoimmune/rheumatic disease

Using human CRP transgenic mice, CRP knockout mice, and a human CRP-specific antisense oligonucleotide drug we provided some of the first direct evidence that CRP is able to suppress autoimmune disease. For example, using mouse analogs of human diseases we showed that CRP transgenic mice are resistant to spontaneous lupus (*a*; a journal highlight) and experimentally induced multiple sclerosis (*b*). Also, we used CRP transgenic mice in tandem with CRP knockout mice and the CRP lowering drug to show that baseline CRP delays onset of incident rheumatoid arthritis, whereas acute phase CRP exacerbates existing arthritis (*c*). These mouse studies were instrumental in a clinical trial that tested the safety of the CRP lowering drug in patients with rheumatoid arthritis (ClinicalTrials.gov Identifier: NCT01414101) (*d*). We are currently investigating the direct impact of CRP on T cell mediated immunity (*e*).

a. Szalai AJ, Weaver CT, McCrory MA, van Ginkel FW, Reiman RM, Marion TN, Volanakis JE. (2003) Delayed lupus onset in $(NZB \times NZW)_{F1}$ mice expressing a human C-reactive protein transgene. *Arthritis & Rheumatism,* 48:1602-1611.

b. Szalai AJ, Nataf S, Hu XZ, Barnum SR. (2002) Experimental allergic encephalomyelitis is inhibited in transgenic mice expressing C-reactive protein. *Journal of Immunology*, 168:5792-5797.

c. Jones NR, Pegues MA, McCrory MA, Kerr SW, Jiang H, Sellatti R, Berger V, Villalona J, Parikh R, McFarland M, Pantages L, Madwed JB, Szalai AJ. (2011) Collagen-Induced arthritis is exacerbated in C-reactive protein deficient mice. *Arthritis & Rheumatism*, 63:2641-2650. PMCID: PMC3168703.

d. Jones NR , Pegues MA, McCrory MA, Singleton W, Bethune C, Baker BF, Norris DA, Crooke RM, Graham MJ, and Szalai AJ. (2012) A selective inhibitor of human C-reactive protein translation is efficacious in vitro and in C-reactive protein transgenic mice and humans. *Molecular Therapy- Nucleic Acids*, 1: e52. PMCID: PMC3511672.

4. My work revealed complement and CRP synergistically protect against pneumococcal infection

We were the first to show that CRP transgenic mice are resistant to infection with *Streptococcus pneumonia*, an ability that depends on CRP-mediated activation of complement (*a*). Those findings led to a fruitful collaboration with Drs. David Briles (a pneumococcus expert) and Dan Bullard (a complement receptor expert). Together we discovered that pneumococci express a surface protein (called PspA) that both inhibits complement activation and impairs its ability to bind with complement receptors (*b*). We also found that these complement inhibiting effects rely on PspA's ability to compete with CRP for pneumococcal binding (*c*). The findings are supporting ongoing development of PspA-based vaccines against pneumococcal infection.

a. Szalai AJ, Briles DE, Volanakis JE. (1996) Role of complement in C-reactive-protein-mediated protection of mice from *Streptococcus pneumoniae*. *Infection and Immunity,* 64:4850-4853. PMCID: PMC174457.

b. Ren B, McCrory MA, Pass C, Bullard DC, Ma Y, Briles DE, Szalai AJ. (2004) The virulence function of Streptococcus pneumonia surface protein A (PspA) involves inhibition of complement activation and impairment of complement receptor-mediated protection. *The Journal of Immunology,* 173:7506-7512.

c. Mukerji R, Mirza S, Roche AF, Widener R, Rhee DK, Weiser JN, Szalai AJ, DE Briles. (2012) Pneumococcal surface protein A (PspA) inhibits complement deposition on the pneumococcal surface by competing with the binding of C-reactive protein (CRP) to cell-surface phosphorylcholine. *The Journal of Immunology*, 189:5327-5335. PMCID: PMC3517878.

5. My work has been instrumental in defining the contribution of CRP to cardiovascular disease

We used CRP transgenic mice to provide the first direct evidence that CRP impacts cardiovascular health. Namely, we showed in 2 separate seminal papers that (i) CRP hastens thrombosis (*a*; an issue highlight) and (ii) CRP advances the development of atherosclerosis (*b*; accompanied by an editorial). We were invited by the American College of Cardiology to write a review on the subject of CRP genotype-phenotype relationships in cardiovascular health (*c;* highlighted in the journal and also posted online and made available for CME credit). Notably, the CRP lowering drug we developed we also tested in mouse models of cardiovascular disease (*d*), which led to an ongoing Phase 2 study of the drugs effect on paroxysmal atrial fibrillation (ClinicalTrials.gov Identifier: NCT01710852).

a. Danenberg HD, Szalai AJ, Swaminathan RV, Peng L, Chen Z, Seifert P, Fay WP, Simon DI, Edelman ER. (2003) Increased arterial thrombosis following arterial injury in human C-reactive protein transgenic mice. *Circulation,* 108:512-515.

b. Paul A, Ko KWS, Li L, Yechoor V, McCrory MA, Szalai AJ, Chan L. (2004) C-reactive protein accelerates the progression of atherosclerosis in apolipoprotein E-deficient mice. *Circulation,* 109:647-655.
c. Hage FG & Szalai AJ. (2007) C-reactive protein (CRP) gene polymorphisms, CRP blood levels, and cardiovascular disease risk. *Journal of the American College of Cardiology,* 50:1115-1122.
d. Szalai AJ, McCrory M, Xing D, Hage FG, Miller A, Oparil S, Chen YF, Mazzone M, Early R, Henry SP, Zanardi TA, Graham MA, Crooke RM (2014) Inhibiting C-reactive protein for the treatment of cardiovascular disease: Promising evidence from rodent models. *Mediators of Inflammation,* Article ID 353614. PMCID: PMC3996300.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/46115819/

D. Research Support

Ongoing Research Support

NIH F31 NS081903 Szalai (PI) 07/01/13-06/31/17
C-reactive protein, autoimmunity and inflammation in the central nervous system
Fellowship support for a student's thesis research on the role of CRP in multiple sclerosis
Role: PI and Trainee Mentor

NIH/NIDDK R01 DK099092 Szalai (PI) 04/01/14-03/31/19
C-reactive protein in acute kidney injury
The major goal of this project is to decipher the role of CRP in acute kidney injury.
Role: PI

NIH/NIDDK R01 DK097423 Mrug (PI) 07/01/13-06/30/18
Mechanisms of C3 effects in ARPKD pathogenesis
Goal: to decipher the contribution of complement C3 to autosomal recessive polycystic kidney disease.
Role: Co-Investigator

Completed Research Support

NIH R21 DA026914 Szalai (PI) 09/01/09-08/31/12
FcγRIIB links CRP signals with ITGAM functions: a G x G x G model of SLE.
Goal: to determine if CRP binding to FcγRIIB modulates expression of the β_2 integrin CD11b on dendritic cells, thereby affecting risk of systemic lupus erythematosus (SLE).
Role: PI

Lupus Research Institute Szalai, Bullard, & Edberg (Co-PIs) 04/01/09-03/31/12
Biological mechanisms of ITGAM variants for genetic risk in SLE
Goal: to determine if disease-associated variation in ITGAM affects the function of the CD11b receptor and thus alters risk of systemic lupus erythematosus
Role: Co-PI

NIH/NIA R01 AG04212 Owsley (PI) 03/15/08-02/28/15
Aging and ARM: dark adaptation impairment
Goal: to investigate the association of inflammatory markers with age-related macular degeneration.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Victor J. Thannickal, M.D.

eRA COMMONS USER NAME (credential, e.g., agency login): han95a

POSITION TITLE: Professor of Medicine and Pathology
Director, Division of Pulmonary, Allergy, and Critical Care Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Southern California College, Costa Mesa, CA	B.A.	1983	Chemistry
Oral Roberts Univ. School of Medicine, Tulsa, OK	M.D.	1987	Medicine
Univ. of Oklahoma College of Medicine, Tulsa, OK	Residency	1990	Internal Medicine
Tufts Univ. School of Medicine, Boston, MA	Fellowship	1994	Pulmonary/Critical Care

A. Personal Statement

My background and expertise is in cellular/molecular mechanisms of lung injury-repair, with a focus on the differentiation and fates of mesenchymal stem/progenitor cells; transforming growth factor-β signaling; and the biology of reactive oxygen species. My clinical interests are in interstitial lung diseases and acute lung injury. **Recent efforts in our laboratory are actively engaged in elucidating mechanisms of cellular senescence, oxidative stress and aging in the context of chronic lung diseases, in concert with the development of experimental therapeutics and biomarker discovery in complex lung diseases.**

I am also committed to trainee education having mentored numerous students, and currently serve as PI of a T32 for post-doctoral trainees in lung biology and translational medicine. I have been actively engaged in training of pre-docs, postdocs, and physician-scientists throughout my academic career. A high percentage of pre-docs have gone on to medical school or graduate school in biomedical sciences (3/4); Ph.D. post-docs have gone on to full-time academic research positions (4/4 – Chinese Academy of Sciences, Indiana Univ., UAB, Univ. of Arizona); and all M.D. fellows have gone on to academic positions (6/8 to full-time, primary research careers: Tufts Univ., Univ. of Michigan; UAB; the other two have clinical academic appointments: UCSF, Michigan State Univ.). I continue to mentor postdoctoral fellows/trainees and junior faculty in our Division and participate in formulating guidelines for career development of physician-scientists within the Department of Medicine. I am also active in the UAB Medical Scientist Training Program. We have re-organized our fellowship training program and developed the necessary infrastructure to more fluidly translate/interact between the basic and clinical spheres.

B. Positions and Honors

Positions and Employment

1990-1991 Chief Resident and Clinical Instructor, Department of Internal Medicine, University of Oklahoma College of Medicine, Tulsa, Oklahoma
1991-1994 Clinical and Research Fellow, Pulmonary and Critical Care Division, Tufts University School of Medicine, Boston, Massachusetts
1994-2001 Assistant Professor of Medicine, Pulmonary and Critical Care Division, Tufts University School of Medicine, Boston, Massachusetts
2001-2005 Assistant Professor of Internal Medicine, Division of Pulmonary and Critical Care Medicine, University of Michigan, Ann Arbor, Michigan
2005-2009 Associate Professor of Internal Medicine, Division of Pulmonary and Critical Care Medicine, University of Michigan, Ann Arbor, Michigan
2009- Professor of Medicine and Pathology, University of Alabama at Birmingham (UAB), Birmingham, Alabama

2009- Director, Division of Pulmonary, Allergy, and Critical Care Medicine, UAB
2014- Vice Chair for Strategic Planning, UAB Department of Medicine

Honors and Awards

1982 American Chemical Society Award, Orange County Division, California
1983 President's Honor Award, Southern California College, Costa Mesa, California
1996 Clinical Scientist Development Award, National Institutes of Health
2001 Excellence in Teaching Award, Tufts University School of Medicine, Boston, Massachusetts
2010 Ben Vaughan Branscomb Chair of Medicine in Respiratory Disease
2010 UAB Healthcare Leadership Academy
2012 Southern Society for Clinical Investigation
2014 Max Cooper Award for Research Excellence, UAB Department of Medicine

Other Experience and Professional Memberships

Editorial Boards: American Journal of Respiratory and Critical Care Medicine; American Journal of Respiratory Cell and Molecular Biology; Journal of Clinical Investigation; American Journal of Pathology

Memberships in Professional Societies: American Society for Biochemistry and Molecular Biology; American Thoracic Society; Federation for American Societies for Experimental Biology; American Society for Investigative Pathology

Study Sections: NIH/NHLBI Respiratory Integrative Biology and Translational Research (*Ad hoc* – 6/04, 6/05, 6/06, 10/07, 2/09, 10/09); NIH/NHLBI Lung Cellular and Molecular Immunology (*Ad hoc* – 6/06, 3/07, 10/09); NIH/NHLBI Lung Injury Repair and Remodeling (*Ad hoc* – 10/08); NIH/NHLBI SBIR/STTR (Respiratory) – 3/09; NIH/NHLBI Special Emphasis Panels – 6/04, 2/08, 6/08, 7/08, 9/08, 10/08, 2/09, 6/10, 9/10, 3/11, 10/11, 2/12, 7/12, 8/12, 11/12, 12/12, 1/13, 3/13; LIRR Member Conflicts – 6/14, 11/14; NIH/NIAMS Special Emphasis Panel – 11/10, 4/11; NIH/NHLBI Phase II Clinical Trials of Novel Therapies for Lung Diseases – 2/13; NIH Science Moving towards Research and Translation and Therapy (SMARRT) – 9/13; NIH/NHGRI Clinical Sites for an Undiagnosed Diseases Network – 10/13; NIH/NIA Special Emphasis Panel – 9/14; NIH/NIA Program Project Grant (P01) application (Chair) – 9/14; **Regular Member** – *VA Pulmonary Medicine Study Section,* 2011-2014; Member, External Advisory Committee, *NIH/NHLBI Lung Repair and Regeneration Consortium* (LRRC) and reviewer for Collaborative Research Proposals (4/12-present); **Regular Member** – *NIH/NHLBI Respiratory Integrative Biology and Translational Research*, 2012-2018.

C. Contributions to Science

1. *Reactive oxygen species in cell signaling*

Early in my career, I made the novel discovery that that the cytokine, transforming growth factor-β1 (TGF-β1), induces the generation of reactive oxygen species (ROS), specifically, hydrogen peroxide (H_2O_2), through a regulated process in lung fibroblasts; this was at a time when the field of redox signaling was in its infancy, leading to a review of "Reactive Oxygen Species in Cell Signaling" in the *Am J Physiol (Lung Cell Mol Physiol)* in 2000 that is now the most highly cited paper in the history of this journal (Google Scholar: 1902; Web of Science: 1097, accessed 1-9-15). In addition to demonstrating that ROS generation in lung fibroblasts is regulated by tyrosine phosphorylation (*J Biol Chem*, 1998), and its distinctiveness from other mitogenic growth factors (*FASEB J*, 2000), we demonstrated that the unique extracellular release of H_2O_2 induced by TGF-β1 was capable of inducing extracellular matrix protein crosslinking (*J Biol Chem*, 2001), and apoptotic cell death of lung epithelial cells by a paracrine mechanism (*FASEB J*, 2005).

a. **Thannickal VJ**, Aldweib KD, Fanburg BL. Tyrosine Phosphorylation Regulates H_2O_2 Production in Lung Fibroblasts Stimulated by Transforming Growth Factor-β1. *J Biol Chem* 1998; 273:23611-23615. PMID: 9722602
b. **Thannickal VJ**, Day RM, Klinz SG, Bastien MC, Larios JM, Fanburg BL. Ras-Dependent and -Independent Regulation of Reactive Oxygen Species by Mitogenic Growth Factors and TGF-β1. *FASEB J* 2000; 14:1741-1748. PMID: 10973923
c. Larios JM, Budhiraja R, Fanburg BL and **Thannickal VJ**. Oxidative Protein Cross-Linking Reactions Involving L-tyrosine in Transforming Growth Factor-β1-Stimulated Fibroblasts. *J Biol Chem* 2001; 276:17437-17441. PMID: 11279068

d. Waghray M, Cui Z, Horowitz JC, Subramanian IM, Martinez FJ, Toews GB, **Thannickal VJ**. Hydrogen Peroxide is a Diffusible Paracrine Signal for the Induction of Epithelial Cell Death by Activated Myofibroblasts. *FASEB J* 2005; 19:854-856. PMID: 15857893

2. *NADPH oxidase (Nox) enzymes: from biochemical discovery, to physiology, and clinical translation*
Several years before the eventual cloning and identification of the Nox family of NADPH oxidases (1999-2001), we characterized the unique biochemical characteristics of the Nox4 isoform (*J Biol Chem*, 1995), leading to the first report of its in-vivo role in mediating lung fibrosis (*Nat Med*, 2009). More recent studies of the regulation of Nox4 expression/activity at the transcriptional level (*Gene*, 2014), and at the post-translational level (*J Biol Chem*, 2014) have been completed. Based on these studies, academic and industry efforts are now developing small molecule inhibitors against Nox4 in human fibrotic disorders.

   a. **Thannickal VJ**, Fanburg BL. Activation of an H_2O_2-Generating NADH Oxidase in Human Lung Fibroblasts by Transforming Growth Factor-β1. *J Biol Chem* 1995; 270:30334-30338. PMID: 8530457
   b. Hecker L, Vittal R, Jones T, Jagirdar R, Luckhardt TR, Horowitz JC, Pennathur S, Martinez FJ, **Thannickal VJ**. NADPH Oxidase-4 Mediates Myofibroblast Activation and Fibrogenic Responses to Lung Injury. *Nat Med* 2009; 15:1077-1081. PMID: 19701206, PMCID: PMC2743335
   c. Bai G, Hock TD, Logsdon N, Zhou Y, **Thannickal VJ**. A Far-Upstream AP-1/Smad Binding Box Regulates Human NOX4 Promoter Activation by Transforming Growth Factor-β. Gene 2014; 540: 62-67. PMID: 24560583, PMCID: PMC4009368
   d. Desai LP, Zhou Y, Estrada AV, Ding Q, Cheng G, Collawn JF, **Thannickal VJ**. Negative Regulation of NADPH Oxidase-4 by Hydrogen Peroxide Inducible Clone-5. *J Biol Chem* 2014; 289:18270-18278. PMID: 24831009, PMCID: PMC4140251

3. *Myofibroblast biology: origins, differentiation, survival (apoptosis-resistance)*
Our group was the first to demonstrate tissue-resident origin of mesenchymal stem/stromal cells (*J Clin Invest*, 2007); the role of cell adhesion signaling in myofibroblast differentiation (*J Biol Chem*, 2003); and effects of TGF-β1 in survival signaling (*J Biol Chem*, 2004; among others). These studies led to pre-clinical studies demonstrating that targeting mechanosensitive signaling (Rho/ROCK) that mediates differentiation and survival of myofibroblasts may be an effective anti-fibrotic therapeutic strategy (*J Clin Invest*, 2013).

   a. Lama VN, Smith L, Badri L, Flint AJ, Andrei A, Murray S, Wang Z, Hui L, Toews GB, Krebsbach PH, Peters-Golden M, Pinsky DJ, Martinez FJ, **Thannickal VJ**. Evidence for Tissue-Resident Mesenchymal Stem Cells in Human Adult Lung from Studies of Transplanted Allografts. *J Clin Invest* 2007; 117:989-996. PMID: 17347686, PMCID: PMC1810571
   b. **Thannickal VJ**, Lee DY, White ES, Cui Z, Larios JM, Chacon R, Horowitz JC, Day RM, Thomas PE. Myofibroblast Differentiation by Transforming Growth Factor-β1 is Dependent on Cell Adhesion and Integrin Signaling via Focal Adhesion Kinase. *J Biol Chem* 2003; 278: 12384-12389. PMID: 12531888
   c. Horowitz JC, Lee DY, Zhang H, Keshamouni VG, Thomas PE, White ES, Cui Z, **Thannickal VJ**. Activation of the Pro-survival PI3K/AKT pathway by Transforming Growth Factor-β1 in Mesenchymal Cells is mediated by p38 MAPK-dependent Induction of an Autocrine Growth Factor. *J Biol Chem* 2004; 279:1359-1367. PMID: 14576166, PMCID: PMC1360222
   d. Zhou Y, Huang X, Hecker L, Kurundkar D, Kurundkar A, Liu H, Jin T-H, Desai L, Bernard K, **Thannickal VJ**. Inhibition of Mechanosensitive Signaling Ameliorates Experimental Pulmonary Fibrosis. *J Clin Invest* 2013; 123:1096-1108. PMID: 23434591, PMCID: PMC3582144

4. *Development of tyrosine kinase inhibitors as a treatment for pulmonary fibrosis*
In the early-mid 2000s, we had identified a number of protein kinase pathways, primarily involving FAK and AKT/PKB, in mediating differentiation and prolonged survival of myofibroblasts (*Cell Signal*, 2007; among others). We identified a protein kinase inhibitor (PKI; AG1879) that targeted these kinase pathways and demonstrated proof-of-concept that this strategy may be effective in promoting the resolution of established fibrosis in a murine model of bleomycin injury-induced fibrosis (*Am J Pathol*, 2007); interesting, this effect was less effective with another PKI (imatanib mesylate; Gleevec; *J Pharmacol Exp Ther* 2007) that subsequently failed in a Phase II clinical study. We have reviewed the rationale and efficacy of targeting particular kinase pathways (*Curr Med Chem,* 2008), and are encouraged by recent results with another PKI (BIBF-1120; Nintedanib, recently approved by the U.S. FDA for IPF), the mechanisms of which are currently under active investigation.

a. Horowitz JC, Rogers DS, Sharma V, Vittal R, White ES, Cui Z, **Thannickal VJ**. Combinatorial Activation of FAK and AKT by Transforming Growth Factor-β1 confers an Anoikis-Resistant Phenotype to Myofibroblasts. *Cell Signal* 2007; 9:761-71. PMID: 17113264, PMCID: PMC1820832
b. Vittal R, Zhang H, Moore BB, Horowitz JC, Martinez FJ, Toews GB, Standiford TJ, **Thannickal VJ**. Modulation of Pro-Survival Signaling in Fibroblasts by a Protein Kinase Inhibitor Protects against Fibrotic Tissue Injury. *Am J Pathol* 2005; 166:367-375. PMID: 15681821, PMCID: PMC1602319
c. Vittal R, Zhang H, Han MK, Moore BB, Horowitz JC, **Thannickal VJ**. Effects of the Protein Kinase Inhibitor, Imatinib Mesylate, on Epithelial/Mesenchymal Phenotypes: Implications for the Treatment of Fibrotic Diseases. *J Pharmacol Exp Ther* 2007; 321:35-44. PMID: 17218487
d. Garneau-Tsodikova S, **Thannickal VJ**. Protein Kinase Inhibitors in the Treatment of Pulmonary Fibrosis. *Curr Med Chem* 2008; 15:2632-2640. PMID: 18855683

5. *Biology of aging and fibrotic lung disease*
Our studies of Nox4/ROS biology led us to explore the concept of antagonistic pleiotropy in aging and age-related lung diseases, such as IPF (*Biogerontology,* 2013). We have demonstrated that one plausible mechanism for the pleiotropic actions of Nox4 in aging may be related to a deficient Nrf2 antioxidant response that leads to altered redox imbalance, myofibroblast senescence and apoptosis-resistance, culminating in persistent fibrosis in aged animals (*Sci Transl Med,* 2014). Epigenetic mechanisms that regulate fibroblast senescence and apoptosis resistance (*Redox Biology,* 2013), as well as the elevated expression of Nox4 in senescent fibroblasts (*Free Radic Biol Med,* 2014) have been uncovered. These studies provide mechanistic insights into the role of cellular senescence and epigenetic mechanisms in age-associated fibrotic diseases; and afford novel therapeutic approaches to these diseases.

a. **Thannickal VJ**. Mechanistic Links between Aging and Lung Fibrosis. *Biogerontology* 2013; 14:609-615. PMID: 23929205, PMCID: PMC3852192
b. Hecker L, Logsdon NJ, Kurundkar D, Kurundkar A, Bernard K, Hock T, Meldrum E, Sanders YY, **Thannickal VJ**. Reversal of Persistent Fibrosis in Aging by Targeting Nox4-Nrf2 Redox Imbalance. *Sci Transl Med* 2014; 6(231):231ra47. PMID: 24718857
c. Sanders YY, Liu H, Zhang X, Bernard K, Hecker L, Desai L, Liu G, **Thannickal VJ**. Histone Modifications in Senescence-Associated Resistance to Apoptosis by Oxidative Stress. *Redox Biology* 2013; 1:8-16. PMID: 24024133, PMCID: PMC3757696
d. Sanders YY, Liu H, Liu G, **Thannickal VJ**. Epigenetic Mechanisms Regulate NADPH Oxidase-4 Expression in Cellular Senescence. *Free Radic Biol Med* 2014; 79C:197-205. PMID: 25526894

Complete List of Published Work: http://www.ncbi.nlm.nih.gov/pubmed/?term=Thannickal+VJ

C. Research Support
Ongoing Research Support

P01 HL114470 Thannickal (PI) 9/16/13 – 7/31/18
NIH/NHLBI
Therapeutic Targeting of the Myofibroblast in Fibrotic Lung Disease
The major goal of this translational program project grant is to develop novel anti-fibrotic therapies targeting myofibroblasts in fibrotic lung disease
Roles: PI; Director, Administrative and Biostatistics Core; Co-Director, Animal and Therapeutics Core

R01 AG046210 Thannickal (PI) 9/1/14 – 5/31/19
Myofibroblast Senescence in Pulmonary Fibrosis
The goal of this project is to identify mechanisms for myofibroblast senescence and apoptosis-resistance in persistent fibrosis associated with aging
Role: PI

T32 HL105346 Thannickal (PI) 9/1/10 – 8/30/15
NIH/NHLBI
Training Program in Lung Biology and Translational Medicine
The goal of this program is to provide multidisciplinary training for biomedical research scientists with the focus on bench-to-bedside translation.

Role: Program Director

R01 HL94230 Pennathur/Thannickal (MPI) 8/1/09 – 5/31/15
NIH/NHLBI
Mass Spectrometry-Based Biomarker Discovery
The goal of this project is to identify novel plasma biomarkers of oxidative stress in patients with idiopathic pulmonary fibrosis and to determine their utility in prognosis and responsiveness to anti-oxidant therapy.
Role: Co-PI

R01 HL105473 Liu (PI) 4/1/11 – 2/29/16
NIH/NHLBI
miR-21 and Lung Fibrosis
The goal of this project is to define the role of miR-21 in regulating myofibroblast differentiation and lung fibrosis.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Younger, Jarred W

eRA COMMONS USER NAME (credential, e.g., agency login): JWYOUNGER

POSITION TITLE: Associate Professor of Psychology, Rheumatology and Anesthesiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Maryville College, Maryville, TN	B.A	06/1998	Psychology
University of Tennessee, Knoxville, TN	Ph.D.	08/2003	Experimental Psychology
Arizona State University, AZ	Postdoc	06/2005	Pain Psychology
Stanford University, Stanford	Postdoc	10/2007	Pain Management

A. Personal Statement

I will be serving as a Core Mentor for postdoctoral trainees under NIAMS T32 “Training Program in Rheumatic and Musculoskeletal Diseases Research”. I recently moved from Stanford University to the University of Alabama at Birmingham to further establish my research program in chronic pain and neuroinflammation. I currently lead a lab of 12 research personnel, including two postdoctoral trainees, and am in the process of hiring an additional postdoctoral trainee. My work involves exploring immune contributions in chronic pain and fatigue. My laboratory is highly multidisciplinary and we use pharmaceutical, psychophysical, neuroimaging, and immune monitoring approaches to develop new diagnostic tools and treatments. My trainees each lead multiple research projects and are steadily producing new data and new manuscripts.

I have a great deal of experience developing student researchers. In addition to my postdoctoral fellows, I have directly mentored over 200 undergraduate researchers, and several full-time bachelor- and masters-level researchers. I have also served as a secondary mentor for eight MD and PhD postdoctoral fellows, advising in research design, pain assessment, and statistics. While I provide a safe foundation for trainees, I encourage them to discover their own unique line of research and pursue grant funding to develop their independent research career. I am highly invested in my postdoctoral trainees’ success. I meet with each trainee a minimum of one hour per week, and have quarterly longer meetings to discuss longer-term career goals and to provide feedback on performance. My trainees almost always take first author positions on manuscripts. They are encouraged to pursue additional training and network opportunities, and even to work in other laboratories if it helps further their career.

I have held a faculty position for only slightly over three years, so I do not have a long history of postdoctoral fellows moving on from my laboratory. My past postdoctoral fellow is now developing a very successful career in industry as the managing member of a healthcare company’s Scientific Advisory Board. She was always primarily interested in a career consulting with industry, and I was happy to help her develop her career even though she was not pursuing a classic academic faculty direction. I do expect, however, that the majority of trainees I mentor will eventually develop faculty research careers.

I am excited about growing the number of postdoctoral trainees in my laboratory. Two important factors I considered when moving to UAB was the morale of postdoctoral trainees and the trajectory of the overall medical research enterprise at the institution. I was impressed that the “The Scientist” listed UAB as the #8 best place to work, based on surveys of current postdocs. UAB is also ranked #21 in total NIH funding. These factors showed me that UAB places a strong emphasis on biomedical research and postdoctoral trainee support. It is undoubtedly a great place for trainees to further their research careers.

B. Position and Honors

Positions and Employment

2001-2003 Instructor: University of Tennessee; Knoxville, TN
2002-2003 Instructor: Maryville College; Maryville, TN
2003-2005 Postdoctoral Researcher: Arizona State University; Tempe, AZ
2005-2006 Assistant Research Scientist: Arizona State University; Tempe, AZ
2006-2007 Postdoctoral Research Fellow: Stanford University School of Medicine
2007-2010 Instructor: Stanford University School of Medicine, Stanford, CA
2010-2014 Assistant Professor, Stanford University School of Medicine, Stanford, CA
2014- Associate Professor, Departments of Psychology, Rheumatology and Anthesiology, University of Alabama at Birmingham; Director of the UAB Neuroinflammation, Pain and Fatigue Lab, Birmingham, AL

Other Experience and Professional Memberships

1998 - 2011 Member, American Psychological Association
2000 - 2003 Member, Society of Behavioral Medicine
2000 - 2001 Teaching Assistant: University of Tennessee; Knoxville, Tennessee.
2000 - Ad-hoc reviewer for International Journal of Experimental and Clinical Hypnosis
2001 - 2003 Graduate representative to University Faculty Senate Committee on Teaching
2002 Ad-hoc reviewer for the Psi Chi Journal for Undergraduate Research
2003 - 2005 Member of APA Div 38 (Health Psychology) Student Council (Research Committee)
2003 - 2005 Post-doctoral representative to APA Div 38 Research Committee
2004 Ad-hoc reviewer for Cognitive Therapy and Research.
2004 Ad-hoc reviewer for Psychological Bulletin
2004 - 2005 Member of Dissertation Committee: Adam McCray
2005 Ad-hoc reviewer for Journal of Personality
2006 Ad-hoc reviewer for Journal of Behavioral Medicine
2007 - Member, American Pain Society
2008 - Member, International Association for the Study of Pain
2009 - Ad-hoc reviewer for the Clinical Journal of Pain, Expert Opinion on Pharmacotherapy, Journal of Pain Research, and Gender Medicine
2009 Grant reviewer for German Funding Initiative on Musculoskeletal Diseases
2009 Grant reviewer for DoD Congressionally Directed Medical Research Programs
2009 - Member, Organization for Human Brain Mapping
2010 - Ad-hoc reviewer for Experimental Neurology
2010 - Editorial Board for Frontiers in Neuropsychiatric Imaging and Stimulation
2011 - Member of Women's Health Strategic Planning Group at Stanford
2011 - Ad-hoc reviewer for Pain Research and Treatment, Psychosomatic Medicine, Physiology and Behavior, Pain, Brain Behavior and Immunity, Clinical Psychiatry, and Pain Medicine.
2012 - Ad-hoc reviewer for Neuropsychopharmacology, Drug and Alcohol Dependence, Biological Psychiatry, and Frontiers in Psychiatry
2012 - Guest Editor for Pain Research and Treatment
2012 - Pre-major advisor at Stanford
2012 - Member of Editorial Board – Pain Medicine
2012 - Reviewer for VA Merit Review Gulf War Illness Special Emphasis Panel
2013 - Dissertation Committee Member for Jason Thompson

Honors

2000 Best paper by a young scientist, Soc for Clinical and Experimental Hypnosis
2002 Outstanding Graduate Research Award, University of Tennessee

2010 Department of Anesthesia Research Award, Stanford University
2011 Outstanding Research Presentation, American Academy of Pain Medicine

C. Contributions to Science

I believe that many individuals suffering from chronic pain and fatigue conditions such as fibromyalgia, chronic fatigue syndrome, and Gulf War Illness are experiencing the effects of low-level inflammation in the central nervous system. Abnormal microglia and astrocyte activity produces proinflammatory agents that cause a central sickness response in individuals who are not actively infected. Symptoms associated with those conditions may therefore be reversed by reducing the degree of inflammation. My contributions to science involve efforts to examine inflammation in those disorders, and trialing new treatment options.

1.Microglia antagonists are effective in treating fibromyalgia

My team was the first to try low-dose naltrexone (LDN) for managing the symptoms of fibromyalgia. Closely following basic science research conducted by other groups, I recognized that LDN could antagonize TLR4 on microglia and reduce the production of proinflammatory agents in the central nervous system. As I hypothesized that fibromyalgia involved hypersensitive microglia cells, I tested the ability of LDN to reduce symptoms in that group. LDN is given at approximately 4.5mg per day. I have found in two separate studies that LDN indeed is far superior to placebo at reducing pain in fibromyalgia. It also has a much better response rate than current FDA-approved drugs for fibromyalgia. It also is rated as tolerable as placebo, and has virtually no side-effects. The drug is cheap and therefore is an excellent option for millions of individuals. I have found that LDN tends to work better in individuals with higher erythrocyte sedimentation rate, suggesting it is working via a novel anti-inflammatory action. Since I have published my findings, we estimate that perhaps tens of thousands of individuals are using the medication approach to manage their symptoms. I am now in the process of testing other microglia modulators both alone and in combination with LDN. I am also testing botanicals with demonstrated microglia-antagonistic properties. Identifying centrally-active anti-inflammatories may produce a huge advance in the medical management of chronic pain. These drugs may work not only in fibromyalgia, but also in rheumatoid arthritis, multiple sclerosis, and several other conditions associated with chronic inflammation.

a. **Younger J**, Parkitny L, McLain D. (2014). The use of low dose naltrexone (LDN) as a novel anti- inflammatory treatment for chronic pain. *Clinical Rheumatology,* 33(4), 451-9. PMID: 24526250.
b. **Younger J**, Noor N, McCue R, Mackey S. (2013). Low-dose naltrexone for the treatment of fibromyalgia: A small, randomized trial on daily pain. *Arthritis & Rheumatism*, 65(2), 529-38. PMID: 23359310.
c. **Younger J**, Mackey S (2009). Fibromyalgia symptoms are reduced by low-dose naltrexone: a pilot study. *Pain Medicine.* 10(4), 663-672. PMID: 19453963.

2.Daily immune monitoring reveals that leptin is an important driver of chronic pain and fatigue

Individuals with chronic pain and fatigue often show considerable day-to-day variability in their symptom severity. I believe that variability is an important source of information. By taking blood samples daily and assessing a range of proinflammatory factors, I attempt to find analytes that “track” with the changes in pain and fatigue. I first used this approach in women with fibromyalgia and found that one adipokine, leptin, is highly predictive of daily symptom severity. Leptin is an interesting agent because it can cross the blood-brain barrier and hypersensitize microglia, causing significantly-increased release of proinflammatory factors in the central nervous system. After identifying leptin in fibromyalgia, I secured a grant to examine leptin in chronic fatigue syndrome. Once again, leptin was highly predictive of fatigue severity in those individuals. I have subsequently found that leptin is not only an important within-person predictor of pain, but also a between-person predictor. I have two new manuscripts (currently in review) that show leptin to be the best predictor of pain and fatigue in women. In one project, I analyzed over 6000 older adult women and found leptin predicts daily pain severity. In another, I found that fatigue in breast cancer patients was best predicted by serum leptin levels. Based on the strength of the preliminary data, I have secured an R01 award (R01AI107655) and Department of Defense award (GW110044) to apply this technique to larger samples. I will now test leptin experimentally by injecting metreleptin in a controlled laboratory environment. After determining causality, we can proceed to both pharmaceutical and behavioral methods for reducing leptin-driven central inflammation.

a. Stringer EA, Baker KS, Carroll IR, Montoya JG, Chu L, Maecker HT, **Younger JW**. (2013). Daily cytokine fluctuations, driven by leptin, are associated with fatigue severity in chronic fatigue syndrome: Evidence of inflammatory pathology. *Journal of Translational Medicine,* 11: 93. PMID: 23570606.

3.Neuroimaging methods may be able to detect pain

The "holy grail" of pain research may be the ability to objectively determine pain severity. Both researchers and clinicians currently rely almost solely on self-report, which can be noisy and biased. Because pain is an experience that is generated in the brain, a method for measuring pain will almost certainly require neuroimaging. Our lab was one of the first to show that magnetic resonance imaging (MRI) can be used to accurately predict when a person is experiencing pain. We have shown that both brain structure and function can be used to separate pain, both experimentally-induced, and chronic. We are now working to improve the resolution of the detection, with the ultimate goal of being able to predict not only when someone is in pain, but the degree of pain they are experiencing. My team is also working on advanced magnetic resonance spectroscopy (MRS) brain thermometry techniques to provide an objective measure of brain inflammation. These tools should greatly advance our understanding of chronic pain and inflammation.

a. Ung H, Brown JE, Johnson KA, **Younger J**, Hush K, Mackey S. (2014). Multivariate classification of structural MRI data detects chronic low back pain. Cerebral Cortex, 24(4), 1037-44. PMID: 23246778.
b. Brown J, Chatterjee N, **Younger J**, Mackey S (2011). Towards a physiology-based measure of pain: Patterns of human brain activity distinguish painful from non-painful thermal stimulation. *PLoS ONE,* 6(9):e24124. PMID: 21931652.

Complete List of Published Work:

An updated list of my full published contributions to science can be found at the publically-available ResearchGate link below.

http://www.researchgate.net/profile/Jarred_Younger/publications

D. Research Support

Ongoing Research Support

GW110044 Younger (PI) 07/01/14 – 09/29/15
Identifying Immune Drivers of Gulf War Illness Using a Novel Daily Sampling Approach
The major goal of this project is to screen for inflammatory markers that are characteristic of Gulf War Illness.
Role: PI

GW130015 Younger (PI) 10/1/14 – 09/30/17
Treating Gulf War Illness with Novel Anti-Inflammatories: A Screening of Botanical Microglia Modulators
The major goal of this project is to screen nine botanical anti-inflammatories for treatment of Gulf War Illness.
Role: PI

IASP International Trainee Fellowship Younger (PI) 07/14/14 –
07/13/15 Neuroimmodulatory pharmacotherapy in pain: therapy and outcomes
The goal of this international trainee fellowship is to explore immune drivers of chronic pain and fatigue.
Role: Mentor

Fetzer Foundation Award Younger (Consultant) 02/09/15 –
08/31/16 Moral Elevation and the Brain
The goal of this project is to determine if oxytocin produced naturally through evoked feelings of altruism can reduce the experience of pain.
Role: PI

R01 AI107655 Younger (PI) 07/01/14 – 06/30/19

Daily Immune Monitoring in Chronic Fatigue Syndrome
The goal of this project is to screen daily blood samples for inflammatory agents that drive symptom fluctuations in women with chronic fatigue syndrome.
Role: PI

Completed Research Support in Last 3 years

HHSN268201100003C Stefanick (PI) 10/2010-9/2015
Women's Health Initiative Extension
The goal of this continuing project is to examine the large WHI database for important health-related trends in post-menopausal women. Dr. Younger's role focuses on pain-related questions.
Role: Investigator

P01 AT006651 Mackey (PD) 09/01/11 – 05/31/16
Stanford CAM Center for Chronic Back Pain
The goal of the clinical trial is to test real-time functional magnetic resonance feedback training (rtfMRI), mindfulness therapy, and acupuncture in treating low back pain.
Role: Co-Investigator

Sex/Gender-Specific Brain Risks for Prescription Opioids in Chronic Low Back Pain
Younger (Co-PI) 11/2013 – 11/2015
The goal is to explore gender-specific differences in brain morphometry in predicting opioid abuse.
Role: Co-Investigator

R00 DA023609 Younger (PI) 7/01/2010 - 6/30/2013
Mechanisms of Opioid-Induced Hyperalgesia in Pain Patients: Examination via fMRI.
Role: PI
The goal of this project was to determine brain and health changes that were caused by rapid opioid detoxification in pain patients.

Immune Screening in Fibromyalgia Patients Younger (PI) 4/1/2012-3/31/2013
The goal was to develop a preliminary blood test to diagnosis of fibromyalgia.
Role: PI

Identifying inflammatory drivers of chronic fatigue via daily immune and symptom sampling
Identify chronic fatigue biomarkers Younger (PI) 5/1/2011-4/30/2012
The goal was to identify blood biomarkers for diagnosing chronic fatigue syndrome.
Role: PI.

Peripheral Biomarkers of Opioid-Induced Hyperalgesia, Cognitive Dysfunction, and Drug Craving
Inflammatory serum markers for opioids Younger (PI) 9/1/2010 – 8/31/2013
The goal was to assess serum markers of inflammation that predicted adverse opioid events.
Role: PI

Microglia Modulators for Chronic Multisymptom Illnesses
Treatments designed for chronic pain and fatigue Younger (PI) 07/01/2010-06/30/2013
The goal was to design novel, microglia-based treatments for chronic pain and fatigue disorders.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Absher, Devin Michael

eRA COMMONS USER NAME (agency login): DEVINABSHER

POSITION TITLE: Co-leader of the Cancer control & Population Sciences Program

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
U.C. San Diego, San Diego, CA	BS	06/1991	Molecular Biology
Emory University, Atlanta, GA	PHD	05/2000	Biochem. & Mol. Biol.
Stanford University, Stanford, CA	Postdoctoral Fellow	10/2005	Human Genetics

A. PERSONAL STATEMENT

I am a Faculty Investigator at the HudsonAlpha Institute for Biotechnology with more than 15 years of experience doing research in human genetics and genomics. For the past decade, I have led a genomics laboratory using high-throughput technologies to study the genetics of common diseases and traits. These studies include genome-wide association studies for a broad spectrum of chronic diseases, including cardiovascular disease, bipolar disorder, lupus, and rheumatoid arthritis. I have also performed a variety of studies on natural genetic variation in human populations that have enabled more detailed association studies. My laboratory has contributed to The Cancer Genome Atlas project, studying copy number variation in three types of cancer. We also study the epigenetics of complex diseases, using both microarrays and next-generation sequencing to assay DNA methylation patterns genome-wide. My training experience includes masters level and Ph.D. level graduate students as well as the three postdoctoral fellows currently in my lab.

1. Li JZ, **Absher DM**, Tang H, Southwick AM, Casto AM, et al. Worldwide human relationships inferred from genome-wide patterns of variation. Science. 2008 Feb 22;319(5866):1100-4. PubMed PMID: 18292342.
2. **Absher DM**, Li X, Waite LL, Gibson A, Roberts K, et al. Genome-wide DNA methylation analysis of systemic lupus erythematosus reveals persistent hypomethylation of interferon genes and compositional changes to CD4+ T-cell populations. PLoS Genet. 2013;9(8):e1003678. PubMed PMID: 23950730; PubMed Central PMCID: PMC3738443.
3. Day K, Waite LL, Thalacker-Mercer A, West A, Bamman MM, et al. Differential DNA methylation with age displays both common and dynamic features across human tissues that are influenced by CpG landscape. Genome Biol. 2013;14(9):R102. PubMed PMID: 24034465; PubMed Central PMCID: PMC4053985.
4. Irvin MR, Zhi D, Joehanes R, Mendelson M, Aslibekyan S, et al. Epigenome-wide association study of fasting blood lipids in the Genetics of Lipid-lowering Drugs and Diet Network study. Circulation. 2014 Aug 12;130(7):565-72. PubMed PMID: 24920721; PubMed Central PMCID: PMC4209699.

B. POSITIONS AND HONORS

Positions and Employment

1991 - 1993 Staff Research Associate I, Department of Medicine, Kenneth R. Chien Laboratory, University of California, San Diego, CA

1993 - 2000 Graduate Student, Stephen T. Warren Laboratory, Emory University, Atlanta, GA

2001 - 2005 Postdoctoral Fellow, Richard M. Myers Laboratory, Stanford University, Stanford, CA

2005 - 2008 Senior Scientist, Stanford Human Genome Center, Stanford University, Stanford, CA

2008 -	Faculty Investigator, HudsonAlpha Institute for Biotechnology, Huntsville, AL
2009 -	Adjunct Faculty, University of Alabama at Birmingham, Birmingham, AL
2009 -	Adjunct Faculty, University of Alabama in Huntsville, Huntsville, AL
2015 -	Co-leader of the Cancer control & Population Sciences Program, University of Alabama at Birmingham, Comprehensive Cancer Center, Birmingham, AL

Other Experience and Professional Memberships

2011 - 2013	Teaching, Molecular Epidemiology, University of Alabama, Birmingham
2012 - 2014	Teaching, NHGRI Short Course in Next Generation Sequencing
2013 - 2014	Teaching, Epigenetics, University of Alabama, Birmingham
2013 - 2014	Teaching, Genomics, University of Alabama, Birmingham
2014 -	Teaching, Genomics, HudsonAlpha Institute for Biotechnology

Honors

1987	Provost's Honors , University of California, San Diego
1988	Provost's Honors , University of California, San Diego
1989	Provost's Honors , University of California, San Diego
1993	NIH Predoctoral Training Grant , Emory University
2002	NIH Postdoctoral Training Grant , Stanford University

C. Contribution to Science

1. Genomic and epigenomic analysis of cancer - My laboratory has been a contributor to The Cancer Genome Atlas project, studying copy number variation in Glioblastoma, Lung and Ovarian cancers. Recently, we revealed novel biomarkers in renal cell carcinoma and prostate cancer, using DNA methylation profiling.
   a. Integrated genomic analyses of ovarian carcinoma. Nature. 2011 Jun 29;474(7353):609-15. PubMed PMID: 21720365; PubMed Central PMCID: PMC3163504.
   b. Kobayashi Y, **Absher DM**, Gulzar ZG, Young SR, McKenney JK, et al. DNA methylation profiling reveals novel biomarkers and important roles for DNA methyltransferases in prostate cancer. Genome Res. 2011 Jul;21(7):1017-27. PubMed PMID: 21521786; PubMed Central PMCID: PMC3129245.
   c. Lasseigne BN, Burwell TC, Patil MA, **Absher DM**, Brooks JD, et al. DNA methylation profiling reveals novel diagnostic biomarkers in renal cell carcinoma. BMC Med. 2014 Dec 4;12(1):235. PubMed PMID: 25472429; PubMed Central PMCID: PMC4265327.

2. Genetic and epigenetic studies of autoimmune diseases – My laboratory has performed genome-wide and epigenome-wide association studies for systemic lupus erythematosus (SLE), rheumatoid arthritis, and other autoimmune diseases.
   a. **Absher DM**, Li X, Waite LL, Gibson A, Roberts K, et al. Genome-wide DNA methylation analysis of systemic lupus erythematosus reveals persistent hypomethylation of interferon genes and compositional changes to CD4+ T-cell populations. PLoS Genet. 2013;9(8):e1003678. PubMed PMID: 23950730; PubMed Central PMCID: PMC3738443.
   b. Julià A, Domènech E, Ricart E, Tortosa R, García-Sánchez V, et al. A genome-wide association study on a southern European population identifies a new Crohn's disease susceptibility locus at RBX1-EP300. Gut. 2013 Oct;62(10):1440-5. PubMed PMID: 22936669.
   c. Alonso A, Domènech E, Julià A, Panés J, García-Sánchez V, et al. Identification of Risk Loci for Crohn's Disease Phenotypes Using a Genome-Wide Association Study. Gastroenterology. 2014 Dec 31;PubMed PMID: 25557950.

3. Genetic studies of cardiovascular risk factors and lipid metabolism - To provide insights into the etiology of coronary artery disease and its risk factors we have performed genome-wide and epigenome-wide

association analysis that has identified novel risk factors for CAD and for common human traits that influence CAD and type-2 diabetes.

a. Heid IM, Jackson AU, Randall JC, Winkler TW, Qi L, et al. Meta-analysis identifies 13 new loci associated with waist-hip ratio and reveals sexual dimorphism in the genetic basis of fat distribution. Nat Genet. 2010 Nov;42(11):949-60. PubMed PMID: 20935629; PubMed Central PMCID: PMC3000924.
b. Speliotes EK, Willer CJ, Berndt SI, Monda KL, Thorleifsson G, et al. Association analyses of 249,796 individuals reveal 18 new loci associated with body mass index. Nat Genet. 2010 Nov;42(11):937-48. PubMed PMID: 20935630; PubMed Central PMCID: PMC3014648.
c. Schunkert H, König IR, Kathiresan S, Reilly MP, Assimes TL, et al. Large-scale association analysis identifies 13 new susceptibility loci for coronary artery disease. Nat Genet. 2011 Mar 6;43(4):333-8. PubMed PMID: 21378990; PubMed Central PMCID: PMC3119261.
d. Deloukas P, Kanoni S, Willenborg C, Farrall M, Assimes TL, et al. Large-scale association analysis identifies new risk loci for coronary artery disease. Nat Genet. 2013 Jan;45(1):25-33. PubMed PMID: 23202125; PubMed Central PMCID: PMC3679547.

4. Epigenetic studies of cardiovascular risk factors and lipid metabolism - To provide insights into the etiology of coronary artery disease and its risk factors we have performed genome-wide and epigenome-wide association analysis that has identified novel risk factors for CAD and for common human traits that influence CAD and type-2 diabetes.
   a. Hidalgo B, Irvin MR, Sha J, Zhi D, Aslibekyan S, et al. Epigenome-wide association study of fasting measures of glucose, insulin, and HOMA-IR in the Genetics of Lipid Lowering Drugs and Diet Network study. Diabetes. 2014 Feb;63(2):801-7. PubMed PMID: 24170695; PubMed Central PMCID: PMC3968438.
   b. Frazier-Wood AC, Aslibekyan S, **Absher DM**, Hopkins PN, Sha J, et al. Methylation at CPT1A locus is associated with lipoprotein subfraction profiles. J Lipid Res. 2014 Apr 7;55(7):1324-1330. PubMed PMID: 24711635; PubMed Central PMCID: PMC4076093.
   c. Irvin MR, Zhi D, Joehanes R, Mendelson M, Aslibekyan S, et al. Epigenome-wide association study of fasting blood lipids in the Genetics of Lipid-lowering Drugs and Diet Network study. Circulation. 2014 Aug 12;130(7):565-72. PubMed PMID: 24920721; PubMed Central PMCID: PMC4209699.

5. Epigenetic studies of aging – We have performed analyses of the aging process in various tissues, how the epigenome ages, and the effects of aging on gene expression.
   a. Wheeler HE, Metter EJ, Tanaka T, **Absher D**, Higgins J, et al. Sequential use of transcriptional profiling, expression quantitative trait mapping, and gene association implicates MMP20 in human kidney aging. PLoS Genet. 2009 Oct;5(10):e1000685. PubMed PMID: 19834535; PubMed Central PMCID: PMC2752811.
   b. Day K, Waite LL, Thalacker-Mercer A, West A, Bamman MM, et al. Differential DNA methylation with age displays both common and dynamic features across human tissues that are influenced by CpG landscape. Genome Biol. 2013;14(9):R102. PubMed PMID: 24034465; PubMed Central PMCID: PMC4053985.
   c. Ma Y, Smith CE, Lai CQ, Irvin MR, Parnell LD, et al. Genetic variants modify the effect of age on APOE methylation in the Genetics of Lipid Lowering Drugs and Diet Network study. Aging Cell. 2015 Feb;14(1):49-59. PubMed PMID: 25476875; PubMed Central PMCID: PMC4324456.

D. RESEARCH SUPPORT

Ongoing Research Support

P30 AR048311, NIH John Mountz (PI) 2012/09/01-2016/08/31
Rheumatic Diseases Core Center
The RDCC provides a variety of core facility services to researchers in the field of rheumatic disease. Dr. Absher serves as co-director of the Transgenic Mouse and Genomics Core.
Role: OP

HHSN268201300006C, NIH Absher, Devin (PI) 2013/05/01-2016/05/01
Integrative genomics and risk of CHD and related phenotypes in the WHI
This project will identify epigenetic biomarkers of adverse cardiovascular events in the Women's Health Initiative.
Role: PI

R01 AR057202, NIH Lou Bridges (PI) 2009/08/01-2015/07/31
Genome Wide Association Study in African-Americans with Rheumatoid Arthritis
Performed a genome-wide genetic association study of rheumatoid arthritis in African Americans.
Role: Co-Investigator

R21 CA155951, NIH Elizabeth Brown (PI) 2011/04/01-2015/06/30
A genome-wide methylation study of epigenetic contributions to multiple myeloma
Performed genome-wide DNA methylation analysis of immune cells from individuals with multiple myeloma.
Role: OP

R01 HL104135, NIH Donna Arnett (PI) 2010/07/01-2015/06/30
Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate
The goal of this project was to identify epigenetic alterations that influence triglyceride levels in response to environmental challenges. We examined the methylation state of CD4 T-cells in individuals prior to a high fat challenge.
Role: OP

Completed Research Support

R01 MH094141, NIH 2011/07/01-2014/06/30
Rick Myers (PI)
Whole Genome and Exome Sequencing for Bipolar Disorder
Preformed a detailed genetic analysis of bipolar disorder. Used ultrahigh-throughput sequencing to determine the deep whole genome sequence of 2,000 bipolar patients and 2,000 controls.
Role: Co-Investigator

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Allison, David B.

eRA COMMONS USER NAME (credential, e.g., agency login): Dallison1

POSITION TITLE: Distinguished Professor; Quetelet Endowed Professor of Public Health; Associate Dean for Science; Director, Office of Energetics; Director, Nutrition Obesity Research Center

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Vassar College, Poughkeepsie, New York	B.A.	05/1985	Psychology
Hofstra University, Hempstead, New York	M.A	08/1987	Clinical Psychology
Hofstra University, Hempstead, New York	Ph.D.	07/1990	Clinical Psychology
Johns Hopkins University School of Medicine	Post-doc	08/1991	Behavioral Pediatrics
Columbia University & Saint Luke's/Roosevelt Hospital, New York	Post-doc	05/1994	Obesity

A. Personal Statement

I am looking forward to participating in this T32 training program.

Originally trained as a psychologist, I have studied obesity for over 20 years, and gone on to develop advanced expertise in statistical science—becoming a professor of biostatistics and an elected Fellow of the American Statistical Association. In applications, I have developed expertise in genetic epidemiology, in aging research, and in nutrition and obesity research. My research interests include obesity, energetics, quantitative genetics, clinical trials, statistical and research methodology, and research integrity. In recent years, my work has involved several major areas: (a) the relations among body weight, body composition, caloric intake, and changes thereof with longevity in animal models and humans; (b) the genetic, behavioral, and environmental influences on obesity and related traits; (c) statistical methods for genetic and epidemiologic studies; (d) design, implementation, and analysis of randomized controlled trials; and (e) research integrity and reproducibility. In addition, attesting to my organizational abilities, I have served as principal investigator or co-principal investigator for 5 successful NIH R13-funded conferences, edited 5 books, initiated 4 successful NIH-funded T32 training programs as a principal investigator, and served as the director of several NIH- and NSF-funded national short courses on statistical genetics. I am currently funded to offer 2 national short courses on obesity via NIH R25 grants (R25DK099080 “Mathematical Sciences in Obesity Research” www.soph.uab.edu/energetics/shortcourse/; and R25HL124208 ”Strengthening Causal Inference in Behavioral Obesity Research” www.soph.uab.edu/energetics/causal_inference_shortcourse/). I am also deeply committed to mentoring new scholars in our field, attested through multiple mentoring awards (see below), having successfully mentored dozens of early career faculty, post-doctoral fellows, and graduate students who have now gone on to be successful independent scientists and faculty.

I have published over 500 papers in peer-reviewed journals. A complete listing can be found in my full CV at: http://www.soph.uab.edu/energetics/personnel/david_allison. Three recent papers published with current or former mentorees are listed here:

- Schwartz, T. S., Gainer, R., Dohm, E. D., Johnson, M. S., Wyss, J. M., & **Allison, D. B.** (2015). Second-Hand Eating? Maternal perception of the food environment affects reproductive investment in mice. *Obesity*. doi: 10.1002/oby.21047
- Kaiser, K. A., Brown, A. W., Bohan Brown, M. M., Shikany, J. M., Mattes, R. D., & **Allison, D. B.** (2014). Increased fruit and vegetable intake has no discernible effect on weight loss: a systematic

review and meta-analysis. *American Journal of Clinical Nutrition*, 100(2):567-576. doi:10.3945/ajcn.114.090548. PMCID PMC4095660

- Capers, P. L., Brown, A. W., Dawson, J., & **Allison, D. B.** (2015). Double sampling with multiple imputation to answer large sample meta-research questions: Introduction and illustration by evaluating adherence to two simple CONSORT guidelines. *Frontiers in Nutrition*, 09 March 2015 | doi: 10.3389/fnut.2015.00006, http://journal.frontiersin.org/article/10.3389/fnut.2015.00006/abstract.

B. Positions and Selected Honors

Academic Employment

1991–1994 Post-Doctoral Fellowship, New York Obesity Research Center, St. Luke's/Roosevelt Hospital, Columbia University College of Physicians and Surgeons
1994–2001 Associate Research Scientist, NY Obesity Research Center, Saint Luke's/Roosevelt Hospital Center
1994–1999 Assistant Professor of Clinical Psychology (in Psychiatry), Columbia University College of Physicians and Surgeons
1999–2001 Associate Professor of Medical Psychology (in Psychiatry), Columbia University College of Physicians and Surgeons
2001–2011 Head and founder, Section on Statistical Genetics, University of Alabama at Birmingham
2001–Present Professor (with tenure) of Biostatistics & Director, Nutrition Obesity Research Center, Dept. of Nutrition Sciences, University of Alabama at Birmingham
2011-Present Associate Dean for Science, UAB School of Public Health
2011 Appointed Distinguished Professor by the Board of Trustees of University of Alabama at Birmingham
2012 Appointed Quetelet Endowed Professor of Public Health by the Board of Trustees of University of Alabama at Birmingham

Memberships, Honors, and Awards (Selected from > 50) – Mentoring Awards Highlighted in Blue

2014 Named 'F1000 Faculty Member of the Year Award 2014' for the Diabetes & Endocrinology Faculty.
2014 Elected Chair-Elect of the American Society of Nutrition Obesity Research Interest Section
2014 Elected Fellow of the Gerontological Society of America
2014 Elected Fellow of the New York Academy of Medicine
2014 Atwater Award from the United States Department of Agriculture
2013 Selected Member of the National Public Health Honor Society, Delta Omega
2013 Wright Gardner Award from the Alabama Academy of Science, to honor individuals whose research work during residence in Alabama has been outstanding
2013 Elected Member of the Johns Hopkins Society of Scholars
2013 American Society of Nutrition's 2013 Dannon Institute Mentorship Award
2013 University of Alabama at Birmingham Graduate Dean's Excellence in Mentorship Award
2012 ***Elected Member of the Institute of Medicine (IOM) of the National Academies***
2012 Appointed Quetelet Endowed Professor of Public Health by the Board of Trustees of University of Alabama at Birmingham
2011 Appointed Distinguished Professor by the Board of Trustees of University of Alabama at Birmingham. Dr. Allison was on the 21st person in the history of UAB to be awarded this honor.
2011 Selected as the 2011 Distinguished Faculty Lecturer by University of Alabama at Birmingham. Recognizing faculty who have advanced the frontiers of science, this has been called the highest award a UAB faculty member can receive.
2009 Elected Fellow of the American Association for the Advancement of Science (AAAS)
2009 TOPS Research Achievement Award from the Obesity Society. Recognizes an individual for singular achievement or contribution to obesity research.
2009 American Society of Nutrition's Centrum Center for Nutrition Science Award. Given in recognition of recent investigative contributions of significance to the basic understanding of human nutrition.
2008 Minority Health Research Center (MHRC) Charles Barkley Excellence in Mentoring Award
2006 Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM). Administered by the National Science Foundation, the award was accompanied by a Presidential certificate and a personal visit with the President in the Oval Office.

2002 Andre Mayer Award from the International Association for the Study of Obesity (IASO). International award given once every four years for outstanding achievement by an investigator under age 40.
2002 Lilly Scientific Achievement Award from the North American Association for the Study of Obesity for outstanding achievement by an investigator within 15 years of receiving their doctoral degree.
1999 Award for Outstanding Achievement in Health Psychology from the Health Psychology Division of the American Psychological Association
1996 Neal Miller Early Career Award from the Academy of Behavioral Medicine

C. Contributions to Science

Opening up new ideas: Science thrives when we constantly challenge ourselves to consider new ideas and new approaches to research. Much of my work has involved introducing new ideas in the field of obesity. Many of these have then served as catalysts for the field, as well as for individuals working directly with me, to follow up with research addressing the hypotheses introduced, questions raised, or new methodologic approaches suggested. As one recent example, to find ways to increase the efficiency with which meta-researchers can assess large bodies of scientific literature, in collaboration with my mentee Dr. AW Brown, I developed and tested crowdsourcing as a novel approach. The method proved to be reliable and cost effective, opening an avenue to timely and economic meta-analyses of current research. Two provocative concept articles on putative contributors to the obesity epidemic in the United States beyond those conventionally discussed emphasize my role as an advocate of openness to new ideas and have spurred multiple hypothesis-testing investigations around the world. Another influential area of my research, currently funded through a ***Transformative R01 grant***, addresses the theory that perceptions about energetic uncertainty influence adiposity and lifespan (as tested in mice and flies).

- Brown A, **Allison DB**. 2014. Using crowdsourcing to evaluate published scientific literature: methods and example. *PLoS One* 9:e100647. DOI: 10.1371/journal.pone.0100647. PMCID: PMC4079692.
- Keith S, … [20 authors in total], **Allison DB**. 2006. Putative contributors to the secular increase in obesity: exploring the roads less traveled. *International Journal of Obesity* 30:1585–1594. PMID: 16801930.
- McAllister EJ, … [22 authors in total], **Allison DB**. 2009. Ten putative contributors to the obesity epidemic. *Critical Reviews in Food Science and Nutrition* 49:868–913. PMCID: PMC2932668.
- Schwartz TS, Gainer R, Dohm ED, Johnson MS, Wyss JM, **Allison DB**. 2015. Second-hand eating? Maternal perception of the food environment affects reproductive investment in mice. *Obesity* (in press).

Methods development: Advances in research depend vitally on good methods, and just as the content of science evolves, so too must the methods. I have published extensively on the development of methods for experimental design and data analysis. For example, in 2002, shortly after large-scale, high-dimensional genomics (microarrays) entered the field, my team introduced the first statistical method for analyzing the distribution of P-values, an approach which then spawned many extensions and similar approaches by others. My group has helped the field push for more rigor in ‘omics’ analysis. In the area of epidemiology, we introduced more efficient analyses to determine years of life lost. We have developed and introduced new methods for testing effects on ‘maximum lifespan’ which are now used by the National Institute on Aging as standard procedure in their *Interventions Testing Program*. Most recently, we have introduced a method to test for causal effects of human fetal genotype on the phenotype of the mother (the fetal drive hypothesis).

- **Allison DB**, et al. [7 authors in total]. 2002. A mixture model approach for the analysis of microarray gene expression data. *Computational Statistics & Data Analysis* 39:1–20.
- Mehta T, Tanik M, **Allison DB.** 2004. Toward sound epistemological foundations of statistical methods for high dimensional biology. *Nature Genetics* 36:943–947. PMID: 15340433.
- Gao G, Wan W, Zhang S, Redden DT, **Allison DB**. 2008. Testing for differences in distribution tails to test for differences in ‘maximum’ lifespan. *BMC Medical Research Methodology* 8:49. PMCID: PMC2529340.
- Liu N, Archer E, Srinivasasainagendra V, **Allison DB**. 2015. A statistical framework for testing fetal drive effects: illustration in a human dataset. *Frontiers in Genetics* 5:464. PMCID PMC4292723

Dispelling misinformation (i.e., ‘myth busting’): In the field of obesity and nutrition research, ideas and beliefs that would, if challenged, not withstand scientific questioning are often perpetuated. Since the earliest days of my career, beginning with a 1993 JAMA paper showing mislabeling of calories in marketed foods, I have published numerous papers that effectively ‘busted myths’ and corrected misinformation regarding obesity. I have done this through systematic reviews, original empirical data collection, meta-analyses, hypothesis-driven experiments, and methods development. A recent, much-cited and widely-discussed example includes our studies regarding the presumed effects of regular breakfast consumption (as opposed to

breakfast-skipping) on preventing or reducing obesity. My mentees and I showed how the existing observational evidence in the field had been exaggerated, and we conducted a large multi-site RCT to test the effect and found none. In this and other analyses, my colleagues and I proved how scientific reporting often is distorted by biased research reporting and research lacking probative value. My role in these types of critical evidence evaluation has been a key factor in both my election to the Institute of Medicine and my selection for the USDA/ASN's Atwater Award.

- **Allison DB**, Heshka S, Sepulveda D, Heymsfield SB. 1993. Counting calories? – Caveat emptor. *Journal of the American Medical Association* 270:1454–1456. PMID: 8371446.
- Brown AW, Bohan Brown MM, **Allison DB**. 2013. Belief beyond evidence: using the proposed effect of breakfast on obesity to show 2 practices that distort scientific evidence. *American Journal of Clinical Nutrition* 98:1298–1308. PMCID: PMC3798081.
- Dhurandhar EJ, ... [13 authors in total], **Allison DB**. 2014. The effectiveness of breakfast recommendations on weight loss: a randomized controlled trial. *American Journal of Clinical Nutrition* 100:507–513. PMCID PMC4095657.
- Casazza K, ... [20 authors in total], **Allison DB**. 2013. Myths, presumptions, and facts about obesity. *New England Journal of Medicine* 368:446–454. DOI: 10.1056/NEJMsa1208051. PMCID PMC3606061

Leading large collaborative projects: I enjoy organizational activities, and as a senior scientist as well as director of the NIH-funded Nutrition Obesity Research Center, I am well-positioned and often have the opportunity to offer leadership to large research teams advancing medical science in nutrition, obesity, and disease prevention. The following are just a few of many publications (as first or senior author) attesting to my leadership role in large collaborative efforts. Topics, to name just a few, include the identification of research priorities and opportunities in the domain of aging and energetics; RCTs of pharmaceuticals that led to FDA approval of a clinically useful drug; a novel pooling analysis showing that many mammalian populations living with or around humans are also experiencing epidemics of weight gain; and the exposition that self-reported energy intake and physical activity energy expenditure are unreasonably poor measures for use in scientific research.

- **Allison DB**, et al. [9 authors and many sites in total]. 2012. Controlled-release phentermine/topiramate in severely obese adults: a randomized controlled trial (EQUIP). *Obesity* 20:330–342. PMCID: PMC3270297.
- **Allison DB**, et al. [25 authors in total]. 2014. Aging and energetics' "Top 40" future research opportunities 2010–2013. [v1; ref status: indexed, http://f1000r.es/4ae]. *F1000Research* 3:219. DOI: 10.12688/f1000research.5212.1. PMCID: PMC4197746.
- Klimentidis YC, … [12 authors in total], **Allison DB**. 2010. Canaries in the coal mine: a cross-species analysis of the plurality of obesity epidemics. *Proceedings of the Royal Society B: Biological Sciences* 278:1626–1632. DOI: 10.1098/rspb.2010.1890. PMCID: PMC3081766.
- Dhurandhar NV, ... [45 authors and signatories in total], **Allison DB**, & the Energy Balance Measurement Working Group. 2014. Energy balance measurement: when something is not better than nothing. *International Journal of Obesity* [Epub ahead of print, Nov 13]. DOI: 10.1038/ijo.2014.199. PMID: 25394308. PMCID Journal – In Process

Research integrity: One of the most important values I strive to convey to my mentees is research integrity, because I am deeply committed to ethical principles such as intellectual honesty, trustworthiness, and the personal responsibility to conduct science to the highest possible professional standards. I have a long track record as an advocate for clear, transparent reporting of research results, and I openly write on controversial topics that relate to biostatistics (e.g., so-called P-hacking, misuse of odds ratios) and medical claims and recommendations (e.g., lack of evidential basis for most dietary supplements).

- Cope MB, **Allison DB.** 2010. White hat bias: examples of its presence in obesity research and a call for renewed commitment to faithfulness in research reporting. *International Journal of Obesity* 34:84–88; discussion 83. PMCID: PMC2815336.
- Gadbury GL, **Allison DB**. 2012. Inappropriate fiddling with statistical analyses to obtain a desirable P-value: tests to detect its presence in published literature. *PLoS One* 7:e46363. DOI: 10.1371/journal.pone.0046363. PMCID: PMC3466248.
- Tajeu GS, Sen B, **Allison DB**, Menachemi N. 2012. Misuse of odds ratios in obesity literature: an empirical analysis of published studies. *Obesity* 20:1726–1731. PMCID: PMC3399983.

- Kaiser KA, ... [13 authors in total], **Allison DB**. 2012. Is funding source related to study reporting quality in obesity or nutrition randomized control trials (RCTs) in top tier medical journals? *International Journal of Obesity* 36:977–981. PMCID: PMC3288675.
- Brown, A. W., Ioannidis, J. P., Cope, M. B., Bier, D. M., & **Allison, D. B.** (2014). Unscientific Beliefs about Scientific Topics in Nutrition. *Adv Nutr. 5*(5): 563-565; doi:10.3945/an.114.006577. PMCID PMC4188234.

D. Research Support

In the past three years, I have held grants for work in areas such as: (a) the relations among body weight, body composition, caloric intake, and changes thereof with longevity in animal models and humans; (b) genetic, behavioral, and environmental influences on obesity-related traits; (c) statistical methods; and (d) clinical trials of weight loss. Selected grants are summarized below.

(a) Relations among body weight, body composition, caloric intake, and longevity

NIH R01 AG043972 (Allison) (*Transformative R01*) 09/15/12 – 08/31/17
Energetics, Disparities, & Lifespan: A Unified Hypothesis
Test a theory that perceptions about the energetic security of the environment influence both organisms' tendency to store energy as body fat and the fundamental rate of aging or senescence.

NIH P30 DK056336 (Allison) 06/01/00 – 06/30/17
UAB Nutrition Obesity Research Center
This research center supports all aspects of research on nutrition with an emphasis on obesity.

NIH R01 AG033682 (Allison) 02/15/10 – 02/14/15
Body Composition, Energetics, and Longevity
Examine the effects of repeated weight loss and regain on longevity in mice.

(b) Genetic, behavioral, and environmental influences on obesity and related traits

NSF IOS 1051890 (Morgan/Hahn) 04/01/11 – 03/31/14
Integrating Physiological and Genetic Mechanisms to Understand the Evolution of Cold Tolerance
Test hypotheses about biochemical and physiological mechanisms underlying the evolution of cold tolerance.

NIH R01 DK052431 (Leibel/Allison/Chung – multiple PI) 08/01/03 – 11/30/13
Molecular Genetic Analysis of Human Obesity
Evaluate the association of obesity candidate genes with obesity phenotypes.

NIH R01 DK074842 (Boyer) 09/13/07 – 08/31/13
Genetics of Obesity in Yup'ik Eskimos
Conduct linkage genome scan & exhaustive gene-based candidate gene association study related to obesity.

(c) Methodology

NIH R01 GM099992 (de los Campos) 09/01/12 – 06/30/17
Factors Affecting Prediction Accuracy of Complex Human Traits and Diseases
Produce a comprehensive evaluation of Whole Genome Prediction methods.

NIH R25 HL124208 (Allison) 08/15/14 – 06/30/18
Strengthening Causal Inference in Behavioral Obesity Research
National short course funded by the National Heart Lung and Blood Institute.

NIH R25 DK099080 (Allison/Thomas) 07/01/13 – 06/30/18
The Mathematical Sciences in Obesity Research
The course develops connections between mathematical scientists and obesity researchers for novel research.

(d) Clinical trials

NIH R01 DK078826 (Allison) 03/01/09 – 02/28/13
Design Issues in Obesity RCTs: Building an Evidence Base
Use meta-analytic and raw data pooling methods to evaluate merits of various design features in obesity RCTs.

Jason Pharmaceuticals (Allison) 09/14/10 – 09/13/12
Randomized Clinical Trial of the Medifast 5&1 Plan
Conduct a randomized controlled trial of a weight loss program.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Atkinson, Thomas Prescott

eRA COMMONS USER NAME (credential, e.g., agency login): patkinso

POSITION TITLE: Professor of Pediatrics, Medicine, and Microbiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Tulane University	B.S.	05/1975	Biology
Emory University	Ph.D.	08/1986	Experimental Pathology
Emory University	M.D.	05/1987	Medicine
University of Alabama at Birmingham		06/1989	Pediatrics Residency
Georgetown University		06/1990	Pediatrics Residency
National Institutes of Health/NIAID		06/1992	Allergy/Immunology Fellowship

A. Personal Statement

I believe I am well-qualified to participate in this T32 Training Program as a content mentor for trainees for the following reasons: First, I have over 25 years' experience in basic laboratory and clinical research beginning with my own training at Emory University as a member of the Emory University Medical Scientist Training Program. Second, over the past 15 years I have mentored 6 clinical fellows during their research projects, two PhD graduate students (including one currently in his third year of training), one research post-doctoral fellow as well as numerous summer students. Finally, for the past 20 years I have been a member of the faculty of the UAB MSTP Program and for the past twelve years I have served as the Training Program Director for the UAB Allergy/Immunology Fellowship Training Program.

B. Positions and Honors

Positions and Employment

1975 – 1981 Officer, U.S. Navy
1981 – 2000 Officer, Medical Corps, U.S. Naval Reserve
1990 – 1991 Chief Medical Staff Fellow, NIAID Allergy & Immunology Fellowship Program
1992 – 1999 Assistant Professor, Division of Allergy and Immunology, Department of Pediatrics, University of Alabama at Birmingham, Birmingham, Alabama (UAB).
1994 – Present Associate Scientist, UAB Comprehensive Cancer Center
1997 – Present Associate Scientist, UAB Center for AIDS Research
1999 – 2008 Associate Professor, Division of Allergy and Immunology, UAB Department of Pediatrics
2001 – Present Member U.S. Food and Drug Administration Pulmonary-Allergy Drug Advisory Committee (PADAC)
2003 – Present Director, Division of Allergy, Asthma & Immunology, UAB Department of Pediatrics
2003 – Present Director, UAB Allergy & Immunology Fellowship Training Program
2007 – Present Director, UAB Cellular Immunobiology Flow Cytometry Unit
2008 – Present Professor and Director, Division of Allergy & Immunology, UAB Department of Pediatrics
2010 – Present Member, American Board of Allergy & Immunology (2015 Vice Chair)

Other Experience and Professional Memberships

Fellow, American Academy of Allergy and Immunology
Member, Clinical Immunology Society
Member, International Organization of Mycoplasmology
Member, Alabama Society for Allergy, Asthma & Immunology

Honors

1971 Phi Eta Sigma
1975 Phi Beta Kappa, *Magna cum Laude* Graduate in Biology
1984 Sigma Xi
1987 Alpha Omega Alpha, *Magna cum Laude* Graduate in Medicine
2007 Joseph E. Suddeth Volunteer of the Year Award, Arthritis Foundation, Alabama Chapter
2008 Earl Brewer Physician Award, Arthritis Foundation

C. Contribution to Science

1. During my PhD work at Emory University I became interested in mast cell and basophil signaling, and I carried this area of interest into my Fellowship training at the NIH as a Clinical Fellow where my studies were focused on the role of phospholipase C in mast cell signaling. After moving to UAB for my first (and only) faculty position, I continued these studies in mast cells and other cell types for several years. Papers published during this time were among the first demonstrating the importance of PLC γ isozymes in mast cell signal transduction through the high affinity IgE receptor, FcεRI.
    a. **Atkinson TP**, Kaliner MA, Hohman RJ. 1992. Phospholipase C-γ1 is translocated to the membrane of rat basophilic leukemia cells in response to aggregation of IgE receptors. *J Immunol.* 148:2194-2200. PMID: 1312104.
    b. **Atkinson TP**, Lee CW, Rhee SG, Hohman RJ. 1993. Orthovanadate induces translocation of phospholipase C-γ 1 and C-γ2 in permeabilized mast cells. *J Immunol* 151:1448-1455. PMID: 7687631.
    c. Berney SM, **Atkinson TP**. 1995. Phosphatidylinositol hydrolysis in freshly isolated human T lymphocytes*. J Immunol Methods*. 186:71-7. PMID:7561150.
    d. **Atkinson TP**, Yang Q 1996. Translocation of phospholipase C-γ2 induced by *in vitro* activation of protein tyrosine kinase activity in mast cell lysates*. Cell Signaling* 8:461-465. PMID: 8958450.

2. After moving to UAB I began seeing primary immunodeficiency patients clinic, an area in which I still maintain an active clinical interest, and over the years, principally in collaboration with groups at the NIH, I have continued to pursue studies on the etiology and clinical characteristics of this extraordinarily diverse group of disorders which has resulted in a number of publications.
    a. Zhu Z-B., **Atkinson TP**, Hovanky KT, Boppana SB, Dai YL, Densen P, Go RCP, Jablecki JS, Volanakis JE. 2000. High prevalence of complement C6 deficiency in African-Americans in the Southeastern United States. *Clin Exp Immunol*. 119:305-310. PMID: 10632667.
    b. Chun HG, Zheng L, Ahmad M, Wang J, Speirs CK, Siegel RM, Dale JK, Puck JM, Davis J, Hall CG, Skoda-Smith S, **Atkinson TP**, Straus SE, Lenardo MJ. 2002. Pleiotropic defects in lymphocyte activation caused by caspase-8 mutations lead to human immunodeficiency. *Nature* 419:395-399. PMID: 12353035.
    c. Bi LL, Pan G, **Atkinson TP**, Zheng L, Dale JK, Makris C, Reddy V, McDonald JM, Siegel RM, Puck JM, Lenardo MJ, Straus SE. 2007. Dominant inhibition of Fas ligand-mediated apoptosis due to a heterozygous mutation associated with autoimmune lymphoproliferative syndrome (ALPS) Type Ib. *BMC Med Genet.* 8:41. PMID: 17605793.
    d. Lucas CL, Kuehn HS, Zhao F, Niemela JE, Deenick EK, Palendira U, Avery DT, Moens L, Cannons JL, Biancalana M, Stoddard J, Ouyang W, Frucht DM, Rao VK, **Atkinson TP**, e. 2013. Dominant-activating germline mutations in the gene encoding the PI(3)K catalytic subunit p110δ result in T cell senescence and human immunodeficiency. *Nat Immunol*. 15(1):88-97. PMID: 24165795

3. In 1998 I began a collaboration with the UAB Diagnostic Mycoplasma Laboratory which has over the ensuing years become my dominant research area. My research has become focused on the role of these atypical bacteria and chronic diseases such as asthma and different types of arthritis. These organisms are also notorious for causing invasive infections in patients with humoral immunodeficiencies. Results from a prospective clinical study in children with asthma suggest that the immune response to the organism by asthmatic children is not as vigorous as the response of non-asthmatic children. Work in my laboratory has demonstrated that *Mycoplasma pneumoniae* activates mast cells for IL-4 production by binding to sialoglycoproteins on the cell surface, among which, and critical for efficient cellular activation, is the FcεRI α chain. Among current studies in the lab (so far unpublished) is a project examining the possible role of urogenital mycoplasmas in Juvenile Idiopathic Arthritis.
    a. Hoek KL, Cassell GH, Duffy LB, **Atkinson TP**. 2002. *Mycoplasma pneumoniae*-induced activation and cytokine production in rodent mast cells. *J Allergy Clin Immunol*. 109(3):470-76. PMID: 11897994.
    b. Hoek KL, Duffy, LB Cassell GH, **Atkinson TP**. 2005. A role for the *Mycoplasma pneumoniae* adhesin P1 in interleukin (IL)-4 synthesis and release from rodent mast cells. *Microb Pathogen.* 39-149-58. PMID: 16169702.
    c. Luo D, Dai Y, Duffy LB, **Atkinson TP**. 2008. Inhibition of message for FcεRI alpha chain blocks mast cell IL-4 production induced by co-culture with *Mycoplasma pneumoniae. Microb Pathog.* 44:286-92. PMID: 18042342.
    d. **Atkinson TP**, Duffy LB, Pendley D, Dai Y, Cassell GH. 2009. Deficient immune response to *Mycoplasma pneumoniae* in childhood asthma. *Allergy Asthma Proc*. 30(2):158-65. PMID: 19463205.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/41445774/

D. Research Support

Ongoing Research Support

Not Applicable

Completed Research Support

R21AI096364 Krause (PI) 08/15/12-7/31/14
Nanotechnology-based detection of *Mycoplasma pneumoniae*.
The goal of this subcontract was to provide the PI with characterized clinical isolates and pure cultures of *M. pneumoniae* as well as other species of human mycoplasmas for testing by Nanorod Array-Surface Enhanced Raman Spectroscopy (NA-SERS).
Atkinson (PI) (Subcontract)

Kaul Pediatric Research Institute Atkinson (PI) 01/01/12-12/31/13
Virulence mechanisms in ureaplasma infection
The aims of this project were to characterize the down-modulation of expression of antimicrobial peptides at the mRNA and protein level and to examine the mechanism of down-modulation of antimicrobial gene expression by ureaplasmas.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Laurence A. Bradley

eRA COMMONS USER NAME (credential, e.g., agency login): BradleyL

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Vanderbilt University, Nashville, Tennessee	BA	05/1971	Psychology
Vanderbilt University, Nashville, Tennessee	PhD	08/1975	Psychology
Duke University School of Medicine	Internship	07/1976	Clinical Psychology

A. PERSONAL STATEMENT

I have established a very strong research program over the past 40 years concerning the interplay between biological and behavioral factors that influence persistent pain in persons with rheumatologic or gastrointestinal illnesses. The overall goal of this work, continuously supported by the NIH since 1989, is to provide empirical findings that are likely to enhance management of pain and related health outcomes. My role as a research investigator and mentor have prepared me in 4 ways to serve as a Content Mentor in our proposed T32 training program. First, my laboratory has always produced very high quality research that has led to the recent National Institutes of Health (NIH) recognition of the exceptional quality of the current R01 project (Ethnic Differences in Responses to Painful Stimuli) we share with colleagues at the University of Florida (1). That is, the NIH recently re-defined the new, second 5-year cycle of our grant award as an R37 MERIT (Method to Extend Research in Time) award that will provide long-term support to outstanding, experienced investigators. Second, I have had the pleasure to train and collaborate with a very strong group of pre- and post-doctoral trainees. Since 1989, I have mentored 13 graduate students in the UAB Medical Psychology doctoral training program, 2 persons who had completed their undergraduate degrees but who wished to work with me before entering doctoral training programs in Psychology, and 4 post-doctoral Fellows. Five of the 15 pre-doctoral trainees noted above are now tenured or tenure track faculty in medical schools in the United States (3 at UAB,1 at University of North Carolina [Chapel Hill], 1 at University of Wisconsin) and in August 2015, another pre-doctoral trainee who earned his doctorate in 2014 will begin a research-oriented, post-doctoral fellowship at the site of his present clinical internship (University of California-San Diego). In addition, my most recent post-doctoral Fellow is now a tenure track faculty member in the Arizona State University College of Nursing and Health Innovation. Third, I have always developed strong working relationships with physician investigators, basic scientists, and biostatisticians in our Division and throughout the UAB School of Medicine. This has allowed my trainees to work with and learn from these scientists from diverse scientific disciplines. For example, my former post-doctoral Fellow, now at Arizona State University, is a young expert in sleep research who worked with UAB faculty in Neurology, Biochemistry, Public Health, as well as Rheumatology. She is now studying the relationship between sleep disturbance and pain (2) and will soon begin to evaluate the role of new pain biomarkers as possible mediators (e.g., resolvin) in this relationship. Similarly, my most recent pre-doctoral trainee now at UC San Diego worked with UAB Preventive Medicine faculty to study the relationship between pain and HbA_{1c} in a large, predominantly black, rural sample of adults with diabetes (3). Finally, my research on ethnic differences in pain among persons with knee osteoarthritis (OA) has allowed me to become involved in research with investigators outside of UAB who also may provide learning opportunities to trainees in the proposed T32. For example, I recently completed a 5 year, study cycle with investigators at Boston University and the University of Iowa, as well as those at UAB, on the NIH-supported Multicenter Osteoarthritis Trial (MOST). My MOST colleagues and I are particularly interested in evaluating the extent to

which alterations in central processing of sensory information may contribute to pain in persons with knee OA (4). I've also contributed to a successful, AHRQ-funded study of outcomes produced in a randomized, controlled trial of a cognitive-behavioral therapy (CBT) intervention for better managing pain delivered by community health care workers to individuals with knee OA and diabetes in the Alabama Black Belt region. All of these research efforts have led me to become a Senior Scientist in the UAB Minority Health and Health Disparities Research Center, a member of the Professional Advisory Group for the AHRQ-funded Deep South Resource Center for Minority Aging Research (RCMAR) project at UAB, Morehouse School of Medicine, Tuskegee University, and the University of Alabama (Tuscaloosa), and the NIH-supported Orofacial Pain: Prospective Evaluation and Risk Assessment Study (OPPERA) project at the University of North Carolina. All of my trainees during the past 8 years have benefitted from exposure to investigators at these diverse institutions and I am quite certain that our future T32 trainees also will benefit from exposure to these investigators.

1. Cruz-Almeida Y, Sibille KT, Goodin BR, Petrov ME, Bartley EJ, Riley JL 3rd, King CD, Glover TL, Sotolongo A, Herbert MS, Schmidt JK, Fessler BJ, Staud R, Redden D, **Bradley LA**, Fillingim RB. Racial and ethnic differences in older adults with knee osteoarthritis. Arthritis Rheumatol 2014; 66: 1800-1810. PubMed PMID: 24729357; PubMed Central PMCID: PMC4077911.
2. Petrov ME, Goodin BR, Cruz-Almeida Y, King C, Glover TL, Bulls HW, Herbert M, Sibille KT, Bartley EJ, Fessler BJ, Sotolongo A, Staud R, Redden D, Fillingim RB, **Bradley LA**. Disrupted sleep is associated with altered pain processing by sex and ethnicity in knee osteoarthritis. J Pain 2015, in press. PubMed PMID: 25725172.
3. Herbert MS, Varley AL, Andreae SJ, Goodin BR, **Bradley LA**, Safford MM. Association of pain with HbA_{1c} in a predominantly black population of community-dwelling adults with diabetes: a cross-sectional analysis. Diabet Med 2013; 30: 1466-1471. PubMed PMID: 23796252; PubMed Central PMCID: PMC3935766.
4. Neogi T, Frey-Law L, Scholz J, Niu J, Arendt-Nielsen L, Woolf C, Nevitt M, **Bradley L**, Felson DT; Multicenter Osteoarthritis (MOST) Study. Sensitivity and sensitisation in relation to pain severity in knee osteoarthritis: trait or state? Ann Rheum Dis 2015; 74: 682-688. PubMed PMID: 24351516; PubMed Central PMCID: PMC4062615.

B. POSITIONS AND HONORS

Positions and Employment

1976-1977 Assistant Professor of Psychology, Department of Psychology, University of Tennessee at Chattanooga, Chattanooga, Tennessee
1977-1980 Assistant Professor of Psychology, Department of Psychology, Fordham University, Bronx, New York
1980-1982 Assistant Professor of Psychology, Department of Psychiatry & Behavioral Medicine, Section on Medical Psychology, Wake Forest University, Bowman Gray School of Medicine, Winston-Salem, North Carolina
1982-1989 Associate Professor of Psychology and Administrative Head of Section on Medical Psychology, Department of Psychiatry & Behavioral Medicine, Wake Forest University, Bowman Gray School of Medicine, Winston-Salem, North Carolina
1989-1992 Associate Professor of Psychology and Medicine, Departments of Psychology and Medicine, Divisions of Gastroenterology and Clinical Immunology & Rheumatology, University of Alabama at Birmingham, Birmingham, Alabama
1992-1994 Professor of Psychology and Medicine, Departments of Psychology and Medicine, Divisions of Gastroenterology and Clinical Immunology & Rheumatology, University of Alabama at Birmingham, Birmingham, Alabama
1994- Professor of Medicine, Department of Medicine, Division of Clinical Immunology & Rheumatology, University of Alabama at Birmingham, Birmingham, Alabama

Other Experience and Professional Memberships

1976- Member, American Psychological Association
1978- Member, International Association for the Study of Pain and the American Pain Society
1984- Member, American College of Rheumatology
1987-1989 Associate Editor, Psychology, Pain
1988- Fellow, American Psychological Association
1991-1994 Associate Editor, Arthritis Care and Research

1991-2000 Director, Education, Epidemiology & Health Services Research Component, Multipurpose Arthritis and Musculoskeletal Diseases Center, UAB Division of Clinical Immunology & Rheumatology
1995-2000 Associate Editor, Clinical Psychology, Pain
1995-2004 Editorial Board Member, Arthritis Care and Research
1998- Editor, Psychosocial Factors, Up to Date in Rheumatology
2001-2012 Director, Neurobehavioral Medicine Working Group, Multidisciplinary Clinical Research Center, UAB Division of Clinical Immunology & Rheumatology
2008- Special Government Consultant for the Arthritis Advisory Committee (AAC), FDA
2012- Member, Osteoarthritis Research Society International

Honors

1986 Visiting Behavioral Scientist, Örebro Hospital, Örebro, Sweden
1992 Distinguished Scholar Award, Arthritis Health Professions Association

C. CONTRIBUTION TO SCIENCE

Measurement of Pain and Psychological Variables

I was introduced to pain research and the difficulties in treating persons with persistent pain during my clinical internship at Duke University School of Medicine in 1975-1976. This was only 10 years after Drs. Ronald Melzack and Patrick Wall had published the first model of the gate control theory in the journal Science. I was simply fascinated by gate control theory and I tried to use the model as I evaluated multiple persons with persistent pain at Duke. Indeed, two of my fellow interns and I published a paper using data from Duke patients regarding the association between psychological distress and persistent pain of unknown cause (1). We reported that scores on a standardized measure of psychological distress most frequently were “normal” among persons with low back pain for whom no causal findings could be identified. We replicated this study using another large sample of patients at Duke as well as with patients seen in the Hospital for Special Surgery in New York during my work at Fordham University. Thus, we provided very strong evidence that, contrary to common belief in the late 1970’s, difficulty in finding a medical cause for persistent pain is not highly related to patients’ psychological distress.

Pain measurement became a major focus of my work at Fordham and at Bowman Gray School of Medicine at Wake Forest University. At that time, investigators had great difficulty in using factor analysis to provide evidence in support Dr. Melzack’s assertion that the McGill Pain Questionnaire was composed of 3 primary groups of verbal pain descriptors (i.e., sensory, affective, and sensory-affective). However, my Fordham graduate students, Edward Prieto and Laurie Hopson, and I recognized the errors in previous factor analyses of the McGill Pain Questionnaire and we corrected these errors using data we collected at the Hospital for Special Surgery. We published both an initial paper (2) as well as a successful replication study that provided validation of Dr. Melzack’s instrument. The McGill Pain Questionnaire still remains one of the most frequently used pain research measures.

I developed a strong relationship with the Division of Rheumatology during my stay at Bowman Gray and I received my first large grant from the Robert Wood Johnson Foundation in 1983 to study outcomes produced by a cognitive behavioral intervention for persons with rheumatoid arthritis (RA). In addition to producing outcome data described below, I and my post-doctoral Fellow at the time, Dr. Karen Anderson (now Associate Professor at MD Anderson Cancer Center) published a substantial number of papers that supported the validity of a behavioral observation method for measuring pain in persons with RA (3). I acknowledge the great help we received from Dr. Frank Keefe at Duke in developing and testing our behavioral measurement device. One of our most interesting findings was that, contrary to standardized self-report pain measures, pain behavior measured in the laboratory is not related to psychological distress. However, when patients interact with their physicians in the clinic, pain behavior is highly associated with psychological distress (4).

1. **Bradley LA**, Prokop CK, Margolis R, Gentry WD. Multivariate analyses of the MMPI profiles of low back pain patients. J Behav Med 1978;1: 253-272. PubMed PMID: 158659.
2. Prieto EJ, Hopson L, **Bradley LA**, Byrne M, Geisinger KF, Midax D, Marchisello PJ. The language of low back pain: factor structure of the McGill pain questionnaire. Pain 1980; 8: 11-19. PubMed PMID: 6445051.
3. McDaniel LK, Anderson KO, **Bradley LA**, Young LD, Turner RA, Agudelo CA, Keefe FJ. Development of an observation method for assessing pain behavior in rheumatoid arthritis patients. Pain 1986; 24: 165-184. PubMed PMID: 3960569.

4. Anderson KO, **Bradley LA**, Turner RA, Agudelo CA, Pisko EJ, Salley AN Jr, Fletcher KE. Observation of pain behavior in rheumatoid arthritis patients during physical examination. Relationship to disease activity and psychological variables. Arthritis Care Res 1992; 5: 49-56. PubMed PMID: 1581373.

Outcomes of Cognitive Behavioral Interventions in Persons with Rheumatoid Arthritis

Our randomized, controlled outcome study was one of the first tests of the efficacy of cognitive behavioral therapy for persons with RA. We found that, compared to an attention placebo condition viewed as valid by the patients, cognitive behavioral therapy produced significantly greater reductions in patients' pain behavior and disease activity at posttreatment (1). Moreover, an 18-month follow-up assessment revealed that the cognitive behavioral therapy produced reductions in RA related clinic visits and days hospitalized as well as reductions in costs of these medical services (2). These outcomes led investigators in both the United States and Great Britain to perform similar studies, most of which produced results similar to ours.

In addition, Dr. Steven Linton in Sweden invited me to work with him on a study of the outcomes of cognitive behavioral therapy for nurses who had suffered back injuries during the previous 12 months. We found that cognitive behavioral therapy, relative to a waiting list control condition, produced significantly greater improvements in pain intensity ratings, anxiety, sleep quality and fatigue ratings, observed pain behavior, and self-reports of activities, mood, and helplessness (3). In addition, the persons who received cognitive behavioral therapy broke a trend for increasing amounts of pain-related work absenteeism, while the control group did not. An 18-month follow-up showed that all who received cognitive behavioral therapy had returned to work, and one third had no pain-related work absences during the follow-up (4).

1. **Bradley LA**, Young LD, Anderson KO, Turner RA, Agudelo CA, McDaniel LK, Pisko EJ, Semble EL, Morgan TM. Effects of psychological therapy on pain behavior of rheumatoid arthritis patients. Treatment outcome and six-month followup. Arthritis Rheum 1987; 30: 1105-1114. PubMed PMID: 3314877.
2. Young LD, **Bradley LA**, Turner RA. Decreases in health care resource utilization in patients with rheumatoid arthritis following a cognitive behavioral intervention. Biofeedback Self Regul 1995; 20: 259-268. PubMed PMID: 7495919.
3. Linton SJ, **Bradley LA**, Jensen I, Spangfort E, Sundell L. The secondary prevention of low back pain: a controlled study with follow-up. Pain 1989; 36: 197-207. PubMed PMID: 2521930.
4. Linton SJ, **Bradley LA**. An 18-month follow-up of a secondary prevention program for back pain: help and hindrance factors related to outcome maintenance. Clin J Pain 1992; 8: 227-236. PubMed PMID: 1421736.

Health Care Seeking in Persons with Fibromyalgia

After moving from Bowman Gray to UAB, I began a series of NIH-funded studies regarding the extent to which psychosocial and biological factors may, in accord with gate control theory, influence pain among persons with fibromyalgia. My UAB Rheumatology colleague, Dr. Graciela Alarcón, graduate students, and I produced a series of investigations that eventually led us to publish the first brain imaging investigation with fibromyalgia patients (1). We could only measure resting state regional cerebral blood flow (rCBF) but our findings of low rCBF and generalized low pain thresholds suggested that abnormal pain perception in women with fibromyalgia may result from functional abnormalities within the central nervous system. Eventually, Dr. David Felson at Boston University asked me to speak at an international conference regarding the implications of our fibromyalgia studies for the study of pain in knee OA (2). This was a remarkable experience that convinced me that I should devote my work to developing a better understanding of the factors that influence knee OA pain.

1. Mountz JM, Bradley LA, Modell JG, Alexander RW, Triana-Alexander M, Aaron LA, Stewart KE, Alarcón GS, Mountz JD. Fibromyalgia in women. Abnormalities of regional cerebral blood flow in the thalamus and the caudate nucleus are associated with low pain threshold levels. Arthritis Rheum 1995; 38: 926-938. PMID: 7612042
2. Bradley LA, Kersh BC, DeBerry JJ, Deutsch G, Alarcón GA, McLain DA. Lessons from fibromyalgia: abnormal pain sensitivity in knee osteoarthritis. Novartis Found Symp 2004; 260: 258-270; discussion 270-279. PubMed PMID: 15283455.

Ethnic Differences in Knee Osteoarthritis (OA) Pain

During the first cycle of R01 funding, our work with Dr. Roger Fillingim and colleagues at the University of Florida have produced exceptional findings of reliable differences between African American (AA) and non-

Hispanic white (NHW) persons with knee OA in responses to noxious heat, pressure, and cold stimuli (1). We also began to examine how variables, such as sleep disturbance, may interact with ethnicity to influence pain. For example, we recently found that sex interacts with insomnia severity to predict greater temporal summation of heat and punctate pressure pain among women and lower heat temporal summation among men (2). During the current 5-year cycle of our R37 funding, we will examine the roles of several variables (e.g., sleep, new biomarkers of pain inhibition, imaging of brain structure and function) to better understand factors that contribute to ethnic variations in knee OA pain at baseline as well as change in these variables and pain during a 2-year follow-up period. We anticipate an exceptional period of work that will lead to substantial new findings and better understanding of individual differences in pain among persons with knee OA.

1. Cruz-Almeida Y, Sibille KT, Goodin BR, Petrov ME, Bartley EJ, Riley JL 3rd, King CD, Glover TL, Sotolongo A, Herbert MS, Schmidt JK, Fessler BJ, Staud R, Redden D, **Bradley LA**, Fillingim RB. Racial and ethnic differences in older adults with knee osteoarthritis. Arthritis Rheumatol 2014; 66: 1800-1810. PubMed PMID: 24729357; PubMed Central PMCID: PMC4077911.
2. Petrov ME, Goodin BR, Cruz-Almeida Y, King C, Glover TL, Bulls HW, Herbert M, Sibille KT, Bartley EJ, Fessler BJ, Sotolongo A, Staud R, Redden D, Fillingim RB, **Bradley LA**. Disrupted sleep is associated with altered pain processing by sex and ethnicity in knee osteoarthritis. J Pain 2015; in press. PubMed PMID: 25725172.

D. RESEARCH SUPPORT

ACTIVE

R37 AG033906, NIH/NIA Fillingim, Roger B (PI) 2009/04/01-2019/04/30
Ethnic Differences in Responses to Painful Stimuli
During the first 5-year cycle (2009-2014), we documented ethnic differences in clinical and laboratory pain responses as well as pain-related disability in persons with knee osteoarthritis (OA). Nevertheless, the mechanisms underlying these disparities remain poorly understood. During the second 5-year cycle, our goal is to elucidate the mechanisms underlying ethnic group differences in knee OA-related pain by directly and prospectively assessing the nature and evolution of altered central pain processing and its relationship with progression of pain and disability among middle-aged and older African Americans and non-Hispanic whites with and without symptomatic knee OA.
Role: Subaward Site PI
Role: Co-Investigator
My role is to supervise data collection and contribute to developing and testing new hypotheses during the cycle. I will devote special attention to sleep data, brain imaging data, and assist my colleague, Dr. Jeffrey Edberg, in developing and testing new hypotheses regarding new biomarkers of pain inhibition.

COMPLETED

U01 AG018947B, NIH/NIA Felson, David T (PI) 2009/01/01 – 2014/12/31
Multicenter Osteoarthritis Trial (MOST)
During this 5-year cycle of the MOST will use our unique cohort to address a series of entirely new questions representing three investigative themes: mechanical risk factors, causes of knee symptoms and long term disease trajectory. We will examine alterations in pain sensitivity using standardized, quantifiable sensory testing to better understand the neurological mechanisms that sustain or magnify painful knee OA symptoms as well as the contribution of pain to functional loss and the long term trajectory of this chronic disease.
Role: Co-Investigator
My role during the past grant cycle was to help produce a set of quantitative sensory testing protocols for assessing pain sensitivity in persons with knee OA. I also participated in developing manuscripts for publication with several MOST investigators involved in pain research.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Daniel C. Bullard

eRA COMMONS USER NAME (credential, e.g., agency login): bullard

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Iowa State University	BS	05/1986	Zoology
Case Western Reserve University	PhD	01/1992	Genetics
Baylor College of Medicine	Postdoctoral Fellow	08/1995	Genetics

A. Personal Statement

Since coming to UAB in late 1996, I have mentored many different undergraduate students, graduate students, postdoctoral fellows, and clinical fellows. A strong focus in my lab is to train these individuals in scientific areas related to rheumatic disease research, write and publish manuscripts or independent research grants, and to effectively present their work at local, national, or international meetings. I also have significant additional mentoring experience at the graduate education level as part of my duties as the Director for the Genetics, Genomics, and Bioinformatics graduate program, a position I have held since 2009. Thus, I think I'm highly qualified to train both predoctoral and postdoctoral fellows, and can serve as a strong mentor as part of the Training Program in Rheumatic and Musculoskeletal Diseases Research.

My research is also very relevant to the thematic areas of this training grant. I have focused for over two decades on defining the cellular and genetic mechanisms by which adhesion molecules, such as the β_2 integrins, ICAM-1, and the selectins regulate immune and inflammatory processes, especially during the development of diseases such as systemic lupus erythematosus, vasculitis disorders, rheumatoid arthritis, and multiple sclerosis. To date, I have published 81 peer reviewed papers, 7 invited reviews, and 6 book chapters, with the majority of these articles covering different aspects of adhesion molecule biology. I have significant expertise in mouse genetics and with the generation and characterization of genetically altered mice. I have applied my knowledge and extensive experience with the mouse system to solve key unanswered questions regarding the specific roles of different adhesion molecules in the development of both acute and chronic inflammatory responses *in vivo*. As a postdoctoral fellow in Dr. Arthur Beaudet's laboratory, I personally generated 7 different lines of adhesion molecule mutant mice by gene targeting in embryonic stem cells, and have continued to generate additional knockout and transgenic lines here at UAB. A main area of emphasis in my laboratory has been to analyze different selectin, β_2 integrin, and ICAM-1 mutant lines in established mouse models of lupus and vasculitis (MRL/MpJ-*Fas*^{lpr} mice), rheumatoid arthritis (collagen-induced arthritis or CIA), and multiple sclerosis (experimental autoimmune encephalomyelitis or EAE) to specifically determine how these proteins contribute to the initiation and progression of disease. Our investigations have led to the identification of novel and previously unpredicted functions for these adhesion molecules, especially in regulating autoimmunity and tissue damage. Selected examples are summarized below in Part C.

In addition, my lab has been part of a major collaborative functional human genomics initiative with Drs. Szalai, Edberg, and Kucik here at UAB designed to investigate how genetic variants in the *ITGAM* (CD11b) gene, which have been shown in multiple GWAS to be strongly associated with the development of SLE, modify Mac-1-dependent processes. These studies have focused on both rs1143679, which results in an Arg→His change at AA position 77 in the β-propeller region of the extracellular domain, and rs1143678 that leads to a Pro→Ser change at position 1146 in the cytoplasmic tail. *Ex vivo* analyses of leukocytes with these specific amino acid changes, including the published study from our group shown below, have demonstrated that both the extracellular (^{77}His) and cytoplasmic (^{1146}Ser) variants can significantly impact Mac-1 functions and reduce leukocyte adhesion, phagocytosis, and activation. These studies are ongoing, and we are now

generating humanized mice to determine how these variants potentially modulate the pathogenesis of SLE using *in vivo* model systems.

Zhou, Y., Wu, J., Kucik, D.F., White, N.B., Redden, D.T., *Szalai, A.J., ***Bullard, D.C.,*** and *Edberg, J.C. (2013). Multiple Lupus Associated *ITGAM* Variants Alter Mac-1 Functions on Neutrophils, *Arthritis Rheum*, 65:2907-2916. *Authors contributed equally to this work. PMCID: PMC3969028

B. Positions and Honors

Positions

1995-1996:	Assistant Professor, Dept. of Molecular and Human Genetics, Baylor College of Medicine
1996-2003:	Assistant Professor, Department of Comparative Medicine, University of Alabama at Birmingham
2003-2011:	Associate Professor, Department of Genetics, University of Alabama at Birmingham
2011-present:	Professor, Department of Genetics, University of Alabama at Birmingham

Other Experience and Professional Memberships

1999-present	American Society for Investigative Pathology
2002-present	Mammalian Genome Society
2006-present	American Association of Immunologists
2004-2013	Assistant Editor, *The American Journal of Pathology*
2008-present	Section Editor, *Inflammatory Bowel Diseases*
2008-2012	Member, Comparative Medicine Study Section, NCRR
2009-present	Director, UAB Genetics, Genomics, and Bioinformatics Graduate Program

Honors

1989-1991	Predoctoral Training Grant NIH, Normal and Abnormal Development
1992-1995	Postdoctoral Fellowship NIH, Institute of General Medical Sciences
1998-2001	Hulda Irene Duggan Arthritis Young Investigator, Arthritis Foundation

Invited Speaker: World Congress for Microcirculation, Novartis International Conference on Animal Models of Dermatologic Disease, NIH Conference on Vasculitis, Keystone Symposia on Molecular Mechanisms of Leukocyte Trafficking, Duke Symposium on Advances in Arthritis Treatment, The Jackson Laboratory Meeting on Mouse Initiatives: Modeling the Human Genome and Disease, Japanese Society for Immunology, American College of Rheumatology Meeting, Joint Scientific Meeting of the Australian Vascular Biology and Australian and New Zealand Microcirculation Societies, American Society of Dermatopathology Meeting

C. Contributions to Science

1.) My early publications focused mainly on determining the roles of the P- and E-selectin in mediating acute and chronic inflammatory responses. Although previous studies of these selectins clearly established their importance in mediating leukocyte rolling, major questions remained with regard to the requirements and functions of these adhesion molecules *in vivo*, especially during the development of inflammatory diseases. To answer these questions, I generated lines of P-selectin and E-selectin single mutant mice, and also used a double targeting strategy to successfully mutate both of these closely linked genes to establish a line of E-/P-selectin double mutant mice during my postdoctoral fellowship. Analyses of these different mutant lines by my laboratory and those of my collaborators resulted in several seminal findings for the selectin field. For example, we established that both P- and E-selectin expression are critical only for mediating rolling *in vivo* during the initial phases of leukocyte recruitment, and discovered that deficiency of these selectins significantly increased infectious susceptibility. Furthermore, we were the first lab to identify a critical requirement for these adhesion molecules in negatively regulating the initiation of collagen-induced arthritis. These findings suggested that E- and P-selectin are also important for restricting immune or inflammatory responses during the development of diseases such as RA.

a. **Bullard, D.C.**, Qin, L., Lorenzo, I., Quinlin, W.M., Doyle, N.A., Bosse, R., Vestweber, D., Doerschuk, C.M., and Beaudet, A.L. (1995). P-Selectin/ICAM-1 Double Mutant Mice: Acute Emigration of Neutrophils into the Peritoneum is Completely Absent but is Normal into Pulmonary Alveoli, *J Clin Invest*, 95:1782-1788. PMCID: PMC295704

b. **Bullard, D.C.**, Kunkel, E.J., Kubo, H., Hicks, M.J., Lorenzo, I., Doyle, N.A., Doerschuk, C.M., Ley, K., and Beaudet, A.L. (1996). Infectious Susceptibility and Severe Deficiency of Leukocyte Rolling and Recruitment in E-/P-Selectin Mutant Mice, *J Exp Med*, 183:2329-2336. PMCID: PMC2192541

c. **Bullard, D.C.,** Mobley J.M., Justen J.M., Sly, L.M., Chosay J.G., Dunn C.J., Lindsey, J.R., Beaudet A.L., and Staite N.D. (1999). Acceleration and Increased Severity of Collagen-Induced Arthritis in P-selectin Deficient Mice, *J Immunol*, 163:2844-2849.

d. Ruth, J.H., Amin, M.A., Woods, J.M., He, X., Samuel, S.L., Yi, N., Haas, C.S., Koch, A.E., and **Bullard, D.C.** (2005). Accelerated Development of Arthritis in Mice Lacking Endothelial Selectins, *Arthritis Res Ther*, 7:R959-R970. PMCID: PMC1257424

2.) During the late 1980's and 1990's, many different adhesion molecules were implicated in SLE development, although the evidence supporting this hypothesis was mainly generated from comparative expression analyses of different organ systems. To overcome this barrier and determine the *in vivo* roles of these proteins in SLE pathogenesis, we generated and analyzed multiple lines of adhesion molecule mutant MRL/MpJ-*Fas*^{lpr} mice. MRL/MpJ-*Fas*^{lpr} mice develop a spontaneous autoimmune disease with many similarities to SLE, including autoantibody production, immune complex formation and deposition, glomerulonephritis, vasculitis, and dermatitis. These investigations have made a significant impact on the field. For example, our group was the first group to identify a regulatory role for Mac-1 in the development of SLE-like disease, findings that were published several years before the first reports showing strong association of *ITGAM* SNPs with SLE. Our analyses also identified both ICAM-1 and LFA-1 as important promoters of disease development, including vasculitis, while P-selectin and PSGL-1 were found to play contrasting roles in restricting autoimmunity. Finally, in more recent studies, we initiated studies of other genes/molecules that regulate adhesion molecule expression and functions, including the eNOS. Interestingly, we found that eNOS deficiency in MRL/MpJ-*Fas*^{lpr} mice resulted in the accelerated development and increased severity of vasculitis, suggesting that that NO produced by this enzyme may be critical for inhibiting lesion formation and vascular damage in human vasculitic diseases.

a. **Bullard, D.C.,** King, P.D., Hicks, M.J., Hurley, L.A., Zhou, L., Dupont, B., Beaudet, A.L., and Elkon, K.B. (1997). Intercellular Adhesion Molecule-1 Deficiency Protects MRL/MpJ Fas^{lpr} Mice from Early Lethality, *J Immunol*, 159:2058-2067.

b. Kevil, C.G., Hicks, M.J., He, X., Zhang, X., Ballantyne, C.M., Raman, C., Schoeb, T.R., and **Bullard, D.C.** (2004). Loss of LFA-1, but not Mac-1, Protects MRL/MpJ-*Fas*^{lpr} Mice from Autoimmune Disease, *Amer J Pathol,* 165:609-616. PMCID: PMC1618580

c. He, X., Schoeb, T.R., Panoskaltsis-Mortari, A., Zinn, K.R., Kesterson, R.A., Zhang, J., Samuel, S., Hicks, M.J., Hickey, M.J., and **Bullard, D.C.** (2006). Deficiency of P-selectin or P-selectin Glycoprotein Ligand-1 Leads to Accelerated Development of Glomerulonephritis and Increased Expression of CC Chemokine Ligand 2 in Lupus-Prone Mice, *J Immunol*, 177:8748-56.

d. Schoeb, T.R., Jarmi, T., Hicks, M.J., Henke, S., Zarjou, A., Suzuki, H., Kramer, P., Novak, J., Agarwal, A., and **Bullard, D.C**. (2012). eNOS Inhibits the Development of Autoimmune-Mediated Vasculitis in Mice, *Arthritis Rheum*, 64:4114-4124. PMCID: PMC3510336

3.) In collaboration with Dr. Scott Barnum at UAB, we performed a comprehensive series of studies investigating the roles of the individual members β_2 integrin family in the initiation and progression of EAE. Findings from previous studies, which primarily used antibody inhibition of adhesion molecule interactions, suggested that these proteins contributed to disease development, although little mechanistic information was reported. For these EAE studies, we analyzed 3 different lines of knockout mice (CD11a, CD11b, and CD11c) that I previously generated in collaboration with Dr. Christie Ballantyne at Baylor College of Medicine. Major findings from this work included identifying an important role for Mac-1 expression on both myeloid cells and T cells for EAE initiation. We also discovered that p150/95 (CD11c/CD18) was essential for full EAE development, suggesting that the functions of this adhesion molecule in this model are distinct from that of Mac-1. This phenotype was surprising since previous studies suggested that both p150/95 and Mac-1 bind to many of the same ligands, are co-expressed on a number of different leukocyte populations, and perform

many of the same functions. Finally, using adoptive T cell transfer methods, we identified LFA-1 as a key regulatory molecule during the development of EAE, and further showed in separate studies that this molecule is important for T regulatory cell functions.

a. **Bullard, D.C.,** Hu, X., Schoeb, T.R., Axtell, R.C., Raman, C., Barnum, S.R. (2005). Critical requirement of CD11b (Mac-1) on T-cells and Accessory Cells for Development of Experimental Autoimmune Encephalomyelitis, *J Immunol*, 175:6327-33.

b. **Bullard, D.C.**, Hu, X., Adams, J.E., Schoeb, T.R., Barnum, S.R. (2007). p150,95 (CD11c/CD18) Expression is Required for the Development of Experimental Autoimmune Encephalomyelitis, *Amer J Pathol,* 170:2001-2008. PMCID: PMC1899456

c. Dugger, K.J., Zinn, K.R., Weaver, C.T., **Bullard, D.C**., and Barnum, S.R. (2009). Effector and Suppressor Roles for LFA-1 during the Development of Experimental Autoimmune Encephalomyelitis, *J Neuroimmunol*, 206:22-27. PMCID: PMC2665690

d. Wohler J.E., **Bullard, D.C**., Schoeb, T.R., and Barnum S.R. (2009). LFA-1 is Critical for Regulatory T Cell Homeostasis and Function, *Mol Immunol*, 46:2424-2428.

4.) Alternative spliced isoforms of adhesion molecules, such as ICAM-1, were first discovered in the 1990's, but limited information has been published regarding their roles, if any, during the development of immune and inflammatory responses. Working with Dr. Scott Barnum, we showed that these ICAM-1 isoforms can significantly contribute to CNS inflammation during the initiation and progression of EAE and cerebral malaria, especially when expressed on T cells. For these studies, we took advantage of existing ICAM-1 mutant lines and developed new lines of transgenic mice that exclusively expressed single ICAM-1 isoforms. Although further work is necessary, these findings strongly suggest that alterations in the expression of different ICAM-1 isoforms may significantly impact susceptibility to various inflammatory diseases like multiple sclerosis.

a. **Bullard, D.C.,** Hu, X., Schoeb, T.R., Collins, R.G., Beaudet, A.L., and Barnum, S.R. (2007). ICAM-1 Expression is Required on T Cells for the Development of Experimental Autoimmune Encephalomyelitis, *J Immunol*, 178:851-857.

b. Hu, X., Barnum, S.R., Wohler, J.E., Schoeb, T.R., and **Bullard, D.C.** (2010). Differential ICAM-1 Isoform Expression Regulates the Development and Progression of Experimental Autoimmune Encephalomyelitis, *Mol Immunol*, 47:1692-1700. PMCID: PMC3755382

c. Ramos, T.N., **Bullard, D.C.,** Darley M.M., McDonald K., Crawford D.F., and Barnum S.R. (2013). Experimental cerebral malaria develops independently of endothelial expression of intercellular adhesion molecule-1 (Icam-1). *J Biol Chem,* 2013 288:10962-6. PMCID: PMC3630868

d. **Bullard, D.C**., Hu, X., Crawford, D., McDonald, K., Ramos, T.N., and Barnum, S.R. (2014). Expression of a Single ICAM-1 Isoform on T cells is Sufficient for Development of Experimental Autoimmune Encephalomyelitis. *Eur J Immunol,* 44:1194-1199. PMCID: PMC3984619

For a complete list of my published works captured using the NIH MyBibliography tool, see:
http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/47933570/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support:

UAB Department of Genetics Bridge Funds (PI: Bullard) 01/01/15 - 12/31/16

NIH R21 CA192629 (PI: Bellis, Bullard Co-Inv.) 01/01/15 - 12/31/16
Glycan control of stem cell-associated pathways in pancreatic cancer
This project will focus on the role of the ST6Gal-I sialyltransferase in conferring a cancer stem cell phenotype.

American Heart Association GRNT20380114 Grant-in-Aid (PI: Bellis, Bullard Co-Inv.) 07/01/14 - 06/30/16
Glycosylation-dependent control of TNFR1 signaling in macrophage survival
The goal of this project is to elucidate the role of TNFR1 sialylation in regulating macrophage survival within atherosclerotic plaques.

NIH/NIAID U19 AI109962 (PI:Randall; Project 2 PI: Zajac, Bullard Co-Inv.) 08/01/14 - 07/31/19
Virus-induced Cell Fate Decisions in Anti-Viral Immunity

Project 2: Regulation of anti-viral CD8+ T Cell responses via adhesion molecules
This project is designed to evaluate how cell-cell interactions mediated by adhesion molecules dictate the magnitude and quality of anti-viral immune responses.

Completed Research Support:

UAB Immunology, Autoimmunity, and Transplantation Strategic Planning Grant (PI: Bullard) 04/15/13 - 04/14/15
An In Vivo Approach for Mechanistic Investigations of SLE-Associated ITGAM (CD11b) SNPs

Stiefel, Inc. (PI: Bullard) 12/01/10 - 12/31/13
Treatment of Psoriasiform Skin Disease in CD18 mutant PL/J Mice

NIH R21 DA026956 (PI: Bullard, Co-PI: Edberg) 09/30/09 – 08/31/12
Functional Evaluation of ITGAM SNPs

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Chaplin, David

eRA COMMONS USER NAME (agency login):

POSITION TITLE: Professor of Microbiology and Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Harvard University, Cambridge, MA	AB	05/1973	Biochemistry
Washington University in St. Louis, St. Louis	MD	06/1980	Internal Medicine
Washington University in St. Louis, St. Louis	PhD	06/1980	Cell and Developmental Biology
University of Texas Southwestern Medical School, Dallas, TX	Resident	06/1982	Medical Residency
Harvard University, Boston, MA	Postdoctoral Fellow	08/1984	Immunogenetics Postdoctoral Fellowship

A. PERSONAL STATEMENT

I bring to this application a career-long commitment to the training and career development of scientists in both basic and translational research. Prior to joining the faculty of the University of Alabama at Birmingham in 2001, I was Chief of the Division of Allergy and Clinical Immunology in the Department of Medicine at Washington University in St. Louis and Associate Investigator in the Howard Hughes Medical Institute. In this position, I was responsible for the division's fellowship program in Allergy and Immunology through which I mentored two faculty members to successful acquisition of K08 awards. I also served on the admissions and steering committees of the Washington University Medical Scientist Training Program, one of our nation's elite programs for launching the careers of physician scientists. During this time, I was elected to serve as Councilor of the American Society for Clinical Investigation, the premier organization for fostering the careers of physician scientists and helping them to obtain recognition for exceptional excellence in their research activities. After moving to UAB where I served for 11 years as Chair of the Department of Microbiology, I had ultimate responsibility for the department's graduate training program that averaged annually 78 students studying to obtain the PhD degree. I also provided oversight of the departmental post-doctoral training program that consisted of ~40 postdoctoral fellows. I was a leader in the conversion of UAB's graduate programs in the biomedical sciences from departmental programs to the current interdisciplinary themes that are housed within the newly developed Graduate Biomedical Sciences Program (GBS). I have been Chair of the Steering and Oversight Committee of the GBS for 4 years. I am also a member of the steering committee for the Howard Hughes Medical Institute Med-into-Grad Program, an enrichment program designed to support the recruitment and training of students with a special interest in graduate studies with a human disease focus. This program recently received support from a new T32 grant, and I will serve on its Executive Committee. These two latter roles together with my role as Director of the Training Academy of the NCATS-funded UAB Clinical and Translational Science Award positioned me particularly well to help establish UAB's new Certificate Program in Translational and Molecular Sciences. Throughout my time on the faculty at Washington University and at UAB, my research has focused on mechanisms governing the interactions of the innate and adaptive immune responses, with a special interest in the mechanisms of asthmatic inflammation, topics of particular relevance to this training program. Over the course of my career, I have mentored 16 students to the PhD or MD/PhD degrees and 11 post-doctoral fellows, over 70% of whom are currently in faculty positions or continued training in academic medical centers or staff scientists in biotech firms. In 2010, I received the UAB Graduate Dean's Award for Excellence in Mentorship.

1. Stephens R, Randolph DA, Huang G, Holtzman MJ, **Chaplin DD**. Antigen-nonspecific recruitment of Th2 cells to the lung as a mechanism for viral infection-induced allergic asthma. J Immunol. 2002 Nov 15;169(10):5458-67. PubMed PMID: 12421921.
2. Zindl CL, Kim TH, Zeng M, Archambault AS, Grayson MH, Choi K, Schreiber RD, **Chaplin DD**. The lymphotoxin LTalpha(1)beta(2) controls postnatal and adult spleen marginal sinus vascular structure and function. Immunity. 2009 Mar 20;30(3):408-20. PubMed PMID: 19303389; PubMed Central PMCID: PMC2874947. Deshane JS, Redden DT, Zeng M, Spell ML, Zmijewski JW, Anderson JT,
3. Deshane RJ, Gaggar A, Siegal GP, Abraham E, Dransfield MT, **Chaplin DD**. Subsets of airway myeloid-derived regulatory cells distinguish mild asthma from chronic obstructive pulmonary disease. J Allergy Clin Immunol. 2015 Feb;135(2):413-424.e15. PubMed PMID: 25420684; PubMed Central PMCID: PMC4323991.

B. POSITIONS AND HONORS

Positions and Employment

1984 - 1991	Assistant Professor of Medicine and Microbiology, Washington University School of Medicine, St. Louis, MO
1984 - 2001	Associate Investigator, Howard Hughes Medical Institute, St. Louis, MO
1991 - 1995	Associate Professor of Medicine, Microbiology and Genetics, Washington University School of Medicine, St. Louis, MO
1994 - 2001	Professor of Medicine, Microbiology and Genetics, Washington University School of Medicine, St. Louis, MO
1994 - 2001	Chief, Division of Allergy and Immunology, Department of Medicine, Washington University in St. Louis, St. Louis, MO
2001 -	Professor of Microbiology and Medicine, University of Alabama at Birmingham, Birmingham
2001 - 2012	Charles McCauley Professor and Chair, Department of Microbiology, University of Alabama at Birmingham, Birmingham, AL
2004 -	Co-Director, UAB Skin Diseases Research Center, University of Alabama at Birmingham, Birmingham, AL
2008 -	Co-Director, Program in Immunology, University of Alabama at Birmingham, Birmingham, AL
2010 -	Chair, Steering and Oversight Committee, UAB Graduate Biomedical Sciences Graduate Programs, University of Alabama at Birmingham, Birmingham, AL
2011 -	Director, Training Academy, UAB Center for Clinical and Translational Science, University of Alabama at Birmingham, Birmingham, AL
2013 -	Associate Dean for Faculty Development, School of Medicine, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

1985 -	Member, American Association of Immunologists
1986 -	Member, American Academy of Allergy, Asthma and Immunology
1993 -	Member, American Society for Clinical Investigation
1995 - 1998	Councilor, American Society for Clinical Investigation
1997 -	Member, Association of American Physicians
2005 - 2007	Chair, Basic and Clinical Immunology Interest Section, American Academy of Allergy, Asthma and Immunology

Honors

2001	Fellow, American Academy of Allergy, Asthma and Immunology
2006	Fellow, American Society for Microbiology
2010	Dean's Award for Mentorship, University of Alabama at Birmingham

C. Contribution to Science

1. My early publications were focused on bridging the gap between phage and plasmid cloning technologies and chromosomal segregation and recombination analysis for mapping genes and providing substrates for gene discovery in previously incompletely mapped genomic regions. I developed improved methods for cosmid cloning to permit formation of molecular maps covering several hundred kilobases within the mouse major histocompatibility complex and then developed tools for application of yeast artificial chromosome cloning to analyze nearly the entire human major histocompatibility complex. This work permitted locating the adrenal steroid 21-hydroxlase genes within the Class III region of the mouse MHC and identification within the MHC class I regions of a previously unrecognized gene, eventually defined to encode corneodesmosin, a protein expressed exclusively in the skin. It also permitted defining the physical relationship between genes in the human MHC with prominent immunologic functions and those with no known immune function.

   a. Kozono H, Bronson SK, Taillon-Miller P, Moorti MK, Jamry I, **Chaplin DD**. Molecular linkage of the HLA-DR, HLA-DQ, and HLA-DO genes in yeast artificial chromosomes. Genomics. 1991 Nov;11(3):577-86. PubMed PMID: 1774062.
   b. Zhou Y, **Chaplin DD**. Identification in the HLA class I region of a gene expressed late in keratinocyte differentiation. Proc Natl Acad Sci U S A. 1993 Oct 15;90(20):9470-4. PubMed PMID: 8415725; PubMed Central PMCID: PMC47590.
   c. Matsumoto M, Zhou Y, Matsuo S, Nakanishi H, Hirose K, Oura H, Arase S, Ishida-Yamamoto A, Bando Y, Izumi K, Kiyonari H, Oshima N, Nakayama R, Matsushima A, Hirota F, Mouri Y, Kuroda N, Sano S, **Chaplin DD**. Targeted deletion of the murine corneodesmosin gene delineates its essential role in skin and hair physiology. Proc Natl Acad Sci U S A. 2008 May 6;105(18):6720-4. PubMed PMID: 18436651; PubMed Central PMCID: PMC2373361.

2. Extending my interest in gene families, I next addressed the genetics and function of the IL-1alpha and IL-1beta family. Using diverse genetic approaches, I demonstrated the molecular linkage of the IL-1 alpha and beta genes, and identified key promoter and enhancer elements that controlled expression of these genes in settings of tissue inflammation and injury. I developed neutralizing monoclonal antibodies that permitted careful dissection for the cellular production and release of both IL-1 isoforms, allowing me to demonstrate that stimuli that led to induction of apoptosis resulted in efficient release of proteolytically activated IL-1 from IL-1-producing cells. This provided a strong foundation for understanding the role of the apoptosis-associated Caspase-1 protein in the activation of IL-1beta. Finally, I used gene targeting to demonstrate an important role for IL-1beta in the delivery antigens from the skin to regional lymph nodes in the induction of delayed type hypersensitivity responses.

   a. Hogquist KA, Nett MA, Unanue ER, **Chaplin DD**. Interleukin 1 is processed and released during apoptosis. Proc Natl Acad Sci U S A. 1991 Oct 1;88(19):8485-9. PubMed PMID: 1924307; PubMed Central PMCID: PMC52533.
   b. Shornick LP, De Togni P, Mariathasan S, Goellner J, Strauss-Schoenberger J, Karr RW, Ferguson TA, **Chaplin DD**. Mice deficient in IL-1beta manifest impaired contact hypersensitivity to trinitrochlorobenzone. J Exp Med. 1996 Apr 1;183(4):1427-36. PubMed PMID: 8666901; PubMed Central PMCID: PMC2192516.
   c. Shornick LP, Bisarya AK, **Chaplin DD**. IL-1beta is essential for langerhans cell activation and antigen delivery to the lymph nodes during contact sensitization: evidence for a dermal source of IL-1beta. Cell Immunol. 2001 Aug 1;211(2):105-12. PubMed PMID: 11591114.

3. My work studying the two IL-1 isoforms demonstrated the utility of gene targeting technology for defining the biological functions of closely related gene products. I next applied this technology to analysis of the individual functions of the closely related tumor necrosis factor and lymphotoxin proteins. By deleting the lymphotoxin-alpha gene using gene targeting, I demonstrated a previously unrecognized role for the lymphotoxin protein, acting in its cell surface heterotrimer form, governing the formation of lymph nodes, Peyer's patches, and splenic lymphoid follicles. Using lymphoid cell and bone marrow transfer, I was able to show essential roles for B-lymphocytes in the induction of the follicular dendritic cell network and lymphoid follicles. With tools to manipulate selected components of lymphoid follicles, my group was able

to define the role of normal follicle structure in the immunoglobulin affinity maturation process and the formation and expression of B-cell memory.

a. Matsumoto M, Mariathasan S, Nahm MH, Baranyay F, Peschon JJ, **Chaplin DD**. Role of lymphotoxin and the type I TNF receptor in the formation of germinal centers. Science. 1996 Mar 1;271(5253):1289-91. PubMed PMID: 8638112.
b. Matsumoto M, Lo SF, Carruthers CJ, Min J, Mariathasan S, Huang G, Plas DR, Martin SM, Geha RS, Nahm MH, **Chaplin DD**. Affinity maturation without germinal centres in lymphotoxin-alpha-deficient mice. Nature. 1996 Aug 1;382(6590):462-6. PubMed PMID: 8684487.
c. Fu YX, Huang G, Wang Y, **Chaplin DD**. B lymphocytes induce the formation of follicular dendritic cell clusters in a lymphotoxin alpha-dependent fashion. J Exp Med. 1998 Apr 6;187(7):1009-18. PubMed PMID: 9529317; PubMed Central PMCID: PMC2212211.
d. Fu YX, Huang G, Wang Y, **Chaplin DD**. Lymphotoxin-alpha-dependent spleen microenvironment supports the generation of memory B cells and is required for their subsequent antigen-induced activation. J Immunol. 2000 Mar 1;164(5):2508-14. PubMed PMID: 10679088.

4. In alignment with my clinical interest in understanding asthma pathogenesis, I also investigated the mechanisms leading to recruitment of antigen-specific Th2 lymphocytes to the airways following a variety of innate and adaptive immune system stimuli. These studies demonstrated that the signals that prepared the airways for recruitment of activated lymphocytes included both antigen-activated and antigen non-specific pathways. Important implications from this work are that both innate and adaptive mechanisms can lead to recruitment of mature differentiated lymphocytes to the airways, and that the outcome of this recruitment depends primarily on the activation status of the lymphocytes that are recruited.

a. Randolph DA, Stephens R, Carruthers CJ, **Chaplin DD**. Cooperation between Th1 and Th2 cells in a murine model of eosinophilic airway inflammation. J Clin Invest. 1999 Oct;104(8):1021-9. PubMed PMID: 10525040; PubMed Central PMCID: PMC408580.
b. Randolph DA, Huang G, Carruthers CJ, Bromley LE, **Chaplin DD**. The role of CCR7 in TH1 and TH2 cell localization and delivery of B cell help in vivo. Science. 1999 Dec 10;286(5447):2159-62. PubMed PMID: 10591648.
c. Jung YW, Schoeb TR, Weaver CT, **Chaplin DD**. Antigen and lipopolysaccharide play synergistic roles in the effector phase of airway inflammation in mice. Am J Pathol. 2006 May;168(5):1425-34. PubMed PMID: 16651610; PubMed Central PMCID: PMC1606597.

5. Most recently, I've investigated the roles of free radical-producing myeloid cells as modulators of allergen-induced airway inflammation. Initial studies performed in mice demonstrated that airway allergen challenge of sensitized mice recruits both pro-inflammatory, superoxide-producing myeloid cells and anti-inflammatory nitric oxide-producing cells. These cells can be distinguished by their expression of specific cell surface antigens as well as by their expression of nitric oxide or superoxide. Adoptive transfer experiments as well as experiments using specific inhibitors of the free radical biosynthetic pathways demonstrated that the superoxide-producing cells play a major role in the induction of airway hyper-responsiveness in experimental allergic asthma in mice. Studies in human subjects have recently shown the presence of similar populations of nitric oxide- and superoxide-producing cells. Of special interest, the populations of superoxide-producing and nitric oxide-producing cells can distinguish with high fidelity normal subjects from subjects with mild asthma and subjects with COPD.

a. Anderson JT, Zeng M, Li Q, Stapley R, Moore DR 2nd, Chenna B, Fineberg N, Zmijewski J, Eltoum IE, Siegal GP, Gaggar A, Barnes S, Velu SE, Thannickal VJ, Abraham E, Patel RP, Lancaster JR Jr, **Chaplin DD**, Dransfield MT, Deshane JS. Elevated levels of NO are localized to distal airways in asthma. Free Radic Biol Med. 2011 Jun 1;50(11):1679-88. PubMed PMID: 21419218; PubMed Central PMCID: PMC3124865.
b. Deshane J, Zmijewski JW, Luther R, Gaggar A, Deshane R, Lai JF, Xu X, Spell M, Estell K, Weaver CT, Abraham E, Schwiebert LM, **Chaplin DD**. Free radical-producing myeloid-derived regulatory cells: potent activators and suppressors of lung inflammation and airway hyperresponsiveness. Mucosal Immunol. 2011 Sep;4(5):503-18. PubMed PMID: 21471960; PubMed Central PMCID: PMC3694614.

c. Deshane JS, Redden DT, Zeng M, Spell ML, Zmijewski JW, Anderson JT, Deshane RJ, Gaggar A, Siegal GP, Abraham E, Dransfield MT, **Chaplin DD**. Subsets of airway myeloid-derived regulatory cells distinguish mild asthma from chronic obstructive pulmonary disease. J Allergy Clin Immunol. 2015 Feb;135(2):413-424.e15. PubMed PMID: 25420684; PubMed Central PMCID: PMC4323991.

D. RESEARCH SUPPORT

Ongoing Research Support

U54 TR001005, National Institutes of Health Kimberly, Robert (PI) 2014/09/01-2015/08/31

UAB Center for Clinical and Translational Science

The overall goals of the UAB Center for Clinical and Translational Science are to support innovative, transdisciplinary research across the T1-T4 spectrum in order to improve human health and health care delivery by supporting the creation of a vibrant research environment fostering team approaches to science. As Director of the CCTS Training Academy, Dr. Chaplin leads the development of programs to assure the acquisition of translational science competencies and career enhancement skills across the workforce spectrum.

Role: KP

P30 AR050948, National Institutes of Health Elmets, Craig (PI) 2004/04/01-2015/08/31

UAB SKIN DISEASES RESEARCH CENTER

The overall goals of the UAB Skin Diseases Research Center are to facilitate recruitment of investigators into the fields of 1) immunodermatology and cutaneous microbiology, 2) skin cancer, 3) biochemistry of the skin, and 4) genetics and developmental biology, and to support the application of state-of-the-art methodologies to these fields. As co-director of the Center, Dr. Chaplin will focus his efforts on program development for training of skin diseases researchers and for enhancing mentor-mentee relationships at all academic levels across the skin diseases workforce. He will also assure effective interactions between skin disease researchers and the robust community of basic and clinical immunologists at UAB.

Role: KP

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Walter Winn Chatham

eRA COMMONS USER NAME (credential, e.g., agency login): wchatham

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Duke University, Durham NC	BSE	05/1976	Biomedical Engineering
Vanderbilt University, Nashville TN	MD	05/1980	Medicine
University of North Carolina-Chapel Hill	n/a	06/1983	Internal Medicine
University of Alabama at Birmingham	n/a	07/1989	Rheumatology

A. Personal Statement

I direct the Lupus Clinic at UAB, where I presently follow approximately 480 patients with SLE and coordinate the enrollment of these patients as well as an additional 400+ patients followed by other UAB faculty in a research registry for SLE outcome and translational studies directed toward correlating genotype to clinical phenotype as well as understanding the immunopathogenesis of lupus. In this role I have streamlined mechanisms for providing clinical assessments of disease activity (SLEDAI and other disease activity scores), serological data and documentation of intercurrent SLE treatments at the time research samples are procured. I am also the co-PI on current studies developing and validating improved disease activity outcome measures in SLE, as well as the site PI on seven current and twelve previous SLE intervention studies funded by the NIH Immune Tolerance Network as well as industry sponsors. In this context with access to a broad array of lupus research opportunities I will serve as a Content Mentor for the planned T32 Training Grant. I also previously served for eleven years (1999-2010) as the Program Director for the Rheumatology Fellowship Training Program at UAB, mentorng over 24 trainees with regard to their clinical training and career development. Representative recent publications relevant to this described role:

Kalunian KC, **Chatham WW**, Massarotti EM, Reyes-Thomas J, Harris C, Furie RA, Chitkara P, Putterman C, Gross RL, Somers EC, Kirou KA, Ramsey-Goldman R, Hsieh C, Buyon JP, Dervieux T, Weinstein A. Measurement of cell-bound complement activation products enhances diagnostic performance in systemic lupus erythematosus. Arthritis Rheum. 2012 Dec;64(12):4040-7.

Ginzler EM, Wallace DJ, Merrill JT, Furie RA, Stohl W, **Chatham WW**, Weinstein A, McKay JD, McCune WJ, Zhong ZJ, Freimuth WW, Petri MA; the LBSL02/99 Study Group. Disease Control and Safety of Belimumab Plus Standard Therapy Over 7 Years in Patients with Systemic Lupus Erythematosus. J Rheumatol. 2014 Feb;41(2):300-9.

Absher DM, Li X, Waite LL, Gibson A, Roberts K, Edberg J, **Chatham WW**, Kimberly RP. Genome-Wide DNA Methylation Analysis of Systemic Lupus Erythematosus Reveals Persistent Hypomethylation of Interferon Genes and Compositional Changes to CD4+ T-cell Populations. PLoS Genet. 2013 Aug;9(8):e1003678. Epub 2013 Aug 8. PMCID: PMC3738443

ACCESS Trial Group. Treatment of lupus nephritis with abatacept: the abatacept and cyclophosphamide combination efficacy and safety study. Arthritis Rheumatol. 2014 Nov;66(11):3096-104.

B. Positions and Honors

Positions and Employment

1983-1986 Internist and Medical Director for United Neighborhood Health Services, Inc., Nashville, TN (US Public Health Services/National Health Service Corp)

1984-1986 Clinical Assistant Professor, University of Tenn Health Sciences, Baptist Hospital, Nashville, TN

1986-1989	Fellow in Rheumatology, Division of Clinical Immunology and Rheumatology, The University of Alabama at Birmingham, Birmingham, AL
1989-present	Staff Physician, Department of Veterans Affairs Medical Center, Birmingham, AL
1989-1991	Instructor in Medicine, Division of Clinical Immunology and Rheumatology, The University of Alabama at Birmingham; Research Associate, Birmingham VA Hospital
1991-	Associate Scientist, Multipurpose Arthritis and Musculoskeletal Diseases Center, UAB
1991-1999	Assistant Professor of Medicine, Division of Clinical Immunology and Rheumatology, The University of Alabama at Birmingham, Birmingham, AL
1996-present	Clinical Director, UAB Arthritis and Musculoskeletal Center
1999-2006	Associate Professor of Medicine, Division of Clinical Immunology and Rheumatology, The University of Alabama at Birmingham, Birmingham, AL
1999-2010	Program Director, Training Program in Rheumatology, The University of Alabama at Birmingham, Birmingham, AL
2006-	Professor of Medicine, Division of Clinical Immunology and Rheumatology, The University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

American College of Physicians, 1982-present ; Fellow 2007-present

Alabama Society of Rheumatic Diseases, 1988-present [President, 1993-1994]

American College of Rheumatology, 1990-present

Association of Subspecialty Professors, 2004-present

Honors and Awards

American College of Rheumatology Fellows Award

Pfizer Research Award

American College of Rheumatology Clinician Scholar Educator Award 2006-2009

C. Contribution to Science

1. During and following completion of my post-doctoral training I performed studies that established the mechanisms whereby surface bound immunoglobulins engender neutrophil responses capable of promoting tissue injury. It had previously been observed (by Steven Weiss and colleagues) that neutrophils were capable of degrading matrix proteins when activated on biologic surfaces. Studies I undertook with Dr. Warren Blackburn and Dr. Louis Heck as my research mentors in the context of a VA Career Development Award established that surface bound immunoglobulins engender significant release of activated neutrophil metalloproteases including collagenase, with activation of these enzymes occurring via the synergistic actions of cathepsin G and HOCl released into the surface phagolysosome. These studies established the importance of tissue adherent immunoglobulins in engendering neutrophil responses relevant to direct tissue injury as well as the increased expression and release of neutrophil azurophilic granule constituents, a consideration of subsequent significance with regard to the pathogenesis of ANCA associated vasculitis, as well as release of neutrophil BAFF/BLyS and neutrophil NETosis in the pathogenesis of lupus.

Chatham WW, Heck LW, Blackburn WD Jr: Ligand dependent release of activated neutrophil collagenase. Arthritis Rheum 33:228-234, 1990

Chatham WW, Blackburn WD Jr, Heck, LW: Additive enhancement of neutrophil collagenase activity by HOC1 and cathepsin G. Biochem Biophys Res Commun 184:560-567, 1992

Blackburn WD Jr, **Chatham WW**: HOCl production by human neutrophils activated with surface associated IgG: requirement for extracellular calcium. J Leuk Biol 55:793-797, 1994.

Chatham WW, Turkiewicz A, Blackburn WD: Determinants of neutrophil HOCl generation -- ligand dependent responses and the role of adhesion. J Leuk Biol 56:654-660, 1994.

2. Neutrophils are found in abundance in rheumatoid joint effusions, but their role in promoting joint destruction has not been established. Work by Hugo Jasin and colleagues had established that in rheumatoid joints there were abundant deposits of immunoglobulin in the surface layers of articular cartilage. Studies by Carl Nathan and colleagues had established a prominent role for TNFα in engendering prolonged respiratory burst responses by surface adherent neutrophils. In the context of our work on neutrophil responses to surface

bound immunoglobulins, we subsequently established a role for neutrophils in degrading the articular surface as well as facilitating the attachment of synovial fibroblasts to the neutrophil mediated altered articular cartilage. These studies established a role for neutrophils in rheumatoid joint destruction and provided a rationale for employing therapeutic strategies in treating rheumatoid arthritis (including those that target TNFα) that impact neutrophil activation on articular surfaces.

Chatham WW, Heck LW, Blackburn WD Jr: Lysis of fibrillar collagen by PMN in synovial fluid...a role for surface bound immunoglobulins. Arthritis Rheum 33:1333-1339, 1990

Chatham WW, Swaim R, Frohsin H, Heck, LW, Miller EJ, Blackburn WD Jr: Degradation of human articular cartilage by neutrophils in synovial fluid. Arthritis Rheum 36(1):51-58, 1993.

Blackburn WD Jr, Minghetti PP, **Chatham WW**: Human neutrophils activated by surface associated IgA leads to release of activated collagenase. Clin. Immunol. Immunopath. 76(3): 241-247 1995.

McCurdy LH, **Chatham WW**, Blackburn WD Jr.: Rheumatoid fibroblast adhesion to human articular cartilage. Arthritis Rheum. 38(11):1694-1700, 1995.

3. Complement proteins bound to immunoglobulins modulate the inflammatory responses to immune complexes via the generation of chemotactic factors as well as by ligation of complement receptors on phagocytic cells. While complement fixed to immune complexes augments the respiratory burst and degranulation responses to fluid phase ligands, the role of complement fixed to surface bound immunoglobulins had not previously been examined. In the context of our studies to determine factors in synovial fluid modulating neutrophil responses to adherent immunoglobulin, we confimred complement fixation to surface bound immunoglobulins actually attenuates neutrophil mediated degradation of subjacent matrix. We subsequently showed that ligation of the C3b receptor attenuated FcR mediated neutrophil azurophilic granule release and HOCl production. These studies established a protective role for complement fixation to immune complexes with regard to tissue injury as well as the potential limitations of therapies that target early steps of complement activation required for C3b fixation to immunoglobulin.

Chatham WW, Blackburn WD Jr: Fixation of C3 alters IgG induced HOC1 generation and collagenase activation. J Immunol 151(2):949-958, 1993.

S Thiagarajan and **Chatham WW**: Ligation of CR1 attenuates Fc receptor mediated myeloperoxidase release and HOCl production by neutophils. J Leuk Biol, 63:477-485, 1998.

4. The role of BLyS/BAFF in promoting the proliferation and survival of autoreactive B cells rendered this protein an attractive target for treating autoimmune disorders such as systemic lupus erythematosus. In the context of a transition in my career toward the care of patients with lupus, I became involved with a number of multi-center initiatives to further examine the role of BlyS/BAFF in the development of lupus as well as initiatives targeting this molecule as a treatment for lupus. These collective efforts have established that changes in the circulating levels of BLyS/BAFF correlate with subsequent lupus disease flare and that targeting BLyS/BAFF with specific monoclonal antibody reagents decreases autoantibody levels without compromising protective immunity, decreases SLE activity measures, and decreases the frequency/severity of lupus flares.

Petri M, Stohl W**,** **Chatham W**, McCune JW, Chevrier M, Ryel J, Recta V, Zhong J, Freimuth W. Association of plasma B lymphocyte stimulator levels and disease activity in systemic lupus erythematosus. Arthritis Rheum. 2008 Aug;58(8):2453-9.

Chatham WW, Wallace DJ, Stohl W, Latinis KM, Manzi S, McCune WJ, Tegzová D, McKay JD, Avila-Armengol HE, Utset TO, Zhong ZJ, Hough DR, Freimuth WW, Migone TS; on behalf of the BLISS-76 Study Group. Effect of Belimumab on Vaccine Antigen Antibodies to Influenza, Pneumococcal, and Tetanus Vaccines in Patients with Systemic Lupus Erythematosus in the BLISS-76 Trial. J Rheumatol. 2012 Jun 20.

Furie R, Petri M, Zamani O, Cervera R, Wallace DJ, Tegzová D, Sanchez-Guerrero J, Schwarting A, Merrill JT, **Chatham WW**, Stohl W, Ginzler EM, Hough DR, Zhong ZJ, Freimuth W, van Vollenhoven RF; BLISS-76 Study Group. A phase III, randomized, placebo-controlled study of belimumab, a monoclonal antibody that inhibits B lymphocyte stimulator, in patients with systemic lupus erythematosus. Arthritis Rheum. 2011 Dec;63(12):3918-30.

Stohl W, Hiepe F, Latinis KM, Thomas M, Scheinberg MA, Clarke A, Aranow C, Wellborne FR, Abud-Mendoza C, Hough DR, Pineda L, Migone TS, Zhong ZJ, Freimuth WW, **Chatham WW**. Belimumab reduces

autoantibodies, normalizes low complement, and reduces select B-cell populations in patients witrnh systemic lupus erythematosus. Arthritis Rheum. 2012 Jan 24.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1nCplolIJFHQH/bibliography/47958328/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

W Winn Chatham MD, Co-investigator 08/26/2014 - 06/30/2019
(PI: Elizabeth Brown PhD)
NIH R01 AR064820
"Association of genetic and autoantibody signatures with SLE clinical course."
This project correlates SLE genotypes and proteonomic markers with disease expression in an SLE cohort.
Overlap: NONE

W. Winn Chatham MD, Co-Principle Investigator 08/18/2014 - 12/31/2015
IPSOS-INSIGHT, LLC
SLE Patient Management Using Simple Disease Assessment Tools in Clinical Practice (MANAGE)
This project is to develop and validate a simplified disease activity measure in systemic lupus.
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 04/11/2013 - 04/10/2016
Bristol Meyers Squibb Corporation
A Phase 3 Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Efficacy and Safety of BMS-188667 (Abatacept) or Placebo on a Background of Mycophenolate Mofetil (MMF) and Corticosteroid in Subjects with Active Class III or IV Lupus Nephritis.
This study examines the effectiveness and safety of adding abatacept to mycophenolate in lupus nephritis.
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 10/01/2014 - 09/30/2016
Celgene Corporation
A Pilot Phase 2, Randomized, Placebo-Controlled, Double-Blind, Study to Evaluate Efficacy, Safety, Tolerability, Pharmacokinetics, Pharmacodynamics and Pharmacogenetics of CC-220 in Subjects with SLE
This study examine the effectiveness and safety of a thalidomide analog in the treatment of lupus.
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 10/22/2013 - 10/21/2016
MedImmune
A Phase 2, Open-Label Extension Study to Evaluate Long-Term Safety of MEDI-546 in Adults with Systemic Lupus Erythematosus
This study examines the effectiveness/safety of targeting the Type I interferon receptor in lupus treatment
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 05/24/2012 - 05/23/2015
GlaxoSmithKline
A Phase 4, Multi-Center, Randomized, Open-Label Study to Evaluate the Effect of BENLYSTA™ (Belimumab; HGS1006) on Vaccine Responses in Subjects with Systemic Lupus Erythematosus (SLE)
This study is to determine whether treatment with belimumab alters primary immune responses
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 07/03/2014 - 01/02/2016
Human Genome Sciences
A Phase 3, Multi-Center, Randomized, Double-Blind, Placebo-Controlled, 52-Week Study to Evaluate the Efficacy and Safety of Belimumab (HGS1006) Administered Subcutaneously (SC) to Subjects with SLE
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 07/03/2014 - 01/02/2016
Human Genome Sciences
A Multi-Center, Continuation Trial of Belimumab (HGS1006, LymphoStat-Ba), a Fully Human Monoclonal Anti-BLyS Antibody, in Subjects with Systemic Lupus Erythematosus (SLE) who Completed the Phase 3 Protocol HGS1006-C1056 in the United States
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 07/29/2014 - 07/28/2019
Human Genome Sciences
A 5-Year Prospective Observational Registry to Assess Adverse Events of Interest and Effectiveness in Adults with Active, Autoantibody-Positive Systemic Lupus Erythematosus Treated with or without Belimumab
Overlap: NONE

Pending Research Support

W Winn Chatham MD, Co-Investigator
P01 AI110366 (Kimberly) 10/01/2015 – 09/31/2020
NIH / NIAID
B cells in SLE: Genetic and Genomic Mechanisms
Core A: Administrative and Recruitment Core (Kimberly)
Antibody and immune complex mediated feedback on B cell function plays an essential in governing B cell biology and host defense against micro-organisms. This project identifies newly appreciated receptors and their genetic variants which provide such feedback for control of B cell activity. Understanding the genetics and epigenetics of such receptors and their downstream partners and targets will identify opportunities for personalized, precision medicine and guide the use of therapeutics.
Overlap: None

Completed Research Support

W. Winn Chatham MD, Site Principle Investigator 07/01/2009 - 06/30/2013
Immune Tolerance Network, NIAID/NIH
ITN034A1: A Randomized, Double-Blind, Controlled, Phase II Multicenter Trial of CTLA4Ig (Abatacept) Plus Cyclophosphamide vs Cyclophosphamide Alone in the Treatment of Lupus Nephritis
The objective of this study is to determine the effectiveness, safety and tolerability of CTLA4 Ig in combination with cyclophosphamide in compared to cyclophosphamide plus placebo in the treatment of lupus nephritis.
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 06/19/2009 - 12/31/2011
Autoimmunity Centers of Excellence, NIAID/NIH
ALE02: Effect of Vitamin D3 on the IFNα Signature in Patients with Systemic Lupus Erythematosus.
The Objective of this protocol was to explore the impact of vitamin D3 supplementation on the expression of an IFNα signature in SLE patients with vitamin D deficiency.
Overlap: NONE

W. Winn Chatham MD, Site Principle Investigator 06/15/2009 - 12/31/2010
Autoimmunity Centers of Excellence, NIAID/NIH
ALN01: A Randomized, Double-Blind, Placebo-Controlled, Phase II, Multi-Center Study for Lupus Nephritis by Inhibition of Tumor Necrosis Factor-a Using Etanercept
The primary objective of this study was to assess the safety and tolerability of etanercept (an anti-TNF therapy) compared to placebo for treatment of active lupus nephritis in subjects receiving standard of care therapy.
Overlap: None

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Cron, Randall Q.

eRA COMMONS USER NAME (credential, e.g., agency login): RQCRON

POSITION TITLE: Professor of Pediatrics & Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of California, Riverside	BS (honors)	06/1985	Biomedical Sciences
National Institutes of Health, Bethesda, MD	Pre-doctoral Fellow	09/1987	(HHMI Scholar)
University of Chicago, IL	PhD	09/1990	Immunology
University of California, Los Angeles	MD	06/1991	Medicine
Stanford Children's Hospital, Stanford, CA	Residency	06/1994	Pediatrics
University of Washington, Seattle, WA	Fellowship	06/1997	Pediatric Rheumatology
Stanford University School of Medicine	Post-doctoral Fellow	10/1999	(HHMI Fellow)

A. Personal Statement

My research training began at the NIH (as a HHMI scholar during medical school) and continued with a PhD in Immunology following my mentor, Dr. Jeff Bluestone, to the University of Chicago, where I characterized murine peripheral TCR$\gamma\delta$ T cell repertoire, phenotype, and effector function. I completed medical school at UCLA and did a Pediatrics residency at Stanford where I gained an interest in Rheumatology (immune system-based disorders). This was followed by a fellowship at the University of Washington in Pediatric Rheumatology. I returned to the lab to study human CD4 T cell effector function regulated at the transcriptional level with Dr. David Lewis. Following Dr. Lewis to Stanford, I completed an HHMI post-doctoral fellowship exploring CD154 dysregulation in systemic lupus erythematosus, as well as HIV-1 transcriptional regulation by NFAT transcription factors. This was the basis for my own lab's studies at the University of Pennsylvania. I was recruited to UAB in 2007 to begin a division of Pediatric Rheumatology. In general, my lab studies CD4 T cell transcription in primary human CD4 T cells. As such, we have adapted or developed an array of useful methodologies/technologies for studying gene transcription (CD154, HIV-1, and others) in primary murine and human CD4 T cells. We are currently defining the hCD154 *cis*-elements and epigenetic changes responsible for CD154 hyper-expression in lupus CD4 T cells. We are also studying the role of the gut microbiota, and the associated host adaptive immune response (both B cells and T cells) in patients with spondyloarthritis. In addition, we are exploring the role of the Treg transcription factor, FoxP3, for its ability to inhibit HIV-1 transcription, and for Tregs to inhibit HIV-1 expression in neighboring CD4 T cells and macrophages. Lastly, we are studying the effect of macrophage activation syndrome (MAS) patient mutations for their ability to decrease perforin-mediated cytolytic activity in NK cells. Many MAS patients have single copy mutations in familial hemophagocytic lymphohistiocytosis genes, and these mutations function as partial dominant negative proteins to inhibit cytolysis. Clinically, I have developed interests in and researched the diagnosis and treatment of both MAS, and temporomandibular joint arthritis in children with chronic arthritis. I have trained many undergraduate and graduate students, as well as 17 research/clinical fellows for both clinical and basic science research projects. Most all of them have had several first author publications in reputable peer-reviewed scientific journals.

B. Positions and Honors

Positions:

1998-1999 Physician and Clinical Instructor, Dept. of Pediatrics, Stanford University, Stanford, CA
1999-2007 Assist. Prof. of Pediatrics, Dept. of Pediatrics, U. of Penn. & Children's Hospital of Philadelphia, PA
2007-2009 Assoc. Prof. of Pediatrics, Dept. of Pediatrics, University of Alabama at Birmingham, AL
2007-present Director, Pediatric Rheumatology, Children's Hospital of Alabama, Birmingham, AL
2008-present Director, Pediatric Rheumatology Infusion Center, Children's Hospital of Alabama, Birmingham, AL
2009-present Director, Pediatric Rheumatology Fellowship Program, University of Alabama at Birmingham, AL
2009-present Tenured Professor of Pediatrics & Medicine, University of Alabama at Birmingham, AL

Editorial Boards:

2002-2006 Editorial Board, *Clinical and Diagnostic Laboratory Immunology*
2002-2006 Editorial Board, Co-founder and Basic Science Editor, *Pediatric Rheumatology Online Journal*
2002-present Editorial Board, *Genes and Immunity*
2005-2008 Editorial Board, Associate Editor, Section Editor (2014-2018), *Journal of Immunology*
2006-2010 Editorial Board, *Clinical and Vaccine Immunology*
2006-2009 Editorial Board, Advisory Editor, *Arthritis and Rheumatism*
2007-present Editorial Board, Section Editor, Senior Editor (2008-present) *Pediatric Rheumatology*
2015-2017 Editorial Board, *Arthritis Care and Research*

Recent Grant Review Committees:

2013-2015 American College of Rheumatology (ACR) Research and Education Foundation (REF) basic science study section C, Chair/grant reviewer
2013 NIH/NIAID, "Autoimmunity Centers of Excellence" and "Basic Research Program", ACE grant
2014 NIH/NIAID/CFAR, "Creative and Novel Ideas in HIV Research (CNIHR) Awards Program"
2015 NIH/NIAMS Special Emphasis Panel/Scientific Review Group, "Hypersensitivity and Immune-Mediated Diseases"

Honors:

1985 Watkins Award (outstanding male graduate), University of California at Riverside
1985 Summer Externship/Scholarship, Riverside Medical Clinic/University of California at Riverside
1986 Graduate Scholarship, The International Fraternity of Phi Gamma Delta
1986 Research Scholar, Howard Hughes Medical Institute/National Institutes of Health
1988 Lucille P. Markey Charitable Trust recipient, University of Chicago
1988 Dean's Fund recipient, University of Chicago
1991 Outstanding Performance in the Field of Immunology, University of Chicago
1996 Postdoctoral Research Fellowship, Howard Hughes Medical Institute
1997 Travel Award, American College of Rheumatology Research & Education Foundation
1997 Senior Scholar Award, American College of Rheumatology/Merck
1998 Child Health Research Center Scholar, Stanford University Medical Center
1999 Arthritis Foundation Investigator Award
1999 Elizabeth Glaser Pediatric AIDS Foundation Scholar
2000 Child Health Research Center Scholar, Children's Hospital of Philadelphia (CHOP)
2000 Junior Clinical Investigator Award, General Clinical Research Center, CHOP
2001 Junior Faculty Exchange Program with EULAR, American College of Rheumatology/Merck
2001 Mary L. Smith Charitable Trust grant recipient
2002 American Association of Immunologists Junior Faculty Travel Award
2002 Arthritis National Research Foundation grant recipient
2002 Dorough Lupus Foundation grant recipient
2002 Society for Pediatric Research, Young Investigator Travel Award, and elected member
2003 Travel Award, Arthritis Research Conference
2004 Nickolett Family Awards Program for JRA Research grant recipient
2004 Ethel Brown Foerderer Fund for Excellence Fellow
2005 Nickolett Family Awards Program for JRA Research grant recipient
2006 American Association of Immunologists Junior Faculty Travel Award
2006 Keynote Speaker, UMDNJ Department of Medicine Residents Research Day
2006 Kassie McMullen Biglaw Memorial Research Award, Lupus Foundation of America

2007 Arthritis Foundation, Alabama Chapter Endowed Chair in Pediatric Rheumatology, UAB
2007 Invited Lecturer, 52nd Annual Lowe Conference on Rheumatic Diseases, Camp McDowell, AL
2008 Invited Lecturer, ACR State-of-the-Art Clinical Symposium, Chicago, IL
2010 Ralph V. Platou, MD, Lecturer, Pediatric Grand Rounds, Tulane School of Medicine, New Orleans
2011 Invited Lecturer, Venenum Distinguished Speaker Seminar Series, HUMIGEN, Hamilton, NJ
2011 American College of Rheumatology REF/AMGEN Pediatric Rheumatology Visiting Professor
2011 Nominee, Council member of Society for Pediatric Research (SPR)
2011 UAB Health Care Leadership Academy, selected member
2012 Alabama Society for Rheumatic Diseases, elected as President
2012 Senior Host, ACR/EULAR Exchange Program
2012 selected by peers as "Super Doctor" (~top 5% of physicians in region) [superdoctors.com]
2012 Department of Pediatrics Excellence in Teaching Award
2013 Rud Polhill/KPRI grant recipient
2013 selected as Top Rheumatologist in Birmingham, AL by Internat. Assoc. of Health Care Profes.
2013 Department of Pediatrics Excellence in Teaching Award
2013 Invited Lecturer, 10th Annual Lectureship in Oral & Maxillofacial Surgery, UAB
2014 American College of Rheumatology RFF/AMGEN Pediatric Rheumatology Visiting Professor
2014 Invited Lecturer, EuroTMjoint Meeting, Tampere, Finland
2014 Department of Pediatrics Excellence in Medical Education Award
2014 Invited Lecturer, 30th Annual Histiocyte Society meeting, Toronto, ON
2015 American Pediatric Society (APS), elected member
2015 Invited Lecturer, 8th Annual Conference of the Rheumatology Nurses Society, Orlando, FL
2015 selected as Castle Connolly Top Doctor, America's Top Doctors®

C. Contribution to Science

1. Identification and characterization of murine peripheral TCRγδ–expressing T cells. During my PhD, we were first to identify TCRγδ T cells in the peripheral lymphoid organs. We identified novel TCRγδ proteins, characterized their cell surface phenotype (including the first ever CD8α+, CD8β- cells), and reported the first cytokines expressed by this novel T cell subset. We were also the first to report on ligands for TCRγδ receptors, namely both non-classical and classical MHC proteins.

a. Matis LA, **Cron R**, Bluestone JA. Major histocompatibility complex-linked specificity of gamma delta receptor-bearing T lymphocytes. *Nature*. 1987;330:262-4.
b. **Cron RQ**, Koning F, Maloy WL, Pardoll D, Coligan JE, Bluestone JA. Peripheral murine CD3+, CD4-, CD8- T lymphocytes express novel T cell receptor gamma delta structures. *J Immunol*. 1988;141:1074-82.
c. **Cron RQ**, Gajewski TF, Sharrow SO, Fitch FW, Matis LA, Bluestone JA. Phenotypic and functional analysis of murine CD3+,CD4-,CD8- TCR-gamma delta-expressing peripheral T cells. *J Immunol*. 1989;142:3754-62.
d. **Cron RQ**, Ezquerra A, Coligan JE, Houlden BA, Bluestone JA, Maloy WL. Identification of distinct T cell receptor (TCR)-gamma delta heterodimers using an anti-TCR-gamma variable region serum. *J Immunol.* 1989;143:3769-75.

2. Transcriptional and post-transcriptional dysregulation of CD154 and its role in systemic lupus. We were first to clone and characterize the CD154 (CD40-ligand) transcriptional promoter, demonstrating its cyclosporine A sensitivity via NFAT transcription factor engagement of the proximal promoter. Using DNase I hypersensitivity site mapping, we identified several transcriptional regulatory elements within and around the *hCD154* gene locus. We further characterized a number of transcription factors required for optimal CD154 expression. In a collaborative effort, we identified and characterized a novel T cell specific RNA binding protein which uniquely regulated CD154 mRNA stability. Studying pediatric lupus patients, we identified both NFAT2 and STAT5 transcription factors as responsible for prolonged CD154 expression on lupus CD4 T cells.

a. Hamilton BJ, Genin A, **Cron RQ**, Rigby WF. Delineation of a novel pathway that regulates CD154 (CD40 ligand) expression. *Mol Cell Biol*. 2003;23:510-25.
b. **Cron RQ**, Bandyopadhyay R, Genin A, Brunner M, Kersh GJ, Yin J, Finkel TH, Crow MK. Early growth response-1 is required for CD154 transcription. *J Immunol*. 2006;176:811-8.
c. Mehta J, Genin A, Brunner M, Scalzi LV, Mishra N, Beukelman T, **Cron RQ**. Prolonged expression of CD154 on CD4 T cells from pediatric lupus patients correlates with increased CD154 transcription,

increased nuclear factor of activated T cell activity, and glomerulonephritis. *Arthritis Rheum*. 2010;62:2499-509.

d. Lowe RM, Genin A, Orgun N, **Cron RQ**. IL-15 prolongs CD154 expression on human CD4 T cells via STAT5 binding to the CD154 transcriptional promoter. *Genes Immun*. 2014;15:137-44.

3. Host factor transcriptional regulation of HIV-1 expression and latency in CD4 T cells. We, along with other labs, simultaneously identified NFAT transcription factor binding sites embedded within the critically important dual proximal NFκB binding sites in the HIV-1 long terminal repeat (LTR/viral transcriptional promoter). We further characterized a variety of CD4 T cell host transcription factors (STAT5, FOXP3, c-maf) that also regulated HIV-1 transcription in primary human CD4 T cells. In collaboration with the lab of Olaf Kutsch (UAB), we further characterized a critical viral sequence just upstream of the HIV-1 LTR NFAT/NFκB binding sites which regulates HIV-1 latency establishment.

a. **Cron RQ**, Bartz SR, Clausell A, Bort SJ, Klebanoff SJ, Lewis DB. NFAT1 enhances HIV-1 gene expression in primary human CD4 T cells. *Clin Immunol*. 2000;94:179-9125.
b. Selliah N, Zhang M, White S, Zoltick P, Sawaya BE, Finkel TH, **Cron RQ**. FOXP3 inhibits HIV-1 infection of CD4 T-cells via inhibition of LTR transcriptional activity. *Virology*. 2008;381:161-7.
c. Duverger A, Jones J, May J, Bibollet-Ruche F, Wagner FA, **Cron RQ**, Kutsch O. Determinants of the establishment of human immunodeficiency virus type 1 latency. *J Virol*. 2009;83:3078-93.
d. Zhang M, Clausell A, Robinson T, Yin J, Chen E, Johnson L, Weiss G, Sabbaj S, Lowe RM, Wagner FH, Goepfert PA, Kutsch O, **Cron RQ**. Host factor transcriptional regulation contributes to preferential expression of HIV type 1 in IL-4-producing CD4 T cells. *J Immunol.* 2012;189:2746-57.

4. Diagnosis, genetic susceptibility, and cytolytic defects in macrophage activation syndrome (MAS). MAS is an often fatal complication of infectious, rheumatology, and oncologic conditions. We first reported the concept that MAS is integral to the disease process in a large portion of children with the autoinflammatory condition, systemic juvenile idiopathic arthritis (sJIA). In collaboration with Dr. Angelo Ravelli (Genoa), we have also been instrumental in developing a novel set of criteria for diagnosing MAS in the setting of sJIA. We have demonstrated the effectiveness of recombinant human interleukin-1 receptor antagonist in treating refractory cases of MAS in children with sJIA and other disorders. We are also exploring genetic mutations from MAS patients that disrupt perforin-mediated cytolytic activity of NK cells and CD8 T cells. We are exploring and pushing the concept that these mutations are relatively common in MAS patients and alter cytolytic activity, triggering MAS via a cytokine storm, via dominant negative mechanisms.

a. Behrens EM, Beukelman T, Paessler M, **Cron RQ**. Occult macrophage activation syndrome in patients with systemic juvenile idiopathic arthritis. *J Rheumatol*. 2007;34:1133-8.
b. Miettunen PM, Narendran A, Jayanthan A, Behrens EM, **Cron RQ**. Successful treatment of severe paediatric rheumatic disease-associated macrophage activation syndrome with interleukin-1 inhibition following conventional immunosuppressive therapy: case series with 12 patients. *Rheumatology (Oxford).* 2011;50:417-9.
c. Minoia F, Davì S, Horne A, Demirkaya E, Bovis F, Li C, Lehmberg K, Weitzman S, Insalaco A, Wouters C, Shenoi S, Espada G, Ozen S, Anton J, Khubchandani R, Russo R, Pal P, Kasapcopur O, Miettunen P, Maritsi D, Merino R, Shakoory B, Alessio M, Chasnyk V, Sanner H, Gao YJ, Huasong Z, Kitoh T, Avcin T, Fischbach M, Frosch M, Grom A, Huber A, Jelusic M, Sawhney S, Uziel Y, Ruperto N, Martini A, **Cron RQ**, Ravelli A; Pediatric Rheumatology International Trials Organization; Childhood Arthritis and Rheumatology Research Alliance; Pediatric Rheumatology Collaborative Study Group; Histiocyte Society. Clinical features, treatment, and outcome of macrophage activation syndrome complicating systemic juvenile idiopathic arthritis: a multinational, multicenter study of 362 patients. *Arthritis Rheumatol.* 2014;66:3160-9.
d. Zhang M, Behrens EM, Atkinson TP, Shakoory B, Grom AA, **Cron RQ**. Genetic defects in cytolysis in macrophage activation syndrome. *Curr Rheumatol Rep*. 2014;16:439-46.

5. Diagnostic imaging and intra-articular treatment of TMJ arthritis in children with chronic arthritis. Using MRI with contrast imaging, we have identified the temporomandibular joint (TMJ) as one of the most commonly arthritic joints in children with chronic arthritis. We have developed and validated an MRI scoring systems for tracking TMJ arthritis progression and response to therapy. We were the first to report the use of intra-articular long-acting corticosteroids as effective therapy in a cohort of children with chronic arthritis. Similarly, we were first to report the risks and benefits of intra-articular infliximab (a tumor necrosis factor inhibitor) in treating refractory TMJ arthritis in a cohort of children with chronic arthritis.

a. Arabshahi B, Dewitt EM, Cahill AM, Kaye RD, Baskin KM, Towbin RB, **Cron RQ**. Utility of corticosteroid injection for temporomandibular arthritis in children with juvenile idiopathic arthritis. *Arthritis Rheum*. 2005;52):3563-9.
b. Weiss PF, Arabshahi B, Johnson A, Bilaniuk LT, Zarnow D, Cahill AM, Feudtner C, **Cron RQ**. High prevalence of temporomandibular joint arthritis at disease onset in children with juvenile idiopathic arthritis, as detected by magnetic resonance imaging but not by ultrasound. *Arthritis Rheum*. 2008;58:1189-96.
c. Stoll ML, Morlandt AB, Teerawattanapong S, Young D, Waite PD, **Cron RQ**. Safety and efficacy of intra-articular infliximab therapy for treatment-resistant temporomandibular joint arthritis in children: a retrospective study. *Rheumatology (Oxford*). 2013;52:554-9.
d. Vaid YN, Dunnavant FD, Royal SA, Beukelman T, Stoll ML, **Cron RQ**. Imaging of the temporomandibular joint in juvenile idiopathic arthritis. *Arthritis Care Res (Hoboken).* 2014;66:47-54.

131 PUBMED cited articles:
http://www.ncbi.nlm.nih.gov/sites/myncbi/randall.cron.1/bibliography/47798344/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support (last 3 years):

Genetics of Macrophage Activation Syndrome
Principal Investigator: Randy Q. Cron, M.D., Ph.D.
Agency: Kaul Pediatric Research Institute
Type: Pilot Grant Period: 2/1/13 to 1/31/16 (no cost extension)
This study analyzes genetic mutations in patients with MAS and the influence of these mutations on cytolysis.

Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis
Co-Investigator: Randy Q. Cron, M.D., Ph.D. (PI – Lou Bridges, M.D., Ph.D., Project PI – Chuck Elson, M.D.)
Agency: NIH/NIAMS
Type P60 AR064172 Period: 10/1/13 to 9/30/18
This study explores antibody and T cell responses to gut bacteria in those with spondyloarthritis.

Treatment of Macrophage Activation Syndrome with Anakinra
Principal Investigator: Randy Q. Cron, M.D., Ph.D.
Agency: Swedish Orphan Biovitrum
Type: Investigator initiated Period: to be determined
This is a randomized, blinded placebo controlled trial to study early use of anakinra in treating MAS.

Completed Research Support (last 3 years):

Lymphoma Risk in SLE: A Consequence of Immune Suppression or Stimulation?
Co-Investigator: Randy Q. Cron, M.D., Ph.D. (PI – Ann Clark, M.D., M.Sc.)
Agencies: Arthritis Society of Canada & National Institutes of Health/NIAMS
Period: 7/1/09 to 6/30/14
This study attempts to determine if SLE disease activity is associated with lymphoma development.

Development of new diagnostic classification criteria for macrophage activation syndrome complicating systemic-onset juvenile idiopathic arthritis
Co-Principal Investigator: Randy Q. Cron, M.D., Ph.D.
Agencies: American College of Rheumatology (ACR) & European League Against Rheumatism (EULAR)
Type: Planning grant Period: 7/1/13 to 6/30/14
This is to develop classification criteria for macrophage activation syndrome in children with systemic arthritis.

Macrophage Activation Syndrome Biomarkers in Systemic Juvenile Idiopathic Arthritis
Co-Investigator: Randy Q. Cron, M.D., Ph.D. (PI – Alexei Grom, M.D.)
Agency: National Institutes of Health/NIAMS
Type: P60 Period: 7/1/08 to 6/30/13
This grant examines the diagnostic value of genetic (Munc13-4 gene polymorphisms) and serologic (sCD163 and sIL2Rα) markers of MAS.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Cui, Xiangqin

eRA COMMONS USER NAME (credential, e.g., agency login): xiancui

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Nankai University, Tianjin	BS	07/1991	Biology
Nankai University, Tianjin	MS	07/1991	Genetics
Iowa State University	PHD	08/2001	Genetics
The Jackson Laboratory, Bar Harbor, ME	Postdoctoral Fellow	07/2004	Statistical Genetics

A. Personal Statement

I was initially trained as a lab/field geneticist and later on moved into statistical genetics through my postdoctoral training. After joining the UAB Department of Biostatistics, I have been conducting research in genome-wide studies, such as gene expression (both arrays and next-generation sequencing), DNA methylation, metabolomics, and microbiome with more than 50 publications in these areas. I was the PI of a NIH R13 grant for a national conference on next generation sequencing and served as co-investigators on many grants. More recently, I transitioned into the PI for the methodology core in NIAMS Multidisciplinary Clinical Research Center (MCRC) for study design, data analysis, investigator development, and research base education. I have mentored two PhD students and numerous master students. I also run two NIH funded short courses with Dr. Hemant Tiwari.

B. Positions and Honors

Positions and Employment

2004 – 2009 Assistant Professor, University of Alabama at Birmingham, Department of Medicine, Birmingham, AL
2004 - 2012 Assistant Professor, University of Alabama at Birmingham, Department of Biostatistics, Birmingham, AL
2012 - Associate Professor, University of Alabama at Birmingham, Department of Biostatistics, Birmingham, AL

Other Experience and Professional Memberships

2002 - Member, Member, American Statistical Association (ASA)
2007 - Member, International Society for Computational Biology (ISCB)
2007 - 2011 Member, American Association for the Advancement of Science (AAAS)
2008 - 2011 Appointed microarray referee, Plant Cell
2009 - Scientific Advisor, CAMDA (Critical Analysis of Microarray (Massive) Data Analysis
2009 - Associate Editor, Frontiers in Epigenomics
2014 - Associate Editor, PeerJ

Honors

1996	Phi Kappa Phi, Iowa State University Chapter
1998	Fung Fellowship, Iowa State University
2002	Runner-up, CAMDA (Critical Assessment of Microarray Data Analysis) competition
2012	Best Paper Award, Science Unbound Foundation

C. Contribution to Science

1. Development of New Statistical Methods for Transcriptomics. For more than a decade, I have been conducting methodology research for high-dimension transcriptomics profiling. Together with collaborators, we have published some high impact papers on the design and analysis for high-throughput studies, especially on the variance shrinkage and data normalization.
2. Application Research in Kidney Diseases. For the past 10 years, I have been working closely with investigators in kidney disease research, especially polycystic kidney disease. We have conducted genetic studies in both human ang mouse models for identifying modifier genes and for disease progression mechanisms.
3. Epigenetics/Epigenomics Research. Since my graduate training, epigenetics has been an important part of my research. We showed that DNA methylation plays an important row in transposon silencing which results in mutant phenotype reverting back to normal. More recently, high-throughput profiling of DNA methylation analysis and miRNA analysis become an important part of my collaboration research.
4. Cancer Research. Cancer has been par of my research for both methodology and application. We recently completed a contract for genomic/transcriptomic characterization of GM=BM xenografts for establishing their utility.
5. Collaboration Research in Rheumatoid Arthritis (RA). For the past few years, I have been heavily involved in the RA research, especially in the transcriptomic profiling in the MCRC P60 grant. More recently, I became the PI of the methodology core to provide methodology support for the projects and the research base together with providing education for the research community.

D. RESEARCH SUPPORT

Ongoing Research Support

R01 CA186646, NIH/NCI 2014/07/01-2019/03/31
Brown, Elizabeth (PI)
Molecular characterization of myeloma and related asymptomatic precursor states
Molecular characterization of myeloma and related asymptomatic precursor states The goal of this investigation is to identify and characterize the contribution of microRNAs (miRNA) in serum exosomes on the risk of multiple myeloma, and within the spectrum of its progression, the risk of asymptomatic precursor states, including monoclonal gammopathy of undetermined significance and smoldering myeloma.
Role: Co-Investigator

R21 CA182861, NIH/NCI 2014/07/01-2019/03/31
Brown, Elizabeth (PI)
The Role of Exosome Heparanase and miRNAs as Biomarkers for Myeloma
The goal of the proposed Exploratory/Developmental investigation is to characterize the role of heparanase, a potent tumor regulator, and exosome miRNAs as biomarkers for early detection, classification and progression of individuals at highest risk for developing multiple myeloma from asymptomatic precursor states
Role: Co-Investigator

R01 CA178441, NIH/NCI 2014/04/01-2019/02/28
Tollefsbol, Trygve (PI)
Combinatorial Epigenetic-Based Prevention of Breast Cancer
Breast cancer is a significant health problem worldwide and is a leading cause of cancer morbidity and mortality. The overall goal of this application is to develop a combinatorial dietary approach consisting of green

tea polyphenols and sulforaphane-rich broccoli sprouts for efficacious and safe use in preventing the epigenetic aberrations of breast cancer.
Role: Co-Investigator

P30 DK079337, NIH/NIDDK 2007/07/01-2018/07/31
Agarwal, Anupam (PI)
UAB-UCSD O'Brien Core Center for Acute Kidney Injury Research
Core Center will establish an interdisciplinary center including genetics, genomics, epigenetics, animal models, and clinical trials in AKI-related research,
Role: Co-Investigator

P60 AR064172, NIH/NIAMS 2008/09/01-2018/06/30
Cui, Xiangqin (PI)
Multidisciplinary Clinical Research Center - Methods Core
The objectives of the Methodology Core are: (1) to conduct cutting-edge research in arthritis is and MSD by providing statistical, epidemiological, outcomes, and health service expertise and leadership; (2) to support data collect ion, management, and analytic efforts of the four MCRC projects; (3) to develop original research in methodology applicable to clinical research in arthritis and MSD; and (4) to nurture and support new investigators in arthritis and MSD.
Role: PI

R01DK097107, NIH/NIDDK 2013/08/01-2016/06/30
Mannon, Peter (PI)
Ulcerative Colitis – Regulation of the IL-13 Receptor System
Role: Co-Investigator

R01 HL109785, NIH/NHLBI 2012/04/01-2016/03/31
Dell'Italia, Louis (PI)
Mitochondrial Haplotype Influences LV Dysfunction in Heart Failure.
Mitochondrial DNA Background Drives Disease Susceptibility and Gene Expression
Role: Co-Investigator

R21 NS085497, NIH/NINDS 2013/09/01-2015/08/30
King, Peter (PI)
Molecular Signatures of Amyotrophic Lateral Sclerosis in Skeletal Muscle Role:
Co-Investigator

R25 GM093044 , NIH/NIGMS 2010/08/01-2015/07/31
Tiwari, Hemant (PI)
Short Course on Statistical Genetics and Genomics
To offer an annual statistical genetics short course to be focused on applying advanced quantitative approaches to the search for genes that predispose complex human disorders and quantitative traits.
Role: Co-Investigator

Completed Research Support

UL1 TR0000165, NIH/NCRR 2008/05/19-2015/04/30
Kimberly, Robert (PI)
UAB Center for Clinical and Translational Science
To 1) establish a centralized communication structure to enhance collaboration between our research centers and programs across all fields of clinical and translational research, including pediatric and community groups; 2) t rain and develop clinical and translational investigators to become principal investigators and productive members of research teams; 3) facilitate utilization of existing resources and provide new resources; 4) emphasize novel interdisciplinary research that is important given our geographic location and history (i.e.,

health disparities research) and that utilizes our unique strengths (i.e., outcomes research and drug discovery); and 5) assess the progress of the CCT S toward it' s goals.
Role: PI

R13 HG005792 2011/01/21-2012/12/31
National Human Genome Research Institute (NHGRI)
Cui, Xiangqin (PI)
Statistical Analyses for Next Generation Sequencing
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Cutter, Gary R.

eRA COMMONS USER NAME (credential, e.g., agency login): cutterg

POSITION TITLE: Professor of Biostatistics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Missouri, Columbia, MO	B.A.	1970	Mathematics
University of Texas, Houston, TX	M.S.	1971	Biometry
University of Texas, Houston, TX	Ph.D.	1974	Biometry

A. Personal Statement

I am Professor of Biostatics in the section on Research Methods and Clinical TriaIs in Department of Biostatistics at the UAB School of Public Health with a major interest in design, analysis and interpretation of clinical trials, epidemiologic studies and evaluation research. I am the director of the Biostatistics/Bioinformatics Resource (BBR) Core Center for Acute Kidney Injury Research, UAB-USC and Co-Director of the Center For Aids Research, Biostatistics Core, and the PI of several Coordinating Centers. I am currently serving on the Protocol Review Committee for the Bone Marrow Transplant Program at NHLBI and a member of numerous Data and Safety Monitoring Committees for NIH and Industry. I have has served as an advisor to 6th & 7th grade science classes to the Orinda Intermediate Middle School; numerous masters, doctoral and post-doctoral students in Biostatistics and mentored 2 students to graduation with PhDs this past year; I have offered short courses to faculty and fellows in numerous disciplines from neonatology, neurology, optometry, rehabilitation medicine, etc. I have served as the PI and director of an NINDS-funded T32 pre- and post-doctoral training program for biostatistics and as Associate Director, UAB Biostatistics Pre-Doctoral Training Program, NHLBI. I also mentor, including primary mentor, on various K-awards for clinicians in a broad array of medical specialties.

B. Positions and Honors

2000-2013 Director, Nitric Oxide in the Prevention of CLD in Premature Infants, Coordinating Center
2002-present Professor (Adjunct) of Medicine, University of Nevada, Reno
2002-2005 Director, Center for Research Design and Statistical Methods, University of Nevada, Reno
2002-2005 Director (Adjunct), Research Methods and Biometry, The Cooper Institute, Denver, CO
2003-present Professor of Biostatistics, Head, RMCT, University of Alabama at Birmingham, Birmingham, AL.
2003-present Director, Statistical Coordinating Center, Combination Therapy in MS Trial (CombiRx).
2005-present Principal Investigator and Director Coordinating Center, Thymectomy Plus Prednisone versus Prednisone alone, a multinational trial.
2005-Present Associate Director, UAB Biostatistics Pre-Doctoral Training Program, NHLBI.
2007-Present Director, UAB Biostatistics Pre/Post-Doctoral Training Program, NINDS
2008-2009 Member, Clinical Advisory Panel, NINDS.
2008-Present Scientific Advisory Board, Canine Comparative Oncology and Genomics Consortium
2008-Present Member, Scientific Advisory Board, Implementing Systemic Interventions to Close te Discovery-Delivery Gap, UNC 1RO1 CA124402-01
2008-Present Director, Biostatistics/Bioinformatics Resource (BBR) Core Center for Acute Kidney Injury Research, UAB-USCD
2008-Present Director, Center For Aids Research, Biostatistics Core, UAB.

2008-Present Director, Statistical Coordinating Center, Collaborative Antiviral Study Group (CASG)
2009-Present Director, North American Research Committee on MS (NARCOMS) Data Center
2010-Present Director, Statistical Coordinating Center, Cesarean Section Optimal Antibiotic Prophylaxis (C/SOAP) Trial
2010-Present Editorial Board, Multiple Sclerosis
2010-Present Kidney Safety Project Team Member NIH Foundation
2010-Present US Neurology - Editorial Board
2010-Present Executive Committee UAB CCTS (CTSA)
2010-2011 NINDS Clinical Trials Course Invited Faculty
2011-Present Deputy Director, Neurofibromatosis Consortium Operations Center
2014 2014 Distinguish Faculty Investigator Award
2014-Present Director, UAB STI Cooperative Research Center (CRC), Biostatistics Core
2014-Present Director and PI, Chronic Hypertension and Pregnancy Coordinating Center (NHLBI)

C. Contribution to Science (selected publications from over 480)

My contributions to science have been to enhance perspective: my own and others as I assist them in moving their research forward. As a collaborative biostatistician, I remind others of the process and explain how advances are made; through hard work, replication and validation. My contributions span multiple diseases, which I will summarize and reference in more or less chronological order below.

My initial efforts were as Deputy Director of the Hypertension Detection and Followup Program. This seminal study was key in establishing the mortality benefits of treating hypertension. Below are some of the publications that resulted from my cardiovascular contributions.

1. HDFP Cooperative Study Group. Mild hypertensives in the hypertension detection and follow-up program. *Ann NY Acad Sci* 304:254-266, 1978.
2. Shulman N, **Cutter G**, Daugherty R, Sexton M, Pauk G, Taylor MJ, Tyler M. Correlates of attendance and compliance in the hypertension detection and follow-up program. *Controlled Clinical Trials* 3(1):13-27, March 1982.
3. Oberman A, **Cutter G**. Issues in the natural history and treatment of coronary heart disease in black populations: surgical treatment. *Am Heart J* 108(3 Pt 2):688-694, Sept 1984.
4. **Cutter G**, Oberman MK, Kimmerling R, Oberman A. The natural history of smoking cessation among patients undergoing coronary arteriography. *J Cardiopulmonary Rehabilitation* 7:332-340, 1985.

My next thematic contribution was and is in maternal/fetal medicine. These are both clinical trials and observational studies.

1. Cassell GH, Waites KB, Crouse DR, Rudd PT, Cannupp KC, Stagno S, **Cutter GR**. Association of Ureaplasma urealyticum infection of the lower respiratory tract with chronic lung disease and death in very low birthweight infants. *Lancet* 2(8605):240-245, July 30, 1988.
2. Malloy M, **Cutter G**, et. al. (Umbilical Artery Catheter Trial Study Group). Relationship of intraventricular hemorrhage or death with the level of umbilical artery catheter placement: a multicenter randomized clinical trial. *Pediatr* 90(6):881-887, 1992.
3. Malloy MH, **Cutter GR**. The association of heparin exposure with intraventricular hemorrhage among very low birth weight infants. *J Perinatol* 15(3):185-191, May 1995.
4. Caufield PW, **Cutter GR**, Dasanayake AP. Initial acquisition of mutans streptococci by infants: evidence for a discrete window of infectivity. *J Dent Res* 72(1):37-45, Jan 1993.

My contributions to the science of coordinating centers is an important aspect of my career. Some of these contributions are illustrated in work below

1. **Cutter GR**, Blanton MM, Perkins L. Distributed data analysis in large scale trials: Should you or shouldn't you? American Statistical Association Proceedings of the Statistical Computing Section. *American Statistical Association*, pp 78-82, 1985.

2. Perkins LL, **Cutter GR**, Wagenkencht LE, Savage PJ, Dyer AR, Birch RE. Distributed data analysis in multicenter studies: The CARDIA study. *Controlled Clinical Trials* 13(1):80-90, Feb 1992.
3. **Cutter GR**, St. Jeor ST, Brunner RL, Wolfe, Pam, Foreyt JP, Dyer AR, Brownell KD. Methodological Issues in Weight Cycling. *Ann Behavioral Medicine* 18(4)280-289, 1996
4. Kinsella JP, **Cutter GR**, Walsh WF, Gerstmann DR, Bose CL, Hart C, Sekar KC, Auten RL, Bhutani VK, Gerdes JS, George TN, Southgate WM, Carriedo H, Couser RJ, Mammel MC, Hall DC, Pappagallo M, Sardesai S, Strain JD, Baier M, Abman SH. Early inhaled nitric oxide therapy in premature newborns with respiratory failure. N Engl J Med. 2006 Jul 7; 355(4):354-64.

Probably my greatest contributions have been in multiple sclerosis. I led the development of the multiple sclerosis functional composite (MSFC) and have contributed to many clinical trials and epidemiological studies in MS.

1. Rudick RA, **Cutter G**, Reingold S. The multiple sclerosis functional composite: a new clinical outcome measure for multiple sclerosis trials. Mult Scler. 2002 Oct;8(5):359-65.
2. Rudick RA, **Cutter G**R, Baier M, Weinstock-Guttman B, Mass MK, Fisher E, Miller DM, Sandrock AW. Estimating long-term effects of disease-modifying drug therapy in multiple sclerosis patients. Mult Scler. 2005 Dec;11(6):626-34.
3. Morgan C, Aban I, Katholi C, **Cutter G**. Modeling lesion counts in multiple sclerosis when patients have been selected for baseline activity. Mult Scler. 2010 Aug: 16(8):926-34. PMID20562161
4. **Cutter GR**, Stüve O. Does risk stratification decrease the risk of natalizumab-associated PML? Where is the evidence? Mult Scler. 2014 May 8. [Epub ahead of print] PubMed PMID: 24812045.

Research Support

ACTIVE

U01 NS 042685 (Cutter) 09/23/2005 – 08/31/2015
NIH/NINDS
Thymectomy Plus Prednisone vs. Prednisone Alone in NonThymomatous Myasthenia Gravis
This multinational clinical trial aims to assess the utility of thymectomy in treating nonthymomatous Myasthenia Gravis patients comparing surgery plus medications versus medications alone.

P30 AI027767 (Saag, M.) 06/01/2014 – 05/31/2019
NIH/NIAID
UAB Center for Aids Research
This CFAR is organized as a partnership between the University of Alabama at Birmingham and the Southern Research Institute. The primary purpose of this partnership is to generate interdisciplinary AIDS research efforts. This Center is responsible for planning, evaluating, managing and documenting a broad array of research activities within two institutions. Particular emphasis is placed upon linking clinical and basic science studies through the use of shared facilities and to translate as quickly as possible fundamental knowledge about AIDS and its related disorders into clinical treatment and prevention programs.

U01 HL119242 (Cutter) 09/01/2014 – 05/31/2020
NIH/NHLBI
Chronic Hypertension and Pregnancy (CHAP): Data Coordinating Center
We propose a large pragmatic multi-center randomized trial of pregnant women with mild chronic hypertension to evaluate the benefits and harms of antihypertensive therapy to a goal <140/90 mmHg (as recommended for the general population in the US) compared with ACOG's current policy of expectant management of mild chronic hypertension in pregnancy. The trial will be conducted in 12 experienced research-oriented Ob/Gyn departments (including 25 clinical sites) in the United States. The monitoring plan will include a pre-specified option to increase the planned sample size of 4700 women after interim evaluation by an independent Data Safety and Monitoring Board.

R01 HD064729 (Tita) 04/01/2010 – 07/31/2015
NIH/NICHD

Caesarean Section Optimal Antibiotic Prophylaxis (C/SOAP) Trial
A multicenter randomized trial to determine the efficacy and safety of a modified (extended-spectrum) antibiotic prophylaxis strategy at cesarean delivery to reduce surgical site infections.

R01 AG021927 (Marson) 07/01/2010 – 06/30/2015
NIH/NIA
Functional Change in Mild Cognitive Impairment (COINS)
This R01 project investigates longitudinal change in higher order functional abilities in patients with MCI, and develops predictor models for clinical progression and conversion from MCI to dementia.

No number assigned (Cutter) 01/01/2004 – 12/31/2015
Consortium of MS Centers (CMSC)
North American Research Consortium on Multiple Sclerosis (NARCOMS)
The goals of this project are to facilitate a confidential way for patients to supply valuable information to researchers about their course of disease that may lead to more effective treatments and care.

W81XWH-12-1-0155 (Korf) 05/15/2012 – 05/14/2017
U.S. Department of Defense
NEUTOFIBOMATOSIS CLINICAL CONSORTIUM AWARD
This is a cooperative study group that is focusing on multiple trials in NF. The role of the operations center is both as the data center and the overall coordinating of the study group.

U01 NS045719 (Lublin) 06/01/2004 – 11/30/2015
NIH/NINDS
CombiRx Statistical and Data Management Center
A Phase III, multi-center, double-blind, randomized study comparing the combined use of Interferon Beta-1a and Glatiramer Acetate to either agent alone in patients with relapsing remitting multiple sclerosis.
140305 (Greenberg) 09/01/2013 – 08/31/2016 1.2 calendar
Patient Centered Outcomes Research Institute $24,771 current year direct
Collaborative Assessment of Pediatric Transverse Myelitis: Understand, Reveal, Educate (CAPTURE)

P30DK079337 (Agarwal) 09/20/13 – 07/31/18
NIH/NIDDK
UAB/UCSD O'Brien Core Center for Acute Kidney Injury Research
In summary, these cores and the outstanding cohort of investigators assembled for this center will provide unique expertise that is critical for innovative and productive research in AKI. With its Extended Research Base that includes both clinical and basic investigators, this O'Brien center will accelerate the translation of new investigative insights towards novel therapies for patients with AKI.

R01 AI101138 (Shimamura) 08/08/13 – 07/31/18
NIH/NIAID
Innate Immunity and Viral Renal Allograft Injury
A murine renal transplant model recapitulates this finding of NK cell induction by murine CMV (MCMV) infection during rejection. This model will be used to define mechanisms of MCMV induced NK activation in renal transplants, followed by extension of the mechanistic intragraft analyses from the animal model to examine NK activation in clinical renal transplant biopsies.

RSTFD0000541263 (Cutter) 09/01/13 – 08/31/17
Children's Hospital (Boston)
Early Biomarkers of Autism Spectrum Disorders in Infants with Tuberous Sclerosis

MG Registry (Cutter) 01/01/14-present (annually)
MGFA
This is new registry (1.5 years old) that is a patient registry of Myasthenia Gravis Patients based solely on patient reported outcomes tracking their disease over time.

U19 AI113212 (Cutter) 06/15/14 - 05/31/19
NIAID/NIH
AC STI Clinical Research Consortium/UAB STI CRC - DiSCIS Biostatistics & Bioinformatics Core
The data core supports this program project consisting of the investigation of microbiome as how it impacts the infection status of partners with STDs.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Alan Eberhardt

eRA COMMONS USER NAME (credential, e.g., agency login): aeberhar

POSITION TITLE: Professor of Biomedical Engineering

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Delaware, Newark, DE	BSCE	1985	Civil Engineering
University of Delaware, Newark, DE	MSCE	1987	Civil Engineering
Northwestern University, Evanston, IL	PhD	1990	Theoretical & Applied Mechanics

A. Personal Statement

For the past 20 years, Dr. Eberhardt has been a highly active and productive researcher in orthopedic and injury biomechanics at UAB. He has raised over a half million dollars as principal investigator, and has served as co-investigator on grants exceeding $5 million. These efforts were extremely valuable in facilitating the graduation of 27 Masters and three PhD students, who have gone on to professional careers in orthopedic device industries and academic positions in Biomedical Engineering. Results of those efforts have appeared in international orthopedic and biomechanics conferences, and have been reported in over 45 peer-reviewed manuscripts. Most relevant to the proposed efforts are his involvement in the study of the mechanical characterization of biological tissues. Dr. Eberhardt is the Director of the Experimental Biomechanics Core at UAB, which contains all the modern tools for characterizing bone and soft tissues at the macro-level (MTS systems, drop tower impactor) to the micro-level (Bose Low-force Testbench, Nano-indenter). He is also a well-accomplished finite element modeler, and is therefore well suited to mentor students in both experimental and computational biomechanical studies. Most recent publications are included below (Trainees are underlined)

a. Maddox GE, Ludwig J, Craig ER, Woods D, Joiner A, Chaudhari N, Killingsworth C, Siegal GP, **Eberhardt A**, Ponce B. Flexor tendon repair with a knotless, bidirectional barbed suture: an in vivo biomechanical analysis. J Hand Surg Am. 2015 May;40(5):963-8. PMID: 25747739

b. Schlitz RS, Schwertz JM, **Eberhardt AW**, Gilbert SR. Biomechanical Analysis of Screws Versus K-Wires for Lateral Humeral Condyle Fractures. J Pediatr Orthop. 2015 May 12. Epub. PMID: 25985374

c. Ponce BA, Thompson KJ, Raghava P, **Eberhardt AW**, Tate JP, Volgas DA, Stannard JP. The role of medial comminution and calcar restoration in varus collapse of proximal humeral fractures treated with locking plates. J Bone Joint Surg Am. 2013 Aug 21;95(16):e113(1-7). PMID: 23965707

d. Casazza K, Hanks LJ, Clines GA, Tse HM, **Eberhardt AW**. Diabetes-related impairment in bone strength is established early in the life course. World J Diabetes. 2013 Aug 15;4(4):145-50. PMID 23961325

B. Positions and Honors

Positions and Employment

1991 - 1997 Assistant Professor of Mechanical Engineering, University of Alabama at Birmingham
1997 - 1999 Associate Professor of Mechanical Engineering, University of Alabama at Birmingham
1999 - 2009 Associate Professor of Biomedical Engineering, University of Alabama at Birmingham
2001 - 2007 Director, Biomedical Engineering Undergraduate Program, University of Alabama at Birmingham

2008 - Associate Director, UAB Science and Technology Honors Program, University of Alabama at Birmingham
2009 - Professor of Biomedical Engineering, University of Alabama at Birmingham
2013 - Associate Dean, School of Engineering, University of Alabama at Birmingham

Other Experience and Professional Memberships

1995 - Member, American Society of Mechanical Engineering
2003 NSF Research to Aid Persons with Disabilities Program – Proposal reviewer/panelist
2005 - Associate Member, Orthopedic Research Society
2005 - 2008 Member, Society for Biomaterials
2007 - 2009 Member, American Society of Engineering Education
2007 NSF Graduate Research Fellowship Program – Bioengineering panelist
2008 Conference Co-chair: Southeastern Meeting of the American Society of Biomechanics

Honors

1985-6 University of Delaware Davis Fellowship, Davis Scholar, graduated cum laude
Member: Tau Beta Pi, Pi Tau Sigma
1987 Northwestern University Walter P. Murphy Graduate Fellowship
1990 NIH Predoctoral Fellowship
1997 ASME Shortall Outstanding Faculty Advisor Award
2002 UAB President's Teaching Award
2013 Ellen Gregg Ingall's Lifetime Award for Excellence in Teaching

C. Contributions to Science

Dr. Eberhardt's most significant contributions to science have come in three areas: 1) tribology of joint replacement; 2) biomechanics of the pelvis in side impact; and 3) design for people with disabilities. With regard to the tribology of joint replacement, five peer-reviewed manuscripts and five conference presentations resulted from Dr. Eberhardt's PhD dissertation on layered elastic models for joint contact simulations. The original manuscript by Eberhardt et al., published in the Journal of Biomechanical Engineering, "An Analytical Model of Joint Contact," remains as a seminal work in joint contact simulation. Dr. Eberhardt has been the first or corresponding author on numerous publications related to modern total joint replacement, including six journal publications and fourteen conference presentations related to surface treatments of titanium alloy for improved wear and/or fatigue resistance; five manuscripts and eight conference presentations on crack propagation in layered tribological systems; and two manuscripts and four presentations on the behavior of modern polyethylene materials.

Dr. Eberhardt is a leader in pelvic injury biomechanics. Noteworthy accomplishments include eight peer-reviewed manuscripts in prestigious bioengineering journals and 22 conference presentations based on experimental testing and computational modeling of pelvic fracture in side impact. In the early 2000's, he participated in a series of invited lectures/seminars at prestigious automotive crash conferences. Most recently, he led a Center of Excellence in the Global Human Body Modeling Consortium (GHBMC), working with other premiere programs to develop full-scale human finite element models of car occupants for crash simulation.

For the past 17 years, with funding from the NSF RAPD Program, Dr. Eberhardt collaborated with physical therapists from United Cerebral Palsy of Greater Birmingham, the Children's Hospital of Alabama and other professionals from the rehabilitation industry to develop student design projects to aid the disabled. The fruits of these efforts are found in the numerous prototype designs that were constructed, tested and delivered to disabled children and adults - many of which continue to improve the quality of life among clients. Nearly 200 engineering seniors have participated in RAPD projects, along with some 250 lower classmen. Projects tended to fall into two categories: 1) assistive technologies – projects geared toward aiding a person or persons with disabilities; and 2) research tools – projects geared toward developing a device to aid clinicians/engineers in studying a particular disease condition.

a. Kim YH, Kim JE, **Eberhardt AW**. A new cortical thickness mapping method with application to an in vivo finite element model. Comput Methods Biomech Biomed Engin. 2014;17(9):997-1001. PMID: 23113651.

b. Savage AJ, Spruiell MD, Schwertz JM, McGwin G, **Eberhardt A**, Ponce BA. The effect of sliding knots on the suture-tendon interface strength: a biomechanical analysis comparing sliding and static arthroscopic knots. Am J Sports Med. 2013 Feb;41(2):296-301. PMID: 23299852

c. Ramaswamy G, Sohn P, **Eberhardt A**, Serra R. Altered responsiveness to TGF-β results in reduced Papss2 expression and alterations in the biomechanical properties of mouse articular cartilage. Arthritis Res Ther. 2012 Mar 6;14(2):R49. PMID 22394585. PMCID: PMC3446415

D. Research Support

Ongoing Research Support

National Science Foundation CBET-1263941 Eberhardt (PI) 08/01/13 - 7/31/18
Engineering Senior Design Projects for the Disabled: Experiential Learning for Undergraduates
The purpose of this work is to develop senior design projects that aid persons with disabilities.
Role: PI

National Institutes of Health R25 HD078327 Eberhardt (PI) 04/01/13 - 3/31/18
Enhanced Senior Design through Clinical and Industrial Immersion and Entrepreneurship
The purpose of this work is to enhance ongoing senior design efforts as stated in the title, featuring new interactions with Business faculty and students, clinical and manufacturing rotations and a new partnership with pediatric neurosurgery.
Role: PI

Completed Research Support

Nutech Medical Eberhardt (PI) 01/01/13 – 06/30/15
Biomechanical Characterization of SI Joint Motion Following Implantation of Sacral Fusion Plugs.
The purpose of this work is to investigate the efficacy of a new cancellous bone plug in fusion of the sacroiliac joint.
Role: PI

Global Human Body Modeling Consortium Eberhardt (PI) 07/01/08 -12/31/11
Center of Excellence: Pelvis and Lower Limb
The purpose of this work is to develop biofidelic finite element models of 5^{th}, 50^{th} and 95^{th} percentile male and female pelves for use in full human body models in car crash simulations.
Role: PI

NIH R01 DE013952 Lemons (PI) 09/01/05 - 08/31/10
Analysis of In Situ and Explanted Surgical Implant Devices
The purpose of this study is to develop nanostructure materials to improve osseointegration of biomedical implants, with a focus on the temporomandibular joint.
Role: Co-Investigator

NIH/ NIAMS R21 AR054771 Gilbert (PI) 09/11/07 – 09/31/09
Pharmacologic Activation of the HIF pathway in Bone
The goals of this project are to evaluate the efficacy of small molecules to activate HIF in mesenchymal or bone cells in vitro, and then test the effects of the lead compounds in a murine distraction osteogenesis model in vivo.
Role: Co-Investigator

Nat'l Science Foundation DMR-0402891 Vohra (PI) 06/15/04 – 05/31/08
NIRT: Nanostructure Functionally Graded Metalloceramic Biomaterials
The purpose of this study is to develop nanostructure functionally graded materials for biomedical applications, including wear resistant materials for total joint replacements.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Edberg, Jeffrey

eRA COMMONS USER NAME (agency login): edberg

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Illinois-Urbana, Urbana, IL	BS	1984	Chemistry
University of Virginia, Charlottesville, VA	PHD	1988	Biochemistry
Cornell University Medical College-Hospital for Special Surgery, New York, NY	Postdoctoral Fellow	1991	Immunology

A. PERSONAL STATEMENT

Dr. Edberg has extensive experience in genetic and biological characterization of immunological pathways. Recent work has focused on understanding the functional consequences of genetic variation in genes encoding proteins important in the immune response. Of particular interest is the study of genetic variants implicated in genome wide association studies. The translation of SNP association studies to the identification and characterization of functional causative variants is the ultimate goal of genetic association studies. Most recently, he was part of the team that established the novel demonstration of the genetic control of expression of an activating Fc receptor on human B cells that was published in Science Translational Medicine. Elucidation of the functional importance of disease associated variants will provide insights into both pathogenic disease mechanisms and therapeutic approaches. As part of these studies, he has also been instrumental in creating and maintaining biorepositories of both patients with SLE and healthy control participants. Through this effort, we have assembled a repository of genotypic characterized individuals that are consented and available for recall.

1. Harley JB, Alarcón-Riquelme ME, Criswell LA, Jacob CO, Kimberly RP, Moser KL, Tsao BP, Vyse TJ, Langefeld CD, Nath SK, Guthridge JM, Cobb BL, Mirel DB, Marion MC, Williams AH, Divers J, Wang W, Frank SG, Namjou B, Gabriel SB, Lee AT, Gregersen PK, Behrens TW, Taylor KE, Fernando M, Zidovetzki R, Gaffney PM, **Edberg JC**, Rioux JD, Ojwang JO, James JA, Merrill JT, Gilkeson GS, Seldin MF, Yin H, Baechler EC, Li QZ, Wakeland EK, Bruner GR, Kaufman KM, Kelly JA. Genome-wide association scan in women with systemic lupus erythematosus identifies susceptibility variants in ITGAM, PXK, KIAA1542 and other loci. Nat Genet. 2008 Feb;40(2):204-10. PubMed PMID: 18204446; PubMed Central PMCID: PMC3712260.
2. Kelley JM, Monach PA, Ji C, Zhou Y, Wu J, Tanaka S, Mahr AD, Johnson S, McAlear C, Cuthbertson D, Carette S, Davis JC Jr, Dellaripa PF, Hoffman GS, Khalidi N, Langford CA, Seo P, St Clair EW, Specks U, Stone JH, Spiera RF, Ytterberg SR, Merkel PA, **Edberg JC**, Kimberly RP. IgA and IgG antineutrophil cytoplasmic antibody engagement of Fc receptor genetic variants influences granulomatosis with polyangiitis. Proc Natl Acad Sci U S A. 2011 Dec 20;108(51):20736-41. PubMed PMID: 22147912; PubMed Central PMCID: PMC3251158.
3. Zhou Y, Wu J, Kucik DF, White NB, Redden DT, Szalai AJ, Bullard DC, **Edberg JC**. Multiple lupus-associated ITGAM variants alter Mac-1 functions on neutrophils. Arthritis Rheum. 2013 Nov;65(11):2907-16. PubMed PMID: 23918739; PubMed Central PMCID: PMC3969028.
4. Li X, Wu J, Ptacek T, Redden DT, Brown EE, Alarcón GS, Ramsey-Goldman R, Petri MA, Reveille JD, Kaslow RA, Kimberly RP, **Edberg JC**. Allelic-dependent expression of an activating Fc receptor on B

cells enhances humoral immune responses. Sci Transl Med. 2013 Dec 18;5(216):216ra175. PubMed PMID: 24353158; PubMed Central PMCID: PMC3982386.

B. POSITIONS AND HONORS

Positions and Employment

1991 - 1993	Instructor in Medicine, Cornell University Medical College, New york, NY
1991 - 1996	Assistant Scientiest, Hospital for Special Surgery, New York, NY
1993 - 1996	Assistant Professor in Medicine, Cornell University Medical College, New York, NY
1996 - 2002	Assistant Professor of Medicine, University of Alabama at Birmingham, Birmingham, AL
2002 - 2008	Associate Professor of Medicine (with Tenure), University of Alabama at Birmingham, Birmingham, AL
2008 -	Professor of Medicine, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

1994 - 1996	Member, Medical/Scientific Committee, NY Chapter of the Arthritis Foundation
1994 - 1996	Member, Institutional Review Board, The Hospital for Special Surgery- Cornell Medical Center
1995 - 1996	Director, Cornell University Medical College Arthritis Center Flow Cytometry Core
1995 - 1996	Member, Arthritis Foundation, New York Chapter, Grant Review Committee
1996 - 1998	Member, National Arthritis Foundation Inflammation Study Section
1999 - 2008	Director, NIH Sponsored UAB General Clinical Research Center Laboratory Core
2001 - 2002	Member, NIH Immunological Sciences Study Section
2002 -	Member, UAB Arthritis Center and UAB Comprehensive Cancer Center
2003 -	Member, NIH-AMS, GHD, ACTS and multiple Special Emphasis/Scientific Review Group study sections
2004 - 2004	Member, NIH Innate Immunity Study Section
2008 -	Director, Core Laboratory Component of the UAB Center for Clinical and Translational Sciences (CTSA)

Honors

1988	Post-Doctoral Fellowship, Irvington Institute for Medical Research
1991	Career Development Award, The S.L.E. Foundation of New York
1992	Young Scholar Award, Arthritis Foundation (New York Chapter)

C. Contribution to Science

1. I have made several seminal and important contributions to our understanding of the functional role of receptors for the Fc region of IgG (Fc gamma receptors) in regulating inflammation and immune responses. These publications have demonstrated the importance of receptor structure in IgG ligand binding and ligand induced receptor function. Through this work, we have shown the importance of receptor glycosylation in regulating IgG binding affinity, demonstrated the striking effects of SNP variants on receptor expression and IgG binding to CD16A (FcgRIIIa) and CD32C (FcgRIIc) and demonstrated the influence of promoter SNP variants on receptor expression of CD32B (FcgRIIb). The functional consequences of these genetic variants have been established in numerous systems including the strong and reproducible association of these variants with SLE and with Ab-based immune responses. Finally, our recent work establishing the allelic dependent expression of the activating FcgRIIc (CD32C) on B cells that has challenged the prevailing paradigm of unidirectional negative feedback on B cells by IgG immune complexes via the inhibitory FcγRIIb and places CD32C as a previously unrecognized determinant in human antibody/autoantibody responses.
    a. **Edberg JC**, Kimberly RP. Cell type-specific glycoforms of Fc gamma RIIIa (CD16): differential ligand binding. J Immunol. 1997 Oct 15;159(8):3849-57. PubMed PMID: 9378972.
    b. Stein MP, **Edberg JC**, Kimberly RP, Mangan EK, Bharadwaj D, Mold C, Du Clos TW. C-reactive protein binding to FcgammaRIIa on human monocytes and neutrophils is allele-specific. J Clin Invest. 2000 Feb;105(3):369-76. PubMed PMID: 10675363; PubMed Central PMCID: PMC377443.

c. Li X, Su K, Ji C, Szalai AJ, Wu J, Zhang Y, Zhou T, Kimberly RP, **Edberg JC**. Immune opsonins modulate BLyS/BAFF release in a receptor-specific fashion. J Immunol. 2008 Jul 15;181(2):1012-8. PubMed PMID: 18606652; PubMed Central PMCID: PMC3684394.

d. Li X, Wu J, Ptacek T, Redden DT, Brown EE, Alarcón GS, Ramsey-Goldman R, Petri MA, Reveille JD, Kaslow RA, Kimberly RP, **Edberg JC**. Allelic-dependent expression of an activating Fc receptor on B cells enhances humoral immune responses. Sci Transl Med. 2013 Dec 18;5(216):216ra175. PubMed PMID: 24353158; PubMed Central PMCID: PMC3982386.

2. The importance of anti-neutrophil cytoplasmic antibodies (ANCA) in the pathogenesis of granulomatosis with polyangiitis (GPA)(formally known as Wegener's Granulomatosis) is now widely appreciated. Our work has established that these ANCA autoantibodies engage Fc receptors on the surface of neutrophils and that this engagement elicits an inflammatory program in these cells that includes rapid mobilization of cytoplasmic granules and the release of the highly chemotactic b-defensins. We have also established that these ANCA autoantibodies are not limited to the IgG class. IgA ANCA autoantibodies can also be demonstrated in patients with GPA and we have shown the remarkable importance of a SNP variant in the gene encoding the IgA Fc receptor (FCAR) that acts as a molecular switch to determine the pro-inflammatory capacity of this receptor on neutrophils. The importance of this FCAR variant in GPA is established through our demonstration of genetic association with disease in patients with GPA. Finally, as part of an international consortium studying GPA, we have established additional HLA and non-HLA novel genetic associations with disease.

a. Tanaka S, **Edberg JC**, Chatham W, Fassina G, Kimberly RP. Fc gamma RIIIb allele-sensitive release of alpha-defensins: anti-neutrophil cytoplasmic antibody-induced release of chemotaxins. J Immunol. 2003 Dec 1;171(11):6090-6. PubMed PMID: 14634123.

b. Mahr AD, **Edberg JC**, Stone JH, Hoffman GS, St Clair EW, Specks U, Dellaripa PF, Seo P, Spiera RF, Rouhani FN, Brantly ML, Merkel PA. Alpha-antitrypsin deficiency-related alleles Z and S and the risk of Wegener's granulomatosis. Arthritis Rheum. 2010 Dec;62(12):3760-7. PubMed PMID: 20827781; PubMed Central PMCID: PMC3123032.

c. Kelley JM, Monach PA, Ji C, Zhou Y, Wu J, Tanaka S, Mahr AD, Johnson S, McAlear C, Cuthbertson D, Carette S, Davis JC Jr, Dellaripa PF, Hoffman GS, Khalidi N, Langford CA, Seo P, St Clair EW, Specks U, Stone JH, Spiera RF, Ytterberg SR, Merkel PA, **Edberg JC**, Kimberly RP. IgA and IgG antineutrophil cytoplasmic antibody engagement of Fc receptor genetic variants influences granulomatosis with polyangiitis. Proc Natl Acad Sci U S A. 2011 Dec 20;108(51):20736-41. PubMed PMID: 22147912; PubMed Central PMCID: PMC3251158.

d. Xie G, Roshandel D, Sherva R, Monach PA, Lu EY, Kung T, Carrington K, Zhang SS, Pulit SL, Ripke S, Carette S, Dellaripa PF, **Edberg JC**, Hoffman GS, Khalidi N, Langford CA, Mahr AD, St Clair EW, Seo P, Specks U, Spiera RF, Stone JH, Ytterberg SR, Raychaudhuri S, de Bakker PI, Farrer LA, Amos CI, Merkel PA, Siminovitch KA. Association of granulomatosis with polyangiitis (Wegener's) with HLA-DPB1*04 and SEMA6A gene variants: evidence from genome-wide analysis. Arthritis Rheum. 2013 Sep;65(9):2457-68. PubMed PMID: 23740775.

3. The functional consequences of genetic variants that are strongly associated with SLE have been established in numerous systems. We have made fundamental and important contributions to the understanding of how genetic variants influence autoimmunity. Highlights of our work include the demonstration of the importance of copy number variants in the TLR7 locus with SLE and the prominent role of SNP variants in regulating the binding of ligand by CD16. We have also demonstrated new and novel functional associations in the ITGAM locus with SLE in which a previously unrecognized cytoplasmic domain variant has striking functional effects on Mac-1 function. We have also extended our study of the functional importance of promoter variants in the inhibitory CD32B locus to show that genetically controlled altered expression of this receptor influences therapeutic responses to IVIG in children with Kawasaki disease.

a. Kelley J, Johnson MR, Alarcón GS, Kimberly RP, **Edberg JC**. Variation in the relative copy number of the TLR7 gene in patients with systemic lupus erythematosus and healthy control subjects. Arthritis Rheum. 2007 Oct;56(10):3375-8. PubMed PMID: 17907191.

b. Shrestha S, Wiener HW, Olson AK, **Edberg JC**, Bowles NE, Patel H, Portman MA. Functional FCGR2B gene variants influence intravenous immunoglobulin response in patients with Kawasaki disease. J Allergy Clin Immunol. 2011 Sep;128(3):677-80. PubMed PMID: 21601260; PubMed Central PMCID: PMC3444515.

c. Zhou Y, Wu J, Kucik DF, White NB, Redden DT, Szalai AJ, Bullard DC, **Edberg JC**. Multiple lupus-associated ITGAM variants alter Mac-1 functions on neutrophils. Arthritis Rheum. 2013 Nov;65(11):2907-16. PubMed PMID: 23918739; PubMed Central PMCID: PMC3969028.

d. Dong C, Ptacek TS, Redden DT, Zhang K, Brown EE, **Edberg JC**, McGwin G Jr, Alarcón GS, Ramsey-Goldman R, Reveille JD, Vilá LM, Petri M, Qin A, Wu J, Kimberly RP. Fcγ receptor IIIa single-nucleotide polymorphisms and haplotypes affect human IgG binding and are associated with lupus nephritis in African Americans. Arthritis Rheumatol. 2014 May;66(5):1291-9. PubMed PMID: 24782186; PubMed Central PMCID: PMC4069204.

4. Through work in our own laboratory and through collaboration with an international consortium, we have established the importance of genetic and epigenetic variation in the development and progression of SLE. From the initial SLEGEN GWAS study to detailed replication and novel discovery of new variants, we have established the importance of multiple loci in the SLE diathesis. Our work established the importance and strong association between variants in the CRP locus and SLE and between variants in IRF5 and SLE in multiple ethnic groups. We have also been the first group to examine the importance of epigenetic regulation in leukocyte subsets in patients with SLE and have demonstrated that epigenetically-mediated hypersensitivity to interferon persists beyond acute stages of the disease and is apparent in memory, naïve and regulatory T-cells, suggesting that this epigenetic state in lupus patients is established in progenitor cell populations. We also identified a widespread, but lower amplitude shift in methylation in CD4+ T-cells near genes involved in cell division and MAPK signaling. These cell type-specific effects are consistent with disease-specific changes in the composition of the CD4+ population and suggest that shifts in the proportion of CD4+ subtypes can be monitored at CpGs with subtype-specific DNA methylation patterns.

   a. Harley JB, Alarcón-Riquelme ME, Criswell LA, Jacob CO, Kimberly RP, Moser KL, Tsao BP, Vyse TJ, Langefeld CD, Nath SK, Guthridge JM, Cobb BL, Mirel DB, Marion MC, Williams AH, Divers J, Wang W, Frank SG, Namjou B, Gabriel SB, Lee AT, Gregersen PK, Behrens TW, Taylor KE, Fernando M, Zidovetzki R, Gaffney PM, **Edberg JC**, Rioux JD, Ojwang JO, James JA, Merrill JT, Gilkeson GS, Seldin MF, Yin H, Baechler EC, Li QZ, Wakeland EK, Bruner GR, Kaufman KM, Kelly JA. Genome-wide association scan in women with systemic lupus erythematosus identifies susceptibility variants in ITGAM, PXK, KIAA1542 and other loci. Nat Genet. 2008 Feb;40(2):204-10. PubMed PMID: 18204446; PubMed Central PMCID: PMC3712260.

   b. Kelly JA, Kelley JM, Kaufman KM, Kilpatrick J, Bruner GR, Merrill JT, James JA, Frank SG, Reams E, Brown EE, Gibson AW, Marion MC, Langefeld CD, Li QZ, Karp DR, Wakeland EK, Petri M, Ramsey-Goldman R, Reveille JD, Vilá LM, Alarcón GS, Kimberly RP, Harley JB, **Edberg JC**. Interferon regulatory factor-5 is genetically associated with systemic lupus erythematosus in African Americans. Genes Immun. 2008 Apr;9(3):187-94. PubMed PMID: 18288123.

   c. **Edberg JC**, Wu J, Langefeld CD, Brown EE, Marion MC, McGwin G Jr, Petri M, Ramsey-Goldman R, Reveille JD, Frank SG, Kaufman KM, Harley JB, Alarcón GS, Kimberly RP. Genetic variation in the CRP promoter: association with systemic lupus erythematosus. Hum Mol Genet. 2008 Apr 15;17(8):1147-55. PubMed PMID: 18182444.

   d. Absher DM, Li X, Waite LL, Gibson A, Roberts K, **Edberg J**, Chatham WW, Kimberly RP. Genome-wide DNA methylation analysis of systemic lupus erythematosus reveals persistent hypomethylation of interferon genes and compositional changes to CD4+ T-cell populations. PLoS Genet. 2013;9(8):e1003678. PubMed PMID: 23950730; PubMed Central PMCID: PMC3738443.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/myncbi/jeffrey.edberg.1/bibliography/41157278/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

R01 AR064820, NIH Brown, Elizabeth (PI) 2014/08/26-2019/06/30
ASSOCIATION OF GENETIC AND AUTOANTIBODY SIGNATURES WITH SLE CLINICAL COURSE
Role: Co-Investigator

R37 AG033906, NIH Fillingim, Roger (PI) 2014/09/15-2018/04/30
ETHNIC DIFFERENCES IN RESPONSES TO PAINFUL STIMULI
Role: Co-Investigator

P30 AR048311, NIH Mountz, John D. (PI) 2012/09/01-2017/08/30
RHEUMATIC DISEASES CORE CENTERS (P30) - ANALYTIC GENOMICS AND TRANSGENICS CORE
Role: Co-Investigator

U54TR001005, NIH Kimberly, Robert P. (PI) 2014/09/01-2015/08/31
UAB CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE (CCTS)
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Floyd, Candace L.

eRA COMMONS USER NAME (agency login): Cfloyd

POSITION TITLE: Associate Professor and Director of Research, Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
James Madison University , Harrisonburg, VA	BA	05/1991	History/Education
Virginia Commonwealth University, Richmond, VA	MS	08/1998	Biological Psychology
Virginia Commonwealth University , Richmond, VA	PHD	12/2000	Pharmacology/ Biological Psychology
University of California, Davis, Davis, CA	Postdoctoral Fellow	06/2004	Neurotrauma

A. PERSONAL STATEMENT

As the leader of a research team that evaluates novel interventions for traumatic brain injury (TBI) and spinal cord injury (SCI), I am qualified to serve as mentor on this T32 application. My research team investigates pathophysiological mechanisms, novel therapeutic targets, and intervention strategies to promote recovery after TBI and SCI. My graduate training was in models of TBI including both in vitro and in vivo model systems and a central focus was astrocyte response to injury. My post-doctoral training at the University of California, Davis (UCD) focused on cellular and molecular pathways instrumental in the pathophysiology of TBI. As an Assistant Professor at UCD and continuing into my current position as an Associate Professor (tenured) and Director of Research at University of Alabama at Birmingham, I expanded my research to include evaluation of 17b-estradiol as a protective agent in traumatic TBI and SCI in cell culture and in rodent models. Additionally, my research team is evaluating therapeutic strategies to alleviate neuropathic pain after SCI in rodent models, including a cervical hemicontusion SCI model that my group developed. Recently, I have been working to develop and characterize a large animal model of SCI (pigs) as a tool to accelerate translation of novel therapeutics for this devastating condition. I am currently or have recently served as the principal investigator (PI) or co-PI on funded research projects including those funded from university sources, philanthropic research foundations, and federal sources. In addition, I am currently or have recently successfully administered research projects (e.g. staffing, research plans, budget), collaborated with other researchers, and produced peer-reviewed publications from each project. As a result of these previous experiences, I am aware of the importance of frequent communication in constructing a realistic research plan and timelines. I will train the mentees in all aspect of research in an academic medical center.

B. POSITIONS AND HONORS

Positions and Employment

2001- 2004 Post-Doctoral Fellow, Department of Neurosurgery, University of California, Davis, Davis, CA
2004 - 2006 Assistant Professor, Department of Neurosurgery, University of California, Davis, Davis, CA
2006 - 2012 Assistant Professor, Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham, Birmingham, AL
2012 - Director of Research, Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham, Birmingham, AL
2012 - Women's Committee of Spain Rehabilitation Center Endowed Chair in Rehabilitation Neuroscience Research, Department of Physical Medicine and Rehabilitation, University of

	Alabama at Birmingham
2012-	Director, TJ Atchison Spinal Cord Injury Research Program, Department of Physical Medicine and Rehabilitation University of Alabama at Birmingham

Other Experience and Professional Memberships

2015	Peer Review: NIH Brain Injury and Neurovascular Pathologies, ad hoc
2014-	Peer Review: Department of Veteran's Affairs Rehabilitation Research and Development Brain Injury Panel, standing member
2014	Peer Review: NIH Brain Injury and Neurovascular Pathologies, ad hoc
2014	Peer Review: DoD Vision Research Program
2013	Peer Review: NIH Basic Biology of Neurological Disorders ZRG1 Special Emphasis Panel
2011-	Founding Member, UAB Alliance for the Development and Advancement of Pain Treatment
2011	Organizer, UAB Alliance for the Development and Advancement of Pain Treatment Symposium
2011-	Peer Review: Department of Veterans Affairs RR&D: Brain Injury, standing member
2011	Peer Review: DoD USAMRRA Traumatic Brain Injury Rehabilitation
2010-2014	Peer Review: DoD Spinal Cord Injury Research Program
2009	Co-Chair for Peer Review: NIH Minority Biomedical Research SCORE
2008	Peer Review: Henry M. Jackson Foundation Comprehensive Neuroscience Program
2008-	Peer Review: Singapore National Scientific Research Grant Administration, standing member
2007-2009	Peer Review: DoD Post-Traumatic Stress Disorder and Traumatic Brain Injury: Intramural Research Program
2007-2011	Peer Review: DoD Post-Traumatic Stress Disorder and Traumatic Brain Injury: Extramural Research Program
1998 -	Member, International Neurotrauma Society
1996 -	Member, Society for Neuroscience
1996-	Member, National Neurotrauma Society
1996 -	Member, American Academy for the Advancement of Science

Honors

2005	Honorary Presenter, 11th International Symposium of Neuronal Regeneration
2006	Program Committee, National Neurotrauma Society
2007	McNulty Civitan Scientist, Civitan International Research Center
2009	Nominated as Young Investigator of the Year, Brain Injury Association of America
2009	Nominated for Councilor, National Neurotrauma Society
2009	Program Committee, American Society for Neurochemistry (Pre-Meeting Workshop Organizer)
2011	Secretary-Treasurer, National Neurotrauma Society
2012	Vice President, National Neurotrauma Society
2013	Nominated for President, National Neurotrauma Society
2013-2015	Program Committee, Society for Neuroscience
2014	Nominated for President, National Neurotrauma Society
2015	Foundation Junior Fellow, Civitan International

C. Contribution to Science

1. A long-standing and on-going component of my contribution to science is the development and characterization of highly clinically-relevant animal models of central nervous system (CNS) injury. This work is based upon the fundamental hypothesis that improving the clinical relevance of animal models of traumatic brain injury and spinal cord injury is a fundamental step to improving the potential success of translation of new therapeutic strategies from the bench to the bedside. My work has and continues to focus on developing animal models of injury, as seen in the publications below. Also, these publications document characterization and/or optimization of techniques to assess outcome after a CNS insult. Of particular relevance to this application, these publications detail the development of a new spinal cord injury

model in rodents, a cervical hemicontusion model. I served as a primary or co-investigator in all of these studies.

a) Rice AC, **Floyd CL**, Lyeth BG, Hamm RJ, DeLorenzo RJ. Status epilepticus causes long-term NMDA receptor-dependent behavioral changes and cognitive deficits. Epilepsia. 1998 Nov;39(11):1148-57. PubMed PMID: 9821978.

b) **Floyd CL**, Golden KM, Black RT, Hamm RJ, Lyeth BG. Craniectomy position affects Morris water maze performance and hippocampal cell loss after parasagittal fluid percussion. J Neurotrauma. 2002 Mar;19(3):303-16. PubMed PMID: 11939498.

c) Hallam TM, **Floyd CL**, Folkerts MM, Lee LL, Gong QZ, et al. Comparison of behavioral deficits and acute neuronal degeneration in rat lateral fluid percussion and weight-drop brain injury models. J Neurotrauma. 2004 May;21(5):521-39. PubMed PMID: 15165361.

d) Dunham KA, Siriphorn A, Chompoopong S, **Floyd CL**. Characterization of a graded cervical hemicontusion spinal cord injury model in adult male rats. J Neurotrauma. 2010 Nov;27(11):2091-106. PubMed PMID: 21087156; PubMed Central PMCID: PMC2978055.

2. Historically, cellular protection strategies in traumatic brain injury and spinal cord injury research have nearly exclusively targeted pathological occurrences in neurons, with little consideration of the role of glia in pathobiology and recovery. In contrast to this view, I hypothesize that glia have a critical contribution to the pathophysiology of CNS injury. The studies below illustrate my scientific contributions wherein I demonstrate that astrocytes have a crucial role in the pathology of brain and spinal cord injury. Also, this work demonstrates that I have identified potential new therapeutic targets in astrocytes that can confer protection after CNS injury. I served as a primary or co-investigator in all of these studies.

a) **Floyd CL**, Rzigalinski BA, Weber JT, Sitterding HA, Willoughby KA, et al. Traumatic injury of cultured astrocytes alters inositol (1,4,5)-trisphosphate-mediated signaling. Glia. 2001 Jan;33(1):12-23. PubMed PMID: 11169788.

b) **Floyd CL**, Rzigalinski BA, Sitterding HA, Willoughby KA, Ellis EF. Antagonism of group I metabotropic glutamate receptors and PLC attenuates increases in inositol trisphosphate and reduces reactive gliosis in strain-injured astrocytes. J Neurotrauma. 2004 Feb;21(2):205-16. PubMed PMID: 15000761.

c) **Floyd CL**, Gorin FA, Lyeth BG. Mechanical strain injury increases intracellular sodium and reverses Na+/Ca2+ exchange in cortical astrocytes. Glia. 2005 Jul;51(1):35-46. PubMed PMID: 15779085; PubMed Central PMCID: PMC2996279.

d) Olsen ML, Campbell SC, McFerrin MB, **Floyd CL**, Sontheimer H. Spinal cord injury causes a wide-spread, persistent loss of Kir4.1 and glutamate transporter 1: benefit of 17 beta-oestradiol treatment. Brain. 2010 Apr;133(Pt 4):1013-25. PubMed PMID: 20375134; PubMed Central PMCID: PMC2850584.

3. In addition to the contributions listed above, I have a long-standing interest in the investigation of physiological estrogen (17b-estradiol) and estrogen receptor agonists as a protective therapeutics in traumatic brain injury and traumatic spinal cord injury. My work has demonstrated that the presence of physiological estrogen confers protection in female rats and that post-injury administration of pharmacological (supra-physiological) doses of 17b-estradiol to male animals confers protection. In addition, we have evaluated the efficacy of a non-feminizing agonist of the g-protein coupled estrogen receptor to confer protection in male rats after traumatic brain injury. I served as a primary or co-investigator in all of these studies.

a) Chaovipoch P, Jelks KA, Gerhold LM, West EJ, Chongthammakun S, et al. 17beta-estradiol is protective in spinal cord injury in post- and pre-menopausal rats. J Neurotrauma. 2006 Jun;23(6):830-52. PubMed PMID: 16774470.

b) Kachadroka S, Hall AM, Niedzielko TL, Chongthammakun S, **Floyd CL**. Effect of endogenous androgens on 17beta-estradiol-mediated protection after spinal cord injury in male rats. J Neurotrauma. 2010 Mar;27(3):611-26. PubMed PMID: 20001688; PubMed Central PMCID: PMC2867591.

c) Siriphorn A, Chompoopong S, **Floyd CL**. 17β-estradiol protects Schwann cells against H2O2-induced cytotoxicity and increases transplanted Schwann cell survival in a cervical hemicontusion spinal cord injury model. J Neurochem. 2010 Nov;115(4):864-72. PubMed PMID: 20456002.

d) Day NL, **Floyd CL**, D'Alessandro TL, Hubbard WJ, Chaudry IH. 17β-estradiol confers protection after traumatic brain injury in the rat and involves activation of G protein-coupled estrogen receptor 1. J Neurotrauma. 2013 Sep 1;30(17):1531-41. PubMed PMID: 23659385; PubMed Central PMCID: PMC3751264.

4. My research team also has a research focus on novel approaches to promote repair and recovery after CNS injury. This work is highly collaborative and includes interdisciplinary collaborations with investigators from outside the field of CNS injury research. For example, we collaborated with researchers in materials science in the development and characterization of a novel regenerative matrix. We have on-going collaborations in this area with associated publications in preparation and/or in press. I served as a primary or co-investigator in all of these studies.

   a) Rismanchi N, **Floyd CL**, Berman RF, Lyeth BG. Cell death and long-term maintenance of neuron-like state after differentiation of rat bone marrow stromal cells: a comparison of protocols. Brain Res. 2003 Nov 21;991(1-2):46-55. PubMed PMID: 14575875.

   b) Roman JA, Niedzielko TL, Haddon RC, Parpura V, **Floyd CL**. Single-walled carbon nanotubes chemically functionalized with polyethylene glycol promote tissue repair in a rat model of spinal cord injury. J Neurotrauma. 2011 Nov;28(11):2349-62. PubMed PMID: 21303267; PubMed Central PMCID: PMC3218389.

   c) Lucas EK, Reid CS, McMeekin LJ, Dougherty SE, **Floyd CL**, et al. Cerebellar transcriptional alterations with Purkinje cell dysfunction and loss in mice lacking PGC-1α. Front Cell Neurosci. 2014;8:441. PubMed PMID: 25610371; PubMed Central PMCID: PMC4285109.

Complete List of Published Work in MyBiblography:

http://www.ncbi.nlm.nih.gov/pubmed/?cmd=historysearch&querykey=3

D. RESEARCH SUPPORT

Ongoing Extramural Research Support

July 2012-April 2017
R01 NS075162, NIH: National Institute of Neurological Disorders and Stroke (NINDS)
FLOYD, CANDACE L. (PI)
Role of dentate gyrus gating and neurogenesis in the pathophysiology of mild TBI
Role: PI

September 2011-August 2015
W81XWH-11-1-0373, DoD, U.S. Army Medical Research and Materiel Command, Office of Congressionally Directed Medical Research Programs (CDMRP)
FLOYD, CANDACE L. (PI)
Opioid Abuse after TBI
Role: PI

October 2013-September 2016
W81XWH-13-1-0482, DoD, U.S. Army Medical Research and Materiel Command, Office of Congressionally Directed Medical Research Programs (CDMRP)
FLOYD, CANDACE L. (PI)
Treatment of Neuropathic Pain after SCI with a Catalytic Oxidoreductant
Role: PI

Completed Extramural Research Support

August 2008-July 2014
W81XWH-08-2-0153, DoD, U.S. Army Medical Research and Materiel Command, Office of Congressionally Directed Medical Research Programs (CDMRP)
CHAUDRY, IRSHAD (PI)

Treatment of TBI with Hormonal and Pharmacological Support, Preclinical Validation Using Diffuse and Mechanical TBI Animal Models
Role: co-PI

July 2012-Feburary 2015
National Football League Charities Medical Research Program
FLOYD, CANDACE L. (PI)
Evaluation of a novel catalytic oxidoreductant to protect the brain after concussion
Role: PI

July 2008-June 2012
W81XWH-08-01-0289, DoD, U.S. Army Medical Research and Materiel Command, Office of Congressionally Directed Medical Research Programs (CDMRP)
FLOYD, CANDACE L. (PI)
Characterizing the relationship between blast exposure and mild TBU with dynamic modeling and testing in a new mouse model
Role: PI

July 2007-June 2009
R21 NS052559, NIH: National Institute of Neurological Disorders and Stroke (NINDS)
FLOYD, CANDACE L. (PI)
Neuroprotective effects of selective ERb activation by genistein in SCI
Role: PI

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BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Fontaine, Kevin Robert

eRA COMMONS USER NAME (credential, e.g., agency login): kfontai1

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Massachusetts at North Dartmouth	B.A.	05/1986	Psychology
Assumption College, Worcester, MA	M.A.	05/1988	Counseling Psychology
Victoria University of Manchester, UK	Ph.D.	09/1992	Psychology
Johns Hopkins University School of Medicine	Post-doc	06/1996	Obesity
Johns Hopkins University	M.A.	05/2010	Science Writing

A. Personal Statement

I am the Antoine Lavoisier Endowed Professor of Energetics and Health Lifestyles and Chair of the Department of Health Behavior in the School of Public Health at the University of Alabama at Birmingham (UAB). I have the expertise, leadership skills, training, mentoring experience to be an active participate of this T32 training program. My research focuses primarily on clinical obesity treatment and evaluating the effects of various dietary and physical activity interventions on body weight, body composition and quality of life. I am also involved in a number of studies evaluating the effects strength promoting exercise and lifestyle physical activity on body composition, function and quality of life in both children and adults with chronic disease and in adults with physical disabilities. I have been the PI or co-Investigator on numerous private foundation and NIH grants and collaborate frequently with investigators both within and outside of UAB. In addition, I mentor a vast number of students and faculty, both here at UAB and at The Johns Hopkins University School of Medicine's Division of Rheumatology.

1. Shafferman, A., **Fontaine, K.R**., Cron, R.Q., & Beukelman, T. (2014). Changes in body mass index in children with Juvenile Idiopathic Arthritis treated with Tumor Necrosis Factor Inhibitors. Journal of Rheumatology, 41(1), 113-118.
2. Krista K, **Fontaine KR**, Astrup A, Leanne Birch L, Brown AW, Bohan Brown MM, Durant N, Dutton G, Foster EM, Heymsfield SB, McIver K, Mehta T, Menachemi N, Newby PK, Pate R, Rolls BJ, Sen B, Smith Jr. DL , Thomas D, & Allison DB. Myths, Presumptions, and Facts in Obesity. New England Journal of Medicine, 2013; 368: 446-454. PMCID PMC3606061
3. Dutton, G., **Fontaine. K.R.**, Thomas, A., Dawson, J., Capers, P., & Allison, D. B. (2014). Randomized Controlled Trial Examining Expectancy Effects on the Accuracy of Weight Measurement. Clinical Obesity, Dec 22. doi: 10.1111/cob.12083. [Epub ahead of print]

B. Position and Honors

Positions and Employment

1992-1995 Lecturer in Psychology, University of Central Lancashire Preston, England.
1995-1996 Post-Doctoral Research Fellow, Department of Medicine, Johns Hopkins Weight Management Center, Baltimore, MD
1996-1997 Instructor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD
1997-1999 Assistant Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD

1999-2001	Assistant Professor of Medicine, University of Maryland, Baltimore, MD
2001-2008	Assistant Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD
2008-2012	Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD
2008-2012	Associate Professor, Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
2012-	Adjunct Faculty, Division of Rheumatology, Johns Hopkins University School of Medicine, Baltimore, MD
2012-	Adjunct Faculty, Department of Health, Behavior, and Society, Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD
2012-	Professor, Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, AL
2012-	Senior Scientist, Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center, University of Alabama at Birmingham, AL
2012-	Member, Center for Exercise Medicine, University of Alabama at Birmingham, AL
2012-	Senior Scientist, Comprehensive Cancer Center, University of Alabama at Birmingham, Birmingham, AL
2013-	Vice Chair, Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, AL
2014-	Chair, Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, AL

Awards and Other Professional Activities

1998-	North American Association for the Study of Obesity
2000-	Editorial Board, Eating Behaviors: An International Journal
2003-	American College of Rheumatology
2005-	Editorial Board, BMC Public Health
2007-	Editorial Board, Obesity

Honors

1982	Rudolph Le Vault Award for Excellence in Psychology
1990	Overseas Research Studentship Award
2001	University of Maryland, Women's Health Investigator Award
2004	Fibromyalgia Young Investigator Award, National Institutes of Health
2010	Outstanding Graduate, Johns Hopkins Writing Program
2012	Creativity is a Decision Award, The Nutrition Obesity Research Center (NORC) at UAB
2012	Back of the Envelope Award (BOTE), School of Public Health, UAB
2014	Grant Reviewer, National Institutes of Health, R15 AREA

C. Contribution to Science

1. My early contributions and publications focused on estimating the association of overweight and obesity on health-related quality of life (HRQL), as well as the independent association of body weight and pain to HRQL. These investigations helped to establish the extent to which overweight and obesity hamper HRQL, and have been replicated by many investigators, most notably that overweight and obesity take a greater toll upon physical HRQL domains or functioning compared to mental or emotional HRQL domains.
    a. **Fontaine, K.R.**, Cheskin, L.J. & Barofsky, I. (1996). Health-related quality of life in obese persons seeking treatment. Journal of Family Practice, 43, 265-270.
    b. **Fontaine, K.R.**, Barofsky, I. & Cheskin, L.J (1997). Predictors of quality of life among obese persons. Journal of Nervous and Mental Disease, 185, 120-122.
    c. Barofsky, I., **Fontaine, K.R.** & Cheskin, L.J. (1998). Pain in the obese: Impact on health-related quality of life. Annals of Behavioral Medicine, 19, 408-410.
    d. **Fontaine, K.R.** (1999). Predicting treatment seeking for overweight. Journal of Nervous and Mental Disease, 187, 248-250.

2. My second set of contributions focused upon the association of body mass index (BMI) to indices of obesity. Specifically, we have established the J or U-shaped association between BMI and mortality, as well as years of life lost and obesity-attributable deaths. More recently, I spearheaded as series of

secondary analyses which indicate that the deleterious BMI-mortality association found among whites and Europeans does not appear to be present among Hispanic adults. We are currently embarking on a series of projects to attempt to disentangle possible explanations for this lack of association.

a. **Fontaine, K.R**., Redden, D., Wang, C., Westfall, A. & Allison, D.B. (2003). Years of life lost due to obesity. Journal of the American Medical Association, 289, 187-193
b. Greenberg, J.A., **Fontaine, K.R**. & Allison, D.B. (2007). Putative biases in estimating mortality attributable to obesity in the US population. International Journal of Obesity, 31, 1439-1445.
c. **Fontaine, K.R**., McCubrey, R., Mehta, T., Pajewski, N.M., Keith, S.W., Bangalore, S.S., Crespo, C.J., & Allison, D.B. (2012). Body Mass Index and Mortality Rate among Hispanic Adults: A Pooled Analysis of Multiple Epidemiologic Datasets, International Journal of Obesity, 36, 1121-1126.
d. Mehta, T., McCubrey, R., Pajewski, N.M., Keith, S.W., Allison, D.B., Crespo, C.J. & **Fontaine, K.R**. (2013). Does obesity associate with mortality among Hispanic persons: Results from the National Health Interview Survey. Obesity, 21 (7), 1474-1477.

3. I have also been involved in a number of investigations related to evaluating the effects of disease modifying drugs on body composition, as well as the effects of various dietary and exercise/physical activity regiments in adolescents and adults with chronic rheumatic diseases, including fibromyalgia and chronic fatigue syndrome.

a. Rowe, P.C., Marden, C.L., Flaherty, M., Jasion, S.E., Cranston, E.M., Johns, A.S., Fan, J., Fontaine, K.R. & Violand, R.L. (2014). Impaired range of motion in chronic fatigue syndrome. Journal of Pediatrics, 165 (2), 360-366 PMID 24929332.
b. Fontaine, K.R., Conn, L. & Clauw, D.J. (2011). Effects of Lifestyle Physical Activity in Adults with Fibromyalgia: Results at Follow-Up. Journal of Clinical Rheumatology, 17, 64-68. [PMC3206258]
c. Fontaine, K.R., Conn, L. & Clauw, D.J. (2010). Effects of Lifestyle Physical Activity on Pain and Function in Adults with Fibromyalgia: Results of a Randomized Trial. Arthritis Research & Therapy, 12, 55. [PMC2888205]
d. Wung, P.K., Anderson, T., Fontaine, K.R., Hoffman, G.S., Specks, U., Merkel, P.A., Spiera, R., Davis, J.C., St. Clair, E.W., McCune, W.J. & Stone, J.H. (2008). Effects of Glucocorticoid Therapy on Weight During Treatment of Systemic Inflammation. Arthritis Care & Research, 59, 746-753.

Complete List of Published Work:
http://www.ncbi.nlm.nih.gov/pubmed/?term=fontaine+kr

D. Research Support

Ongoing Research Support

DOE/NIDRR Rimmer (PI) 10/01/13 -09/30/18
Dose-Response Effects of Transformative Exercise in Improving Health and Function in Adults with Spinal Cord Injury and Multiple Sclerosis
The goal of this project is to investigate the effects of various exercise interventions on the health and function on adults with physical disabilities.
Role: Co-I

DOE-NIDRR Rimmer (PI) 10/1/13-09/30/14
POWERSforID: A Telehealth Weight Management System for Adults with ID
The goal of this RCT is to investigate the effects of low carbohydrate diet on health and body composition in adults with ID.
Role: Co-I

R25 HL124208 (Fontaine Co-PI) 07/01/14-06/30/18
NIH – NHLBI

Strengthening Causal Inference in Behavioral Obesity Research
This annual course will provide didactic and demonstration opportunities to learn and integrate methods of causal inference from senior investigators from a variety of disciplines.
Role: Co-PI

R21 AR062269 Sule (PI) 07/01/13-06/30/15
Exercise and Body Composition in Juvenile Idiopathic Arthritis
The goal is to evaluate the effects of resistance exercise on body composition, strength, fitness, and disease activity in children with arthritis.
Role: Co-I

Egg Nutrition Counsel Fontaine (PI) 01/01/15-12/31/17
Does an Egg-Rich Diet Improve Metabolism and Health in older Adults?
The goal is to evaluate the effects of incorporating eggs into a low carbohydrate diet on health and function in older adults.
Role: PI

American Institute for Cancer Research Gower (PI) 01/01/15-12/31/17
Targeted Disruption to Cancer Metabolism and Growth through Dietary Macronutrient Modification
The goal of this study is to evaluate the effects of a ketogenic diet on body composition and cancer-biomarkers in women with persistent ovarian cancer.
Role: Co-I

Completed Research Support

UAB Back of the Envelope Award Fontaine (PI) 01/01/13-12/31/13
Gain to Lose: A counter-intuitive approach to fat loss
The goal of this award is to begin to investigate whether preserving muscle mass promotes more efficient fat loss.

R21 DK077959 Fontaine (PI) 07/01/08-06/30/12
Obesity and Mortality Among Hispanics
The goal is to estimate the association between body mass index and indices of body fat to mortality among US residing Hispanic adults.
Role: PI

R01 AR053168 Fontaine (PI) 07/15/06 – 05/31/12
Lifestyle physical activity for fibromyalgia
The goal of this study is to determine the efficacy of lifestyle physical activity on the major symptoms of fibromyalgia, and to evaluate the effects of the intervention on pain threshold, sleep, fitness, and perceived exertion.
Role: PI

R01 DK076671 Allison (PI) 08/15/07 – 06/30/11
Obesity and mortality
The goal of this study is to estimate the following: (1) the association of relative body weight to indices of mortality, (2) the magnitude of the bias of using self-reported versus measured body weight in studies of the association between obesity and health outcomes, (3) whether and to what extent the association of overweight and obesity to mortality is declining over calendar time, and (4) the association of body composition to mortality.
Role: Co-Investigator

Arthritis Foundation Haque (PI) 07/01/08-06/30/11
Treatment of Vitamin D Deficiency in Rheumatoid Arthritis
The goal of this study is to generate preliminary data regarding treatment of vitamin D deficiency and its effect on important patient related quality of life outcomes in RA.
Role: Co-Investigator

K23 AR049720 Fontaine (PI) 04/01/04 – 03/31/07
Lifestyle physical activity and function in Rheumatoid Arthritis
Mentored Patient-Oriented Research Career Development Award: to develop and test the effects of lifestyle physical activity on health and function in adults with rheumatoid arthritis.
Role: PI

American College of Rheumatology Fontaine (PI) 7/1/03 – 6/30/05
Promoting Physical Activity in Fibromyalgia
Rheumatology Health Professional Investigator Award: to test the effects of lifestyle physical activity on symptoms and quality of life in adults with fibromyalgia.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Mona N. Fouad

eRA COMMONS USER NAME (credential, e.g., agency login): mfouad

POSITION TITLE: Professor of Medicine; Director, Division of Preventive Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Alexandria University, Alexandria, Egypt	MD	1977	Medicine
University of Alabama at Birmingham, Birmingham, AL	MPH	1986	Epidemiology/Maternal Child Health

A. Personal Statement

As Professor of Medicine and Director of the UAB Division of Preventive Medicine, Director of the UAB Minority Health and Health Disparities Research Center, and a past member of the NIH National Advisory Council on Minority Health and Health Disparities, I have played a prominent leadership role in training minority researchers and leaders in the national effort to eliminate health disparities. Through this work I have developed a strong interest in mentoring minority investigators, fellows, and young faculty, helping to train the next generation of leaders in the fight against health disparities. I have served as mentor to 11 post-doctoral fellows/faculty and 4 pre-doctoral students, who successfully obtained their doctoral degrees. As PI on numerous federally funded projects and co-PI on additional grants, I direct the training and research cores for multiple projects. I am responsible for training and career development of minority students and faculty on the NCI-funded *Morehouse School of Medicine/Tuskegee University/UAB Partnership.* I also lead the Research Training Core and am the PI of the NIMHD-funded *Comprehensive Minority and Health Disparities Research Center (MHDRC),* which focuses on the interdisciplinary research efforts needed to understand and eliminate problems related to cancer screening and diabetes/obesity in the Deep South.

B. Positions and Honors

Positions and Employment

1979 – 1980 General Practitioner and Unit Director, Montaza Rural Health Unit, Alexandria Health Department, Alexandria, Egypt
1984 – 1986 Research Assistant - Heart Disease CABG/PTCA Follow-up Research Project, School of Public Health, University of Alabama at Birmingham (UAB)
1986 – 1988 Health Education/Coordinator Interventionist, Birmingham Heart Disease Prevention Project, Division of General & Preventive Medicine, UAB
1988 – 1990 Research Fellow, Birmingham Heart Disease Project, Div. of General & Preventive Med., UAB
1991 – 1993 Research Instructor, Department of Medicine, University of Alabama at Birmingham
1993 – 1996 Research Assistant Professor of Medicine, UAB
1996 – 1998 Director, Division of Preventive Medicine, Recruitment Unit, UAB
1996 – 2000 Assistant Professor of Medicine, Department of Medicine, UAB
1997 – Present Associate Scientist, Center for Aging, UAB
1997 – Present Associate Scientist, Comprehensive Cancer Center, UAB
1998 – Present Director, Recruitment and Retention Shared Facility, UAB
2000 – 2005 Associate Professor of Medicine, Department of Medicine, Division of Preventive Medicine, UAB
2001 – Present Scientist, Center for Outcomes and Effectiveness Research and Education (COERE)
2002 – Present Director, Minority Health and Health Disparities Research Center, UAB
2005 – Present Professor of Medicine, Department of Medicine, Division of Preventive Medicine, UAB
2005 – 2008 Chair, Commission on the Status of Women, UAB
2009 – Present Director, Division of Preventive Medicine, UAB

Apr 1, 2014 – Present Senior Associate Dean for Diversity and Inclusion, School of Medicine, UAB

Other Experience and Professional Memberships

2015 American Society of Preventive Oncology (ASCO)
2005 – Present Association for Prevention Teaching and Research (APTR) *(formerly the Association of Teachers of Preventive Medicine* (ATPM)
2004 – Present International Society of Preventive Oncology (ISPO)
2004 – Present American Society of Preventive Oncology (ASPO)
2001 – Present American Public Health Association (APHA)
1998 – Present American Association for Cancer Education (AACE)
1990 – Present American Heart Association (AHA)

Selected National and Regional Councils and Committees:

2011 – 2014 Section Editor in the area of Disparities, *Cancer*, the International Journal of the American Cancer Society
2010 – Present Member, American Cancer Society Mid-South Division Board of Directors
2010 – Present Chair, Dillard-LSUHSC Minority and Health Disparities Research Center (P20) Advisory Council, New Orleans, Louisiana
2009 – Present Chair, The Center for Health Disparities Research, Engagement and Training (P60) Advisory Council, University of Minnesota, Minneapolis, Minnesota
2008 – 2012 Member, National Advisory Council on Minority Health and Health Disparities of the National Institutes of Health, Bethesda, Maryland
2008 – Present Member, Council of Scientific Advisors, H. Lee Moffitt Cancer Ctr & Research Inst, Tampa, FL

Honors

B-Metro Fusion Award, presented by the City of Birmingham to recognize people in Birmingham who represent excellence in their chosen fields and foster, cultivate, and exemplify a wide array of diversity in our community, October 2014.
MOMENTUM Women's Leadership Award, Woman of Impact Award, February 2014.
2012 Albert LoBuglio Distinguished Faculty Award for Outstanding Contributions to the Research Mission of the UAB Comprehensive Cancer Center, University of Alabama at Birmingham, October 2012.
2008 President's Diversity Faculty Award, University of Alabama at Birmingham
The Max Cooper Award for Excellence in Research for 2007, UABirmingham School of Medicine, May 2007.
2007 Woman of the Year, "Ordinary People Doing Extraordinary Things, Alabama Power Community Service Award" May 2007.
Executive Leadership in Academic Medicine (ELAM) Fellowship, Nominated and selected by the SOM and the ELAM Program for Women to participate as a fellow in the 2006-2007 class.
Recognition of Excellence in Eliminating Health Disparities Award, American Medical Association's (AMA) Program on Health Disparities, April 2005.
Association of Academic Health Centers (AHC) Sullivan Best Practice Award in recognition of outstanding work to reduce health disparities in the United States, October 2004.
2004 Odessa Woolfolk Community Service Award, April 2004.

C. Contribution to Science

1. Recruitment and retention of minorities in clinical trials

My research on recruitment and retention of minorities in clinical trials has documented barriers and identified potential solutions. For successful accrual of minority participants, a comprehensive strategy on all levels is required: a) funding; b) policy and regulation; c) insurance coverage/reimbursement; d) minority investigators; e) patient navigation and support; f) public awareness and community participation.

a. **Fouad MN**, Johnson R, Nagy MC, Person S, Partridge E. Adherence and retention in clinical trials: a community-based approach. *Cancer*, 2014 Apr 1;120 Suppl 7:1106-12.
b. Vickers SM, **Fouad MN**. An overview of EMPaCT and fundamental issues affecting minority participation in cancer clinical trials: enhancing minority participation in clinical trials (EMPaCT): laying the groundwork for improving minority clinical trial accrual. *Cancer*, 2014 Apr 1;120 Suppl 7:1087-90.
c. **Fouad MN**, Lee JY, Catalano PJ, Vogt TM, Zafar SY, West DW, Simon CM, Klabunde CN, Kahn KL, Weeks JC, Kiefe CI. Enrollment of patients with lung and colorectal cancers in clinical trials. *J Oncol Pract*, 2013;9(2):e40-e47.

d. **Fouad MN**, Corbie-Smith G, Curb D, Howard BV, Mouton C, Simon M, Talavera G, Thompson J, Wang CY, White C, Young R. Special populations recruitment for the Women's Health Initiative: successes and limitations. *Control Clin Trials* 25:335-352, 2004.

2. Research to understand variability in cancer care and outcomes based on race, gender, and age

Health care utilizations and patient outcomes could be influenced by physician and patient factors. These factors could be due to physician practice behavior, patient demographics, perception and preference or patient comorbidities that could affect disease outcomes

a. **Fouad M**, Funkhouser E, May D, Partridge E, Kiefe C: Physicians Variability in Breast and Cervical Cancer Screening Practices within Same Clinics. *Clin J Womens Health* 1(2):59-68, 2001.

b. **Fouad MN,** Mayo CP, Funkhouser EM, Hall HI, Urban DA, Kiefe CI. Comorbidity independently predicted death in older prostate cancer patients, more of whom died with than from their disease. *J Clin Epidemiol,* 2004;57(7):720-728.

c. Laiyemo AO, Doubeni C, Pinsky PF, Doria-Rose VP, Bresalier R, Lamerato LE, Crawford ED, Kvale P, **Fouad M**, Hickey T, Riley T, Weissfeld J, Schoen RE, Marcus PM, Prorok PC, Berg CD. Race and colorectal cancer disparities: health-care utilization vs different cancer susceptibilities. *J Natl Cancer Inst,* 2010 April21;102(8):538-546. PMCID: PMC2857802

d. Martin MY, **Fouad MN**, Oster RA, Schrag D, Urmie J, Sanders S, Pisu M. What do cancer patients worry about when making decisions about treatment? Variation across racial/ethnic groups. *Supportive Care in Cancer,* 2013 Jan;22(1):233-44.

3. Innovative community-based approaches to reduce cancer health disparities

Building community capacity, empowerment and engagement are key principals to eliminating health disparities. Models such as training community health advisors, implementing community based participatory research, and engaging nontraditional health stakeholders such as policy makers and business leaders have been successful in reducing health disparities in cancer screening and compliance with treatment.

a. **Fouad MN**, Partridge E, Dignan M, Holt C, Johnson R, Nagy C, Person S, Wynn T, Scarinci I. Targeted intervention strategies to increase and maintain mammography utilization among African American Women. *Am J Public Health*, 2010 Dec;100(12):2526-31. PMID: 21068422

b. Partridge E, **Fouad M**. Community-driven approaches for reducing health disparities in cancer. *JAMA,* 2010 Mar 17;303(11):1090-1091.

c. **Fouad M**, Partridge E, Dignan M, Holt C, Johnson R, Nagy C, Parham G, Person S, Scarinci I, Wynn T. A community-driven action plan to eliminate breast and cervical cancer disparity: successes and limitations. *J Cancer Educ,* 2006;21(Suppl.):S91-100.

d. **Fouad MN**, Johnson R, Nagy MC, Person S, Partridge E. Adherence and retention in clinical trials: a community-based approach. *Cancer*, 2014 Apr 1;120 Suppl 7:1106-12.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/mona.fouad.1/bibliography/43289344/public/?sort=date&direction=ascending.

D. Research Support

Ongoing Research Support

U58 DP005814 (Fouad) CDC 09/30/14 – 09/29/17
Birmingham REACH for Better Health
The proposed project, "Birmingham REACH for Better Health," aims to reduce the disparities in chronic disease between African Americans and Whites in Birmingham, Alabama, by addressing the two major drivers of such disparities: nutrition and physical activity. Role: PI

U54 MD008176 (Fouad) NIMHD 09/26/12 – 07/31/17
Mid-South Transdisciplinary Collaborative Center for Health Disparities Research
The Mid-South Transdisciplinary Collaborative Center for Health Disparities Research (Mid-South TCC) seeks to reduce the disparities in chronic disease burden experienced by African Americans in six Mid-South states. Our goal is to address the social determinants that interplay to impact a person's health and produce disparate

health outcomes of minority populations. We will focus on pathways to obesity and chronic illness and the mechanisms connecting these pathways to health disparities throughout the life-course.
Role: Lead PD/PI

2P60MD000502-10 (Fouad/Scarinci) NIMHD 09/30/03 – 03/31/17
Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III
This application by the University of Alabama at Birmingham (UAB) proposes to expand our current NIMHD-funded P60 Center of Excellence – "Comprehensive Minority and Health Disparities Research Center (MHDRC)" to generate new knowledge on minority health and health disparities in the areas of cancer prevention and control, cardiovascular disease, and their risk factors in African American and Hispanic populations, with an emphasis on developing and testing interventions to reduce, and ultimately eliminate, these disparities. Role: Lead PD/PI

U24 MD006970 (Vickers/Fouad) NIMHD 10/01/11 – 05/31/16
EMPaCT: Phase II
The objective of EMPaCT Phase II is to increase recruitment and retention of racial/ethnic minorities into therapeutic clinical trials through the well-established EMPaCT consortium and in partnership with the American Cancer Society, with the ultimate goal of reducing cancer-related health disparities. Role: Subcontract PI

P30 CA13148 (Fouad) NCI 03/01/05 – 03/31/16
Comprehensive Cancer Center Core Support Grant-Recruitment & Retention Shared Facility
The objective of the RRSF is to provide UAB researchers with an infrastructure to recruit subjects into clinical trials with emphasis on special populations (African Americans, women, and older individuals). Role: PI

U54 CA118948 (Manne) NCI 09/30/05 – 08/31/16
Morehouse School of Medicine/Tuskegee University/University of Alabama Cancer Center Partnership
The Partnership has goals of attaining excellence in research focused on the basis of cancer health disparities and on reducing the cancer burden. The primary objectives are to maintain progress in establishing productive cancer research programs at MSM and TU, to persist in developing a pipeline of prospective minority investigators at TU and further expand cancer disparity research at UABCCC. Role: Co-PI

U54 MD008602 (Benjamin/Martin) NIMHD 07/01/13 – 06/30/18
(Fouad, PI: Research Project 1)
Gulf States Collaborative Center for Health Policy Research (Gulf States CC)
The overall goal of the Gulf States CC is to significantly reduce the burden of chronic disease in minority, low-income, and other vulnerable populations in the Gulf region and increase community resilience by conducting innovative health policy research that generates policy change and health system improvement. The overall goal of Research Project 1, "*Policy, System and Environment Changes: A Comprehensive Approach to Reducing Obesity,"* is to examine the impact of a comprehensive intervention including evidence and practice-based policy, environmental, and systems changes strategies on improving healthy eating, and increasing physical activity in a high risk population – African Americans. Role: PI, Research Project 1

U54 MD008620 (Vickers) NIMHD 10/15/13 – 06/30/18
National Transdisciplinary Collaborative Center for African American Men's Health
This proposed center seeks to address, through a regional approach, health disparities in conditions affecting African American men on a national scope. The program will target disparities in unintentional and violence-related injuries and chronic diseases in African American men across the life course of this population. The goal is to develop, implement, and evaluate interventions that will improve African American men's health through research, outreach, and training. Role: Co-Leader, Collaboration and Partnerships Core

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Gaffo, Angelo

eRA COMMONS USER NAME (agency login):

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Universidad Peruana Cayetano Heredia, Lima	MD	03/1999	Medicine
University of Alabama at Birmingham, Birmingham, AL	OTH	06/2003	Internal Medicine
University of Alabama at Birmingham, Birmingham, AL	OTH	06/2005	Internal Medicine
University of Alabama at Birmingham, Birmingham, AL	OTH	06/2007	Rheumatology
University of Alabama at Birmingham, Birmingham, AL	OTH	12/2008	Epidemiology
Birmingham VA Medical Center, Birmingham, AL	OTH	06/2009	Quality Improvement

A. PERSONAL STATEMENT

I have the expertise, motivation, and training to serve as content mentor for the UAB Division of Rheumatology T32 training grant Program. Since the beginning of my career in rheumatology at the Birmingham VA Medical Center and UAB I have developed clinical and research expertise in two main areas: 1) Crystalline arthritis, where I have published high-impact original research, function as investigator at the UAB Center of Research Translation in Gout and Hyperuricemia, have developed a network of collaboration with US and international investigators, and maintain a busy practice at the BVAMC and; 2) Systemic vasculitis, where my UAB clinical practice has focused more and I have developed a clinic session enriched for vasculitis and other complex autoimmune conditions, and I have been active through academic publications, lectures, and being Principal Investigator for UAB vasculitis-related studies. In addition, I have been deeply interested in medical and trainee education as is reflected in my roles as Associate Director for the UAB Rheumatology Training program, my role as mentor for undergraduate Hispanic and Latino students at UAB, and my involvement with other educational and academic initiatives at UAB such as the Kaizen-IM program and the Undiagnosed Diseases Program. I am convinced that my skills and experience will be useful for future T32 trainees in a role complimentary to that of the primary mentor.

a. **Gaffo AL**, Jacobs DR Jr, Sijtsma F, Lewis CE, Mikuls TR, Saag KG. Serum urate association with hypertension in young adults: analysis from the Coronary Artery Risk Development in Young Adults cohort. Ann Rheum Dis. 2013 Aug;72(8):1321-7.

b. **Gaffo AL**, Schumacher HR, Saag KG, Taylor WJ, Dinnella J, Outman R, Chen L, Dalbeth N, Sivera F, Vázquez-Mellado J, Chou CT, Zeng X, Perez-Ruiz F, Kowalski SC, Goldenstein-Schainberg C, Chen L, Bardin T, Singh JA. Developing a provisional definition of a flare in patients with established gout. Arthritis Rheum. 2012 May;64(5):1508-17.

c. Nevin CR, Cherrington A, Roy B, Daly DD, Rodriguez JM, Patel M, Snyder ED, **Gaffo AL**, Barney J, Willig JH. A qualitative assessment of internal medicine resident perceptions of graduate medical education following implementation of the 2011 ACGME duty hour standards. BMC Med Educ. 2014 Apr 22;14:84

B. POSITIONS AND HONORS

Positions and Employment

1999 - 2002 Physician-Investigator, NGO, Lima
2000 - 2001 Local Investigator, Merck & Co and Bristol-Myers Squibb Research Protocols

2001 - 2002	Physician, Investigation and Development Laboratories (Universidad Peruana Cayetano Heredia)
2002 - 2003	Internship, Internal Medicine, University of Alabama at Birmingham
2003 - 2005	Residency, Rheumatology, University of Alabama at Birmingham
2005 - 2007	Fellowship, Rheumatology, University of Alabama at Birmingham
2007 - 2009	Fellowship in Quality Movement, National VA Quality Scholars Program at the Birmingham VA Medical Center
2009 -	Staff Rheumatologist, Birmingham VA Medical Center
2009 -	Assistant Professor of Medicine, University of Alabama at Birmingham

Other Experience and Professional Memberships

1999 -	Member, Peruvian College of Physicians
2002 -	Member, American College of Physicians
2005 -	Member, American College of Rheumatology
2005 -	Member, Alabama Society of Rheumatic Diseases

Honors

2009	Irtaza and Shana Siddique Endowed Award for Academic Excellence in Epidemiology, University of Alabama at Birmingham School of Public Health
2011	Outstanding Teaching Award, University of Alabama at Birmingham Division of Rheumatology
2012	Outstanding Teaching Award, University of Alabama at Birmingham Division of Rheumatology
2013	Outstanding Teaching Award, University of Alabama at Birmingham Division of Rheumatology

C. Contribution to Science

1. My main area of research interest has been on epidemiology of hyperuricemia and clinical aspect of gout, mainly related to definition of flares. My published work with the NIH-funded database CARDIA laid the foundation for the successful funding of one of the projects of the UAB Center for Gout and Hyperuricemia (CORT – [https://clinicaltrials.gov/ct2/show/NCT02038179]). Our international study leading to the most widely accepted gout flare definition to date is leading into a subsequent validation study will be used as part of a composite outcome for gout response in clinical trials and practice.
    a. **Gaffo AL**, Roseman JM, Jacobs DR Jr, Lewis CE, Shikany JM, Mikuls TR, Jolly PE, Saag KG. Serum urate and its relationship with alcoholic beverage intake in men and women: findings from the Coronary Artery Risk Development in Young Adults (CARDIA) cohort. Ann Rheum Dis. 2010 Nov;69(11):1965-70. PubMed PMID: 20525839.
    b. **Gaffo AL**, Jacobs DR Jr, Lewis CE, Mikuls TR, Saag KG. Association between being African-American, serum urate levels and the risk of developing hyperuricemia: findings from the Coronary Artery Risk Development in Young Adults cohort. Arthritis Res Ther. 2012 Jan 6;14(1):R4. PubMed PMID: 22225548; PubMed Central PMCID: PMC3392790.
    c. **Gaffo AL**, Schumacher HR, Saag KG, Taylor WJ, Dinnella J, Outman R, Chen L, Dalbeth N, Sivera F, Vázquez-Mellado J, Chou CT, Zeng X, Perez-Ruiz F, Kowalski SC, Goldenstein-Schainberg C, Chen L, Bardin T, Singh JA. Developing a provisional definition of flare in patients with established gout. Arthritis Rheum. 2012 May;64(5):1508-17. PubMed PMID: 22083456.
    d. Sattui SE, Singh JA, **Gaffo AL.** Comorbidities in patients with crystal diseases and hyperuricemia. Rheum Dis Clin North Am. 2014 May;40(2):251-78. PubMed PMID: 24703346; PubMed Central PMCID: PMC4159668.

2. In addition to the contributions mentioned above, I have a genuine and long-standing interest in the care of patients with systemic vasculitis. My experience in the field has led to invitation to contribute on review articles and book chapters in the field.
    a. **Gaffo AL**. Diagnostic approach to ANCA-associated vasculitides. Rheum Dis Clin North Am. 2010 Aug;36(3):491-506. PubMed PMID: 20688246.
    b. **Gaffo AL**. Thrombosis in vasculitis. Best Pract Res Clin Rheumatol. 2013 Feb;27(1):57-67. PubMed PMID: 23507057.

D. RESEARCH SUPPORT

Ongoing Research Support

P50 AR060772, NIH/NIAMS Kenneth Saag/Louis Bridges (PI) 2012/09/01-2017/08/31
CoRT Project 2: The Effects of Urate Lowering Therapy on Inflammation, Endothelial function, and Blood Pressure
This project will confirm the usefulness and elucidate the mechanisms for a novel approach for hypertension prevention and control, relevant in individuals with hyperuricemia and gout and that can greatly improve cardiovascular outcomes in diverse populations.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: James F. George

eRA COMMONS USER NAME (credential, e.g., agency login): JFGEORGE

POSITION TITLE: Professor of Surgery

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Wittenberg University, Springfield, Ohio	BA	1981	Biology
University of Cincinnati	MS	1983	Immunology
University of Cincinnati	PhD	1987	Immunology
University of Alabama at Birmingham	Post-doc	1991	Immunology

A. Personal Statement

In the most recent era, my studies have focused on the role of heme oxygenase-1 and the products of heme recycling in chronic/acute renal and vascular injury. Post and pre-doctoral education continues to be a strong component of my activities in the laboratory. I currently have one MSTP student and one post-doctoral fellow who work with us in the fields of acute kidney injury and heme oxygenase-1. In these studies, I closely collaborate and share facilities with Dr. Anupam Agarwal. In collaboration with Dr. Anupam Agarwal, we have developed a major rodent microsurgical facility for the study of acute kidney injury that is part of the NIDDK funded UAB-UCSD O'Brien Center for Acute Kidney Injury (P30 DK079337, http://www.obrienaki.org).

B. Positions and Honors

Positions and Employment:

1987-1991 Postdoctoral Fellow Laboratory of Max D. Cooper, University of Alabama at Birmingham.
1991-2000 Assistant Professor Department of Surgery, University of Alabama at Birmingham.
1991-Present Adjunct Faculty, Department of Microbiology, University of Alabama at Birmingham.
1998-Present Adjunct Faculty, Department of Medicine, University of Alabama at Birmingham.
2000-2007 Associate Professor, Department of Surgery, University of Alabama at Birmingham.
2007-Present Professor of Surgery, Department of Surgery, University of Alabama at Birmingham.
2009-Present Director of Research, Division of Cardiothoracic Surgery, University of Alabama at Birmingham

Honors/Awards:

1985 Outstanding Ph.D. Student, University of Cincinnati
1997 Young Investigator Award, American Society of Transplant Physicians
1997 Research Achievement Award, American Heart Association

Other Professional Activities:

NIH Ad-Hoc Member TTT Study section 2014 and 2015, Board of Directors, International Society for Heart and Lung Transplantation, 2010-2013; Program Committee, International Meeting on Heme Oxygenase 2009; International Society for Heart and Lung Transplantation (ISHLT)– Awards committee 2000-Pres.; ISHLT Council on basic science and pathology 1993-Pres; ISHLT Chairman, Council on basic science and Pathology 2001-2008.; ISHLT Abstracts selection review committee 1994-Pres; ISHLT Co-chairman program committee on basic science and pathology 1995, 1996, 2000; American Society of Transplant Physicians - Scientific Studies Committee 1996-1999; NIH Study Section, Innovative grants on immune tolerance 2001; NIH Study section, Program projects on Immune tolerance and rejection 2003; NIH Ad-Hoc Member TTT

Study section 2006; NIH Study Section, Tolerance Induction in Non-human primates 2007; Editorial Board J. Heart and Lung Transplantation 1995-1999; Associate Editor Journal of Heart and Lung Transplantation 1999-present

C. Contributions to science

1. I have a long-standing interest in end-stage heart and kidney disease. In the late 1990's through 2005, my focus was on the role of hematopoietically derived donor cells on modulation of the host responses to allogeneic transplanted tissue. At that time, the guiding hypothesis of our work was based on a postulated "veto effect" in which donor cells could mediate deletion of allospecific T cell clones. In support of this idea, we showed that, in a semiallogeneic skin graft model, Fas-ligand expression on infused donor bone marrow cells was required for operational tolerance. In the absence of Fas-ligand, establishment of chimerism was not enough. In turn, Fas expression was also required on the recipient cells. This mechanism, however, did not extend to extension of graft survival by infusion of other types of donor cells, such as splenocytes.

   a. **George JF**, Sweeney SD, Kirklin JK, Simpson EM, Goldstein DR, et al. An essential role for Fas ligand in transplantation tolerance induced by donor bone marrow. Nat Med. 1998 Mar;4(3):333-5. PMID: 9500608.

   b. Goldstein DR, Chang T, Sweeney SD, Kirklin JK, Thomas JM, et al. Enhanced allograft survival induced by posttransplant donor spleen cell infusion occurs via a mechanism that is distinct from the mechanism of enhancement by donor bone marrow. Transplantation. 2000 Mar 15;69(5):1020-2. PMID: 10755572.

   c. Goldstein DR, Thomas JM, Kirklin JK, **George JF**. Indefinite allograft survival mediated by donor bone marrow is dependent on the presence of a functional CD95 (Fas) gene in recipients. J Heart Lung Transplant. 2001 Oct;20(10):1132-5. PMID: 11595570.

2. In the early/mid-2000's, a family issue reduced my productivity for 2-3 years. After things were resolved, I made a series of decisions that resulted in changes in research direction. Instead of being focused solely on basic transplantation biology, I broadened my focus towards clinical and translational studies and, because of new responsibilities within my Division, expanded my expertise into clinical research of end-stage organ failure and transplantation. I engaged in the study of the relationship of age at the time of transplant, transplant outcomes, and changes in specific risk factors for death/morbid events as a function of time (i.e. transplant year). Using our own institutional database and the Cardiac Transplant Research Database (a multi-institutional database spanning 18 years of transplantation at 32 institutions), we created multivariable parametric models of these populations to determine the influence of specific risk factors on populations differing by age, race, and transplant year. We performed similar studies of malignancies in cardiac transplant recipients. We showed that those most at-risk for rejection were non-white individuals when transplanted at ages 10-30 years. This held true for all eras of transplantation. While the aggregate risk for these events declined as a function of transplant year, the relative increase in risk for a subpopulation at increased risk for rejection (i.e. black recipients) or infection (i.e. older recipients) did not change. For malignancies, we found that freedom from post-transplant lymphoproliferative disorders (PTLD) was lowest in children between the ages of 1 <10 years versus infants and adolescents. Solid organ malignancies in adults declined by transplant year until the aggregate risk was no greater than the normal population, but the distribution of malignancies was substantially skewed towards more dangerous variants.

   a. **George JF**, Pamboukian SV, Tallaj JA, Naftel DC, Myers SL, et al. Balancing rejection and infection with respect to age, race, and gender: clues acquired from 17 years of cardiac transplantation data. J Heart Lung Transplant. 2010 Sep;29(9):966-72. PMID: 20580261.

   b. **George JF**, Taylor DO, Blume ED, Kirklin JK, Naftel DC, et al. Minimizing infection and rejection death: clues acquired from 19 years of multi-institutional cardiac transplantation data. J Heart Lung Transplant. 2011 Feb;30(2):151-7. PMID: 20934888.

c. Chinnock R, Webber SA, Dipchand AI, Brown RN, **George JF**. A 16-year multi-institutional study of the role of age and EBV status on PTLD incidence among pediatric heart transplant recipients. Am J Transplant. 2012 Nov;12(11):3061-8. PMID: 23072522.

d. Higgins RS, Brown RN, Chang PP, Starling RC, Ewald GA, Tallaj JA, Kirklin JK, **George JF**. A multi-institutional study of malignancies after heart transplantation and a comparison with the general United States population. J Heart Lung Transplant. 2014 May;33(5):478-85. PMID: 24630406.

3. Starting in 2007, I established a collaborative relationship with Dr. Anupam Agarwal, an international expert in the mechanisms of heme oxygenase-1 (HO-1) gene regulation. This collaboration came about because, by that time, I had accumulated substantial expertise and infrastructure in the implementation of animal models of disease and together we established a microsurgical core laboratory that is now an NIH-funded national resource (1P30 DK079337) to support our studies. We developed a highly synergistic professional relationship in which we investigated how HO-1 participates in regulation of a number of important homeostatic systems. This is a complex question because the capability to express HO-1 is nearly ubiquitous. We therefore developed a unique set of mouse strains using transgenic and cre-lox technologies and used them to investigate how HO-1 modulates homeostatic mechanisms of central importance. Among our most important papers are those showing that one of the primary pathways by which HO-1 affects the immune system is through its action on cells of the myeloid lineage, which participate in innate immunity and also act as antigen presenting cells for adaptive immunity. For example, we showed that a lack of HO-1 in antigen presenting cells abrogated the ability of regulatory T cells to inhibit T cell activation and expansion in vitro. We also found that HO-1 expression, or a lack of it, strongly affects trafficking and function of myeloid cells in acute kidney injury. We similarly showed that expression human HO-1 using a bacterial artificial chromosome transgenic mouse lacking endogenous HO-1 expression corrected most, if not all, of the immune defects observed in global HO-1 deficient mice. Therefore, HO-1 and other molecules associated with heme metabolism, have a strong effect on inflammation in the kidney.

a. **George JF**, Braun A, Brusko TM, Joseph R, Bolisetty S, Wasserfall CH, Atkinson MA, Agarwal A, Kapturczak MH. Suppression by CD4+CD25+ regulatory T cells is dependent on expression of heme oxygenase-1 in antigen-presenting cells. Am J Pathol. 2008 Jul;173(1):154-60. doi: 10.2353/ajpath.2008.070963. Epub 2008 May 29. PMID: 18511516

b. Zarjou A, Guo L, Sanders PW, Mannon RB, Agarwal A, **George JF**. A reproducible mouse model of chronic allograft nephropathy with vasculopathy. Kidney Int. 2012 Dec;82(11):1231-5. PMID: 22874842; NIHMSID: NIHMS390755; PubMed Central PMCID: PMC3495090.

c. Kim J, Zarjou A, Traylor AM, Bolisetty S, Jaimes EA, Hull TD, **George JF**, Mikhail FM, Agarwal A. In vivo regulation of the heme oxygenase-1 gene in humanized transgenic mice. Kidney Int. 2012 Aug;82(3):278-91. PMID: 22495295; NIHMSID: NIHMS363442; PubMed Central PMCID: PMC3396739.

d. Hull TD, Kamal AI, Boddu R, Bolisetty S, Guo L, Tisher CC, Rangarajan S, Chen B, Curtis LM, **George JF**, Agarwal A. Heme Oxygenase-1 Regulates Myeloid Cell Trafficking in AKI. J Am Soc Nephrol. 2015 Feb 12; PMID: 25677389.

A partial list of published works (93 publications: NCBI – My Bibliography URL)
http://www.ncbi.nlm.nih.gov/sites/myncbi/1HogjiJcPgYQG/bibliography/42319773/public/?sort=date&direction=descending
(note that, because of a bug in the My NCBI implementation, 3 publications in this list, PMIDs 5950480, 2919728, 2515878, which concern sea urchins and epidemiology in the Sudan, were published by someone else)

D. Research Support

Active Research Support

NIH/NIDDK - R01 DK083390 Agarwal/George (MPI) 07/01/11 - 06/30/15
The role of heme oxygenase-1 in the immune response
The major goals of this proposal are to decipher the role of heme oxygenase-1 in antigen presenting cells (dendritic cells) in a model of chronic renal transplant rejection.

NIH/NIDDK - P30 DK079337 | Agarwal (PI) George (Co-I) | 09/01/08 - 07/31/18

UAB-UCSD O'Brien Core Center for Acute Kidney Injury Research
The major objectives of this grant are to provide state-of-the-art core resources to address experimental questions for the advancement of AKI research.

NIH/NIDDK/NIAID – R01 AI101138 | Shimamura (PI) George (Co-I) | 08/08/13 – 07/31/18

Innate Immunity and Viral Renal Allograft Injury
The major objectives of this project are to determine the cellular and molecular mechanisms by which CMV infection potentiates the development of graft rejection.

NIH/NHLBI - HL125735 | Prabhu (PI) George (Co-I) | 04/10/15 – 03/30/2020

Splenic Marginal Zone Macrophages in Chronic Ischemic Heart Failure.
The major goals are to determine the role of splenic marginal zone macrophages in chronic ischemic heart failure

Veterans Administration Merit Grant | Prabhu (PI) George (Co-I) | 05/01/2015 – 4/30/2020

Role of Regulatory T-Lymphocytes in Chronic Heart Failure
The major goal is to determine the role of regulatory T cells in the inflammatory response in chronic ischemic heart failure.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Shawn Robert Gilbert

eRA COMMONS USER NAME (credential, e.g., agency login): SHAWNG

POSITION TITLE: Associate Professor, Division of Orthopaedics, Department of Surgery

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of North Carolina at Chapel Hill	BS	1992	Biology
University of North Carolina School of Medicine	MD	1996	Medicine
University of North Carolina School of Medicine		2003	Orthopaedic Research Fellowship

A. Personal Statement

As a surgeon, I face the challenging problems associated with poor bone healing, segmental bone loss and bone infections. My particular area of emphasis is on correction of limb deformities, which often requires complex treatments such as distraction osteogenesis. These experiences give me insight into the relevance of the animal models to public health problems. With respect to basic science, I have worked in all aspects of skeletal repair from studying genetic models (1), to drug discovery (2), to in vitro evaluation and in vivo applications in animal models (3), working with graduate students for many of these projects. Furthermore, I have been involved in clinical research including chart reviews, prospective trials, and studies utilizing large clinical databases. As an academic surgeon, I am constantly teaching on clinical rotations and mentoring undergraduate and medical students as well as residents in clinical and basic research. I have developed a new curriculum for a seminar on research in orthopaedics for our residents, and have developed innovative teaching techniques including simulation for medical management of surgical patients (4). Collectively, my experiences in mentoring trainees in research projects, my clinical practice, and my focus on education provide a useful background and skill set for serving as a content mentor for musculoskeletal research.

1. The hypoxia-inducible factor alpha pathway couples angiogenesis to osteogenesis during skeletal development. Wang Y, Wan C, Deng L, Liu X, **Gilbert SR**, Bouxsein ML, Faugere MC, Guldberg RE, Gerstenfeld LC, Haase VH, Johnson RS, Schipani E, Clemens TL. *J Clin Invest.* 117:1616, 2007**.** PMID: 17549257, PMC: 1878533
2. Discovery of a new molecular probe ML228: An activator of the hypoxia inducible factor (HIF) pathway. Theriault JR, Felts AS, Bates BS, Perez JR, Palmer M, **Gilbert SR**, Dawson ES, Engers JL, Lindsley CW, Emmitte KA. *Bioorg & Med Chem Let* 22(1):76-81, 2012. PMID 22172704. PMCID:PMC3251333.
3. Stewart RL, Goldstein J, Eberhardt AE, Chu G, **Gilbert SR.** Increasing Vascularity to Improve Healing of a Segmental Defect of the Rat Femur. *J Orthop Trauma*, 25(8):472. 2011. PMID:21738061. PMC3748583
4. High-fidelity simulations for orthopaedic residents: medical complications and systems challenges. Lee White M, **Gilbert SR**, Youngblood AQ, Zinkan JL, Martin R, Tofil NM. *J Bone Joint Surg Am.* 2013 May 15;95(10):e701-4. PubMed PMID: 23677371.

B. Positions and Honors

Positions

1996-97 Internship, General Surgery, UNC Hospitals
1997-98 Research fellowship, Orthopaedics, UNC Dept Orthopaedics
1998-2002 Residency, Orthopaedic Surgery, UNC Hospitals
2002-2003 Fellowship, Pediatric Orthopaedics, Children's Healthcare of Atlanta – Scottish Rite
2003-2009 Assistant Professor of Orthopaedics, University of Alabama Birmingham
2003-present Associate Scientist, Center for Metabolic Bone Disease, U. of Alabama Birmingham
2007-present Assistant Professor Pathology, U. of Alabama Birmingham
2008-present Biomatrix Engineering and Regenerative Medicine Center, U. of Alabama Birmingham
2009-present Associate Professor of Orthopaedics and Pathology, U. of Alabama Birmingham
2010-2013 Associate Professor, Dept. of Physiology and Biophysics, U. of Alabama Birmingham
2012-present Associate Professor with Tenure Orthopaedic Surgery, University of Alabama at Birmingham
2013-present Scientist, Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center, University of Alabama at Birmingham
2013-present Associate Professor, Department of Cell, Developmental and Integrative Biology, University of Alabama at Birmingham (secondary appointment)

Other Experience and Professional Memberships

Fellow, American Academy of Orthopaedic Surgery
Fellow, American Academy of Pediatrics
American Society for Bone and Mineral Research
Limb Lengthening and Reconstruction Society
Orthopaedic Research Society
Pediatric Orthopaedic Surgery of North America
Scoliosis Research Society, Member
Editorial Board Member, *Surgery and Related Research*
NIH ZRG1 CB-N (58) peer review panel 2009

Honors

1992 B.S. Biology with Highest Honors and Distinction
1996 M.D. with Honors
1998 Outstanding teaching performance, Musculoskeletal course (UNC School of Medicine)
2009 St. Giles Young Investigator Award (Pediatric Orthopaedic Society of North America)
2009 Vern Tolo Outstanding Basic Science Paper (2009 POSNA Annual Meeting)
2013 POSNA/SLAOTI South American Travelling Fellow

C. Contribution to Science

1. My basic science research focuses on translational research to improve healing of bone and growth plate injuries, and investigations on the role of vasculature in skeletal development and regeneration. I contributed to an early seminal work that established the role of the Hypoxia Inducible Factor (HIF) pathway in bone development (1). I was then co-first author on a study that first established activating the HIF pathway as a therapeutic target for speeding bone healing using a distraction osteogenesis model (2). My lab also explored the potential application of this strategy in other bone healing models including simple fractures (3) and more challenging bone defect models (4). These publications established that an FDA approved, inexpensive small molecule activator of the HIF pathway, desferroxamine, could be useful to promote bone healing. Other investigators have taken this approach and applied it to other bone healing models, confirming that this approach has therapeutic potential.

1. The hypoxia-inducible factor alpha pathway couples angiogenesis to osteogenesis during skeletal development. Wang Y, Wan C, Deng L, Liu X, **Gilbert SR**, Bouxsein ML, Faugere MC, Guldberg RE, Gerstenfeld LC, Haase VH, Johnson RS, Schipani E, Clemens TL. *J Clin Invest.* 117:1616, 2007**.** PMID: 17549257, PMC: 1878533
2. Activation of the hypoxia-inducible factor-1alpha pathway accelerates bone regeneration. ***Gilbert SR,** *Wan C, Wang Y, Cao X, Shen X, Ramaswamy G, Jacobsen KA, Alaql ZS, Eberhardt AW, Gerstenfeld LC, Einhorn TA, Deng L, Clemens TL. *Proc Natl Acad Sci* 105(2):686, 2008. (*co-first authors) PMID: 18184809, PMC2206597.
3. Prolyl Hydroxylase Inhibitors Increase Neoangiogenesis and Callus Formation Following Femur Fracture in Mice. Shen X, Wan C, Ramaswamy G, Mavalli M, Wang Y, Duvall CL, Deng LF, Guldberg RE, Eberhart A, Clemens TL, **Gilbert SR**. *J Orth Res*. 27:1298, 2009. PMID: 19338032
4. Increasing Vascularity to Improve healing of a Segmental Defect of the Rat Femur. Stewart R, Goldstein J, Eberhardt A, Gabriel Chu GT, **Gilbert S**. *J Orthop Trauma* 25(8):472-6, 2011. PMID: 21738061

2. Subsequent Research efforts have focused on developing novel methods for improving bone healing, such as the collaboration with Dr. Jun to develop a biomimetic matrix (1), developing newer, more potent HIF activating compounds (supported by NIH R03 (Gilbert PI)) (2), and developing methods to deliver the agent effectively to facilitate translation to clinical application(3). These studies push towards seeing my laboratory based discoveries making their way towards the bedside.

1. Anderson JM, Patterson JL, Vines JB, Javed A, **Gilbert SR**, Jun HW. Biphasic Peptide Amphiphile Nanomatrix Embedded with Hydroxyapatite Nanoparticles for Stimulated Osteoinductive Response. *ACS Nano* 2011 Nov 17. PMID: 22077993 PMC3691849 (***Featured as a Top Story by the Extracellular Matrix News, November 17, 2011***)
2. Theriault JR, Felts AS, Bates BS, Perez JR, Palmer M, **Gilbert SR**, Dawson ES,Engers JL, Lindsley CW, Emmitte KA. Discovery of a new molecular probe ML228: An activator of the hypoxia inducible factor (HIF) pathway. *Bioorg Med Chem Lett*, 22:76-81. 2012. PMID: 22172704; PMCID: PMC3251333
3. Hertzberg BP, Holt JB, Graff RD, **Gilbert SR**, Dahners LE. An evaluation of carrier agents for desferoxamine, an up-regulator of vascular endothelial growth factor. J Biomater Appl. 2013 May;27(8):1046-54. [2012 Jan 19. Epub] PMID: 22262572

3. I have developed a new area of investigation into the impact of obesity on skeletal development and fractures in the course of mentoring a masters student, Ian Backstrom. The effects of obesity on bone quality and fracture risks in children and adolescent are controversial. We performed a clinical review of high energy trauma patients with fractures of the femur and tibia and were the first to show a higher rate of growth plate fractures in obese patients (1). This led us to develop a laboratory based investigation to explain our clinical finding. We are currently investigating the effects of diet induced obesity on the morphology and strength of the physis in a rat model through a grant from the Pediatric Orthopaedic Society of North America.

1. Altered lower extremity fracture characteristics in obese pediatric trauma patients.**Gilbert SR**, MacLennan PA, Backstrom I, Creek A, Sawyer J. *J Orthop Trauma.* 2014 Apr 15. [Epub ahead of print] PubMed PMID: 24740109 (PMCID:4198524).

4. Throughout my career, I have sought ways to improve training of students and residents. I participated in redesigning our musculoskeletal course for medical students in the pre-clinical curriculum and developed new lectures and cased based conferences. I have mentored numerous medical students, residents and graduate students on research projects. I have developed a new seminar for orthopaedic interns to teach and apply skills for developing quality clinical or bench research projects. Finally, I have contributed to the literature regarding innovative teaching methods with a novel use of simulation to teach management of medical complications in surgical patients (1) and have participated in developing and evaluating a new skills assessment for orthopaedic residents and residency candidates.

1. High-fidelity simulations for orthopaedic residents: medical complications and systems challenges. Lee White M, **Gilbert SR**, Youngblood AQ, Zinkan JL, Martin R, Tofil NM. *J Bone Joint Surg Am.* 2013 May 15;95(10):e701-4. PubMed PMID: 23677371.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/40327493/?sort=date&direction=ascending

D. Research Support

Current

Pediatric Orthopaedic Society of North America

6/1/2014-5/31/2015

Effects of Obesity on the Physis

The goal of this project is to determine the effect of high fat, high carbohydrate diet on the developing growth plate and adjacent primary spongiosa

Role: PI

Completed

NIH R03 EB017344

5/1/13 – 4/30/14

A hybrid nanosack for the enhanced islet engraftment in the omentum

The goal of this project is to develop hybrid sack and evaluate vascularization in rat omentum

Role: Co-Invest

DOD OR090206

10/1/2010-10/29/2014

Promoting Angiogenesis in Contaminated Open Fractures

The goal of this project is to evaluate the extent of hypovascularity in a contaminated open fracture model relevant to severe combat extremity injuries. We will also evaluate the effects of pro angiogenic small molecules in this setting.

Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Goepfert, Paul

eRA COMMONS USER NAME (agency login):

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Houston Baptist University	BS	05/1987	Biology and Chemistry
Baylor College of Medicine	MD	05/1991	Medicine
University of Alabama at Birmingham	Intern	1992	Department of Medicine
University of Alabama at Birmingham	Resident	1994	Department of Medicine
University of Alabama at Birmingham	Postdoctoral Fellow	1996	Department of Medicine, Infectious Diseases
University of Alabama at Birmingham	Clinical Fellow	1997	Department of Medicine, Infectious Diseases

A. PERSONAL STATEMENT

My role on this grant application is to serve as a content mentor to students who are interested in translational and interdisciplinary research. I have previously mentored numerous graduate and postgraduate students who have done their thesis or rotated in my laboratory. Several of these students have won awards while presenting their work at meetings held locally, nationally and internationally. Numerous publications in peer reviewed journals have resulted from their hard work. Several of these students have gone on to academic research careers and have become independent investigators. My laboratory focuses on T cell immune responses in HIV-1 infection to determine correlates of protection that may be important for future vaccine design. We currently have funding for several projects that analyze a variety of T cell immune responses to HIV-1 partially taking into account the tremendous viral diversity associated with this infection. As such, there are numerous projects and research opportunities that would provide the necessary complementary expertise to students for their research work.

1. Williams LD, Bansal A, Sabbaj S, Heath SL, Song W, Tang J, Zajac AJ, **Goepfert PA**. Interleukin-21-producing HIV-1-specific CD8 T cells are preferentially seen in elite controllers. J Virol. 2011 Mar;85(5):2316-24. PMCID: PMC3067790.
2. Akinsiku OT, Bansal A, Sabbaj S, Heath SL, **Goepfert PA**. Interleukin-2 production by polyfunctional HIV-1-specific CD8 T cells is associated with enhanced viral suppression. J Acquir Immune Defic Syndr. 2011 Oct 1;58(2):132-40. PMCID: PMC3391567.
3. Bet A, Sterrett S, Sato A, Bansal A, **Goepfert PA**. Characterization of T-cell responses to cryptic epitopes in recipients of a noncodon-optimized HIV-1 vaccine. J Acquir Immune Defic Syndr. 2014 Feb 1;65(2):142-50. PMCID: PMC3896890.
4. Williams LD, Amatya N, Bansal A, Sabbaj S, Heath SL, Sereti I, **Goepfert PA**. Immune activation is associated with CD8 T cell interleukin-21 production in HIV-1-infected individuals. J Virol. 2014 Sep 1;88(17):10259-63. PMCID: PMC4136345.

B. POSITIONS AND HONORS

Positions and Employment

1997 -	Associate Scientist, Comprehensive Cancer Center, University of Alabama at Birmingham
1997 - 2000	Member, Co-Investigator, NIAID AIDS Vaccine Evaluation Group, University of Alabama at Birmingham
1997 - 2003	Assistant Professor, Department of Medicine, Division of Infectious Diseases, University of Alabama at Birmingham
1998 -	Associate Scientist, Center for AIDS Research, University of Alabama at Birmingham
1998 - 2003	Assistant Professor, Department of Microbiology, University of Alabama at Birmingham
2000 -	Member, Co-investigator, HIV Vaccine Trials Network, University of Alabama at Birmingham
2003 -	Associate Scientist, Gene Therapy Center, University of Alabama at Birmingham
2003 - 2009	Associate Professor, Department of Medicince, Division of Infectious Diseases, University of Alabama at Birmingham
2003 - 2009	Associate Professor, Department of Microbiology, University of Alabama at Birmingham
2009 -	Professor, Department of Microbiology, University of Alabama at Birmingham
2009 -	Professor, Department of Medicine, Division of Infectious Diseases, University of Alabama at Birmingham

Other Experience and Professional Memberships

1994 -	Member, Amican College of Physicians
1995 -	Member, American Society of Virology`
1997 -	Member, American Society of Microbiology
2001 -	Member, Southern Society for Clinical Investigation
2006 -	Member, American Association of Immunologists
2009 -	Member, American Society for Clinical Investigation

Honors

1989	High Honors in Basic Science, Baylor College of Medicine, Houston, TX
1990	Senior AOA Member, Baylor College of Medicine, Houston, TX
1996	J. Claude Bennett Award for Excellence in Research by a Clinical Associate Fellow, University of Alabama at Birmingham
2007	UAB School of Medicine Excellence in Teaching "Argus Award", University of Alabama at Birmingham
2008	Max Cooper Award for Excellence in Research, University of Alabama at Birmingham
2009	Top 25 Reviewer, Journal of Virology
2010	Top 25 Reviewer, Journal of Virology
2012	Graduate Dean's Excellence in Mentorship Award, University of Alabama at Birmingham

C. Contribution to Science

1. Mentoring of graduate/postgraduate students: I have mentored 4 graduate students in the past and have also served as the lab mentor for several rotation students, medical students, residents and fellows. Currently, I am mentoring two graduate students and one post-doc. This mentoring experience has been very productive resulting in several publications, a few recent ones have been cited below.

   a. Williams LD, Bansal A, Sabbaj S, Heath SL, Song W, Tang J, Zajac AJ, **Goepfert PA**. Interleukin-21-producing HIV-1-specific CD8 T cells are preferentially seen in elite controllers. J Virol. 2011 Mar;85(5):2316-24. PMCID: PMC3067790.

   b. Akinsiku OT, Bansal A, Sabbaj S, Heath SL, **Goepfert PA**. Interleukin-2 production by polyfunctional HIV-1-specific CD8 T cells is associated with enhanced viral suppression. J Acquir Immune Defic Syndr. 2011 Oct 1;58(2):132-40. PMCID: PMC3391567.

   c. Bet A, Sterrett S, Sato A, Bansal A, **Goepfert PA**. Characterization of T-cell responses to cryptic epitopes in recipients of a noncodon-optimized HIV-1 vaccine. J Acquir Immune Defic Syndr. 2014 Feb 1;65(2):142-50. PMCID: PMC3896890.

d. Williams LD, Amatya N, Bansal A, Sabbaj S, Heath SL, Sereti I, **Goepfert PA**. Immune activation is associated with CD8 T cell interleukin-21 production in HIV-1-infected individuals. J Virol. 2014 Sep 1;88(17):10259-63. PMCID: PMC4136345.

2. Safety and immunogenicity of HIV-1 vaccines: I have several years of expertise in HIV-1 vaccine studies. To date, 4 large scale HIV vaccine studies have been conducted. These have aimed at inducing both arms of the adaptive immunity i.e. T cells and antibodies although the correlates of protection are not yet fully defined. We have shown that the route of immunization and the dose of DNA can impact the functionality of the elicited T cell responses. Additionally, I have been involved as a principal investigator for studies aimed at using canarypox and MVA as delivery vectors for HIV vaccines.

   a. **Goepfert PA**, Horton H, McElrath MJ, Gurunathan S, Ferrari G, Tomaras GD, Montefiori DC, Allen M, Chiu YL, Spearman P, Fuchs JD, Koblin BA, Blattner WA, Frey S, Keefer MC, Baden LR, Corey L. High-dose recombinant Canarypox vaccine expressing HIV-1 protein, in seronegative human subjects. J Infect Dis. 2005 Oct 1;192(7):1249-59. PMID: 16136469.

   b. Bansal A, Jackson B, West K, Wang S, Lu S, Kennedy JS, **Goepfert PA**. Multifunctional T-cell characteristics induced by a polyvalent DNA prime/protein boost human immunodeficiency virus type 1 vaccine regimen given to healthy adults are dependent on the route and dose of administration. J Virol. 2008 Jul;82(13):6458-69. PMCID: PMC2447094.

   c. **Goepfert PA**, Elizaga ML, Sato A, Qin L, Cardinali M, Hay CM, Hural J, DeRosa SC, DeFawe OD, Tomaras GD, Montefiori DC, Xu Y, Lai L, Kalams SA, Baden LR, Frey SE, Blattner WA, Wyatt LS, Moss B, Robinson HL. Phase 1 safety and immunogenicity testing of DNA and recombinant modified vaccinia Ankara vaccines expressing HIV-1 virus-like particles. J Infect Dis. 2011 Mar 1;203(5):610-9. PMCID: PMC3072720.

   d. **Goepfert PA**, Elizaga ML, Seaton K, Tomaras GD, Montefiori DC, Sato A, Hural J, DeRosa SC, Kalams SA, McElrath MJ, Keefer MC, Baden LR, Lama JR, Sanchez J, Mulligan MJ, Buchbinder SP, Hammer SM, Koblin BA, Pensiero M, Butler C, Moss B, Robinson HL. Specificity and 6-month durability of immune responses induced by DNA and recombinant modified vaccinia Ankara vaccines expressing HIV-1 virus-like particles. J Infect Dis. 2014 Jul 1;210(1):99-110. PMCID: PMC4072895.

3. Role of HIV specific T cells in pathogenesis: In addition to the contributions described above, my research has also largely focused on evaluating CD8 T cell responses in context of HIV to understand and identify correlates of protective immunity. CD8 T cells play a very important role in modulating HIV disease progression as the emergence of these cells during acute infection coincides with the decline in plasma viremia. However, the precise attributes of these cells responsible for exacting viral control are yet to be defined. A large body of literature including several seminal findings from my lab has shown that the CD8 T cell associated with viral control produce a polyfunctional profile that includes their ability to produce IL-21. My lab was also among the first to describe that targeting gag is beneficial for HIV control.

   a. **Goepfert PA**, Bansal A, Edwards BH, Ritter GD Jr, Tellez I, McPherson SA, Sabbaj S, Mulligan MJ. A significant number of human immunodeficiency virus epitope-specific cytotoxic T lymphocytes detected by tetramer binding do not produce gamma interferon. J Virol. 2000 Nov;74(21):10249-55. PMCID: PMC102068.

   b. Edwards BH, Bansal A, Sabbaj S, Bakari J, Mulligan MJ, **Goepfert PA**. Magnitude of functional CD8+ T-cell responses to the gag protein of human immunodeficiency virus type 1 correlates inversely with viral load in plasma. J Virol. 2002 Mar;76(5):2298-305. PMCID: PMC135950.

   c. Bansal A, Gough E, Sabbaj S, Ritter D, Yusim K, Sfakianos G, Aldrovandi G, Kaslow RA, Wilson CM, Mulligan MJ, Kilby JM, **Goepfert PA**. CD8 T-cell responses in early HIV-1 infection are skewed towards high entropy peptides. AIDS. 2005 Feb 18;19(3):241-50. PMID: 15718834.

   d. Williams LD, Bansal A, Sabbaj S, Heath SL, Song W, Tang J, Zajac AJ, **Goepfert PA**. Interleukin-21-producing HIV-1-specific CD8 T cells are preferentially seen in elite controllers. J Virol. 2011 Mar;85(5):2316-24. PMCID: PMC3067790.

4. Role of other immune subsets in HIV pathogenesis: Besides T cells, other immune subsets such as NK cells and neutrophils are also involved in affecting HIV disease course and I have been involved as a co-investigator in all these studies.

a. Merino AM, Sabbaj S, Easlick J, **Goepfert P**, Kaslow RA, Tang J. Dimorphic HLA-B signal peptides differentially influence HLA-E- and natural killer cell-mediated cytolysis of HIV-1-infected target cells. Clin Exp Immunol. 2013 Dec;174(3):414-23. PMCID: PMC3826307.

b. Merino AM, Dugast AS, Wilson CM, **Goepfert PA**, Alter G, Kaslow RA, Tang J. KIR2DS4 promotes HIV-1 pathogenesis: new evidence from analyses of immunogenetic data and natural killer cell function. PLoS One. 2014;9(6):e99353. PMCID: PMC4047121.

c. Bowers NL, Helton ES, Huijbregts RP, **Goepfert PA**, Heath SL, Hel Z. Immune suppression by neutrophils in HIV-1 infection: role of PD-L1/PD-1 pathway. PLoS Pathog. 2014 Mar;10(3):e1003993. PMCID: PMC3953441.

5. Persistent immune activation in HIV infected patients: Chronic immune activation is a hallmark of HIV infection and even ART treated individuals have higher levels of immune activation than HIV seronegative controls. Understanding the mechanisms that contribute to this state and finding strategies that can ameliorate it will prevent co-morbidities such as cardiovascular disease, diabetes mellitus etc that have been associated with a persistent inflammatory state. I have been involved as a co-investigator in all these studies.

a. Overton ET, Sterrett S, Westfall AO, Kahan SM, Burkholder G, Zajac AJ, **Goepfert PA**, Bansal A. Effects of atorvastatin and pravastatin on immune activation and T-cell function in antiretroviral therapy-suppressed HIV-1-infected patients. AIDS. 2014 Nov 13;28(17):2627-31. PMCID: PMC4338916.

b. Li H, **Goepfert P**, Reeves RK. Short communication: Plasmacytoid dendritic cells from HIV-1 Elite Controllers maintain a gut-homing phenotype associated with immune activation. AIDS Res Hum Retroviruses. 2014 Dec;30(12):1213-5. PMID: 25387330.

c. Claiborne DT, Prince JL, Scully E, Macharia G, Micci L, Lawson B, Kopycinski J, Deymier MJ, Vanderford TH, Nganou-Makamdop K, Ende Z, Brooks K, Tang J, Yu T, Lakhi S, Kilembe W, Silvestri G, Douek D, **Goepfert PA**, Price MA, Allen SA, Paiardini M, Altfeld M, Gilmour J, Hunter E. Replicative fitness of transmitted HIV-1 drives acute immune activation, proviral load in memory CD4+ T cells, and disease progression. Proc Natl Acad Sci U S A. 2015 Mar 24;112(12):E1480-9. PMCID: PMC4378387.

D. RESEARCH SUPPORT

Ongoing Research Support

UM1 AI069452, NIH/NIAID M. Saag (PI) 2013/12/01-2020/11/30
Alabama-Clinical Trials Unit
The Alabama HIV/AIDS CTU is designed to provide an administrative infrastructure that brings Network investigators at UAB together to facilitate the conduct of high capacity, quality-assured, safety-driven clinical trials through provision of administrative support, financial support, communications, staff training, oversight, regulatory support, pharmacy services, synchronization of scientific effort, community relations, and CAB support, and coordination of study personnel in order to achieve maximal efficiency of available staff effort.
Role: Site Leader

P30 AI27767, NIH/NIAID M. Saag (PI) 2014/06/01-2019/05/31
UAB Center for AIDS Research
The primary purpose of this center is to support interdisciplinary AIDS research efforts. This Center is responsible for the planning, evaluating, managing and documenting a broad array of research activities within the two institutions. The purpose of this project is linking clinical and basic science studies through the use of shared facilities and to translate as quickly as possible fundamental knowledge about AIDS and its related disorders into clinical treatment and prevention programs. This effort will fund the leadership of the highly successful CFAR Developmental Grant Program which provides faculty development resources to HIV/AIDS investigators.
Role: Core Director

R01 AI112566, NIH/NIAID Goepfert, Paul (PI) 2014/07/15-2018/06/30

A Rational Approach for HIV Vaccine T Cell Epitope Selection
Compare the quality of immune responses to adapted and nonadapted epitopes during acute HIV infection and following HIV vaccination of seronegative individuals.

R21 AI116188, NIH Kutsch (PI) 2014/09/19-2016/08/31
Kinomic analysis of host cell factors controlling latent HIV-1 infection
The goal of this application is to establish a comprehensive model of latent HIV-1 infection that considers the dynamic, bidirectional interactions of the virus with the host-cell at the kinase, transcription factor and possibly chromatin level and to use this knowledge to drive a drug repositioning effort to identify drug combinations that will reverse the unresponsive state of the host T cells, thereby allowing cognate antigen and possible therapeutic stimuli to trigger HIV-1 reactivation.
Role: Co-Investigator

R01 AI102663, NIH/NIAID/University of Texas, El Paso subcontract
Kan-Mitchell (PI) 2012/08/01-2016/06/30
Effector and Regulatory Activities of HLA-E-Restricted HIV-Specific Î±Î²CD8 T Cells
To study HLA-E restricted HIV-specific CD8 T cells and their role in HIV infection. As a subcontracting site, UAB will provide the clinical specimens and perform the flow cytometry and intracellular cytokine staining assays.
Role: Site PI

R01 AI064060, NIH/NIAID/Emory University subcontract
Hunter (PI) 2005/02/15-2016/03/31
CTL and HIV Polymorphisms in Heterosexual Transmission
A consortium, contractual agreement under the direction of the Program Director, Eric Hunter of Emory University with the major goal of this proposal is to define in detail the critical role that the innate and adaptive cellular immune systems play in the highly heterogeneous process of HIV-1 transmission and viral control.
*NCE through 03/31/2016
Role: Site PI

UM1 AI068614, NIH/NIAID/Fred Hutchinson Cancer Research Center
Corey (PI) 2014/12/01-2015/11/30
UAB HVTN Protocol Funding
The purpose of this supplemental funding to the Vaccine Clinical Trials Research Site of the NIH/NIAID Alabama Clinical Trials Unit (CTU) is to provide protocol implementation funds to conduct clinical research evaluating candidate HIV vaccines for the prevention of HIV infection in adult populations.
Role: Site Leader

R01 AI084772, NIH/NIAID Goepfert, Paul (PI) 2009/09/11-2015/08/31
HIV-1 Cryptic Epitopes â Implications for Vaccine Design
To understand the full breadth and functional features of cytotoxic T lymphocytes that may be induced during both HIV-1 infection and HIV-1 vaccination. This information will be highly relevant and directly applicable to the design of an HIV-1 vaccine. *NCE through 08/31/2015

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: George Howard

eRA COMMONS USER NAME (credential, e.g., agency login): ghoward

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
St. Andrews Presbyterian Coll-Laurinburg, NC	BA	05/1973	Mathematics & Business
UNC at Chapel Hill-Chapel Hill, NC	MS	05/1976	Operations Research
UNC at Greensboro-Greensboro, NC	MBA	05/1979	Finance and Marketing
UNC at Chapel Hill-Chapel Hill, NC	MSPH	05/1982	Biostatistics
UNC at Chapel Hill-Chapel Hill, NC	DrPH	05/1987	Biostatistics

A. Personal Statement

My qualifications have focused on being a statistician, working in the overlap of the development and application of statistical methods in the domains of epidemiological studies and clinical trials.

Since 1994 a major focus of my research has been on geographic and racial differences in stroke risk, including the role of obesity and nutrition as a contributor. As part of this effort I have been the PI of the REasons for Geographic And Racial Differences in Stroke (REGARDS) Study, a longitudinal cohort of 30,239 African American and White participants from all 48 of the contiguous US States. Advancing the understanding of racial and geographic disparities in stroke has been a major theme of my career for the past two decades. Previously, I have been the PI of the coordinating center for the Insulin Resistance Atherosclerosis Study (IRAS), and was one of the original investigators for the Atherosclerosis Risk in Communities (ARIC) study.

In the domain of clinical trials, I am the PI of the Statistical and Data Management Center for the Carotid Revascularization for Primary Prevention of Stroke Trial (CREST-2), a pair of randomized trials each with an anticipated sample size of 1,240 that assess: 1) the difference between carotid endarterectomy versus intensive medical management, and 2) between carotid stenting and intensive medical management. He is also the immediate past PI of the Coordinating Centers the Carotid Revascularization Endarterectomy Stenting Trial (CREST) a randomized trial of 2,502 patients contrasting endarterectomy versus carotid stenting, Secondary Prevention of Small Subcortical Strokes (SPS3) a 2-by-2 factorial randomized trial of 3,000 lacunar stroke patients assessing aspirin versus clopidogrel and standard versus intensive blood pressure management, and the Trial of Early Aggressive Treatment of Rheumatoid Arthritis (TEAR) Trial a 2-by-2 factorial randomized trial of 750 patients with early arthritis assessing triple therapy versus an anti-TNF inhibitor and early versus late therapy.

Examples of publications showing statistical methodology to be applied to epidemiological studies (“a” below) and clinical trials (“b” below); examples of publications from epidemiological studies

a. **Howard G**, McClure LA, Moy CS, Safford MM, Cushman M, Judd SE. Kissela BM, Kleindorfer DO, Howard VJ, Rhodes DJ, Muntner P, Tiwari HK. Imputation of incident events in longitudinal cohort studies. Am J Epidemiol 2011;174:718-726.

b. **Howard G**, Waller JL, Voeks JH, Howard VJ, Jauch EC, Lees KR, Nichols FT, Rahlfs VW, Hess DC. A simple, assumption-free and clinically interpretable approach for analysis of modified Rankin outcomes. Stroke 2012;43:644-649. PMID 22343650.

c. **Howard G**, Cushman M, Kissela BM, Kleindorfer DO, McClure LA, Safford MM, Rhodes JD, Soliman EZ, Moy CS, Judd SE, Howard VJ. Traditional risk factors as the underlying cause

of racial disparities in stroke: lessons from the half full (empty?) glass. Stroke. 2011;42:3369-75. PMID: 21960581

d. **Howard G**, Banach M, Cushman M, Goff DC, Howard VJ, Lackland DT, McVay J, Meschia JF, Muntner P, Oparil S, Rightmyer M, Taylor HA. Is blood pressure control for stroke prevention the correct goal? The lost opportunity of preventing hypertension. Stroke 2015, in press.

B. Positions and Honors

Positions and Employment

1978-1981 Instructor, Department of Neurology, Bowman Gray School of Medicine, Winston-Salem, NC.
1980-1982 Health and Human Services Traineeships, Division of Associated and Dental Health Professions.
1982-1983 Health and Human Services Traineeships, National Cancer Institute.
1981-1988 Research Assistant Professor, Department of Neurology, Bowman Gray School of Medicine, Winston-Salem, NC.
1988-1989 Research Associate Professor, Department of Public Health Sciences, Bowman Gray School of Medicine, Winston-Salem, NC.
1989-1991 Research Professor, Dept. of Public Health Sciences, Bowman Gray School of Medicine, Winston-Salem, NC.
1991-1999 Professor, Dept. of Public Health Sciences, Wake Forest University School of Medicine, Winston-Salem, NC.
1999-2011 Professor and Chairman, Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL.
2011-present Professor, Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL.

Other Experience and Professional Memberships

1981-Present American Statistical Association
1984-Present Society for Clinical Trials
1984-Present Biometric Society (ENAR)
1987-Present Stroke Council, American Heart Association (FAHA)
1990-Present Epidemiology Council, American Heart Association (FAHA)

Federal Government Public Advisory Committees (recent)

2014 – Present Member, Board on the Health of Select Populations, Institute of Medicine
2014 – Present Member, Medical Follow-up Agency (MUFA) Advisory Committee, Institute of Medicine
2014 – Present NIDCD DSMB : Acute Video-oculography for Vertigo in Emergency Rooms for Rapid Triage (AVERT) Study
2006 – Present Executive Committee, Aspirin to Reduce Risk of Initial Vascular Events (ARRIVE) Study, Bayer HealthCare.
2007 – Present NHLBI. Hispanic Study, Observational Studies Monitoring Board (Chair)
2007 – Present NHLBI. Vest prevention of early sudden death trial (VEST) and Prediction of ICD Therapies Study (PREDICTS). Data and Safety Monitoring Board.
2003 – 2009 Morehouse School of Medicine: Scientific Advisory Board, Stroke Prevention/Interention Research Program
2001 – 2004 Leadership Committee, Council on Cardiovascular Epidemiology and Prevention, American Heart Association
2006 – 2010 Prevention Advisory Board, National Stroke Association
2004 – 2010 Veteran's Administration, DSMB, The Home INR Study (THINRS)
2005 – 2010 Neurobiological Technologies, Inc. Steering Committee, NTI-ASP-0502: Study of Acute Viprinex™ for Emergency Stroke, and NIT-ASP-0503: ASP-II (Ancrod in Stroke Program-II)
2007 – 2010 Boehringer Ingelheim. Flibanserin Data and Monitoring Committee
2004 – 2007 NHLBI, Data and Safety Monitoring Board, Omega-3 Fish Oil Studies
2005 – 2009 CDC, National Forum for the Prevention of Heart Disease and Stroke, Policy Research Advisory Committee

2003 – 2006	NINDS, Data and Safety Monitoring Board, Phase I trials.
2004 – 2009	American Heart Association, Burgher Grant Program RFP Development and Monitoring Board

Honors and Awards (recent)

1. Lowell Reed Lecture, Applied Health Statistics Section of the American Public Health Association. New Orleans, LA. November 16, 2014
2. Daniel C. Gainey Lectureship in Stroke and Related Diseases at the Mayo Clinic, September 8-10, 2013, Rochester, MN
3. Winner of the University Alabama at Birmingham Presidential Medal (a sole award presented to researchers annually), 2011.
4. Robert M. Hearin Distinguished Lecture. *Seeking the causes of racial and geographic disparities in stroke disparity*. University of Mississippi Medical Center, September 22, 2011.
5. Member of the faculty for the World Heart Association International 10-day Course in Cardiovascular Epidemiology and Prevention (Hyderabad India 2009, Grenada West Indies 2011)
6. Member of the faculty for the American Heart Association 10-Day Course in Cardiovascular Epidemiology and Prevention (Tahoe City, CA, 1995 – 2011)
7. Keynote speaker. Stroke Society of Australaisa. Melborne, December 2010.
8. Plenary Presentation. American Academy of Neurology. *Traditional Risk Factors Play a Minor Role in the Excess Stroke Incidence in African Americans.* Honolulu, April 2011
9. William Feinberg Memorial Lecture. *Seeking the Causes of Excess Risk in African Americans*. University of Arizona, Tuscon, May 19-20, 2011.
10. Public Health Grand Rounds. University of Texas School of Public Health, Houston, April 19-20, 2011.
11. Grand Rounds. Eastern Virginia School of Medicine. Norfolk, VA. January 23-24, 2011.
12. Keynote Presentation. Sixth International Congress on Vascular Dementia, Barcelona, Spain. November 18-21, 2009.

C. Contribution to Science

As noted above, my contributions fall into two broad domains, direction of large epidemiological studies of cerebrovascular and cardiovascular disease, and clinical trials that fall primarily in the domain of stroke prevention.

Within the observational studies, most recently my focus has been on advancing the understanding of the contributors to racial and geographic disparities in stroke mortality through the creation, evaluation and follow-up of the REasons for Geographic And Racial Differences in Stroke (REGARDS) study. This RO1-funded grant supports one of the largest longitudinal cohorts of blacks (44% of the cohort) and whites (56%) of the cohort aged 45+. The cohort was recruited from 1,866 counties across the 48 contiguous states in the US. Not only has the cohort served to provide valuable insights to the disparities in stroke mortality (examples are summarized in reference “a” below), but has served as a platform for over 40 ancillary studies (largely NIH-funded) addressing other diseases including heart disease, kidney disease, venous thrombosis, fractures, sepsis and others. The study has produced over 250 publications across this broad range of studies, and has provided insights to the understanding of obesity nationally.

Previously in observational epidemiology, I have made major contributions to subclinical measures of atherosclerosis using B-mode ultrasound to assess intimal-medial thickness of the carotid artery. This work was performed in both the ARIC and IRAS studies, for example showing where associations with smoking (“b” below) and insulin resistance (“c” below).

In clinical trials, I have contributed as the PI of the coordinating center for numerous studies, most recently focusing on carotid revascularization (the CREST and CREST-2 trials. These studies have served as the foundation for current guidelines for the management of extracranial carotid atherosclerosis (“d” below).

a. **Howard G**. Ancel Keys Lecture: Adventures (and Misadventures) in Understanding (and Reducing) Disparities in Stroke Mortality. Stroke 2013;44:3254-3259. 24029634; PMCID: PMC3878050.

b. **Howard G**, Wagenknecht LE, Burke GL,, Diez-Roux A, Evans GW, McGovern P, Nieto FJ, Tel GS. Cigarette Smoking and Progression of Atherosclerosis: The Atherosclerosis Risk In Communities (ARIC) Study. JAMA 1998;279;119-124

c. **Howard G**, O’Leary DH, Zaccaro D, Haffner S, Rewers M, Hamman R, Selby JV, Saad MF, Savage P, Bergman R for the IRAS Investigators. Insulin Sensitivity and Atherosclerosis. Circulation 1996;93(10):1809-1817

d. Brott TG, Hobson RW II, **Howard G**, Roubin GS, Clark WM, Brooks W, Mackey A, Hill WD, Leimgruber PP, Sheffett AJ, Howard VJ, Moore WS, Voeks JH, Hopkins LN, Cutlip DE, Cohen DJ, Popma JJ, Ferguson RD, Cohen SN, Blackshear JL, Silver FL, Mohr JP, Lal BK, Meschia JF. Stenting compared to endarterectomy for treatment of carotid artery stenosis. New Eng J Med, 2010;363:11-23. PMID: 20505173

Bibliography available at:
http://www.ncbi.nlm.nih.gov/sites/myncbi/george.howard.1/bibliography/44287758/public/?sort=date&direction=descending

D. Research Support

R01 NS041588 (G Howard) 9/1/2012 – 11/30/2017 NIH/NINDS
Etiology of Geographic and Racial Differences in Stroke (REGARDS)
The major goals of this project are to provide national data on stroke incidence, case fatality, prevalence of cerebrovascular risk factors and lifestyle choices ad assess geographic and racial variations in these.

R01 NS038384 (Brott) (subcontract) 1/1/2011 – 12/31/2016 NIH/NINDS
Carotid Revascularization Endarterectomy versus Stenting Trial (CREST)
CREST is a randomized clinical trial of cerebrovascular symptomatic patients with high-grade stenosis randomized to carotid endarterectomy (CEA) and carotid angioplasty with stenting (CAS). Primary endpoints are any stroke, MI or death in the 30-day peri-procedural period, or ipsilateral stroke in the post-30 day period. The unit at UAB is the statistical coordinating center for the trial.

U01 NS080165 (G Howard) 3/15/14 – 2/28/21 NIH/NINDS
CREST-2 Statistical and Data Coordinating Center – (SDCC)
CREST-2 is a pair of randomized trials to assess potential stroke reduction: 1) carotid endarterectomy plus aggressive medical management versus medical management alone, and 2) carotid stenting plus aggressive medical management versus medical management alone. Each trial will have approximately 1,240 patients randomized and followed for up to 4 years for any stroke during a 44-day peri-procedural period plus ipsilateral stroke over a follow-up period extending 4 years. The study will be performed in approximately 120 clinical centers in the US and Canada.

P60 AR064172 (Cui) 9/1/2008 - 8/31/2013 NIH/NIAMS
Methodology Core for the Multidisciplinary Clinical Research Center
This Core is responsible for the design and analysis of 4 novel research projects in rheumatoid arthritis and musculoskeletal diseases. The methodology core is also responsible for the methods development and publications.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Laura Bouchard Hughes

eRA COMMONS USER NAME (credential, e.g., agency login): lhughes

POSITION TITLE: Associate Professor, Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Auburn University	B.S.	1986-1991	Zoology
University of Alabama at Birmingham	M.D.	1992-1996	Medicine
University of Alabama at Birmingham	M.S.P.H.	2001-2003	Biostatistics

A. Personal Statement:

As the Program Director of the Clinical Immunology and Rheumatology Fellowship Training Program I am well suited to serve on this T32 Training Grant entitled, “Training Program in Rheumatic and Musculoskeletal Diseases Research”. My role will be to serve on the Internal Advisory Committee and well as potential Content Mentor for trainees. My role as the Clinical Training Program Director involves recruiting highly qualified candidates to our Fellowship Program who have demonstrated the capacity and interest to pursue a career in academic medicine performing research. I am involved in developing all lecture series for the fellows and we include didactic sessions on getting started in clinical and basic research. I develop the curriculum and schedule for all of our clinical trainees which is customized according to their clinical and research activities. I meet with all fellows frequently to help them identify a mentor and potential research projects. I have performed genetic and pharmacogenetic research in the past which lead to a K23 award. I am currently involved in research projects focused on osteoarthritis and rheumatoid arthritis. I serve as the Director of the Musculoskeletal Ultrasound Service for our Clinic and train the fellows in this modality. In summary, my role as Training Program Director will allow me to recruit excellent candidates to our program who can benefit from the T32, provide didactic training through lecture series on various aspects of conducting clinical and basic science research, prepare a schedule for the trainees to include appropriate amounts of protected time to pursue research and a career in academic medicine, and to help identify appropriate mentors and projects that will best position our trainees for success in academic medicine and research.

1. **Hughes LB**, Criswell LA, Beasley TM, Edberg JC, Kimberly RP, Moreland LW, Seldin MF, Bridges SL Jr. (2004) Genetic risk factors for infection in patients with early rheumatoid arthritis. Genes Immun, 5(8); 641-7. PMID: 15526004

2. **Hughes LB**, Beasley TM, Patel H, Morgan SL, Baggott JE, Saag KE, McNicholl J, Moreland LW, Alarcon GS, Bridges SL Jr. (2006) Racial or ethnic differences in allele frequencies of single nucleotide polymorphisms in the methylenetetrahydrofolate reductase gene and their influence on response to methotrexate in rheumatoid arthritis. Ann Rheum Dis 65(9): 1213-8. PMCID: PMC1798268

3. **Hughes LB**, Morrison D, Padilla M, Vaughn K, Westfall A, Mikuls T, Holers VM, Parrish L; Alarcón G, Conn DL, Jonas B, Callahan L, Smith E, Gilkeson G, Howard G, Moreland L, Fraser P, Allison D, Patterson N, Reich D, Bridges SL Jr. (2008) The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African-Americans through European genetic admixture. Arthritis Rheum 58(2): 349-58. PMID: 18240241

4. Guermazi A, Roemer FW, Hayashi D, Crema MD, Niu J, Zhang Y, Marra MD, Katur A, Lynch JA, El-Khoury GY, Baker K, **Hughes LB**, Nevitt MC, Felson DT. (2011) Assessment of synovitis with contrast-

enhanced MRI using a whole-joint semiquantitative scoring system in people with, or at high risk of, knee osteoarthritis: the MOST study. Ann Rheum Dis 70(5):805-11. PMID: 21187293

B. Positions and Honors:

Positions and Employment

1996-2000	Internal Medicine Resident, Carraway Methodist Medical Center, Birmingham, AL.
1999-2000	Chief Medical Resident, Carraway Methodist Medical Center, Birmingham, AL.
2000-2003	Fellow, Clinical Immunology and Rheumatology, UAB, Birmingham, AL.
2004-2008	Assistant Professor, Department of Medicine, UAB, Birmingham, AL.
2004-Present	Associate Scientist, UAB Multipurpose Arthritis and Musculoskeletal Disease Center
2008-Present	Associate Professor, Department of Medicine, UAB, Birmingham, AL.
2008-2010	Associate Training Program Director, Div. of Clinical Immunology and Rheumatology
2010-Present	Training Program Director, Div. of Clinical Immunology and Rheumatology
2010-Present	Director,The Kirklin Clinic, Musculoskeletal Ultrasound Service

Other Experience and Professional Memberships

2004-Present	Investigator, CLEAR Registry
2005-Present	Arthritis Foundation Cellular Immunology Study Section
2007-2010	Advisory Editor *Arthritis & Rheumatism*
2004-Present	Ad hoc Reviewer, American College of Rheumatology Research and Education Foundation – Medical and Graduate Student Research and Summer Clinical Preceptorship Applications
2005-Present	Director, Cooper Green Hospital Rheumatology Clinic
2006-2008	Senator, UAB Faculty Senate
2008-2010	Member, UAB Faculty Policies and Procedures Committee
2009-Present	Member, UAB Hospital Pharmacy and Therapeutics Committee
2010-Present	Member, Ultrasound School of North American Rheumatologists (USSONAR)
2011-2012	Participant, ACR-Musculoskeletal Ultrasound Train-the-Trainer Program

Honors

1994	Pathology Honor Society of the Association of Pathology Chairmen
1995	Alpha Omega Alpha
1996	American Medical Woman's Association, Janet M. Glasgow Memorial Achievement Citation
1996	J. Marion Sims Award for Excellence in Obstetrics
1999	Internal Medicine Resident of the Year, Carraway Methodist Medical Center
2000-2003	Clinical Investigator Fellowship Award, UAB
2003-2005	Walter B. Frommeyer. Fellowship in Investigative Medicine
2003	Semi-finalist, First Annual Amgen Rheumatology Young Investigators Forum
2005-2006	President, Alabama Society for the Rheumatic Disease
2010	Department of Medicine Division Teacher Award, UAB School of Medicine
2011	Southern Society for Clinical Investigation

C. Contribution to Science

1. My early research and publications focused on genetics and pharmacogenetics in rheumatoid arthritis, especially in African-Americans. As my clinical activities became more time consuming, including becoming the Clinical Training Program Director and the Director of our clinic's Musculoskeletal Ultrasound Service, my career and research focus changed. I have been an investigator on projects focused on osteoarthritis as well as rheumatoid arthritis. I have incorporated my musculoskeletal ultrasound skills to further my involvement in teaching, mentoring and participating in research projects. Most recently I participated in a training course in London to learn ultrasound guided synovial biopsies in rheumatoid arthritis patients as a member of the RhEumatoid Arthritis SynOvial tissue Network (REASON) Study.

1. **Hughes LB**, Criswell LA, Beasley TM, Edberg JC, Kimberly RP, Moreland LW, Seldin MF, Bridges SL Jr. (2004) Genetic risk factors for infection in patients with early rheumatoid arthritis. Genes Immun, 5(8); 641-7. PMID: 15526004

2. **Hughes LB**, Beasley TM, Patel H, Morgan SL, Baggott JE, Saag KE, McNicholl J, Moreland LW, Alarcon GS, Bridges SL Jr. (2006) Racial or ethnic differences in allele frequencies of single nucleotide polymorphisms in the methylenetetrahydrofolate reductase gene and their influence on response to methotrexate in rheumatoid arthritis. Ann Rheum Dis 65(9): 1213-8. PMCID: PMC1798268

3. **Hughes LB**, Morrison D, Padilla M, Vaughn K, Westfall A, Mikuls T, Holers VM, Parrish L; Alarcón G, Conn DL, Jonas B, Callahan L, Smith E, Gilkeson G, Howard G, Moreland L, Fraser P, Allison D, Patterson N, Reich D, Bridges SL Jr. (2008) The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African-Americans through European genetic admixture. Arthritis Rheum 58(2): 349-58. PMID: 18240241

C. Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/1zeL9d8Fphku/bibliography/47937346/public/?sort=date&direction=ascending.

D. Research Support

Ongoing Research Support

R01 AR062376 (S. L. Bridges, Jr., PI) 9/01/11-8/31/15
NIH/NIAMS
Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis
The goals of this proposal are: 1) To examine associations of serum ACPA to a variety of specific citrullinated epitopes and of serum anti-PAD4 Abs with clinical, genetic, and radiographic features in Af-Amer with anti-CCP+ RA. 2) To examine associations of periodontitis and exposure to *P. gingivalis* with serum ACPA profiles and anti-PAD4 Abs in Af-Amer with anti-CCP+ and anti-CCP-neg RA. 3) To compare the degree of clonality and mutation patterns of peripheral blood B cells from Af-Amer with and without anti-CCP Ab, ACPA, anti-PAD4 Abs; and to assess the reactivity of antibodies from citrullinated protein-specific and PAD4-specific B lymphocytes in RA.

P60 AR048095 (Bridges, PI; Elson, PI, Project 3) 09/16/13 – 03/20/18
NIH/NIAMS
UAB Multidisciplinary Clinical Research Center – Project 3
Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.

UH2 AR067687 (Pope, PI) 09/26/14 – 08/31/15
Northwestern University/NIH/NIAMS
The Rheumatoid Arthritis Synovial Tissue Network (REASON)
We have assembled a consortium of leading academic rheumatology groups which includes UAB, Columbia, Mayo Clinic, Washington University, Michigan, and Northwestern to form the REASON Network. We will create a new generation of US rheumatologists who will perform ultrasound guided synovial biopsies from RA patients, with tissues used to identify novel pathways and biomarkers that might predict therapeutic response

R37 AG033906 (Fillingim, PI) 09/01/14 - 04/30/19
University of Florida/NIH/NIA
Ethnic Differences in Responses to Painful Stimuli
During the first 5-year cycle (2009-2014), we documented ethnic differences in clinical and laboratory pain responses as well as pain-related disability in persons with knee osteoarthritis (OA). Nevertheless, the mechanisms underlying these disparities remain poorly understood. During the second 5-year cycle, our goal is to elucidate the mechanisms underlying ethnic group differences in knee OA-related pain by directly and

prospectively assessing the nature and evolution of altered central pain processing and its relationship with progression of pain and disability among middle-aged and older African Americans and non-Hispanic whites with and without symptomatic knee OA.

Completed Research Support

NIH/NIAMS R01 AR057202 (Bridges) 09/25/2009 - 07/31/2014
Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis
Goals: 1) to perform a GWAS in 800 African-Americans (Afr-Am) with anti-CCP + RA and 800 controls to identify novel genetic associations; 2) to replicate these putative associations susceptibility to CCP+ RA among Afr-Am in independent set of 800 African-American CCP+ RA patients and 800 matched controls; and 4) To further characterize genetic regions associated RA in African-Americans and to analyze genome-wide associations with radiographic severity; BMD in early RA and healthy controls; and eQTLs of genes expressed in PBMC, particularly those associated with radiographic severity.
Role Co-Investigator

NIH/NIAMS P60 AR048095 (RP Kimberly) Project 3 (Bridges) 09/01/08 - 08/31/13
Multidisciplinary Clinical Research Center (MCRC) Project 3: Predictors of RA Severity in African-Americans.
Goals: To identify differences in gene expression patterns and serologic factors between African-American RA patients with radiographic damage and those without damage at 3 years' disease duration; and to determine the relative contributions of baseline clinical, genetic, serologic, socioeconomic, environmental factors, and treatment on radiographic severity of RA in African-Americans at 3 years' disease duration.
Role: Co-Investigator

NIH N01 AR062278 (Bridges) 09/30/06-03/31/12
NIH/NIAMS Continuation of the Consortium for the Longitudinal Evaluation of African-Americans with Early RA (CLEAR) Registry. Goals 1. To complete the longitudinal evaluation of subjects currently enrolled in the CLEAR Registry; and 2. To expand the CLEAR registry and repository by enrolling a cross-sectional group of 600 African-American patients with RA (not restricted to early disease) and 300 African-American healthy controls matched for age, sex, and geographic location.
Role: Co-Investigator

R01 AG28359 (C Lewis, PI) 07/01/06-06/30/11
NIH (NIA)
Inflammation and Knee Osteoarthritis
The goals of this project are to elucidate the underlying relationship of inflammation to the pathogenesis of osteoarthritis, and to understand how other structures that often contribute to osteoarthritis severity and symptoms play into this relationship. Some of the effect of obesity on development and progression of knee OA could be accounted for by an association of OA with adipokines, adipocyte-specific or enriched proteins that have a variety of local, peripheral, and central effects including promotion of the pro-inflammatory state associated with obesity. This project offers a comprehensive elucidation of all of these relationships so that the direct and indirect affects of systemic inflammation on osteoarthritis can be understood.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Kimberly, Robert P.

eRA COMMONS USER NAME (agency login): KIMBERLYR

POSITION TITLE: Howard L. Holley Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Princeton University, Princeton, NJ	AB	06/1968	Biology
University of Oxford, Oxford, England	BA	06/1970	Physiology (PPP)
University of Oxford, Oxford, England	MA	06/1970	Physiology (PPP)
Harvard Medical School, Boston, MA	MD	06/1973	Medicine

A. PERSONAL STATEMENT

I am a physician-scientist dedicated to the study of human biology and pathophysiology and its translation to clinical application. Trained in translational investigation and therapeutic trials in SLE at the NIH, I have developed adept skills in team science to build nationally and internationally-based collaborative consortia which have explored the genetic architecture of risk for autoimmune disease. Within my own laboratory group in molecular immunology, recognized internationally for our work in human Fc receptors, we have identified functionally critical genetically encoded variants of human antibody receptors which have created the foundation for both SLE and RA disease risk, the pharmacogenomics of responses to therapeutic monoclonal antibodies and the pathophysiology of ANCA antibodies in vasculitis. Since the beginning of my career, first as a trainee and then as a mentor, I have enjoyed taking new directions. My work ranges from the first demonstration of NSAID-induced changes in renal function, which helped to spur development of Cox-2 inhibitors, to reversal of acute immunologic injury with "pulse" steroids and the development of therapeutic monoclonal antibodies. I take great satisfaction in the success of my trainees, many now faculty at Harvard, Cornell, University of Washington, UAB, Colorado and other institutions.

Supporting my commitment to human investigation and training, I have led, as Principal Investigator, two T32's, three R01's and multiple P-series programs including P01, P30, P50, and P60 grants. As the Howard L. Holley Professor of Medicine, Associate VP for Medicine and Biomedical Research and the Senior Associate Dean for Clinical and Translational Research in the School of Medicine, I bring substantial experience in the development and administration of multiple-investigator scientific programs, including the Training Academy of the UAB Center for Clinical and Translational Science (CCTS). I serve on and have chaired the Association of American Medical College's (AAMC) Group on Research Advancement and Development (GRAND), which guides the AAMC on matters pertinent across the translational research and training spectrum. As Director of the CCTS at UAB, I work with leadership at the UAB Hub and at the Network Partners to ensure the Center is integrated across the institutions, and I work to implement strategies that foster clinical and translational science education and training throughout the fabric of the enterprise.

1. Kimberly RP, Plotz PH. Aspirin-induced depression of renal function. N Engl J Med. 1977 Feb 24;296(8):418-24. PubMed PMID: 834212.
2. Porges AJ, Redecha PB, Kimberly WT, Csernok E, Gross WL, Kimberly RP. Anti-neutrophil cytoplasmic antibodies engage and activate human neutrophils via Fc gamma RIIa. J Immunol. 1994 Aug 1;153(3):1271-80. PubMed PMID: 8027554.
3. Ichikawa K, Liu W, Zhao L, Wang Z, Liu D, Ohtsuka T, Zhang H, Mountz JD, Koopman WJ, Kimberly RP, Zhou T. Tumoricidal activity of a novel anti-human DR5 monoclonal antibody without hepatocyte cytotoxicity. Nat Med. 2001 Aug;7(8):954-60. PubMed PMID: 11479629.

4. Li X, Wu J, Ptacek T, Redden DT, Brown EE, Alarcón GS, Ramsey-Goldman R, Petri MA, Reveille JD, Kaslow RA, Kimberly RP, Edberg JC. Allelic-dependent expression of an activating Fc receptor on B cells enhances humoral immune responses. Sci Transl Med. 2013 Dec 18;5(216):216ra175. PubMed PMID: 24353158; PubMed Central PMCID: PMC3982386.

B. POSITIONS AND HONORS

Positions and Employment

1973 - 1975	Intern & Asst. Resident in Medicine, Hospital of the University of Pennsylvania
1975 - 1977	Clinical Associate, Arthritis & Rheumatism Branch, NIAMDDK, NIH
1977 - 1979	Fellow in Rheumatic Diseases, Hospital for Special Surgery-Cornell Medical Center
1979 - 1996	Asst. Attending - Attending Physician, New York Hospital & Hospital for Special Surgery
1979 - 1996	Asst. Professor – Professor of Medicine, Cornell University Medical College
1988 - 1996	Director, Biomedical Component and Program Director, Cornell Arthritis Center (MAMDC)
1991 - 1996	Professor, Program in Immunology, Cornell Graduate School of Medical Sciences
1996 -	Professor of Microbiology and Senior Scientist, UAB Comprehensive Cancer Center
1996 -	Senior Scientist , UAB Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center
1996 -	Howard L. Holley Professor of Medicine, University of Alabama School of Medicine
1996 - 2013	Director, UAB Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center
2003 -	Professor of Cell, Developmental and Integrative Biology and Professor of Genetics, UAB
2006 -	Senior Associate Dean for Clinical and Translational Research, UAB
2012 -	Associate Vice President for Medicine and Biomedical Research, UAB
2012 -	Director, UAB Center for Clinical and Translational Science

Honors

Magna cum laude in Biology (Princeton); Phi Beta Kappa (Princeton); Rhodes Scholarship (Univ of Oxford, Oxford, England); First in PPP (Oxford); New College Book Prize (Oxford); Postdoctoral Fellow of The Arthritis Foundation; Andrew W. Mellon Teacher Scientist Award (Cornell); Member, GMA 1 Study Section (1987-1990; 1994-98, Chair 1996-98); American Society for Clinical Investigation; Association of American Physicians.

C. Contribution to Science

1. I have worked with my trainees (bolded) to develop new approaches to important problems in clinical and translational research. In addition to discoveries by Drs. Andy Porges and Xinrui Li (above), my trainees have identified novel genomically encoded variants in antibody receptors and demonstrated not only their functional impact in model systems but also their importance for human disease phenotypes.
    a. **Salmon JE**, Millard S, Schachter LA, Arnett FC, Ginzler EM, Gourley MF, Ramsey-Goldman R, Peterson MG, Kimberly RP. Fc gamma RIIA alleles are heritable risk factors for lupus nephritis in African Americans. J Clin Invest. 1996 Mar 1;97(5):1348-54. PubMed PMID: 8636449; PubMed Central PMCID: PMC507190.
    b. **Wu J**, Edberg JC, Redecha PB, Bansal V, Guyre PM, Coleman K, Salmon JE, Kimberly RP. A novel polymorphism of FcgammaRIIIa (CD16) alters receptor function and predisposes to autoimmune disease. J Clin Invest. 1997 Sep 1;100(5):1059-70. PubMed PMID: 9276722; PubMed Central PMCID: PMC508280.
    c. **Su K**, Wu J, Edberg JC, Li X, Ferguson P, Cooper GS, Langefeld CD, Kimberly RP. A promoter haplotype of the immunoreceptor tyrosine-based inhibitory motif-bearing FcgammaRIIb alters receptor expression and associates with autoimmunity. I. Regulatory FCGR2B polymorphisms and their association with systemic lupus erythematosus. J Immunol. 2004 Jun 1;172(11):7186-91. PubMed PMID: 15153543.
    d. **Kelley JM**, Monach PA, Ji C, Zhou Y, Wu J, Tanaka S, Mahr AD, Johnson S, McAlear C, Cuthbertson D, Carette S, Davis JC Jr, Dellaripa PF, Hoffman GS, Khalidi N, Langford CA, Seo P, St Clair EW, Specks U, Stone JH, Spiera RF, Ytterberg SR, Merkel PA, Edberg JC, Kimberly RP. IgA and IgG antineutrophil cytoplasmic antibody engagement of Fc receptor genetic variants influences granulomatosis with polyangiitis. Proc Natl Acad Sci U S A. 2011 Dec 20;108(51):20736-41. PubMed PMID: 22147912; PubMed Central PMCID: PMC3251158.

2. My initial studies of antibody-mediated clearance in patients with autoimmune disease (Kimberly, RP et al, Clin Exp Immunol, 51, 261; 1983) led to a sustained interest in the genetic basis for variation in function of human Fc receptors. These studies identified have identified not only inter-individual variation but also the range of distinct intracellular binding partners which provide the basis for differential receptor function. These observations, along with the allele-specific expression of a novel Fc receptor on human B cells, have provided the foundation for the next generation of antibody-mediated therapy.

   a. Edberg JC, Qin H, Gibson AW, Yee AM, Redecha PB, Indik ZK, Schreiber AD, **Kimberly RP**. The CY domain of the Fcgamma RIa alpha-chain (CD64) alters gamma-chain tyrosine-based signaling and phagocytosis. J Biol Chem. 2002 Oct 25;277(43):41287-93. PubMed PMID: 12200451.

   b. Li X, Wu J, Carter RH, Edberg JC, Su K, Cooper GS, **Kimberly RP**. A novel polymorphism in the Fcgamma receptor IIB (CD32B) transmembrane region alters receptor signaling. Arthritis Rheum. 2003 Nov;48(11):3242-52. PubMed PMID: 14613290.

   c. Gibson AW, Li FJ, Wu J, Edberg JC, Su K, Cafardi J, Wiener H, Tiwari H, **Kimberly RP**, Davis RS. The FCRL3-169CT promoter single-nucleotide polymorphism, which is associated with systemic lupus erythematosus in a Japanese population, predicts expression of receptor protein on CD19+ B cells. Arthritis Rheum. 2009 Nov;60(11):3510-2. PubMed PMID: 19877046; PubMed Central PMCID: PMC2784265.

   d. Li X, Baskin JG, Mangan EK, Su K, Gibson AW, Ji C, Edberg JC, **Kimberly RP**. The unique cytoplasmic domain of human FcγRIIIA regulates receptor-mediated function. J Immunol. 2012 Nov 1;189(9):4284-94. PubMed PMID: 23024279; PubMed Central PMCID: PMC3478424.

3. Building on my experience as the PI of the P50 group that led to SLEGEN, I was a founding member of SLEGEN, an international human genetics consortium in autoimmunity, and I continue to work with the SLEGEN team. Together we have published more than 50 manuscripts. In complementary fashion, I have led the Lupus Nephritis End-Stage Renal Disease consortium (LN-ESRD) creating the world's largest cohort (>1,400 persons with LN-ESRD) to define the genetic underpinnings of disparities in health outcomes for one of the most impactful clinical outcomes in lupus. My group has also expanded these initiatives to epigenetics, and work is ongoing in each of these areas.

   a. Harley JB, Alarcón-Riquelme ME, Criswell LA, Jacob CO, **Kimberly RP**, Moser KL, Tsao BP, Vyse TJ, Langefeld CD, Nath SK, Guthridge JM, Cobb BL, Mirel DB, Marion MC, Williams AH, Divers J, Wang W, Frank SG, Namjou B, Gabriel SB, Lee AT, Gregersen PK, Behrens TW, Taylor KE, Fernando M, Zidovetzki R, Gaffney PM, Edberg JC, Rioux JD, Ojwang JO, James JA, Merrill JT, Gilkeson GS, Seldin MF, Yin H, Baechler EC, Li QZ, Wakeland EK, Bruner GR, Kaufman KM, Kelly JA. Genome-wide association scan in women with systemic lupus erythematosus identifies susceptibility variants in ITGAM, PXK, KIAA1542 and other loci. Nat Genet. 2008 Feb;40(2):204-10. PubMed PMID: 18204446; PubMed Central PMCID: PMC3712260.

   b. Absher DM, Li X, Waite LL, Gibson A, Roberts K, Edberg J, Chatham WW, **Kimberly RP**. Genome-wide DNA methylation analysis of systemic lupus erythematosus reveals persistent hypomethylation of interferon genes and compositional changes to CD4+ T-cell populations. PLoS Genet. 2013;9(8):e1003678. PubMed PMID: 23950730; PubMed Central PMCID: PMC3738443.

   c. Freedman BI, Langefeld CD, Andringa KK, Croker JA, Williams AH, Garner NE, Birmingham DJ, Hebert LA, Hicks PJ, Segal MS, Edberg JC, Brown EE, Alarcón GS, Costenbader KH, Comeau ME, Criswell LA, Harley JB, James JA, Kamen DL, Lim SS, Merrill JT, Sivils KL, Niewold TB, Patel NM, Petri M, Ramsey-Goldman R, Reveille JD, Salmon JE, Tsao BP, Gibson KL, Byers JR, Vinnikova AK, Lea JP, Julian BA, **Kimberly RP**. End-stage renal disease in African Americans with lupus nephritis is associated with APOL1. Arthritis Rheumatol. 2014 Feb;66(2):390-6. PubMed PMID: 24504811; PubMed Central PMCID: PMC4002759.

4. Systemic vasculitis is an uncommon condition typically associated with anti-neutrophil cytoplasmic antibodies (ANCA). My group has a sustained interest in the role of ANCA in disease pathogenesis, especially as these ANCA interact with receptors for antibody. Robust animal models for ANCA-associated disease have been difficult to establish, and therefore investigative work has focused on human studies (see Porges, 1994 and Kelley, 2011 above). Our studies have demonstrated the importance of both IgG

and IgA ANCA, and have opened new areas of inquiry in IgA biology and receptor signaling (alternatively spliced Fc gamma chain).

a. Tanaka S, Edberg JC, Chatham W, Fassina G, **Kimberly RP**. Fc gamma RIIIb allele-sensitive release of alpha-defensins: anti-neutrophil cytoplasmic antibody-induced release of chemotaxins. J Immunol. 2003 Dec 1;171(11):6090-6. PubMed PMID: 14634123.
b. Wu J, Ji C, Xie F, Langefeld CD, Qian K, Gibson AW, Edberg JC, **Kimberly RP**. FcalphaRI (CD89) alleles determine the proinflammatory potential of serum IgA. J Immunol. 2007 Mar 15;178(6):3973-82. PubMed PMID: 17339498.
c. Kelley JM, Edberg JC, **Kimberly RP**. Pathways: Strategies for susceptibility genes in SLE. Autoimmun Rev. 2010 May;9(7):473-6. PubMed PMID: 20144911; PubMed Central PMCID: PMC2868085.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/myncbi/robert.kimberly.1/bibliography/40347175/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

2012/09/01-2017/08/31
P50 AR060772, NIH/NIAMS
Saag, Kenneth; Bridges, SL (PI)
Center of Research Translation (CORT) in Gout and Hyperuricemia, Administrative Core
The overall goal is to improve the healthcare of patients with gout and hyperuricemia by translating fundamental knowledge into clinical application. The specific objectives are to assure the CORT has the organizational oversight and institutional resources (1) to conduct outstanding, innovative research projects drawing on the strengths of the CCTS along with other relevant university-wide interdisciplinary research centers using state-of-the-art tools from genetics, statistics, epidemiology, and outcomes research; (2) to foster the development of pilot projects and of new evaluative, analytic, and translational methods to research in gout and hyperuricemia; and (3) to promote the training of clinical investigators in the most current methods of translational research and evaluation applicable to gout and hyperuricemia.
Role: KP

2014/01/01-2016/12/31
CE-1304-6631, PCORI
Singh, Jasvinder (PI)
Individualized Patient Decision Making for Treatment Choices Among Minorities with Lupus
Lupus is a serious disease where the immune system attacks normal parts of the body, including the kidneys, heart, brain, lungs, joints, and skin affecting women and minorities more commonly. This research study will develop a computer tool (decision aids) to help African-American and Hispanic lupus patients with kidney disease and their doctors choose the best individual treatment for each individual patient. We will then use state-of-the-art statistics to come up with the best estimates of the risks and benefits for lupus medications. The decision aids will be developed with input from patients at all stages of our study to be sure that the information created is helpful, practical, and relevant to patients facing treatment decisions for lupus nephritis. The decision aids will be available in both English and Spanish languages.
Role: Co-Investigator

2012/10/01-2015/09/30
No number assigned, Alabama Department of Commerce
Kimberly, Robert P (PI)
Innovation and Economic Development in Clinical and Translational Science
The UAB Center for Clinical and Translational Science (CCTS) at the University of Alabama at Birmingham (UAB) embodies the vision of excellence in discovery science and delivery to improve human health through translational research. Through effective and efficient interdisciplinary research teams, supported by academic ingenuity, regulatory oversight, resource coordination and methodological innovation, the CCTS embraces preclinical work, bench-to-bedside translation and community implementation.
Role: PI

2014/09/01-2015/08/31
U54 TR001005-01, National Center for Advancing translational Sciences (NCATS)
Kimberly, Robert P. (PI)
UAB Center for Clinical and Translational Science (CCTS)
The UAB CCTS will enhance human health by driving scientific discovery and translation across the bench, bedside, and community continuum. The CCTS Components support this overall mission in a highly integrative network. Five strategic priorities comprise the CCTS 1) enhancing research infrastructure; 2) promoting investigator education, training and development; 3) accelerating discovery across the T1 interface; 4) expanding value-added partnerships; and 5) building sustainability.
Role: PI

Completed Research Support

U54 TR001005-01S1 Kimberly (PI) 09/09/14 - 03/08/15
UAB Center for Clinical and Translational Science

Alexion Pharmaceuticals (No # assigned) Kimberly (PI) 12/17/13 – 12/16/14
Genetic Architecture of End-stage Renal Disease in SLE

UL1 TR000165 Kimberly (PI) 05/19/08 - 04/30/14
UAB Center for Clinical and Translational Science (3 Linked Awards: UL1TR000165, KL2TR000166, TL1TR000167)

P01 AI083194 Harley (PI) 08/15/09 – 07/31/14
Genomics of Lupus

P60 AR048095 Kimberly (PI) 09/01/08 – 06/30/14
NIAMS Multidisciplinary Clinical Research Center

P01 AR049084 Kimberly (PI) 06/20/03 - 03/31/14
Program Project in the Genetics of SLE

Alliance for Lupus Research Kimberly (PI) 02/01/11 – 07/31/13
SLEGEN ImmunoChip Proposal

RC2 AR058951 Kimberly (PI) 09/28/09 – 08/31/12
A National Consortium to Explore the Genotypic Basis for ESRD in Lupus

RC2 AR059092 Kimberly (Site PI) 02/01/10 – 08/31/12
Genes and Phenotypes (GAP) studies of immunologic and inflammatory pathways

272201000023C-0-0-1 Arnett (PI) 06/01/10 - 07/31/12
Population Genetics Analysis Program: Immunity to Vaccines/Infections II
“Genetic Factors and Immune Response to Anthrax Vaccine” Kimberly (Project PI)

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Korf, Bruce

eRA COMMONS USER NAME (agency login): bkorf1

POSITION TITLE: Professor and Chair, Department of Genetics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Cornell University, Ithaca, NY	AB	06/1974	Genetics
Rockefeller University, New York, NY	PHD	05/1979	Genetics and Cell Biology
Cornell University Medical College, New York	MD	05/1980	
Children's Hospital, Boston, Boston, MA	Resident	06/1982	Pediatrics Residency
Harvard Medical School Genetics Training Program, Boston, MA	Postdoctoral Fellow	06/1985	Medical Genetics Fellowship
Harvard-Longwood Neurology Training Program, Boston, MA	Resident	06/1985	Neurology residency (child neurology)

A. PERSONAL STATEMENT

I serve as chair of the Department of Genetics, director of the Heflin Center for Genomic Sciences at UAB, and co-director of the UAB-HudsonAlpha Center for Genomic Medicine. The Heflin Center provides core genomics laboratory services to members of the UAB Comprehensive Cancer Center, including genomic sequencing and bioinformatics support. I have a career-long interest in and commitment to training and mentoring. I served as program director of the Harvard Medical School Genetics Training Program and as PI of the T32 genetics training program until I left Boston in 2002. At UAB, I established a genetics training program, genetic counseling training program, and led the effort to create the genetics and genomics theme in our graduate program. I have mentored postdoctoral fellows in medical genetics, clinical cytogenetics, and clinical molecular genetics. As director of the Heflin Center for Genomic Sciences, I have initiated an "immersion course" for clinical investigators in the application of genomic technologies for clinical and translational research. This is a week-long course that has been given four times in the past 2 years, each time to about 25 students. I have also been involved in genetics educational activities through the American College of Medical Genetics and Genomics, serving as co-director of the Genetics Review Course and as president of the ACMG Foundation for Genetic and Genomic Medicine. My research focus is on the genetics and treatment of neurofibromatosis; I am PI of a DOD-funded clinical trials consortium for NF therapy. I also am developing novel therapies for neurofibromatosis using animal models that incorporate human NF1 mutations in an effort to develop mutation-guided therapies. Finally, I am involved in the integration of genomics into medical practice, using exome and genome sequencing to solve complex chronic genetic disorders.

1. **Korf BR**. Genomic medicine: educational challenges. Mol Genet Genomic Med. 2013 Sep;1(3):119-22. PubMed PMID: 24498609; PubMed Central PMCID: PMC3865578.
2. **Korf BR**. Integration of genomics into medical practice. Discov Med. 2013 Nov;16(89):241-8. PubMed PMID: 24229741.
3. **Korf BR**. The medical genetics residency milestones. J Grad Med Educ. 2014 Mar;6(1 Suppl 1):87-90. PubMed PMID: 24701269; PubMed Central PMCID: PMC3966601.

4. **Korf BR**, Berry AB, Limson M, Marian AJ, Murray MF, O'Rourke PP, Passamani ER, Relling MV, Tooker J, Tsongalis GJ, Rodriguez LL. Framework for development of physician competencies in genomic medicine: report of the Competencies Working Group of the Inter-Society Coordinating Committee for Physician Education in Genomics. Genet Med. 2014 Nov;16(11):804-9. PubMed PMID: 24763287.

B. POSITIONS AND HONORS

Positions and Employment

1985 - 1986	Instructor in Neurology, Harvard Medical School, Boston, MA
1986 - 1993	Assistant Professor of Neurology, Harvard Medical School, Boston, MA
1986 - 1999	Director, Clinical Genetics Program, Children's Hospital, Boston, Boston, MA
1993 - 2009	Associate Professor of Neurology (Pediatrics), Harvard Medical School, Boston, MA
1998 - 1999	Associate Chief, Division of Genetics, Children's Hospital, Bostonq, Boston, MA
1999 - 2002	Medical Director, Harvard-Partners Center for Genetics and Genomics, Boston, MA
2003 -	Wayne H. and Sara Crews Finley Chair of Medical Genetics, University of Alabama at Birmingham, Birmingham, AL
2003 -	Professor and Chair, Department of Genetics, University of Alabama at Birmingham, Birmingham, AL
2006 -	Director, Heflin Center for Genomic Sciences, University of Alabama at Birmingham, Birmingham, AL
2014 -	Co-Director, UAB-HudsonAlpha Center for Genomic Medicine, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

1988 -	Chair, Medical Advisory Committee, Children's Tumor Foundation
1996 - 2002	Member, Board of Directors, American College of Medical Genetics
1998 - 2014	Associate Editor, Education, Genetics in Medicine
1999 - 2002	Vice President, Clinical Genetics, American College of Medical Genetics
1999 - 2006	Member, Liaison Committee on Medical Education
2002 - 2004	President, Association of Professors of Human and Medical Genetics
2002 - 2005	Member, Editorial Board, American Journal of Human Genetics
2003 - 2006	Member, Board of Directors, American Society of Human Genetics
2003 - 2008	Member, Board of Scientific Counselors, National Cancer Institute
2009 - 2011	President, American College of Medical Genetics
2009 - 2013	Member, Board of Scientific Counselors, National Human Genome Research Institute
2012 -	President, ACMG Foundation for Genetic and Genomic Medicine
2012 - 2013	Member, Blue Ribbon Panel on Intramural Research Program, National Human Genome Research Institute

Honors

1983	von Meyer Traveling Fellowship, Children's Hospital, Boston
1989	von Recklinghausen Award, National Neurofibromatosis Foundation
1991	President's Award, National Neurofibromatosis Foundation, Massachusetts Chapter
1993	Courtemanche Award, National Neurofibromatosis Foundation
1993	Howard Fox Guest Lecturer, NYU Medical Center
1994	Steve and Lottie Walker Foundation Lectureship, UCLA
1997	Carol Farb Lecture, MD Anderson Hospital, Houston
2000	Louis K. Zeller Lecture, Youngstown, OH
2002	Stanley Meyer Lecture, Penn State University
2003	Bradford Dean Dixon Memorial Lecture, Children's Hospital of Alabama
2004	James Pittman Lecture, UAB Alumni Association
2005	Neuhauser Lecture, Society of Pediatric Radiology

2007	Medical Honoree, Children's Tumor Foundation, NE Chapter
2009	ASHG Award for Excellence in Genetics Education, American Society of Human Genetics
2013	Medical Honoree, Children's Tumor Foundation
2014	AAAS Fellow, American Association for the Advancement of Science

C. Contribution to Science

1. I have a career-long involvement in the diagnosis and management of neurofibromatosis. I have been integrally involved in genetic testing for all forms of NF and establishing genotype-phenotype correlations. I am medical director of the UAB Medical Genomics Laboratory, which characterized the phenotype of Legius syndrome associated with SPRED1 mutation in a large cohort of patients and also identified LZTR1 as playing a role in schwannomatosis. I am PI of the NF Clinical Trials Consortium, and have overseen the implementation of trials for plexiform neurofibroma, glioma, learning disability, and vestibular schwannoma in these disorders.
   a. Messiaen L, Yao S, Brems H, Callens T, Sathienkijkanchai A, Denayer E, Spencer E, Arn P, Babovic-Vuksanovic D, Bay C, Bobele G, Cohen BH, Escobar L, Eunpu D, Grebe T, Greenstein R, Hachen R, Irons M, Kronn D, Lemire E, Leppig K, Lim C, McDonald M, Narayanan V, Pearn A, Pedersen R, Powell B, Shapiro LR, Skidmore D, Tegay D, Thiese H, Zackai EH, Vijzelaar R, Taniguchi K, Ayada T, Okamoto F, Yoshimura A, Parret A, **Korf B**, Legius E. Clinical and mutational spectrum of neurofibromatosis type 1-like syndrome. JAMA. 2009 Nov 18;302(19):2111-8. PubMed PMID: 19920235.
   b. Piotrowski A, Xie J, Liu YF, Poplawski AB, Gomes AR, Madanecki P, Fu C, Crowley MR, Crossman DK, Armstrong L, Babovic-Vuksanovic D, Bergner A, Blakeley JO, Blumenthal AL, Daniels MS, Feit H, Gardner K, Hurst S, Kobelka C, Lee C, Nagy R, Rauen KA, Slopis JM, Suwannarat P, Westman JA, Zanko A, **Korf BR**, Messiaen LM. Germline loss-of-function mutations in LZTR1 predispose to an inherited disorder of multiple schwannomas. Nat Genet. 2014 Feb;46(2):182-7. PubMed PMID: 24362817; PubMed Central PMCID: PMC4352302.
   c. Weiss B, Widemann BC, Wolters P, Dombi E, Vinks AA, Cantor A, **Korf B**, Perentesis J, Gutmann DH, Schorry E, Packer R, Fisher MJ. Sirolimus for non-progressive NF1-associated plexiform neurofibromas: an NF clinical trials consortium phase II study. Pediatr Blood Cancer. 2014 Jun;61(6):982-6. PubMed PMID: 24851266.
   d. Weiss B, Widemann BC, Wolters P, Dombi E, Vinks A, Cantor A, Perentesis J, Schorry E, Ullrich N, Gutmann DH, Tonsgard J, Viskochil D, **Korf B**, Packer RJ, Fisher MJ. Sirolimus for progressive neurofibromatosis type 1-associated plexiform neurofibromas: a neurofibromatosis Clinical Trials Consortium phase II study. Neuro Oncol. 2015 Apr;17(4):596-603. PubMed PMID: 25314964.

2. I have served as a mentor for postdoctoral trainees throughout my career, mostly physicians or PhDs involved in clinical and translational research in genetics and genomics.
   a. Mikhail FM, Lose EJ, Robin NH, Descartes MD, Rutledge KD, Rutledge SL, **Korf BR**, Carroll AJ. Clinically relevant single gene or intragenic deletions encompassing critical neurodevelopmental genes in patients with developmental delay, mental retardation, and/or autism spectrum disorders. Am J Med Genet A. 2011 Oct;155A(10):2386-96. PubMed PMID: 22031302.
   b. **Korf BR**, Rehm HL. New approaches to molecular diagnosis. JAMA. 2013 Apr 10;309(14):1511-21. PubMed PMID: 23571590.
   c. **Korf BR**. The medical genetics residency milestones. J Grad Med Educ. 2014 Mar;6(1 Suppl 1):87-90. PubMed PMID: 24701269; PubMed Central PMCID: PMC3966601.
   d. Cunha KS, Rozza-de-Menezes RE, Andrade RM, Theos A, Luiz RR, **Korf B**, Geller M. Validity and interexaminer reliability of a new method to quantify skin neurofibromas of neurofibromatosis 1 using paper frames. Orphanet J Rare Dis. 2014 Dec 5;9:202. PubMed PMID: 25475340; PubMed Central PMCID: PMC4267434.

D. RESEARCH SUPPORT

Ongoing Research Support

2013/02/07-2018/02/06
F100225004-UAB, Department of Defense
Korf, Bruce (PI)
A Phase II Study of Everolimus (RAD001) for children with Neurofibromatosis Type I and Chemotherapy-Refractory Radiographic Progressive Low-Grade Glioma
Study of the efficacy of everolimus in treatment of low grade glioma in children with NF1. I serve as site PI for the UAB data collection site.
Role: PI

2012/05/05-2017/05/14
W81XWH-12-1-0155, Department of Defense
Bruce Korf (PI)
The NF Clinical Trials Consortium
This is a multicenter clinical trials award intended to perform clinical trial studies in patients with NF. UAB is a patient recruitment site, but also serves as the coordinating center for the consortium.
Role: PI

2013/07/01-2015/06/30
Y1Award ID 2013-01-029 , Childeren's Tumor Foundation
Korf, Bruce (PI)
Characterizing Novel NF-1 Mouse Models and Developing New Therapeutic Interventions
I serve as mentor for Dr. Kairong Li in this postdoctoral training award. The goal is to develop new mouse models that incorporate human NF1 mutations to use to test new therapeutics.
Role: PI

Completed Research Support

2013/05/01-2014/04/30
R13 CA177217, National Cancer Institute (NCI)
KORF, BRUCE R (PI)
Third International Meeting on Genetic Syndromes of the Ras/MAPK Pathway
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Lefkowitz, Elliot J.

eRA COMMONS USER NAME (agency login): ELLIOTL

POSITION TITLE: Full Professor (with tenure)

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Univ. of Maryland, College Park, MD	BS	05/1977	Microbiology
Univ. of Texas Medical Branch, Galveston, TX	PHD	06/1983	Microbiology
Univ. of Wisconsin, Madison, WI	Postdoctoral Fellow	02/1987	Microbiology
Univ. of Alabama at Birmingham, Birmingham, AL	Postdoctoral Fellow	1991	Microbiology

A. PERSONAL STATEMENT

For over twenty-five years, I have played a significant role in the development and provision of genomics and informatics resources at UAB. I am currently Director of Informatics for the UAB Center for Clinical and Translational Sciences (CCTS), an NIH/NCATS Clinical and Translational Science Award site; Director of the UAB AIDS Center (CFAR) Bioinformatics Facility; and Director of the Bioinformatics Core for the UAB Microbiome Facility. As Director of these Informatics facilities, I oversee a team of Bioinformaticians and Systems Analysts who work and collaborate with UAB investigators to provide them with the broad range of tools and expertise necessary to support all of their informatics needs. These efforts have allowed me to establish informatics-related collaborations across many of the Schools at UAB. My own personal research interests are directed at contributing to the understanding of microbial genomics and evolution by developing and utilizing computational tools and bioinformatics techniques to mine sequence and other data for significant patterns characteristic of function and/or evolution. The citations below provide an example of some of my recent collaborative work developing and utilizing bioinformatics tools to support the analysis of microbiome datasets.

As Director of CCTS and CFAR Informatics, my responsibilities extend to the development of UAB's overall informatics programs, including oversight and support of activities related to research, service, and teaching. We assist investigators in the analysis of a wide range of data types including those derived from the use of next generation sequencing, including whole genome, exome, transcriptome, microbiome, and metagenomic sequences. By providing these services, we help to ensure that each individual and laboratory can maximize their ability to publish and obtain funding, and especially to derive biological information and knowledge from their data. I am also responsible for providing educational opportunities to campus investigators to enhance their knowledge, understanding, and application of informatics data and analytical tools in support of their own research interests. These opportunities include the organization and participation in for-credit courses covering various aspects of informatics education; organization of seminars and workshops targeted to specific informatics problems; providing informatics training opportunities to students, fellows, and staff from across campus; and supporting the integration of informatics training opportunities into campus NIH training (T) and development (K) award programs. I have personally mentored graduate students and postgraduate fellows throughout my research career. This includes students obtaining their degree in my own lab; serving on student dissertation committees; mentoring students on training grants; and mentoring fellows seeking and working on development awards.

My overall career as detailed above, my scientific contributions as detailed below, and especially my past training activities place me in an ideal position to serve as a preceptor on the NIAMS T32 Training Grant, "Training Program in Rheumatic and Musculoskeletal Diseases Research".

1. Muzny CA, Sunesara IR, Kumar R, Mena LA, Griswold ME, Martin DH, **Lefkowitz EJ**, Schwebke JR, & Swiatlo E. Characterization of the vaginal microbiota among sexual risk behavior groups of women with bacterial vaginosis. PLoS One. 2013;8(11):e80254. PubMed PMID: 24236175; PubMed Central PMCID: PMC3827412.
2. Kumar R, Eipers P, Little RB, Crowley M, Crossman DK, **Lefkowitz EJ**, & Morrow CD. Getting started with microbiome analysis: sample acquisition to bioinformatics. Curr Protoc Hum Genet. 2014 Jul 14;82:18.8.1-18.8.29. PubMed PMID: 25042718. PubMed Central PMCID: (PMCID entry submitted to NCBI for processing).
3. Stoll ML, Kumar R, Morrow CD, **Lefkowitz EJ**, Cui X, Genin A, Cron RQ, & Elson CO. Altered microbiota associated with abnormal humoral immune responses to commensal organisms in enthesitis-related arthritis. Arthritis Res Ther. 2014 Nov 30;16(6):486. PubMed PMID: 25434931; PubMed Central PMCID: PMC4272554.
4. Muzny CA, Sunesara IR, Griswold ME, Kumar R, **Lefkowitz EJ**, Mena LA, Schwebke JR, Martin DH, & Swiatlo E. Association between BVAB1 and high Nugent scores among women with bacterial vaginosis. Diagn Microbiol Infect Dis. 2014 Dec;80(4):321-3. PubMed PMID: 25262105; PubMed Central PMCID: PMC4326426.

B. POSITIONS AND HONORS

Positions and Employment

1991 - 1999	Research Assistant Professor, UAB Department of Microbiology
1992 -	Director, Molecular and Genetic Bioinformatics Facility, UAB Center for AIDS Research
1999 - 2004	Research Associate Professor, UAB Department of Microbiology
2001 -	Secondary Faculty Appointment, UAB Department of Computer and Information Sciences
2004 - 2010	Associate Professor, UAB Department of Microbiology
2007 -	Secondary Faculty Appointment, UAB Department of Genetics
2008 - 2011	Co-Director, Biomedical Informatics, UAB Center for Clinical and Translational Science
2010 - 2013	Associate Professor (with tenure), UAB Department of Microbiology
2011 -	Director, Biomedical Informatics, UAB Center for Clinical and Translational Science
2011 -	Secondary Faculty Appointment, UAB Department of Mechanical Engineering
2013 -	Full Professor (with tenure), UAB Department of Microbiology

Other Experience and Professional Memberships

2006 - 2014	Chair, Virus Data Subcommittee, International Committee on Taxonomy of Viruses
2008 -	Advisory Board, Archives of Virology
2009 -	Member, Target Selection Board, NIAID Structural Genomics Centers for Infectious Diseases
2010 -	Member, Scientific Working Group, NIAID ViPR Virus Pathogen Resource Center
2011 -	Associate Editor, BMC Microbiology
2014 -	Data Secretary, International Committee on Taxonomy of Viruses

C. CONTRIBUTION TO SCIENCE

1. My initial scientific career introduced me to traditional bench-top research and involved research on viruses, viral immune defenses, and antiviral agents. I became increasingly involved in research related to viral genetics and evolution, areas of investigation that required I become proficient in the computational analysis (bioinformatics) of sequence data.

a. **Lefkowitz E**, Worthington M, Conliffe MA, & Baron S. Comparative effectiveness of six antiviral agents in Herpes simplex type 1 infection of mice. Proc Soc Exp Biol Med. 1976 Jul;152(3):337-42. PubMed PMID: 948482.
b. **Lefkowitz EJ** & Fleischmann WR Jr. An inhibitor of interferon action: I. Physical association of the inhibitor with interferon-gamma. J Interferon Res. 1985 Winter;5(1):85-99. PubMed PMID: 3921633.
c. **Lefkowitz EJ**, Pattnaik AK & Ball LA. Complementation of a vesicular stomatitis virus glycoprotein G mutant with wild-type protein expressed from either a bovine papilloma virus or a vaccinia virus vector system. Virology. 1990 Oct;178(2):373-83. PubMed PMID: 2171187.

d. Coggins WB, **Lefkowitz EJ** & Sullender WM. Genetic variability among group A and group B respiratory syncytial viruses in a children's hospital. J Clin Microbiol. 1998 Dec;36(12):3552-7. PubMed PMID: 9817872; PubMed Central PMCID: PMC105239.

2. In the late 1990s, my work shifted from a combination of wet-bench and computational research, to solely bioinformatics-based research. This provided me with the opportunity to collaborate on a number of research projects involving the complete sequencing, annotation, and analysis of both bacterial and large viral genomes. I have been part of the teams that have sequenced the complete genomes of ectromelia virus, monkeypox virus, rabbitpox virus, *Ureaplasma urealyticum*, *Streptococcus pneumoniae* strain R6, and *Mycoplasma hyopneumoniae*. In addition to genome annotation, this work also included the reconstruction of the evolutionary histories of these organisms and the association of genomic features with mechanisms of pathogenesis.

   a. Glass JI, **Lefkowitz EJ**, Glass, JS, Heiner CR, Chen EY, & Cassell GH. The complete sequence of the mucosal pathogen Ureaplasma urealyticum. Nature. 2000 Oct 12;407(6805):757-62. PubMed PMID: 11048724.

   b. Hoskins J, Alborn Jr., WE, Arnold J, Blaszczak LC, Burgett S, DeHoff BS, Estrem ST, Fritz L, Fu DJ, Fuller W, Geringer C, Gilmour R, Glass JS, Khoja H, Kraft AR, Lagace RE, LeBlanc DJ, Lee LN, **Lefkowitz EJ**, Lu J, Matsushima P, McAhern SM, McHenry M, McLeaster K, Mundy CW, Nicas TI, Norris FH, O'Gara M, Peery RB, Robertson, GT, Rockey P, Sun PM, Winkler ME, Yang Y, Young-Bellido, M, Zg-hao G, Zook CA, Baltz RH, Jaskunas SR, Rosteck PR, Skatrud PL, & Glass JI. Genome of the bacterium Streptococcus pneumoniae strain R6. J Bacteriol. 2001 Oct;183(19):5709-17. PubMed PMID: 11544234; PubMed Central PMCID: PMC95463.

   c. Minion FC, **Lefkowitz EJ**, Madsen ML, Cleary BJ, Swartzell SM, & Mahairas GG. The genome sequence of Mycoplasma hyopneumoniae strain 232, the agent of swine mycoplasmosis. J Bacteriol. 2004 Nov;186(21):7123-33. PubMed PMID: 15489423; PubMed Central PMCID: PMC523201.

   d. Chen N, Li G, Liszewski MK, Atkinson JP, Jahrling PB, Feng Z, Schriewer J, Buck C, Wang C, **Lefkowitz, EJ**, Esposito JJ, Harms T, Damon IK, Roper RL, Upton C, & Buller, RM. Virulence differences between monkeypox virus isolates from West Africa and the Congo basin. Virology. 2005 Sep 15;340(1):46-63. PubMed PMID: 16023693.

3. As my genomics collaborations progressed, my laboratory pursued interests in providing a better understanding of the evolutionary history of poxviruses and flaviviruses by investigating evolutionary patterns present in their genomic sequences. These patterns include those present in both coding sequences as well as regulatory sequences. The goals of our work included the provision of bioinformatics resources and analytical tools to the research community that could be used to support the development of environmental detectors, diagnostics, animal models, vaccines, and antimicrobial drugs, as well as provide a better understanding of the molecular biology, evolution, and epidemiology of these agents. Some of these efforts involved the development of the NIH-funded Bioinformatics Resource Center for Biodefense and Emerging or Re-Emerging Infectious Diseases directed at viral pathogens (www.vbrc.org). I also serve as Data Secretary for the International Committee on Taxonomy of Viruses (ICTV). In this role I provide support to the ICTV for handling of viral taxonomy proposals; communicate the results of ICTV deliberations to the scientific community; and interact with various international agencies such as the NIH National Center for Biotechnology Information to incorporate the official, ICTV virus taxonomy into their own taxonomic databases.

   a. Odom MR, Hendrickson RC, & **Lefkowitz EJ**. Poxvirus protein evolution: family wide assessment of possible horizontal gene transfer events. Virus Res. 2009 Sep;144(1-2):233-49. PubMed PMID: 19464330; PubMed Central PMCID: PMC2779260.

   b. Hendrickson RC, Wang C, Hatcher EL, & **Lefkowitz EJ**. Orthopoxvirus genome evolution: the role of gene loss. Viruses. 2010 Sep;2(9):1933-67. PubMed PMID: 21994715; PubMed Central PMCID: PMC3185746.

   c. Virus taxonomy: classification and nomenclature of viruses: Ninth Report of the International Committee on Taxonomy of Viruses. (2012) Ed: King, A.M.Q., Adams, M.J., Carstens, E.B. & **Lefkowitz, E.J.** San Diego: Elsevier

d. Hatcher EL, Hendrickson RC, & **Lefkowitz EJ**. Identification of nucleotide-level changes impacting gene content and genome evolution in orthopoxviruses. J Virol. 2014 Dec;88(23):13651-68. PubMed PMID: 25231308; PubMed Central PMCID: PMC4248964.

4. My research interests as described above, have always started with a biological question for which our collaborators generated research data in the laboratory, and my group analyzed that data using bioinformatics tools and databases. Frequently my group has been involved in the development and use of novel bioinformatics algorithms and tools to assist in helping us understand the biological data that was the focus of a particular study. The citations below provide examples of some of the bioinformatics tools and bioinformatics analyses we have developed and supported. More recently, we have been developing and utilizing tools for the analysis of microbiome and metagenomic next generation sequence data. These efforts and citations were discussed above under my personal statement.

   a. Wang C & **Lefkowitz EJ**. SS-Wrapper: a package of wrapper applications for similarity searches on Linux clusters. BMC Bioinformatics. 2004 Oct 28;5:171. PubMed PMID: 15511296; PubMed Central PMCID: PMC545957.

   b. **Lefkowitz EJ**, Upton C, Changayil SS, Buck C, Traktman P, & Buller RM. Poxvirus Bioinformatics Resource Center: a comprehensive Poxviridae informational and analytical resource. Nucleic Acids Res. 2005 Jan 1;33(Database issue):D311-6. PubMed PMID: 15608205; PubMed Central PMCID: PMC540064.

   c. Wang C & **Lefkowitz EJ**. Genomic multiple sequence alignments: refinement using a genetic algorithm. BMC Bioinformatics. 2005 Aug 8;6:200. PubMed PMID: 16086841; PubMed Central PMCID: PMC1208854.

   d. Lazrak A, Fu L, Bali V, Bartoszewski R, Rab A, Havasi V, Keiles S, Kappes J, Kumar R, **Lefkowitz E**, Sorscher EJ, Matalon S, Collawn JF, & Bebok Z. The silent codon change I507-ATC->ATT contributes to the severity of the ΔF508 CFTR channel dysfunction. FASEB J. 2013 Nov;27(11):4630-45. PubMed PMID: 23907436; PubMed Central PMCID: PMC4046180.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/elliot%20j..lefkowitz.1/bibliography/40353132/public/?sort=date&direction=descending

D. RESEARCH SUPPORT

Ongoing Research Support

2008/05/01-2015/08/31
U54 TR001005, NIH/National Center for Advancing Translational Sciences
Robert Kimberly (PI)
UAB Center for Clinical and Translational Science (CCTS)
The CCTS establishes an NIH Clinical and Translational Sciences Award at UAB to develop a transformative infrastructure that supports all phases of translational research. CCTS Informatics provides UAB investigators with access to, and assistance with the analysis of all types of biomedical information from basic genetic and genomics data to clinical data.
Role: Director of Informatics

1997/03/01-2019/05/01
P30 AI027767, National Institute of Allergy and Infectious Diseases
Michael Saag (PI)
Genomics Core, UAB Center for AIDS Research
The primary purpose of this center is to support interdisciplinary AIDS research efforts. The Genomics core facility provides bioinformatics analysis services, including microbiome analysis services to Center investigators.
Role: Director of Bioinformatics

2014/06/01-2019/05/01
U19 AI113212, National Institute of Allergy and Infectious Diseases
Edward Hook (PI)
The UAB Sexually Transmitted Infection (STD) Cooperative Research Center (CRC)
The goals of this grant are to establish multidisciplinary translational research projects addressing the origins and associated processes of the two most common genital discharge syndromes in men and women, non-gonococcal urethritis (NGU) and bacterial vaginosis (BV) in the racial subgroup (African Americans) most profoundly impacted by sexually transmitted infections (STIs) in the Southeastern U.S.
Role: Co-Investigator

2013/10/01-2018/09/01
P60 AR064172, National Institute of Allergy and Infectious Diseases
Louis Bridges (PI)
UAB Multidisciplinary Clinical Research Center, Core B, Methodology Core
The goal of the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases.
Role: Co-Investigator

2014/06/01-2019/05/01
R01 MH105447, National Institute of Mental Health
Sarah Clinton (PI)
Epigenetics, neurodevelopment, and emotional behavior
This project uses next-generation sequencing to map DNA methylation patterns in the developing and adult brain of animals naturally prone to differences in fear/anxiety behavior and stress vulnerability.
Role: Co-Investigator

2013/09/01-2016/08/01
Friends of Carra
Mathew Stoll (PI)
Enteric Flora in Newly Diagnosed Spondyloarthritis: A Collaborative Study
Provision of computational resources to support the analysis of next generation sequence microbiome data.
Role: Co-Investigator

2013/07/01-2016/06/01
American College of Rheumatology Research and Education Foundation
Mathew Stoll (PI)
Exploration of the gut microbiome in spondyloarthris
The major goals of this project are to identify specific fecal bacterial flora that may contribute to spondyloarthritis.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Liu, Nianjun, PhD

eRA COMMONS USER NAME (agency login): NLIU01

POSITION TITLE: Associate Professor of Biostatistics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Peking University, Beijing	BS	07/1990	Computational Mathematics
Peking University, Beijing	MS	07/1993	Applied Mathematics
Yale University, New Haven, Connecticut	MPHIL	05/2003	Biostatistics
Yale University, New Haven, Connecticut	PHD	05/2005	Biostatistics

A. PERSONAL STATEMENT

I am pleased to participate as a content mentor for the UAB Training Program in Rheumatic and Musculoskeletal Diseases Research. I joined the Department of Biostatistics at the University of Alabama at Birmingham as an assistant professor in 2005, and was promoted to tenured associated professor in 2010. My work involves both research and teaching/mentoring. My research is in the field of biostatistics and especially statistical genetics. I dedicate in both methodology development and real data analysis. I have taught many graduate level courses to students in the Department of Biostatistics, and students outside the department such as from Epidemiology, Biology, Psychology, Sociology, Medicine, and Nursing. In the past few years, I have served as mentor for three MS students, one PhD student, and two postdoctoral fellows. I have also served as co-mentor for four postdoctoral fellows. I am currently the Director of Graduate Program of the Department of Biostatistics. I am also the Associate Director of UAB Statistical Genetics Post-doctoral Training Program (funded by NHLBI T32HL072757). I have the expertise, experience, and motivation necessary to contribute to the proposed training program. I am pleased and privileged to be a part of this proposal.

B. POSITIONS AND HONORS

Positions and Employment

1993 - 1995 Instructor, Institute of Computer Science and Technology, Peking University, Beijing
1995 - 1998 Lecturer, Institute of Computer Science and Technology, Peking University, Beijing
1998 - 1999 Senior Scientist, Administration Center, China Academic Library and Information System, Beijing
2000 - 2005 Teaching and Research Assistant, Department of Epidemiology and Public Health, Yale University, New Haven, CT
2005 - 2010 Assistant Professor, Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL
2010 - Associate Professor, Department of Biostatistics, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2004 - Member, American Society of Human Genetics
2005 - 2010 Member, International Genetic Epidemiology Society
2007 - Member, American Statistical Association
2009 - 2013 Member, Institute of Mathematical Statistics
2010 - Associate Editor , Frontiers in Statistical Genetics and Methodology

2013 - Editorial Board Member , The Open Access Journal of Science and Technology
2014 - Associate Editor , Frontiers in Nutrition Methodology
2014 - Editorial Board Member , Enliven: Biostatistics and Metrics

C. Contribution to Science

1. **Haplotype and Linkage Disequilibrium**. I have been working on haplotype and linkage disequilibrium (LD) for many years. I have proposed the first work to handle nonrandom missing genotypes in haplotype inference and analysis in unrelated samples, and the first work that theoretically characterizes the role of LD in haplotype inference. Together with my colleagues, I have proposed several similarity measures for the comparison of haplotype block partitions and tag SNP sets, which are the first similarity measures proposed for tag SNPs. I have also developed novel statistical methods for haplotype analysis of data from various genetic association studies, such as candidate gene, genome-wide, and next-generation sequence studies.
   a. **Liu N**, Sawyer SL, Mukherjee N, Pakstis AJ, Kidd JR, Kidd KK, Brookes AJ, Zhao H. Haplotype block structures show significant variation among populations. Genet Epidemiol. 2004 Dec;27(4):385-400. PubMed PMID: 15389924.
   b. **Liu N**, Beerman I, Lifton R, Zhao H. Haplotype analysis in the presence of informatively missing genotype data. Genet Epidemiol. 2006 May;30(4):290-300. PubMed PMID: 16528706.
   c. **Liu N**, Bucala R, Zhao H. Modeling Informatively Missing Genotypes in Haplotype Analysis. Commun Stat Theory Methods. 2009;38(18):3445-3460. PubMed PMID: 20052310; PubMed Central PMCID: PMC2801447.
   d. Lin WY, Yi N, Zhi D, Zhang K, Gao G, Tiwari HK, **Liu N**. Haplotype-based methods for detecting uncommon causal variants with common SNPs. Genet Epidemiol. 2012 Sep;36(6):572-82. PubMed PMID: 22706849; PubMed Central PMCID: PMC3513398.

2. **Population Structure and Admixture**. I have proposed methods to infer population structure and assign individuals to populations using multilocus genotype data, and for doing structured association test.
   a. **Liu N**, Chen L, Wang S, Oh C, Zhao H. Comparison of single-nucleotide polymorphisms and microsatellites in inference of population structure. BMC Genet. 2005 Dec 30;6 Suppl 1:S26. PubMed PMID: 16451635; PubMed Central PMCID: PMC1866760.
   b. **Liu N**, Zhao H. A non-parametric approach to population structure inference using multilocus genotypes. Hum Genomics. 2006 Jun;2(6):353-64. PubMed PMID: 16848973; PubMed Central PMCID: PMC3525165.
   c. Redden DT, Divers J, Vaughan LK, Tiwari HK, Beasley TM, Fernández JR, Kimberly RP, Feng R, Padilla MA, **Liu N**, Miller MB, Allison DB. Regional admixture mapping and structured association testing: conceptual unification and an extensible general linear model. PLoS Genet. 2006 Aug 25;2(8):e137. PubMed PMID: 16934005; PubMed Central PMCID: PMC1557785.
   d. **Liu N**, Zhao H, Patki A, Limdi NA, Allison DB. Controlling Population Structure in Human Genetic Association Studies with Samples of Unrelated Individuals. Stat Interface. 2011;4(3):317-326. PubMed PMID: 22308192; PubMed Central PMCID: PMC3269890.

3. **Genetic Association Analysis for Genome-Wide and Next-Generation Sequencing Data.** With the advancement of biotechnology, more data become available from the whole genome. I have developed several new methods to analyze data from genome-wide association studies (GWAS) and from next-generation sequencing studies.
   a. Yi N, **Liu N**, Zhi D, Li J. Hierarchical generalized linear models for multiple groups of rare and common variants: jointly estimating group and individual-variant effects. PLoS Genet. 2011 Dec;7(12):e1002382. PubMed PMID: 22144906; PubMed Central PMCID: PMC3228815.
   b. Lin WY, Tiwari HK, Gao G, Zhang K, Arcaroli JJ, Abraham E, **Liu N**. Similarity-based multimarker association tests for continuous traits. Ann Hum Genet. 2012 May;76(3):246-60. PubMed PMID: 22497480; PubMed Central PMCID: PMC3329946.

c. Lin WY, Yi N, Lou XY, Zhi D, Zhang K, Gao G, Tiwari HK, **Liu N**. Haplotype kernel association test as a powerful method to identify chromosomal regions harboring uncommon causal variants. Genet Epidemiol. 2013 Sep;37(6):560-70. PubMed PMID: 23740760; PubMed Central PMCID: PMC4116485.

d. Yan Q, Tiwari HK, Yi N, Lin WY, Gao G, Lou XY, Cui X, **Liu N**. Kernel-machine testing coupled with a rank-truncation method for genetic pathway analysis. Genet Epidemiol. 2014 Jul;38(5):447-56. PubMed PMID: 24849109; PubMed Central PMCID: PMC4073214.

4. **Bioinformatics.** I have published papers in protein-protein interaction, in genotype imputation, and in study design, genotype calling, and analysis of next-generation sequencing study.

a. Liu Y, **Liu N**, Zhao H. Inferring protein-protein interactions through high-throughput interaction data from diverse organisms. Bioinformatics. 2005 Aug 1;21(15):3279-85. PubMed PMID: 15905281.

b. Zhang B, Zhi D, Zhang K, Gao G, Limdi NN, **Liu N**. Practical Consideration of Genotype Imputation: Sample Size, Window Size, Reference Choice, and Untyped Rate. Stat Interface. 2011;4(3):339-352. PubMed PMID: 22308193; PubMed Central PMCID: PMC3269888.

c. Zhi D, Wu J, **Liu N**, Zhang K. Genotype calling from next-generation sequencing data using haplotype information of reads. Bioinformatics. 2012 Apr 1;28(7):938-46. PubMed PMID: 22285565; PubMed Central PMCID: PMC3493122.

d. Zhi D, **Liu N**, Zhang K. On the design and analysis of next-generation sequencing genotyping for a cohort with haplotype-informative reads. Methods. 2015 Jan 30;PubMed PMID: 25644447. PMCID: Publisher provided directly to PMC.

5. **Pharmacogenomics and Personalized medicine.** Working with my collaborators, we have identified genetic variants associated with warfarin dose response. We further built predictive models using those genetic variants, together with clinical variables, to guide warfarin dose for individual patients.

a. Limdi NA, Beasley TM, Crowley MR, Goldstein JA, Rieder MJ, Flockhart DA, Arnett DK, Acton RT, **Liu N**. VKORC1 polymorphisms, haplotypes and haplotype groups on warfarin dose among African-Americans and European-Americans. Pharmacogenomics. 2008 Oct;9(10):1445-58. PubMed PMID: 18855533; PubMed Central PMCID: PMC2586955.

b. Limdi NA, Wadelius M, Cavallari L, Eriksson N, Crawford DC, Lee MT, Chen CH, Motsinger-Reif A, Sagreiya H, **Liu N**, Wu AH, Gage BF, Jorgensen A, Pirmohamed M, Shin JG, Suarez-Kurtz G, Kimmel SE, Johnson JA, Klein TE, Wagner MJ. Warfarin pharmacogenetics: a single VKORC1 polymorphism is predictive of dose across 3 racial groups. Blood. 2010 May 6;115(18):3827-34. PubMed PMID: 20203262; PubMed Central PMCID: PMC2865873.

c. Perera MA, Cavallari LH, Limdi NA, Gamazon ER, Konkashbaev A, Daneshjou R, Pluzhnikov A, Crawford DC, Wang J, **Liu N**, Tatonetti N, Bourgeois S, Takahashi H, Bradford Y, Burkley BM, Desnick RJ, Halperin JL, Khalifa SI, Langaee TY, Lubitz SA, Nutescu EA, Oetjens M, Shahin MH, Patel SR, Sagreiya H, Tector M, Weck KE, Rieder MJ, Scott SA, Wu AH, Burmester JK, Wadelius M, Deloukas P, Wagner MJ, Mushiroda T, Kubo M, Roden DM, Cox NJ, Altman RB, Klein TE, Nakamura Y, Johnson JA. Genetic variants associated with warfarin dose in African-American individuals: a genome-wide association study. Lancet. 2013 Aug 31;382(9894):790-6. PubMed PMID: 23755828; PubMed Central PMCID: PMC3759580.

D. RESEARCH SUPPORT

Ongoing Research Support

2014/02/01-2019/01/31
R01 HL092173, NIH
Nita Limdi (PI)
Genetic and Clinical Predictors of Response to Warfarin and Novel Anticoagulants
Role: Co-Investigator

2013/09/16-2018/07/31
P60 AR064172, NIH

Xiangqin Cui (PI)
Methodology Core for the UAB Multidisciplinary Clinical Research Center
Role: Co-Investigator

Completed Research Support

2008/04/01-2015/03/31
R01 GM081488, National Institute of General Medical Sciences (NIGMS)
Liu, Nianjun (PI)
Genome Wide Haplotype Association Analysis
Role: PI

2009/09/30-2012/08/31
R01 GM081488-02S1, National Institute of General Medical Sciences (NIGMS)
Liu, Nianjun (PI)
Genome Wide Haplotype Association Analysis
Role: PI

2011/09/01-2012/08/31
R01 GM077490, NIH
Liu, Nianjun (PI)
Genome-wide Structured Association Testing & Regional Admixture Mapping
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Robinna Gail Lorenz

POSITION TITLE: Assistant Dean for Physician Scientist Education; Professor of Pathology; Director, UAB MSTP

eRA COMMONS USER NAME (credential, e.g., agency login): robinlorenz

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Stanford University, Stanford, CA	B.S.	1984	Biological Sciences
Washington University School of Medicine, St. Louis, MO	Ph.D.	1990	Immunology
Washington University School of Medicine, St. Louis,MO	M.D.	1990	Medicine

A. Personal Statement

Dr. Lorenz will serve on the Internal Advisory Committee and as a Content Mentor for this Training Program in Rheumatic and Musculoskeletal Disease Research. She is uniquely suited for these roles for several reasons. First, her research has focused for many years on the responses of the mucosal and systemic immune systems to gastrointestinal microbiota. This research has been funded by the American Cancer Society, the Sandler Program for Asthma Research-AAF, and the National Institute of Health. Recently this focus has led her laboratory to focus on the interrelationship between the GI Microbiota, the intestinal immune response, and the risk of Type 1 Diabetes and autoimmunity development in the mouse models. Second, she is a national leader in the training of graduate students and physician-scientists. She is currently the Chair of the NIH Training, Workforce Development, and Diversity (TWD) NIGMS Study Section, is active in the AAMC GREAT Group (MD/PhD Steering Committee Chair 2011-2012), and has several publications discussing physician-scientist recruitment, training, and outcomes evaluation. She has been recognized at the local level by the Dean's Award for Excellence in Mentorship, the Dean's Award for Excellence in Education Leadership, and the President's Award for Excellence in Teaching. At the national level, she has been recognized for her outstanding achievement in clinical laboratory immunology by the ACLPS Ellis Benson Award, and for her leadership in pathology education by the ASIP Robbins Distinguished Educator Award. She has trained three post-doctoral fellows and seven pre-doctoral fellows in her laboratory, and the highlights of their research is listed in section C below.

1. Paik JC, Howard, G, and **Lorenz RG**. 2009 Postgraduate Choices of Graduates from Medical Scientist Training Programs, 2004-2008. *JAMA* 302(12):1271-1273. PMC2778489.
2. **Lorenz RG**: Perspective: Residency 101 for Physician-Scientists. Science Careers CTSciNet (Clinical and Translational Science Network), November 26, 2010; http://community.sciencecareers.org/ctscinet/articles/2010/11/perspective-residency-101-for-physician-scientists.php.
3. NIH Graduate and Professional School Fair, Washington DC (webcast: http://videocast.nih.gov/summary.asp?Live=11386)

B. Positions and Honors

Positions and Employment

1994-2002	Assistant Professor, Dept. of Pathology and Immunology and Internal Medicine, Division of Laboratory Medicine, Washington University School of Medicine, St. Louis, MO
2002-2007	Associate Professor, Dept. of Pathology, Division of Laboratory Medicine, and Department of Microbiology, University of Alabama at Birmingham, Birmingham, AL
2003-present	Scientist, Comprehensive Cancer Center, Tumor Immunology Program, UAB, Birmingham, AL

2006-present	Director, Medical Scientist Training Program, UAB, Birmingham, AL
2007-present	Professor, Dept. of Pathology, Division of Laboratory Medicine, and Department of Microbiology and Department of Medical Education, UAB, Birmingham, AL
2010-present	Director, Short Term Training Program for Health Professionals, UAB, Birmingham, AL
2013-present	Assistant Dean for Physician Scientist Education, UAB, Birmingham, AL
2014-present	Director, Preparation for Graduate and Medical Education Program, UAB, Birmingham, AL

Other Experience and Professional Memberships

2002-2008	Member (Co-Chair, 09-10), Molecular and Cell Biology of Cancer Review Committee, American Cancer Society
2003-2009	Member (Co-Chair 06-09), Research Training Awards Committee, Crohn's and Colitis Foundation
2001-present	Member, Special Emphasis Review Panels (12 total), National Institutes of Health
2003-2006	Director of Admissions, Integrative Biological sciences Graduate Program, University of Alabama at Birmingham, Birmingham, AL
2003-2008	Associate Director, Pathology Residency Program, University of Alabama Health System
2004-present	Director, SIBS Undergraduate Research Program, University of Alabama at Birmingham
2004-2008	Associate Editor, The Journal of Immunology
2005-present	Editorial Board (Council, 14-present), The Journal of Histochemistry and Cytochemistry and the Histochemical Society
2005-2008	Program Committee, American Association of Immunologists
2006-2009	Vice-Chairholder, Area Committee on Immunology and Ligand Assay, Clinical and Laboratory Standards Institute
2008-2015	Member, NIH NIGMS Biomedical Research and Research Training Review Subcommittee (BRT) (now TWD) (Chair, 2013-2015)
2008-2011	Member, AAMC Group on Graduate Research Education and Training (GREAT) MD-PhD Section Steering Committee (Chair 2011-2012)
2013-2014	President, Academy of Clinical Laboratory Physicians and Scientists
2013-present	Senior Assistant Editor, American Journal of Pathology
2014-2016	Member, Advisory Committee for Medical School Programs, NBME (AAMC representative)
2014-2017	Awards Committee, American Association of Immunologists
2015-present	Member, FASEB Science Policy Committee (ASIP Representative)

Honors

1984-1990	Medical Scientist Training Program Fellow, Washington University School of Medicine, St. Louis, MO
1991-1994	Post-Graduate Medical Scientist Training Program Fellow, Washington University School of Medicine, St. Louis, MO
1994-1999	Charles E. Culpeper Medical Scholar
2002-2006	American Cancer Society Research Scholar
2006	Ellis Benson Award (Outstanding Achievements in Laboratory Medicine), Academy of Clinical Laboratory Physicians and Scientists
2006-2009	Sandler Program for Asthma Research Early Excellence Investigator
2008	Dean's Award for Excellence in Mentorship, UAB
2011	Dean's Award for Excellence in Educational Leadership, UAB
2015	President's Award for Excellence in Teaching, UAB
2016	American Society for Investigative Pathology Robbins Distinguished Educator Award

C. Contribution to Science (http://orcid.org/0000-0002-2514-9819)

C.1. Processing and Presentation of Self-Proteins

This research was initiated at a time when it was widely believed that normal individual's T-cells were tolerant to self-proteins, but the mechanism(s) by which this tolerance was unknown. This series of publications demonstrated that self-proteins are continuously processed and presented by MHC molecules and that several different types of thymic cells are involved in the this self-protein processing and presentation. Our findings demonstrating the continuous presence of self-antigens/MHC on antigen presenting cells allowed the field to rule-out absence of self-antigen as a mechanism of tolerance. This led the field to propose alternative hypotheses and design studies that have led to our current understanding of the multiple mechanisms of T-cell

tolerance. My role in these studies was as the graduate student (Mentor: Paul Allen) who performed all of the experiments. These studies formed the basis of my PhD thesis and as I moved through my training, I took on more responsibility for planning the experiments and writing the publications.

1. **Lorenz RG** and Allen PM. 1988 Direct evidence for functional self-protein/Ia-molecule complexes *in vivo*. *Proc. Natl. Acad. Sci. USA* 85:5220-5223. PMC281720
2. **Lorenz RG**, Tyler AN, and Allen PM: T cell recognition of bovine ribonuclease self/non-self discrimination at the level of binding to the I-A^k molecule. J. Immunol. 1988;141:4124-4128.
3. **Lorenz RG** and Allen PM. 1989. Thymic cortical epithelial cells can present self antigens *in vivo*. *Nature* 337:560-562. PMID:2915706.
4. **Lorenz RG** and Allen PM: Thymic cortical epithelial cells lack full capacity for antigen presentation. Nature 1989;340:557-559.

C.2. The role of Cyclooxygenase-2 in the homeostasis of the intestinal immune response

The mucosal immune system is exposed to multiple antigens, both pathogenic and nonpathogenic / tolerogenic. However, at the time of this publication, it was unclear how mucosal T-cells learned to be non-responsive to food antigens. Using a transgenic T-cell receptor mouse model, we were able to demonstrate that non-pathogenic luminal antigens have the potential to induce intestinal inflammation in genetically susceptible individuals. This was also the first model for celiac disease. Our initial publication identified cyclooxygenase-2 as essential in promoting tolerance to oral antigens. This led to studies evaluating the safety of selective cyclooxygenase-2 inhibitors in patients with inflammatory bowel disease. My role in these studies was as the Principal Investigator. The hands-on experimental work was primarily completed by a Gastroenterology Fellow (Rodney Newberry). Together we planned the experiments interpreted the data, and and wrote the publications.

1. Newberry RD, Stenson WF, and **Lorenz RG**. 1999 Cyclooxygenase-2 dependent arachidonic acid metabolites are essential modulators of the intestinal immune response to dietary antigen. *Nature Med.* 5:900-906 (Cover) (Discussed in News and Views article by O. Morteau, COX-2:promoting tolerance. *Nature Med.* 5:867-868. PMID:10426313.
2. Newberry RD, McDonough JS, Stenson WF, and **Lorenz RG**: Spontaneous and continuous cycloxygenase-2 dependent prostaglandin E2 production by stromal cells in the murine small intestine lamina propria: directing the tone of the intestinal immune response. J. Immunol. 2001;166:4465-4472.
3. Sandborn WJ, Stenson WF, Brynskov J, **Lorenz RG**, Steidle G, Robbins J, Kent JD, and Bloom, BJ: Safety of Celecoxib in patients with ulcerative colitis in remission: A randomized, placebo-controlled pilot study. Clin. Gastro. Hep. 2006; 4:203-211.

C.3. Importance of CD4+ T-cells in Helicobacter-associated gastric disease

It had been clear for many years that gastric Helicobacter infection induced gastritis. However, the critical factors (host, bacterial, environmental) were unknown at this time. Our studies demonstrated that the gastritis induced by Helicobacter infection is dependent on the CD4+ T-cell response and that it is this induced chronic-inflammation that subsequently leads to the diseases associated with this infection (gastric cancer, gastric epithelial damage). Our findings helped to shape the understanding that current vaccing strategies (which induce a CD4+ T-cell response) were actually increasing the severity of the pathogenesis after Helicobacter infection, rather than preventing it. This knowledge has led to a shift in the current thinking about how to prevent this infections and its associated diseases. My role in these studies was as the Principal Investigator. The hands-on experimental work was primarily completed by two of my PhD students (Steve Martin and Julia Schmitz). Together we planned the experiments, interpreted the data, and wrote the publications.

1. Roth KA, Kapadia SB, Martin SM, and **Lorenz RG**: Cellular immune responses are essential for the development of *Helicobacter felis* associated gastric pathology. J. Immunol. 1999;163:1490-1497.
2. Schmitz JM, Durham, CG, Ho SB, and **Lorenz RG**: Gastric mucus alterations associated with murine helicobacter infection. J. Histochem. Cytochem. 2009;57: 457-467. PMCID: PMC2675072.
3. Schmitz JM, Durham CG, Schoeb TR, Soltau TD, Wolf KJ, Tanner SM, McCracken VJ, and **Lorenz RG**. 2011 *Helicobacter felis* associated gastric pathology in gnotobiotic mice. *J. Histochem. Cytochem.* 2011 Sep;59(9):826-41. PMC3201166.

C.4. P-glycoprotein and Induced Regulatory T-cells in intestinal inflammation

A large number of studies have implicated polymorphisms in P-glycoprotein (Mdr1a) in increased susceptibility to inflammatory bowel disease. The mechanisms and/or critical cell types involved were unknown; however, one previous manuscript had indicated that P-gp deficiency in the intestinal epithelium was critical for disease development. Our series of studies clearly indicated that P-gp deficiency in hematopoietic cells also contributed to the disease pathogenesis and we further demonstrated the critical importance of P-gp expression for the development of induced regulatory T-cells. This finding has lead to a reassessment of the use of P-gp inhibitors in patients, as this may be altering their ability to regulate immune responses. IN addition, these studies lead to an important side-observation. That was that bone marrow depletion/transfer regiments that were previously reported to completely replace recipient humoral and cellular immune cells with donor cells (based on peripheral immune cell reconstitution), actually do not completely replace the T-cell compartment in the mucosa. This newly recognized chimerism may play a role in the susceptibility to graft-vs-host disease and other complications observed after bone marrow transplant. My role in these studies was as the Principal Investigator. The hands-on experimental work was primarily completed by two of my PhD students (Elizabeth Staley and Scott Tanner). Together we planned the experiments, interpreted the data, and wrote the publications.

1. Staley EM, Schoeb TR and **Lorenz RG**. 2009 Differential Susceptibility of P-glycoprotein Deficient Mice to Colitis Induction by Environmental Insults. *Inflammatory Bowel Disease.* 15:684-96. PMC2887754.
2. Staley EM, Dimmitt RA, Schoeb TR, Tanner SM**, Lorenz RG**. 2011 Critical Role For P-Glycoprotein Expression in Hematopoietic Cells In The Fvb.Mdr1a-/- Model of Colitis. *J Pediatr Gastroenterol Nutr.* 2011 Dec;53(6):666-73. PMID:21681110. PMCID: PMC3658612.
3. Staley EM, Yarbrough VR, Schoeb TR, Daft JG, Tanner SM, Steverson D, and **Lorenz RG**: Murine P-glycoprotein Deficiency Alters Intestinal Injury Repair and Blunts LPS Induced Radioprotection. Radiation Research. 2012 Sep;178(3):207-16. Epub 2012 Jul 10. PMC3474324.
4. Tanner, SM, Staley, EM, and Lorenz, RG: Altered generation of induced regulatory T cells in the FVB.*mdr1a*$^{-/-}$ mouse model of colitis. Mucosal Immunology. 2013 Mar;6(2):309-23. doi: 10.1038/mi.2012.73. PMID: 22874899. PMCID: PMC3676969.

C.5. Role of microbiota in autoimmune disease and intestinal T-cell development

The role of the microbiota in disease susceptibility and in shaping the development of the immune system and its responses was just being recognized at the time these studies were initiated. Through the use of a very controlled environment, our studies were able to demonstrate that a dietary change as minimal as altering the pH of the drinking water could impact the composition of the intestinal microbiota and mucosal immune cells, as well as the development of autoimmune disease. We further demonstrated the impact of the microbiota on disease through a novel set of experiments that allowed for the switching of microbiota between two different strains of mice at the time of birth. Our data demonstrated the importance of intestinal microbiota in disease susceptibility studies and the sensitivity of this microbiota to dietary influences. Our studies also illustrated for the first time a method to colonize neonatal mice with the microbiota from a different strain. This novel experimental approach will allow for easier study of the impact of microbiota on disease. My role in these studies was as the Principal Investigator. The hands-on experimental work was primarily completed by two of my PhD students (Kyle Wolf and Joseph Daft). Together we planned the experiments, interpreted the data, and wrote the publications.

1. Dimmitt RA*, Staley EM*, Chuang G, Tanner SM, Soltau, TD, and **Lorenz RG**: The role of postnatal acquisition of intestinal microbiome in the early development of immune function. Journal of Pediatric Gastroenterology & Nutrition. 2010;51(3):262-73. (*Denotes equal first authors). PMCID: PMC2932839.
2. Wolf KJ and **Lorenz RG**: Gut microbiota and obesity. *Current Obesity Reports.* 2012 Jan;1(1):1-8. PMC3478901.
3. Wolf, KJ, Daft, JG, Tanner, SM, Hartmann, R, Khafipour, E, and **Lorenz, RG**: Consumption of acidic water alters the gut microbiome and decreases the risk of diabetes in NOD mice. J. Histochem. Cytochem. 2014; 62(4):237-250. Doi: 10.1369/0022155413519650. PMC3966285.
4. Daft JG, Ptacek T, Kumar R, Morrow C, and **Lorenz RG**. Cross-fostering immediately after birth induces a permanent microbiota shift that is shaped by the nursing mother. 2015. In Press. Microbiome.

D. Research Support

Ongoing Research Support

T32 (GM008361) Lorenz, Robinna G 07/01/15 - 06/30/20
NIH/NIGMS
Title: “Medical Scientist Training Program”
The goal of this grant is to provide training leading to both the MD and the PhD degree with a rigorous academic program and supportive atmosphere to outstanding students from across the country

T35 (HL007473) Lorenz, Robinna G 06/01/06 – 08/31/18
NIH/NHLBI
Title: “Short Term Training in Health Professional Schools”
The goal of this grant is to intricduce medical and dental students to the concept of scientific research.

R25 HL120883 Lorenz, Robinna G 04/01/14-05/30/19
NIH/NHLBI
Preparation for Graduate and Medical Education (Pre-GAME) Program
The goal of this grant is to introduce highly qualified undergraduates from diverse and underrepresented minority backgrounds to the concept of scientific research and to clinicians who practice at academic medical centers. The ultimate goal of the program is to encourage these students to pursue careers studying patients and their diseases.

R13 GM109532 Lorenz, Robinna G 05/01/14-01/31/17
NIH/NIGMS
Southeastern Medical Scientist Symposium
This fully student-organized symposium seeks to foster connections between the MD/PhD students at multiple institutions across the Southeast, exposing students to trends, challenges, and opportunities inherent in careers of academic physicians.

R21 ES024413 Stoll, Matthew 08/01/14-07/31/16
NIH/NIEHS
Interactions Between AhR Ligands and the Gut Microbiota in Murine Arthritis
This grant investigates whether AhR ligands contribute to spondyloarthritis. I serve as an co-investigator for the grant.

Richard A. Elkus Eminent Scholars Program in GI Oncology Lorenz, Robinna G. 09/01/12-08/31/15
UAB Comprehensive Cancer Center
Dietary Influences in Colorectal Cancer: Role of Xenobiotic Pumps and Sensors
The goal of this grant is to determine the interrelationship between the GI microbiota, dietary influences and the handling of dietary xenobiotics.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Mannon, Peter

eRA COMMONS USER NAME (agency login): PMANNON

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date	FIELD OF STUDY
Boston University School of Medicine, Boston, MA	MD	10/1983	Medical Sciences (cum laude)
Boston University, Boston, MA	BA	05/1983	Medicine (summa cum laude
University of North Carolina at Chapel H, Chapel Hill, NC	MPH	12/2000	Epidemiology
Trinity College, Dublin	Other training	1979	Latin and English

A. PERSONAL STATEMENT

I am well positioned to serve as a Content Mentor for the Training Program in Rheumatic and Musculoskeletal Diseases Research at UAB. As the Director of the Inflammatory Bowel Diseases (IBD) Center at The Kirklin Clinic I have direct contact with a large population of patients with Crohn's disease, ulcerative colitis, autoimmune enteropathy and their extraintestinal manifestations involving the rheumatic and musculoskeletal systems. In fact we have an active collaboration with the Division of Rheumatology as a member of the IBD Center. My research is largely translational and focuses on the investigation of endotypes of IBD as well as the development of novel therapies to have improved outcomes for defined subsets of patients. I have a lab that processes primary intestinal tissue to support this work and many active collaborations that support associated studies using intracellular phosphoflow, high throughput sequencing and it's analysis, and gut microbiome sequencing and metabolic assays. I give talks frequently inside and outside of UAB on aspects of IBD, mucosal immunology, and the gut microbiome. I recently spoke at UAB Rheumatology Grand Rounds on anti-IL-12/23 p40 therapies. I have mentored a number of pre-doctoral and post-doctoral fellows at Duke, having membership on several doctoral thesis committees, and I have been continuously involved in the training of MD and PhD pre- and post-doctoral trainees as a faculty member at Duke, the NIH Intramural Program, and at UAB (resulting publications below). I am happy to continue this in such a role as a Content Mentor with expertise in areas complementary to rheumatic or musculoskeletal diseases research.

1. Lee JG, Leung JW, Cotton PB, Layfield LJ, **Mannon PJ**. Diagnostic utility of K-ras mutational analysis on bile obtained by endoscopic retrograde cholangiopancreatography. Gastrointest Endosc. 1995 Oct;42(4):317-20. PubMed PMID: 8536899.

2. Blaze CA, **Mannon PJ**, Vigna SR, Kherani AR, Benjamin BA. Peptide YY receptor distribution and subtype in the kidney: effect on renal hemodynamics and function in rats. Am J Physiol. 1997 Oct;273(4 Pt 2):F545-53. PubMed PMID: 9362332.

3. Breen CM, **Mannon PJ**, Benjamin BA. Peptide YY inhibits vasopressin-stimulated chloride secretion in inner medullary collecting duct cells. Am J Physiol. 1998 Sep;275(3 Pt 2):F452-7. PubMed PMID: 9729520.

4. Hussain N, Quezado M, Huizing M, Geho D, White JG, Gahl W, **Mannon P**. Intestinal disease in Hermansky-Pudlak syndrome: occurrence of colitis and relation to genotype. Clin Gastroenterol Hepatol. 2006 Jan;4(1):73-80. PubMed PMID: 16431308.

B. POSITIONS AND HONORS

Positions and Employment

1983 - 1986	Internal Medicine Internship and Residency, Duke University Medical Center
1986 - 1987	Clinical Fellow in Gastroenterology, The Johns Hopkins Hospital, Baltimore, MD
1987 - 1989	Research Fellow in Gastroenterology, Duke University Medical Center
1989 - 1991	Associate in Medicine, Duke University Medical Center
1991 - 2000	Assistant Professor of Medicine, Duke University Medical Center
1998 - 2000	Chief, Gastroenterology Section, Durham VA Medical Center, Durham, VA
2000 - 2008	Staff Clinician, Mucosal Immunity Section, MIS/LHD/NIAID/NIH
2000 - 2008	Head, Clinical Inflammatory Bowel Diseases Research Unit
2001 - 2008	Associate Professor of Medicine, Unifrormed Services University of the Health Sciences, Bethesda, MD
2002 - 2003	Vice Chair, NIAID Institutional Review Board
2003 - 2005	Chair, NIAID Institutional Review Board
2008 -	Professor of Medicine, UNIVERSITY OF ALABAMA AT BIRMINGHAM, Birmingham, AL
2008 - 2008	Professor of Medicine, USUHS, Bethesda, MD
2009 - 2012	Director, Gastroenterology/Hepatology Clinical Research Program
2010 -	Director, UAB IBD Center
2012 -	Member, Clinical and Translational Working Group, NIDDK IBD Genetics Consortium
2012 -	Member, NIAID Autoimmune DSMB
2013 -	Professor of Microbiology, University of Alabama at Birmingham

Other Experience and Professional Memberships

1989 -	Member, American Gastroenterological Association
1989 - 1992	VA Associate Investigator Career Development Award "Neuropeptide-Y Receptor Heterogeneity", Veterans Administration
1995 - 1998	VA Research Associate Career Development Award "Regulation of NPY/PYY1 Receptor Gene Expression in HT-29 Cells", Department of Veterans Affairs
1998 - 2000	VA Merit Review Award "Characterization of Peptide YY as a Growth Factor in Intestinal Epithelium", Department of Veterans Affairs
2007 - 2007	Body Site-specific Protocol GI Tract Working Group, Human Microbiome Project, NIDDK
2007 - 2009	Editorial Board, World Journal of Gastroenterology
2007 - 2010	Editorial Board, Mucosal Immunology
2008 - 2010	Contributor, Gastroenterology, Selected Summaries
2010 - 2012	GI Site Expert, Data Analysis Working Group, Human Microbiome Project, NHGRI
2011 -	Member, Southern Society of Clinical Investigation
2011 -	Member, DSMB for MERIT-UC trial, NIDDK
2013 -	Associate Editor, Mucosal Immunology
2013 - 2016	NIDDK R01 DK097107-01A1 "Ulcerative Colitis - Regulation of the IL-13 Receptor System", National Institutes of Health

Honors

1989	John A. Harford Foundation Program for Student Scholars in Geriatrics Seed Grant Award "Age-related Effects on the Neuropeptide Y Receptor in Rat Brain

	Hippocampus", Duke University
2004	ECCO Prize 2004, European Crohn's and Colitis Organization
2007	NIAID Merit Award for Outstantding Progress in Inflammatoy Bowel Disease Research, NIAID, NIH
2008	NIAID Merit Award for Leadership and Notable Contributions to the NIAID Reserach Initiative Management System, NIAID, NIH
2010	Protective Life Clinical Initiative Award "An Interdisciplinary Clinical Initiative for the Management of Inflammatory Bowel Disease Patients", Protective Life
2011	IAT Pilot Grant "TCR Diversity as a Predictive Biomarker of Inflammatory Bowel Disease Activity and Resposne to Therapy", UAB Immunology, Autoimmunity and Transplantation
2014	Angus Cooper Award in Transplant Immunology "Role of the Gut Microbiome in Post-transplant Obesity", UAB Comprehensive Transplant Institute

C. Contribution to Science

1. Clinical Trials of Novel Therapies in IBD I have played a key role in several studies of novel agents in IBD as lead investigator or contributor to study design. These include the first report of the efficacy of anti-IL-12/23 p40 drug in Crohn's disease. In addition there were studies of extracorporeal photopheresis for Crohn's and interferon-beta-1a for ulcerative colitis.

   a. **Mannon PJ**, Fuss IJ, Mayer L, Elson CO, Sandborn WJ, Present D, Dolin B, Goodman N, Groden C, Hornung RL, Quezado M, Yang Z, Neurath MF, Salfeld J, Veldman GM, Schwertschlag U, Strober W. Anti-interleukin-12 antibody for active Crohn's disease. N Engl J Med. 2004 Nov 11;351(20):2069-79. PubMed PMID: 15537905.

   b. Fuss IJ, Becker C, Yang Z, Groden C, Hornung RL, Heller F, Neurath MF, Strober W, **Mannon PJ**. Both IL-12p70 and IL-23 are synthesized during active Crohn's disease and are down-regulated by treatment with anti-IL-12 p40 monoclonal antibody. Inflamm Bowel Dis. 2006 Jan;12(1):9-15. PubMed PMID: 16374252.

   c. Abreu MT, von Tirpitz C, Hardi R, Kaatz M, Van Assche G, Rutgeerts P, Bisaccia E, Goerdt S, Hanauer S, Knobler R, **Mannon P**, Mayer L, Ochsenkuhn T, Sandborn WJ, Parenti D, Lee K, Reinisch W. Extracorporeal photopheresis for the treatment of refractory Crohn's disease: results of an open-label pilot study. Inflamm Bowel Dis. 2009 Jun;15(6):829-36. PubMed PMID: 19130617.

   d. Reinisch W, Knobler R, Rutgeerts PJ, Ochsenkühn T , Anderson F, von T irpit z C, Kaatz M, Janneke van der Woude C, Parenti D, **Mannon PJ**. Extracorporeal photopheresis (ECP) in patients with steroid-dependent Crohn's disease: an open-label, multicenter, prospective trial. Inflamm Bowel Dis. 2013 Feb;19(2):293-300. PubMed PMID: 22573600; PubMed Central PMCID: PMC3437245.

2. Investigator initiated pilot studies of novel therapies for IBD I have lead several studies that tested the novel application of existing agents in Crohn's, UC and autoimmune enteropathy. For instance, based on G-CSF ability to induce Th2 effects and regulatory cytokines and immunocytes, I performed a pilot study in Crohn's disease which showed significant increases in IL-10 production and plasmacytoid DC infiltration in lamina propria mononuclear cells. Based on type I interferon ability to inhibit IL-13 transcription and induce SOCS1, I performed a pilot study of interferon-beta-1a in UC which showed the correlation of clinical response with inhibit ion of IL-13 production and the resistance to treatment with high IL-17 production. The lat ter study lead to a multinational clinical trial in UC.

   a. **Mannon PJ**, Fuss IJ, Dill S, Friend J, Groden C, Hornung R, Yang Z, Yi C, Quezado M, Brown M, Strober W. Excess IL-12 but not IL-23 accompanies the inflammatory bowel disease associated with common variable immunodeficiency. Gastroenterology. 2006 Sep;131(3):748-56. PubMed PMID: 16952544.

   b. Foroughi S, Foster B, Kim N, Bernardino LB, Scott LM, Hamilton RG, Metcalfe DD, **Mannon**

PJ, Prussin C. Anti-IgE treatment of eosinophil-associated gastrointestinal disorders. J Allergy Clin Immunol. 2007 Sep;120(3):594-601. PubMed PMID: 17765756; PubMed Central PMCID: PMC2768344.

c. **Mannon PJ**, Leon F, Fuss IJ, Walter BA, Begnami M, Quezado M, Yang Z, Yi C, Groden C, Friend J, Hornung RL, Brown M, Gurprasad S, Kelsall B, Strober W. Successful granulocyte-colony stimulating factor treatment of Crohn's disease is associated with the appearance of circulating interleukin-10-producing T cells and increased lamina propria plasmacytoid dendritic cells. Clin Exp Immunol. 2009 Mar;155(3):447-56. PubMed PMID: 19094118; PubMed Central PMCID: PMC2669521.

d. **Mannon PJ**, Hornung RL, Yang Z, Yi C, Groden C, Friend J, Yao M, Strober W, Fuss IJ. Suppression of inflammation in ulcerative colitis by interferon-β-1a is accompanied by inhibition of IL-13 production. Gut. 2011 Apr;60(4):449-55. PubMed PMID: 20971977; PubMed Central PMCID: PMC3430969.

3. Work on the Gut Microbiome I have served as the GI Site expert on the Human Microbiome Project, invloved in the early stages of planning and then at the final stages of data analysis. My expertise in this area has lead to invitations to speak on the gut microbniome and implications for GI health and disease, as well as start pilot projects at UAB on transplant-associated metabolic syndrome and microbiome effects on Barretts esophagus.

   a. Structure, function and diversity of the healthy human microbiome. Nature. 2012 Jun 13;486(7402):207-14. PubMed PMID: 22699609; PubMed Central PMCID: PMC3564958.

   b. A framework for human microbiome research. Nature. 2012 Jun 13;486(7402):215-21. PubMed PMID: 22699610; PubMed Central PMCID: PMC3377744.

   c. Segata N, Haake SK, **Mannon P**, Lemon KP, Waldron L, Gevers D, Huttenhower C, Izard J. Composition of the adult digestive tract bacterial microbiome based on seven mouth surfaces, tonsils, throat and stool samples. Genome Biol. 2012 Jun 14;13(6):R42. PubMed PMID: 22698087; PubMed Central PMCID: PMC3446314.

   d. Alegre ML, Mannon RB, **Mannon PJ**. The microbiota, the immune system and the allograft. Am J Transplant. 2014 Jun;14(6):1236-48. PubMed PMID: 24840316.

4. Peptide YY and Neuropeptide Y Receptors and Gut Physiology My very first work was focused on the receptor pharmacology of PYY/NPY and the mechanisms of its effects on gut physiology. I reported on the first solubilization of functioning receptors from cell membrane, described the localization of the receptors in the gut, defined PYY as a proliferator of gut epithelial cells, and demonstrated PYY/NPY GCPR receptor cross-talk with tyrosine kinase receptors.

   a. **Mannon PJ**, Mervin SJ, Taylor IL. Solubilization of the neuropeptide Y receptor from rat brain membranes. J Neurochem. 1991 May;56(5):1804-9. PubMed PMID: 1849554.

   b. **Mannon PJ**, Mervin SJ, Sheriff-Carter KD. Characterization of a Y1-preferring NPY/PYY receptor in HT-29 cells. Am J Physiol. 1994 Nov;267(5 Pt 1):G901-7. PubMed PMID: 7977753.

   c. **Mannon PJ**, Kanungo A, Mannon RB, Ludwig KA. Peptide YY/neuropeptide Y Y1 receptor expression in the epithelium and mucosal nerves of the human colon. Regul Pept. 1999 Aug 31;83(1):11-9. PubMed PMID: 10498339.

   d. **Mannon PJ**, Mele JM. Peptide YY Y1 receptor activates mitogen-activated protein kinase and proliferation in gut epithelial cells via the epidermal growth factor receptor. Biochem J. 2000 Sep 15;350 Pt 3:655-61. PubMed PMID: 10970776; PubMed Central PMCID: PMC1221294.

D. RESEARCH SUPPORT

Ongoing Support

2013/08/01-2016/06/30

R01 DK097107, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) Mannon, Peter (PI)
Ulcerative Colitis - Regulation of the IL-13 Receptor System
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: McLain (nee Jackson), Amie B.

eRA COMMONS USER NAME (agency login):

POSITION TITLE: Senior Scientist

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Alabama, Tuscaloosa, AL	BS	1978	Microbiology
University of Alabama at Birmingham, Birmingham, AL	MD	1984	
University of Alabama at Birmingham School of Medicine, Birmingham, AL	Resident	1988	Physical Medicine and Rehabilitation
Drexel University College of Medicine/The George Washington University, Philadelphia, PA	Fellow	1999	Executive Leadership in Academic Medicine (ELAM)

A. PERSONAL STATEMENT

I am a board-certified physiatrist who has been involved in research or clinical care activities involving spinal cord injured individuals since 1988. My research interest began before medical school while performing translational work in pyelonephritis as a secondary complication from neurogenic bladder. In 1989, following medical training and board certification in Physical Medicine and Rehabilitation, I continued research and clinical care activities involving individuals with neurological disabilities. I am currently a professor in the University of Alabama (UAB) School of Medicine, and I serve as Chair of the Department of Physical Medicine and Rehabilitation (PM&R) and Director of the PM&R Residence Program. I also serve as the Project Directorship/Principal Investigator for the National Institute of Disability Research and Rehabilitation (NIDRR) Regional UAB Spinal Cord Injury (SCI) Model Care System grant. Our system maintains a vast database of long term follow-up conditions for individuals with SCI. Specific research leadership has involved assessing and improving health outcomes in individuals with disabilities. I have served as PI for several intersystem collaborative research projects, such as “Respiratory Complications after Acute SCI,” “Gynecological and Obstetrical Complications in Females with SCI,” and “Menopause and Effects of Osteoporosis after SCI.” Other related research has included participation as co-PI for studies investigating urological dysfunction and management, sexual functioning, weight management, and general determination of appropriate outcome measurements for individuals with SCI and other disorders. This research has resulted in publications in peer-reviewed journals and improved the quality of life for individuals with disabilities. Furthermore, I am an executive committee and steering committee member of the NIH National Center for Medical Rehabilitation Research 1T32HD071866 Grant: Interdisciplinary Training in Pathobiology and Rehabilitation Medicine, which has the overarching goal “to develop future leaders in translational rehabilitation research who are specifically equipped to test and disseminate novel rehabilitative strategies that will alleviate functional impairment and compromised life quality in the face of chronic disease management with exercise medicine as a major focus." One of the two main fields of focus for grant awardees is neuromusculoskeletal and movement disorders. In addition, I have mentored four medical students over the past 10 years, and I continue to lecture trainees and residents in various departments within the UAB School of Medicine.

1. **Jackson AB**. UAB Index of Motor Recovery: An Outcome Measure for Neurological Return and Assessment Following SCI. Intellectual property of Amie B. Jackson M.D. and the UAB Research Foundation. 2007.

2. Alexander MS, Biering-Sorensen F, Bodner D, Brackett NL, Cardenas D, Charlifue S, Creasey G, Dietz V, Ditunno J, Donovan W, Elliott SL, Estores I, Graves DE, Green B, Gousse A, **Jackson AB**, Kennelly M, Karlsson AK, Krassioukov A, Krogh K, Linsenmeyer T, Marino R, Mathias CJ, Perkash I, Sheel AW, Schilero G, Schurch B, Sonksen J, Stiens S, Wecht J, Wuermser LA, Wyndaele JJ. International standards to document remaining autonomic function after spinal cord injury. Spinal Cord. 2009 Jan;47(1):36-43. PubMed PMID: 18957962.
3. Yarar-Fisher C, Bickel CS, Windham ST, **McLain AB**, Bamman MM. Skeletal muscle signaling associated with impaired glucose tolerance in spinal cord-injured men and the effects of contractile activity. J Appl Physiol (1985). 2013 Sep 1;115(5):756-64. PubMed PMID: 23766505; PubMed Central PMCID: PMC4073980.
4. Yarar-Fisher C, Bickel CS, Kelly NA, Windham ST, **McLain AB**, Bamman MM. Mechanosensitivity may be enhanced in skeletal muscles of spinal cord-injured versus able-bodied men. Muscle Nerve. 2014 Oct;50(4):599-601. PubMed PMID: 24668759; PubMed Central PMCID: PMC4263275.

B. POSITIONS AND HONORS

Positions and Employment

1988 -	Attending and Member, Medical and Dental Staff, UAB Hospital, Birmingham, AL
1988 -	Attending for SCI and General Rehabilitation Inpatient Services (Admitting attending 12 months per year, 1988-2006), UAB Hospital, Birmingham, AL
1988 - 1991	Instructor, Department of Rehabilitation Medicine, UAB SOM, Birmingham, AL
1989 -	Director and Practitioner for Women's Clinic for the Disabled (1clinic/month), UAB Hospital, Birmingham, AL
1990 - 2006	Director of Spinal Cord Injury Services, UAB Hospital, Birmingham, AL
1991 - 1995	Assistant Professor, Department of Rehabilitation Medicine, UAB SOM, Birmingham, AL
1992 - 1994	Assistant Medical Director, Spain Rehabilitation Center, UAB Hospital, Birmingham, AL
1994 - 1996	Interim Chair, Department of Physical Medicine & Rehabilitation, UAB SOM, Birmingham, AL
1994 - 2003	Medical Director, Spain Rehabilitation Center, UAB Hospital, Birmingham, AL
1995 -	Professor with tenure, Department of Physcial Medicine & Rehabilitation, UAB SOM, Birmingham, AL
1995 -	Attending and Member, The Children's Hospital of Alabama, Birmingham, AL
1996 -	Chair, Department of Physical Medicine & Rehabilitation, UAB SOM, Birmingham , AL
1996 - 2006	Fellowship Program Director, Spinal Cord Injury Medicine, Department of Physical Medicine & Rehabilitation, UAB SOM, Birmingham, AL
1998 -	Active Practitioner for SCI and General Rehabilitation Outpatient Clinics, UAB Hospital, Birmingham, AL
2003 -	Assistant Medical Director, Spain Rehabilitation Center, UAB Hospital, Birmingham, AL
2006 -	Senior Scientist, Department of Neurobiology, UAB SOM, Birmingham, AL
2006 - 2010	Chief of Staff, UAB Highlands Hospital, Birmingham, AL
2007 -	Residency Program Director, Department of Physical Medicine & Rehabilitation, UAB SOM, Birmingham, AL
2009 -	Director of Adolescent-Adult Transition Clinic (in partnership with The Children's Hospital of Alabama) for individuals with spina bifida, spinal cord injury and other spine disorders, UAB Hospital, Birmingham, AL
2010 - 2011	Associate Chief of Staff (CoS renamed to Assoc. CoS after incorporation under UAB Health System), UAB Hospital, Highlands Campus, Birmingham, AL
2011 -	Senior Scientist, UAB Center for Exercise Medicine, UAB SOM, Birmingham, AL
2012 -	Senior Scientist, University-wide Interdisciplinary Research Center, University of Alabama School of Medicine (UAB SOM), Birmingham, AL

Other Experience and Professional Memberships

Current	Reviewer, Arch PMR; JSCM; PM&R; and AJPH
1987 -	Member, American Academy of Physical Medicine and Rehabilitation
1988 -	Member, American Spinal Injury Association

1988 -	Member, Alabama Society of Physical Medicine and Rehabilitation
1988 -	Teaching in Department of PM&R (15 topics), UAB School of Medicine (Residents)
1988 -	Teaching in Department of Surgery; Division of Orthopedics (3 topics), UAB School of Medicine (Residents)
1988 -	Lecturer: Departments of Physical Medicine and Rehabilitation (6 topics), Neurology (2 topics), and Medicine (1 topic), UAB School of Medicine Departmental Grand Rounds
1988 -	Lecturer, UAB Schools of Optometry, Allied Health Related Professions (Physical Therapy Students), Biomedical Engineering Graduate School, Women's Studies, Nutritional Sciences
1988 - 2006	Teacher: Independent Living Skills Classes—Daily Inpatient Education for Spain Rehabilitation Center's Patients with SCI and their Families (4 topics), Spain Rehabilitation Center
1990 -	Member, American Medical Association
1990 -	Member, International Spinal Cord Society
1991 -	Member, American Society of SCI Professionals (formerly American Paraplegia Society)
1992 -	Member, Association of Academic Physiatrists
1992 - 1994	President, Alabama Society of Physical Medicine and Rehabilitation
1995	Ad Hoc Review Committee (Development/Evaluation of Female External Urinary Collection Devices), National Institute of Child Health and Human Development (NICHD)
1995 - 2000	Governing Board, Model SCI Care Systems
1995 - 2000	Director, National Spinal Cord Injury Statistical Center (funded by National Institute on Disability and Rehabilitation Research)
1996 - 2007	Medical Director, Orthotics-Prosthetic Division, University Hospital
1997 -	School of Medicine Dean's Council for Graduate Medical Education, UAB
1997 - 1998	Graduate Education Policy Advisory Committee, UAB
2000 -	Board of Directors, American Spinal Injury Association
2000	Ad Hoc Review Panel, Urological Center for Spinal Cord Injury, National Institute of Health
2001 -	Member, The American Board of Medical Consultants
2001 -	Co-director, National Spinal Cord Injury Statistical Center (funded by National Institute on Disability and Rehabilitation Research)
2002 -	Board of Directors, Center for Research in Women's Health, UAB
2003 - 2007	Physician Advisory Council, Spina Bifida Association of America
2004	Reviewer, Ad Hoc Study Section, Grant 133B-7 Health and Function Outcomes for Individuals with Disabilities for the National Institute on Disability and Rehabilitation Research (NIDRR)
2006 -	Invited as Founding Member to establish an international agenda for individuals with SCI, Landsort Initiative--Present Care and Future Research for Individuals Living throughout the World with SCI
2007 -	Editorial Board, Journal of Spinal Cord Medicine
2007 -	Editorial Board, Disability and Health Journal: The official Journal of the American Association on Health and Disability
2008	President, American Spinal Injury Association
2009 -	Board of Directors, Lakeshore Foundation
2009	Consultant for Spinal Cord Injury Research Program FY2009, U.S. Department of Defense
2010 -	UAB Health System Board, UAB Health System

Honors

1992	Lotus Award Nominee for service and promotion of advocacy for individuals with Disabilities
1997	Robert B. Kyle Professorship in Rehabilitation Medicine, UAB
2008	Distinguished Clinician Award, American Academy of Physical Medicine and Rehabilitation
2014	International Biographical Centre, Top 100 Health Professionals 2014
2014	America's Top Doctor - 2001, 2002, 2003, 2004, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014
	Harrison Society (Medical School)
	Alumni Honors Scholarship and Award (Undergraduate)
	University of Alabama Alpha Epsilon Delta Pre-Medical Honor Society (Undergraduate)

C. Contribution to Science

1. Women with SCI or other musculoskeletal diseases often must deal with unique issues, such as those related to reproduction, breast feeding, menopause, and metabolism, among others. As the founder and director of the nation's first Women's Clinic for the Disabled at the Spain Rehabilitation Center, I have served on the NIH Committee for Health of Women with Disabilities and I currently have an NIDRR-funded collaborative study to prospectively examine the conditions encountered in women with SCI who become pregnant. The gender-specific therapies and dissemination of information to patients and care givers provided through this clinic, as well as the results of my long-standing research program involving these topics, continue to improve the quality of life for many women with SCI and/or other musculoskeletal disorders.
   a. **Jackson AB**, DeVivo M. Effects of menopause after SCI: A comparison study of women with SCI, able-bodied women, and men with SCI. Global Spinal Cord Injury conference, a combined scientific conference of the American Spinal Injury Association and the International Spinal Cord Society; 2006 June; Boston, MA, USA.
   b. Alexander MS, Bodner D, Brackett NL, Elliott S, **Jackson AB**, Sønksen J. Development of international standards to document sexual and reproductive functions after spinal cord injury: preliminary report. J Rehabil Res Dev. 2007;44(1):83-90. PubMed PMID: 17551862.
   c. Yarar-Fisher C, Chen Y, **Jackson AB**, Hunter GR. Body mass index underestimates adiposity in women with spinal cord injury. Obesity (Silver Spring). 2013 Jun;21(6):1223-5. PubMed PMID: 23913734; PubMed Central PMCID: PMC3740452.
   d. **Jackson AB**. Cherry and Merkatz's Complications of Pregnancy. 6th ed. Cohen WR, editor. Philadelphia, PA: Lippincott Williams and Wilkins; 2015. Women with Disabilities

2. For three 5-year cycles I have successfully maintained the Project Directorship/Principal Investigator for the National Institute of Disability Research and Rehabilitation (NIDRR) Regional UAB Spinal Cord Injury (SCI) Model Care System grant. Our system provides comprehensive services for patients from emergency services through rehabilitation and community re-entry, and maintains a vast database of long term follow-up conditions for individuals with SCI. Furthermore, we conduct collaborative and site-specific research, such as the controlled intervention trial of a novel approach to treating neuropathic pain.
   a. **Jackson AB**. Developer and Narrator. Reproductive Health for women with SCI, Part II Pregnancy and Delivery. [Video]. Birmingham, AL: UAB Medical Rehabilitation Research and Training Center; 2002.
   b. DeVivo MJ, Go BK, **Jackson AB**. Overview of the national spinal cord injury statistical center database. J Spinal Cord Med. 2002 Winter;25(4):335-8. PubMed PMID: 12482178.
   c. **Jackson AB**. SCI in the last 30 years: A demographic profile of new injuries. 30th Annual Meeting of the American Spinal Injury Association; 2004 May; Denver, CO, USA.
   d. **Jackson AB**. Medical Consultant. Smoking's Effects on Secondary Complications of Spinal Cord Injury. [DVD]. Birmingham, AL: Board of Trustees of the University of Alabama at Birmingham; 2009.

D. RESEARCH SUPPORT

Ongoing Research Support

2011/01/01-2016/01/01
H133N110008, National Institute on Disability and Rehabilitation Research (NIDRR)
Jackson, Amie B. (Project Director)
Spinal Cord Injury Model Systems
Grantee: UAB Spinal Cord Injury Care System.
Role: Project Director

Completed Research Support

2006/01/01-2011/01/01
H133N110008, National Institute on Disability and Rehabilitation Research (NIDRR) Grant
Jackson, Amie B. (Project Director)
Spinal Cord Injury Model Systems
Grantee: UAB Spinal Cord Injury Care System.
Role: Project Director

2009/01/01-2010/01/01
National Institute of Child Health and Human Development (NICHD)
Bickel, C. Scott (PI)
Fatigability, Gender, and Optimal Stimulation Parameters after Spinal Cord Injury
Role: Co-Investigator

2000/01/01-2006/01/01
H133N110008, National Institute on Disability and Rehabilitation Research (NIDRR)
Jackson, Amie B. (Project Director)
Spinal Cord Injury Model Systems
Grantee: UAB Spinal Cord Injury Care System Project Director: Dr. Amie B. Jackson
Role: Project Director

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Morgan, Sarah Luise

eRA COMMONS USER NAME (credential, e.g., agency login): SMORGA

POSITION TITLE: Professor of Nutrition Sciences and Medicine, Division of Clinical Immunology and Rheumatology, Department of Medicine, The University of Alabama at Birmingham Medical Director, UAB Osteoporosis Prevention and Treatment Clinic

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Iowa State University, Ames, Iowa	B.S., B.S.	1977	Dietetics and Nutrition and Related Sciences
University of Iowa, Iowa City, Iowa	M.D.	1981	Medicine
University of Iowa, Iowa City, Iowa	Internal Medicine Residency	1981-1984	Internal Medicine
University of Alabama at Birmingham, Birmingham, AL		1984-1986	Postdoctoral fellowship in clinical nutrition Clinical Nutrition
University of Alabama at Birmingham, Birmingham, AL	M.S.	1987	

A. Personal Statement

I am a board-certified (American Board of Internal Medicine) internist trained in clinical nutrition. As registered/licensed dietitian, and a diplomate of the American Board of Physician Nutrition Specialists I have always had an interest in the relationship between nutritional status and health. My early interest in folate and methotrexate (MTX) metabolism started when I recognized that many of the side effects of low-dose MTX therapy for rheumatoid arthritis (RA) were similar to symptoms of folate deficiency. We were able to document that MTX therapy caused impaired folate status in peripheral blood mononuclear cells. This observation lead to two randomized controlled trials where we demonstrated that giving folic acid supplements during low dose MTX therapy for RA, lowered drug toxicity and did not alter the efficacy of therapy. In addition, we have completed rat adjuvant arthritis experiments with MTX therapy showing that blockage of purine biosynthesis and the accumulation of aminoimidazolecarboxamide (AICA) are important metabolic markers of efficacy. In an additional randomized, controlled trial, we supplemented patients with RA on MTX with either folic acid or folinic acid and again demonstrated the importance of AICA accumulation. We are also interested in the little studied pathway of MTX degradation to the less active metabolite, 7-OH-MTX by the enzyme aldehyde oxidase. We have found, in patients with RA on MTX therapy, that there are at least two phenotypes of MTX catabolism. The first phenotype is decreased formation of 7-OH-MTX from MTX and the second phenotype of rapid formation of 7-OH-MTX from MTX. In rat studies we have shown that 7-OH-MTX is less effective than MTX in controlling joint swelling. We have postulated that decreased formation of 7-OH-MTX may allow for a better clinical response by increasing MTX retention, increasing MTX polyglutamate formation and downstream inhibition of purine metabolism. The other phenotype, with increased formation of 7-OH-MTX from MTX, may interfere with MTX polyglutamylation and enzyme binding and will increase MTX excretion and decrease MTX retention and efficacy *in vivo*. My research career was

interrupted from 2000-2009 when the Dean of the School of Medicine asked me to participate in the arena of research compliance. As the Medical Director of the UAB Osteoporosis Prevention and Treatment Clinic and Bone Densitometry unit, I also have collaborated with investigators on research related to osteoporosis and bone densitometry. I would welcome the opportunity to mentor basic science doctoral students or PhDs in the area of folate and/or MTX metabolism in RA patients, or Medical Fellows interested in training in Osteoporosis or clinical bone research.

B. Positions and Honors

Positions and Employment

1981-1984 Resident, Internal Medicine, University of Iowa Hospitals and Clinics
1984-1986 Postdoctoral Fellow, Clinical Nutrition, University of Alabama at Birmingham
1986-1989 Instructor, Department of Nutrition Sciences, University of Alabama at Birmingham
1989-1993 Assistant Professor, Department of Nutrition Sciences, School of Medicine
1993-1999 Associate Professor, Department of Nutrition Sciences, School of Medicine
1996 – 2009 Division Director, Clinical Nutrition and Dietetics, Department of Medicine
1998- Present Medical Director, UAB Osteoporosis Prevention and Treatment Clinic and DXA facility
1999- Present Professor of Nutrition Sciences and Medicine
2001-2008 Associate Dean of Research Compliance, UAB School of Medicine
2008 -2009 Interim Research Compliance Officer, UAB
2011 -Present Professor, Division of Clinical Immunology and Rheumatology, Department of Medicine

Other Experience and Professional Memberships

1986 C.E. Butterworth Award for Outstanding Graduate Student in Nutrition Sciences The University of Alabama at Birmingham
1986-1988 Future Nutrition Leader's Award, International Life Sciences Institute/Nutrition Foundation
1989 Fellow of the American College of Physicians
1991 Outstanding Young Alumna Award, Iowa State University
1991-1994 Clinical Associate Physician, University of Alabama at Birmingham, General Clinical Research Center
1997 Fellow of the American Dietetics Association
2011-2012 President, International Society for Clinical Densitometry
21012-present Chair, Education Council, International Society for Clinical Densitometry

Honors

1999 Distinguished Alumni Achievement Award, Iowa State University
2001 Outstanding Female Faculty Award, University of Alabama at Birmingham
2009 “Fab 40” Outstanding Alumni Award for the UAB School of Health Professions
2007 Distinguished Alumnus Award for Achievement, University of Iowa Carver College of Medicine

C. Contributions to Science

My early research evaluated the folate status of individual taking low-dose methotrexate (MTX) for rheumatoid arthritis (RA), since MTX is a structural anti-vitamin of folic acid. The demonstration of impaired folate status in individuals taking low dose methotrexate compared to patients with RA not treated with MTX was one of the early metabolic differences shown in the RA population on MTX.

1. **Morgan, S**L, Baggott JE, Altz-Smith M. Folate status of rheumatoid arthritis patient on long-term, low-dose methotrexate therapy. Arthritis Rheum 1987-30:1348-1356. PMCID: n/a

The early experience using MTX for RA demonstrated that toxicity was a limiting factor in use of MTX. I hypothesized that toxicity in MTX-treated RA patients was similar to a complicated state of folate deficiency and that giving folic acid supplements during MTX therapy would be beneficial. I completed two randomized, double-blind, placebo controlled trials to demonstrate this. It is now considered **standard of care** to give folic acid supplements during low-dose MTX therapy for RA.

1.. **Morgan SL**, Baggott JE, Vaughn WH, Young PK, Austin JV, Krumdieck CL, Alarcón GS. The effect of folic acid supplementation on the toxicity of low-dose methotrexate treatment of rheumatoid arthritis. Arthritis Rheum 1990; 33:9-18. PMCID: n/a
2. **Morgan SL**, Baggott JE, Vaughn WH, Austin JS, Veitch TA, Lee JY, Koopman WJ, Krumdieck CL, Alarcón GS. Supplementation with folic acid during methotrexate therapy of rheumatoid arthritis: Results from a double-blind, placebo-controlled trial. Ann Intern Med 1994; 121:833-41. PMCID: n/a
3. Baggott JE, **Morgan SL**, Folic acid supplements are good (not bad) for rheumatoid arthritis patients treated with low-dose methotrexate. Am J Clin Nutr88:479-80, 2008.

My research group has also evaluated the mechanism of action of MTX in RA and metabolic consequences of low-dose MTX therapy. We have demonstrated that hyperhomocysteinemia occurs without folic acid supplementation. We have also completed studies which provide a basis for the observation that catabolism of MTX to 7-OH MTX may be important in clinical efficacy. In addition, we have completed studies in the rat adjuvant arthritis model as well as in a clinical trial setting which documents the relative importance of inhibition of purine metabolism (AICAR T'ase) in efficacy of MTX therapy and that the accumulation of AICA is important in efficacy.

1. **Morgan SL**, Baggott JE, Lee JY, Alarcón GS. Folic acid supplementation prevents deficient blood folate levels and hyperhomocysteinemia during long term, low dose methotrexate therapy for rheumatoid arthritis: Implications for cardiovascular disease prevention. J Rheumatol 1998; 25: 441-46. :PMCID: n/a
2. **Morgan SL**, Baggott JE, Alarcon GS, Bernreuter W, Arani R. Separation of inflammation and destructive response – MTX affects inflammation and tissue destruction different in the rat AA model, J Rheumatol 28: 1476-81, 2001.
3. Fox, RI, **Morgan SL**, Smith HT, Robbins BA, Choc MG, Baggott JE. Combined oral cyclosporine and methotrexate therapy in patients with rheumatoid arthritis elevates methotrexate levels and reduces 7-hydroxymethotrexate levels when compared with methotrexate alone. Rheumatology 42: 989-94, 2003.
4. Morgan JE, **Morgan SL**, Sams WM, Linden J. Urinary adenosine and aminoimidazolecarboxamide excretion in methotrexate-treated patients with psoriasis. Arch Dermatol 135: 813-117, 1999. PMCID: n/a

With other scientists at UAB I have participated in investigations of MTX pharmacogenetics and evaluated the relative importance of various SNPs in MTX therapy in RA. Such observations will be seminal to the institution of personalized medicine

1. Baggott JE, Bridges SL, **Morgan S**L. Evidence for two phenotypes in the metabolism of methotrexate to 7-hydroxymethotrexate in patients with rheumatoid arthritis. Arthritis Rheum 52: 356-358, 2005. PMCID: n/a
2. Hughes LB, Beasley TM, Patel H, Tiwari HK, **Morgan SL,** Baggott JE, Saag KG, McNicholl J, Moreland LW, Alarcón GS, Bridges SL Jr. Racial or ethnic differences in allel frequencies of single-nucleotide polymorphisms in the methylenetetrahydrofolate reductase gene and their influence on response to methotrexate in rheumatoid arthritis. Ann Rheum Dis 9: 1121-3, 2006. PMCID: n/a
3.. **Morgan SL**, Baggott JE. Folate supplementation during methotrexate therapy for rheumatoid arthritis. Clin Exp Rheumatol 28 (Suppl 61): S102-106, 2010. PMCID: n/a
4. Halilova KI, Brown EE, **Morgan SL**, Bridges SL Jr, Hwang MH, Arnett DK, Danila MI. Markers of treatment response to methotrexate in rheumatoid arthritis: where do we stand? Int J Rheumatol 2012: epub 2012 Jul 9. PMCID: PMC3400362

D. Research Support

Ongoing Research Support

PA-07-070 (Cram, Peter – U of Iowa – PI, Saag, UAB Site PI) 05/01/010-04/30/15 .12 calendar
A patient activation intervention to enhance bone health in older adults.
NIH/University of Iowa (subcontract) Project total $910,011
A patient activation intervention to improve bone health in older adults.
There is no scientific or budgetary overlap

Completed Research Support

R25 CA047888 (Nagy)
Cancer Prevention Control Training Grant
National Institutes of Health 09/20/1988-08/31/12 0.48 calendar year
National Cancer Institute Project total: $791,532
Role: Director of the Medical Fellowship program (co-investigator)
A training program for pre- and post-doctoral students, to increase the pool of chronic disease specialists committed to cancer prevention and control.

P60 AR48095 (Kimberly)
National Institutes of Health 09/01/08 – 03/31/13 .12 calendar year
NIAMS Project total: $5,894,011
Multidisciplinary Clinical Research Center
Sub project: Pharmacogenomics of Methotrexate
Role: coinvestigator
The goals of this project are to determine if known single nucleotide polymorphisms in genes encoding enzymes in folate metabolism and adenosine pathways influence clinical response to MTX or drug toxicity in RA in a previously defined cohort.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Paul Muntner

eRA COMMONS USER NAME (credential, e.g., agency login): Pmuntner

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Rochester, Rochester, NY	BS	1991	Engineering
Johns Hopkins University, Baltimore, MD	MHS	2000	Biostatistics
Johns Hopkins University, Baltimore, MD	PhD	2001	Epidemiology

A. Personal Statement

Dr. Muntner earned a MHS in biostatistics in 2000 and a PhD in epidemiology in 2001. Over the past 12 years he has worked on several large NIH and industry sponsored studies of hypertension, cardiovascular disease and chronic kidney disease. He is currently the principal investigator for an ancillary study to ALLHAT investigating visit-to-visit variability of blood pressure and cardiovascular disease outcomes. Additionally, he is PI on an ancillary study related to hypertension to the Jackson Heart Study (Incorporation of a Hypertension Working Group into the Jackson Heart Study). He is currently a co-investigator on several large population-based cohort studies including the Coronary Artery Risk Development in Young Adults (CARDIA) and the Renal Reasons for Geographic and Racial Differences in Stroke (REGARDS) study. Dr. Muntner is on the CARDIA renal working group and the REGARDS-MI working group. Also, he is a co-investigator on the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Myocardial Infarction study, and Renal REGARDS. Finally, Dr. Muntner is a co-investigator on two program project grants “The Masked Hypertension Study” and “Identifying new approaches for detecting hypertension.” Dr. Muntner has published over 270 peer-reviewed articles from this work over the past 12 years. Dr. Muntner is Director of the Doctoral Program and Chair of the Mentoring Committee at the University of Alabama at Birmingham. He is a Senior Mentor on an AHRQ-funded K12 grant award. Dr. Muntner has mentored numerous early stage investigators, post-doctoral fellows, and PhD students. Currently, Dr. Muntner’s former mentees have faculty positions at the University of Pennsylvania, Boston University, Mount Sinai School of Medicine, and the University of Alabama at Birmingham.

B. Positions and Honors

Positions and Employment

1997-2000 Pre-doctoral Fellow and Research Assistant, Department of Epidemiology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, MD
2000-2005 Assistant Professor of Epidemiology, Department of Epidemiology, Tulane University School of Public Health and Tropical Medicine, New Orleans, LA
2001-2005 Adjunct Assistant Professor of Medicine, Department of Medicine, Tulane University School of Medicine, New Orleans, LA
2005-2007 Associate Professor of Epidemiology, Department of Epidemiology, Tulane University School of Public Health and Tropical Medicine, New Orleans, LA
2005-2007 Adjunct Associate Professor of Medicine, Department of Medicine, Tulane University School of Medicine, New Orleans, LA
2007-2009 Associate Professor of Medicine, Department of Community and Preventive Medicine, Mount Sinai School of Medicine, New York, NY
2009-present Professor of Epidemiology, Department of Epidemiology, University of Alabama at Birmingham, Birmingham, AL

2009-present Professor of Medicine, Department of Medicine, University of Alabama at Birmingham, Birmingham, AL

Honors

2015 - UAB Graduate School Dean's Award for Excellence in Mentorship.
2015 - UAB President's Award for Excellence in Teaching.
2015 – Associate Editor Journal of the American Society of Hypertension
2014 – Member – AHA/ACC Hypertension Guidelines
2012 - Tinsley Harrison Award - Best Original Research in the American Journal of Medical Science for 2011.
2009 - Guest Editor - Circulation.
2007 - Associate Editor - American Journal of Kidney Diseases.
2005 - Sandra Dougherty American Heart Association Award - Finalist.
2002 - Invited Faculty - National Kidney Foundation Clinical Meeting - Presented "Which Lipid Parameters affect the Progression of Kidney and Cardiovascular Disease."
1999 - Jean Coombs Award for presentation of "Plasma Lipids and the Initiation of Renal Dysfunction" at the annual Society of Epidemiologic Research meeting.
1997-2000 NIH-NHLBI Pre-Doctoral Training Grant in Cardiovascular Disease Epidemiology.

C. Contributions to Science

Hypertension phenotypes CBP measurement relies on a small number of readings (usually three and often less) taken in a medical office or clinic. Ideally, BP measurements are repeated on more than one occasion. If the average of the readings is at or above a threshold level, a diagnosis of hypertension is made. Although this is the most common method for BP measurement and diagnosis of hypertension in the US, prior studies suggest that CBP is inadequate for diagnosing hypertension and for assessing risk for adverse outcomes. Over the past 5 years, I have conducted a number of studies showing the importance of novel blood pressure phenotypes including visit-to-visit variability of blood pressure, nocturnal hypertension, non-dipping blood pressure and other phenotypes that can be captured on ambulatory blood pressure monitoring. Of note, ambulatory blood pressure monitoring is used in Europe but is only beginning to be used in the US. This research has the potential to change how hypertension is diagnosed and treated in the US.

1. **Muntner P**, Joyce C, Levitan EB, Holt E, Shimbo D, Webber LS, Oparil S, Re R, Krousel-Wood MA. Reproducibility of visit-to-visit variability of blood pressure measured as part of routine clinical care. Journal of Hypertension. 2011 Dec;29(12):2332-8.
2. **Muntner P**, Levitan EB, Joyce C, Holt E, Mann D, Oparil S, Krousel-Wood M. Association between antihypertensive medication adherence and visit-to-visit variability of blood pressure. Journal of Clinical of Hypertension. 2013 Feb; 15(2):112-7.
3. **Muntner P**, Lewis CE, Diaz KM, Carson AP, Kim Y, Calhoun D, Yano Y, Viera AJ, Shimbo D. "Racial Differences in Abnormal Ambulatory Blood Pressure Monitoring Measures: Results From the Coronary Artery Risk Development in Young Adults (CARDIA) Study." American Journal of Hypertension. 2014 Nov 4.
4. Shimbo D, Kent ST, Diaz KM, Huang L, Viera AJ, Kilgore M, Oparil S, **Muntner P**. "The use of ambulatory blood pressure monitoring among Medicare beneficiaries in 2007-2010." Journal of the American Society of Hypertension. 2014 Dec;8(12):891-7.

Using administrative data in research. Large administrative data is emerging as a key component for conducting rigorous research in the 21st century. I have made scientific advances in the use surrounding the methodological use of these resources and in identifying and providing solutions to vexing questions. Since 2013, I have served as the co-director of the UAB pharmacoepidemiology and economics research (PEER) unit. The PEER unit has an annual budget of ~$8 million and a staff of over 15 statisticians and programmers. In my work with the PEER unit has made scientific advances in developing and validating claims-based algorithms, studying medication adherence and patterns of medication use. Additionally, the work I have conducted has been used for drug approval and consideration of pharmacovigilance programs with the US Food and Drug Administration.

1. Yun H, Curtis JR, Saag K, Kilgore M, **Muntner P**, Smith W, Matthews R, Wright N, Morrisey MA, Delzell E. Generic alendronate use among medicare beneficiaries: are part d data complete? Pharmacoepidemiology and Drug Safety. 2013 Jan;22(1):55-63. Kent ST, Shimbo D, Huang L, Diaz KM, Viera AJ, Kilgore M, Oparil S, **Muntner P. "**Rates, amounts, and determinants of ambulatory blood pressure monitoring claim reimbursements among Medicare beneficiaries." Journal of the American Society of Hypertension. 2014 Dec;8(12):898-908.
2. **Muntner P**, Gutiérrez OM, Zhao H, Fox CS, Wright NC, Curtis JR, McClellan W, Wang H, Kilgore M, Warnock DG, Bowling CB. "Validation Study of Medicare Claims to Identify Older US Adults With CKD Using the Reasons for Geographic and Racial Differences in Stroke (REGARDS) Study." American Journal of Kidney Diseases. 2015 Feb;65(2):249-58.
3. Thacker EL, **Muntner P**, Zhao H, Safford MM, Curtis JR, Delzell E, Bittner V, Brown TM, Levitan EB. "Claims-based algorithms for identifying Medicare beneficiaries at high estimated risk for coronary heart disease events: a cross-sectional study." BMC Health Services Research. 2014 Apr 29;14:195. doi: 10.1186/1472-6963-14-195.
4. Krousel-Wood M, Holt E, Joyce C, Ruiz R, Dornelles A, Webber LS, Morisky DE, Frohlich ED, Re RN, He J, Whelton PK, **Muntner P**. "Differences in cardiovascular disease risk when antihypertensive medication adherence is assessed by pharmacy fill versus self-report: the Cohort Study of Medication Adherence among Older Adults (CoSMO)." Journal of Hypertension. 2015 Feb;33(2):412-20.

Mentored research. I take great pride in the mentoring of early stage investigators in the fields of epidemiology, hypertension, kidney disease and cardiovascular disease research. I have mentored fellows in the conduct of analyses that have important policy implications. This research has surrounded implications for use of lipid-lowering medication for patients with chronic kidney disease, the impact of day-to-day blood pressure fluctuation on risk prediction models and use of hemoglobin A1c to diagnosis pre-diabetes. The role I take as a mentor is to build a foundation for my mentees to learn how to lead independent research studies. This starts with close hands-on collaboration and evolves into an independent role for the mentee. My former mentorees have developed into independent researchers with positions at prestigious research institutions, government and non-profit organizations.

1. Mann DM, Carson AP, Shimbo D, Fonseca V, Fox CS, Muntner P. Impact of HbA1c screening criterion on the diagnosis of pre-diabetes among US adults. Diabetes Care. 2010 Jul 13.
2. Carson AP, Fox CS, McGuire DK, Levitan EB, McLaustra M, Mann D, **Muntner P**. Low Hemoglobin A1c and Risk of All-Cause Mortality among U.S. Adults with and without Diabetes. Circulation Cardiovascular Quality Outcomes. 2010 Nov 1;3(6):661-667.
3. Colantonio LD, Baber U, Banach M, Tanner RM, Warnock DG, Gutiérrez OM, Safford MM, Wanner C, Howard G, **Muntner P.** "Contrasting Cholesterol Management Guidelines for Adults with CKD." Journal of the American Society of Nephrology. 2014 Nov 13. pii: ASN.2014040400
4. Ye S, Wang YC, Shimbo D, Newman JD, Levitan EB, **Muntner P**. "Effect of change in systolic blood pressure between clinic visits on estimated 10-year cardiovascular disease risk" Journal of the American Society of Hypertension. 2014 Mar;8(3):159-65.

D. Research Support

Ongoing Research Support

American Heart Association (Muntner, PI) American Heart Association 04/01/15 – 03/31/19
UAB Strategically Focused Hypertension Research Center
This study focuses on circadian blood pressure patterns. In a population science study, we will evaluate racial differences in nocturnal hypertension and non-dipping blood pressure. In a clinical science project, we will evaluate the effect of sodium intake on diurnal blood pressure and sleep apnea. In basic science studies, we will study mechanisms leading to loss of diurnal blood pressure patterns. Additionally, this grant involves the training of three post-doctoral fellows.

NIH/NHLBI R01 HL117323 (Muntner, PI) 07/15/13 – 06/30/16
Incorporation of a Hypertension Working Group into the Jackson Heart Study

The objective of this grant is to identify novel risk factors for hypertension and potential approaches to improve hypertension control rates and reduce BP related complications among African Americans. We will integrate a strong mentorship component to help early stage investigators (ESIs), especially minority investigators, move towards independence.

NIH/NHLBI R01 HL110993 (Muntner, PI) NIH/NHLBI 05/01/2012 - 04/30/2015
Visit-to-visit variability of blood pressure and CVD and renal outcomes.
This study will investigate whether visit-to-visit variability in blood pressure is associated with incident cardiovascular and renal disease events and to examine the clinical correlates of increased visit-to-visit variability of blood pressure.

Amgen Inc. 200709824 (Muntner, PI) 03/01/2012 – 12/31/2015
Cardiovascular Disease, Prevention, Treatment and Outcomes.
The goal of this study is to determine the prevalence of high LDL-cholesterol and patterns of statin use and outcomes among US adults.

NIH/NIAMS R01 AR060240 (Saag, PI) 07/01/2011 – 03/31/2016
Activating Patients to Reduce Osteoporosis (APROPOS)
The overall goal of this project is to examine whether the intervention leads to changes in osteoporosis-related health beliefs, greater levels of doctor-patient communication, and changes in possible concerns about osteoporosis medication safety and efficacy.
Role: Co-investigator

NIH/NHLBI R01 HL080477 (Safford, PI) 09/30/2011 - 08/31/2016
REasons for the Geographic and Racial Differences in Stroke (REGARDS – MI Study) (REGARDS-MI).
This study will continue to retrieve and rigorously adjudicate acute coronary heart disease (CHD) events in the REasons for Geographic And Racial Differences in Stroke cohort to test hypotheses on regional and racial differences in acute CHD outcomes.

AHRQ U19 HS021110 (Saag, PI) 09/01/2011– 08/31/2016
UAB Deep South Arthritis and Musculoskeletal CERTs
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal
Role: Project PI

NIH/NHLBI N01 HC48047 (Lewis, PI) 12/30/2008 – 6/30/2018
Coronary Artery Risk Development in Young Adults (CARDIA): Field Center
We will re-examine at least 3525 participants at Y25 according to the five main objectives: 1) Assess the timing impact and varying risk factor levels throughout young adulthood on the subclinical ventricular, vascular, and pulmonary function abnormalities development in mid-life; 2) Examine young adult antecedents and obesity consequences, longitudinal relationships and interactions among adiposity, insulin resistance and inflammation; 3) Identify subclinical disease development determinants and trajectories in women during menopause transition compared to men of similar age; 4) Further assess the basis for racial differences in subclinical disease development; and 5) Provide a platform for in-depth ancillary studies in cardiovascular and other areas.
Role: Co-investigator

NIH/NIEHS R01 ES021735 (He/McClure) 10/01/2012-06/30/2017
Trace Elements Levels and Risk of Stroke: A Reason for 'Stroke Belt'
The overall objectives are to examine the associations between trace element levels and stroke risk and to investigate whether geographic variation of trace element levels is related to the "Stroke Belt"
Role: Co-investigator

Completed Research Support (within the past three years)

NIH R01 HL110993 P Muntner (PI) 05/01/12 - 04/30/15
Visit-to-visit variability of clinic blood pressure and cardiovascular outcomes Objective: to determine the association between blood pressure variability and cardiovascular and renal disease outcomes in a real-world clinic setting.

NIH R03 AG042336 CB Bowling (PI) P Muntner (Co-Investigator) 08/01/12 - 07/31/14
Grants for Early Medical and Surgical Subspecialists Transitioning to Aging Research (GEMSSTAR)
The objective of this grant is to identify geriatric-specific reasons for excess mortality and functional decline among older adults with CKD.

NIH P01 HL088117 KW Davidson (PI) P Muntner (Subcontract PI) 09/01/08 - 08/30/13
Depression, Biobehavioral mechanisms, and CHD/Mortality outcomes. The goal is to identify depression phenotypes/mechanisms that place ACS pts at excess cardiac and mortality risk.

NIH N01 HC48047 CE Lewis (PI) P Muntner (Co-Investigator) 12/30/83 - 06/30/13
Coronary Artery Risk Development in Young Adults (CARDIA): Field Center We will re-examine at least 3525 participants at Y25 according to the five main objectives: 1) Assess the timing impact and varying risk factor levels throughout young adulthood on the subclinical ventricular, vascular, and pulmonary function abnormalities development in mid-life; 2) Examine young adult antecedents and obesity consequences, longitudinal relationships and interactions among adiposity, insulin resistance and inflammation; 3) Identify subclinical disease development determinants and trajectories in women during menopause transition compared to men of similar age; 4) Further assess the basis for racial differences in subclinical disease development; and 5) Provide a platform for in-depth ancillary studies in cardiovascular and other areas.

Amgen, No grant number P Muntner (PI) 03/01/12 - 01/31/13
Cardiovascular Disease, Prevention, Treatment and Outcomes Goal is to determine the burden and outcomes associated with coronary heart disease and stroke among US adults using population-based cohort data sets.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Richard M. Myers, Ph.D.

POSITION TITLE: President, Science Director and Faculty Investigator, HudsonAlpha Institute for Biotechnology

eRA COMMONS USER NAME (credential, e.g., agency login): MYERS.RICHARDM

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
The University of Alabama, Tuscaloosa	B.S.	12/1976	Biochemistry
The University of California, Berkeley	Ph.D.	01/1982	Biochemistry
Harvard University, Cambridge	Postdoctoral	12/1985	Biochemistry and Molecular Biology

A. Personal Statement

I am President and Faculty Investigator of the HudsonAlpha Institute for Biotechnology, a non-profit research and teaching institute in Huntsville, AL focused on genetics and genomics. I have more than 35 years of experience studying the regulation of gene expression, human genetics, cancer genetics and genomics. I directed one of the first U.S. genome centers, and have been involved in developing and applying functional genomics and genetics approaches to understand how genes and regulatory regions contribute to basic biology, human diseases, including autoimmune and inflammatory disorders, cancer, childhood genetic disorders, psychiatric and neurological disorders, responses to environment, and population genetics. We use DNA sequencing and other high-throughput methods to identify genetic variants and to measure gene expression, binding of transcription factors, and epigenetic variation on a comprehensive, genome-wide level to study these problems. For decades, a significant fraction of my research has been in large collaborations of genomics and genetics work, including the Human Genome Project, the ENCODE Project, The Cancer Genome Atlas, and the Pritzker Neuropsychiatric Consortium, and I have served as PI and coordinator for our portions of these projects. In addition, my laboratory does directed biological research on human diseases and basic problems in gene regulation.

Throughout my career, in addition to my research, I have spent a significant amount of my effort in teaching, educational outreach, and institutional and national service activities. I have directly mentored or am now mentoring a total of 23 PhD students, 4 medical students, 4 MSTP students, 58 postdoctoral fellows, 6 residents and more than 100 undergraduates and technicians in my laboratory and served as co-advisor to many more trainees during my faculty positions at UCSF, Stanford and HudsonAlpha. For many of my years in California, I was director of the major graduate programs in Biochemistry and Biophysics (at UCSF) and Genetics (at Stanford), and spent a significant portion of my efforts in recruitment, mentoring, curriculum development (for graduate and medical students) and worked with postdocs and residents on their career planning. I was PI for 13 years of the Stanford Genetics and Developmental Biology training program, authoring the grant application renewals three times. In addition, I was the founding PI and director of the Stanford Genome Training Program, a large NHGRI-funded program that supported PhD students, postdocs and MD/PhD students in the genetics, genomics and bioinformatics fields, for 12 years, until I moved to HudsonAlpha.

I have participated and continue to participate in designing and teaching courses in genetics and genomics to undergraduate, medical and graduate students, as well as to non-science majors. I have published numerous manuals, textbooks and articles that are widely used by researchers and students. I have had a long-standing special interest in increasing and fostering diversity in research and education, with particular emphasis in under-represented groups. We have continued and greatly expanded these types of activities at HudsonAlpha Institute, where we have a team of science education professionals, led by Dr. Neil Lamb, who develop, test, and implement multiple programs that teach the importance of science in our everyday lives at every age level,

from children to adults. These programs provide services, ideas, excitement and tools throughout the State of Alabama and the country and have reached hundreds of thousands of people.

Based on this experience and my personal motivations and goals in teaching and mentoring, I believe that I will be an asset to this T32 training program and greatly look forward to expanding our already deep collaborations with Dr. Bridges and many other colleagues and trainees at UAB.

a. http://hudsonalpha.org/education/lifelong-learning

b. Lamb, N.E., Myers, R.M. and Gunter, C. (2009). Education and personalized genomics: deciphering the public's genetic health report. (Perspective). Personalized Med. 6: 681-690. PMCID: PMC2821046.

c. Watson, J.D., Caudy, A.A., Myers, R.M. and Witkowski, J.A. (2007). Recombinant DNA: Genes and Genomes, 3rd Edition. W. H. Freeman Press. ISBN 0-7167-2866-4.

d. Genome Analysis: A Laboratory Manual. Cold Spring Harbor Laboratory Press. Vols. 1-4 (1997-1999).

B. Positions and Honors

Positions and Employment

1986-1993	Assistant and Associate Professor of Physiology and Biochemistry & Biophysics and Director of the Human Genome Center, University of California, San Francisco, CA
1993-1996	Associate Professor of Genetics and Director of the Stanford Human Genome Center, Stanford University School of Medicine, Stanford, CA
1996-2008	Stanford W. Ascherman Professor and Chair of Genetics and Director, Stanford Human Genome Center, Stanford University School of Medicine, CA
July 2008-	President, Science Director and Faculty Investigator, HudsonAlpha Institute for Biotechnology, Huntsville, AL; Adjunct Professor, Department of Genetics, UAB School of Medicine.

Other Experience and Professional Memberships – Current Activities

2013-	Member, HeLa Genome Data Access Working Group, NIH and the Henrietta Lacks family
2014-	Founder, IMIDomics (a biotech company working on immune-mediated inflammatory disorders)
2011-	Member, Scientific Advisory Committee, Department of Energy, Joint Genome Institute
2011-	Member, Scientific Advisory Board, Biogen Idec, Inc.
2010-	Member, Scientific Advisory Board, New York Genome Center
2009-	Member, Scientific Advisory Board, DNAnexus, Inc.
2008-	Member, Scientific Advisory Board, Bay City Capital, San Francisco
2010-	Founder and Consultant: Kailos Genetics, Inc. Huntsville, AL.
1995-	Associate Editor, Genome Research (Cold Spring Harbor Laboratory Press)
2007-	Member, Human Genome Reference Consortium, National Human Genome Research Institute

Honors

1982-1984	Damon Runyon-Walter Winchell Postdoctoral Fellowship
1984-1985	Leukemia Society of America Senior Postdoctoral Fellowship
1988	Basil O'Connor Starter Scholar Research Award
1987-1990	Searle Scholar Award
1986-2003	Wills Foundation Award
2002	Pritzker Foundation Award and Darden Lecture Award
2003	Blount Initiative Award
2005	Honorary Doctorate in Humane Letters, University of Alabama
2011-present	AAAS Fellow, The American Association for the Advancement of Science

C. Contributions to Science

1. Regulation of mammalian gene expression: My training was in biochemistry and molecular biology, first in enzymology and then in protein:DNA interactions and gene regulation, and I have continued these interests my whole career. In college, I used protein purification and affinity labeling to study kinetics and allostery in *E. coli* tryptophan synthase. In graduate school, I purified SV40 T antigen and studied its binding to the viral genome, and studied how the binding affects gene expression and DNA replication. I studied similar problems as a postdoc, where I developed a method for generating single base mutations, used it to saturate the beta-globin promoter with single base mutations and studied the contribution of each base pair in transcription. We

began to study human gene regulation on a genome-wide scale with the advent of high-throughput, often sequencing-based, methods, including identifying *cis*-acting elements, epigenetic contributors, and proteins that bind to DNA on a very large scale, as part of the ENCODE Project Consortium as well as for more focused problems in human biology. We helped develop ChIP-seq, tissue-ChIP-seq, and Methyl-seq, as well as other methods for studying gene regulation and epigenetics on a global level. This work has been a combination of individual projects to target specific pathways or biological questions and large team-oriented collaborations that produce datasets and resources for the research community.

a. **Myers, R.M**., Tilly, K. and Maniatis, T. (1986). Fine structure genetic analysis of a beta-globin promoter. Science. 232: 613-618. PMID: 3457470.

b. Reddy, T.E., Gertz, J., Crawford, G.E., Garabedian, M.J. and **Myers, R.M**. (2012). The hypersensitive glucocorticoid response specifically regulates period 1 and expression of circadian genes. Mol. Cell. Biol. 32: 3756-3767. PMCID: PMC3430195.

c. Gertz, J., Savic, D., Varley, K.E., Partridge, E.C., Safi, A., Jain, P., Cooper, G.M., Reddy, T.E., Crawford, G.E. and **Myers R.M.** (2013). Distinct properties of cell type-specific and shared transcription factor binding sites. Mol. Cell. 52: 25-36. PMCID: PMC3811135.

d. Savic, D., Gertz, J., Jain P., Cooper, G.M. and **Myers R.M**. (2013). Mapping genome-wide transcription factor binding sites in frozen tissues. Epigenetics & Chromatin. 6: 30. PMCID: PMC3848595.

2. Technology development and my introduction to human genetics: During my postdoc in Tom Maniatis's lab, as an adjunct to the method we devised to generate mutations, I developed two methods for detecting mutations in total genomic DNA. One involved cleaving mismatches in double-stranded helices and the other used a gradient of DNA denaturants in an electrophoretic gel that separates DNA fragments differing by a single base pair. This sparked a new interest to study human genetics, which I began to do when I arrived for my first faculty position at UCSF. I met and immediately began a long and fruitful collaboration with David Cox to apply these methods to human diseases, with a particular interest in disorders of the nervous system, first Huntington disease and Down Syndrome, then epilepsy, Alzheimer disease and a mouse neurodevelopmental mutation (the *weaver* gene). The approach used genetic linkage analyses with polymorphic DNA markers (some of which we developed with my mutation detection methods, developing physical and genetic maps, as well as radiation hybrid maps with a method that David and I developed (discussed in the next section), physical walking and cloning of the regions of the genome harboring the genes, and then applying mutation detection methods to identify the causative genes for these Mendelian disorders.

a. **Myers, R.M**., Lumelsky, N., Lerman, L.S. and Maniatis, T. (1985). Detection of single base substitutions in total genomic DNA. Nature. 313: 495-498. PMID: 3969155.

b. **Myers, R.M.,** Larin, Z. and Maniatis, T. (1985). Detection of single base substitutions by ribonuclease cleavage of mismatches in RNA:DNA duplexes. Science. 230: 1242-1246. PMID: 4071043.

c. Patil, N., Cox, D.R., Bhat, D., Faham, M., **Myers, R.M**. and Peterson, A.S. (1995). A potassium channel mutation in weaver mice implicates membrane excitability in granule cell differentiation. Nature Genet. 11: 126-129. PMID: 7550338.

d. Pennacchio, L.A., Lehesjoki, A.E., Stone, N.E., Willour, V.L., Virtaneva, K., Miao, J., D'Amato, E., Ramirez, L., Faham, M., Koskiniemi, M., Warrington, J., Norio, R., de la Chapelle, A., Cox, D.R. and **Myers, R.M.** (1996). Mutations in the gene encoding cystatin B in Progressive Myoclonus Epilepsy (EPM1). Science. 271: 1731-1734. PMID: 8596935.

3. Human genome mapping and sequencing and my participation in the Human Genome Project: In 1984, I attended a conference in Alta, Utah sponsored by the U.S. Department of Energy. Along with a group of 18 researchers, we discussed how to determine if the atomic bomb blasts in World War II increased the germline mutation rate in the survivors. Someone commented that “the rate is so low that we would have to sequence the entire human genome to know the answer”. Soon after, the DOE proposed the basis for the Human Genome Project. A year later, I began collaborating with David Cox at UCSF developing radiation hybrid mapping, physical mapping, exon mapping, and applying my mutation detection methods to find disease genes. We were awarded one of the first NIH genome center grants in 1990. Our mapping and gene finding efforts, and later DNA sequencing (with funding from the DOE and with the Joint Genome Institute in Walnut

Creek, CA) were significant parts to the publicly-funded finished human genome sequence in 2003; we contributed three human chromosomes, representing more than 10% of the total done by this worldwide effort. We use this expertise and infrastructure to other sequencing projects, including large numbers of full-length cDNAs as part of the Mammalian Gene Collection, and the genomes of many other organisms, including the sticklebacks, zebrafish, the coelacanth, and plants. These efforts are community projects, which means that the data are provided rapidly and without restriction to others. While my laboratory has always done projects we design and perform to answer specific questions, a significant fraction of our work has been service-oriented like the HGP. I find this rewarding and helpful, as it creates a training environment for students and postdocs, providing infrastructure and multidisciplinary expertise that benefits them in their individual projects.

a. Cook-Deegan, R. (1989). The Alta summit, December 1984. Genomics 5: 661-663. PMID: 2613249.

b. Cox, D.R., Burmeister, M., Price, E.R., Kim, S. and **Myers, R.M**. (1990). Radiation hybrid mapping: A somatic cell genetic method for constructing high-resolution maps of mammalian chromosomes. Science 250: 245-250. PMID: 2218528.

c. International Human Genome Sequencing Consortium. (2004). Finishing the euchromatic sequence of the human genome. Nature 431: 931-945. PMID: 15496913.

d. Schmutz, J., Wheeler, J., Grimwood, J., Dickson, M.,..., Tsai, M., and **Myers, R.M**. (2004).Quality assessment of the human genome sequence. Nature 429: 365-368. PMID: 15164052.

4. More recent human disease and population genetics projects: My lab uses genetics and functional genomics to study a variety of human diseases, including diseases of the immune system, including rheumatoid arthtritis, lupus, and psoriasis, disorders of the nervous system, notably ALS, Parkinson disease, bipolar disorder, schizophrenia and major depression, as well as several types of cancer, including breast, prostate, kidney, colon and pancreatic cancer. We are part of a large study that uses whole genome sequencing to identify the causes of intellectual and developmental delay in children with undiagnosed causes of these disorders. We identify DNA sequence differences and differences in functional readout of the genome (including transcriptome, methylome, transcription factor occupancy and immune repertoire measurements), between affected and unaffected individuals, and between responders and non-responders in drug trials. We have also applied these methods to study human population history and migrations.

a. Julià, A., Domènech, E., Chaparro, M., García-Sánchez, V...., Absher, D., **Myers, R. M.,** Gisbert, J. P. and Marsal, S. (2014). A genome-wide association study identifies a novel locus at 6q22.1 associated with ulcerative colitis. Hum. Mol. Genet. 23: 6927-6934. [Epub ahead of print]. PMID: 25082827.

b. Alonso, A., Domènech, E., Julià, A.,... Absher, D., **Myers, R. M**., Marsal, S., and Gisbert, J. P. (2015). Identification of Risk Loci for Crohn's Disease Phenotypes Using a Genome-Wide Association Study. Gastroenterology. 148: 794-805. PMID: 25557950. [PubMed - in process].

c. Varley, K.E., Gertz, J., Roberts, B.S., Davis, N.S., Bowling, K.M., Kirby, M.K., Nesmith, A.S., Oliver, P.G., Grizzle, W. E., Forero-Torres, A., Buchsbaum, D.J., LoBuglio, A.F. and **Myers, R.M**. (2014). Recurrent read-through fusion transcripts in breast cancer. Breast Can Res Treat. 146: 287-297. PMCID: PMC4085473.

d. Cirulli, E.T., Lasseigne, B.N., Petrovski, S., ..., Gitler, A.D., Rouleau, G.A., Brown, R., Harms, M.B., Cooper, G., Harris, T., **Myers, R.M.,** and Goldstein, D.B. (2015). Exome sequencing in amyotrophic lateral sclerosis identifies risk genes and pathways. Science 347: 1436-1441. PMID: 25700176. [PubMed indexed for MEDLINE]. Comment in Science 347: 1422-1423 (2015).

5. Service: I have served and continue to serve on a large number of advisory panels and editorial boards, including panels for the National Institutes of Health, the Department of Energy, several universities, and the Pharmacogenomics Research Network. I am a member of the HeLa Genome Data Access Working Group, led by the National Institutes of Health. I am an Associate Editor of Genome Research and participate in strategic planning and grant reviews for the NIH, DOE and other agencies. I serve on the Scientific Advisory Boards of The Joint Genome Center in Walnut Creek, CA, Bay City Capital, and the New York Genome Center.

While these activities consume a significant amount of my efforts, I think that they are as important as the research programs that I direct, and I take a lot of pride in both doing this work and showing to my trainees and

colleagues that it serves all of our interests to dedicate time to such activities. I believe that researchers in all arenas – academia, companies, research institutes – owe it to the public, legislators, teachers and our trainees to help them understand the importance of science and to be honest brokers in describing our enterprise.

Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/myncbi/1r9GxydAihe5D/bibliography/46518505/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

UM1 HG007301 Myers & Cooper (Co-PIs) 06/14/15-05/31/17
Genomic Diagnosis in Children with Developmental Delay
We are using DNA sequencing to identify causes in children with undiagnosed mental disorders.
Role: Co-PI

U54 HG006998 Myers (PI) 09/21/12-07/31/16
Toward a comprehensive functional annotation of the human genome
This is part of the ENCODE Project, whose goals are to identify and understand the roles of all the functional elements throughout the entire human genome.
Role: PI

IIR13265422 Myers (PI) 07/01/14-06/30/15
Genomic Profiling of ER+ breast cancer to identify signatures of therapy response
We are studying women treated in a clinical trial with combined with anti-VEGF and estrogen therapy.
Role: PI

R01 AR057202 Bridges (PI) 09/25/09-07/31/15
Title: Genome Wide Association Study in African-Americans with Rheumatoid Arthritis
We are performing a genome-wide genetic association study of rheumatoid arthritis in African Americans.
Role: Collaborator

R01 HL104135 Arnett (PI) 08/15/10-06/30/15
Title: Epigenetic Determinants of Lipid Response to dietary Fat and Fenofibrate
We are identifying epigenetic alterations that affect triglyceride levels in response to environmental challenges.
Role: Collaborator

Completed Research Support

NIH (PIs of Collaborative R01: Richard M. Myers and Michael Boehnke) 8/30/11 - 6/30/14
Title: Whole Genome and Exome Sequencing for Bipolar Disorder
We sequenced whole genomes from 2,000 individuals with bipolar disorder and 2,000 controls.
Role: Co-PI

NHGRI P50 HG02568 (PI: David Kingsley) 4/19/02 - 5/31/13
Title: Center for Vertebrate Diversity
This grant supported work to understand the genetic basis for biological diversity seen in vertebrate animals.
Role: Collaborator

NIH RC4 AI092765 (PI: Dan Littman) 9/30/10 - 9/29/13
Title: Elucidation of the transcriptional network underlying the Th17 lineage program
We used genomic technologies to define the comprehensive transcriptional regulatory network of Th17 cells.
Role: Collaborator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Jan Novak

eRA COMMONS USER NAME (credential, e.g., agency login): Jan_Novak

POSITION TITLE: Professor of Microbiology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Charles University, Prague, Czech Republic	B.S.	05/1985	Biology
Charles University, Prague, Czech Republic	M.Sc.	09/1987	Biology/Physiology
Institute of Microbiology, Czech Academy of Sciences, Prague, Czech Republic	Ph.D.	12/1990	Cell/Molecular Biology
Institute of Microbiology, Czech Academy of Sciences, Prague, Czech Republic	Postdoctoral studies	02/1992	Microbiology
University of Alabama at Birmingham, AL, USA	Postdoctoral studies	03/1994	Microbiology/Genetics

A. Personal Statement

I have been involved for the past 18 years in glycobiology and glycoimmunobiology and proteomic and genetic studies relevant to human health and disease, namely in relation to renal and autoimmune diseases. I have been involved in pioneering studies of biochemistry and genetics of glycosylation of IgA1 and IgG and the changes associated with autoimmune and chronic inflammatory diseases, such as IgA nephropathy, periodontal disease, inflammatory bowel disease, and rheumatoid arthritis, and infectious diseases, such as HIV infection. With my colleagues in my laboratory, we generated immortalized IgA1-producing cells as a new tool for studies of pathways leading to galactose deficiency of *O*-glycans on IgA1 in patients with IgA nephropathy. Furthermore, our group characterized unique anti-glycan antibodies recognizing the aberrantly glycosylated IgA1 in patients with IgA nephropathy and thus defined the autoimmune character of the disease, with the aberrant IgA1 being an autoantigen. Using IgA1 proteins from patients with multiple myeloma and IgA nephropathy as well as healthy controls, we have developed new techniques for analysis of *O*- and *N*-glycans using high-resolution mass spectrometry and other cutting-edge technologies, developed animal models of IgA nephropathy, and performed studies of signal transduction in IgA1-secreting cells. More recently, our group has studied biological activities of IgA1-containing immune complexes and started focusing on HIV-1 functional glycomics; we demonstrated the impact of cell-specific glycosylation of envelope glycoprotein on antibody recognition and virus infectivity.

I am committed to training young investigators to become successful independent scientist. The environment in my laboratory supports interdisciplinary collaborative studies, as evidenced by a number of high-impact multi-author publications and awards to the trainees for their research studies. Current trainee on a T32 training grant based in the Division of Nephrology at UAB, Dr. Colin Reily, has participated in studies related to pathogenesis of IgA nephropathy in my laboratory since October 2012. His support through the T32 grant greatly supported his training and preparation for transition towards independence, through a pending K01 application. Dr. Reily has excelled in his studies in my laboratory, and his research abilities are reflected by multiple awards he has received including awards for excellence at the UAB postdoctoral research day in 2013 and 2014 and selection of his research work as an oral presentation at the annual ASN meeting, Kidney Week 2013. He also received the prestigious Joy Cappel 2014 Young Investigator Award at the Southeastern Immunology Symposium in June 2014, Emory University, Atlanta, GA. In recognition of his outstanding interdisciplinary training in kidney-related research, he was awarded the 2014 Dale Benos Scholar Award by the T32 NRTC executive committee at UAB.

Previous visiting scientists and trainees in my laboratory have been successful in their scientific advances and career development. Based on my experience in training postdoctoral scientists and my current research and funding, I am well qualified to serve as a mentor on this T32 proposal.

a. Stuchlova Horynová, M., Raska, M., Clausen, H., **Novak, J.** Aberrant *O*-glycosylation and anti-glycan antibodies in an autoimmune disease IgA nephropathy and breast adenocarcinoma. *Cell. Mol. Life Sci.* 70, 829–839, 2013. PMID: 22864623
b. Reily, C.R., Ueda, H., Huang, Z.-Q., Mestecky, J., Julian, B.A., Willey, C.D., **Novak, J.** Cellular signaling and production of galactose-deficient IgA1 in IgA nephropathy, an autoimmune disease. *J. Immunol. Res.* 2014, article ID 197548, 1-10, 2014. PMID: 25152896
c. Maillard, N., Wyatt, R.J., Julian, B.A., Kiryluk, K., Gharavi, A., Fremeaux-Bacchi, V., **Novak, J.** Current understanding of the role of complement in IgA nephropathy. *J. Am. Soc. Nephrol.* In Press. 2015. PMID: 25694468
d. **Novak, J.,** Rizk, D.V., Takahashi, K., Zhang, X.W., Bian, Q., Ueda, H., Ueda, Y., Reily, C., Lai, L.Y., Hao, C.M., Novak, L., Huang, Z.Q., Renfrow, M.B., Suzuki, H., Julian, B.A. New insights into the pathogenesis of IgA nephropathy. *Kidney Diseases.* In Press. 2015.

B. Positions and Honors

Positions and Employment

1985-86	Institute of Microbiology, Czech. Acad. Sci., Prague. Department of Biogenesis of Natural Compounds. Research Assistant.
1986-90	Institute of Microbiology, Czech. Acad. Sci., Prague. Department of Biogenesis of Natural Compounds. Graduate Student. (Ph.D.)
1990-92	Institute of Microbiology, Czech. Acad. Sci., Prague. Post-Doctoral Fellow.
1992-94	University of Alabama at Birmingham (UAB), Department of Oral Biology, Post-Doctoral Fellow.
1994	UAB, Department of Oral Biology, Research Fellow.
1994	November. University of Groningen, Department of Microbiology, Groningen Biomolecular Sciences and Biotechnology Institute. The Netherlands. Visiting Scientist.
1994-96	UAB, Dept. Oral Biology, Research Associate.
1996-present	UAB, Member of the Graduate School Faculty.
1996-2005	UAB, Departments of Microbiology and Oral Biology, Research Assistant Professor.
2003-present	Mucosal HIV and Immunobiology Center, UAB, Investigator.
2005-present	Nephrology Research and Training Center, UAB, Associate Scientist; Arthritis and Musculoskeletal Center, Division of Clinical Immunology and Rheumatology, Department of Medicine, UAB, Scientist; Comprehensive Cancer Center, UAB; CFAR, UAB, Scientist.
2005-2006	UAB, Department of Microbiology, Research Associate Professor.
2006-2013	UAB, Department of Microbiology, Associate Professor.
2013-present	UAB, Department of Microbiology, Professor.

Other Experience and Professional Memberships

Memberships: American Society of Nephrology, Czech Biochemical Society, American Society for Microbiology, International Society of Nephrology, Society for Mucosal Immunology, The Henry Kunkel Society
Invited speaker: Int. Symposium on IgA Nephropathy, Tokyo, Japan, 2006; Italy, 2009; ASN Annual Meeting, Philadelphia, 2008; World Congress of Nephrology, Milan, Italy, 2009 and Vancouver, Canada, 2011; Human Proteome Organization Congress, Geneva, Switzerland, 2011; NIH conference on Glomerular diseases, 2012; ASN Annual Meeting 2012; Int. Symposium on IgA Nephropathy, Nanjing, China, 2013; ASN Annual Meeting, Atlanta, 2013; Gordon Research Conference, Italy, 2014; APCN, Tokyo, Japan, 2014.
Keynote speaker: 7th International Symposium on Tonsils and Mucosal Barriers of the Upper Airways (ISTMB),
Asahikawa, Japan, 2010.
Moderator: ASN Annual Meetings, 2005, 2008; International Symposium on IgA Nephropathy, Italy, 2009, China 2013.
Session Chairman: 7th International Symposium on Tonsils and Mucosal Barriers of the Upper Airways (ISTMB), Asahikawa, Japan, 2010.
Workshops co-organizer and co-chair: Immunological kidney diseases, International Congress of Immunology,

Kobe, Japan, 2010. ARC conference, ASN Annual Meeting, San Diego, CA, October 30-31, 2012.
Symposium co-organizer (with Drs. Renfrow and Bellis): Glycoimmunobiology 2013, Birmingham, 2013.
2001-present *Reviewer-Journals*: Am. J. Kidney Dis., Kidney Int., J. Am. Soc. Nephrol., NDT;
1998-present *Grant Reviewer- Research Foundations:* NIH, USA; Research Council of Hong Kong; The National Heart Foundation of New Zealand; Grant Agency of the Czech Republic; Health Research Board of Ireland; various EU grant agencies.
1998-present *Reviewer - Journals:* Eur. J. Mass Spectrom., JACM, J. Immunol., Kidney Int., Lancet, Trends Molec. Med., J. Am. Soc. Nephrol., Am. J. Kidney Dis., J. Biol. Chem, PNAS, NDT.
2013-present International IgA Nephropathy Network, Steering committee member
2014-2016 American Society of Nephrology, member of the Glomerular Diseases Advisory Group
2015-present *Editorial board member*: Kidney Diseases (Karger, Switzerland)

C. Contributions to Science

1. Glycomic analyses of immunoglobulins. The PI has been involved in pioneering studies of IgA1 and IgG glycosylation and the changes associated with autoimmune and chronic inflammatory diseases, such as IgA nephropathy, periodontal disease, celiac disease, rheumatoid arthritis, and infectious diseases, such as HIV infection. The findings included development of new techniques for profiling of IgG glycosylation and application of these techniques to the analyses of IgG from sera of HIV-infected individuals and from sera and gingival crevicular fluid in patients with periodontal disease. The analyses revealed a proinflammatory nature of IgG, galactose deficiency, in sera of HIV-infected individuals and locally produced in gingival tissue of patienst with periodontal disease. Main focus of PI's studies has been on IgA1 *O*-glycome and its profiling by new techniques, such as high-resolution mass spectrometry, surface plasmon resonance, and high-throughput lectin ELISA. Moreover, use of unique IgA1-producing cell lines generated in PI's laboratory enabled studies of metabolic biosynthetic pathways involved in production of IgA1 with aberrant *O*-glycosylation (see below, #2).

a. Renfrow, M.B., Cooper, H.J., Tomana, M., Kulhavy, R., Hiki, Y., Toma, K., Emmett, M.R., Mestecky, J., Marshall A. G., **Novak, J**. Determination of aberrant *O*-glycosylation in the IgA1 hinge region by electron capture dissociation Fourier transform ion cyclotron resonance mass spectrometry. *J. Biol. Chem*. 280, 19136-19145, 2005. PMID: 15728186
b. Takahashi, K., Wall, S.B., Suzuki, H., Smith, IV, A.D., Hall, S., Poulsen, K., Kilian, M., Julian, B.A., Mestecky, J., **Novak, J.,** Renfrow, M.B. Clustered *O*-glycans of IgA1: Defining macro- and micro-heterogeneity by use of electron capture/transfer dissociation. *Mol. Cell. Proteomics.* 9, 2545-2557, 2010. PMID: 20823119
c. Takahashi, K., Smith IV, A.D., Poulsen, K., Kilian, M., Julian, B.A., Mestecky, J., **Novak, J.,*** Renfrow, M.B.* Naturally occurring structural isomers in serum IgA1 *O*-glycosylation. *J. Prot. Res.* 11, 692-702, 2012. PMID: 22067045; PMCID: PMC3844682 (*co-senior and co-coresponding author)
d. Suzuki, H., Raska, M., Yamada, K., Moldoveanu, Z., Julian, B.A., Wyatt, R.J., Tomino, Y., Gharavi, A.G., **Novak, J.** Cytokines alter IgA1 *O*-glycosylation by dysregulating C1GalT1 and ST6GalNAc-II enzymes. *J. Biol Chem.* 289, 5330-5339, 2014. PMID: 24398680; PMCID: PMC3931088

2. Pathogenesis of IgA nephropathy. The main focus of PI's studies since 1998 has been the mechanisms involved in pathogenesis of IgA nephropathy. Since the beginning, working with Milan Tomana, Jiri Mestecky, and Bruce A. Julian, and later also with additional collaborators, Zina Moldoveanu, Robert J. Wyatt, Matthew B. Renfrow, Hitoshi Suzuki, Yasuhiko Tomino, Kazuo Takahashi, Ali Gharavi, Krzysztof Kiryluk and others, resulted in a paradigm-shifting hypothesis: IgA nephropathy was defined as an autoimmune disease, with the aberrantly glycosylated IgA1 being an autoantigen recognized by anti-glycan antibodies. The result was formation of pathogenic immune complexes that drive the disease pathogenesis. Biochemical and genetic studies defined genetic contributions to IgA nephropathy and begin to define genetic determinants for the production of the autoantigen. New tools, models, and approaches have been developed, including immortalized IgA1-secreting cells from patients with IgAN and controls, antibodies specific for aberrantly glycosylated IgA1, and targeted high-resolution mass spectrometry analyses, that have provided unique insights into the nature of pathogenic IgA1-containing immune complexes. These results support a multi-hit hypothesis wherein aberrantly glycosylated IgA1, the key autoantigen in IgAN, forms pathogenic immune complexes with unique autoantibodies. These findings provide insight into the mechanisms of disease in IgAN and offer clues for future development of disease-specific therapy and biomarkers.

a. Suzuki, H., Fan, R., Zhang, Z., Brown, R., Hall, S., Julian, B.A., Chatham, W.W., Suzuki, Y., Wyatt, R.J., Moldoveanu, Z., Lee, J.Y., Robinson, J., Tomana, M., Tomino, Y., Mestecky, J., **Novak, J.** Aberrantly glycosylated IgA1 in IgA nephropathy patients is recognized by IgG antibodies with restricted heterogeneity. *J. Clin. Invest.* 119, 1668-1677, 2009.
b. Berthoux, F., Suzuki, H., Thibaudin, L., Yanagawa, H., Maillard, N., Mariat, C., Tomino, Y., Julian, B.A., **Novak, J.** Serum autoantibodies specific for galactose-deficient IgA1 associate with disease progression in IgA nephropathy. *J. Am. Soc. Nephrol*. 23, 1579-1587, 2012. PMID: 22904352 PMCID: PMC3431415
c. Kiryluk, K., **Novak, J.,** Gharavi, A.G. Pathogenesis of IgA nephropathy: recent insight from genetic studies. *Annu. Rev. Med.* 64, 339-356, 2013. PMID: 23072577
d. Kiryluk, K., **Novak, J.** The genetics and immunobiology of IgA nephropathy. *J. Clin. Invest.* 124(6), 2325-2332, 2014. PMID: 24892706; PMCID: PMC4089454

3. Functional glycomic studies of HIV envelope glycoprotein and bacteria. Glycosylated surfaces on microbes and viruses engage immune system and module immune responses. In some instances, the result is undesired, as it results in pathology (ref b), in other instances it is desired but difficult to accomplish, such as development of effective HIV vaccine. PI's work with colleagues revealed how critically is cell-specific glycosylation of HIV-1 Env glycoprotein affecting immune recognition and virus infectivity.

a. Raska, M., Takahashi, K., Czernekova, L., Zachova, K., Hall, S., Moldoveanu, Z., Elliott, M.C., Wilson, L., Brown, R., Jancova, D., Barnes, S., Vrbkova, J., Tomana, M., Smith, P.D., Mestecky, J., Renfrow, M.B., **Novak, J.** Glycosylation patterns of HIV-1 gp120 are cell-producing type dependent and affect antibody recognition. *J. Biol. Chem.* 285, 20860-20869, 2010. PMID: 20439465
b. McCarthy, D.D., Kujawa, J., Wilson, C., Papandile, A., Poreci, U., Porfilio, E.A., Ward, L., Lawson, M.A.E., Macpherson, A.J., McCoy, K.D., Pei, Y., Novak, L., Lee, J.Y., Julian, B.A., **Novak, J.,** Ranger, A., Gommerman, J.L., Browning, J.L. Mice over-expressing BAFF develop a commensal flora-dependent, IgAassociated nephropathy. *J. Clin. Invest.* 121, 3991-4002, 2011. PMID: 21881212 PMCID: PMC3195458
c. Raska, M., Czernekova, L., Moldoveanu, Z., Zachova, K., Elliott, M.C., Novak, Z., Hall, S., Vrbkova, J., Hoelscher, M., Maboko, L., Brown, R., Tomana, M., Smith, P.D., Mestecky, J., **Novak, J.** Differential glycosylation of envelope gp120 is associated with differential recognition of HIV-1 by virus-specific antibodies and cell infection. *AIDS Res. Ther.* 11, 23, 2014. PMID: 25120578
d. Shen, R., Raska, M., Bimczok, D., **Novak, J.,** Smith, P.D. HIV-1 envelope glycan moieties modulate HIV-1transmission. *J. Virol*. 88, 14258-14267. 2014. PMID: 25275130

4. Biologically active compounds. The PI since his early pre- and post-doctoral work in Czech Republic and then at UAB studied biologically active compounds, including new types of antibiotics, and later also biological activities of immune complexes. The goals were related to development of disease-specific treatments for various applications.

a. Lu, S.-E., **Novak, J.,** Austin, F.W., Gu, G., Ellis, D., Kirk, M., Wilson-Stanford, S., Tonelli, M., and Smith, L. Occidiofungin, a unique antifungal glycopeptide produced by a strain of *Burkholderia contaminans*. Biochemistry. 48, 8312-8321, 2009.
b. Hashimoto, A., Suzuki, Y., Suzuki, H., Ohsawa, I., Brown, R., Hall, S., Tanaka, Y., **Novak, J.,** Ohi, H., Tomino, Y. Determination of severity of murine IgA nephropathy by glomerular complement activation by aberrantly glycosylated IgA and immune complexes. *Am. J. Pathol.* 181, 1338-1347, 2012. PMID: 22871574
c. Tamouza, H., Chemouny, J., Raskova Kafkova, L., Berthelot, L., Flamant, M., Demion, M., Mesnard, L., Walker, F., Julian, B.A., Tissandié, E., Tiwari, M.K., Camara, N.O.S., Vrtovsnik, F., Benhamou, M., **Novak, J.,** Monteiro, R.C., Moura, I.C. IgA1 immune complex-mediated activation of MAPK/ERK kinase pathway inmesangial cells is associated with glomerular damage in IgA nephropathy. *Kidney Int.* 82, 1284-1296, 2012. PMID: 22951891
d. Schoeb, T.R., Jarmi, T., Hicks, M.J., Henke, S., Zarjou, A., Suzuki, H., Kramer, P., **Novak, J.,** Agarwal, A., Bullard, D.C. Endothelial nitric oxide synthase inhibits the development of autoimmune-mediated vasculitis in mice. *Arthritis Rheum*. 64, 4114-4124, 2012. PMID: 22933338

5. Biomarker development and characterization. An integral part of development of disease-specific treatment

is identification of surrogate markers for diagnosis, prognosis, and assessment of responses to therapy. PI has been involved in studies focused on serum and urinary markers of IgA nephropathy and related diseases.

a. Mischak, H., Allmaier, G., Apweiler, R., Attwood, T., Baumann, M., Benigni, A., Bennett, S.E., Bischoff, R., Bongcam-Rudloff, E., Capasso, G., Coon, J.J., D'Haese, P., Dominiczak, A.F., Dakna, M., Dihazi, H., Ehrich, J.H., Fernandez-Llama, P., Fliser, D., Frokiaer, J., Garin, J., Girolami, M., Hancock, W.S., Haubitz, M., Hochstrasser, D., Holman, R., Jankowski, J., Julian, B.A., Klein, J.B., Kolch, W., Luider, T., Massy, Z., Mattes, W.B., Molina, F., Monsarrat, B., **Novak, J.,** Peter, K., Rossing, P., Sánchez Carbayo, M., Schanstra, J.P., Semmes, O.J., Spasovski, G., Theodorescu, D., Thongboonkerd, V., Vanholder, R., Veenstra, T., Weissinger, E., Yamamoto, T., Vlahou A. Recommendations for biomarker identification and classifier validation in clinical proteomics. *Science Translational Medicine*. 2, 46ps42, 2010. PMID: 20739680
b. He, M., **Novak, J.,** Julian, B.A., Herr, A.E. Microfluidic lectin blotting: Towards the assessment of aberrantly glycosylated serum IgA1 in IgA nephropathy. *J. Am. Chem. Soc.* 133, 19610-19613, 2011. PMID: 22070432
c. Hastings, M.C., Moldoveanu, Z., Suzuki, H., Berthoux, F., Julian, B.A., Sanders, J.T., Renfrow, M. B., **Novak, J.,** Wyatt, R.J. Biomarkers in IgA nephropathy: Relationship to pathogenetic hits. *Expert Opin. Med. Diagn.* 7,615-627, 2013. PMID: 24175678
d. Yanagawa, H., Suzuki, H., Suzuki, Y., Kiryluk, K., Gharavi, A., Matsuoka, K., Julian, B.A., **Novak, J.,** Tomino, Y. A panel of serum biomarkers differentiates IgA nephropathy from other renal diseases. *PLoS ONE*.9(5)**,** e98081, 2014. PMID: 24858067

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/40651132/

D. Research Support

Ongoing Research Support

R01 DK78244 Novak, J. (P.I.) 06/01/07 - 05/31/17
Molecular Basis of Pathogenicity of IgA1-containing Immune Complexes
The goal is to define the role of aberrant glycosylation of IgA1 in the formation of immune complexes in IgAN.
Role: PI

Multi-PI R01 DK099228 Mestecky, J., (Contact P.I.), Novak, J. (PI) 07/01/14 - 04/30/17
IgA Nephropathy: Interventions with Generation of Nephritogenic Immune Complexes
The goal is to provide proof of the concept that monovalent single- chain anti-glycan antibodies can block formation of nephritogenic immune complexes and prevent glomerular injury in IgA nephropathy.
Role: PI

Multi-PI R01 DK082753 Gharavi, A.G. (Contact P.I.), Novak, J. (P.I.) 05/01/09 - 06/30/19
Elucidating IgA Nephropathy Through Genetic Studies of IgA1 Glycosylation
This study will test the hypothesis that a high level of serum Gd-IgA1 defines an endophenotype that can be used to identify the genetic basis for the aberrant glycosylation of IgA1, and thus the genetic basis of IgAN.
Role: PI

R01 GM098539 Renfrow, M.B. (P.I.) 10/01/11 - 09/30/15
Analytical Tools for the Analysis of Clustered *O*-Glycans in Clinical Samples
This proposal seeks to develop analytical tools for the analysis of clustered *O*-glycans in clinical samples that have become targets for their potential as biomarkers for cancer and other diseases.
Role: Co-PI

Completed Research Support

R21 DK083663 Novak, J. (P.I.) 07/01/10 - 06/31/13
New animal model for studies of mucosal immunity and IgA nephropathy
Goal of this project was to generate transgenic mice in which IgA contains *O*-linked glycans enabling formation of pathogenic immune complexes.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Ponce, Brent

eRA COMMONS USER NAME (credential, e.g., agency login): bponce

POSITION TITLE: Associate Professor, Department of Surgery

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Cincinnati, Cincinnati Ohio	B.A.	1992	
Vanderbilt University School of Med., Nashville, Tennessee	M.D.	1996	Medical
Wright State Medical School, Dayton, Ohio		1997	Medical
Harvard Medical School, Boston, MA		2003	Orthopedic Residency
Harvard Medical School, Boston, MA		2003	Shoulder Fellowship

A. Personal Statement

Since joining the Division of Orthopaedics at UAB, I have worked closely with Faculty members, Residents and Medical students as well as Dr. Alan Eberhardt in the Biomedical Engineering department on multiple research projects. My collaborations with the forenamed have focused on the Shoulder and are in keeping with the mission to improve healthcare through problem solving and scientific discovery. I have secured funding for our cadaveric lab along with grant writing efforts to secure additional funding for haptic arthroscopic simulators and renovation of lab space which has led to my appointment as director of the surgical skills lab. I have mentored several UAB medical student's interested in orthopaedic surgery and so was selected as the faulty advisor for the Surgery Interest Group. Just recently I was honored to be named Kurt M.W. Niemann Outstanding UAB Orthopaedic Surgery Faculty in recognition of my teaching of and personal investment in the residents. Therefore I believe mentoring talent and building relationships are foundational for orthopaedics, training of residents and practicing surgeons. This solidifies my belief that it is critical for us to seek to build consensus and create cohesive teams to allow our profession to flourish in the future.

B. Positions and Honors

2013	Best Scientific Exhibit AAOS Annual Meeting, Chicago, IL. March 19-23, 2013
2013	"Telementoring: Virtual Reality in Orthopaedic Education".
2013	President, Veteran's Administration Orthopaedic Association
2013	1st Place, Yelton Essay Compeetition Alabama Orthopaedic Society; "Palpation of the Rotator Cuff: Was Codman Correct?
2011	Kurt M.W. Niemann Outstanding UAB Orthopaedic Surgery Faculty
2010	Mid America Orthopaedic Association Traveling Fellowship
2008	"The Effect of Arthroscopic Rotator Interval Closure on Glenohumeral Volume", 2nd Place, 2008 Yelton Essay Competition, AOS-MOS
2006	Air Force Meritorious Service Medal, US Air Force Academy
2005	Air Force Accommodation Medal – Operation Iraqi Freedom
2005	Best scientific exhibit AAOS annual meeting, February 23-27, 2005 Washington, DC
2004	United States Air Force Expert Marksman
1999	United States Air Force Achievement Medal
1997-1999	Airsickness Management Consultant for United States Air Force AETC

1992-1996	United States Air Force Health Professions Scholarship
1992	GTE Academic All-American – Swimming/Biology
1992	Robert McKibbin Medal – Outstanding Male Graduate, University of Cincinnati
1991-1992	Mortar Board University of Cincinnati
1988-1992	University of Cincinnati College of Arts and Science Welch Scholarship
1988	National High School Athletic All-American, Swimming

PROFESSIONAL SOCIETIES:

Alabama Orthopaedic Society (AOS)
American Academy of Orthopaedic Surgeons (AAOS)
American Medical Association (AMA)
Arthroscopy Association of North America (AANA)
Jefferson County Medical Society
Medical Association of the State of Alabama (MASA)
Mid-America Orthopaedic Association (MAOA)
Society of Military Orthopaedic Surgeons (SOMOS)
Veterans Administration Orthopaedic Society

C. Contributions to Science

1. Augmented reality in orthopaedic surgery

Augmented reality is a new technology that allows a remote user to virtually project their hands into a local user's viewing field, allowing virtual collaboration. My research in this field has dealt with application of this technology in the field of orthopaedic surgery. To date, I have completed two studies and written a review on the topic. The first study involved remote instruction of residents in arthroscopic shoulder surgery. Here, we demonstrated that the technology was feasible for use in the operating room and contributed significantly to the resident's learning experience while allowing enhanced autonomy. The second study was a case report in which I performed a shoulder replacement in Birmingham, AL while a remote surgeon in Atlanta, GA virtually collaborated. This study showed that a virtual teleconsult in surgery was possible.

a. **Ponce BA**, Jennings JK, Clay TB, May MB, Huisingh C, Sheppard ED. Telementoring: use of augmented reality in orthopaedic education: AAOS exhibit selection. J Bone Joint Surg Am. 2014 May 21;96(10):e84.

b. **Ponce BA**, Menendez ME, Oladeji LO, Fryberger CT, Dantuluri PK. Emerging technology in surgical education: combining real-time augmented reality and wearable computing devices. Orthopedics. 2014 Nov 1;37(11):751-7.

c. Baker DK, Fryberger CT, **Ponce BA**. The emergence of augmented reality in orthopaedic surgery and education. Accepted for publication in the Orthopaedic Journal of Harvard Medical School.

2. Surgical techniques and anatomy of the shoulder

As a fellowship-trained shoulder surgeon, I have a great interest I advancing the field by improving surgical technique and understanding of the anatomy. To date, I have completed 7 anatomical studies and 2 biomechanical studies. These studies have come in areas that were previously poorly understood, including sternoclavicular joint reconstruction, suprascapular notch decompression, calcar restoration, and the effect of sliding knots on suture stability.

a. Sabatini JB, Shung JR, Clay TB, Oladeji LO, Minnich DJ, **Ponce BA**. Outcomes of augmented allograft figure-of-eight sternoclavicular joint reconstruction. J Shoulder Elbow Surg. 2014 Dec 3. pii: S1058-2746(14)00547-3. doi: 10.1016/j.jse.2014.10.001. [Epub ahead of print]
b. Dietrich LN, Bentley A, Savage JA, Momaya AM, Larrison MC, McGwin G, **Ponce BA.** Arthroscopic decompression at the suprascapular notch: a radiographic and anatomic roadmap. J Shoulder Elbow Surg. 2014 Oct 10.
c. **Ponce BA**, Kundukulam JA, Sheppard ED, Determann JR, McGwin G, Narducci CA, Crowther MJ. Rotator cuff crepitus: could Codman really feel a cuff tear? J Shoulder Elbow Surg. 2014 Jul;23(7):1017-22.
d. **Ponce BA**, Kundukulam JA, Pflugner R, McGwin G, Meyer R, Carroll W, Minnich DJ, Larrison MC. "Sternoclavicular joint surgery: how far does danger lurk below?" Journal of Shoulder and Elbow Surgery. 2013 Jan 15. [Epub ahead of print]

3. Outcomes in shoulder surgery

Using large databases such as the Nationwide Inpatient Sample (NIS) and the National Surgical Quality Improvement Program (NSQIP), I have undertaken numerous studies aimed at identifying risk factors for poor outcomes in shoulder surgery, particularly shoulder arthroplasty. By identifying patients at risk for adverse outcomes, surgeons will be better equipped at identifying those who may not be good candidates for surgery, determining comorbidities that require special attention prior to surgery, and better informing their patients as to the risks and benefits of the procedure.

a. Young BL, Menendez ME, Baker DK, **Ponce BA**. Factors Associated with In-hospital Pulmonary Embolism Following Shoulder Arthroplasty. Accepted for publication in the Journal of Shoulder and Elbow Surgery.
b. Menendez ME, Baker DK, Fryberger CT, **Ponce BA**. Predictors of Extended Length of Stay Following Elective Shoulder Arthroplasty. Accepted for publication in the Journal of Shoulder and Elbow Surgery.
c. **Ponce BA**, Oladeji LO, Rogers ME, Menendez ME. Comparative analysis of anatomic and reverse total shoulder arthroplasty: in-hospital outcomes and costs. J Shoulder Elbow Surg. 2015 Mar;24(3):460-7. doi: 10.1016/j.jse.2014.08.016. Epub 2014 Oct 25.
d. **Ponce BA,** Oladeji LO, Raley JA, Menendez ME. Analysis of perioperative morbidity and mortality in shoulder arthroplasty patients with preexisting alcohol use disorders. J Shoulder Elbow Surg. 2014 Aug 26.

4. Fellowship director, UAB Orthopaedic Research Fellowship

For the past three years, I have served as the director of this fellowship designed for medical students interested in orthopaedics who are willing to take a year out from medical school. In addition to increasing the research output of both myself and the division as a whole tremendously, it also allows me to serve as a mentor to an aspiring orthopaedic surgeon and cultivate their interests within the field. To date, the three fellows have had nearly 20 publications accepted between them. These publications by Evan Sheppard, Lasun Oladeji, and Dustin Baker can be seen above. This fellowship will be expanded in the future, with 3 individuals planned to arrive for the 2015-2016 year.

D. Research Support

"Enhancement of Surgical Skills Training for Undergraduate and Graduate Medical Education." University of Alabama Health Services Foundation grant – PI $137,00

"A Biomechanical Evaluation of Proximal Humerus Fractures Treated with Locking Plate Osteosynthesis: The Importance of Calcar Comminution and Fixation". Synthes research project/grant – PI $15,950.00

"A Biomechanical Evaluation of Stitch Strengths in the Anterior Cruciate Ligament".
Arthrex research project/grant - PI - $5,292.00

"A Biomechanical Evaluation of the Lasso-Loop Stitch for Shoulder Arthroscopy".
Mitek research project/grant – PI - $25,187.00

"The Effect of Repetitive Screw Insertion on the Pullout Strength of Screws in Bone". AO North America – Research Grant – PI - $5,000.00; Orthopaedic Trauma Association Research Grant - $10,000.00

"Hormone Receptors in the Shoulder" Mid-America Orthopaedic Association multipurpose resident grant - $4,000

"Biomechanical evaluation of the incline mattress stitch" ArthroCare research grant - $15,227.50

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Sasanka Ramanadham, Ph.D.

eRA COMMONS USER NAME (credential, e.g., agency login): ramanadhams

POSITION TITLE: Professor of Cell, Developmental, and Integrative Biology; Sr Scientist, Comp Diabetes and Exer Med Centers; Scientist, CMBD, CFRB, CFAR, NORC

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
McGill University, Montreal, Canada	B.Sc.	1976-1980	Biochemistry
Texas Tech Univ. Health Sciences Ctr, Lubbock, TX	Ph.D.	1980-1985	Pharmacology
University of British Colombia, Vancouver, Canada	PDF	1985-1988	Fellowship
Washington University Sch Med, St. Louis, MO	PDF	1991-1993	Fellowship

A. Personal Statement. I have been involved with the study of lipid signaling in beta-cell biology for nearly 25 years. My graduate thesis dealt with cardiovascular complications associated with diabetes and our current work is aimed at identifying and reversing processes that contribute to pancreatic islet beta-cell death associated with the onset and progression of diabetes. Our group was the first to identify expression of a Ca^{2+}-independent phospholipase A_2beta ($iPLA_2\beta$) in beta-cells and demonstrate that its activation contributes to beta-cell apoptosis. Hydrolysis of membrane phospholipids by $iPLA_2\beta$ leads to the release of a fatty acid and lysolipids, which all have biological activity. Recent studies from our lab indicate that inhibition of $iPLA_2\beta$ reduces diabetes incidence and preserves beta-cell mass in the autoimmune NOD model of diabetes. Further, that $iPLA_2\beta$ regulation can occur at the transcriptional level and that $iPLA_2\beta$-derived lipid products can feedback on upstream inducers and trigger downstream alternate splicing events favoring generation of pro-apoptotic variants. My work also recognized the importance of $iPLA_2\beta$ signaling in bone formation, as its deficiency leads to age-related compromise in bone integrity. A current focus in my lab is to understand the contribution of $iPLA_2\beta$-derived lipids for optimal bone formation and I have a PhD candidate that is working on this project.

B. Positions and Honors

Academic Positions/Employment:

06/85-08/85	Res., Department of Pharmacology, University of Hawaii, Honolulu, Hawaii, U.S.A.
02/88-05/88	Res., Laboratoire de Pharmacodyamie, Faculte de Pharmacie, Montpellier, FRANCE
09/88-12/90	Fac. Instr., Dept. Ocular Res., Ctr. for Biotech., Baylor Coll. of Med., The Woodlands, TX
01/94-06/94	Research Instructor, Dept of Int Med, Washington Univ. Sch. Med., St. Louis, MO
07/94-06/04	Asst. Professor (Research), Dept of Int. Med, Washington Univ. Sch. Med., St. Louis, MO
07/04-06/10	Associate Professor (Research), Dept of Int. Med, Wash. Univ. Sch. Med., St. Louis, MO
07/10-07/12	Associate Professor of Physiology and Biophysics; Sr Scientist, CDC, UAB, AL
10/10-10/12	SOM Admissions Res. Interview Committee (ARIC), UAB, Birmingham, AL
10/10-	Affiliated Graduate Faculty Member, Virginia Commonwealth Univ, Richmond, VA
02/11-	MERIT Research Mentor, University Alabama at Birmingham, Birmingham, AL
08/25/2011	Tenure in the Department of Physiology & Biophysics, School of Medicine and Dentistry-Joint Health Sciences, UAB, Birmingham, AL
09/11-	GBS Faculty Member, UAB, Birmingham, AL
10/11-	MSTP Faculty Member, UAB, Birmingham, AL
08/12-	Promotion to Professor in Dept of Cell, Developmental, and Integrative Biology, School of Medicine and Dentistry-Joint Health Sciences, UAB, Birmingham, AL
0/12-	SOM Admissions Interview Committee (AIC), UAB, Birmingham, AL

7/12- Co-Core Director, Beta Cell Biology Core, UAB, Birmingham, AL

Honors and Awards:

1982-1984 Seed Research Grant, Texas Tech Univ. Health Sciences Center
1984 Student Travel Award to ASPET '84 (Indianapolis) from Eli Lilly.
1985-1988 Canadian Heart Foundation Fellowship
1988 Laboratoires Unicet, Abbott, and Cilag, France (1988)
1990-1991 Retina Res. Found. Grant, Ctr. for Biotech, Baylor Coll. of Medicine, Woodlands, TX
1991-1993 NIH Diabetes Post-Doctoral Training Grant to Washington Univ. Sch. Med.
1994-1996 JDRFI Research Grant Award
1996-2000 American Diabetes Association Career Development Award
2001-2004 American Diabetes Association Research Award
2004-2009 NIH R01 Award
2007-2008 Campbell Foundation Research Grant
2009-2011 American Diabetes Association Research Award
2010-2014 Competitive NIH R01 Renewal Award
2011 UAB-CFAR Developmental Award; UAB-DRTC P/F Award
10/12 CMBD P&F Award
10/12 AJPhysiol Paper selected as a Top 9 Publication in Pancreatic Cell News
11/12-Pr CDIB Promotion and Tenure Committee, UAB, Birmingham, AL
02/13 UAB-CDC Seed Award
04/13 Recipient of the 2012 TTUHSC GSBS Distinguished Alumni Award
07/13 Iacoccca Family Foundation Grant Award for Diabetes Research
09/13 Comprehensive Cancer Center Pilot PPG Grant Award
04/14 Selected to give the 19th Alexander D. Kenny Memorial Lecture, TTUHSC, Lubbock, TX
07/14 Endocrinology paper highlighted by “Pancreatic Cells News”
09/14 Diabetes paper highlighted by “Pancreatic Cells News”

Other Experience and Professional Memberships

Selected Invited Talks (2009-2015):

1. 4th Int Conf on PLA_2 and Lipid Mediators, Tokyo, Japan. May 26, 2009.
2. Keystone Symposium on Bioactive Lipids: Biochem and Diseases, Kyoto, Japan**.** June 7, 2010.
3. 12th Inter Conf on Bioactive Lipids in Cancer, Inf, & Related Dis. Seattle, WA. Sept. 20, 2011.
4. American Diabetes Association Meetings, Chicago, IL. June 2013.
5. 5th Int Conf on PLA_2-Mediated Signaling in Translational Medicine. New Orleans, LA. May 2013.
6. 15th Internationals Winter Eicosanoid Conf, Baltimore, MD. March 11-13, 2014.
7. FASEB Conf: Phospholipid Cell Sig & Metab in Infl & Cancer, Niagara Falls, NY. June 1-6, 2014.
8. 6th International Conf on PLA_2 and Lipid Mediators, Tokyo, JAPAN. Feb. 10-12, 2015.

Other Selected Invitations:

1. Session Chair, Servier 11th IGIS Symposia. St. Jean Cap Ferrat, FRANCE. March 25-28, 2010.
2. Session Co-Chair/Invited Speaker, 12th Int Conf Bioactive Lipids. Seattle, WA, Sept. 18-21, 2011.
3. Session Chair/Invited Speaker**:** 2012 FASEB Mtg on Phospholipid Metab. Saxton, VT, July 2012.
4. Session Chair: 6th Int Conf on PLA_2 and Lipid Mediators, Tokyo, JAPAN. Feb. 10-12, 2015.

Current Professional Societies: ADA (1990); APS (2002); ACS (2009); ASBMB (2010)

C. Contribution to Science

1. My introduction to the diabetes field started as a graduate student under my PhD mentor, Dr. Thomas E. Tenner Jr. When I joined, his lab was studying reserpine-induced supersensitivity on cardiovascular function. For personal reasons, I became interested in studying diabetes and approached Dr. Tenner with the proposal to examine the consequences of diabetes on heart function. At that time (1980), while diminished heart function was recognized in diabetes, the biochemical mechanisms were not well understood. Using the streptozotocin diabetes rat model, I demonstrated for the first time that both

inotropic and chronotropic responses were diminished in diabetic hearts and that they were related to decreases in β1-adrenergic receptors and their signaling.

a. **Ramanadham S**, Tenner TE Jr: Alterations in Cardiac Performance in Experimentally-Induced Diabetes. *Pharmacology* 27: 130-139, 1983.
b. Tenner TE Jr, **Ramanadham S**, Yang MCM, Pang PKT: Chronotropic Actions of □PTH-(1-34) in the Right Atrium of the Rat. *Can J Physiol Pharmacol* 61(10): 1162-1167, 1983.
c. **Ramanadham S**, Young J, Tenner TE Jr: Chronic Effects of Streptozotocin (STZ)-Diabetes on Myocardial Sensitivity in the Rat. *Diabetologia* 29: 741-748, 1986.
d. **Ramanadham S**, Tenner TE Jr: Alterations in the Myocardial Beta-Adrenoceptor System of Streptozotocin-Diabetic Rats. *Eur J Pharmacol* 136: 377-389, 1987.

2. For my first post-doctoral fellowship, I joined the lab of Dr. John H. McNeill at the University of British Colombia. While extending my graduate work to intact heart studies, I began to explore the effects of vanadium in diabetic animals. My studies demonstrated that vanadium sulfate administration prevented the development of diabetes in streptozotocin-treated rats. Intriguingly, the reversal of diabetes was still evident following its withdrawal. These findings were communicated in several manuscripts and contributed to obtaining funding from the Canadian Heart Foundation and Canadian Diabetes Association. This area was explored further for many years after I left UBC and still surfaces periodically in various investigations.

a. **Ramanadham S**, Mongold JJ, Brownsey RE, Cros GH, McNeill JH: Oral Vanadyl in the Treatment of Diabetes Mellitus in the Rat. *Amer J Physiol* 257(3 pt 2): H904-H911, 1989.
b. **Ramanadham S**, McGrath, McNeill JH: Chronotropic Function in Spontaneously-Diabetic BB rats. *Can J Physiol Pharmacol* 67(5): 519-321, 1989.
c. **Ramanadham S**, Brownsey RE, Cros GH, Mongold JJ, McNeill JH: Sustained Prevention of Myocardial and Metabolic Abnormalities in Diabetic Rats Following Withdrawal from Oral Vanadyl Treatment. *Metabolism* 38: 1390-1395, 1989.
d. Pederson RA, **Ramanadham S**, Buchan AMJ, McNeill JH: Long-Term Effects of Vanadyl Treatment on Streptozotocin-Induced Diabetes in the Rat. *Diabetes* 38: 1390-1395, 1989.

3. I followed up with a second post-doctoral fellowship at Washington University of School of Medicine under Dr. John Turk. The focus of this lab was to identify lipid signaling in beta-cell function and my work demonstrated expression of a novel Ca^{2+}-independent phospholipase A_2 ($iPLA_2\beta$) in the beta-cells, whose activity was critical for optimal insulin secretion in response to glucose. I contributed to the formative description of this enzyme properties and function in the beta-cell. This led to my getting awarded a Career Development Award from the ADA and progression to Assistant Professor in Medicine. The $iPLA_2\beta$ was subsequently described in other cells and tissues and is becoming increasingly recognized as a contributor to several diseases including cancer, neurodegenerative, and autoimmune. While examining the biology of this enzyme, I noted that in its absence bone formation was severely compromised. A current focus in my lab is to examine the contribution of $iPLA_2\beta$-derived lipids to bone integrity.

a. Gross RW, **Ramanadham S**, Kruszka KK, Han X, Turk, J: Rat and Human Pancreatic Islet Cells Contain a Ca^{2+}-Independent Phospholipase A_2 Activity Selective for Hydrolysis of Arachidonate Which is Stimulated by ATP and Specifically Localized to Islet β-cells. *Biochemistry* 32: 327-336, 1993.
b. **Ramanadham S**, Gross RW, Han X, Turk J: Inhibition of Arachidonate Release by Secretagogue-Stimulated Pancreatic Islets Suppresses Both Insulin Secretion and the Rise in Cytosolic Ca^{2+} Concentration. *Biochemistry* 32: 337-346, 1993.
c. **Ramanadham S**, Hsu F-F, Bohrer A, Ma Z, Turk J: Studies of the Role of Group VI Phospholipase A_2 in Fatty Acid Incorporation, Phospholipid Remodeling, Lysophosphatidyl-choline Generation, and Secretagogue-Induced Arachidonic Acid Release in Pancreatic Islets and Insulinoma Cells. *J Biol Chem* 274(20): 13915-13927, 1999.
d. **Ramanadham S**, Yarasheski KE, Silva MJ, Wohltmann M, Novack DV, Christiansen B, Tu X, Zhang S, *Lei X*, Turk J: Age-Related Losses in Bone are Accelerated in Group VIA Calcium-Independent Phospholipase A_2□ ($iPLA_2\beta$)-Null Mice. *Amer J Pathol* 172(4): 868-891, 2008.

4. My subsequent studies with iPLA$_2\beta$ revealed that its prolonged activation promoted adverse effects in the beta-cells leading to their death. As the PI, I directed studies that led to the identification of an underlying mechanism involving iPLA$_2\beta$-mediated ceramide accumulations via hydrolysis of sphingomyelins. More recently, my group demonstrated that iPLA$_2\beta$-derived lipids trigger alternate splicing events that promote generation of pro-apoptotic variants of several key apoptotic factors. Our work continues to identify underlying mechanisms that iPLA$_2\beta$ activation contributes to, which could be key to the onset and progression of various diseases, including diabetes.

   a. **Ramanadham S**, Hsu F-F, Zhang S, Jin C, Bohrer A, Song H, Bao S, Ma, Z, Turk J: Apoptosis of Insulin-Secreting Cells Induced by Endoplasmic Reticulum Stress is Amplified by Overexpression of Group VIA Calcium-Independent Phospholipase A$_2\beta$ (iPLA$_2\beta$) and Suppressed by Inhibition of iPLA$_2\beta$. *Biochemistry* 43: 918-930, 2004. *http://www.ncbi.nlm.nih.gov/pubmed/14744135.*
   b. Lei X, Zhang S, Bohrer A, Bao S, Song H, **Ramanadham S**: The Group VIA Calcium-Independent Phospholipase A$_2$ (iPLA$_2\beta$) Participates in ER Stress-Induced β-Cell Apoptosis by Promoting Ceramide Generation via Hydrolysis of Sphingomyelins by Neutral Sphingomyelinase and not by *de novo* Synthesis of Ceramides. *Biochemistry* 46(35): 10170-10185, 2007. **PMC2530898.**
   c. Lei X, Zhang S, Bohrer A, Barbour SE, **Ramanadham S**: Role of Calcium-Independent Phospholipase A$_2$ (iPLA$_2\beta$) in Human Pancreatic Islet β-Cell Apoptosis. *Amer J Physiol Endocrinol Metab* 303(11): E1386-1395, 2012. *(EPub ahead of print Oct. 16, 2012).* **Selected as a Top 9 Publication in Pancreatic Cell News, Oct. 23, 2012.** *http://www.ncbi.nlm.nih.gov/pubmed/23074238*
   d. Barbour SE, Nguyen PT, Park MA, Emani B, Lei X, Kambalapalli M, Shultz JC, Wijesinghe D, Chalfant, CE, **Ramanadham S**: Group VIA Phospholipase A$_2$ **(**iPLA$_2\beta$) Modulates Bcl-x 5' Splice Site Selection and Suppresses Anti-Apoptotic Bcl-x(L) in β-cells. *JBC*, *on-line 3/11/15*; PMID 25762722.

5. The motivation for continued study of iPLA$_2\beta$ is derived from the most recent findings that its activation contributes to beta-cell apoptosis due to stresses associated with onset and progression of T1D. As the PI, I directed studies that led to the demonstration that inhibition of the enzyme dramatically reduces diabetes incidence and immune responses in diabetes-prone model of autoimmune T1D. Our group efforts in this area were rewarded by an award from the Iacocca Family Foundation and establishment of collaborations with clinical faculty and NIH-sponsored TrialNet and nPOD resources.

   a. Lei X, Bone RN, Ali T, Wohltmann M, Gai Y, Goodwin KJ, Bohrer A, Turk, J, Ramanadham S: Genetic Modulation of Islet β-Cell iPLA$_2\beta$ Expression Provides Evidence for its Impact on β-Cell Apoptosis and Autophagy. Islets 5(1): 29-44, 2013.
   b. Ali T, Kokotos G, Magrioti V, Bone RN, Mobley JA, Hancock W, Lei X, **Ramanadham S**: Characterization of FKGK18 as Inhibitor of Group VIA Ca^{2+}-Independent Phospholipase A$_2$ (iPLA$_2\beta$): Candidate Drug for Preventing Beta-Cell Apoptosis and Diabetes. *PlosOne* 2013 Aug. 20; 8(8):e71748. doi: 10.1371/journal.pone.0071748, 2013.
   c. Lei X, Bone RN, Ali T, Zhang S, Bohrer A, Tse HM, Bidasee KR, **Ramanadham S**: Evidence of Contribution of iPLA$_2\beta$-Mediated Events During Islet β-Cell Apoptosis Due to Pro-Inflammatory Cytokines Suggests a Role for iPLA$_2$ in T1D Development. *Endocrinology 55(9):3352-64, 2014 Jul 8:en20132134. [Epub ahead of print].* **Featured by "Pancreatic Cells News", July 17, 2014 and Endocrine News, August 2014.**
   d. Bone RN, Gai Y, Magrioti V, Kokotou MG, Ali T, Lei X, Tse HM, Kokotos G, **Ramanadham S**. Inhibition of Ca^{2+}-Independent Phospholipase A$_2$ (iPLA$_2\beta$) Ameliorates Islet Infiltration and Incidence of Diabetes in NOD Mice. *Diabetes, 2014 Sep 11. pii: DB_140097. [Epub ahead of print].* **Featured by "Pancreatic Cells News", September 16, 2014.**

D. Research Support

Completed

1. Role: PI; Funding Agency: Iacocca Foundation 6/2013-5/2014
   Title: *Countering lipid-mediated immune response to prevent beta-cell death and T1DM*
   Project Goal: Identifying novel targets modified by lipid signals that are amenable for drug intervention to prevent the evolution of T1DM and associated complications

2. Role: PI; Funding Agency: DRTC P&F Program, UAB 05/01/11-04/30/12
   Title: *Low Bone Mass in Diabetes: Importance of Signaling Between Islet and Osteoblast ?*
   Project Goal: To elucidate the link between osteoblast and pancreatic islet □□□□-cells.

3. Role: PI
   Funding Agency: Center for Metabolic Bone Disorders P&F Program, UAB 11/01/12-10/31/13
   Title: *iPLA2Beta - Derived Lipid Signals and Bone Integrity*
   Project Goal: To explore the contribution of iPLA$_2$b-derived lipids to bone formation.

4. Role: PI
   Funding Agency: American Diabetes Association (1-09-RA-147) 01/1/09 - 12/31/11
   Title: iPLA$_2$Beta-Dependent Ceramide Generation and Mitochondrial Activation in Beta-Cell Apoptosis
   Project Goal: Examine iPLA$_2\beta$-mediated ceramide generation during β-cell apoptosis

5. Role: PI (4.8 CM); Funding Agency: NIH/NIDDK 2015-2020
   Title: *Calcium-independent PLA$_2$Beta and immune responses*
   Project Goal: To examine the role of iPLA$_2\beta$ in autoimmune □eta-cell apoptosis

6. Role: PI (0.5 CM)
   Funding Agency: UAB-CDC (Seed Funding) 02/01/13-01/31/14
   Title: *Does Dysregulation of Autophagy Contribute to Beta-Cell Survival in Diabetes ?*
   Project Goal: Address contribution of autophagy to □-cell death in diabetes

7. Role: PI-Project 2 of 3 (Multi PI: Joseph Messina and Bingdong Sha)
   Funding Agency: UAB CCC pilotPPG 12/13-11/14
   Title: *Role of ER stress in cancer (Project 2- Understanding the role of iPLA$_2$□-derived lipids in cancer cell survival)*
   Project Goal: Examine how ER stress modulates cancer cell survival and tumorigenesis

Pending

1. Role: PI (4.8 CM); Funding Agency: NIH/NIDDK (To be Submitted June 5, 2015) 2015-2021
   Title: *Calcium-independent PLA$_2$Beta and immune responses*
   Project Goal: To examine the role of iPLA$_2\beta$ in autoimmune □eta-cell apoptosis

2. Role: Co-PI; Funding Agency: NIH (To be Submitted June 5, 2015) 2016-2021
   Title: *Preserving β-cell survival by regulating Bcl-x splicing mediated by iPLA$_2\beta$-derived lipids.*
   Project Goal: Examine role of iPLA$_2\beta$-derived lipids in Bcl-x alternate splicing

My NCBI:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1BkgIhUI5hk5g/bibliography/47765391/public/?sort=date&direction=ascending

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: David T. Redden

eRA COMMONS USER NAME (credential, e.g., agency login): DRedden

POSITION TITLE: Professor, Biostatistics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Alabama, Tuscaloosa, Alabama	PhD	1995	Applied Statistics
University of Alabama, Tuscaloosa, Alabama	MS	1993	Applied Statistics
Auburn University, Auburn, Alabama	BS	1991	Mathematics

A. Personal Statement

I have 20 years of experience as a research biostatistician and university professor. I have served as Principal Investigator of a K25 award that developed statistical methods to estimate and control for the effects of admixture within genetic association studies. As the former Principal Investigator of the NIAMS Multidisciplinary Clinical Research Center (MCRC) Methodology Core, I mentored junior investigators and oversaw the design, data collection and management, and analysis of the MCRC projects. These 4 projects included an outcome and effectiveness research study with, two genetic association studies, and an imaging study. I have also served as Co-PI and Statistician on multiple R01 grants and longitudinal studies investigating AIDS, Diabetes, Obesity, Tuberculosis, Asthma, Early Childhood Education, Nutrition, Gerontology, Urinary Incontinence, and Pain. I currently serve on the Executive Committee of UAB Center for Clinical and Translational Science. I have expertise in design and analysis of clustered trials, group randomized trials, power calculations, generalized estimating equations, and regression methodology. Within this T32 application, I will serve as a Content Mentor.

B. Positions and Honors

Positions and Employment

1995 - 1996	Post-Doctoral Fellow, University of Alabama at Birmingham, Civitan International Research Center
1996 - 1999	University of Alabama at Birmingham, Research Assistant Professor, Division of Medical Statistics, Department of Hematology and Oncology, School of Medicine
1999 - 2001	Research Triangle Institute, Statistician, Statistical Research Division
2001 - 2004	University of Alabama at Birmingham, Assistant Professor, Department of Biostatistics, School of Public Health.
2002 – 2009	Veterans Administration Hospital, Birmingham AL, Research Statistician, Geriatric Research, Education and Clinical Center
2004 - 2012	University of Alabama at Birmingham, Associate Professor, Department of Biostatistics, School of Public Health
2012 -	University of Alabama at Birmingham, Full Professor, Department of Biostatistics, School of Public Health
2014 -	University of Alabama at Birmingham, Chair, Department of Biostatistics, School of Public Health

C. Contribution to Science (Underlining indicates that a co-author is a student or mentee).

Development of New Statistical Methodology. Over the past 20 years, I have had the privilege to work on many challenging and innovative clinical research projects. Within several clinical research projects, hypotheses are often presented and data are collected that do not have appropriate statistical methods.

From those studies, I have had the opportunity to work with graduate students, post-doctoral fellows, and other researchers on developing new statistical methods in group randomized trials, quantile regression, genetic association studies, and clinical trials. Below is subset of my published articles focusing on statistical methods.

a) Cui X, Yu S, Tamhane A, Causey ZL, Steg A, Danila MI, Reynolds RJ, Wang J, Wanzeck KC, Tang Q, Ledbetter SS, **Redden DT**, Johnson MR, Bridges SL Jr. Simple regression for correcting ΔCt bias in RT-qPCR low-density array data normalization. BMC Genomics. 2015 Dec;16(1):1274. doi: 10.1186/s12864-015-1274-1. Epub 2015 Feb 14. PubMed PMID: 25776666. PMCID – In Progress

b) Li P, **Redden DT**. Small sample performance of bias-corrected sandwich estimators for cluster-randomized trials with binary outcomes. Stat Med. 2015 Jan 30;34(2):281-96. PubMed PMID: 25345738; NIHMSID: NIHMS634700; PubMed Central PMCID: PMC4268228.

c) Richardson E, **Redden DT**. Moving towards multiple site outcomes in spinal cord injury pain clinical trials: An issue of clustered observations in trial design and analysis. J Spinal Cord Med. 2014 May;37(3):278-87. doi: 10.1179/2045772313Y.0000000165. Epub 2013 Nov 11. PubMed PMID: 24621021; PubMed Central PMCID: PMC4064577.

d) **Redden DT**, Fernández JR, Allison DB. A simple significance test for quantile regression. Stat Med. 2004 Aug 30;23(16):2587-97. PubMed PMID: 15287086.

Conduct and Analysis of Cluster Designs/Group Randomized Trials. In 1995, the first NIH research project on which I worked was a multi-site study that followed the development of children over time. Within that project, I learned about cluster randomized trials and hierarchical linear models. Both of those topics have fascinated me over my career, and I have had the opportunity to reuse the skills developed during that period for clustered designs in tuberculosis, osteoporosis screening, AIDS research, and spinal cord injury research. Below is subset of my published articles focusing on cluster designs.

a) Bailey FA, Williams BR, Woodby LL, Goode PS, **Redden DT**, Houston TK, Granstaff US, Johnson TM 2nd, Pennypacker LC, Haddock KS, Painter JM, Spencer JM, Hartney T, Burgio KL. Intervention to improve care at life's end in inpatient settings: the BEACON trial. J Gen Intern Med. 2014 Jun;29(6):836-43. doi: 10.1007/s11606-013-2724-6. PubMed PMID: 24449032; PubMed Central PMCID: PMC4026508.

b) Warriner AH, Outman RC, Feldstein AC, Roblin DW, Allison JJ, Curtis JR, **Redden DT**, Rix MM, Robinson BE, Rosales AG, Safford MM, Saag KG. Effect of self-referral on bone mineral density testing and osteoporosis treatment. Med Care. 2014 Aug;52(8):743-50. doi: 10.1097/MLR.0000000000000170. PubMed PMID: 24984211; PubMed Central PMCID: PMC4101066.

c) Megazzini KM, Sinkala M, Vermund SH, **Redden DT**, Krebs DW, Acosta EP, Mwanza J, Goldenberg RL, Chintu N, Bulterys M, Stringer JS. A cluster-randomized trial of enhanced labor ward-based PMTCT services to increase nevirapine coverage in Lusaka, Zambia. AIDS. 2010 Jan 28;24(3):447-55. doi: 10.1097/QAD.0b013e328334b285. PubMed PMID: 19926959. No Direct NIH funding acknowledged

d) Bailey WC, Gerald LB, Kimerling ME**, Redden D**, Brook N, Bruce F, Tang S, Duncan S, Brooks CM, Dunlap NE. Predictive model to identify positive tuberculosis skin test results during contact investigations. JAMA. 2002 Feb 27;287(8):996-1002. PubMed PMID: 11866647.

Collaborative Research in Organ Donation and Transplant Research. Over the past 10 years, I have worked closely with investigators involved in organ donation and transplant research. I collaborated with Derek Dubay, MD, in the development of his Mentored Patient-Oriented Research Career Development Award (K23). This K award was instrumental in setting the stage for a recent R03 award. The collaboration has led to numerous collaborative papers of which a subset is listed below.

a) White JA, **Redden DT**, Bryant MK, Dorn D, Saddekni S, Abdel Aal AK, Zarzour J, Bolus D, Smith JK, Gray S, Eckhoff DE, DuBay DA. Predictors of repeat transarterial chemoembolization in the

treatment of hepatocellular carcinoma. HPB (Oxford). 2014 Dec;16(12):1095-101. doi: 10.1111/hpb.12313. Epub 2014 Aug 26. PubMed PMID: 25158123; PubMed Central PMCID: PMC4253333.

b) DuBay DA, Ivankova N, Herby I, Wynn TA, Kohler C, Berry B, Foushee H, Carson AP, **Redden DT**, Holt C, Siminoff L, Fouad M, Martin MY. African American organ donor registration: a mixed methods design using the theory of planned behavior. Prog Transplant. 2014 Sep;24(3):273-83. doi: 10.7182/pit2014936. PubMed PMID: 25193729; PubMed Central PMCID: PMC4377221.

c) DuBay DA, **Redden DT**, Bryant MK, Dorn DP, Fouad MN, Gray SH, White JA, Locke JE, Meeks CB, Taylor GC, Kilgore ML, Eckhoff DE. Resource utilization associated with procurement of transplantable organs from donors that do not meet OPTN eligible death criteria. Transplantation. 2014 May 27;97(10):1043-8. doi: 10.1097/01.TP.0000441093.32217.cb. PubMed PMID: 24503760; PubMed Central PMCID: PMC4024080.

d) DuBay D, **Redden D**, Haque A, Gray S, Fouad M, Siminoff L, Holt C, Kohler C, Eckhoff D. Is decedent race an independent predictor of organ donor consent or merely a surrogate marker of socioeconomic status? Transplantation. 2012 Oct 27;94(8):873-8. doi: 10.1097/TP.0b013e31826604d5. Erratum in: Transplantation. 2013 Feb 27;95(4):e23. PubMed PMID: 23018878; PubMed Central PMCID: PMC3566527.

Collaborative Research in End of Life Care. Over the past 15 years, I have served as the lead statistician for the Department of Veterans Affairs Birmingham/Atlanta Geriatric Research Education and Clinical Center (GRECC). Within this collaborative effort, I have designed numerous clinical trials, multiple pilot studies, a cluster design study for improving end of life care, and a new group randomized trial. This long standing collaboration has been very productive and a subset of the published papers is listed below.

a) Johnson TM 2nd, Markland AD, Goode PS, Vaughan CP, Colli JL, Ouslander JG**, Redden DT**, McGwin G, Burgio KL. Efficacy of adding behavioural treatment or antimuscarinic drug therapy to α-blocker therapy in men with nocturia. BJU Int. 2013 Jul;112(1):100-8. doi: 10.1111/j.1464-410X.2012.11736.x. Epub 2013 Feb 28. PubMed PMID: 23448285. No Direct NIH funding acknowledged

b) Gleason JL, Richter HE, **Redden DT**, Goode PS, Burgio KL, Markland AD. Caffeine and urinary incontinence in US women. Int Urogynecol J. 2013 Feb;24(2):295-302. doi: 10.1007/s00192-012-1829-5. Epub 2012 Jun 15. PubMed PMID: 22699886; PubMed Central PMCID: PMC3505252.

c) Bailey FA, Williams BR, Goode PS, Woodby LL, **Redden DT**, Johnson TM 2nd, Taylor JW, Burgio KL. Opioid pain medication orders and administration in the last days of life. J Pain Symptom Manage. 2012 Nov;44(5):681-91. doi: 10.1016/j.jpainsymman.2011.11.006. Epub 2012 Jul 4. PubMed PMID: 22765968. No Direct NIH funding acknowledged

d) Bailey FA, Allen RS, Williams BR, Goode PS, Granstaff S, **Redden DT**, Burgio KL. Do-not-resuscitate orders in the last days of life. J Palliat Med. 2012 Jul;15(7):751-9. doi: 10.1089/jpm.2011.0321. Epub 2012 Apr 26. PubMed PMID: 22536938. No Direct NIH funding acknowledged

Collaborative Research focusing on Rheumatoid Arthritis. In 2005, I served as Principal Investigator of the Multidisciplinary Clinical Research Center (MCRC). Many of the projects focused on either rheumatoid arthistis or the genetic studies of rheumatoid arthritis. Even though I have transitioned from being PI of the MCRC, many of the collaborations are ongoing.

a) Tang Q, Danila MI, Cui X, Parks L, Baker BJ, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR; CLEAR Investigators, Bridges SL Jr. Brief Report: Expression of Interferon-γ Receptor Genes in Peripheral Blood Mononuclear Cells Is Associated With Rheumatoid Arthritis and Its Radiographic Severity in African Americans. Arthritis Rheumatol. 2015 May;67(5):1165-70. doi: 10.1002/art.39056.PubMed PMID: 25708927; PubMed Central PMCID: PMC4414815.

b) Aslibekyan S, Sha J, Redden DT, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Reynolds RJ, Danila MI, Bridges SL Jr. Gene-body mass index interactions are associated with methotrexate toxicity in rheumatoid arthritis. Ann Rheum Dis. 2014 Apr;73(4):785-6. doi: 10.1136/annrheumdis-2013-204263. Epub 2013 Nov 29. PubMed PMID: 24291656; PubMed Central PMCID: PMC3970399.

c) Tamhane A, McGwin G Jr, Redden DT, Hughes LB, Brown EE, Westfall AO, Conn DL, Jonas BL, Smith EA, Brasington RD, Moreland LW, Bridges SL Jr, Callahan LF. Complementary and alternative medicine use in African Americans with rheumatoid arthritis. Arthritis Care Res (Hoboken). 2014 Feb;66(2):180-9. doi:10.1002/acr.22148. PubMed PMID: 23983105; PubMed Central PMCID: PMC3977347.

d) Reynolds RJ, Cui X, Vaughan LK, Redden DT, Causey Z, Perkins E, Shah T, Hughes LB; CLEAR Investigators, Damle A, Kern M, Gregersen PK, Johnson MR, Bridges SL Jr. Gene expression patterns in peripheral blood cells associated with radiographic severity in African Americans with early rheumatoid arthritis. Rheumatol Int. 2013 Jan;33(1):129-37. doi: 10.1007/s00296-011-2355-3. Epub 2012 Jan 12. PubMed PMID: 22238028; PubMed Central PMCID: PMC3769702.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/david.redden.1/bibliography/47766083/public/?sort=date&direction=ascending.

D. Research Support

Ongoing Research Support

P60 AR064172 (Cui) 09/16/2013 – 07/31/2018
Methodology Core for the Multidisciplinary Clinical Research Center
The core is responsible for the design and analysis of 4 novel research projects in rheumatoid arthritis and musculoskeletal diseases. The methodology core is also responsible for the methods development and publication. Role: PI

R01 DK082548 (Burgio) 08/06/2012 – 07/31/2015
Combined Behavioral and Drug Treatment of Overactive Bladder in Men
The primary objective of this trial is to compare the effectiveness of interventions for urinary incontinence across 3 arms: behavior alone, drug alone and combined therapy. Role: Co-Investigator

H133N110008 (McLain) 10/01/2011 – 09/30/2016
Model Regional Spinal Cord Injury Care System
Research Project: Virtual Walking for Reducing Spinal Cord Injury-Related Neuropathic Pain. Goals are to examine effects of immersive virtual reality walking on SCI-related neuropathic pain. Role: Co-Investigator

R37 AR067427 (Bradley) 09/15/2014 – 04/30/2019
Ethnic Differences in Responses to Painful Stimuli (UPLOAD)
The proposed study will be the first to directly investigate ethnic group differences in central pain processing and to prospectively characterize the temporal development and mediators of changes in central pain processing contributing to ethnic group differences in knee osteoarthritis-related pain. Role: Co-Investigator

R01 AR060240 (K. Saag) 09/01/2011 – 08/31/2016
Activating Patents to Reduce Osteoporosis Aproposis
This research project is a two group design to compare education among doctors and direct to patient information with regard to getting prescriptions for osteoporosis filled. Role: Co-Investigator

U19 HS021110 (K. Saag) 09/30/2011 – 08/31/2016
UAB Deep South Arthritis and Musculoskeletal
This center award has multiple projects focusing on novel research strategies for arthritis and musculoskeletal research. Role: Co-Investigator

P50 AR060772 (K. Saag) 09/01/2012 – 08/31/2017
Centers of Research Translation (CoRT)
CoRT will support the conduct of innovative translation research and the training of clinical investigators in gout and hyperuricemia. The overall goal of the UAB CoRT is to improve the health care of patients with gout and hyperuricemia by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in translational investigation. Role: Co-Investigator

UL1 TR000165 (Kimberly) 05/01/2011 – 04/30/2015
UAB Center for Clinical & Translational Science (CCTS)
Dr. Redden serves on the Executive Committee of the UAB CCTS which provides infrastructure and services in translating research from bench to bedside. Within his role, Dr. Redden is a member of the Biostatistics and Epidemiology Research Division (BERD) which assists the university in the design and analysis of clinical translational research. Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Safford, Monika M

eRA COMMONS USER NAME (credential, e.g., agency login): msafford

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Dartmouth College	BA	1978-1982	German, Biology
Cornell University Medical College	MD	1982-1986	Medicine
Hospital of the University of Pennsylvania	Internship, Residency	1986-1998	Internal Medicine

A. Personal Statement

I am well-qualified to contribute to the T32 training grant entitled “Training Program in Rheumatic and Musculoskeletal Diseases Research.” I am a general internist and health disparities researcher with a focus on eliminating disparities in cardiovascular outcomes for individuals with cardiometabolic diseases, especially focused on vulnerable and high risk populations. I have had research grants from CDC, American Diabetes Association, NHLBI, AHRQ and PCORI, and am currently co-PI on a T32 in Health Services Research in health services research (Ken Saag, PI). In addition, I hold a K24 from NHLBI which protects 25% of my time for mentoring activities. Mentoring has been a career-long passion for me, and I have mentored numerous junior faculty and students at all levels. Over the past 20 years, I have served on 16 dissertation committees, as mentor for 16 fellows in our program, and as mentor for 19 junior faculty. I count among my mentees a director of health services research at a major pharmaceutical company, a Department Chairman, and numerous R-01 funded investigators. I currently mentor two Rheumatologist junior faculty, Dr. Iris Navarro-Millan and Dr. Maria Danila. My research program currently includes an NHLBI-sponsored R01, a project that is part of a program grant, a PCORI-sponsored trial, and several quality improvement grants from pharmaceutical companies. I am also training director for the AHA Hypertension Strategically Focused Center at UAB, and am co-investigator on UAB’s Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs), led by Ken Saag of the Division of Rheumatology. As such, I have the established research program, the experience and the passion to mentor trainees in this program, facilitated by the well-established relationships I enjoy with members of the training program.

B. Positions and Honors

1989-1991 Instructor in Medicine, The Miriam Hospital, Brown University Medical School, Providence, RI
1991-1995 General Internal Medicine, The Hartford Medical Group, West Hartford, CT
1995-1997 Medical Director, Primary Care Group Ambulatory Practice, University Hospital, Univ. of Medicine and Dentistry of NJ, Newark, NJ
1997-2003 Assistant Professor of Medicine, NJ Medical School, Univ. of Medicine and Dentistry of NJ, Newark, NJ
2003-2007 Assistant Professor of Medicine, Univ. of Alabama at Birmingham (UAB) School of Medicine, Birmingham, AL
2007-present Associate Professor of Medicine (with tenure), UAB, Birmingham, AL 2009-present Assistant Dean of Continuing Medical Education, UAB, Birmingham, AL
2009-present Associate Director Center for Outcomes and Effectiveness Research and Education (COERE)
2012-present Professor of Medicine, UAB, Birmingham, AL
2013-present Inaugural Endowed Professor of Medicine, UAB, Birmingham, AL

Honors:

Oral presentation with citation, Society for Behavioral Medicine, 2015 Alere Research to Practice Award, Society for Behavioral Medicine, 2014
Inaugural Endowed Professorship in Diabetes Outcomes and Prevention Research, 2013 Max Cooper Award for Research Excellence, UAB School of Medicine, 2013
UAB Minority Health Research Center Mentoring Award, 2012 Guest Editor, Osteoporosis International, 2011
Deputy Editor, Medical Care, 2006-2009
Research Excellence Award, Department of Medicine, UAB School of Medicine, 2010-2013
First prize for oral presentations, Minority Health Research Center Annual Symposium, April 2011 ("Developing a peer support intervention in the Alabama Black Belt")
Second prize for oral presentations, Minority Health Research Center Annual Symposium, April 2011 ("Acute Coronary Heart Disease Incidence and Mortality in the REGARDS Study")
Report in Top 10% in importance of all abstracts presented at American Heart Association Annual Meetings, 2010 ("Awareness, Treatment and Control of Hypertension, Diabetes and Hyperlipidemia and Area-Level Mortality Regions in the Reasons for Geographic And Racial Differences in Stroke (REGARDS) Study")
1982: Magna cum laude, Dartmouth College, Hanover, NH 1982: Phi Beta Kappa, Dartmouth College, Hanover, NH
1978: Valedictorian, Monroe-Woodbury Senior High School, Central Valley, NY

Other Experience and Professional Memberships:

1996: Clinical Effectiveness Program, Brigham and Women's Hospital and Harvard School of Public Health, Boston, MA

1998: 24th Ten-Day American Heart Association Seminar on the Epidemiology and Prevention of Cardiovascular Diseases, Tahoe City, CA

Member: American Diabetes Association; American Heart Association Council on Epidemiology and Prevention; Society of General Internal Medicine; American Stroke Association; Society for Behavioral Medicine

2003-present: Senior Scientist, UAB Center for Outcomes and Effectiveness Research, Aging, Minority Health Research; Lister Hill Center for Health Policy

2008-present: Associate Director, UAB Diabetes Research and Translation Center; Associate Director, Center for Outcomes and Effectiveness Research

C. Contributions to Science (mentees underlined)

1. My early career research focused on quality of health care in individuals living with diabetes. In a series of studies, I participated in the Translating Research Into Action for Diabetes study to advance the science of quality improvement. Some of the seminal work emerging from this 6-site collaboration that included Joe Selby, current director of PCORI, included studies reporting on strong associations between the intensity of clinical care management and processes, but not outcomes of care. These studies added to the evidence that led to greater focus on physiologic outcomes in the quality of care and pay for performance context.

a. Kim C, Williamson DF, Herman WH, **Safford MM**, Selby JV, Marrero DG, Curb JD, Thompson TJ, Narayan VK, Mangione CM. Referral Management and the care of patients with diabetes: The TRIAD Study. *Am J Man Care* 2004 Feb;10(2 Pt 2):137-43.
b. Kerr EA, Gerzoff RB, Krein SL, Selby JV, Piette JD, Curb JD, Herman WH, Marrero DG, Narayan DM, **Safford MM**, Mangione CM. A comparison of diabetes care quality in VA and commercial managed health care systems: results from the TRIAD Study. *Ann Int Med* 2004 Aug 17;141(4):272-81.
c. Mangione CM, Gerzoff RB, Williamson DF, Steers WN, Kerr EA, Brown AF, Waitzfelder EE, Marrero DG, Dudley RA, Kim C, Herman W, Thompson TJ, **Safford MM**, Selby JV. Association of diabetes disease management programs' intensity with quality of care: the TRIAD Study. *Ann Int Med* 2006 July 18;145(2):107-16.

2. My work in the TRIAD study led to an interest in large database work, which led to a series of studies using VA data that developed strategies to define diabetes, assess novel performance metrics, and study variations in care using large databases. This line of inquiry led to later studies using Medicare data, eventually

culminating in studies using epidemiologic data linked with claims data. Some of the major findings of my large database observational studies include studies describing disparities in coronary heart disease outcomes in the modern era, and studies validating the Pooled Cohort Risk Equation that serves as the foundation of the newest cholesterol clinical management guidelines, as well as a study led by Dr. Navarro-Millan on cardiovascular disease outcomes in rheumatoid arthritis patients.

a. **Safford MM,** Brown TM, Muntner P, Durant RW, Glasser S, Halanych J, Shikany JM, Prineas R, Samdarshi T, Bittner V, Lewis CE, Gamboa C, Cushman M, Howard V, Howard G, for the Reasons for Geographic And Racial Differences in Stroke (REGARDS) study investigators. Association of race and sex with risk of incident acute coronary heart disease events. *JAMA* 2012 Nov 7;308(17):1768-1774. PMC3772637.

b. Hlatky MA, Ray RM, Burwen DR, Margolis KL, Johnson KC, Kucharska-Newton A, Manson JE, Robinson JG, **Safford MM,** Allison M, Assimes TL, Bavry AA, Berger J, Cooper-DeHoff RM, Heckbert SR, Li W, Liu S, Martin LW, Perez MV, Tindle HA, Winkelmayer WC, Stefanick ML. Use of Medicare data to identify coronary heart disease outcomes in the Women's Health Initiative. *Circ Qual & Outcomes* 2014 Jan;7(1):157-62. Epub 2014 Jan7. PMID: 24399330

c. Muntner P, Colantonio LD, Cushman M, Goff DC, Howard G, Howard VJ, Kissela B, Levitan EB, Lloyd-Jones DM, **Safford MM**. Validation of the atherosclerotic cardiovascular disease pooled cohort risk equations. *JAMA* 2014 Apr 9;311(14):1406-15. Doi:10.1001/jama. PMC4189930.

d. Navarro-Millán I, Yang S, DuVall SL, Chen L, Baddley J, Cannon GW, Delzell ES, Zhang J, **Safford MM**, Patkar NM, Mikuls TR, Singh JA, Curtis JR. Association of hyperlipidaemia, inflammation and serological status and coronary heart disease among patients with rheumatoid arthritis: data from the National Veterans Health Administration. *Ann Rheum* Dis 2015 Jan 21. Epub ahead of print.

3. My greatest contributions have been in the field of health disparities research. I have reported on health disparities in a number of contexts, developing an approach to focus on potentially remediable influences. For example, in our 2012 report in JAMA (2.a. above), we demonstrated that higher risks for coronary heart disease outcomes among black Americans compared with white Americans were largely attributable to excess risk factor burden in black Americans. This analysis indicated that greater success in risk factor prevention and treatment among black Americans is needed. A mentee, Nicole Redmond, led a study demonstrating that stress plays a role in coronary heart disease among those with annual income below $35,000, suggesting that stress reduction interventions should be targeted more intensely at lower income individuals. I have also conducted a series of studies showing that lack of appropriate treatment intensity may not play a large role in disparities in blood pressure control, and that apparent racial differences in statin treatment are caused by greater treatment for white men compared with other race-gender groups.

a. **Safford MM**, Halanych JH, Lewis CL, Levine D, Houser S, Howard G. Understanding racial disparities in hypertension control: Intensity of hypertension medication treatment in the Reasons for Geographic and Racial Differences in Stroke (REGARDS) study. *Ethn Dis* 2007 Summer;17(3):421-6.

b. Redmond N, Richman J, Gamboa C, Albert MA, Sims M, Durant RW, Glasser SP, **Safford MM**. Perceived stress is associated with incident coronary heart disease and all-cause mortality in low but not high income participants in the REGARDS study. *JAHA* 2013 Dec 2(6);e000447. PMC3886761.

c. **Safford MM**, Gamboa CM, Durant RW, Brown TM, Glasser SP, Shikany JM, Zweifler RM, Howard G, Muntner P. Race-sex differences in the management of hyperlipidemia. The REGARDS Study. *Am J Prev Med* 2015 May;48(5):520-7. PMC4422177.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/monika.safford.1/bibliography/40366995/public/?sort=date&direction=ascending

D. Research Support

Ongoing:

No number (Safford) Medscape 01/01/15 – 12/31/15
The Patient Activated Learning System. This project is building a database of questions and answers related to arthritis as a novel approach to patient education. The project is a collaboration with ARthritis Power, a PCORI-funded Patient Powered Research Network.

No number (Safford) Medscape 06/01/14 – 12/31/15

Improving tissue plasminogen activator use in acute ischemic stroke: a quality improvement continuing medical education project. This project uses a stakeholder-engaged approach to designing a quality improvement intervention focused on modifying processes of care to optimize the care of ischemic stroke patients.

R-AD-1306-03565 (Safford) PCORI 05/01/14 – 04/30/17
Improving Medication Adherence in the Alabama Black Belt. This RCT will test an intervention designed to improve medication adherence among 500 Black Belt residents living with diabetes using the Corbin and Strauss framework.

K24 HL111154 (Safford) NHLBI 08/17/12 – 04/30/17
Mid-career Investigator Award in Patient Oriented Research (K24). This mid-career award assures protected time for mentorship to the next generation of patient-oriented researchers in fields related to the mission of NHLBI, while assuring the continuation of the candidate's patient-oriented research program.

P60 MD000502 (Fouad; Safford Project PI) NIMHD 04/01/12 – 03/31/17
Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III. This refunding of the UAB Minority Health Center will continue the capacity building for health disparities research at UAB and partnering institutions. The project led by Dr. Safford will examine the quality-outcome link for ischemic stroke using structured medical record review of REGARDS data. The project included the development of an extensive medical record abstraction tool. Role: PD/PI, Stroke Research Project

R01 HL80477 (Safford) NHLBI 09/01/11 – 08/31/16
REasons for Geographic And Racial Differences in Stroke-MI (REGARDS-MI) Study. This ancillary study to the REGARDS study seeks to understand underlying mechanisms for geographic and racial differences in acute coronary heart disease incidence mortality.

T32 HS013852 (Saag; Safford Co-PI) AHRQ 07/01/08 - 06/30/18
Fellowship Training in Health Services Research. The fellowship prepares post-doctoral and physician candidates for a career in health services research, providing a mentored 2 to 3-year experience.

No Number Assigned (Muntner; Safford, Project PI) Amgen, Inc. 09/01/11 – 12/31/15
Cardiovascular Disease, Prevention, Treatment, and Outcomes. This study examines the relationship between low density lipoprotein cholesterol and cardiovascular outcomes in national Medicare data, the REGARDS cohort and other national cohort studies. Role: Investigator and Project Leader.

U18 HS016956 (Saag) AHRQ 09/01/11 - 08/31/16
Center for Education and Research in Therapeutics. Demonstration Project 3: Defining Serious Adverse Events from Biologic Therapies A multi-center pharmaco-epidemiology study to evaluate the safety of various biologic therapies on the risk for various outcomes. Role: Core investigator.

U01 NS041588 (Howard) NINDS 05/01/08-04/30/18
The Reasons for Geographic And Racial Differences in Stroke Study. This prospective observational study follows 30,228 individuals for stroke outcomes. Participants are undergoing a second in-home visit to collect physiologic data, in addition to survey data. Dr. Safford directs the medical record abstraction for the study, which has included over 25,000 medical records to date. Role: Director, Outcomes Unit; Co-investigator; Steering Committee Member.

P60 DK079626 (Garvey) NIDDK 04/14/08-04/13/18
Diabetes Research and Translation Center. The DRTC at UAB endeavors to decrease morbidity/mortality and increase quality of life for diabetes patients, and to provide an outstanding environment for student training and for faculty career development in diabetes research. Role: Associate Director.

Selected Completed:

R18 H5019239 (Safford) AHRQ 09/30/10 – 09/28/13
Using Comparative Effectiveness Reviews to Optimize Quality of Life for Persons with Diabetes and Chronic Pain. This group-randomized, controlled trial determined the incremental effectiveness of a CHW-delivered, CBT-based patient activation intervention with integrated CER content, beyond simple dissemination of CME to providers, directly informing policy.

No number assigned (Safford) AAFP- UNC 01/01/09 – 09/30/12
Encourage: Evaluating Community Peer Advisors and Diabetes Outcomes in Rural Alabama. This group-randomized implementation trial in rural Alabama tested the effectiveness of Peer Advisors in improving diabetes outcomes beyond diabetes education alone. The Encourage study was part of the Peers for Progress Consortium, in which 8 grantees implemented common measures across their projects.

P60 DK079626 (Garvey, PI; Pisu, PI of Pilot Project, Safford, Co-PI) NIDDK 07/09-06/10

Cost-effectiveness of a peer advisor intervention. This ancillary study to the ENCOURAGE study gathered data to conduct a cost-effectiveness analysis alongside the trial.

R18 DK65001 (Allison, PI; Safford, Co-PI) NIDDK 05/06-04/09
Internet Intervention for Improving Rural Diabetes Care. This 4-year RCT tested the effectiveness of a physician-based Internet intervention to improve diabetes care in 220 rural practices in the Southeast. This project included medical record abstraction of over 3000 patients at baseline and follow-up.

U18 HS016956 (Saag, PI; Safford, Project PI) AHRQ 09/07-08/09
Project 4: Osteonecrosis of the Jaws. This study examined safety endpoints of bisphosphonates, studying over 950,000 veterans at risk for osteoporosis. Total award: $421,300.

VA Health Services Research & Development IIR06-266 (Safford) 01/06-01/09
Why are intermediate health outcomes in diabetes so high? This project examined medication intensification in response to uncontrolled HbA1c, blood pressure and LDL cholesterol, using VA data.

U48/CCU216385 (Safford, site PI) CDC 11/98-10/03
Translating Research Into Action for Diabetes (TRIAD). This 6-site study recruited 11,800 diabetes patients cared for in 10 managed care health plans to study diabetes quality of care and health outcomes. This study included a medical record review of the NJ site's participants.

No Number Assigned (Safford) ADA 07/01-06/03
Validation of cross-sectional case-mix adjustment of HbA1c in the VA. We used VA data to validate an approach to case-mix adjustment of the HbA1c performance measure, using only administrative data.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Scarinci, Isabel Cristina

eRA COMMONS USER NAME (credential, e.g., agency login): SCARINCI

POSITION TITLE: Professor, Associate Director for Faculty Development and Education, Associate Director for Globalization and Cancer, UAB Comprehensive Cancer Center

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
State Univ. of Londrina, Londrina, Paraná, Brazil	B.S.	05/1984	Psychology
Univ. of Alabama at Birmingham, Birmingham, AL	M.P.H.	05/1993	Public Health
Louisiana State University, Baton Rouge, LA	M.A.	05/1996	Psychology
Louisiana State University, Baton Rouge, LA	Ph.D.	05/1998	Clinical Psychology

A. Personal Statement

I am a Clinical Psychologist with experience and expertise in the application of behavioral science to public health by promoting behavior change at the population level. My primary area of interest is cancer prevention and control among low-income, racial/ethnic minorities, and immigrant populations (particularly Latinos and African Americans). I work primarily in the areas of breast and cervical cancer and tobacco control. In terms of methodological approaches to research, I have expertise in community-based participatory research (CBPR) and use of mixed methodology (qualitative/quantitative), particularly as it relates to culturally-relevant needs/assets assessments. I am particularly interested in the development of community-based programs that are theoretically based and culturally relevant to these populations. With regard to training and mentorship, I am currently the co-leader of the UAB Minority Health and Health Disparities Research Center (MHRC) Training Core and our primary goal is to train undergraduate/graduate students, postdoctoral fellows, and junior faculty in health disparities. I also co-lead a number of other NIH-funded training programs focusing on development of future researchers in health disparities, particularly cancer. I am currently the PI/Co-PI on four large studies focusing on cancer disparities and most of them include a training component in the U.S. and abroad.

1. Scarinci, I.C., Garcia, F., Kobetz, E., Partridge, E.E., Brandt, H., Bell, M., Dignan, M, Ma, G, Daye, J., Castle, P. (2010) Cervical Cancer Prevention: New Tools and Old Barriers. Cancer, 116:2531-42.
2. Wynn, T., Anderson-Lewis, C., Johnson, R., Hardy, C., Hardin, G., Walker, S., Marron, J., Fouad, M., Partridge, E., and Scarinci, I.C. (2011) Developing a Community Action Plan to Eliminate Cancer Disparities: Lessons Learned. Progress in Community Health Partnerships: Research, Education, and Action, 5(2):161-168.
3. Scarinci, I.C., Bandura, L., Hidalgo, B., Cherrington, A. (2012) Development of a Theory-Based, Culturally-Relevant Intervention on Cervical Cancer Prevention among Latina Immigrants Using Intervention Mapping. Health Promotion Practice, 13(1):29-40.
4. Scarinci, I.C., Moore, A., Wynn, T., Cherrington, A., Fouad, M, Li, Y. (2014). A community-based, culturally relevant intervention to promote healthy eating and physical activity among middle-aged African American women in rural Alabama: findings from a group randomized controlled trial. Preventive Medicine, 69C:13-20.

B. Positions and Honors

Positions and Employment

2014-	Associate Director, Globalization and Cancer, Comprehensive Cancer Center, UAB, Birmingham, AL
2012-	Associate Director for Faculty Development and Education, Division of Preventive Medicine, UAB, Birmingham, AL
2011-	Senior Scientist, Center for Aging, UAB, Birmingham, AL
2010-	Professor, Division of Preventive Medicine, UAB, Birmingham, AL
2007-2011	Scientist, Center for Aging, UAB, Birmingham, AL
2005-2010	Associate Professor, Division of Preventive Medicine, UAB, Birmingham, AL
2004-	Associate Scientist, Center for the Study of Community Health, UAB, Birmingham, AL
2002-	Associate Scientist, Comprehensive Cancer Center, UAB, Birmingham, AL
2002-	Scientist, Center for Outcomes & Effectiveness Research & Education, UAB, Birmingham, AL
2002-	Associate Scientist, Sparkman Center for Global Health, UAB, Birmingham, AL
2002-	Associate Scientist/Co-Leader Latino-Hispanic Health Program/Co-Leader of Training and Community Service Programs/Member of Steering Committee, Minority Health and Research Center (MHRC), UAB, Birmingham, AL
2002-2005	Assistant Professor, Division of Preventive Medicine, UAB, Birmingham, AL
1999-2005	Adjunct Assistant Professor, Graduate School, University of Memphis, Memphis, TN
1999-2002	Adjunct Assistant Professor, Department of Preventive Medicine, University of Tennessee-Memphis, Memphis, TN
1998-2002	Assistant Professor, University of Memphis Center for Community Health, Memphis, TN

Other Experience and Professional Memberships

2014-	Member (Invited), Advisory Committee on Minority Health, Department of Health and Human Services (DHHS), Office of Minority Health (OMH)
2001-	Editorial Board – Ethnicity & Disease

Honors (Past Five Years)

2014-	Honorary Consul of Brazil in Alabama – a diplomatic post through the US Department of State
2012	Awarded the William J. Koopman Mentoring Award – University of Alabama at Birmingham, Department of Medicine
2010	Awarded the President's Diversity Award – University of Alabama at Birmingham
2010	Received a "Special Honor" from the Municipal Health Secretariat in Curitiba, Paraná for being a key leader in the approval of the municipal law prohibiting tobacco use in all indoor places (law 13,254)
2010	Awarded the "NAACP Community Service Award" for service to improve the health of African Americans in the community, Birmingham Chapter of the National Association for the Advancement of Colored People (NAACP) and Helpmate Ministries

C. Contributions to Science

My ultimate goal is the elimination of cancer disparities, particularly disparities associated with socioeconomic status and race/ethnicity in the local, national, and international arena. My research has also sought to understand their relationship to engagement in healthy behaviors (or high risk behaviors) and preventive care among women and racial/ethnic minorities. It began with an in-depth understanding of the most important constructs in health disparities (race/ethnicity and socioeconomic status) which led me to narrow my research down to two groups who experience of the greater cancer disparities in the U.S. (Latina immigrants and African Americans). We began by engaging these "oppressed" and underserved groups through provision of service (e.g., health screenings) and community-based participatory research. Then, I proceeded to qualitatively understand how they socially construct health, cancer, and cervical cancer, which led to quantitative validation of these findings, and, together with the target audience, developed theory-based, culturally relevant interventions. More recently, I have expanded my efforts to low- and middle-income countries.

Socioeconomic Status /Race/Ethnicity

a. Scarinci, I. C., Watson, J. M., Slawson, D. L., Klesges, R. C., Murray, D. M., Eck-Clemens, L. (2000). Socioeconomic status, ethnicity, and environmental tobacco exposure among nonsmoking females. Nicotine and Tobacco Research, 2, 355-361.
b. Scarinci, I.C., Slawson, D.L., Watson, D.L., Klesges, R.C., Murray, D.M. (2001). Socioeconomic status, ethnicity, and health care access among young and healthy women. Ethnicity and Disease, 11, 60-71.
c. Scarinci, I.C., Beech, B.M., Naumann, W., Kovach, K.W., Pugh, L., Fapohunda, B. (2002). Depression, socioeconomic status, age, and marital status in Black women: a national study. Ethnicity and Disease, 12, 421-8.
d. Scarinci, I.C., Robinson, L.A., Alfano, C.M., Zbikowski, S.M., Klesges, R.C. (2002). The relationship between socioeconomic status, ethnicity, and cigarette smoking in urban adolescents. Preventive Medicine, 34, 171-8.

Understanding Engagement in Healthy Behaviors

a. Scarinci, I.C., Garcés-Palacio, I.C., Partridge, E. (2007). An Examination of Acceptability of HPV Vaccination among African American Women and Latina Immigrants. Journal of Women's Health, 16(8), 1224-33.
b. Scarinci, I.C., Litton, A., Garces-Palacio, I., Partridge, E., Castle, P. (2013) Acceptability and usability of self-collected sampling for HPV testing among African American women living in the Mississippi Delta. Women's Health Issues, 23(2):e123-30.
c. Sinclair, C., Foushee, H., Pevear, J. S., Scarinci, I.C., Carroll, W. (2012) Patterns of blunt use among rural young adult African American men. American Journal of Preventive Medicine, 42(1): 61-4.
d. Garces, I. C., Scarinci, I.C. (2012) Factors associated with perceived susceptibility to cervical cancer among Latina immigrants in Alabama. Maternal & Child Health Journal, 16(1): 242-248.

Intervention Development

a. Castle, P., Rausa, A., Walls, T., Gravitt, P., Partridge, E., Olivo, V., Niwa, S., Morrissey, K.G., Tucker, L., Katki, H., Scarinci, I.C. (2011) Comparative Community Outreach to Increase Cervical Cancer Screening in the Mississippi Delta. Preventive Medicine, 52(6):452-5.
b. Scarinci, I.C., Bandura, L., Hidalgo, B., Cherrington, A. (2012) Development of a Theory-Based, Culturally-Relevant Intervention on Cervical Cancer Prevention among Latina Immigrants Using Intervention Mapping. Health Promotion Practice, 13(1):29-40.
c. Scarinci, I.C., Moore, A., Wynn, T., Cherrington, A., Fouad, M, Li, Y. (2014). A community-based, culturally relevant intervention to promote healthy eating and physical activity among middle-aged African American women in rural Alabama: findings from a group randomized controlled trial. Preventive Medicine, 69C:13-20.

International Work

a. Scarinci, I. C., Silveira, A., Dos Santos, D., Beech, B. (2007). Sociocultural factors associated with cigarette smoking among women in Brazilian worksites: a qualitative study. Health Promotion International, 22, 146-54.
b. Garcés Palacios, I.C., Leon, D.C.R., Scarinci I.C. (2012) Factors associated with the screening of cancer of the cervix in women's socio-economic medium and low incomes in Bogotá, Colombia. Revista Facultad Nacional de Salud Pública de la Universidad de Antioquia (Colombia), 30(1):7-16.
c. Bittencourt, L., Scarinci, I.C. (2014) Is there a role for Community Health Workers in tobacco cessation? Perceptions of Administrators and Health Care Professionals. Nicotine & Tobacco Research, 16(5):626-631.
d. Rosenbaum, A. G., Gage, J. C., Alfaro, K.M., Ditzian, L.R., Maza, M., Scarinci, I.C., Felix, J.C., Castle, P.E., Villalta, S., Miranda, E., Cremer, M.L. (2014). Acceptability of self-collected versus provider-collected sampling for HPV DNA testing among women in rural El Salvador. International Journal of Gynaecology and Obstetrics, 126(2):156-60.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1xYiwsMaReI5c/bibliography/47511284/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

R01 TW009272 Scarinci (PI) 08/01/12-07/31/17
Tobacco Control Network among Women in Paraná, Brazil – II
The Network for Tobacco Control among Women in Paraná, Brazil was established with the goals of reducing tobacco use and exposure to environmental tobacco smoke among women in Paraná, Brazil and to develop a cadre of well-trained researchers who will continue to address comprehensive tobacco control strategies at multiple levels. The overall goal of this renewal is to continue to sustain and strengthen the Network, to conduct a group randomized controlled trial to assess the efficacy of a theory-based, culturally- and gender-relevant Community Health Worker intervention for Brazilian women who are light smokers that will augment the smoking cessation programs offered through the public health system, and to expand our current Career Development and Research Training Program to the other two major tobacco growing states in order to develop a cadre of well-trained researchers who will continue to develop and implement gender-relevant comprehensive tobacco control strategies at all levels.
Role: PI

P60 MD000502 Fouad (PI) 09/20/12-03/31/17
Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III
This application by the University of Alabama at Birmingham (UAB) proposes to expand our current NIMHD-funded P60 Center of Excellence – "Comprehensive MHDRC" to generate new knowledge on minority health and health disparities in the areas of cancer prevention and control, cardiovascular disease, and their risk factors in African American and Hispanic populations, with an emphasis on developing and testing interventions to reduce, and ultimately eliminate, these disparities. Dr. Scarinci is the PI of the Research Project, which is testing the efficacy of theory-culturally relevant intervention to promote HPV vaccination among daughters of Latina immigrants.
Role: PI - Research Project

U54 CA118948 Manne/Scarinci/Partridge (Co-PIs) 09/23/05-08/31/16
Morehouse School of Medicine/Tuskegee University/University of Alabama Cancer Center Partnership
The Partnership has goals of attaining excellence in research focused on the basis of cancer health disparities and on reducing the cancer burden. The primary objectives are to maintain progress in establishing productive cancer research programs at MSM and TU, to persist in developing a pipeline of prospective minority investigators at TU and further expand cancer disparity research at UABCCC.
Role: Co-PI

U54 MD008602 Benjamin (PI) 07/01/13-06/30/18
Gulf States Collaborative Center for Health Policy Research (Gulf States CC)
The overall goal of the Gulf States CC, a regional Consortium proposed by the Bayou Clinic, Inc., a Federally Qualified Health Center Look-Alike, in collaboration with the University of Southern Mississippi and the University of Alabama at Birmingham, is to significantly reduce the burden of chronic disease in minority, low-income, and other vulnerable populations in the Gulf region and increase community resilience by conducting innovative health policy research that generates policy change and health system improvement.
Role: Co-Leader - Evaluation Core; Investigator - Research Project 1

P30 AG031054 Burgio/Scarinci (Co-PIs) 09/01/12-06/30/17
Deep South Resource Center for Minority Aging Research (RCMAR)
The Deep South RCMAR will serve as research-based and mentoring investment in the process of closing the health disparities gap between African Americans and non-minority older adults. In addition, the Deep South RCMAR will increase the number of researchers with the capacity to conduct independent, peer-reviewed research related to minority aging and health disparities.
Role: Co-PI

P20 CA192973 Manne/Scarinci (Co-PIs) 10/01/14-09/30/18
1/2 The Alabama State University/UAB Comprehensive Cancer Center Partnership
The overall objectives of this proposal are to a) forge a Partnership and continue our existing basic cancer research collaborations between Alabama State University (ASU) and UAB Comprehensive Cancer Center to conduct research on cancer health disparities, b) to develop stronger cancer programs at ASU, and, c) to conduct research on the impact on populations at both institutions.
Role: Co-PI

U54 CA153719 Partridge (PI) 05/26/05-08/31/15
Deep South Network for Cancer Control (DSNCC)
The DSNCC proposes to build upon our considerable experience in working with the African-American population in the Deep South. This proposal will focus on two poor rural areas of Alabama and Mississippi to build an infrastructure to increase cancer awareness in this hard to reach population.
Role: Research Core Co-Leader

U54 MD008176 Fouad (PI) 09/26/12-07/31/17
Mid-South Transdisciplinary Collaborative Center for Health Disparities Research (Mid-South TCC)
The Mid-South TCC seeks to reduce the disparities in chronic disease burden experienced by African Americans in six Mid-South states. Our goal is to address the social determinants that interplay to impact a person's health and produce disparate health outcomes of minority populations. We will focus on pathways to obesity and chronic illness and the mechanisms connecting these pathways to health disparities throughout the life-course.
Role: Co-Leader, Pilot Project Program Core and Evaluation Core

U54 MD008620 Vickers/Shikany (Co-PIs) 10/15/13-06/30/18
National Transdisciplinary Collaborative Center for African American Men's Health
The goal is to develop, implement, and evaluate interventions that will improve AA men's health through research, outreach, and training. The goal of Research Project 1, *Patient Navigation to Reduce Readmissions among Black Men with Heart Failure,* a randomized controlled trial, is to compare heart failure self-care education plus a patient navigator-delivered self-care plan (Education + PN arm) to heart failure self-care education alone (Educational Control arm) in a population of male AA HF patients.
Role: Investigator – Evaluation Leader, Administrative Core and Project 1

No number assigned Scarinci (PI) 04/01/14-03/31/16
Sowing the Seeds of Health: Latina Lunches III
The overall goal is to continue efforts to promote breast health education and screening to at least 500 underserved Latina immigrants in Alabama through a yearly educational luncheon using the infrastructure that was built through a previous program *(Sowing the Seeds of Health)*.
Role: PI

U54 CA16308 Skinner/Tiro (Co-PIs) 07/30/14-05/31/16
Parkland-UT Southwestern PROSPR Center: Colon Cancer Screening in a Safety-net (Supplement Title: "PROSPR – Revisions to Enhance the Collection of Cervical Cancer Screening Data")
The goal of the expanded Parkland-UT Southwestern PROSPR Center is to optimize cervical and colon cancer screening in our integrated safety-net system.
Role: Sub-Contract PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Schwiebert, Lisa Marshall

eRA COMMONS USER NAME (credential, e.g., agency login): lschwiebert

POSITION TITLE: Professor of Cell, Developmental, and Integrative Biology

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Bates College, Lewiston, ME	BS	05/1986	Chemistry
Dartmouth College, Hanover, NH	PhD	12/1992	Biochemistry
Johns Hopkins University, Baltimore, MD	Postdoctoral	06/1996	Clinical Immunology

A. Personal Statement

Dr. Lisa Marshall Schwiebert, Professor of Cell, Developmental and Integrative Biology and Associate Dean for Postdoctoral Education, maintains a strong research and training record. Collectively, she has published over 100 manuscripts, abstracts, reviews and book chapters in the areas of asthma, cystic fibrosis, and immunology. Dr. Schwiebert's laboratory was the first to demonstrate the effects of aerobic exercise on cellular and molecular responses in a mouse model of allergic asthma. These seminal findings have led to the initiation of clinical trials that examine the effectiveness of aerobic exercise as an adjunct therapy for the treatment of asthma in adult and pediatric subjects. With regard to training efforts, Dr. Schwiebert has served as the primary mentor for a total of nine trainees, including three graduate students, four postdoctoral fellows, and two clinical fellows. While the majority of these former trainees currently hold tenure-track faculty appointments at top-tier institutions, including Duke University, the University of Houston, the University of South Alabama, and the University of Texas, others have pursued non-academic careers in the areas of science policy and biopharma. Dr. Schwiebert has also served / is serving on more than 20 graduate student dissertation and postdoctoral career development committees and is preceptor on five UAB NIH-funded training grants.

In her role as Associate Dean, Dr. Schwiebert and her staff in the Office of Postdoctoral Education (OPE) work with postdoctoral fellows, faculty members, and administrators campus-wide to facilitate and enhance postdoctoral recruitment, oversight, and career development; approximately 250 postdoctoral fellows are in training at UAB currently. She has developed and also directs a year-round curriculum, including courses in lab management, grant writing, translational science, and job skills, and oversees award programs that emphasize career preparation for basic science and clinical postdoctoral fellows as well as graduate students. In addition, she serves as the Program Director of the NIH-funded IRACDA Mentored Experiences in Research, Instruction, and Teaching (MERIT) Program at UAB. From 2010, while under her leadership, *The Scientist* ranked UAB in the top ten of academic institutions for postdoctoral training; in 2013, the final year of the survey, UAB ranked ***first*** among academic institutions nationwide.

B. Positions and Honors

Professional Employment:

2013-present	Professor	Department of Cell, Developmental, and Integrative Biology, UAB
2013-present	Scientist	Comprehensive Cancer Center, UAB
2012-2013	Associate Professor	Department of Cell, Developmental, and Integrative Biology, UAB

2011-present	Senior Scientist	UAB Center for Exercise Medicine
2009-present	Associate Professor	Division of Pulmonary, Department of Medicine, UAB (secondary)
2009-present	Director	UAB Pulmonary Biospecimen Repository
2008-present	Scientist	UAB Pulmonary Injury and Repair Center
2007-present	Scientist	UAB Lung Health Center
2007-present	Associate Dean	Office of Postdoctoral Education, UAB
2003-2012	Associate Professor	Department of Physiology and Biophysics, UAB
2003-2012	Associate Professor	Department of Cell Biology, UAB (secondary)
1998-2007	Director	Cellular and Molecular Physiology Graduate Program, UAB
1997-2003	Assistant Professor	Department of Physiology and Biophysics, UAB
1997-2003	Assistant Professor	Department of Cell Biology, UAB (secondary)
1997-present	Scientist	Gregory Fleming James Cystic Fibrosis Research Center, UAB
1996-1997	Instructor	Department of Medicine, Johns Hopkins University, Baltimore, MD

Other Experience and Professional Memberships

National Committees/Memberships

2006 NHLBI Strategic Planning Committee, Division of Lung Diseases
American Association of Medical Colleges
American Thoracic Society
American Association of Immunologists
American Physiological Society
American College of Sports Medicine

Grant Reviews/Study Sections/Editorial Experience

2012-present	NIDDK DEM Fellowship Review Committee
2012	NIH LCMI/LIRR Special Emphasis Review Panel
2011, 2012	NHLBI Program Project Review Committee
2010, 2011	NIH Lung Cellular and Molecular Immunology Study Section (adhoc)
2007, 2008	Wellcome Trust PhD Training Programmes (Great Britian; adhoc)
2006-2010	Associate Editor, American Journal of Physiology: Lung
2005 - 2008	American Lung Association (national)
2004	Science Foundation Ireland (ad hoc)
2004, 2006	Italian Cystic Fibrosis Foundation (ad hoc)
2003	The Wellcome Trust (ad hoc; Great Britian)
2002 - 2007	CF Foundation Research Grants and RDP Applications (permanent; USA)
2000	CF Foundation Research Grants (ad hoc; Europe)

Awards/Honors

2015 UAB Becky Trigg Woman Faculty Member of the Year Award
2014 UAB School of Medicine Program Director Award
2013 Named as an Elite American Educator
2013 Nominated and accepted into World Who's Who of Women
2013 Nominated and accepted into National Association of Professional Women
2012 Publication featured in the 'Latest Article Alert from *Allergy, Asthma & Clinical Immunology*'
2008 Publication featured as lead article in American Thoracic Society 'Morning Minute Research Section'
2002 Award for Best Platform Presentation, Pulmonary Section, American Physical Therapy Association
1986 Magna Cum Laude, Phi Beta Kappa, Bates College, Lewiston, ME

C. Contribution to Science

1. Airway epithelial biology and disease: Dr. Schwiebert has a long-standing interest in understanding the immunological mechanisms that drive airway inflammatory diseases, including asthma and cystic fibrosis. Her early work in this area examined how surface molecules, including the cystic fibrosis transmembrane conductance regulator (CFTR) and CD40, regulate the airway epithelial expression of pro-inflammatory mediators, including chemokines and adhesion molecules, that initiate and exacerbate leukocyte migration in the context of airway disease. Collectively, these studies have shown that CFTR and CD40 each play a role in activating airway epithelial cell-mediated expression of pro-inflammatory mediators and, thereby, enhance their function and importance as inflammatory effector cells within the lung and airways. In this area, she has published peer-reviewed manuscripts in top-tier journals, including but not limited to the *Journal of Biological Chemistry*, *Journal of Immunology* and the *American Journal of Respiratory, Cell, and Molecular Biology*. She has also edited a volume entitled Chemokines, Chemokine Receptors, and Disease for the Elsevier 'Current Topics in Membranes' series.

a. Tucker, T., Estell, K., and **L.M. Schwiebert**. Expression and processing of the CD40 receptor in airway epithelia. *Eur. J. Immunol.,* 38:864-9, 2008.
b. Estell, K., Braunstein, G., Collawn, J., and **L. M. Schwiebert**. Plasma membrane CFTR regulates RANTES expression via its C-terminal PDZ-interacting domain. *Mol. Cell. Biol.* 23:594-606, 2003.
c. Propst, S. M., Estell, K., and **L. M. Schwiebert**. CD40-mediated activation of NF-kB in airway epithelial cells. *J. Biol. Chem.,* 277:37054-63, 2002.
d. Propst, S.M., Estell, K., Denson, R., Rothstein, E., and **L. M. Schwiebert**. Proinflammatory and Th2-derived cytokines modulate CD40-mediated expression of inflammatory mediators in airway epithelia: implications for the role of epithelial CD40 in airway inflammation. *J. Immunol.*, 165:2214-2221, 2000.

2. Aerobic exercise and asthma pathogenesis: Funded initially by the NIH/NHLBI, Dr. Schwiebert's laboratory has utilized aerobic exercise as an innovative tool to define the mechanisms that drive asthma-related airway inflammation and hyper-reactivity as well as to elucidate the efficacy of exercise as an adjunct therapy in the treatment of airway inflammatory disease. Using a murine model of allergic asthma, her laboratory was the *first to demonstrate the effects of aerobic exercise on asthma-related airway inflammation and hyper-sensitivity at the cellular and molecular level*. Specifically, her laboratory reported that aerobic exercise at a moderate intensity attenuates asthma-related airway inflammation and hyper-responsiveness via a mechanism that is dependent upon endogenous glucocorticoids and β_2-adrenergic receptors. One of the several publications resulting from these efforts was ***featured as the lead article in 'American Thoracic Society 'Morning Minute Research Section', August, 2008***. Work from her group has shown that aerobic exercise enhances the function of regulatory T cells, which are known to ameliorate asthma pathogenesis, also in a murine asthma model. Notably, *this was the first report in the literature to demonstrate the impact of aerobic exercise on regulatory T cell function in any model system*.

These seminal findings led to the *initiation of clinical trials that examine the effectiveness of aerobic exercise as an adjunct therapy for the treatment of asthma in adult subjects*. Together with the UAB Lung Health Center, Dr. Schwiebert's laboratory completed a randomized, proof-of-concept study that tested the hypothesis that aerobic exercise attenuates asthma-related airway inflammation and pulmonary function in mild-moderate asthmatic patients; this work was published in July, 2012; ***upon publication, this report was featured in the 'Latest Article Alert from Allergy, Asthma & Clinical Immunology'***. In brief, participants with mild-moderate persistent asthma were recruited and randomly assigned to one of two groups that underwent a protocol of either moderate intensity aerobic exercise and/or a usual care asthma education program. Results showed that subjects randomized to the exercise group adhered well (80%) to the exercise prescription and exhibited a trend toward improved fitness levels upon study completion. Both groups exhibited improvements in asthma

control scores. *This project, which was funded by a pilot grant from the UAB CTSA, demonstrates the successful translation of Dr. Schwiebert's basic research into the clinical setting.* Recent efforts include expanding these clinical studies into specific demographic populations, including African-American and Hispanic subjects, which have been demonstrated to have an increased incidence of asthma.

a. Dugger, K., Chrisman, T., Jones, B., Chastain, P., Watson, K., Estell, K., Zinn, K., and **L.M. Schwiebert**. Moderate aerobic exercise alters migration patterns of antigen specific Th cells within an asthmatic lung. *Brain Behav Immunol*, 34:67-78, 2013. PMCID: PMC3826814.
b. Boyd, A., Yang, C., Estell, K., Tuggle, S.C., Bamman, M., Gerald, L., Dransfield, M., Bonner, J., Atkinson, P., and **L.M. Schwiebert**. The effects of aerobic exercise on asthmatic responses in adults: Results of a pilot study. *All Asthma Clin Immunol* 8:13, 2012. PMCID: PMC3511803.
c. Lowder, T., Dugger, K., Deshane, J., Estell, K., and **L.M. Schwiebert.** Moderate intensity aerobic exercise enhances T regulatory cell responses in allergic asthma. *Brain Behav. Immun.,* 24:153-159, 2010. PMCID: PMC2787986.
d. Hewitt, M., Estell, K., Davis, I., and **L.M. Schwiebert**. Repeated bouts of moderate intensity aerobic exercise reduce airway reactivity in a murine asthma model. *Am. J. Respir. Cell Mol. Biol.*, 42:243-249, 2010. PMCID: PMC2822985.

3. Science education and doctoral training: Dr. Schwiebert mentors and instructs trainees at all levels, including postdoctoral scholars, clinical fellows, graduate students, and undergraduates. As Associate Dean for Postdoctoral Education, she has developed and directs year-round curriculum, including courses in lab management, grant writing, translational science, and job skills, and oversees award programs that emphasize career preparation for basic science and clinical postdoctoral fellows as well as graduate students. One of these programs, an internship program for postdocs, was featured recently in an article published in ScienceCareers.org. Dr. Schwiebert has also served / is serving on more than twenty graduate student dissertation and postdoctoral career development committees and is preceptor on five UAB NIH-funded training grants. From 2010, while under her leadership, *The Scientist* has ranked UAB in the top ten of academic institutions for postdoctoral training for the past four years; in 2013, the final year of the survey, UAB ranked *first* among academic institutions nationwide.

a. Laursen, L. Internships Boost Postdocs' Skills, Worldliness, and Marketability. *ScienceCareers.org* (10.1126/science.caredit.a1300231), 2013.
b. The Scientist Staff. Best Places to Work Postdocs 2013. *The Scientist* (http://www.the-scientist.com/?articles.view/articleNo/34849/title/Best-Places-to-Work-Postdocs-2013/), 2013.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1dY_yxBzSgMQi/bibliograpahy/47868905/public/?sort=date&direction=ascending

D. Ongoing and Completed Research Support (within the past three years):

Ongoing Support

Mentored Experiences in Research, Instruction, and Teaching (MERIT) Program
K12 GM088010 Schwiebert (PD) 09/01/14-06/30/19
The major goals of this project are to provide postdoctoral fellows with teaching experiences and recruit underrepresented groups into the biomedical sciences.
Role: Program Director

Effects of aerobic exercise on asthmatic responses in obese adults
Pilot, Univ. of AZ-Tucson Gerald (PI) 01/01/14-12/31/15
The major goal of this project is to determine the effects of aerobic exercise training on asthmatic responses in obese adult patients.
Role: Co-Investigator

Completed Support:
Effects of aerobic exercise on asthmatic responses in obese, African American children
Pilot, UAB/Minority Health Res. Ctr Magruder (PI) 09/01/11-08/31/13
The major goal of this project is to determine the effects of aerobic exercise training on asthmatic responses in obese, African American pediatric subjects.
Role: Co-investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: STANDAERT, DAVID G

eRA COMMONS USER NAME (agency login): DGSTANDAERT

POSITION TITLE: John N. Whitaker Professor and Chair of Neurology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Harvard College	AB	06/1982	Biochemistry
Washington University, St. Louis	DOCTOR OF MEDICINE	06/1988	Medicine
Washington University, St. Louis	DOCTOR OF PHILOSOPHY	06/1988	Pharmacology
Jewish Hospital of St. Louis	Resident	06/1989	Internship
University of Pennysylvania	Resident	06/1992	Neurology Residency
Harvard Medical School / MGH	Postdoctoral Fellow	06/1995	HHMI Scholar / Movement Disorders Fellowship

A. PERSONAL STATEMENT

Dr. Standaert will serve as a mentor for this T32 training program. He is the John N. Whitaker Endowed Chair of Neurology and Director of the Division of Movement Disorders. He is a physician-scientist with a long-standing interest in the basic and clinical aspects of neurodegenerative diseases, especially Parkinson's disease and dystonia. His laboratory is engaged in a variety of studies relevant to this program, including evaluation of novel therapeutics in animal model systems, genetic and genomic studies, and human clinical trials. In addition to his research activities, Dr. Standaert is a practicing neurologist, and brings an important clinical perspective to the program. The Strain Endowed Chair supports a substantial part of Dr. Standaert's effort and allows for the flexible time allocation required to participate as a mentor.

Dr. Standaert has a substantial track record of mentoring neuroscientists. He has trained more than 20 postdoctoral fellows, which include both basic and clinical scientists, and has served as primary mentor for a total of 6 NIH K awards. He has mentored 2 previous graduate students, one of which was an MD/PhD student supported by an F30 award. He is currently mentoring 4 graduate students, one of which is currently supported by an F31s (PhD), and one that recently completed an F31 (MD/PhD). He has served on NIH study sections responsible for review of T32, R25, and F30/31 applications. Additionally, Dr. Standaert is the Program Director of an R25 program for residents in Neurology, Neurosurgery, and Neuropathology.

B. POSITIONS AND HONORS

Positions and Employment

1992 - 1995 Research and Clinical Fellow, Neurology Service, Massachusetts General Hospital
1992 - 1995 Postdoctoral Research Fellowship for Physicians, Howard Hughes Medical Institute
1995 - 2000 Assistant Professor, Harvard Medical School / MGH
2001 - 2006 Associate Professor, Harvard Medical School / MGH
2004 - 2006 Associate Director, Movement Disorders Unit, Massachusetts General Hospital
2005 - 2006 Director, MGH/MIT Morris Udall Center of Excellence in PD Research, Massachusetts General Hospital
2006 - Director, Division of Movement Disorders, Dept. of Neurology, University of Alabama at

	Birmingham
2006 -	Professor of Neurology, University of Alabama at Birmingham
2006 - 2013	Director, Center for Neurodegeneration and Experimental Therapeutics, University of Alabama at Birmingham
2007 -	Professor of Pharmacology and Toxicology, Cell, Development and Integrative Biology, and Neurobiology, University of Alabama at Birmingham
2008 - 2011	Director, Comprehensive Neuroscience Center, University of Alabama at Birmingham
2011 -	John N. Whitaker Professor and Chair of Neurology, University of Alabama at Birmingham

Other Experience and Professional Memberships

2001 -	Scientific Advisory Board, American Parkinson Disease Association
2003 - 2008	Scientific Advisory Board, Dystonia Medical Research Foundation
2003 - 2008	Chairperson, Standards Committee, Parkinson Study Group
2004 - 2008	Regular member, Initial Review Group NSD-B, National Institutes of Health
2005 -	Scientific Advisory Board, Michael J. Fox Foundation
2005 -	Handling Editor, Journal of Neurochemistry
2005 - 2006	Chair, Partners Human Research Committee (IRB), MGH Panel A
2011 -	Editorial Board, Movement Disorders
2013 -	Chair, Scientific Advisory Board, American Parkinson Disease Association
2014 -	American Neurological Association, Board of Directors
2014 -	UAB Health System, Board of Directors

Honors

1982	Graduated magna cum laude, Harvard University
1988	Irwin Levy Prize in Neurology and Neurological Surgery, Washington University
1991	Sam Zeritsky Resident's Research Award in Neurology, University of Pennsylvania
1992	Research Fellowship Award in Neuropharmacology, American Academy of Neurology
1996	Cotzias Fellowship, American Parkinson Disease Association
2006	Fellow, American Neurological Association
2007	"Best Doctors in America", 2007-2014
2008	Fellow, American Academy of Neurology

C. Contribution to Science

1. Inflammatory Mechanisms in Parkinson Disease: Our lab has taken a leading role in investigation of inflammation in PD. We began working in this area in 2007, and it has become a major focus of our research. We view inflammation as an important target for disease modifying therapies in PD.
   a. Moehle MS, Webber PJ, Tse T, Sukar N, Standaert DG, et al. LRRK2 inhibition attenuates microglial inflammatory responses. J Neurosci. 2012 Feb 1;32(5):1602-11. PubMed PMID: 22302802; PubMed Central PMCID: PMC3532034.
   b. Cao S, Standaert DG, Harms AS. The gamma chain subunit of Fc receptors is required for alpha-synuclein-induced pro-inflammatory signaling in microglia. J Neuroinflammation. 2012 Nov 27;9:259. PubMed PMID: 23186369; PubMed Central PMCID: PMC3526448.
   c. Harms AS, Cao S, Rowse AL, Thome AD, Li X, et al. MHCII is required for α-synuclein-induced activation of microglia, CD4 T cell proliferation, and dopaminergic neurodegeneration. J Neurosci. 2013 Jun 5;33(23):9592-600. PubMed PMID: 23739956; PubMed Central PMCID: PMC3903980.
   d. Allen Reish HE, Standaert DG. Role of α-synuclein in inducing innate and adaptive immunity in Parkinson disease. J Parkinsons Dis. 2015;5(1):1-19. PubMed PMID: 25588354.
2. Pathophysiology of Dystonia: Our lab has a long-standing interest in the basic mechanisms of dystonia. We conducted the first studies localizing torsinA in human and rodent brain, and more recently have characterized the role of dopamine and acetylcholine in animal models based on human genetic destinies.

a. Breakefield XO, Blood AJ, Li Y, Hallett M, Hanson PI, et al. The pathophysiological basis of dystonias. Nat Rev Neurosci. 2008 Mar;9(3):222-34. PubMed PMID: 18285800.

b. Sciamanna G, Tassone A, Mandolesi G, Puglisi F, Ponterio G, et al. Cholinergic dysfunction alters synaptic integration between thalamostriatal and corticostriatal inputs in DYT1 dystonia. J Neurosci. 2012 Aug 29;32(35):11991-2004. PubMed PMID: 22933784; PubMed Central PMCID: PMC3471539.

c. Sciamanna G, Hollis R, Ball C, Martella G, Tassone A, et al. Cholinergic dysregulation produced by selective inactivation of the dystonia-associated protein torsinA. Neurobiol Dis. 2012 Sep;47(3):416-27. PubMed PMID: 22579992; PubMed Central PMCID: PMC3392411.

d. Eskow Jaunarajs KL, Bonsi P, Chesselet MF, Standaert DG, Pisani A. Striatal cholinergic dysfunction as a unifying theme in the pathophysiology of dystonia. Prog Neurobiol. 2015 Feb 17;PubMed PMID: 25697043.

3. Glutamatergic signalling in basal ganglia: We have investigated the role of glutamatergic signalling in the basal ganglia, especially as it relates to dopamine mediated plasticity, wearing off, and dyskinesia. We conducted the first studies localizing many of the NMDA and mGluR receptor proteins, and subsequently demonstrated the importance of dopamine-mediated trafficking of NMDA receptors at cortico-striatal synapses.

a. Testa CM, Standaert DG, Young AB, Penney JB Jr. Metabotropic glutamate receptor mRNA expression in the basal ganglia of the rat. J Neurosci. 1994 May;14(5 Pt 2):3005-18. PubMed PMID: 8182455.

b. Standaert DG, Testa CM, Young AB, Penney JB Jr. Organization of N-methyl-D-aspartate glutamate receptor gene expression in the basal ganglia of the rat. J Comp Neurol. 1994 May 1;343(1):1-16. PubMed PMID: 8027428.

c. Testa CM, Friberg IK, Weiss SW, Standaert DG. Immunohistochemical localization of metabotropic glutamate receptors mGluR1a and mGluR2/3 in the rat basal ganglia. J Comp Neurol. 1998 Jan 5;390(1):5-19. PubMed PMID: 9456172.

d. Hallett PJ, Spoelgen R, Hyman BT, Standaert DG, Dunah AW. Dopamine D1 activation potentiates striatal NMDA receptors by tyrosine phosphorylation-dependent subunit trafficking. J Neurosci. 2006 Apr 26;26(17):4690-700. PubMed PMID: 16641250.

4. Biomarkers and Experimental Therapeutics in Parkinson disease: I have been involved in a wide variety of clinical studies of novel experimental therapeutics in PD, and have served on steering committees, as site investigator, and on DSMB panels.

a. Holloway RG, Shoulson I, Fahn S, Kieburtz K, Lang A, et al. Pramipexole vs levodopa as initial treatment for Parkinson disease: a 4-year randomized controlled trial. Arch Neurol. 2004 Jul;61(7):1044-53. PubMed PMID: 15262734.

b. The Parkinson Progression Marker Initiative (PPMI). Prog Neurobiol. 2011 Dec;95(4):629-35. PubMed PMID: 21930184.

c. Olanow CW, Kieburtz K, Odin P, Espay AJ, Standaert DG, et al. Continuous intrajejunal infusion of levodopa-carbidopa intestinal gel for patients with advanced Parkinson's disease: a randomised, controlled, double-blind, double-dummy study. Lancet Neurol. 2014 Feb;13(2):141-9. PubMed PMID: 24361112.

d. Fernandez HH, Standaert DG, Hauser RA, Lang AE, Fung VS, et al. Levodopa-carbidopa intestinal gel in advanced Parkinson's disease: Final 12-month, open-label results. Mov Disord. 2015 Apr;30(4):500-9. PubMed PMID: 25545465.

5. Mechanisms of levodopa-induced dyskinesias: Our lab has had a long-standing interest in the fundamental mechanisms of levodopa-induced dyskinesia, and the underlying neural plasticity which is responsible. Recently, we have focused on long-term adaptations and epigenetic mechanisms.

a. Nicholas AP, Lubin FD, Hallett PJ, Vattem P, Ravenscroft P, et al. Striatal histone modifications in models of levodopa-induced dyskinesia. J Neurochem. 2008 Jul;106(1):486-94. PubMed PMID: 18410512.

b. Crittenden JR, Cantuti-Castelvetri I, Saka E, Keller-McGandy CE, Hernandez LF, et al. Dysregulation of CalDAG-GEFI and CalDAG-GEFII predicts the severity of motor side-effects induced by anti-

parkinsonian therapy. Proc Natl Acad Sci U S A. 2009 Feb 24;106(8):2892-6. PubMed PMID: 19171906; PubMed Central PMCID: PMC2650361.

c. Cantuti-Castelvetri I, Hernandez LF, Keller-McGandy CE, Kett LR, Landy A, et al. Levodopa-induced dyskinesia is associated with increased thyrotropin releasing hormone in the dorsal striatum of hemi-parkinsonian rats. PLoS One. 2010 Nov 10;5(11):e13861. PubMed PMID: 21085660; PubMed Central PMCID: PMC2978093.

d. Eskow Jaunarajs KL, Standaert DG, Viegas TX, Bentley MD, Fang Z, et al. Rotigotine polyoxazoline conjugate SER-214 provides robust and sustained antiparkinsonian benefit. Mov Disord. 2013 Oct;28(12):1675-82. PubMed PMID: 24014074.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/myncbi/david.standaert.1/bibliography/40329048/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

M12-920, AbbVie Laboratories 2012/12/20-2017/12/19
David Standaert (PI)
An Open-Label, Two Part, Multicenter Study to Assess the Safety and Efficacy of Levodopa-Carbidopa Intestinal Gel (LCIG) for the Treatment of Non-Motor Symptoms in Subjects with Advanced Parkinson's Disease

K23 NS080912, NIH/NINDS 2012/09/26-2017/07/31
Amy Amara (PI)
The Effect of Low Frequency STN DBS on Sleep and Vigilance in PD Patients
Role: Mentor

R25 NS079188, NIH/NINDS 2012/04/01-2017/03/31
STANDAERT, DAVID G (PI)
UAB Research and Education Program in Neurology, Neurosurgery, and Neuropathology

P20 NS092530, NIH/NINDS 2015/03/01-2017/02/28
David Standaert (PI)
Innate and Adaptive Immunity in Parkinson Disease

K01 NS069614, NIH/NINDS 2010/04/01-2016/12/31
Michelle Gray (PI)
The Role of Astrocytes in Huntington’s Disease
Role: Mentor

BSF Center, The Bachmann-Strauss Dystonia & Parkinson Foundation, Inc 2013/05/01-2016/04/30
David Standaert (PI)
UAB Bachmann-Straus Dystonia and Parkinson’s Disease Center of Excellence

F31 NS084722, NIH/NINDS 2014/04/01-2016/03/31
Aaron Thome (PI)
Role of microRNAs in modulating inflammation in alpha-syn mediated models of PD
Role: Mentor

DMRF, Dystonia Medical Research Foundation 2015/03/01-2016/02/28
David Standaert (PI)
Evaluation of the effects of a novel nicotinic agonist, AZD1446, on neurochemical and electrophysiologic endpoints in DYT1 mouse models

MJFF, The Michael J. Fox Foundation for Parkinson’s Research 2014/01/15-2016/01/15
David Standaert (PI)

Validation of the Class II MHC Transactivator (CIITA) in Models of PD

Acerta, Acerta Pharma B.V. 2015/01/01-2015/12/31
David Standaert (PI)
BTK Inhibitors and Their Potential Role in Inhibiting the Pro-Inflammatory Microenvironment Associated with Neurodegeneration

U18 NS082132, NIH/NINDS 2012/09/30-2015/12/31
Andrew West (PI)
LRRK2 and Other Novel Exosome Proteins in Parkinson's Disease
Role: Co-Investigator

MGH XDP, MGH Collaborative Center for X-linked Dystonia Parkinsonism (XDP) 2015/01/01-2015/12/31
Michelle Gray (PI)
Modeling X-linked Dystonia Parkinsonism Using BAC Transgenesis
Role: Co-Investigator

U10 NS044547, NIH/NINDS 2013/01/01-2015/11/30
STANDAERT, DAVID G (PI)
PD Neuroprotection Clinical Trial Center

F31 NS081963, NIH/NINDS 2012/09/28-2015/09/27
Mark Moehle (PI)
Role of Microglial LRRK2 in Inflammation
Role: Co-mentor

APDA, American Parkinson Disease Association 2006/09/01-2015/08/31
David Standaert (PI)
APDA Advanced Center for Parkinson’s Research

R01 NS064934, NIH/NINDS 2010/09/01-2015/08/31
Andrew West (PI)
Mechanisms of LRRK2 Mediated Neurotoxicity
Role: Co-Investigator

PPMI, The Michael J. Fox Foundation for Parkinson's Research 2010/07/27-2015/07/26
David Standaert (PI)
The Parkinson Progression Markers Initiative (PPMI)

CERE 120-09, Ceregene, Inc 2013/06/13-2015/06/02
David Standaert (PI)
A Phase 1/2 Trial Assessing the Safety and Efficacy of Bilateral Intraputaminal and Intranigral Administration of CERE-120 (Adeno-Associated Virus Serotype 2[AAV2]-Neurturin{NTN]) in Subjects with Idiopathic Parkinson's Disease (CERE 120-09)

Completed Research Support

P50 NS037409, NIH/NINDS 2000/01/01-2015/01/31
Xandra Breakefield (PI)
Molecular Etiology of Early Onset Torsin Dystonia
Role: Co-Investigator

RJG, RJG Foundation 2011/12/01-2014/11/30
David Standaert, Ashley Harms (PI)
Role of MHC II proteins in Parkinson's-related inflammation
Role: CPI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Chad Steele

eRA COMMONS USER NAME (credential, e.g., agency login): CHSTEEL

POSITION TITLE: Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Louisiana, Monroe, LA	BS	1990-1995	Chemistry
Louisiana State University Health Sciences Center	MS	1996-1998	Microbiology/Immunology
Louisiana State University Health Sciences Center	Ph.D.	1996-2000	Microbiology/Immunology
Louisiana State University Health Sciences Center	Post-doctoral	2001-2003	Pulmonary Immunology

A. Personal Statement

I have had a career-long interest in immunity against fungal infections, initiated in my doctoral work in 1996 with vaginal and oral infections caused by *Candida albicans* (16 manuscripts between 1998 and 2012), followed by my post-doctoral work in 2001 with lung infection caused by *Pneumocystis carinii* (17 manuscripts between 2002 and 2013) and into my first faculty position in 2003 with lung infection caused by *Aspergillus fumigatus* (12 manuscripts between 2005 and 2014). Since 2001, research in my laboratory as well as numerous collaborations has exclusively investigated aspects of lung host defense, inflammation and injury (52 between 2002 and the present). The current goals of my research are to understand lung host defense mechanisms against fungal infections and how immunoprotective responses required for pathogen elimination may paradoxically result in immunopathogenic responses that culminate in lung function decline. An important shift in the my laboratory over the last several years has been both confirming basic science/experimental observations in humans (i.e. bench-to-bedside) as well as the identification of inflammatory biomarkers, immune cells and pathways in human diseases that correlate with lung function decline, and bringing these observations back to experimental animal models to provide mechanistic insight (i.e. bedside-to-bench). A major current focus of the laboratory is understanding the impact of fungal exposure on disease severity in asthma and cystic fibrosis.

B. Positions and Honors

Positions:

07/2003-08/2004 Research Assistant Professor, Department of Pediatrics, University of Pittsburgh School of Medicine, Pittsburgh, PA
09/2004-06/2007 Assistant Professor, Department of Pediatrics, University of Pittsburgh School of Medicine Medicine, Pittsburgh, PA
07/2007-09/2009 Associate Professor, Departments of Medicine and Microbiology, University of Alabama at Birmingham
10/2009-09/2012 Associate Professor (with tenure), Departments of Medicine, Microbiology and Pathology, University of Alabama at Birmingham
10/2012-present Professor (with tenure), Departments of Medicine, Microbiology and Pathology, University of Alabama at Birmingham
7/2014-present Faculty Fellow, Office of the Senior Vice Provost, University of Alabama at Birmingham

Honors/Awards:

1997 R.J. Strawinski Memorial Research Award, Meeting of the South Central Branch of the American Society for Microbiology.
1999 Mycology Millennium Award (Best Manuscript Publication, Journal of Medical Mycology) – Awarded by The International Society of Human and Animal Mycology (ISHAM).
2000 Chancellor's Award (Most Outstanding Ph.D. Graduate) - School of Graduate Studies, LSUHSC-NO

2002 American Federation for Medical Research - Southern Section (SAFMR) and the Southern Society for Clinical Investigation (SSCI) - Trainee Research Award (also awarded in 2003).
2004 Parker B. Francis Pulmonary Research Fellow
2004 NIH Loan Repayment Program Awardee (Pediatric Loan Repayment Program; also awarded 2009)
2006 Faculty of 1000 Biology – nominated for manuscript *PLoS Pathogens* 1:e42
2006 Member, F07-L: NRSA Immunology Fellowships and AREA NIH Study Section
2006 Invited Participant, NHLBI Strategic Planning Process at the Division of Lung Diseases: New Investigator Workshop Theme #3 – Injury/Inflammation, Repair/Remodeling and Replacement/Regeneration
2006 American Lung Association – Career Investigator Award Grant
2007 American Lung Association – Research Training Fellowship Peer Review Committee
2008 Editorial Board – *Infection and Immunity* (reappointed 2011 – 2013)
2008 Associate Editor – *The Journal of Immunology*
2009 Editorial Board – *The American Journal of Physiology - Lung Cellular and Molecular Physiology*
2009 Permanent Member, AIDS-associated Opportunistic Infections and Cancer (AOIC) NIH Study Section
2009 The Max Cooper Award for Research Excellence, Department of Medicine, UAB
2010 Section Editor – *The Journal of Immunology*
2011 Spotlight Article for Werner et al., Infection and Immunity, October 2011
2011 Editorial Board – *The American Journal of Physiology - Lung Cellular and Molecular Physiology* (reappointed)
2012 Spotlight Article for Gessner et al., Infection and Immunity, January 2012
2012 Section Editor – *The Journal of Immunology* (reappointed 2012 – 2014)
2012 Editorial Board – *PLoS ONE*
2013 American Heart Association – Lung Basic Science 2 Review Committee
2014 Elected Chair of the 2018 Gordon Research Conference – Biology of Acute Respiratory Infections

C. Contribution to Science

1. Epithelial cell responses to fungi

I started graduate school in 1996 and joined a laboratory that primarily focused on adaptive immunity in the vaginal and oral mucosa to the opportunistic yeast *Candida albicans*. Our lab had a visiting scientist from Ankara University in Turkey that had an interest in NK cells and vaginal candidiasis and after isolating various fractions of cells, discovered that that cellular portion that had the most anti-fungal activity was the non-NK cell fraction. I subsequently discovered that this fraction was enriched for epithelial cells and after developing protocols to purify them, identified these cells in the vaginal mucosa has having a potent ability to inhibit the growth of *C. albicans*. I subsequently reported that (i) epithelial cell anti-fungal activity in the vaginal mucosa was negatively regulated by estrogen, (ii) human oral epithelial cells possessed more potent anti-fungal activity, owing to the fact that the oral mucosa is colonized with fungi at a much higher rate than the vaginal mucosa and (iii) the level of epithelial cell anti-fungal activity correlated with susceptibility to infection, specifically in non-human primates, pig-tailed macaques were more resistant to vaginal candidiasis and had effective vaginal epithelial cell anti-fungal activity compared to rhesus macaques; in the oral mucosa, HIV-infected individuals without oropharyngeal candidiasis (OPC) possessed higher epithelial anti-fungal activity than HIV-infected individuals with OPC.

a. **Steele C.**, J. Leigh, R. Swoboda and P.L. Fidel, Jr. Growth inhibition of *Candida* by human oral epithelial cells. *Journal of Infectious Diseases* 182:1479-1485 (2000). PMID:11023471 **Citations in Google Scholar: 100**

b. Fidel, P.L. Jr., J. Cutright and **C. Steele**. Effects of reproductive hormones on experimental vaginal candidiasis. *Infection & Immunity* 68:651-657 (2000). PMCID:PMC97188 **Citations in Google Scholar: 145**

c. **Steele C.**, J. Leigh, R. Swoboda and P.L. Fidel, Jr. Potential role for a carbohydrate moiety in anti-*Candida* activity of human oral epithelial cells. *Infection & Immunity* 69:7091-7099 (2001) PMCID: PMC100093 **Citations in Google Scholar: 52**

d. **Steele C.** and P.L. Fidel, Jr. Cytokine and chemokine production by human oral and vaginal epithelial cells in response to *Candida albicans*. *Infection & Immunity* 70:577-583 (2002). PMCID:PMC127706 **Citations in Google Scholar: 149**

2. The fungal beta-glucan receptor Dectin-1

I was fortunate early in my post-graduate career to become involved in the "fervor" of pattern recognition receptor (PRR) biology. Indeed, this field was essentially launched by the publications of the Hoffman and Beutler laboratories on toll like receptors in 1996/1998 and by the summer of 2002, there were more than 800 publications on TLRs. With these discoveries came the quest to discover "non-TLR" PRRs. At this time, I was in the second year of my post-doctoral fellowship and was investigating alveolar macrophage (AM) effector functions against the fungal pathogen *Pneumocystis carinii*. My early studies identified that killing of the organism by AMs involved a beta-glucan inhibitable receptor. Shortly thereafter, the Dectin-1 beta-glucan receptor was identified by Gordon Brown and Siamon Gordon. We subsequently showed that Dectin-1 mediated both the killing function and proinflammatory response of AMs to *P. carinii*. This led to a long and fruitful collaboration between myself and Gordon Brown (9 publications to date) where we have reported roles for Dectin-1 in innate immunity against *P. carinii*, *C. albicans* and *Aspergillus fumigatus*. Notable findings in the latter included the discovery that beta-glucans in *A. fumigatus* were unmasked as the organism swelled and germinated, providing a "window" in which Dectin-1 could recognize the organism. We subsequently showed that Dectin-1 deficiency resulted in profound susceptibility to lung infection with *A. fumigatus* as a result of impaired AM inflammatory responses, impaired neutrophil recruitment to the lungs as well as impaired neutrophil oxidative killing. In other studies, we have published that Dectin-1 controls innate production of IL-17A and IL-22, both of which are required for *A. fumigatus* elimination (IL-17A: Infect Immun 79:3966; 2011 and IL-22: Infect Immun 80:410; 2012).

a. **Steele C.**, L. Marrero, S. Swain, A.G. Harmsen, M. Zheng, G.D. Brown, S. Gordon, J.E. Shellito and J.K. Kolls. Alveolar macrophage-mediated killing of *Pneumocystis carinii* f. sp. muris involves pattern recognition by the Dectin-1 beta-glucan receptor. *Journal of Experimental Medicine* 198:1677-1688 (2003). **Cover article - December 1, 2003 Issue** PMCID:PMC2194130 **Citations in Google Scholar: 219**

b. **Steele C.**, R. Rapaka, A. Metz, S.M. Pop, D.L. Williams, S. Gordon, J.K. Kolls and G.D. Brown. The beta glucan receptor Dectin-1 recognizes specific morphologies of *Aspergillus fumigatus*. *PLoS Pathogens* 1:e42 (2005). **Cover article - December 2005 Issue**; **nominated to Faculty of 1000 Biology by June Kwon-Chung, Ph.D., NIAID/NIH – March 2006** PMCID:PMC1311140 **Citations in Google Scholar: 319**

c. Taylor, P.R., S.V. Tsoni, J.A. Willment, K.M. Dennehy, M. Rosas, H. Findon, K. Haynes, **C. Steele**, M. Botto, S. Gordon and G.D. Brown. A critical role for β-glucan recognition in the control of fungal infection. *Nature Immunology* 8:31-38 (2007). **Cover article - January 2007 Issue** PMCID:PMC1888731 **Citations in Google Scholar: 577**

d. Werner, J., A.E. Metz, D. Horn, I. Faro-Trindade, T.R. Schoeb, M.M. Hewitt, L.M. Schwiebert, G.D. Brown and **C. Steele**. Requisite role for the Dectin-1 beta-glucan receptor in pulmonary defense against *Aspergillus fumigatus*. *Journal of Immunology* 182:4938-4946 (2009). ** In This Issue Highlight Article – April 15, 2009** PMCID:PMC3434356 **Citations in Google Scholar: 209**

3. <u>Translational research: Luminex®-associated collaborations</u>

Since the beginning of my post-doctoral fellowship (2001 – 2003) through my first two faculty appointments (2003 – present), I have been affiliated with a clinical department. This has given me a unique advantage to interact and collaborate with many physician-scientists. Having trained as an immunologist, I have long been a proponent of examining and characterizing biomarkers of inflammation, namely cytokines and chemokines. At the beginning of my first faculty appointment in 2003, our research group acquired the Luminex® multiplex protein array-based Bio-Plex® platform from Bio-Rad. In essence, this is a cytokine bead array platform that can quantify cytokines, chemokines and growth factors at the protein level in any type of biospecimen in as little as 25 µl. My lab took ownership of this platform and became experts in the technology. Since this time, between my own research and offering this technology to collaborators, I have published more than 55 manuscripts in which Luminex® was employed, 18 of which examined inflammatory biomarkers in samples such as sputum, serum, bronchalveolar lavage fluid and nasal lavage fluid from human diseases such as asthma, COPD, IPF and cystic fibrosis. Examples of these collaborations are listed below.

a. Morris A., T. Alexander, S. Radhi, L. Lucht, F. C. Sciurba, **C. Steele** and K. A. Norris. Airway obstruction is increased in *Pneumocystis*-colonized HIV-infected outpatients. *Journal of Clinical Microbiology* 47:3773-6 (2009) PMCID: PMC2772636 **Citations in Google Scholar: 44**

b. Shukla, A., M. MacPherson, J. Hillegass, M. Ramos-Nino, V. Alexeeva, P. Vacek, J. Bond, H. Pass, **C. Steele** and B.T. Mossman. Alterations in gene expression in human mesothelial cells correlate with mineral pathogenicity. *American Journal of Respiratory Cell and Molecular Biology* 41:114-23 (2009). PMCID: PMC2701958 **Citations in Google Scholar: 37**

c. Gilani, S.R., L.J. Vuga, K.O. Lindell, K.F. Gibson, J. Xue, N. Kaminski, V.G. Valentine, E.K. Lindsey, M. P. George, **C. Steele** and S.R. Duncan. CD28 downregulation on circulating CD4 T cells is associated with poor prognosis of patients with idiopathic pulmonary fibrosis. *PLoS ONE* 5:e8959 (2010). PMCID: PMC2813297 **Citations in Google Scholar: 73**

d. Dransfield M.T., A.M. Wilhelm, B. Flanagan, C. Courville, S.L. Tidwell, S.V. Raju, A. Gaggar, **C. Steele**, L.P. Tang, B. Liu and S.M. Rowe. Acquired CFTR dysfunction in the lower airways in COPD. *Chest* 144:498-506 (2013). PMCID:PMC3734887 **Citations in Google Scholar: 23**

4. Basic science: Luminex®-associated collaborations

As detailed above, we have published more than 55 manuscripts to date that employed Luminex® multiplex protein array-based Bio-Plex® platform. Although 18 of these publications investigated human biospecimens or samples from human cells, the majority of these examined samples from mice, such as T cell supernatants, lung homogenates and lung bronchoalveolar lavage fluid.

a. Dostert, C., V. Pétrilli, R. Van Bruggen, **C. Steele**, B.T. Mossman and J. Tschopp. Asbestos and silica activate the Nalp3 inflammasome and trigger innate immunity. *Science* 320:674-677 (2008). PMCID: PMC2396588 **Citations in Google Scholar: 1,136**

b. Tse, H.M., T.E. Thayer, **C. Steele**, C.M. Cuda, L. Morel, J.D. Piganelli and C.E. Mathews. NADPH oxidase-deficiency regulates T helper lineage commitment and modulates autoimmunity. *Journal of Immunology* 185:5247-58 (2010). PMCID: PMC3190397 **Citations in Google Scholar: 39**

c. Goodwin M., V. Sueblinvong, P. Eisenhauer, N.P. Ziats, L. Leclair, M.E. Poynter, **C. Steele**, M. Rincon, D.J. Weiss. Bone marrow derived mesenchymal stromal cells inhibit Th2-mediated allergic airways inflammation in mice. *Stem Cells* 7:1137-48 (2011). PMCID:PMC4201366 **Citations in Google Scholar: 54**

d. Wozniak K.L., S. Ravi, S. Macias, M. Young, M.A. Olszewski, **C. Steele** and F.L. Wormley. Insights into the mechanisms of protective immunity against *Cryptococcus neoformans* infection using a mouse model of pulmonary cryptococcosis. *PLoS One* 4:e6584 (2009). PMCID:PMC2731172 **Citations in Google Scholar: 37**

5. Fungal asthma

I initiated my investigations in *A. fumigatus* in 2003 and for the last 12 years have primarily focused my laboratory's attention on host defense mechanisms against invasive aspergillosis, i.e. the Dectin-1/IL-17A/IL-22 axis detailed above. During this period, I also developed an interest in the role *A. fumigatus* played in other lung diseases, namely cystic fibrosis (CF) and asthma. Early studies examined CF human bronchial epithelial cell responses to *A. fumigatus*. I have also collaborated with other labs on tolerance mechanisms in CF-associated ABPA. More recently, my lab is examining lung disease severity in CF patients that are positive for *A. fumigatus* colonization but do not fit the criteria for ABPA and determining what lung biomarkers correlate with this. In 2011, my laboratory became interested in fungal asthma and specifically identified an immunopathogenic role for the Dectin-1/IL-17A/IL-22 axis in experimental fungal asthma. Since 2012, we have collaborated with the NHLBI Severe Asthma Research Program on inflammatory biomarkers that correlate severity of fungal asthma in humans.

a. Kreindler, J.L.*, **C. Steele***, N. Nguyen, Y.R. Chan, J.M. Pilewski, J.F. Alcorn, S.J. Aujla, P. Finelli, M. Blanchard, S.F. Zeigler, A. Logar, E. Hartigan, M. Kurs-Lasky, H. Rockette, A. Ray and J.K. Kolls. Vitamin D3 attenuates Th2 responses to *Aspergillus fumigatus* mounted by CD4+ T cells from cystic fibrosis patients with allergic bronchopulmonary aspergillosis. *Journal of Clinical Investigation* 120:3242-54 (2010). PMID:20714107 *Co-First Author **Citations in Google Scholar: 82**

b. Lilly, L.M., M.A. Gessner, C.W. Dunaway, A.E. Metz, L.M. Schwiebert, C.T. Weaver, G.D. Brown and **C. Steele**. The beta-glucan receptor Dectin-1 promotes immunopathology during fungal allergy via IL-22. *Journal of Immunology* 189:3653-60 (2012). PMID:22933634 **Citations in Google Scholar: 31**

c. Lathrop M.J., E.M. Brooks, N.R. Bonenfant, D. Sokocevic, Z.D. Borg, M. Goodwin, R. Loi, F. Cruz, C.W. Dunaway, **C. Steele** and D.J. Weiss. Mesenchymal stromal cells mediate *Aspergillus* hyphal extract-induced allergic airway inflammation by inhibition of the Th17 signaling pathway. *Stem Cells Transl Med* 3:194-205 (2014). PMCID:PMC3925050 **Citations in Google Scholar: 7**

Papers in progress

1. **Steele C.**, Hastie, A.T., E.J. Ampleford, C.W. Dunaway, E.R. Bleecker and D.A. Meyers. Defining fungal asthma severity via immune mediator differences in bronchoalveolar lavage fluid from fungal skin test-positive vs. skin test-negative asthmatics.
2. Hastie, A.T., **C. Steele**, W.C. Moore, S. Foster, B.M. Rector, E.J. Ampleford, G. Crisafi, C.W. Dunaway, N.N. Jarjour, E.R. Bleecker, C Steele and D.A. Meyers. Complex patterns of Th1 inflammatory biomarker associations with cells of induced sputum in asthma.
3. Reeder K.R., M.S. Godwin, C.L. Zindl, C.W. Dunaway, C.T. Weaver and **C. Steele**. Shaping the lung IL-22 response during invasive aspergillosis.
4. Garth, J.M., K.R. Reeder, M. Gessner, M.S. Godwin, C.W. Dunaway and **C. Steele**. A surprising role for COX-2 signaling in promoting IL-22 in the absence of IL-33 or TLR9 during invasive aspergillosis.
5. Reeder K.R., C.L. Zindl, C.W. Dunaway, C.T. Weaver and **C. Steele** IL-7 promotes IL-22 mediated immunopathogenic responses during fungal asthma.

Complete List of Published Work in MyBibliography (92 publications as of April 2015):
http://www.ncbi.nlm.nih.gov/sites/myncbi/chad.steele.1/bibliography/41142797/public/?sort=date&direction=ascending.

***h*-index** (Scopus: http://www.scopus.com/search/form.url?zone=TopNavBar&origin=AuthorProfile) – 33 (as of April 1, 2015)

D. Research Support

Active:

R01 HL096702 Steele (PI) 5/01/2010 – 4/30/2015 NCE
Pulmonary defense against *Aspergillus fumigatus*
The main goal of this award is to investigate the mechanisms responsible for myeloid cell-derived IL-17 and its role in lung defense against invasive fungal infection caused by *A. fumigatus.*

R21 HL117090 Steele (PI) 8/01/2012 – 8/31/2014 NCE
Eosinophils and lung immunity to *Pneumocystis*
The major goal of this grant is to determine the role eosinophils and acidic mammalian chitinase in macrophage responses during the lung immune response to *P. murina* infection.

R01 HL119770 Steele (PI) 9/01/2013 – 8/31/2017
National Institutes of Health
Adaptive immunity against *Pneumocystis*
The main goal of this proposal is to investigate the mechanisms driving the development of type 2 and Th2 responses in the lung and periphery during lung infection with *Pneumocystis*.

R01 HL119770-01A1, Steele (PI) 12/1/14 – 11/30/18
National Institutes of Health
Immunopathogenesis during fungal asthma
The major goals of this proposal are to understand the mechanisms by which the cytokine IL-22 contributes to fungal asthma severity, which fungal cell wall moieties drive asthma severity and translate our results with human asthmatics that are skin-test (+) for fungi

Previous (past 5 years):

R21 HL110023	STAT4 mediated immunity to *Pneumocystis*	Steele (PI)	6/01/2011 – 5/31/2013
R01 AI068917	Dectin-1 and invasive pulmonary aspergillosis	Steele (PI)	6/19/09 – 05/31/12
R01 HL080317	Dectin-1 and immunity against *Pneumocystis carinii*	Steele (PI)	05/01/05 – 04/30/10

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Steven M. Theiss

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: John D. Sherrill Chair of Orthopaedic Surgery, Professor of Surgery

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Pennsylvania	BA	05/1985	Biological Basis of Behavior
Northwestern University	MD	05/1989	Medicine
Emory University, Atlanta, GA		10/1989	Orthopaedic Research
University of Pennsylvania		06/1994	Orthopaedic Surgery
Minnesota Spine Center		06/1995	Spine Surgery

A. Personal Statement

I have considerable experience in mentoring trainees. This includes a 5 year stint directing our orthopaedic surgery residency program and also currently directing our spine fellowship program. These programs include mentoring programs focusing on clinical training, but also research. While overseeing our orthopaedic training program, I was involved in planning academic programs in a multitude of rheumatologic disease processes. In addition to mentoring these graduate level students, I have mentored several medical students in various research endeavors. I have conducted some original research on portraying professionalism for trainees

Ponce, BA, Determann JR, Theiss SM**. "**Social Networking Profiles and Professionalism Issues in Residency Applicants: an original study-cohort study." *J Surg Educ.* 2013 Jul-Aug;70 (4):502-7.

B. Positions and Honors

Positions and Employment

1996-2003, Assistant Professor, University of Alabama Birmingham
2003-2013, Associate Professor, University of Alabama Birmingham
2008-2013 Program Director, Orthopaedic Surgery Residency Program
2009-present Program Director Combined Ortho/Neuro Spine Fellowship
2013-present John D. Sherrill Chair of Orthopaedic Surgery

Other Experiences and Professional Memberships

1995- American Medical Association
1996- Medical Association of the State of Alabama (MASA)
1996- Alabama Orthopaedic Society
1998- North American Spine Society
1998 American Academy of Orthopaedic Surgeons
2000- Orthopaedic Research Society
2001- American Spinal Injury Association
2003- AO Spine North America
2006- Mid America Orthopaedic Association
2009- American Orthopaedic Association
2015- Scoliosis Research Society

Honors and Awards

1996, 2003, 2005, 2009- Kurt Niemann Faculty Teaching Award, Division of Orthopedic Surgery, University of Alabama at Birmingham

C. Contribution to Science

My initial course of research focused on the enhancement and inhibitions of bone healing during spine fusion. The basic mechanism of bone healing in this environment is poorly understood and was the focus of my research fellowship at Emory. My central findings were that nicotine inhibited the sequential gene expression of cytokines critical in successful arthrodesis, even as early as several hours after the fusion procedure. We then employed a gene therapy technique to enhance bone healing. Since, my interests have focused the clinical outcomes of spine injury and surgery. Primarily, I have focused on the outcomes of cervical trauma, as well as the assessment and management of adult spine deformities.

a) **Theiss SM**, Boden SD, Hair G, Titus L, Morone MA, Ugbo J. "The Effect of Nicotine of Gene Expression During Spine Fusion." *Spine (Phila PA 1976).* October 2000; 25(20):2588-94
b) Douglas JT, Rivera AA, Lyons GR, Lott PF, Wang D, Zayzafoon M, Siegal GP, Cao X and **Theiss SM**. "*Ex Vivo* Transfer of the Hoxc-8-Interacting Domain of Smad1 By a Tropism-Modified Adenoviral Vector Results in Efficient Bone Formation in a Rabbit Model of Spinal Fusion." *J Spinal Disord Tech.* 2010 Feb;23(1):63-73
c) Maddox JJ, Rodriguez-Feo JA 3rd, Maddox GE, Gullung G, McGwin G, **Theiss SM**. "Nonoperative Treatment of Occipital condyle Fractures; An Outcomes Review of 32 Patients." *Spine* Mar 13, 2012
d) Deinlein D, Bhandarkar A, Vernon P, McGwin G, Wall K, Reece B, McKay J, **Theiss SM.** "Correlation of Pelvic and Spinal Parameters in Adult Deformity Patients with Neutral Sagittal Balance." *Spine Deform*, 2013 Nov.; 1(6): 458-463.

D. Research Support

Ongoing Research support

Pfizer B3451002 Theiss (PI) 5/15-5/17

Phase 2b, Randomized, Double-Blind, Placebo-Controlled, Study to Evaluate the Safety and Efficacy of Staphylococcus Aureus 4-antigen Vaccine (SA4Ag) in Adults Undergoing Elective Posterior Instrumented Lumbar Spinal Fusion Procedures. The goals of the project are to assess the efficacy of a 4-antigen staph aureus vaccine in preventing infection in patients undergoing elective posterior lumbar instrumentation and fusion.
Role:PI

Hensler Surgical Neway (PI) 9/14-9/16

Characterization of Ouput from a Bone Suction Filter Device. The goals of this project is to characterize the output of a suction filter device used during power burring of autologous bone surfaces.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Tiwari, Hemant K.

eRA COMMONS USER NAME (credential, e.g., agency login): HTiwari

POSITION TITLE: Professor and Head of the Section on Statistical Genetics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Kanpur, Kanpur, UP, India	B.Sc.	08/76	Math, Physics, Statistics
Indian Institute of Technology, Kanpur, UP, India	M.Sc.	08/78	Mathematics
University of Notre Dame, Indiana	M.S.	12/83	Mathematics
University of Notre Dame, Indiana	Ph.D.	08/86	Mathematics
LSU Medical Center, New Orleans, Louisiana	Post-Doc	05/93-06/95	Statistical Genetics
Case Western Reserve University, Cleveland, Ohio	Post-Doc	06/96	Statistical Genetics

A. Personal Statement

I have extensive experience in both developing and applying statistical methods for biomedical research. My research interests include Genetic Linkage Analysis, Disequilibrium Mapping, Genome-Wide Association Studies, Structural variations and Epigenetics, Pharmacogenetics/Pharmacogenomics, gene expression, exome sequencing, Bioinformatics, and Metabolomics. I have deep expertise in statistical genetics software programs and developing new methods for genomics data. In addition, I am interested in developing methods for next generation sequencing technology including Exome sequencing, genome-wide methylation, metabolomics, and RNA-Seq data types. I am also a PI of funded educational programs, R25, to deliver national short courses in statistical genetics/genomics (R25 GM093044 (Tiwari)) and short courses on Next-Generation Sequencing Technology and Statistical Methods (R25HG006110 (Tiwari)) and co-PI on "UAB Metabolomics workshop: From design to decision" (PI: Barnes; 1R25GM103798-01). I have excellent record of mentoring. I have mentored/ co-mentored 11 post-doctoral fellows who have themselves become successful researchers. Currently, I am mentoring/co-mentoring 1 post-doctoral and 2 pre-doctoral fellows. I had 4 pre-doctoral fellows graduated and have worked as a dissertation committee member on several fellows including pre-docs from Department of Biostatistics, Epidemiology, and School of Medicine. I am a PI of NHLBI funded pre-doctoral T32 training program in biostatistics (T32HL79888) and also director of the post-doctoral T32 training program in the statistical genetics (T32HL072757). Also, I have experience mentoring students and junior faculty remotely through Skype or Go To meeting. For example I mentored Dr. Lemas from the University of Alaska at Fairbanks and currently mentoring a biostatistics graduate student Ms. Lindsay Waite Jones from HudsonAlpha Biotechnology at Huntsville, Alabama. I have been on several ad hoc or full members of NIH study sections. With my experience in mentoring, teaching, reviewer in many NIH study sections, I am well qualified and is highly enthusiastic about participating in training grant proposal as a mentor/ co-mentor.

B. Positions and Honors

1986 – 1988 Visiting Assistant Professor of Mathematics, University of Notre Dame, Indiana
1988 – 1990 Visiting Assistant Professor of mathematics, Loyola University of Chicago, Chicago, Illinois
1990 – 1993 Asst. Prof. of Mathematics and Computer Science, University of Maine, Fort Kent, Maine
1996 – 1999 Senior Instructor, Department of Epi and Biostatistics, CWRU, Cleveland, Ohio
1999 – 2001 Asst. Prof., Department of Epi and Biostatistics, CWRU, Cleveland, Ohio
2002 – 2006 Assistant Professor, Section on Statistical Genetics, Department Biostatistics, & Department of Pathology, University of Alabama at Birmingham, Birmingham, Alabama

2006 – 2011 Associate Professor, Section on Statistical Genetics, Department Biostatistics, University of Alabama at Birmingham, Birmingham, Alabama
2011 – Professor and Head of Section on Statistical Genetics, UAB
2010 – William "Student: Sealy Gosset Professor in Biostatistics in the School of Public Health, University of Alabama at Birmingham, Birmingham, Alabama

Other Experience

2002 – 2006 Charter Member of NAME Study Section (formally known as ECDA), CSR,NIH
2010 – 2013 Member of CIDR Study Section NIH/NHGRI

C. Contributions to Science

I have published more than 100 peer-reviewed papers including methodological work, collaborative work, and review work. A complete listing can be found in my full CV at: http://www.soph.uab.edu/ssg/people/tiwari.

Statistical Genetics Methods Development. Since 1995, I have had privilege to work on most challenging problems in statistical genetics. For example, in 1998, I developed a new simple method to derive the theoretical expectations of variance components in multilocus epistatic models. Using simple matrix algebra and calculus, I derived a formulation of any n-dimensional multilocus variance components using only n-1 variance components recursively. The purpose of this paper was to give a simple general formulation to derive the additive, dominant, and epistatic effects, and hence the corresponding variance components, for any multilocus model. This manuscript was published in Theoretical Population Biology, a premier journal of mathematical population biology. This formulation also helped in developing GxG interaction extension to Haseman-Elston's seminal paper for non-parametric linkage analysis. I also developed new joint covariance- and marginal-based tests of association and linkage for quantitative traits for random and non-random-sampling. These joint tests of linkage and association utilized information in both the covariance (and more generally, dependency) between genotype and phenotype and the marginal distribution of genotype and are powerful tests for linkage and association. Calculating power is an essential part of any genetic study to determine whether any meaningful results will be obtained with a given sample size and other parameters. There are many tools available to calculate power. However, some situations may require study-specific simulations using given parameters such as sample size, mode of inheritance, allele frequency of the disease and marker, etc. The simulations could be computationally extensive as well as time consuming and could take several weeks to months depending on the nature of the study. We developed a simple method to rapidly estimate power based on asymptotic theory using other available studies similar to the study of interest to the investigator.

a. **Tiwari HK**, Elston RC (1997): Linkage of Multilocus Components of Variance to Polymorphic Markers. Ann *Hum Genet* 61: 253-261. PMID: 9250354
b. **Tiwari HK**, Elston RC (1998): Restrictions on Components of Variance for Epistatic Models. *Theor Popul Biol.* 54:161-174. PMID: 9733657
c. **Tiwari HK**, Holt J, George V, Beasley TM, Amos CI, Allison DB (2005): New Joint Covariance- and Marginal-based Tests for Association & Linkage for Quantitative Traits for random and non-random sampling. Genet Epidemiol 28(1): 48-57. PMID: 15558568
d. **Tiwari HK**, Birkner T, Moondan A, Zhang S, Page GP, Patki A, Allison DB (2011). Accurate and Flexible Power: Calculations on the Spot: Applications to Genomic Research. *Statistics and Its Interface*. Volume 4 (2011) 353-358. PMCID: PMC3196559.

In recent years, my focus has been assisting post- or pre-doctoral students in developing methods pertaining to current research. Often measurement errors lead to invalid admixture coefficients due to missing data and can result in false positive associations in gene mapping. We used multiple imputation (MI) as a tool for correcting measurement error problems in structured association tests (SAT) linear models with emphasis on correcting measurement error contaminated admixture estimates. The admixture coefficients are commonly used in genetic analyses to correct for population substructure. Also, most of the methods use only autosomal chromosomes to correct for substructure. We developed a method that can use both autosomal and Y-chromosome to improve correction for population stratification. Below is the examples of my publications with post- or pre-doctoral students in statistical genetics/ genomics.

a. Padilla MA, Divers J, Vaughan LK, Allison DB, **Tiwari HK**. Multiple Imputation to Correct for Measurement Error in Genetic Structured Association Testing. *Hum Hered*. 2009 Apr 1;68(1): 65-72. PMCID: PMC2716289
b. Wineinger NE, Pajewski NM, **Tiwari HK**. A method for assessing linkage disequilibrium between CNVs and SNPs inside CNVRs. *Front Genet*. 2011 Apr 25;2(17). pii: 00017. PMCID: PMC3109359.
c. Wineinger NE, **Tiwari HK**. The impact of errors in copy number variation detection algorithms on association results. PLoS One. 2012;7(4):e32396. Epub 2012 Apr 16. PMCID: PMC3327691
d. Makowsky R, Yan Q, Wiener HW, Sandel M, Aissani B, **Tiwari HK**, Shrestha S. The utility of mitochondrial and Y chromosome phylogenetic data to improve correction for population stratification. Front Genet. 2012;3:301. doi: 10.3389/fgene.2012.00301. Epub 2012 Dec 21. PMCID: PMC3527715

Currently, I have been developing new optimal association test for methylation data correcting for cell purity with a trainee and developing an optimal method of association in gene mapping for the count data as outcome, specifically when the count data follows zero-inflated negative binomial distribution.

Collaborative Research. I have had extensive record of productive collaborations in searching for genes for obesity, cardiovascular diseases, Rheumatoid Arthritis, SLE, Stroke, and Multiple Sclerosis, to name few. I have served as a lead statistical geneticist in several collaborative projects. My role has been as collaborative scientist to design the study and if funded use most optimal method of analysis. I always test a method through simulations for validity and power before using it for the analysis. Some of the long collaborations have been very productive and have resulted in several papers. Below is few examples of these collaborative publications.

a. Chung WK, Patki A, Matsuoka N, Boyer BB, Liu N, Musani SK, Goropashnaya AV, Tan PL, Katsanis N, Johnson SB, Gregersen PK, Allison DB, Leibel RL, **Tiwari HK**. Analysis of 30 Genes (355 SNPS) Related to Energy Homeostasis for Association with Adiposity in European-American and Yup'ik Eskimo Populations. Hum Hered. 2009;67(3):193-205. PMCID: PMC2715950
b. Arnett DK, Meyers KJ, Devereux RB, **Tiwari HK**, Gu CC, Vaughan LK, Perry RT, Patki A, Claas SA, Sun YV, Broeckel U, Kardia SL. Genetic Variation in NCAM1 Contributes to Left Ventricular Wall Thickness in Hypertensive Families. *Circ Res*. 2011 Jan 6. PMCID: PMC3328104.
c. Gibson AW, Li FJ, Wu J, Edberg JC, Su K, Cafardi J, Wiener H, **Tiwari H**, Kimberly RP, Davis RS. The FCRL3 -169CT promoter single-nucleotide polymorphism, which is associated with systemic lupus erythematosus in a Japanese population, predicts expression of receptor protein on CD19+B cells. *Arthritis Rheum*. 2009 Nov;60(11):3510-2. PMCID: PMC2784265
d. Vaughan LK, Wiener HW, Aslibekyan S, Allison DB, Havel PJ, Stanhope KL, O'Brien DM, Hopkins SE, Lemas DJ, Boyer BB, **Tiwari HK**. Linkage and association analysis of obesity traits reveals novel loci and interactions with dietary n-3 fatty acids in an Alaska Native (Yup'ik) population. Metabolism. 2015 Mar 5. pii: S0026-0495(15)00061-X. doi: 10.1016/j.metabol.2015.02.008. [Epub ahead of print] PMCID: PMC4408244

Reviews of current topics. Reviews are most time consuming manuscripts to write, but they provide all the information in one place and are great service to scientific community. Of course, they require vast knowledge of the topic in question and an author's ability to summarize the large body of work by others in succinct form. Thus, reviews are also very important as methodological work. Here we provide two examples of reviews, one I as a first author and other with my student as a first author.

After publication of a seminal manuscript by Spielman *et al.* (1995) on Transmission Disequilibrium Tests (TDT) for linkage in the presence of association, there have been ~225 published extensions and variations of the original TDT. In this review article, we summarized this large body of work based mainly on four categories: (1) relaxing the requirement of only two alleles at the marker locus; (2) relaxing the requirement of the trait to be dichotomous; (3) relaxing the requirement of a parent/offspring trio design and (4) extension to using genotype information from the X-chromosome (X-linked TDT). Other extensions to the TDT included multiple loci, Bayesian TDT, multiple phenotypes, parent of origin/imprinting effects, inbreeding, TDT for haplotypes, censored data, simultaneous and separately modeling of the linkage and association parameters, and other variations to increase power; we chose to focus this review mostly on the four main categories with some discussion of the other extensions.

a. **Tiwari HK**, Barnholtz-Sloan J, Wineinger N, Padilla MA, Vaughan LK, Allison DB. Review and evaluation of methods correcting for population stratification with a focus on underlying statistical principles. *Hum Hered*. 2009; 66(2):67-86. PMCID: PMC2803696

As with any genetic association analysis, the goal of a CNV association analysis is to find structural genetic variants that affect the disease phenotype of interest. While the technology exists for CNV genotyping, a further understanding and discussion of how to use the CNV data for association analyses was warranted. In this invited review with my past PhD student as a first author, we presented the options available for processing and analyzing CNV data. We partitioned the manuscript into choice of genotyping platform, normalization of the array data, calling algorithm, and statistical analysis.

a. Wineinger N, Kennedy R, Erickson S, Wojcynski M, Bruder C, **Tiwari HK** (2008): Statistical Issues in the Analysis of DNA Copy Number Variations Data. *Int J Computational Biology and Drug Design* 1(4): 368-395. PMCID: PMC2747762

D. Research Support

Ongoing Research Support

NIH R25 GM093044 (Tiwari) 08/01/10 – 07/31/15
NIH/NIGMS
Short Course on Statistical Genetics and Genomics
To offer an annual statistical genetics short course to be focused on applying advanced quantitative approaches to the search for genes that predispose complex human disorders and quantitative traits.
Role: Principal investigator

NIH R25 HG006110 (Tiwari) 04/01/11 – 03/31/17
NIH/NHGRI
Short Course on Next-Generation Sequencing Technology and Statistical Methods
To offer an annual short course focused on technological and statistical approaches pertaining to next-generation sequencing applied to complex human disorders and quantitative traits.

Role: Principal investigator

NIH R25 GM103798 (Barnes) 09/18/12 – 08/31/17
NIH/NIGMS
UAB Metabolomics workshop: From decision to design
To offer an annual 4 day metabolomics workshop to prepare investigators to advance the use of metabolomics in translational research and to direct highly interdisciplinary teams or collaborations in metabolomic studies.
Role: Co-Principal investigator

NIH R01 HL055673 (Arnett) 08/10/96 – 04/30/17
NIH/NHLBI
HyperGEN: Genetics of left ventricular hypertrophy
Conduct Whole exome sequence (WES) 1,200 AA unrelated hypertensives with extreme values for echocardiographic LV mass/hgt2.7 to identify rare and low-frequency variants contributing to LV mass and related structural and functional phenotypes.
Role: Co-Investigator

R01 HL104135 (Arnett) 08/15/10-05/31/15
NIH/NHLBI
Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate
This study aims to discover the epigenetic factors that cause people's bodies to respond so differently to diet and drugs with the belief that such knowledge could ultimately help lower people's risk for cardiovascular disease.
Role: Co-investigator

NIH R01 (Brown) 07/01/14 – 06/30/19
NIH/NIAMS
Association of genetic and autoantibody signatures with SLE clinical course

The purpose of this study is to characterize complex interactions between variation in DNA sequence and autoantibody profiles with the rate of progression and severity of lupus-associated nephritis and severe organ damage, which are more common among ethnic minorities. The knowledge gained from this study may help us to lower the risk of lupus-related clinical manifestations and to manage and treat it more effectively.

Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: TRYGVE TOLLEFSBOL, Ph.D., D.O.

eRA COMMONS USER NAME (credential, e.g., agency login): Trygve

POSITION TITLE: Professor; Senior Scientist; Director

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Houston	B.S.	05/1974	Biology
University of North Texas Health Sciences Center	D.O., Ph.D.	05/1979; 05/1982	Medicine; Molecular Biology
Duke University Medical Center	Postdoc	05/1984	Molecular Biology

A. Personal Statement

Among of my current positions are Professor of Biology and Senior Scientist in the Comprehensive Cancer Center, Comprehensive Center for Healthy Aging, Nutrition Obesity Research Center, and the Comprehensive Diabetes Center at the University of Alabama at Birmingham (UAB) as well as Director of the Cell Senescence Culture Facility. I hold doctorate degrees in molecular biology and osteopathic medicine, trained with members of the *National Academy of Sciences* at Duke University and the University of North Carolina and have published over 120 articles. In 2006 I was highlighted as part of the 25th anniversary of the AFAR for significant contributions to research. Our research has been covered in *Women's Health* magazine, *Shape* magazine, *AICR Newsletter, AARP The Magazine*, *More* magazine, and *Nutrition Action HealthLetter* (collective circulation of >30 million readers) and I have been featured as an *Investigator in the Spotlight* by the NIH (*Nutrition Frontiers* 5, 3, 2014) as well as a *Scientist in the Spotlight* by *ScienceNow*. Currently I am Associate Editor for *Frontiers in Epigenomics*, on the Editorial Boards of *Clinical Epigenetics* and *Molecular Biotechnology*, a contributing Editor of *Lewin's GENES* classic textbook on molecular biology and the Series Editor for *Translational Epigenetics*. Over 30 of my publications have received international accolades such as best paper award, selection for press release and featured on the journal homepage. I have given invited presentations in Germany, China, Italy, Switzerland, The Netherlands, Sweden and Canada, my research has been highlighted in *eScience News* and *ScienceDaily* and I have published 12 scholarly books on topics related to this investigation. I have been investigating epigenetic mechanisms in cancer, aging and nutrition for over 25 years and have trained >40 scientists including 5 PhD or MD/PhD junior faculty, 10 postdoctoral fellows and 27 graduate students. The current application builds exceptionally well on prior experience of my laboratory.

1. Li Y, Chen H, Hardy TM, **Tollefsbol TO**. (2013) Epigenetic regulation of multiple tumor-related genes leads to suppression of breast tumorigenesis by dietary genistein. PLoS One, 8(1):e54369.
2. Li Y, Meeran SM, Patel SN, Chen H, Hardy TM, **Tollefsbol TO**. (2013) Epigenetic reactivation of estrogen receptor-α (ERα) by genistein enhances hormonal therapy sensitivity in ERα-negative breast cancer. Molecular Cancer, 12, 9.
3. Daniel M, **Tollefsbol TO**. (2015) Epigenetic linkage of aging, cancer and nutrition. Journal of Experimental Biology, 218, 59-70.
4. Sinha S, Shukla S, Khan S, **Tollefsbol T**, Meeran S. (2015) Epigenetic reactivation of p21(CIP1/WAF1) and KLOTHO by a combination of bioactive dietary supplements is partially ERα-dependent in ERα- negative human breast cancer cells. Molecular and Cellular Endocrinology, 406, 102-14.

B. Positions and Honors

Positions and Employment

1982-1984 Postdoctoral Fellow, Duke University Medical Center, Durham, NC

1984-1985	Assistant Professor; Dept. of Community Health Science, Michigan State Univ., MI
1985-1988	Assistant Research Professor; Dept. of Medicine, Duke Univ. Medical Center, Durham, NC
1989-1990	Surgical Resident, Medical Center of Central Georgia, Macon, GA
1990-1998	Senior Fellow, Dept. of Microbiology and Immunology, Univ. North Carolina at Chapel Hill, NC
1998-2004	Assistant Professor of Biology; Univ. of Alabama at Birmingham (UAB)
2004-2008	Associate Professor of Biology with tenure, UAB
2000-Present	Director, UAB Cell Senescence Culture Facility
2008-Present	Senior Scientist, UAB Comprehensive Cancer Center; UAB Nutrition Obesity Research Center; UAB Comprehensive Center for Healthy Aging; UAB Comprehensive Diabetes Center
2008-Present	Professor of Biology (tenured)

Other Experience and Selected Professional Memberships (From 2011):

2015	Member (Ad Hoc) of the NIH Center for Excellence for Research on CAM (CERC) Study Section (March 2015) [ZAT1 HS (19)]; the Oak Ridge Associated Universities Review Panel.
2014	Member (Ad Hoc) of the Oak Ridge Associated Universities Review Panel; the Luxembourg National Research Fund Review Panel; the AIRC Review Panel (Italy).
2013	Member (Ad Hoc), NIH Member Conflict SEP (ZRG1 OTC (02)), Center for Scientific Review; appointed Series Editor, *Translational Epigenetics* (Elsevier).
2012	Member (Ad Hoc), NIH Special Emphasis Omnibus Review Panel, Center for Scientific Review; the NIH Special Emphasis Panel, Center for Sci. Review [ZRG1 OTC-C (03)]; the Dr. Joseph Steiner Swiss Cancer Foundation Review Panel; the British Medical Research Council Review Panel; the Oak Ridge Associated Universities Review Panel; the Portugal Fundacao para a Ciencia e a Tecnologia Review; the French NCI Review Panel; the AIRC Review Panel.
2011	Member (Ad Hoc) of the NIH Scientific Review Committee, Chemo-Dietary Prevention (CDP), Center for Scientific Review (February and October, 2011); the AIRC Review Panel; the L'OREAL Austria Review Panel; appointed Associate Editor, *Frontiers in Epigenomics.*

Selected Recognitions and Honors (From 2011):

2015 Ireland Prize for Scholarly Distinction for leadership in epigenetics; Plenary Speaker 2014, *Thirteenth Annual AACR International Conference on Frontiers in Cancer Prevention Research*, New Orleans, LA; Invited Speaker 2014, *Center for Molecular Medicine, Karolinska Institute*, Sweden; Plenary Speaker 2014, *Journal of Experimental Biology Symposium: Epigenetics in Comparative Physiology*, Canada; Plenary Speaker 2013, *American Council for Medicinally Active Plants 4th Annual Conference*, Amherst, MA; Distinguished Speaker 2012, *Genomics Research-2012 Conference*, Boston, MA; Plenary Speaker 2012, *International Conference: Advances in Nutrition and Cancer,* Naples, Italy; Keynote Speaker, 2011 *International Clinical Epigenetics Conference*, Germany; Plenary Speaker, 2011 *European Laboratory for Nutrients Symposium*, The Hague; Plenary Speaker, *Annual World Congress of Molecular & Cellular Biology*, Beijing, China 2011.

C. Contributions to Science.

The following are selected from a total of >120 peer-reviewed publications. The Tollefsbol lab has published >40 peer-reviewed articles in the past 5 years which have appeared in leading journals such as *FASEB Journal, BMC Medicine, PLoS ONE, Molecular Cancer, Experimental Cell Research, Journal of Cellular Physiology, American Association of Pharmaceutical Sciences (AAPS) Journal, Clinical Epigenetics, Current Medicinal Chemistry* and *Cancer Prevention Research*. I have also published 12 books on our research areas.

1. **Contributions to pioneering ideas on the role of epigenetics in cancer, aging and nutrition.** Early in my career, I became fascinated with the role of epigenetics in cancer, aging and nutrition. I have contributed a number of publications that helped pioneer the role of epigenetic mechanisms in these processes and I received the *2015 Ireland Prize for Scholarly Distinction* for leadership in the field of epigenetics (https://www.uab.edu/news/faculty/item/5850-epigenetics-leader-named-recipient-of-uab-s-ireland-prize-for-scholarly-distinction). In 1993 I was the lead author of a theoretical paper that proposed mechanisms for an important role of *de novo* methylation-mediated gene silencing in cancer and aging **(a).** This was soon documented experimentally (*Nat. Genet.* 7, 536-540). Thousands of articles have since confirmed the importance of gene silencing by *de novo* methylation in cancer, aging and nutrition. My laboratory also provided a key paper on mechanisms for epigenetic changes in cancer and aging. We showed that the *de novo* methyltransferases (DNMTs) increase in immortalized precancerous cells contributing to gene silencing in cancer. We also found that a decline in DNMT1 plays a major role in the loss of DNA methylation in aging **(b).** Further, we developed the idea that an important mechanism for changes in the DNMTs during cancer and aging may be due DNMTs transcription and showed that this has a key role in neoplastically transformed and aging

cells **(c).** One of the most important genes in cancer and aging is telomerase reverse transcriptase (*hTERT*) which was the topic of the *2009 Nobel Prize in Physiology* or *Medicine.* We published a theoretical paper in 2001 where we proposed mechanisms for epigenetic control of the *hTERT* gene in these processes **(d).** Many laboratories world-wide have since shown that epigenetic mechanisms play a key role in the regulation of telomerase in cancer, aging and nutrition. These as well as other early publications from my work have contributed to pioneering idea development with respect to the role of epigenetics in cancer and aging.

a. **Tollefsbol TO**, Andrews LG. (1993) Mechanisms for methylation-mediated gene silencing and aging. Medical Hypotheses, 41(1), 83-92.

b. Lopatina N, Haskell J, Andrews L, Poole J, Saldanha S, **Tollefsbol T**. (2002) Differential maintenance and *de novo* methylating activity by three DNA methyltransferases in aging and immortalized fibroblasts. Journal of Cellular Biochemistry, 84(2), 324-34. *Faculty of 1000 recognition.*

c. Casillas MA Jr, Lopatina N, Andrews LG, **Tollefsbol TO**. (2003) Transcriptional control of the DNA methyltransferases is altered in aging and neoplastically-transformed human fibroblasts. Molecular and Cellular Biochemistry, 252(1-2), 33-43. *Among the most "important or provocative articles by noted experts" in the field of gene expression and gene therapy (J. Anti-aging Med 6, 344, 2003).*

d. **Tollefsbol TO**, Andrews LG. (2001) Mechanisms for telomerase gene control in aging cells and tumorigenesis. Medical Hypotheses,56(6), 630-7.

2. <u>Innovative methodology development in epigenetics, nutrition, cancer and aging</u>. Since the early 1990s I have been involved in the development of innovative technology and have contributed many publications as well as 5 *Methods in Molecular Biology* books devoted to technological innovations. Early in the field of epigenetics we performed the first expression of *Dnmt1* in *E. coli* **(a).** This innovation also introduced the concept of potential applications for preserving methylation patterns of cloned DNA in *E. coli*. In addition, in a joint first-authored paper in PNAS, I participated in the first report of gene resurrection through a novel epigenetic phylogenetic analyses. Using rate of loss of CpG methylation though deamination and replacement of these defects, we revived an extinct LINES1 gene when expressed in eukaryotic cells **(b).** More recently, my laboratory has invented a technique referred to as chromatin immunoprecipitation-genomic bisulfite sequencing (ChIP-GBS). This novel technique allows for analyses of histone modifications and DNA methylation in one experiment which greatly increases accuracy, decreases labor, facilitates interpretations of cross-talk between DNA methylation and histone modifications and has broad applications **(c).** My lab also developed a novel approach to analyzing the impact of caloric restriction on aging and precancerous mammalian cells and the epigenetic role in this process. Using human cultured cells we discovered that glucose restriction impacts epigenetic processes in human cells which extends the lifespan of normal cells and induces apoptosis of precancerous cells **(d).** These novel techniques stimulated the concept that sugar reduction may be important for increased health by influencing epigenetic processes and have broad implications in nutrition, cancer, aging and epigenetics.

a. **Tollefsbol TO**, Hutchison CA 3rd. (1995) Mammalian DNA (cytosine-5-)-methyltransferase expressed in *Escherichia coli*, purified and characterized. Journal of Biological Chemistry, 270(31), 18543-50.

b. Adey NB*, **Tollefsbol TO***, Sparks AB, Edgell MH, Hutchison CA 3rd. (1994) Molecular resurrection of an extinct ancestral promoter for mouse L1. Proceedings of the National Academy of Sciences, U S A, 91(4), 1569-73. (*Joint first-authors). *Commentary,* Science *264, 27, 1994.*

c. Li Y, **Tollefsbol TO**. (2011) Combined chromatin immunoprecipitation and bisulfite methylation sequencing analysis. Methods in Molecular Biology, 791, 239-51.

d. Li Y, Liu L, **Tollefsbol TO**. (2010) Glucose restriction can extend normal cell lifespan and impair precancerous cell growth through epigenetic control of *hTERT* and *p16* expression. **FASEB Journal**, 24(5), 1442-53. ***Selected by FASEB J. editors for press release. Several hundred news articles (e.g., Science News Online).* Awarded "best paper" in nutrition (*Science Unbound Foundation).***

3. <u>Leadership in discoveries in dietary epigenetics of cancer prevention and therapy</u>. For over a decade my laboratory has extensively published on the epigenetics and epigenomics of dietary prevention of cancer and in 2011 in a paper in *Epigenomics*, we coined the term "epigenetics diet". We discovered that sulforaphane (SFN) from cruciferous vegetables leads to the down-regulation of the *hTERT* gene through epigenetic mechanisms in cancer cells causing apoptosis. SFN was found to modify the epigenetic expression of *hTERT* in cancer cells that silences this gene. This study suggested that consumption of cruciferous vegetables may prevent cancer through epigenetic control of telomerase **(a).** We have also shown that key bioactive compounds comprising the epigenetics diet can reactivate ERα in ER-negative [ER(-)] breast cancer which is the most fatal of the breast cancers. Some components of the epigenetics diet reactivate ER expression in ER(-) breast cancer that renders these cells susceptible to tamoxifen (TAM) **(b).** Since TAM is FDA-approved for prevention of breast cancer in high-risk women, these findings also have importance to cancer prevention.

We also found that combinatorial approaches using green tea polyphenols (GTPs) and a histone deactylase (HDAC) inhibitor have highly synergistic effects of ERα reactivation in breast cancer cells **(c).** Moreover, we have discovered that epigenetic-modulating dietary GTP epigallocatechin gallate (EGCG) combined with HDAC-inhibiting sodium butyrate at low and physiologically achievable concentrations leads to cell cycle arrest and DNA damage in cancer cells **(d).** The combinatorial analyses are important since they confer less risk of toxicity and higher compliance due to lower dosages.

a. Meeran SM, Patel SN, **Tollefsbol TO**. (2010) Sulforaphane causes epigenetic repression of hTERT expression in human breast cancer cell lines. PLoS One 5(7):e11457. *News article in AICR ScienceNow, 34, 4, 2010, "Finding the Cruciferous Cancer-Prevention Link".*

b. Li Y, Meeran SM, Patel SN, Chen H, Hardy TM, **Tollefsbol TO**. (2013) Epigenetic reactivation of estrogen receptor-α (ERα) by genistein enhances hormonal therapy sensitivity in ERα-negative breast cancer. Molecular Cancer, 12, 9. *Featured in MDLinx as news article highlighting this paper. "Highly Accessed" status.*

c. Li Y, Yuan YY, Meeran SM, **Tollefsbol TO**. (2010) Synergistic epigenetic reactivation of estrogen receptor-α (ERα) by combined green tea polyphenol and histone deacetylase inhibitor in ERα-negative breast cancer cells. Molecular Cancer, 9, 274. ***"Highly Accessed" status. Also, subject of news article in MDLinx Editorial Team, 2010.***

d. Saldanha SN, Kala R, **Tollefsbol TO**. (2014) Molecular mechanisms for inhibition of colon cancer cells by combined epigenetic-modulating epigallocatechin gallate and sodium butyrate. Experimental Cell Research**,** 324(1):40-53.

4. <u>Novel advances in epigenetic and epigenomic gene regulation applied to cancer and nutrition</u>. Our studies have contributed novel findings in the molecular mechanisms of epigenetic and epigenomic gene control in nutrition and cancer. We established numerous mechanisms for control of methylation spreading that play important roles in gene silencing in cancer, aging and nutrition **(a).** In addition, using an innovative neoplastic transformation system of breast cells, we discovered that genome-wide methylation occurs especially in developmentally related genes during neoplasia and that the timing of major methylomic changes may be important in directing the cell toward a cancerous phenotype **(b).** The epigenetic polycomb group protein BMI1 is important in cancer stem cell gene regulation and we discovered that BMI1 is crucial for the short-term survival of cancer cells which provides a foundation for developing a cancer-specific therapy targeting BMI1 **(c).** We have also discovered that novel epigenetic mechanisms of gene control are important with respect to combinatorial dietary preventive compounds. Using GTPs and SFN, we found that this combination led to changes in *ERα*-transcriptional co-repressor complex binding thereby contributing to ERα-reactivation in ER(-) breast cancer cells and TAM sensitivity **(d).** These latter studies illustrate the importance of novel epigenetic mechanisms of gene control in nutrition for cancer prevention and therapy.

a. **Tollefsbol TO**, Hutchison CA 3rd. (1997) Control of methylation spreading in synthetic DNA sequences by the murine DNA methyltransferase. Journal of Molecular Biology, 269(4), 494-504.

b. Mitchell NE, Wilson ML, Bray MS, Crossman DK, **Tollefsbol TO**. (2013) Real-time methylomic aberrations during initiation and progression of induced human mammary epithelial cell tumorigenesis. Epigenomics, 5(2), 155-65.

c. Liu L, Andrews LG, **Tollefsbol TO**. (2006) Loss of the human polycomb group protein BMI1 promotes cancer-specific cell death. Oncogene, 25(31), 4370-5.

d. Meeran S, Patel S, Li Y, Shukla S, **Tollefsbol TO**. (2012) Bioactive dietary supplements reactivate ER expression in ER-negative breast cancer cells by active chromatin modifications. PLoS One, 7(5):e37748.

5. <u>Scholarly leadership in epigenetics, cancer, aging and telomerase</u>. Since 2004 I have created (edited and co-authored) 12 books on epigenetics, cancer, aging and telomerase which have contributed significantly to the scholarship in these fields. It is my belief that scholarly contributions such as these facilitate discoveries especially by those newer to these areas of study. Four of these 12 books appear below.

a. *Cancer Epigenetics.* (2008) **Tollefsbol, T.O.** (ed.) CRC Press (Taylor & Francis Group), (ISBN 9781420045796). 446 pages. *"This is an excellent book on cancer epigenetics that will be of value to clinical scientists, postgraduate students, postdoctoral fellows, and basic scientists who wish to conduct basic or translational cancer research…".* Gastroenterology 137, 2177-2178, 2009.

b. *Handbook of Epigenetics: The New Molecular and Medical Genetics.* (2011) ***Tollefsbol, T.O.*** *(ed.) Academic Press (ISBN 978-0-12-375709-8). 624 pages. "This book is wonderful… Human-oriented articles…emphasize how many abnormalities, and even diseases, are epigenetically-based, completing a most impressive tome."---BIOLOGIST, 2011.*

c. *Epigenetics of Aging*. (2010) **Tollefsbol, T.O.** (ed.) Springer, (ISBN 978-1-4419-0638-0; e-ISBN 978-4419-0639-7). 469 pages. "*Epigenetics of Aging" reminds us that mysterious and fascinating processes govern the last phase of life in all organisms*." *Nature*, 2010.
d. *Transgenerational Epigenetics: Evidence and Debate.* (2014) **Tollefsbol, T.O.** (ed.) Academic Press (ISBN: 978-0124059443). 396 pages. "Wonderfully designed and full of provocative subjects....This book is the first to be devoted in its entirety to transgenerational epigenetics." Doody's Book Reviews.

Figure 1. Scholarly books by Dr. Tollefsbol and colleagues.

Complete List of Published Work in My Bibliograph:
http://www.ncbi.nlm.nih.gov/sites/myncbi/trygve.tollefsbol.1/bibliograpahy/40326843/public/?sort=date&direction=ascending

D. Research Support.
Ongoing Research Support

R01 CA178441 Tollefsbol (PI)
National Institutes of Health (NCI) 4/01/13-2/28/2019
Combinatorial epigenetic-based prevention of breast cancer
The goal is to assess the epigenomics of combined EGCG and sulforaphane in adult breast cancer prevention.
Role: PI Overlap: None (scored in 4th percentile)

Grant #316184 Tollefsbol (PI)
American Institute for Cancer Research 1/01/15-12/31/2016
Epigenetics of early life exposure to cancer preventive cruciferous vegetables
The goal is to assess the epigenomics of sulforaphane in breast cancer prevention at various stages of life.
Role: PI Overlap: None (score of 138)

R03 CA129415 Li (PI)
National Institutes of Health (NCI) 9/20/13-9/19/2015
Maternal epigenetic dietary effects in transgenerational breast cancer prevention
The goal is to assess the effects of maternal genistein during pregnancy on transgenerational breast cancer.
Role: Co-investigator Overlap: None

Research Grant Tollefsbol (PI) 10/01/2005-9/30/2015
Comprehensive Center for Healthy Aging
Cell Senescence Culture Facility
The goal is to provide a cell culture facility for growing of cells for aging research.
Role; PI Overlap: None

SELECTED Completed Research Support (Partial list for completed grants during the last 3 years)
R01 CA129415 Tollefsbol (PI) 4/1/08-1/31/2013
NIH/NCI
Epigenetics of tea polyphenols in cancer prevention

Research Grant Tollefsbol (PI)
American Institute for Cancer Research 1/1/11-12/31/12
Green tea polyphenols in the prevention of breast cancer initiation

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Townes, Tim M.

eRA COMMONS USER NAME (credential, e.g., agency login): ttownes

POSITION TITLE: Professor and Chairman

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Tennessee, Knoxville	B.S.	05/73	Zoology
University of Tennessee, Knoxville	M.S.	05/76	Biology
University of Tennessee, Knoxville	Ph.D.	12/80	Microbiology
University of Cincinnati, School of Medicine	Postdoc	07/84	Biochemistry

A. Personal Statement

Dr. Townes is Director of the UAB Stem Cell Institute and Chairman of the Department of Biochemistry and Molecular Genetics at the UAB Schools of Medicine and Dentistry. The major research interest of Dr. Townes' laboratory is the regulation of gene expression during development. He studies the human hemoglobin genes as a model system and translates the understanding of basic mechanisms of globin gene regulation into strategies to correct hemoglobinopathies such as sickle cell disease. His paper in Nature Genetics [Nature genetics. 2010; 42(9):742-4] provides new insights into the mechanism of hemoglobin switching and provides a foundation for new drug therapies. A report from his laboratory in collaboration with Rudolf Jaenisch [Science (New York, N.Y.). 2007; 318(5858):1920-3] demonstrates the conversion of skin cells into induced pluripotent stem cells (iPSCs), the efficient correction of the sickle gene, and a safe and effective cure for sickle cell disease in a humanized mouse model. In recent studies, Dr. Townes' group has used CRISPR/Cas enhanced gene replacement to correct mutations in iPSCs derived from skin fibroblasts of UAB patients with Sickle Cell Disease (SCD) and Severe Combined Immunodeficiency (SCID). These results suggest that safe and effective cell therapies can be developed for a number of hereditary and acquired blood disorders.

B. Positions and Honors

1984-1989 Assistant Professor, UAB Department of Biochemistry
1989-1992 Associate Professor, UAB Department of Biochemistry
1992- Professor, UAB Department of Biochemistry and Molecular Genetics
2001- Chairman, UAB Department of Biochemistry and Molecular Genetics
2009- Director, UAB Stem Cell Institute

Positions and Employment

1984-1989 Assistant Professor, UAB Department of Biochemistry
1989-1992 Associate Professor, UAB Department of Biochemistry
1992- Professor, UAB Department of Biochemistry and Molecular Genetics
2001- Chairman, UAB Department of Biochemistry and Molecular Genetics
2009- Director, UAB Stem Cell Institute

Other Experience and Professional Memberships

1986- Numerous Ad Hoc NIH grant review committees
1998-2002 NIH, Sickle Cell Disease Advisory Group
2002-2006 NIH, ELB (formerly Hematology-1) study section
2010- NIH College of CSR Reviewers
2011- NIDDK Board of Advisors; Chairman, 2014-

Honors

2001 - James C. and Elizabeth T. Lee Chair

C. Contribution to Science

The contributions/accomplishments of Dr. Townes and his students, postdoctoral fellows and collaborators include:

(1) the first transgenic mice that express a correctly regulated human gene (a); the first mice that express functional human hemoglobin A and S (b,c); the first knockout mouse model of beta-thalassemia (d)

a. **Townes TM**, Lingrel JB, Chen HY, Brinster RL, Palmiter RD. Erythroid-specific expression of human beta-globin genes in transgenic mice. The EMBO Journal 1985; 4(7):1715-23. PMID: 2992937; PMCID: PMC554408
b. Behringer RR, Ryan TM, Reilly MP, Asakura T, Palmiter RD, Brinster RL, **Townes TM**. Synthesis of functional human hemoglobin in transgenic mice. Science. 1989 ; 245(4921):971-3. PMID: 2772649
c. Ryan TM, **Townes TM**, Reilly MP, Asakura T, Palmiter RD, Brinster RL, Behringer RR. Human sickle hemoglobin in transgenic mice. Science. 1990; 247(4942):566-8. PMID: 2154033
d. Ciavatta DJ, Ryan TM, Farmer SC, **Townes TM**. Mouse model of human beta zero thalassemia: targeted deletion of the mouse beta maj- and beta min-globin genes in embryonic stem cells. Proc Natl Acad Sci U S A. 1995; 92(20):9259-63. PMID: 7568113; PMCID: PMC40964

(2) the competition model of human hemoglobin switching during development (a,b); and the first demonstration of a protein directly involved in the competitive switch from human fetal to adult hemoglobin (c,d)

a. Behringer RR, Ryan TM, Palmiter RD, Brinster RL, **Townes TM**. Human gamma- to beta-globin gene switching in transgenic mice. Genes Dev. 1990; 4(3):380-9. PMID: 1692558
b. **Townes TM**, Behringer RR. Human globin locus activation region (LAR): role in temporal control. Trends Genet. 1990 Jul;6(7):219-23. PMID: 2202110
c. Donze D, **Townes TM**, Bieker JJ. Role of erythroid Kruppel-like factor in human gamma- to beta-globin gene switching. J Biol Chem. 1995; 270(4):1955-9. PMID: 7829533
d. Zhou D, Liu K, Sun CW, Pawlik KM, Townes TM. KLF1 regulates BCL11A expression and gamma- to beta-globin gene switching. Nat Genet. 2010; 42(9):742-4. PMID: 20676097

(3) an early example of molecular memory in mammalian cells by reversible histone modification (a)

a. Chen WY, **Townes TM**. Molecular mechanism for silencing virally transduced genes involves histone deacetylation and chromatin condensation. Proc Natl Acad Sci U S A. 2000; 97(1):377-82. PMID: 10618426; PMCID: PMC26671

(4) the first mouse model of sickle cell disease (a) ; and the first correction of a disease utilizing induced pluripotent stem cells (iPS cells) and the first demonstration of homologous recombination in iPS cells (collaboration with Jacob Hanna and Rudolf Jaenisch at MIT) (b)

a. Ryan TM, Ciavatta DJ, **Townes TM**. Knockout-transgenic mouse model of sickle cell disease. Science. 1997; 278(5339):873-6. PMID: 9346487
b. Hanna J, Wernig M, Markoulaki S, Sun CW, Meissner A, Cassady JP, Beard C, Brambrink T, Wu LC, **Townes TM**, Jaenisch R. Treatment of sickle cell anemia mouse model with iPS cells generated from autologous skin. Science 2007; 318(5858):1920-3. PMID: 18063756

(5) the first demonstration of a broad T-Cell Receptor repertoire in T-lymphocytes derived from human induced pluripotent stem cells (a)

a. Chang CW, Lai YS, Lamb LS Jr, Townes TM. Broad T-cell receptor repertoire in T-lymphocytes derived from human induced pluripotent stem cells. PLoS One. 2014; 9(5):e97335. PMID: 24828440; PMCID: PMC4020825

Complete List of Published Work in MyBibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/1BGNwo4d005Q6/bibliography/48021819/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

R01 DK073391 Townes (PI) 07/01/12-06/30/16
Human Globin Gene Regulation During Development
The goal of this grant is to understand the role of Friend-Of-KLF1 (FOKLF) in beta-globin gene expression.
No overlap with present application.

Pending

R01 HL130794 Townes (PI) 12/01/2015-11/30/2020
CRISPR/Cas Enhanced Gene Replacement For Sickle Cell Disease
The primary goal of this grant is to develop a safe and effective genetic therapy for sickle cell disease.
No overlap with the present proposal

R01 HL131027 Townes (PI) 12/01/2015-11/30/2020
CRISPR/Cas Enhanced Gene Replacement For Wiskott-Aldrich Syndrome
The primary goal of this grant is to develop a safe and effective genetic therapy for Wiskott-Aldrich Immunodeficiency.
No overlap with the present proposal

OMB No. 0925-0046 (Approved Through 5/31/2016)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME	POSITION TITLE
Hubert M. Tse	**Assistant Professor**
eRA COMMONS USER NAME (credential, e.g., agency login) **TSEHM10**	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Virginia Tech	B.S.	1992	Biochemistry
University of Colorado Health Sciences Center	Ph.D.	1999	Microbiology and Immunology
Colorado State University	Postdoctoral	1999-2001	Immunology
University of Pittsburgh	Postdoctoral	2001-2009	Immunology

A. Personal statement

The overall theme of my research is focused on the synergy of innate immune-derived signals such as reactive oxygen species (ROS) and pro-inflammatory cytokines in modulating T cell adaptive immune maturation and effector responses in Type 1 diabetes (T1D). Based on our preliminary data with murine models of T1D, we have initiated translational studies to further define the importance of oxidative stress and redox-dependent signals on autoimmune responses in recent onset T1D patients and healthy subjects. Specifically, we will determine if ROS synthesis will enhance anti-viral responses in monocytes and elicit a pro-inflammatory milieu necessary for diabetogenic T cell responses. I am fortunate to have been trained by two excellent mentors, Drs. Andrea Cooper and Jon Piganelli. They are both excellent teachers and have bestowed upon me the importance of training. I thoroughly enjoy being a mentor and cherish the responsibility that I have on the intellectual development of the next generation of young scientists. Throughout my years as a post-doctoral fellow and as an Assistant Professor, I have been fortunate enough to train undergraduate students, graduate students, postdoctoral fellows, and research technicians at various institutions. While at the University of Pittsburgh, I was directly involved in the mentoring and training of several graduate students (Drs. Sheila Schreiner, Martha Sklavos, Gina Coudriet, and Meghan Delmastro), research technicians, and summer undergraduate students. I was an active participant and collaborator on their research projects, helped interpret their results, and directly taught them experimental procedures and techniques. My postdoctoral training in Dr. Piganelli's laboratory provided me with the necessary skills to be an effective mentor and teacher for my own graduate students and postdoctoral fellows. Since my arrival at UAB in July 2009, the members of my research program consist of five undergraduate students (Jonathan Feng, Kristin Ellis, Ramya Singireddy, Dana Pham-Hua, Zach Koenig), two graduate students (Lindsey Padgett, Ashley Burg), two research associates (Drs. Marie Seleme and Shaonli Das), two research assistants (Weiqi Lei and Brian Anderson), and a countless number of rotation students. In addition to teaching numerous Immunology, Autoimmunity, and Redox Biology classes to the graduate students here at UAB, I also realize the importance of teaching predoctoral trainees to be effective scientific writers and to be able to present their data. I am the organizer of a Type 1 Diabetes Work in Progress meeting that will provide a forum for our trainees to present their research and to receive constructive criticism for their professional development. Below, I have included some of the manuscripts that have demonstrated my role as a mentor for various trainees.

1. Ge X, Piganelli JD, **Tse HM**, Bertera S, Mathews CE, Trucco M, Wen L, and Rudert WA (2006). Modulatory Role of DR4- to DQ8-restricted CD4 T-Cell Responses and Type 1 Diabetes Susceptibility. *Diabetes* 55:3455-3462. PMID: 17130492

2. Sklavos MM, Bertera S, **Tse HM**, Bottino R, He J, Beilke JN, Coulombe MG, Gill RG, Crapo JD, Trucco M, and Piganelli JD (2010). Redox Modulation Protects Islets from Transplant-related Injury. *Diabetes*, 59: 1731-1738. PMC2889773

3. Thayer TC, Delano M, Liu C, Chen J, Padgett LE, **Tse HM**, Annamali M, Piganelli JD, Moldawer L, and Mathews CE (2011). Superoxide Production by Macrophages and T cells is Critical for the Induction of Autoreactivity and Type 1 Diabetes. *Diabetes* 60(8):2144-2151. PMC3142064

4. Delmastro-Greenwood MM, **Tse HM**, and Piganelli JD (2014). Effects of Metalloporphyrins on Reducing Inflammation and Autoimmunity. *Antioxidants and Redox Signaling* 20(15):2465-2477. PMID: 23472672 [PMC Journal – in process]

B. Positions and Honors

Positions and Employment

1999 - 2001	Postdoctoral fellow, Mycobacterial Research Laboratories, Department of Microbiology, Colorado State University, Ft. Collins, CO
2001 - 2009	Postdoctoral fellow, Diabetes Institute, Children's Hospital of Pittsburgh, University of Pittsburgh, Pittsburgh, PA
2009 - Present	Assistant Professor, Department of Microbiology, University of Alabama at Birmingham (UAB), Birmingham, AL
2009 - Present	Scientist, Comprehensive Diabetes Center, UAB, Birmingham, AL
2009 - Present	Scientist, Comprehensive Arthritis, Musculoskeletal, and Autoimmunity Center, UAB, Birmingham, AL
2009 - Present	Scientist, Center for Free Radical Biology, UAB, Birmingham, AL
2012 - Present	Scientist, Mucosal HIV and Immunobiology Center, UAB, Birmingham, AL
2013 - Present	Associate Scientist, Center for Metabolic Bone Disease, UAB, Birmingham, AL

Other Experience and Professional Memberships

1993 – 2001	Member, American Society for Microbiology
2002 – Present	The Oxygen Society
2007 – Present	American Diabetes Association
2011 – Present	American Association of Immunologists
2012 – Present	Federation of Clinical Immunology Societies

Honors

1995	American Society for Microbiology Travel Grant
1999	Mentor: McNair Scholars Program
2002	Cochrane-Weber Award
2002	Immunology of Diabetes Society Travel Award
2003	Research Advisory Committee Postdoctoral Fellowship
2004	NIH Pediatric Loan Repayment Program Award
2004	Society for Free Radical Biology and Medicine Travel Award
2006	Society for Free Radical Biology and Medicine Travel Award
2007	9th International Congress of the IDS and ADA Research Symposium Scholarship
2009 – 2012	American Diabetes Association Junior Faculty Award
2009 – 2012	P30 Award UAB Rheumatic Diseases Core Center
2010 – 2011	P30 Award UAB Comprehensive Diabetes Center
2010 – present	T32 Immunologic Diseases and Basic Immunology Graduate student trainee slot (Harry Schroeder, PI)
2011 – 2012	P30 Award UAB Comprehensive Diabetes Center
2012 – 2013	Pilot & Feasibility Award, UAB Department of Physical Medicine and Rehabilitation
2012 – 2017	American Diabetes Association Career Development Award
2013 – 2014	P30 Award UAB Comprehensive Diabetes Center
2013	Featured on the cover of *Diabetes Forecast* (May 2013 issue)
2014	Immunology, Autoimmunity, and Transplantation Research Acceleration Award
2014	UAB institutional nominee for the ADA Pathway to Stop Diabetes Award
2014	AAI Early Career Faculty Travel Grant
2014	American Association of Immunologists Travel for Techniques Award
2014 – 2019	NIH/NIDDK R01 Award DK099550
2015	AAI Early Career Faculty Travel Grant

C. Contributions to Science

1. My early publications determined the mechanism of a novel catalytic antioxidant on macrophage responses and specifically, how a superoxide dismutase mimetic was able to dampen pro-inflammatory innate immune responses. These publications were instrumental as dissipation of oxidative stress with this catalytic antioxidant was shown to be efficacious in the treatment of various pro-inflammatory-mediated diseases including Type 1 diabetes, rheumatoid arthritis, islet transplant rejection, and spinal cord injury. Our work in defining the molecular mechanism that these catalytic antioxidants could enter into the nucleus and oxidize the NF-κB p50 DNA-binding subunit to prevent NF-κB-dependent gene transcription was instrumental in the development of newer families of catalytic antioxidants. These publications further demonstrate that dissipation of free radicals with a catalytic antioxidant is a viable immunotherapy in the treatment of diseases containing an oxidative stress component. I served as the primary author or co-author in all of these studies.

    a. **Tse HM**, Milton MJ, Piganelli JD (2004). Mechanistic Analysis of the Immunomodulatory Effects of a Catalytic Antioxidant on Antigen Presenting Cells: Implication for Their Use in Targeting Oxidation-Reduction Reactions in Innate Immunity. *Free Radical Biology and Medicine* 36:233-247. PMID: 14744635
    b. Bottino R, Balamurugan AN, **Tse H**, Thirunavukkarasu C, Ge X, Profozich J, Milton M, Ziegenfuss A, Trucco M, and Piganelli JD (2004). Response of Human Islets to Isolation Stress and the Effect of Antioxidant Treatment. *Diabetes* 53:2559-2668. PMID: 15448084
    c. **Tse HM**, Milton MJ, Schreiner S, Profozich JL, Trucco M, and Piganelli JD (2007). Disruption Of Innate-Mediated Pro-Inflammatory Cytokine And Reactive Oxygen Species Third Signal Leads To Antigen-Specific Hyporesponsiveness. *Journal of Immunology* 178:908-917. ****Cover article – January 15, 2007 Issue**** PMID: 17202352
    d. Milton-Sklavos MJ, **Tse HM**, and Piganelli JD (2008). Redox Modulation Inhibits CD8 T cell Effector Function. *Free Radical Biology and Medicine* 45:1477-1486. PMID: 18805480

2. In addition to the contributions described above, with a team of collaborators, I directly documented the importance of NADPH oxidase (NOX)-derived superoxide on autoimmune Type 1 diabetes (T1D). These studies demonstrated that the generation of free radicals had a profound role on the activation of both innate and adaptive immune responses in T1D. Importantly, the absence of NOX-derived superoxide was able to protect both spontaneous and adoptive transfer of T1D with murine models of diabetes. The synthesis of free radicals is not only involved in microbial clearance, but these noxious molecules may also impact immune maturation, development, and differentiation of autoreactive T cells and macrophages. Therapies that target the synthesis of free radicals may prove to be beneficial in modulating autoimmune responses in chronic pro-inflammatory-mediated diseases such as T1D. I served as the primary author, co-author, or primary investigator in all of these studies.

    a. **Tse HM**, Thayer TC, Steele C, Cuda CM, Martello RD, Ramiya V, Morel L, Piganelli JD, and Mathews CE (2010). NADPH Oxidase Deficiency Regulates Th Lineage Commitment and Modulates Autoimmunity. *Journal of Immunology* 185(9):5247-5258. PMID: 20881184
    b. Thayer TC, Delano M, Chen J, Padgett LE, **Tse HM**, Annamali M, Piganelli JD, Moldawer L, and Mathews CE (2011). Superoxide Production by Macrophages and T cells is Critical for the Induction of Autoreactivity and Type 1 Diabetes. *Diabetes* 60(8):2144-2151 PMID: 21715554.
    c. Seleme MC, Lei W, Burg AR, Goh KY, Metz A, Steele C, and **Tse HM** (2012). Dysregulated TLR3-Dependent Signaling and Innate Immune Activation in Superoxide-Deficient Macrophages From Non-Obese Diabetic Mice. ***With editorial commentary** *Free Radical Biology and Medicine* 52(9):2047-256. PMID: 22361747
    d. Padgett LE, Burg AB, Lei W, and **Tse HM** (2015). Loss of NADPH Oxidase-Derived Superoxide Skews Macrophage Phenotypes to Delay Type 1 Diabetes. *Diabetes* 64(3):937-946. PMCID: PMC4338593.

3. In addition to my scientific contribution, I enjoy my role as a mentor to three graduate students (Lindsey Padgett, Ashley Burg, and Nadine Morgan) and two undergraduate students (Dana Pham-Hua and Zach Koenig) currently in the lab. Training young scientists is a passion of mine, and a responsibility that I do not take lightly. I am extremely proud of my students' accomplishments and accolades. They have been

fortunate enough to receive numerous travel awards (UAB Diabetes Training Center, Juvenile Diabetes Research Foundation, UAB Graduate Student Association, Keystone Symposia Travel Scholarship, UAB Raymond N. Hiramoto Endowment Travel Award), awards for oral/poster presentations (outstanding oral presentation at Auburn Diabetes Day, UAB Microbiology Retreat, Midwest Islet Club meeting, Comprehensive Musculoskeletal and Autoimmunity Center Research Day, Graduate Biomedical Sciences Organization 1st Annual Research Day), and professional accomplishment awards (NIH/NIAID T32.AI007052.34 Immunologic Diseases and Basic Immunology Training Grant, Keystone Future of Science Award, American Association of Immunologists Thermo-Fisher Award, Robert M. Stroud, MD Advanced Immunology Trainee Seminar Series Lecturer). I have pushed my trainees to publish in many high impact journals and some of our recent publications are highlighted below.

a. Thayer TC, Delano M, Chen J, Padgett LE, **Tse HM**, Annamali M, Piganelli JD, Moldawer L, and Mathews CE (2011). Superoxide Production by Macrophages and T cells is Critical for the Induction of Autoreactivity and Type 1 Diabetes. *Diabetes* 60(8):2144-2151 PMID: 21715554.
b. Seleme MC, Lei W, Burg AR, Goh KY, Metz A, Steele C, and **Tse HM** (2012). Dysregulated TLR3-Dependent Signaling and Innate Immune Activation in Superoxide-Deficient Macrophages From Non-Obese Diabetic Mice. ***With editorial commentary** *Free Radical Biology and Medicine* 52(9):2047-256. PMID: 22361747
c. Padgett LE, Broniowska KA, Hansen PA, Corbett JA, and **Tse HM** (2013). The Role of ROS and Pro-Inflammatory Cytokines in T1D Pathogenesis. *NY Annals* 1281:16-35. PMID: 23323860
d. Padgett LE, Burg AB, Lei W, and **Tse HM** (2015). Loss of NADPH Oxidase-Derived Superoxide Skews Macrophage Phenotypes to Delay Type 1 Diabetes. *Diabetes* 64(3):937-946. PMCID: PMC4338593.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/hubert.tse.1/bibliography/43299606/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

Career Development Award 7-12-CD-11 (PI, Tse, HM) 7/01/12 - 6/30/17
American Diabetes Association
The Synergism Of Innate Immune-Derived Reactive Oxygen Species and T cell Effector Responses In Type 1 Diabetes
The three specific aims of this project are: 1) to elucidate the biochemical mechanisms by which ROS synthesis can affect innate immune anti-viral responses; 2) to determine the effect of ROS synthesis on $CD4^+$ T cell activation and T helper subset differentiation; and, 3) to demonstrate that ROS synthesis is necessary for optimal T cell effector responses in T1D.

Department of Defense W21XWH-13-1-0482 (co-PIs, Tse, HM and Floyd, CL) 10/1/13 – 9/30/16
Spinal Cord Injury Research Program Translation Partnership
Use Of A Catalytic Oxidoreductant To Treat Neuropathic Pain After SCI
The two specific aims of this project are: 1) to assess the efficacy of a novel catalytic oxidoreductant (BuOE) that exhibits increased blood-brain barrier penetrance to reduce oxidative stress, inhibit NF-κB activation, and reduce neuroinflammation after a single or multiple concussion(s); and, 2) to determine if post-concussion administration of a catalytic oxidoreductant will reduce concussion-induced cognitive deficits in attention/impulsiveness, anxiety, and depression/helplessness after a single or multiple concussion(s).

National Science Foundation DMR 1306110 (co-PIs, Tse, HM and Kharlampieva, E) 7/1/13 – 6/30/16
Division of Biomaterials Research
Immunomodulatory Ultrathin Multilayer Coatings for Pancreatic Islet Transplantation
The three specific aims of this project are: 1) to synthesize ultrathin coating materials with hydrogen-bonded immunomodulatory components; 2) to investigate the immunomodulatory activity of the coating material; and, 3) to evaluate the performance of coated islets in response to immune challenges *in vitro*.

National Institutes of Health/NIAID R21 AI103769 (PI, Yother) 4/15/13 – 4/14/15
Glucose-Mediated Regulation of Bacterial Virulence in Animal Models of Diabetes and Hyperglycemia

The two specific aims of this project are to determine the importance of hyperglycemia to enhance and facilitate *S. pneumoniae* infections in murine models of Type 1 and 2 diabetes

National Institutes of Health/NIDDK R01 DK099550 (PI, Tse, HM) 7/1/14 – 6/30/19
Redox Regulation of Anti-Viral Responses in Type 1 Diabetes
The three specific aims of this project are: 1) to determine if the loss of ROS synthesis can affect M1 and M2 macrophage differentiation; 2) to further define the role of NOX-dependent superoxide on anti-viral responses after Coxsackie B4 infection; and 3) to determine if superoxide synthesis can affect viral-induced bystander activation in murine models and human translational studies.

Juvenile Diabetes Research Foundation 1-SRA-2015-42-A-N (PI, Tse, HM) 6/1/15 – 5/30/16
Islet Encapsulation with Immunomodulatory Nanothin Coatings
The two specific aims of this project are: 1) to determine if islet encapsulation with a novel biomaterial can restore euglycemia and display immunoprotection in an allotransplantation setting; and 2) to determine if islet encapsulation can restore euglycemia and afford immunoprotection in xenotransplants.

Completed Research Support

P30 Award (PI, Tse, HM) 05/01/10 - 04/30/11
UAB Diabetes Research and Training Center and the Comprehensive Diabetes Center
The Role of Reactive Oxygen Species and Th17 T cells in Type 1 Diabetes
The specific aim of this pilot project is to examine the interplay of reactive oxygen species synthesis on Th17 T cell differentiation and effector responses in NOD and NOD.*Ncf1*^{m1J} mice.

Junior Faculty Award 1-09-JF-54 (PI, Tse, HM) 7/01/09 - 6/30/12
American Diabetes Association
The Role Of Reactive Oxygen Species In Innate And Adaptive Immune Function In Type 1 Diabetes
The two specific aims of this project are: 1) to elucidate the biochemical mechanisms by which ROS synthesis can affect TLR2, 3, 4, and 9 signaling pathway activation in macrophages and pro-inflammatory cytokine release; and, 2) to determine the effect of ROS synthesis and oxidative stress on the effector response of diabetogenic $CD4^+$ (BDC-2.5, BDC-6.9) and $CD8^+$ (NY8.3, AI4, G9C8) T cells after adoptive transfer into NOD.*Ncf1*^{m1J} mice

P30 Award (PI, Tse, HM) 09/01/09 - 08/31/12
UAB Rheumatic Diseases Core Center
ROS Modulation Of Innate And Adaptive Immunity In RA
The two specific aims of this project are: 1) to assess the importance of ROS synthesis on innate and adaptive immune effector responses in the DBA/1 collagen-induced murine model of rheumatoid arthritis; and, 2) to determine if treatment with a broad range catalytic antioxidant is efficacious in preventing and/or reversing during disease induction.

Pilot and Feasibility Award (PI, Tse, HM) 02/01/13 - 01/31/14
UAB Comprehensive Diabetes Center
M2 Macrophages as a Cellular Therapy to Promote Beta Cell Survival
The specific aim of this pilot project is to examine the efficacy of M2 macrophages to prevent autoimmune responses towards pancreatic β-cells.

NFL Charities Medical Grants (co-PIs, Tse, HM and Floyd, CL) 7/01/12 - 1/31/14
National Football League
Evaluation of a Novel Catalytic Oxidoreductant to Protect the Brain After Concussion
The two specific aims of this project are: 1) to assess the efficacy of a catalytic oxidoreductant to reduce oxidative stress, inhibit NF-κB activation, and reduce neuroinflammation after a single or multiple concussion(s); and, 2) to determine if post-concussion administration of a catalytic oxidoreductant will reduce concussion-induced cognitive deficits in attention/impulsiveness, anxiety, and depression/helplessness after a single or multiple concussion(s).

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: Peter D. Waite, MPH, DDS, MD

eRA COMMONS USER NAME (credential, e.g., agency login): pwaite

POSITION TITLE: Professor and Chairman

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MMNYYY	FIELD OF STUDY
Graceland College, Lamoni, IA	B.S.	06/75	Biology/Chemistry
University of Minnesota, Minneapolis, MN	M.P.H.	06/76	Family Planning
University of Minnesota, Minneapolis, MN	D.D.S	06/79	Dentistry
University of Alabama School of Medicine	M.D.	06/83	Medicine
UAB Dept. of OMS, Birmingham, AL	Certificate	06/82	

A. Personal Statement

I believe I am well-suited for this role as a clinical mentor due to my 30 years in academics. I have been a lecturer, course master, clinic instructor, resident program director, hospital attending and professor/chair of the Department of Oral and maxillofacial surgery. I have mentored student research projects, master science projects, resident and resident performance. I have patiently directed, guided and corrected scientific projects and demonstrated technical surgical skills for young people and new faculty. I have encouraged foreign fellows and dental students in clinical/translational research. I am current PI for AAOMS foundation training grant.

1. Boyd SB, Walters AS, **Waite P**, Harding SM, Song Y. “Long-Term Effectiveness and Safety of Maxillomandibular Advancement for Treatment of Obstructive Sleep Apnea” J Clin Sleep Med 2015 Jan 7. pii: jc-00441-14 (Epub ahead of print)

2.Cheng GC, Koomullil RP, Ito Y, Shih A, Sittitavornwong S, **Waite P.** “Assessment of Surgical Effects on Patients with Obstructive Sleep Apnea Syndrome Using Computational Fluid Dynamics Simulations” Mathematics and Computers in Simulation, Elsevier Science 5-NOV-2014, pp. 44-59.

3.Christou T, Kau CH, **Waite PD,** Kheir NA, Mouritsen D. “Modified Method of Analysis for Surgical Correction of Facial Asymmetry” Ann Maxillofac Surg. 2013 Jul;3(2):185-91. doi:10.4103/2231-0746.119218.

4. Stoll ML, Morlandt AB, Teerawattanapong S, Young D, **Waite PD,** Cron RQ.“Safety and Efficacy of Intra-articular Infliximab Therapy for Treatment-Resistant Temporomandibular Joint Arthritis in Children: A Retrospective Study”. Rheumatology(Oxford). 2013 Mar;52(3):554-9. doi: 10.1093/rheumatology/kes318. Epub 2012 Dec 5.

B. Positions and Honors

Positions and Employment

1985-1989 Assistant Professor, Department of Oral & Maxillofacial Surgery, University of Alabama, School of Dentistry, Birmingham, AL
1985-1989 Assistant Professor, Department of Surgery, University of Alabama School of Medicine, Birmingham, AL
1989-1995 Associate Professor, Department of Oral & Maxillofacial Surgery, University of Alabama, School of Dentistry, Birmingham, AL
1989-Present Associate Professor, Department of Surgery, University of Alabama School of Medicine, Birmingham, AL
1995-Present Professor, Department of Oral & Maxillofacial Surgery, University of Alabama School of Dentistry, Birmingham, AL
1988-1995 Director, Residency Training Program, Department of Oral & Maxillofacial Surgery, University of Alabama School of Dentistry, Birmingham, AL
1991-1994 Vice-Chairman, Department of Oral & Maxillofacial Surgery, University of Alabama School of Dentistry, Birmingham, AL
1994-Present Chairman, Department of Oral & Maxillofacial Surgery, University of Alabama School of Dentistry, Birmingham, AL
1994-Present Chief, Division of Oral & Maxillofacial Surgery, Department of Surgery, University of Alabama School of Medicine, Birmingham, AL

Other Experience and Professional Memberships

American Academy of Cosmetic Surgery President
Health Volunteers Overseas Consultant
Alabama State Dental Board Office Anesthesia Examiner
1990-1993 American Association of Oral and Maxillofacial Surgeons OMSITE Committee
1992-1993 American Association of Oral and Maxillofacial Surgeons Core Curriculum Committee
1992-1994 American Association of Oral and Maxillofacial Surgeons Special Committee on Surgical Skills
American Association of Oral and Maxillofacial Surgeons Subcommittee on Orthognathic, Cleft and Craniofacial Surgery
American Association of Oral and Maxillofacial Surgeons Parameters of Care Committee
America Academy of Cosmetic Surgery Committee of Scientific Sessions
Alabama State Alternate Delegate American Association of Oral Maxillofacial Surgeons
2002-2005 American Board of Oral and Maxillofacial Surgery Advisory Committee
2002-2007 American Association of Oral & Maxillofacial Surgeons, Faculty Selection Executive Committee
American Association of Oral & Maxillofacial Surgeons CRET Committee Member
American Association of Oral & Maxillofacial Surgeons Obstructive Sleep Apnea Clinical Interest Group
American Dental Association Risk Management Consultant
American Dental Association Accreditation Site Committee
American Academy of Cosmetic Surgery Committee of Scientific Sessions
University of Alabama Health Services Foundation Advisory Committee
Oral & Maxillofacial Surgery Foundation Committee on Fellowship
AO ASIF Craniomaxillofacial Faculty, AO North America
2008-2010 Southeastern Society of Oral & Maxillofacial Surgeons Annual Scientific Program Committee
2008 American Association of Oral & Maxillofacial Surgeons Curriculum Data Base Task Force
2008-2009 Commission on Dental Accreditations (CODA) Consultant
2009-2010 Southeastern Society of Oral & Maxillofacial Surgeons Annual Scientific Program Committee Chairman

2009-2010 Charles A. McCallum Alumni Society Program Committee
2011-2014 American Association of Oral & Maxillofacial Surgeons Committee on Continuing Education and Professional Development

Honors

1979 Oral Pathology Award, University of Minnesota 1980, Omicron Kappa Upsilon, Beta Beta Chapter
1983 Oral and Maxillofacial Surgery at Erlangen, Germany 1985 Fred A. Heney Educational Foundation Fellowship 1988 Omicron Delta Kappa
1988 Royal College of Dentist 1989, American Celled of Dentists
1996 Lorenz/Biomet LactoSorb® "Circle of Surgeons" Examination Committee Award, American Academy of Cosmetic Surgery Certificate of Excellence in Continuing Medical Education in Cosmetic Surgery Charles A. Mccallum Endowed Chair of Oral and Maxillofacial Surgery
2008 Consumer' Research Council of America: America' Top Dentists
2009 American Dental Association Certificate of Recognition for Volunteer Service in a Foreign Country
2011 Nominated to Southeastern Society of Oral & Maxillofacial Surgeons Credentials

C. Contribution to Science

Within the specialty of oral and maxillofacial surgery I have always sought the cutting edge or new frontier. Academic healthcare should always strive for better results, challenge the status quo and training of better generation of physicians.

1. Facial trauma is a complex devastating injury. Oral and maxillofacial surgeons are best trained and educated in this area. Trans- conjunctival surgical approaches to orbital fractures and cranio-plasty reconstructions were two innovative concepts first published in 0MS literature by Dr. Waite.
2. Reconstruction of facial deformities requires thorough knowledge of facial cosmetics. Dr. Waite is credited with primary publications of simultaneous rhinoplasty and orthographic surgery.
3. Upper airway obstruction is dependent on variation human anatomy. Dr. Waite is credited with the development current surgical techniques in obstructive sleep apnea and the 3-D analysis of upper airway changes.
4. Mastication is a very complex musculoskeletal neurologic function. The TMJ is not only complex but unlike any other joint in the body requiring bilateral function and compensation. JRA/JIA affects significant children impacting pain motion mastication growth and radiographic changes. Dr. Waite is active in collaboration with the Department of rheumatology and basic science research. We currently maintain the world’s largest series of intra-articular TMJ therapy at UAB.

D. Research Support

1. Evaluation of Obstructive Sleep Apnea by Computational Fluid Dynamics

Principle Investigator – Peter D. Waite

NIH/NIDCR

2. Temporomandibular joint arthritis in juvenile idiopathic arthritis: diagnosed by MRI, Prevalence in JIA subtypes and response to corticosteroid injections and Anti-TNF therapy

Protocol number X100329016

3. Impact of Maxillomandibular Advancement on Health- Related Functional Outcomes

Protocol number X140409011

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BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: WALTER, MARK R

eRA COMMONS USER NAME (agency login): WALTERM

POSITION TITLE: Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
California Lutheran University	BS	05/1984	Chemistry/Biology
University of Alabama at Birmingham	PHD	06/1989	X-ray Crystallography
University of Alabama at Birmingham	Postdoctoral Fellow	12/1991	Laboratory of Steve E. Ealick

A. Personal Statement

Dr. Walter's research focus lies in the area of *structure and function of cytokines involved in viral pathogenesis and autoimmune diseases.* Dr. Walter studies interferons and their role in viral infection and in autoimmune diseases such as systemic lupus erythematosus and Psoriasis vulgaris. These studies provide the framework for detailed biochemical and cellular characterization of how cytokines lead to cellular activation and thus trigger autoimmunity.

Walter MR. Elucidating new drug targets in psoriasis by gene profiling: an opportunity to be seized. Ann Transl Med. 2015 Apr; 3(6):78. PMID: 25992377; PMCID: PMC4416952

B. Positions and Honors

Positions and Employment

1992 - 1997 Assistant Professor, University of Alabama at Birmingham, Birmingham, AL
1998 - 2009 Associate Professor, University of Alabama at Birmingham, Birmingham, AL
2009 - Professor, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

- Member, American Crystallographic Association
- Member, American Association for the Advancement of Science
- Member, American Association of Immunologists
- Member, International Cytokine and Interferon Society
- Member, Biophysical Society

Honors

1996 Presidential Early Career Award, National Institutes of Health, NIAID

C. Contribution to Science

1. Role of IL-10 and IL-10R in signaling

   a. Yoon SI, Jones BC, Logsdon NJ, Harris BD, Kuruganti S, **Walter MR**. Epstein-Barr virus IL-10 engages IL-10R1 by a two-step mechanism leading to altered signaling properties. J Biol Chem. 2012 Aug 3;287(32):26586-95. PubMed PMID: 22692218; PubMed Central PMCID: PMC3410999.

   b. **Walter MR**. The molecular basis of IL-10 function: from receptor structure to the onset of signaling. Curr Top Microbiol Immunol. 2014;380:191-212. PubMed PMID: 25004819.

c. Murugan D, Albert MH, Langemeier J, Bohne J, Puchalka J, Järvinen PM, Hauck F, Klenk AK, Prell C, Schatz S, Diestelhorst J, Sciskala B, Kohistani N, Belohradsky BH, Müller S, Kirchner T, **Walter MR**, Bufler P, Muise AM, Snapper SB, Koletzko S, Klein C, Kotlarz D. Very early onset inflammatory bowel disease associated with aberrant trafficking of IL-10R1 and cure by T cell replete haploidentical bone marrow transplantation. J Clin Immunol. 2014 Apr;34(3):331-9. PubMed PMID: 24519095.

2. Viral Immune response and vaccination

a. Logsdon NJ, Eberhardt MK, Allen CE, Barry PA, **Walter MR**. Design and analysis of rhesus cytomegalovirus IL-10 mutants as a model for novel vaccines against human cytomegalovirus. PLoS One. 2011;6(11):e28127. PubMed PMID: 22132227; PubMed Central PMCID: PMC3221699.

b. Eberhardt MK, Chang WL, Logsdon NJ, Yue Y, **Walter MR**, Barry PA. Host immune responses to a viral immune modulating protein: immunogenicity of viral interleukin-10 in rhesus cytomegalovirus-infected rhesus macaques. PLoS One. 2012;7(5):e37931. PubMed PMID: 22655082; PubMed Central PMCID: PMC3360012.

c. Eberhardt MK, Deshpande A, Chang WL, Barthold SW, **Walter MR**, Barry PA. Vaccination against a virus-encoded cytokine significantly restricts viral challenge. J Virol. 2013 Nov;87(21):11323-31. PubMed PMID: 23946461; PubMed Central PMCID: PMC3807330.

3. Fc receptors

a. Deshpande A, Putcha BD, Kuruganti S, **Walter MR**. Kinetic analysis of cytokine-mediated receptor assembly using engineered FC heterodimers. Protein Sci. 2013 Aug;22(8):1100-8. PubMed PMID: 23703950; PubMed Central PMCID: PMC3832046.

b. Kubagawa H, Kubagawa Y, Jones D, Nasti TH, **Walter MR**, Honjo K. The old but new IgM Fc receptor (FcμR). Curr Top Microbiol Immunol. 2014;382:3-28. PubMed PMID: 25116093.

D. Research Support

Ongoing Research Support

2001/04/01-2018/01/31
R01 AI049342-13, National Institute of Allergy and Infectious Diseases (NIAID)
Barry, Peter A (PI)
Prevention of Primary HCMV Infection by Vaccinating against HCMV-Encoded IL-10
Role: PI

2015/01/01-2017/12/31
2, Lupus Research Institute
WALTER, MARK R (PI)
Single Cell Detection of IFN Signaling in Lupus Patients
Establish methods to detect IFN signaling in human cells using reagents that recognize the IFN receptor signaling complex.
Role: PI

2011/12/01-2016/11/30
R01 AI097629-04, National Institute of Allergy and Infectious Diseases (NIAID)
WALTER, MARK R (PI)
Vaccine-mediated Targeting of Viral IL10 to Control HCMV Shedding and Reinfection
Role: PI

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BIOGRAPHICAL SKETCH

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NAME: Warriner, Amy Hoth M.D.

eRA COMMONS USER NAME (credential, e.g., agency login): warriner

POSITION TITLE: Associate Professor of Medicine, Division of Endocrinology Diabetes & Metabolism, Department of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Wartburg College, Waverly, IA	B.A.	08/94-05/98	Chemistry/Biology
University of Arkansas for Medical Sciences, Little Rock, AR	M.D.	08/98-05/02	Medicine
University of Arkansas for Medical Sciences, Little Rock, AR	Internship & Residency	06/02-07/05	Internal Medicine
University of Alabama at Birmingham, Birmingham, AL	Fellowship	07/05-06/07	Endocrinology, Diabetes & Metabolism

A. Personal Statement

I have been involved in osteoporosis-related research for the past several years with the majority of my work focused on disease outcomes and developing improved methods for pragmatic clinical trials. I was appointed as a K12 Scholar in Comparative Effectiveness in HIV-related bone disease through the longitudinal analysis of bone mineral density changes in HIV-positive persons and the evaluation of fracture prevalence in HIV-positive persons through the use of Medicare and Medicaid data. In collaboration with others, I am leading studies aimed at patient-centered initiatives to improve diagnosis and treatment of osteoporosis. I have been the PI on three pilot studies focused on bone changes in persons with Type 2 Diabetes Mellitus and in persons with HIV.

1. **Warriner AH**, Outman RC, Feldstein AC, Roblin DW, Allison JJ, Curtis JR, Redden DT, Rix MM, Robinson BE, Rosales AG, Safford MM, Saag KG. Effect of self-referral on bone mineral density testing and osteoporosis treatment. Medical Care. 2014 Aug; 52(8): 743-50. PMC4101066.

2. Mudano AS, Gary LC, Oliveira AL, Melton M, Wright NC, Curtis JR, Delzell E, Harrington TM, Kilgore ML, Lewis CE, Singh JA, **Warriner AH**, Pace WD, Saag KG. Using tablet computers compared to interactive voice response to improve subject recruitment in osteoporosis pragmatic clinical trials: feasibility, satisfaction, and sample size. Patient Prefer Adherence. 2013 Jun 14;7:517-23. PMC3685447.

3. Wright NC, **Warriner AH**, Saag KG. Study design considerations for a large simple trial of bisphosphonates. Curr Opin Rheumatol. 2013 Jul;25(4):517-23. No NIH Direct Funding Acknowledged.

B. Positions and Honors

Positions and Employment

2002-2005	Medical Residency, Internal Medicine, University of Arkansas for Medical Sciences
2005-2007	Fellow in Endocrinology and Metabolism, University of Alabama at Birmingham
2007-2013	Assistant Professor, Division of Endocrinology, Diabetes & Metabolism, Department of Medicine
2008-present	Director, UAB HIV Endocrine Clinic
2013-present	Associate Professor, Division of Endocrinology, Diabetes & Metabolism, Department of Medicine
2013-present	Faculty Senate, University of Alabama at Birmingham
2013-present	Co-Director, UAB Weight Loss Medicine Clinic

Other Experience and Professional Memberships

2004-present	Alpha Omega Alpha, Member
2003-present	American Medical Association, Member
2005-present	American Association of Clinical Endocrinologists, Member
2005-present	Endocrine Society, Member
2005-2007	Endocrine Fellows Foundation, Member
2007-present	Certified Clinical Densitometrist
2008-present	International Society for Clinical Densitometry
2008-present	American Society for Bone and Mineral Research

Honors

2004	Resident of the Year, Department of Medicine, University of Arkansas for Medical Sciences
2001	L. B. Ward Endowed Scholarship
2000	American Medical Association Foundation Scholarship
1999	Pulaski County Medical Society Scholarship
1998	Debbie E. Heida Award for Service and Leadership Evangelical Lutheran Church in America's Torrison Scholarship American Medical Society Alliance Education and Research Fund Scholarship
1997	Nobility Award, Wartburg College

C. Contribution to Science

1. My early work focused on evaluating fractures in relation to osteoporosis. Prior definitions of osteoporotic fractures were based on fracture prevalence rather than the clinical likelihood of a fracture being due to osteoporosis specifically. I led an study that brought together experts in osteoporosis, orthopedics, and medical coding to re-evaluate fractures related to osteoporosis, which provides the basis for current and future fracture studies.

    a. **Warriner AH**, Patkar NM, Yun H, Delzell E. Minor, Major, Low-Trauma, and High-Trauma Fractures: What Are the Subsequent Fracture Risks and How Do They Vary? Curr Osteoporos Rep. 2011 Jun 23. No NIH Direct Funding Acknowledged.

2. In addition to the above, I have worked with collaborators to develop new informed consent methods using tablet computers to both present and obtain informed consent to/from potential study participants. We worked with a vendor to develop the electronic informed consent tool using a future pragmatic osteoporosis study as the framework and then evaluated the patient understanding and clinic/patient satisfaction with the electronic informed consent vs. a traditional paper informed consent.

    a. Saag KG, Mohr PE, Esmail L, Mudano AS, Wright N, Beukelman T, Curtis JR, Cutter G, Delzell E, Gary LC, Harrington TM, Karkare S, Kilgore ML, Lewis CE, Moloney R, Oliveira A, Singh HA, **Warriner AH**, Zhang J, Berger M, Cummings SR, Pace W, Solomon DH, Wallace R, Tunis SR. Improving the efficiency and effectiveness of pragmatic clinical trials in older adults in the United States. Contemporary Clinical Trials. 2012 Nov; 33(6): 1211-6. No NIH Direct Funding Acknowledged.

    b. Mudano AS, Gary LC, Oliveira AL, Melton M, Wright NC, Curtis JR, Delzell E, Harrington TM, Kilgore ML, Lewis CE, Singh JA, **Warriner AH**, Pace WD, Saag KG. Using tablet computers compared to interactive voice response to improve subject recruitment in osteoporosis pragmatic clinical trials: feasibility, satisfaction, and sample size. Patient Prefer Adherence. 2013 Jun 14;7:517-23. PMC3685447.

    c. Wright NC, **Warriner AH**, Saag KG. Study design considerations for a large simple trial of bisphosphonates. Curr Opin Rheumatol. 2013 Jul;25(4):517-23. No NIH Direct Funding Acknowledged.

3. Additionally, I have worked with colleagues to improve care of patients through the use of patient-activation, largely to improve testing and treatment for osteoporosis. Despite current evaluation and treatment guidelines, patients are not being adequately tested or treated for osteoporosis. Our goal has

been to better educate patients about osteoporosis risks and treatments to improve appropriate testing and treatment with appropriate medications. We have been developing direct-to-patient approaches that use patient storytelling as a mode of patient education.

a. **Warriner AH**, Outman RC, Feldstein AC, Roblin DW, Allison JJ, Curtis JR, Redden DT, Rix MM, Robinson BE, Rosales AG, Safford MM, Saag KG. Effect of self-referral on bone mineral density testing and osteoporosis treatment. Medical Care. 2014 Aug; 52(8): 743-50. PMC4101066.
b. **Warriner AH**, Outman R, Kitchin E, Chen L, Morgan SL, Saag KG, Curtis JR. A Randomized Trial of a Mailed Intervention and Self-Scheduling to Improve Osteoporosis Screening in Postmenopausal Women. J Bone Miner Res. 2012 Dec; 27(12): 2603-10. No NIH Direct Funding Acknowledged.

D. Research Support

Ongoing Research Support

U19 HS021110 Saag, PI 09/01/11– 08/31/16
AHRQ UAB Deep South Arthritis and Musculoskeletal CERTs Project 3: Informed Consent Tools for Pragmatic Clinical Trials in Musculoskeletal Diseases
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders. This project aims to create new technology for consenting patients for large, pragmatic clinical trials.
Role: Investigator

R01 AR060240 Saag, PI 07/01/11– 06/31/16
NIH Activating Patients to Reduce Osteoporosis (APROPOS)
The overall goal of this project is to examine whether the intervention leads to changes in osteoporosis-related health beliefs, greater levels of doctor-patient communication, and changes in possible concerns about osteoporosis medication safety and efficacy.
Role: Investigator

Completed Research Support

U34 AR062891 Saag, PI 04/01/2013 – 03/31/2015
NIAMS. Effectiveness of DiscontinuinG bisphosphonatEs Study (EDGE)
Planning grant for a Pragmatic Clinical Trial (PCT), "Effectiveness of DiscontinuinG bisphosphonatEs (EDGE) Study", a "real world" effectiveness trial of an initially estimated 4100 patients randomized to continuation or discontinuation of prior alendronate therapy.
Role: Investigator

K12 HS019465 Saag {PI, #1} 07/01/2010–06/30/2013
AHRQ. UAB K12 in Comparative Effectiveness Research. The goal of this project is to build upon the momentum of the ongoing Comparative Effectiveness Research (CER) and training and to expand the training capacity and vibrant intellectual milieu for CER at UAB.
Role: Scholar

P60 DK079626 Garvey, PI 3/1/2010 – 2/28/2015
UAB Diabetes Research and Training Center Pilot Grant. Changes in Bone Turnover with Increased Incretin Hormone Exposure. Funding Source: NIH/NIDDK. The goal of this pilot study is to obtain preliminary data on bone turnover markers following treatment with sitagliptin, a DPP-4 inhibitor.
Role: Principal Investigator of Pilot Study

P60 AR48095 Kimberly, Saag Project PI 09/01/2008 – 06/30/2012
National Institutes of Health/NIAMS
Multidisciplinary Clinical Research Center
Project 4: Improving Care of Osteoporosis: Multi-Modal Intervention to Increase Testing and Treatment (ICOMMITT)

The major goal of this project is to rigorously test the incremental impact of simple, generalizable interventions to improve healthcare among older women at high risk for osteoporosis.
Role: Investigator

UL1 RR025777 Guay-Woodford (PI) 09/17/2010-09/16/2012
CCTS Translational Research Intramural Grant Program Bone Mineral Density in HIV+ Patients Recently Started on Antiretroviral Therapy (ART) Funding Source: NIH National Center for Research Resources. The goal of this study is to evaluated bone mineral density in HIV+ persons naïve to or recently started on ART and evaluate the effect of the virus and inflammation on changes in bone mineral density.
Role: Principal Investigator of Pilot Study

P30 AR046031 Ponnazhagan (PI) 1/1/2010 – 12/31/2011
UAB Core Center for Basic Skeletal Research (CCBSR). Changes in Bone Turnover with Exposure to a GLP-1 Receptor Agonist. Funding Source: NIH/NIAMS. The goal of this pilot study is to evaluate changes in bone turnover and calcitonin in persons with Type 2 Diabetes Mellitus initiated on a GLP-1 receptor agonist.
Role: Principal Investigator of Pilot Study

3UL 1RR025777-02S1 (Guay-Woodford, Saag Project Principal Director) 09/17/2009-09/16/2011
National Institutes of Health /National Center for Research Resources
UAB Center for Clinical and Translational Science (CCTS)
NCRR NRAA Supplement:CCTS Collaborative CTSA Community-based Network for Pragmatic Clinical Trials with Medicare Linkage
The major goal of this Medicare United with Simple Clinical triaLs Expanded network (MUSCLE) is to conduct comparative effectiveness research by developing a “network of networks” for conducting pragmatic trials of therapeutics for chronic musculoskeletal diseases. Role: Co-investigator

U18 HS016956 (Saag) 09/01/2007– 08/31/2011
Agency for Healthcare Research and Quality (AHRQ)
Deep South Musculoskeletal CERTs (DSM)
The long-term goal of this grant is to sustain a center for education and research on therapeutic of musculoskeletal disorders. Role: Investigator

No number assigned (Saag) 7/01/2008 – 06/30/2011
American College of Rheumatology
A Direct to Patient Osteoporosis Intervention for RA Patients on Chronic Steroids
The major goal of this project is to determine the impact of simple, low cost interventions to improve osteoporosis healthcare among RA patients on chronic GCs by testing a direct-to-patient intervention in collaboration with CVS Caremark, one of our Nation’s largest pharmaceutical benefits managers.
Role: Investigator

No Number Assigned Curtis (PI) 09/30/2007 – 09/31/2011
Eli Lilly & Co.
Improving Osteoporosis Care in High-Risk Home Health Patients through a High-Intensity Intervention. The goal of this project is to assess the efficacy of an intervention to improve osteoporosis care in the home health care setting. Role: Co-Investigator

No number assigned (Delzell) 09/12/2007 – 12/31/2008
Amgen
Defining Osteoporotic Fractures: Expert Panel to Define Specific Fracture Sites and Diagnostic Codes Associated with Osteoporosis.
The goal of this project is to evaluate osteoporosis attribution in various fractures through the use of a formal group process. Role: Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Timothy M. Wick, PhD

eRA COMMONS USER NAME (credential, e.g., agency login): TimothyWick

POSITION TITLE: Senior Associate Dean, School of Engineering and Professor & Chair, Department of Biomedical Engineering

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Colorado, Boulder, CO	B.S.	1983	Chemical Engineering
Rice University, Houston, TX	Ph.D.	1988	Chemical Engineering
Rice University, Houston, TX	Post-doc	1988	Biochemistry & Chemical Engineering

A. Personal Statement

I have more than 24 years of experience developing, evaluating and validating biomedical engineering systems and devices to solve health-related problems and improve healthcare technology to benefit society. I have managed several million dollars of research funds from NIH, other government agencies, industry and foundations to develop 3-D human tissue constructs for tissue engineering, as human organ equivalents to identify mechanisms of disease pathology and as human tissue platforms for drug discovery and toxicity testing; with an emphasis on cardiovascular and tissue constructs.

I was Chair of the UAB Department of Biomedical Engineering (BME) from 2005-2014. During this period I successfully guided the department through a period of substantial growth and reinvigoration. This included guiding the recently established bachelor's degree in BME through accreditation (2007) and reaccreditation (2013) with a >225% growth in the undergraduate program, a 40% growth of the BME graduate program, significant faculty recruitment and space management. Having addressed the challenges associated with reinvigorating the BME department at UAB, I now devote considerable time leading research projects (~40%).

I have successfully mentored more than twenty-five Mater's and PhD students at Georgia Tech and UAB. Since stepping down as chair of BME and increasing my research activities, I currently mentor or co-mentor three doctoral students on projects to develop a novel triphasic biomaterial for bone regeneration, tissue engineered cartilage and transdermal drug delivery systems for effective administration of NSAIDs to treat joint pain of osteoarthritis. In Biomedical Engineering, we train students to work on interdisciplinary teams and expect them to have breadth and depth of knowledge in biomedical engineering and related fields to solve important problems in medicine. I am well versed in training students to succeed in an interdisciplinary environment on projects that translate to patients or environment.

a. Moyer, H., Y. Wang, T. Farooque, T.M. Wick, K Signh, L. Xie, R. Guldberg, J. Williams, B.D. Boyan and Z. Schwartz, "A New Animal Model for Assessing Cartilage Repair in a Non-articular Cartilage Site", *Tissue Engineering Part A* 16(7):2321-30 (2010).
b. Saini, S. and T.M. Wick, "Effect of Low Oxygen Tension on Tissue Engineered Cartilage Construct Development in the Concentric Cylinder Bioreactor", *Tissue Engineering,* **10(5/6)**:825-832 (2004).
c. Williams, C. and T.M. Wick, "Perfusion Bioreactor for Small Diameter Tissue-Engineered Arteries", *Tissue Engineering* **10(5/6)**:930-941 (2004).
d. Saini, S. and T.M. Wick, "Concentric Cylinder Bioreactor for Production of Tissue Engineered Cartilage: Effect of Seeding Density and Hydrodynamic Loading on Construct Development", *Biotechnology Progress* **19**:510-521 (2003).

B. Positions and Honors

Positions and Employment

2/88-9/88 Post-doc, Chemical Engineering and Biology Departments, Rice University, Houston, TX
9/88-6/94 Assistant Professor, School of Chemical Engineering, Georgia Tech, Atlanta, GA
4/93-6/94 Assistant Professor, School of Mechanical Engineering, Georgia Tech, Atlanta, GA
7/94-8/05 Associate Professor, School of Mechanical Engineering, Georgia Tech, Atlanta, GA
7/94-6/04 Associate Professor, School of Chemical & Biomolecular Engineering, Georgia Tech, Atlanta, GA
7/99-6/04 Adjunct Associate Professor, Wallace H. Coulter Department of Biomedical Engineering, Georgia Tech, Atlanta, GA
7/99-6/04 Adjunct Associate Professor, School of Medicine, Emory University School of Med., Atlanta, GA
7/04-8/05 Adjunct Professor, School of Mechanical Engineering, Georgia Tech, Atlanta, GA
7/04-8/05 Professor, School of Chemical & Biomolecular Engineering, Georgia Tech, Atlanta, GA
7/04-8/05 Program Chair, Interdisciplinary Bioengineering Graduate Program, College of Engineering, Georgia Institute of Technology, Atlanta, Georgia
9/05-1/15 Professor and Chair, Department of Biomedical Engineering, The University of Alabama at Birmingham, Birmingham, AL
10/06-9/14 Co-Director, BioMatrix Engineering and Regenerative Medicine Center, The University of Alabama at Birmingham, Birmingham, AL
1/15 – Professor, Department of Biomedical Engineering, The University of Alabama at Birmingham, Birmingham, AL
1/15- Senior Associate Dean, School of Engineering, The University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2015 Organizing Committee Member, “International Conference on Significant Advances in Biomedical Engineering (BME-2015), Philadelphia, USA (27-29 April 2015).
2014 Panelist, BMES-NSF Special Session on Research in Biomedical Engineering and Grant Writing, 2015 BMES Annual Meeting, San Antonio, TX (22 October 2014).
2014 Quick Consulting Mentor, Alabama Launchpad Innovation and Entrepreneurship Conference (September 2014).
2012 Invited speaker, BioAlabama Technology Conference, “Tissue Engineering and Regenerative Medicine: Promise and Progress and Potential”, Birmingham, AL (May 2012).
2011 UAB Graduate Dean’s Award for Excellence in Mentorship.
2011 Invited Panelist, “Trends in Biomedical Engineering”, MedTech 2011, Raleigh, NC (November 2011).
2011 Invited Participant, AIMBE Technology Transfer Workshop, Stanford, CA (March 2011).
2008- Member, Tissue Engineering and Regenerative Medicine International Society
2009 invited Keynote Speaker, Bioengineering Theme for “CFD2009: The 7th International Conference on CFD in the Minerals and Process Industries”, Melbourne, Australia.
2005 Fellow of the American Institute for Medical and Biological Engineering (AIMBE).
2004 Invited Participant, Whitaker Foundation Academic Leadership Program
1998 Invited Participant, Whitaker Foundation Academic Leadership Program (2004); Fellow of the American Institute for Medical and Biological Engineering.
1995- Member, Biomedical Engineering Society
1992 Lilly Foundation Teaching Fellowship; Outstanding Chemical Engineering Professor.
1992 U.S. Delegation Representative, The Third USA-China-Japan Conference on Biomechanics. Atlanta, GA.
1993 U.S. Delegation Representative, The Fifth Japan-USA-Singapore-China Conference on Biomechanics, Sendai, Miyagi, Japan.
1991 Du Pont Young Faculty Grant, Department of Chemical Engineering, Georgia Institute of Technology.
1990 Du Pont Young Faculty Grant, Department of Chemical Engineering, Georgia Institute of Technology.
1987 Beecham Award for outstanding original research presented at the Southern Society for Clinical Investigation Annual Meeting.

C. Contributions to Science

1. My early work was directed at understanding the role of red blood cell adhesion in the pathophysiology of sickle cell anemia. We used flow chambers and to measure kinetics and strength of sickle red blood cell adherence to human endothelial cells under physiologically relevant microvascular flow conditions. We were the first group to identify cell adhesion receptors on sickle reticulocytes and to demonstrate that sickle red cells bind to endothelial cells via specific receptor-mediated interactions. We were the first group to identify several specific receptor-ligand adhesion pathways that promote sickle cell binding to endothelial cells under flow conditions. Subsequent experiments demonstrated roles for endothelial cell activation via inflammatory mediators, viruses and sickle cells themselves in increasing sickle cell adherence to endothelial cells. Overall, these mechanistic studies identified a novel role for receptor-mediated adherence of sickle red blood cells to vascular endothelium as a potential contributing factor to sickle vaso-occlusive pain episodes. I served as primary investigator in all of these studies.
   a. Kumar, A., J.R. Eckman, R.A. Swerlick, and T.M. Wick, "Phorbol Ester Stimulation Increases Sickle Erythrocyte Adherence to Endothelium: A Novel Pathway involving $\alpha_4\beta_1$ Integrin Receptors on Sickle Reticulocytes and Fibronectin", *Blood* **88**:4348-4358 (1996).
   b. Walmet, P.A., J.R. Eckman and T.M. Wick, "Inflammatory Mediators Promote Strong Sickle Cell Adherence to Endothelium under Venular Flow Conditions", *American Journal of Hematology*, **73(3)**:215-224 (2003).
   c. Wagner, M.C., J.R. Eckman and T.M. Wick, "Sickle Cell Adhesion Depends on Hemodynamics and Endothelial Activation", *The Journal of Laboratory and Clinical* Medicine, **144(5)**:260-267 (2004).
   d. Wagner, M.C., J.R. Eckman, and T.M. Wick, "Histamine Increases Sickle Erythrocyte Adherence to Endothelium*."* *British Journal of Haematology*, 132:512-522 (2006).

2. In addition to the studies described above, I have mentored several students to develop bioreactors for development of 3D tissue constructs for tissue engineering. The goal of our tissue engineering research is to develop 3-D tissue constructs, bioreactors and bioprocessing technologies to repair or replace diseased or damaged organs. We use novel biomaterials as scaffolds for cells to proliferate and mature into functional 3D tissue constructs. We develop and validate bioreactors that provide spatially correct delivery of mechanical forces and nutrient transport to fabricate musculoskeletal and cardiovascular tissue constructs under well-defined controllable conditions. Validation includes computational modeling of mechanical forces and nutrient gradients in the bioreactor. Our novel perfusion and shear stress bioreactor enhances nutrient transport, tissue formation and cryoprotectant loading within growing cartilage constructs. Tissue perfusion enhances tissue maturation during growth and increases loading of tissues with cryoprotectant agents during preservation. Our bioreactors are scalable and can be integrated with optical devices and other evaluation platforms to assess drug efficacy, toxicity and metabolism *in situ* in real time. In a new funded collaboration with Dr. Rosa Serra, our bioreactors are used to fabricate cartilage with osteoarthritis (OA) phenotype as a model system to identify the role of inflammatory mediators in OA and evaluate effectiveness of therapies to reverse OA progression and restore healthy cartilage phenotype.

   a. Carmona-Moran, C.A. and T.M. Wick, "Identification and Validation of Growth Factor Regimen for Chondrogenesis of Human Mesenchymal Stem Cells in a Shear and Perfusion Bioreactor", *Cellular and Molecular Bioengineering* (*2015)* doi: 10.1007/s12195-015-0387-6*.*
   b. Bhuiyan, D., M.J. Jablonsky, I. Kolesov, J. Middleton, T.M. Wick, and R. Tannenbaum, "Novel Synthesis and Characterization of a Collagen-based Biopolymer Initiated by Hydroxyapatite Nanoparticles", *Acta Biomaterialia*, 15:181-190 (2015). doi: 10.1016/j.actbio.2014.11.044. [Epub ahead of print].
   c. Farooque, T.M., Z.Z. Chen, Z. Schwartz, T.M. Wick, B.D. Boyan and K.G.M. Brockbank, "Protocol Development for Vitrification of Tissue-Engineered Cartilage", *Bioprocessing Journal* 8(4): 28-35 (2009). PMCID: PMC2901181.
   d. Farooque, T. and T.M. Wick, "Bioreactor Development for Cartilage Tissue Engineering: Computational Modeling and Experimental Results", *In:* Proceedings of the Seventh International Conference on CFD in the Minerals and Process Industries, P. Schwarz and P. Witt, *eds.* CSIRO, Melbourne, Australia, pp: 3-7 (2009).

3. A recent collaboration initially funded by UAB and Southern Research Institute is focused on developing novel technologies for improved transdermal of NSAIDs to treat joint pain associated with osteoarthritis. Our technology integrates diclofenac sodium into a wearable bandage that provides rapid and sustained

delivery of therapeutic levels of drug is an attractive alternative to topical application using a gel or solution. Such a device will provide more uniform and sustained relief of OA pain in joints and increase patient compliance. This innovative technology has been designed to provide a controlled drug delivery by optimizing penetration enhancers, and the delivery rate is further controlled by using a novel thermo-responsive polymer. Future iterations of the device can include transport of other therapeutics (e.g. corticosteroids) and novel therapeutics for arthritis and related musculoskeletal conditions. The technology can be configured to deliver therapeutics into large joints (e.g. knee, shoulder) or small joints of the hand or foot.

a. "Articles and Methods Related to Transdermal Delivery of a Therapeutic Agent", A.D. Penman, T.M. Wick, C.A. Moran and E. Kharlampieva. PCT/US2014/032662 filed April 2, 2014; Provisional application 62/058,590 filed Oct. 1, 2014
b. Bamman, M.M., T.M. Wick, C.A. Carmona-Moran and S.L. Bridges, Jr., "Exercise Medicine for Osteoarthritis: Research Strategies to Maximize Effectiveness", *Arthritis Care & Research*. (*submitted, in revision*).

Complete list of Published Work in my Bibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/1vAiFMFGjcqAJ/bibliograpahy/47961341/public/?sort=date&direction=ascending

D. Research Support

Active

UAB/Southern Research 1/1/2013 – 12/31/2016
Wick (PI) Co-PI: Andrew Penman (Southern Research)
Development of a Drug Eluting Band/Glove for Treatment of Osteoarthritis
Seed funds to develop a topical formulations and a flexible drug delivery bandage to effectively supply a sustained dose of nonsteroidal anti-inflammatory to manage joint pain associated with osteoarthritis.

NIDRR (Grant #H133E120005) 9/1/2012 – 8/31/2017
Rehabilitation Engineering Research Center
Rimmer (PI), Wick (Co-director of the Development Core)
Research and development projects aimed to 1) increase access to environments, equipment, and programs associated with healthy, active living; 2) encourage greater rates of participation in healthy levels of physical activity; 3) promote adherence to regular exercise; and 4) explore how physical activity affects health, function and performance in people with disabilities.

NIH R01 AR062507 4/1/2013 – 3/31/2018
Mechanism of Tgfbr2 in Chondroprotection
Serra (PI), Wick (Co-Invest)
This project tests the hypothesis that TGF-β maintains the differentiated chondrocyte phenotype in permanent cartilages, like articular cartilage, by regulating Sox9 levels and activity via protein sumoylation.

Prohealing Multifunctional Endothelium Nanomatrix Coated Stent
NIH R01 HL125391 10/01/2014 – 09/30/2019
Jun (PI), Wick (Co-Invest)
Dr. Wick will provide expertise in a rabbit artery simulating bioreactor to evaluate the influence of hemodynamics on the prohealing multifunctional endothelium nanomatrix coated stent in Aim 2.

Pending

MRI: Acquisition of a Bioplotter for 3D Tissue Engineering
NSF-MRI 9/1/15-8/31/17
Sethu (PI), Wick (Co-PI)
This Major Research Instrumentation proposal is to acquire a 3D bioplotter and establish a 3D BioPrinting core facility at UAB.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Yang Yang

eRA COMMONS USER NAME (credential, e.g., agency login): YANGYA

POSITION TITLE: Associate Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
China Medical University, China	M.D.	02/82	Medicine
Third Military Medical University, China	Ph.D.	10/89	Medicine
Yamanashi Medical University, Japan	Postdoctoral	09/93	Cancer Research
University of Arkansas for Medical Sciences, AR	Postdoctoral	02/00	Myeloma Research

A. Personal Statement

My research focuses on bone microenvironment and cancer (e.g., multiple myeloma) bone metastasis. I have rich experiences on teaching and mentor. I have trained and mentored six medical students and nigh graduate students since I became a faculty member. Below are three recent publications of these students.

1. Ritchie, J.P., Ramani, V.C., Naggi, A., Torri, G., Casu, B., Pisano, C., Carminati, P., Tortoreto, M., Zunino, F., Vlodavsky, I., Sanderson, R.D. and **Yang, Y**. SST0001, a chemically modified heparin, inhibits myeloma growth and angiogenesis via disruption of the heparanase/syndecan-1 axis. Clin Cancer Res 2011; 17(6):1382-93 (* This article has been reviewed by the Faculty of 1000 and the Hematologist in 2011). (PMCID:PMC3060291)

2. Ruan, J., Trotter, T.N., Nan, L., Luo, R., Javed, A., Sanderson, R.D., Suva, L.J., **Yang, Y.** Heparanase inhibits osteoblastogenesis and shifts bone marrow progenitor cell fate in myeloma bone disease. Bone 2013, 57(1):10–17. (PMCID:PMC3786009)

3. Trotter, T.N., Li, M., Pan, Q., Li, J; Peker, D., Rowan P.D., Suva, L.J., Javed, A., and **Yang, Y.** Myeloma cell-derived Runx2 promotes myeloma progression in bone. Blood 2015 Apr 10. pii: blood-2014-12-613968. [Epub ahead of print]

B. Positions and Honors

Positions and Employment

1982-1987 Resident, Chief Resident and Research Assistant, Southwest Hospital, China
1987-1989 Attending Physician and Research Associate, Southwest Hospital, China
1989-1991 Instructor, Southwest Hospital, China
1991-1992 Assistant Professor and Chief of Laboratory, Nanfang University Hospital, China
1993-1994 Postdoctoral Researcher, Yamanashi Medical University, Japan
1994-1997 Research Fellow, Sahlgrenska Hospital, Sweden
1997-2000 Associate Professor and Chief of Laboratory, Nanfang University Hospital, China
2000-2002 Postdoctoral Research Fellow, University of Arkansas for Medical Sciences, AR
2002-2006 Assistant Professor, Dept. of Pathology, University of Arkansas in Medical Science, AR
2006-2010 Assistant Professor, Dept. of Pathology, University of Alabama at Birmingham (UAB), AL
2011-Present Associate Professor, Dept. of Pathology, UAB, AL
2006-Present Associate Scientist, Center for Metabolic Bone Disease, UAB, AL
2006-Present Associate Scientist, Comprehensive Cancer Center, UAB, AL

Other Experience and Professional Memberships

2002-Present American Society of Hematology
2006-Present American Association for Matrix
2006-Present The American Society for Bone and Mineral Research
2007-Present American Association for Cancer Research
2011-Present International Bone and Mineral Society

C. Contribution to Science

My research over fifteen years in multiple myeloma (MM) resulted in four major contributions to science.

(1) *Syndecan-1 in MM*. Syndecan-1 is the dominant heparan sulfate (HS) proteoglycan expressed on the surface of MM cells and a marker of MM. Syndecam-1 can be shed from the MM cell surface and high levels of syndecan-1 in MM patient sera are an indicator of poor prognosis. I was the first one to demonstrate that the shed syndecan-1 is not simply an indicator of poor prognosis, but it actively promotes the growth and dissemination of myeloma tumors. Moreover, I discovered that syndecan-1 shedding is stimulated by heparanase expressed in myeloma cells. These important discoveries have been published in Blood and The Journal of Biological Chemistry (JBC), which have been cited numerous times in peer-reviewed journals.

a. **Yang, Y.**, Yaccoby, S., Liu, W., Langford, K.J., Pumphrey, C.Y., Theus, A., Epstein, J., and Sanderson, R.D. Soluble syndecan-1 promotes growth of myeloma tumors in vivo. Blood 2002; 100(2): 610-617.

b. **Yang, Y.**, Borset, M., Langford, K.J., and Sanderson, R.D. Heparan sulfate regulates targeting of syndecan-1 to a functional domain on the cell surface. JBC 2003; 278(15): 12888-12893.

c. **Yang, Y.**, MacLeod, V., Miao, H.Q., Theus, A, Zhan, F., Shaughnessy, J.Jr., Sawyer, J., Li, J.P., Zcharia, E., Vlodavsky, I., and Sanderson, R.D. Heparanase enhances syndecan-1 shedding: A novel mechanism for stimulation of tumor growth and metastasis. JBC 2007; 282(18):13326-13333.

(2) *Heparanase in MM and myeloma-related bone diseases*. Heparanase-1 (heparanase) is an enzyme that specifically cleaves heparan sulfate chains of syndencan-1 on the surface of myeloma cells. My studies demonstrated that heparanase plays a major role in promoting the progression of multiple myeloma: heparanase drives tumor growth, angiogenesis, and metastasis; stimulates syndecan-1 shedding; and induces an EMT-like phenotype of myeloma cells. Recently, we discovered that heparanase promotes bone resorption and inhibits bone formation in both primary and distant bone sites in myeloma through secreting soluble factors. These discoveries have been published in high ranking journals, presented orally at many international meetings, and reported by 2004 ASH News Daily.

a. **Yang, Y. (corresponding author),** Ren, R., Ramani, V.C., Nan, L., Suva, L.J., and Sanderson, R.D. Heparanase enhances local and systemic osteolysis in multiple myeloma by upregulating the expression and secretion of RANKL. Cancer Res 2010; 70(21): 8329-8338. (PMCID:PMC2970667)

b. Ramani, V.C., **Yang, Y.* (Co-1st author)**, Ren, Y., Nan, L., Sanderson, R.D. Heparanase plays a dual role in driving hepatocyte growth factor (HGF) signaling by enhancing HGF expression and activity. JBC 2011; 286(8):6490-6499 (*Selected as JBC one of 20 best papers published by the journal in 2011). (PMCID:PMC3057851)

c. Ruan, J., Trotter, T.N., Nan, L., Luo, R., Javed, A., Sanderson, R.D., Suva, L.J., and **Yang, Y.** Heparanase inhibits osteoblastogenesis and shifts bone marrow progenitor cell fate in myeloma bone disease. Bone 2013, 57(1):10–17. (PMCID:PMC3786009)

d. Pan, Q., Rowan, P.D., Innis-Shelton, R.D., Trotter, T.N., Li, M., Peker, D., Suva, L.J., and **Yang, Y.** Heparanase promotes myeloma metastasis by inducing EMT-like features in both myeloma cells and endothelial cells. Blood 2014 124:2025.(This abstract won an Abstract Achievement Award from ASH)

(3) *Translational research in MM.* Based on my work showing that heparanase is a viable target for MM therapy, I received Senior Awards from the Multiple Myeloma Research Foundation in 2007-2009 and in 2011-2014 to test the effect of a heparanase inhibitor, SST0001, on myeloma and myeloma-induced bone diseases. I demonstrated that SST0001, an engineered, non-anticoagulant heparin-based compound, dramatically inhibits tumor growth in animal models of human MM and that, unlike chemotherapeutic drugs, SST0001 inhibits tumor activity mainly by affecting the tumor microenvironment. Our study further showed that the combination of SST0001 and the chemotherapeutic drug dexamethasone revealed a synergetic effect in

inhibiting myeloma tumor growth. These discoveries have been published in Blood and the Clinical Cancer Research, and orally presented at the Annual Meeting of the American Society of Hematology. Based on our results, SST0001 is currently in phase I clinical trial on myeloma patients in Europe.

a. **Yang, Y.**, MacLeod, V., Dai, Y., Khotskaya-Sample, Y., Shriver, Z., Venkataraman, G., Sasisekharan R, Naggi A, Torri G, Casu B, Vlodavsky I, Suva, Epstein J, Yaccoby S, Shaughnessy, J.D., Barlogie, B. and Sanderson, R.D. The syndecan-1 heparan sulfate proteoglycan is a viable target for myeloma therapy. Blood 2007; 110(6): 2041-2048. (PMCID:PMC1976367)

b. Ritchie, J.P., Ramani, V.C., Naggi, A., Torri, G., Casu, B., Pisano, C., Carminati, P., Tortoreto, M., Zunino, F., Vlodavsky, I., Sanderson, R.D. and **Yang, Y**. SST0001, a chemically modified heparin, inhibits myeloma growth and angiogenesis via disruption of the heparanase/syndecan-1 axis. Clin Cancer Res 2011; 17(6):1382-1393 (* This article has been reviewed by the Faculty of 1000 and the Hematologist in 2011). (PMCID:PMC3060291)

(4) *The role of Runx2 in MM*. This is a new research direction in my laboratory. Runx2 is a well-known bone-specific transcription factor, essential for osteoblast differentiation and bone formation. Recent studies suggest that Runx2 is also expressed in solid tumors, where expression promotes bone metastasis and osteolysis. However, the function of Runx2 in myeloma is unknown. Our recent study demonstrated, for first time, that (i) Runx2 expression in primary human myeloma cells is significantly greater than in plasma cells from healthy donors; (ii) high levels of Runx2 expression in myeloma cells are associated with a high-risk population of myeloma patients; and (iii) overexpression of Runx2 in myeloma cells enhanced tumor growth and bone homing *in vivo*. Thus, Runx2 expression correlates with poor clinical prognosis and supports the aggressive and metastatic phenotype of MM. These discoveries have been selected for oral presentation at the 2014 Annual Meeting of the American Society of Hematology. A manuscript based on these data has been submitted to Blood and is currently under revision.

In addition, since we found that aggressive myeloma cells can secrete soluble factors to inhibit Runx2 expression in osteoblasts and bone formation in distant bones before metastasis occurs, we hypothesize that the suppression of osteoblast-derived Runx2 contributes to myeloma metastasis. To test this hypothesis, Dr. Javed (the co-PI) and I have created a unique mouse model in which Runx2 is specifically deleted in the osteoblasts of C57BL mice. The methods of making this model were partially published in the Journal of Bone and Mineral Research in Jan. 2015. We have crossed this model with a murine myeloma mouse model to create a syngenic model of murine MM in a Runx2 $^{OB-/-}$ background for the study proposed in this grant.

a. Ruan, J., Trotter, T.N., Nan, L., Luo, R., Javed, A., Sanderson, R.D., Suva, L.J., and **Yang, Y.** Heparanase inhibits osteoblastogenesis and shifts bone marrow progenitor cell fate in myeloma bone disease. Bone 2013, 57(1):10–17. (PMCID:PMC3786009)

b. Li, M., Trotter, T.N., Peker, D., Rowan P.D., Pan, Q., Suva, L.J., Javed, A., and **Yang, Y.** Myeloma cell-derived Runx2 promotes myeloma progression and bone-homing. Blood 2014; 124:724. (This abstract was selected for oral presentation in 2014 Annual Meeting of the American Society of Hematology)

c. Trotter, T.N., Li, M., Pan, Q., Li, J.; Peker, D., Rowan P.D., Suva, L.J., Javed, A., and **Yang, Y.** Myeloma cell-derived Runx2 promotes myeloma progression in bone. Blood 2015 Apr 10. pii: blood-2014-12-613968. [Epub ahead of print]

d. Adhami, M.D., Rashid, H., Chen, H., **Yang, Y.,** and Javed, A. Loss of Runx2 in committed osteoblasts impairs postnatal skeletogenesis. J Bone Miner Res. 2015 Jan; 30(1):71-82. (PMCID:PMC4280286)

D. Research Support

Active grants:

NIH (NCI) R01 CA151538 Yang Yang (PI) 07/08/2011 – 06/30/2016
Heparanase Regulation of Osteolysis in Multiple Myeloma
The major goal of this project is to investigate how heparanase induces bone resorption in multiple myeloma.
Role: Principal Investigator

UAB Center for Metabolic Bone Disease Pilot Grant Yang Yang (PI) 08/01/2014 – 07/31/2015
The Role of Myeloma Cell-Derived Runx2 in Myeloma Metastasis to Bone

The goal of this grant is to determine how myeloma cell-derived Runx2 regulates downstream tumor-progression genes in MM cells and drives the aggressive tumor phenotype of myeloma.
Role: Principal Investigator

NIH (NCI) R01 CA175012 Joanne Murphy-Ullrich (PI) 07/01/2014 – 06/30/2019
The Thrombospondin1-TGF-beta Axis in Multiple Myeloma
To investigate the mechanisms of TSP1 regulation of latent TGF-β activation on multiple myeloma progression.
Role: Co-Investigator

International Myeloma Foundation Senior Award Yang Yang (PI) 01/01/2015 – 12/31/2015
The Role of Myeloma Cell-Derived Runx2 in Myeloma Metastasis: Focus on Bone Microenvironment
This proposal is to investigate how myeloma cell-derived Runx2 modify the bone microenvironment to support bone metastasis.
Role: Principal Investigator

Completed Grants:

NIH (NCI) R01CA138535 Ralph D. Sanderson (PI) 02/01/2010 – 12/31/2014
Novel Heparanase Inhibitors for Cancer Therapy
Role: Co-Investigator

NIH (NCI) R01 CA138340 Ralph D. Sanderson (PI) 07/03/2009 – 04/30/2014
Heparanase Regulation of Myeloma Metastasis: Mechanism and Therapy
Role: Co-Investigator

Multiple Myeloma Research Foundation Senior Award Yang Yang (PI) 08/01/2011 – 02/28/2014
Heparanase as a Therapeutic Target for Regulation of Myeloma Bone Disease
Role: Principal Investigator

UAB Center for Metabolic Bone Disease Seed Fund Yang Yang (PI) 09/01/2012 – 08/31/2013
The Role of Runx2 in Myeloma Bone Disease
Role: Principal Investigator

UAB Comprehensive Cancer Center Pilot Grant Joanne Murphy-Ullrich (PI) 10/02/2012 – 09/30/2013
Role of the Thrombospondin1-TGF-beta axis in Multiple Myeloma
Role: Co-Investigator

NIH (NCI) R01 CA135075 Ralph D. Sanderson (PI) 09/05/2008 – 07/31/2013
Heparanase Regulation of Tumor Host Interactions in Myeloma and Breast Cancer
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Zayzafoon, Majd

eRA COMMONS USER NAME (agency login): MZAYZA

POSITION TITLE: Associate Professor of Pathology, and Medical Education
Director, International Advanced Clinical Training Program
Director, International Health Programs

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Damascus Univ. Med. School, Damascus	MD	08/1987	Medicine
Preston Hospital, Tyne & Wear, Great Britain	Resident	11/1992	Internal Medicine
Preston Hospital, Tyne & Wear, Great Britain	Fellow	11/1995	Gastroenterology
Michigan State University, East Lansing, MI	PhD	07/2001	Physiology
Univ. of Alabama at Birmingham, B'ham, AL	Postdoctoral Fellow	02/2005	Pathology
Univ of Alabama at Birmingham, B'ham, AL	MBA	12/2013	Entrepreneurship

A. PERSONAL STATEMENT

I am an Associate Professor at the Department of Pathology, Director of the International Advanced Clinical Training Program (InterACT), Director of the International Health Program, and Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC) at the University of Alabama at Birmingham. My research expertise lies in the areas of: (1) molecular mechanisms and cell signaling network regulating prostate cancer bone metastases and osteosarcoma, and (2) preclinical cancer and metastasis drug development in animal models. My research activities focus on understanding tumor-stroma interaction with the goals of defining its pathobiology and discovering novel targets that regulate tumor microenvironment for the treatment of cancer. Building on my clinical, basic science and business experiences, I function in the capacity of Associate Director of the CAMBAC to help oversee the activities of the Bone group of the University-wide research center as well as the Director of the International Advanced Clinical Training Program (InterACT), which is a program within the UAB International Health Office, which I also direct. The establishment of the InterACT program has led to the development of cultivated global partnerships between UAB and international sponsoring institutions, and has allowed for transformational mutual exchange in medical and academic education, research and practice. Currently, InterACT is partnered with several countries to provide international medical graduates with strong clinical and research experience as well as an education of the current U.S. medical system as it is conducted at UAB.

1. Sesler CL, Zayzafoon M. NFAT signaling in osteoblasts regulates the hematopoietic niche in the bone microenvironment. Clin Dev Immunol. 2013;2013:107321. PubMed PMID: 24023563; PubMed Central PMCID: PMC3654658.
2. Daft PG, Yuan K, Warram JM, Klein MJ, Siegal GP, Zayzafoon M. Alpha-CaMKII plays a critical role in determining the aggressive behavior of human osteosarcoma. Mol Cancer Res. 2013 Apr;11(4):349-59. PubMed PMID: 23364534; PubMed Central PMCID: PMC3631297.
3. Chu GC, Zhau HE, Wang R, Rogatko A, Feng X, Zayzafoon M, Liu Y, Farach-Carson MC, You S, Kim J, Freeman MR, Chung LW. RANK- and c-Met-mediated signal network promotes prostate cancer metastatic colonization. Endocr Relat Cancer. 2014 Apr;21(2):311-26. PubMed PMID: 24478054; PubMed Central PMCID: PMC3959765.

4. Daft PG, Yang Y, Napierala D, Zayzafoon M. The Growth and Aggressive Behavior of Human Osteosarcoma Is Regulated by a CaMKII-Controlled Autocrine VEGF Signaling Mechanism. PLoS One. 2015;10(4):e0121568. PubMed PMID: 25860662; PubMed Central PMCID: PMC4393114.

B. POSITIONS AND HONORS

Positions and Employment

1988 - 1992	Internal Medicine Residency, Preston Hospital, Tyne & Wear, Great Britain
1992 - 1995	Gastroenterology Fellow, Preston Hospital, Tyne & Wear, Great Britain
1997 - 2001	Graduate Research Assistant, Department of Physiology, The College of Human Medicine, Michigan State University, East Lansing, Michigan
2001 - 2002	Post-Doctoral Research Assistant, Department of Physiology, The College of Human Medicine, Michigan State University, East Lansing, Michigan
2002 - 2005	Post-Doctoral Fellow, Department of Pathology, Univ. of Alabama at Birmingham, Birmingham, Alabama
2005 - 2009	Assistant Professor of Pathology, Univ. of Alabama at Birmingham, Birmingham, Alabama
2008 - 2009	Assistant Professor of Cell, Developmental and Integrative Biology (CDIB), , Univ. of Alabama at Birmingham, Birmingham, Alabama
2008 - 2013	Co-Director, Histomorphometry and Molecular Analyses Core, Department of Pathology, University of Alabama at Birmingham, Birmingham, Alabama
2009 -	Associate Professor of Cell, Developmental and Integrative Biology (CDIB) , Univ. of Alabama at Birmingham, Birmingham, Alabama
2009 -	Associate Professor of Pathology, Univ. of Alabama at Birmingham, Birmingham, Alabama
2010 - 2014	Director, Center for Metabolic Bone Disease, School of Medicine, University of Alabama at Birmingham, Birmingham, Alabama
2013 -	Associate Professor, Department of Medical Education, University of Alabama at Birmingham, Birmingham, Alabama
2013 -	Director, International Advanced Clinical Training Program, School of Medicine, University of Alabama at Birmingham
2014 -	Director, International Health Program, School of Medicine, University of Alabama at Birmingham, Birmingham, Alabama

Other Experience and Professional Memberships

2005 - 2014	Scientist, Center for Metabolic Bone Disease, Univ. of Alabama at Birmingham, Birmingham, Alabama
2006 -	Scientist, Center for Aging, The Univ. of Alabama at Birmingham, Birmingham, Alabama
2006 - 2008	Member, American Society for Bone and Mineral Research Young Investigator Committee
2006 - 2013	Scientist, Cell Adhesion and Matrix Research Center, Univ. of Alabama at Birmingham, Birmingham, Alabama
2007 -	Scientist, Comprehensive Cancer Center, Univ. of Alabama at Birmingham, Birmingham, Alabama
2008 - 2012	Member, American Society for Bone and Mineral Research, Ancillary Program Committee
2009 -	Founder and Owner, Novicure Biotechnology (Biotech CRO Company focused on drug discovery for prostate cancer bone metastasis).
2009 - 2014	Associate Director for Translation and Enrichment, UAB Core Center for Basic and Translational Skeletal Research, Univ. of Alabama at Birmingham, Birmingham, Alabama
2010 - 2013	Elected-Executive Board Member, American Society of Bone and Mineral Research/Advances in Mineral Metabolism
2011 -	Scientist, Nutrition Obesity Research Center (NORC), University of Alabama at Birmingham, Birmingham, Alabama
2011 -	Scientist, Nutrition Obesity Research Center (NORC), University of Alabama at Birmingham, Birmingham, Alabama
2012 - 2013	Member, ASBMR Work Group on Reinventing the ASBMR Annual Meeting Exhibit Hall

2012 - 2014	Member, American Society for Bone and Mineral Research, Finance Committee
2013 - 2014	Associate Director, Comprehensive Arthritis and Musculoskeletal Autoimmunity Center (CAMAC), University of Alabama at Birmingham, Birmingham Alabama
2014 -	Associate Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC), University of Alabama at Birmingham, Birmingham, Alabama

Honors

1997	Scholarship Award, Office of International Students and Scholars at Michigan State University
1998	Assistantship Award , Physiology Department at Michigan State University
2002	Scholarship Award , Consortium for Materials Development in Space
2005	Harold Frost Young Investigator Award, American Society for Bone and Mineral Research.
2006	John Haddad Young Investigator Award, American Society for Bone and Mineral Research
2010	Scholarship and Excellence in Education Program, won by my undergraduate student, Shweta Naran Patel, Barry M. Goldwater
2010	Commendation Award for outstanding service , UAB Faculty Senate
2013	Best abstract award, American Society for Bone and Mineral Research
2015	Commendation Award for outstanding service, Saudi Arabian Cultural Mission

C. Contribution to Science

1. My early work and publications during graduate and post graduate education focused on studying the transcriptional regulation of osteoblasts and the effects of extracellular glucose (as seen in diabetes) on osteoblast differentiation and intracellular signaling. I later shifted my interest to study the effects of microgravity on the differentiation of human mesenchymal stem cells. We discovered that in microgravity, Runx2 expression is inhibited and PPAR gamma is activated causing a switch in the osteoblastic differentiation of hMSC and resulting in a decrease in bone formation and an increase in adipogenesis.
   a. Zayzafoon M, Stell C, Irwin R, McCabe LR. Extracellular glucose influences osteoblast differentiation and c-Jun expression. J Cell Biochem. 2000 Aug 2;79(2):301-10. PubMed PMID: 10967557.
   b. Zayzafoon M, Botolin S, McCabe LR. P38 and activating transcription factor-2 involvement in osteoblast osmotic response to elevated extracellular glucose. J Biol Chem. 2002 Oct 4;277(40):37212-8. PubMed PMID: 12149242.
   c. Zayzafoon M, Gathings WE, McDonald JM. Modeled microgravity inhibits osteogenic differentiation of human mesenchymal stem cells and increases adipogenesis. Endocrinology. 2004 May;145(5):2421-32. PubMed PMID: 14749352.
   d. Zayzafoon M, Fulzele K, McDonald JM. Calmodulin and calmodulin-dependent kinase IIalpha regulate osteoblast differentiation by controlling c-fos expression. J Biol Chem. 2005 Feb 25;280(8):7049-59. PubMed PMID: 15590632.
2. When I became and independent faculty, I used my skills and expertise and started new projects that examine the role of calcium signaling in differentiation of osteoblasts and bone formation. We were the first to describe that NFAT isoforms are expressed in osteoblasts and that the inhibition of NFAT by Cyclosporin A, pharmacological inhibitor of calcineurin, induces osteoblast differentiation in vivo and in vitro. Furthermore, we demonstrated that NFATc1 acts as a transcriptional co-repressor interacting with HDAC3 in differentiating osteoblasts. Finally, we recently discovered that osteoblast-specific NFAT activity mediates early B lymphopoiesis, possibly by regulating VCAM-1 expression on osteoblasts.

   a. Yeo H, McDonald JM, Zayzafoon M. NFATc1: a novel anabolic therapeutic target for osteoporosis. Ann N Y Acad Sci. 2006 Apr;1068:564-7. PubMed PMID: 16831953.
   b. Yeo H, Beck LH, Thompson SR, Farach-Carson MC, McDonald JM, Clemens TL, Zayzafoon M. Conditional disruption of calcineurin B1 in osteoblasts increases bone formation and reduces bone resorption. J Biol Chem. 2007 Nov 30;282(48):35318-27. PubMed PMID: 17884821.
   c. Choo MK, Yeo H, Zayzafoon M. NFATc1 mediates HDAC-dependent transcriptional repression of osteocalcin expression during osteoblast differentiation. Bone. 2009 Sep;45(3):579-89. PubMed PMID: 19463978; PubMed Central PMCID: PMC2732115.

d. Sesler CL, Zayzafoon M. NFAT signaling in osteoblasts regulates the hematopoietic niche in the bone microenvironment. Clin Dev Immunol. 2013;2013:107321. PubMed PMID: 24023563; PubMed Central PMCID: PMC3654658.

3. Another current focus of my laboratory is studying the role of calmodulin kinase (CaMK) in the growth and metastasis of osteosarcoma. We are the first to report that CaMK is critical for the growth of osteosarcoma. Also, we recently discovered that α-CaMKII regulates VEGF transcription by controlling HIF-1α and AP-1 transcriptional activities and the dual therapy by CaMKII and VEGF inhibitors could be a promising therapy against this devastating adolescent disease.

   a. Zayzafoon M. Calcium/calmodulin signaling controls osteoblast growth and differentiation. J Cell Biochem. 2006 Jan 1;97(1):56-70. PubMed PMID: 16229015.
   b. Yuan K, Chung LW, Siegal GP, Zayzafoon M. alpha-CaMKII controls the growth of human osteosarcoma by regulating cell cycle progression. Lab Invest. 2007 Sep;87(9):938-50. PubMed PMID: 17632540; PubMed Central PMCID: PMC2732110.
   c. Daft PG, Yuan K, Warram JM, Klein MJ, Siegal GP, Zayzafoon M. Alpha-CaMKII plays a critical role in determining the aggressive behavior of human osteosarcoma. Mol Cancer Res. 2013 Apr;11(4):349-59. PubMed PMID: 23364534; PubMed Central PMCID: PMC3631297.
   d. Daft PG, Yang Y, Napierala D, Zayzafoon M. The Growth and Aggressive Behavior of Human Osteosarcoma Is Regulated by a CaMKII-Controlled Autocrine VEGF Signaling Mechanism. PLoS One. 2015;10(4):e0121568. PubMed PMID: 25860662; PubMed Central PMCID: PMC4393114.

4. In addition to the contributions described above that were originated from my laboratory, I have several contributions with my colleague from diffent institutions on projects. We recently described how prostate cancer cells harbor stem cell properties of bone marrow mesenchymal stem cells as part of our Program Project studies. Also, I and my collaborators at Emory University described a novel cross-talk between T cells and SCs mediated by CD40L plays a pivotal role in the dysregulation of osteoblastogenesis and osteoclastogenesis induced by ovariectomy.

   a. Josson S, Matsuoka Y, Gururajan M, Nomura T, Huang WC, Yang X, Lin JT, Bridgman R, Chu CY, Johnstone PA, Zayzafoon M, Hu P, Zhau H, Berel D, Rogatko A, Chung LW. Inhibition of β2-microglobulin/hemochromatosis enhances radiation sensitivity by induction of iron overload in prostate cancer cells. PLoS One. 2013;8(7):e68366. PubMed PMID: 23874600; PubMed Central PMCID: PMC3707913.
   b. Smith BN, Burton LJ, Henderson V, Randle DD, Morton DJ, Smith BA, Taliaferro-Smith L, Nagappan P, Yates C, Zayzafoon M, Chung LW, Odero-Marah VA. Snail promotes epithelial mesenchymal transition in breast cancer cells in part via activation of nuclear ERK2. PLoS One. 2014;9(8):e104987. PubMed PMID: 25122124; PubMed Central PMCID: PMC4133359.
   c. Roser-Page S, Vikulina T, Zayzafoon M, Weitzmann MN. CTLA-4Ig-induced T cell anergy promotes Wnt-10b production and bone formation in a mouse model. Arthritis Rheumatol. 2014 Apr;66(4):990-9. PubMed PMID: 24757150; PubMed Central PMCID: PMC3994890.
   d. Chu GC, Zhau HE, Wang R, Rogatko A, Feng X, Zayzafoon M, Liu Y, Farach-Carson MC, You S, Kim J, Freeman MR, Chung LW. RANK- and c-Met-mediated signal network promotes prostate cancer metastatic colonization. Endocr Relat Cancer. 2014 Apr;21(2):311-26. PubMed PMID: 24478054; PubMed Central PMCID: PMC3959765.

D. RESEARCH SUPPORT

Ongoing Research Support

2002/12/01-2020/02/29
P01 CA098912, NIH/NCI
Zayzafoon, Majd (PI)
Prostate Cancer Bone Metastasis: Bio logy and Targeting (PI: Chung)
Core B, “Pathology and High Resolution Imaging Core.” (PI and Director of Core B) The aim of Core B is to provide the program project investigators with state-of-the-art instrumentation, expertise and standardized

routine and advanced histological and imaging services in order to assist project investigators with the validation of their hypotheses. Furthermore, the Core will be procuring fresh prostatic and bone metastatic tissue and provide prostate cancer diagnostic expertise for both clinical specimens and animal models of prostate cancer.
Role: PI

2013/07/01-2016/06/30
No Assigned Project #, International Advanced Clinical Training Program (InterACT)
Zayzafoon, Majd (PI)
International Advanced Clinical Training
The major goal of this project is to provide international trainees with strong clinical and research experience as well as an education of the current U.S. medical system as it is conducted at the University of Alabama at Birmingham (UAB). Throughout their tenure in the program, InterACT trainees will actively participate in the UAB clinical simulation program and work alongside UAB students, researchers, and physicians at UAB research and medical centers. Ultimately, trainees are expected to significantly enhance their education, research experience, and diagnostic and treatment expertise.
Role: PI

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Aslibekyan, Stella

eRA COMMONS USER NAME (credential, e.g., agency login) Saslibek

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Stanford University, Stanford, CA	BA (Honors)	06/05	Human Biology
Harvard School of Public Health, Boston, MA	SM	06/08	Epidemiology
Brown University, Providence, RI	PhD	05/11	Epidemiology
University of Alabama at Birmingham	Postdoctoral Fellowship	02/13	Genetic Epidemiology

A. Personal Statement

I am a chronic disease epidemiologist with extensive training in statistical genetics and epigenetics. Broadly, my research interests lie at the intersection of the environment (specifically diet and drugs) and –omics systems biology, including genomics, epigenomics, and transcriptomics. Specifically, I am interested in how genes interact with treatment and lifestyle variables in the etiology of rheumatoid arthritis. In addition to my own funded projects, I am a member of the UAB Multidisciplinary Clinical Research Center Methodology Core; in that role, I assist other investigators with epidemiologic study design, statistical methods, and scientific writing. I am unequivocally committed to teaching and mentoring, as evidenced by my teaching excellence award and the publication that resulted from my work on the thesis committee of a student receiving her Master's in Epidemiology. Currently, I serve as an advisor of one PhD student and a number of Master's students, and serve as a co-mentor for one postdoctoral fellow in our group. The current application builds on my experience, pedagogic interest, and strengths, providing the perfect framework for my growth as a mentor.

Tran NT*, **Aslibekyan S**, Tiwari HK, Zhi D, Sung YJ, Rao DC, Hunt SC, Broeckel U, Arnett DK, Judd SE, Muntner P, Kent ST, Irvin R. PCSK9 variation and association with blood pressure in African Americans: preliminary findings from the HyperGEN and REGARDS studies. *Front Genet* 2015; in press. *indicates supervised student

B. Positions and Selected Honors

Positions and Employment

2013- Assistant Professor, Department of Epidemiology, University of Alabama at Birmingham, Birmingham, AL

2011-2013 Postdoctoral Fellow, Department of Epidemiology, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2014- Member, International Genetic Epidemiology Society

2008- Member, Human Biology Association

2007- Member, Society of Epidemiologic Research

2006- Member, American Heart Association

Honors

2014 Finalist for the Young Investigator Award, American Heart Association

2013 Best Paper in Nutrition or Obesity Award, Science Unbound Foundation

2010 Reginald D. Archambault Award for Teaching Excellence, Brown University

2008 Sidney E. Frank Graduate Fellowship, Brown University

2005 Departmental Honors, Stanford University

C. Contributions to Science

1. Working with a team of clinical and academic rheumatologists, I have identified several genetic variants that explain the variability in methotrexate treatment response in early aggressive rheumatoid arthritis. Specifically, we discovered that polymorphisms in cytochrome p450 and solute carrier genes explains a higher proportion of variation in toxicity than efficacy, as well as documented a novel association between a variant in a gene encoding carbohydrate sulfotransferase 11 and treatment response. We also found that the effect of obesity, a known risk factor for rheumatoid arthritis, on treatment response varies by genotype at two biologically relevant loci, with a fourfold stronger association among carriers of at least one copy of the minor allele. These finding lay the groundwork for personalized treatment approaches in rheumatoid arthritis.
    a. **Aslibekyan S*,** Brown EB*, Reynolds RJ*, Redden DT, Morgan SL, Baggott JE, Sha J, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Bridges SL, Arnett DK. Genetic variants associated with methotrexate efficacy and toxicity in early rheumatoid arthritis: results from the Treatment of Early Aggressive Rheumatoid Arthritis (TEAR) Trial. *Pharmacogenomics J* 2014; 14:48-53. PMCID: PMC3701736.
    b. **Aslibekyan S,** Sha J, Redden DT, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Hughes LB, Reynolds RJ, Danila MI, Bridges SL. Gene-BMI interactions are associated with methotrexate toxicity in rheumatoid arthritis. *Ann Rheum Dis* 2014: 73; 785-6. PMCID: PMC3970399.

2. In addition to contributions in genetic epidemiology of autoimmune disease, I have made methodological advances in whole genome sequence analysis. Using cutting-edge Bayesian approaches, we have established that rare and very rare variants explain a higher percentage of the variance in blood pressure than common variants, and that the number of contributing rare alleles plays an important role in the genetic architecture of chronic disease traits. My other methodological contributions lay in the area of pathway analysis, a promising technique for modeling complex traits currently facing several challenges to validity and interpretation of findings.
    a. **Aslibekyan S**, Almeida M, Tintle N. Pathway analysis approaches for rare and common variants: insights from genetic analysis workshop 18. *Genet Epidemiol* 2014; Suppl 1:S86-91. PMCID: PMC4221731.
    b. **Aslibekyan S**, Wiener HW, Wu G, Zhi D, Shrestha S, de los Campos G, Vazquez AI. Estimating proportions of explained variance: a comparison of whole genome subsets. *BMC Proc* 2014; Suppl 1 Genetic Analysis Workshop 18:S102. PMCID: PMC4143698.

3. Finally, I have an extensive record of publications documenting the association between genetic or epigenetic variation and the risk of other chronic diseases, namely cardiovascular and metabolic disease. I have conducted several genome- and epigenome-wide studies of validated disease markers like C-reactive protein, tumor necrosis-factor alpha, body mass index, and others. Moreover, I have discovered novel gene-gene and gene-environment interactions in response to lipid-lowering interventions (fenofibrate therapy). Many of my findings have been successfully validated in independent populations and represent potential diagnostic and therapeutic targets.
    a. **Aslibekyan S**, Kabagambe EK, Irvin MR, Straka RJ, Borecki IB, Tiwari HK, Tsai MY, Hopkins PN, Ordovas JM, Arnett DK. A genome-wide association study of inflammatory marker changes in response to fenofibrate treatment in Genetics of Lipid Lowering and Diet Network. Pharmacogenet Genomics 2012; 22(3): 191-197. PMCID: PMC3275691.
    b. **Aslibekyan S**, Demerath E W, Mendelson M, Zhi D, Guan W, Liang L, Sha J, Pankow JS, Liu C, Irvin MR, Fornage M, Hidalgo B, Lin LA, Thibeault KS, Bressler J, Tsai MY, Grove ML, Hopkins PN, Boerwinkle E, Borecki IB, Ordovas JM, Levy D, Tiwari HK, Absher DM, Arnett DK. Epigenome-wide study identifies novel methylation loci associated with body mass index and waist circumference. *Obesity* 2015; in press.
    c. **Aslibekyan S**, An P, Frazier-Wood AC, Kabagambe EK, Irvin MR, Straka RJ, Tiwari HK, Tsai MY, Hopkins PN, Borecki IB, Ordovas JM, Arnett DK. Preliminary evidence of genetic determinants of adiponectin response to fenofibrate in the Genetics of Lipid Lowering Drugs and Diet Network. *Nutr Metab Cardiovasc Dis* 2013; 23:987-94. PMCID: PMC3578131.

d. **Aslibekyan S**, Goodarzi MO, Frazier-Wood AC, Yan X, Irvin MR, Kim E, Tiwari HK, Guo X, Straka RJ, Taylor KD, Tsai MY, Hopkins PN, Korenman SG, Borecki IB, Chen YD, Ordovas JM, Rotter JI, Arnett DK. Variants identified in a GWAS meta-analysis for blood lipids are associated with the lipid response to fenofibrate. PLoS One 2012; 7(10): e48663. PMCID: PMC3485381.

Complete List of Published Work: http://www.ncbi.nlm.nih.gov/pubmed/?term=aslibekyan

D. Research Support

ACTIVE

UAB Multidisciplinary Clinical Research Center Methodology Core
NIH P60 AR064172 (PI: Redden) 09/16/13 – 07/31/18
This program provides methodological support for projects aimed at understanding the role of genetic variation in the etiology and response to treatment in autoimmune disease.

Genetic and Epigenetic Determinants of Trimethylamine-N-oxide
American Heart Association 14CRP18060003 (PI: Aslibekyan) 01/01/14 – 12/31/15
This project investigates the role of genetic and epigenetic variation in determining the levels of trimethylamine-N-oxide (TMAO), an emerging disease risk factor, as well as associations between TMAO and intermediate chronic disease phenotypes such as blood lipids and inflammatory markers.

Epigenetic Determinants of Lipids Response to Dietary Fat and Fenofibrate
NIH R01 HL104135 (PI: Arnett) 08/15/10 – 05/31/15
This project aims to identify epigenetic loci that determine gene-environment interactions that predict lipid response to two interventions, one to raise triglycerides (intake of a high-fat meal), and one to lower triglycerides (treatment with fenofibrate).

HyperGEN: Genetics of Left Ventricular Hypertrophy
NIH R01 HL55673 (PI: Arnett) 08/10/96 – 04/30/17
This project extends the genetic analysis of previously collected hypertension pedigrees with echocardiographic measures. We are conducting a genome-wide association study to identify genomic regions contributing to variation in cardiac size and structure.

Prospective Meta-Analyses of Drug-Gene Interactions: CHARGE GWAS Consortium

NIH R01 HL103612 (PI: Psaty; Subcontract PI: Arnett) 07/01/2011 – 07/13/2015
The benefits of modern drug therapies can be maximized by avoiding some medications in patients who are genetically susceptible to adverse reactions or by selecting other medications for patients who are genetically likely to benefit. This broad-based discovery effort may help to illuminate biologic mechanisms, affect how some drugs are prescribed, or identify novel targets for new therapies.

PENDING

Genomewide Association: Triglyceride Response to Fenofibrate Therapy and Dietary Fat
NIH R01 HL091357 (PI: Arnett) 04/01/2015 – 03/31/2019
Health officials have long recognized the important role fat and cholesterol play in conditions and diseases such as obesity, diabetes, and heart disease. However, how people's genes interact with their consumption of dietary fat or their treatment with drugs to reduce blood fats is poorly understood. This study aims to identify genetic variants that influence fat and cholesterol response to diet and drugs; this knowledge may someday help doctors tailor prevention efforts and treatments based on individual's genetic endowment.

Epigenetic Determinants of Left Ventricular and Function in Hypertensive African-Americans

American Heart Association CVGPS Pathway (PI: Arnett) 02/01/2015 – 01/31/2017
Left ventricular hypertrophy (a thickening of heart walls that can reduce the heart's ability to pump effectively) is common in African Americans, and it contributes more to the risk of cardiovascular death in African Americans than it does in other race groups. This project is designed to determine which non-coding genetic factors (that is, epigenetic factors) may play a role in the development of left ventricular hypertrophy in African Americans.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Ballesteros-Tato, Andre

eRA COMMONS USER NAME (agency login): ABALLEST

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Vigo University, Vigo	B.S.	06/2001	Biology
Autónoma University, Madrid, Spain	Ph.D.	07/2007	Molecular Biology/Immunology
Trudeau institute, Saranac lake, NY	Postdoctoral	03/2008-09/2008	Immunology
University of Rochester, Rochester, NY	Postdoctoral	10/2008-2/2012	Immunology

A. PERSONAL STATEMENT

Recent studies indicate that T follicular helper cells (Tfh) are initially primed by dendritic cells (DCs), suggesting that we may be able to develop adjuvants that preferentially activate DCs to promote Tfh cell priming, or target vaccine antigens to those DCs that preferentially induce Tfh cells Unfortunately, we do not know what signals direct the DCs to promote Tfh cell differentiation, which specific subsets of DCs prime Tfh cell responses or whether effector and Tfh cell responses are differently induced by DCs. One of the main projects in my lab is to study the cellular and molecular mechanisms by which different populations of DCs prime pathogen-specific Tfh cell responses. This knowledge will help us to determine the nature of adjuvants that can be used to boost Tfh cell responses, so that we can rationally design vaccines and therapies that elicit Tfh cells and promote robust, long-lived, high-affinity antibody responses. In addition, my lab focuses on the potential clinical benefits of low-dose IL-2 administration to treat autoimmune disease and the mechanisms underlying these effects. Recent studies indicate that low-dose IL-2 treatment suppresses unwanted immune responses in mice and humans, thus evidencing the potential of IL-2 to treat autoimmune disorders. Increased regulatory T cell activity is one of the potential mechanisms by which low-dose IL-2 immunotherapy induces immunosuppression. However, data obtained in my lab indicate that exogenous IL-2 administration prevents aberrant accumulation of Tfh and GC B cell in lupus-prone mice. Our results demonstrate an unexpected immunosuppressive function of IL- 2 that is independent on its role in Treg homeostasis and provide an alternative mechanism to explain the clinical benefits of IL-2 immunotherapies to treat antibody-mediated autoimmune disorders. We are now exploring the potential therapeutic use of low doses of IL-2 in systemic lupus erythematosus, the potential synergistic effects of combining IL-2 administration with blockade of cytokine pathways that promote Tfh cell development and/or deplete B cells, and how more specifically target IL-2 to Tfh cells. These data will offer new insights into how polymorphisms in the IL-2 and IL-2R genes can affect self-reactive Tfh and B cell responses and influence the development of autoimmune disease manifestations

1. **Ballesteros-Tato A**, León B, Lund FE, Randall TD. Temporal changes in dendritic cell subsets, cross-priming and costimulation via CD70 control CD8(+) T cell responses to influenza. Nat Immunol. 2010 Mar;11(3):216-24. PubMed PMID: 20098442; PubMed Central PMCID: PMC2822886.
2. **Ballesteros-Tato A**, León B, Graf BA, Moquin A, Adams PS, et al. Interleukin-2 inhibits germinal center formation by limiting T follicular helper cell differentiation. Immunity. 2012 May 25;36(5):847-56. PubMed PMID: 22464171; PubMed Central PMCID: PMC3361521.
3. **Ballesteros-Tato A**. Beyond regulatory T cells: the potential role for IL-2 to deplete T-follicular helper cells and treat autoimmune diseases. Immunotherapy. 2014;6(11):1207-20. PubMed PMID: 25496335; PubMed Central PMCID: PMC4289615.

4. León B, Bradley JE, Lund FE, Randall TD, **Ballesteros-Tato A**. FoxP3+ regulatory T cells promote influenza-specific Tfh responses by controlling IL-2 availability. Nat Commun. 2014 Mar 17;5:3495. PubMed PMID: 24633065; PubMed Central PMCID: PMC4013682.

B. POSITIONS AND HONORS

Positions and Employment

2001 - 2002	PhD student, Fundación Jiménez Díaz, Dept Immunology. Madrid, Spain
2002 - 2007	PhD student, National Center of Biotechnology. Madrid, Spain
2008 - 2008	Postdoctoral fellow, Trudeau Institute, Saranac Lake, NY
2008 - 2012	Postdoctoral fellow, University of Rochester, Rochester, NY
2012 - 2012	Postdoctoral fellow, University of Alabama, Birmingham, AL
2012 - Present	Assistant Professor, University of Alabama, Birmingham, AL
2012 - Present	Member of the University of the Comprehensive arthritis musculoskeletal, bone and autoimmunity center (CAMBAC), University of Alabama at Birmingham, Birmingham , AL
2014 - Present	Full Graduate Faculty Member, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2010 - Present	Assistant Member, Faculty of 1000
2012 - Present	Member, American Association of Immunologists.
2013 - Present	Reviewer for *Nature Medicine, Nature communications, Arthritis & Rheumatism and PLOS Biology*
6/2013	Ad Hoc Member, NIH Special Emphasis Scientific Review Group 2013/10 ZCA1 RTRB- Z (O1) Tumor Immunology.
11/2013	Ad Hoc Member, NIH Special Emphasis Scientific Review Group 2014/01 ZCA1 RTRB- Z (O1) Tumor Immunology.
11/2014	Ad Hoc Member, NIH Special Emphasis Scientific Review Group 2015/01 ZCA1 RTRB-Z (J1) Tumor Immunology.
2014-2015	Scientific Advisory, GTCbio's Cytokines & Inflammation Conference 2015
2015 - Present	Editor, Scientific Reports

Honors

2000-2001	Undergraduate Training Fellowship, University of Vigo
2003-2007	Predoctoral training fellowship, Madrid Regional Government
2013	Early Career Faculty Travel Grant, American Association of immunologist
2013	Young investigator award, Biogen *Idec (Recipients of the Biogen Idec foundation young investigator award receive a €18,000 cash award).*
2015	UAB Endowed Pittman Scholar Award, University of Alabama at Birmingham *(Recipients of the Endowed Pittman Scholar Award receive $62,500 over a 5 year period)*

C. CONTRIBUTION TO SCIENCE

1. In my early publications, I studied how dendritic cell (DC) subsets responded to infection and characterized the role of the distinct DC subsets present in the secondary lymphoid and non-lymphoid tissues of influenza-infected mice. At that time, the prevailing dogma was that that cross-priming of virus-specific CD8+ T cells was carried out by lymph-node resident CD8α+ DCs that captured antigen from migratory DCs that trafficked from the inflamed tissues into the lymph-nodes. In contrast, my work demonstrated migratory DCs acquire soluble antigen in the peripheral tissues, migrate to the LNs and cross-prime CD8+ T cells directly, without handing off antigen to other DCs. My data provide a new insight into how temporal changes in DC migration and function modulate CD8+ T cell responses to virus and contribute to better define the function of the different migratory DC subsets in response to virus and pathogen infection.

a. **Ballesteros-Tato A**, León B, Lund FE, Randall TD. Temporal changes in dendritic cell subsets, cross-priming and costimulation via CD70 control CD8(+) T cell responses to influenza. Nat Immunol. 2010 Mar;11(3):216-24. PubMed PMID: 20098442; PubMed Central PMCID: PMC2822886.

b. León B, **Ballesteros-Tato A**, Browning JL, Dunn R, Randall TD, et al. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.

2. Early studies suggested that a brief encounter between naïve T cells and antigen-bearing dendritic cells (DCs) was sufficient to trigger their differentiation into effector and memory CD8+ T cells without additional Ag-stimulation. These studies suggested an antigen-independent differentiation program in which responding CD8+ T cells could be instructed to develop into of fully functional memory CD8+ T cells during the early priming stage of the immune response and that, once initiated, this process could not be interrupted by the absence of antigen and/or co-stimulatory signals provided by DCs. However, my work has lead to a revision of this model. My publications demonstrated that prolonged antigen presentation by DCs during the contraction phase of the primary immune response is required to generate long-lived, fully functional memory CD8+ T cells with enhanced protective capacity.

   a. **Ballesteros-Tato A**, León B, Lund FE, Randall TD. CD4+ T helper cells use CD154-CD40 interactions to counteract T reg cell-mediated suppression of CD8+ T cell responses to influenza. J Exp Med. 2013 Jul 29;210(8):1591-601. PubMed PMID: 23835849; PubMed Central PMCID: PMC3727323.

   b. **Ballesteros-Tato A**, León B, Lee BO, Lund FE, Randall TD. Epitope-specific regulation of memory programming by differential duration of antigen presentation to influenza-specific CD8(+) T cells. Immunity. 2014 Jul 17;41(1):127-40. PubMed PMID: 25035957; PubMed Central PMCID: PMC4233138.

   c. León B, **Ballesteros-Tato A**, Randall TD, Lund FE. Prolonged antigen presentation by immune complex-binding dendritic cells programs the proliferative capacity of memory CD8 T cells. J Exp Med. 2014 Jul 28;211(8):1637-55. PubMed PMID: 25002751; PubMed Central PMCID: PMC4113940.

3. The generation of CD4+ T follicular helper (Tfh) cells is required for protective immunity to most viruses and for protection after vaccination. However, the precise signals that control Tfh cell development are still unclear. My previous publications identified Interleukin-2 (IL-2) as a critical factor that controls Tfh cell differentiation in vivo. My work demonstrated that an elevated level of IL-2 prevents Tfh cell differentiation and that FoxP3+ regulatory T cells (Tregs) promote, rather than inhibit, virus-specific Tfh responses by consuming IL-2. These studies significantly changed our understanding for how Tfh cell responses are initiated.

   a. **Ballesteros-Tato A**, León B, Graf BA, Moquin A, Adams PS, et al. Interleukin-2 inhibits germinal center formation by limiting T follicular helper cell differentiation. Immunity. 2012 May 25;36(5):847-56. PubMed PMID: 22464171; PubMed Central PMCID: PMC3361521.

   b. **Ballesteros-Tato A**. Beyond regulatory T cells: the potential role for IL-2 to deplete T-follicular helper cells and treat autoimmune diseases. Immunotherapy. 2014;6(11):1207-20. PubMed PMID: 25496335; PubMed Central PMCID: PMC4289615.

   c. **Ballesteros-Tato A**, Randall TD. Priming of T follicular helper cells by dendritic cells. Immunol Cell Biol. 2014 Jan;92(1):22-7. PubMed PMID: 24145854; PubMed Central PMCID: PMC4052723.

   d. León B, Bradley JE, Lund FE, Randall TD, **Ballesteros-Tato A**. FoxP3+ regulatory T cells promote influenza-specific Tfh responses by controlling IL-2 availability. Nat Commun. 2014 Mar 17;5:3495. PubMed PMID: 24633065; PubMed Central PMCID: PMC4013682.

Complete List of Published Work in My Bibliography:
http://www.ncbi.nlm.nih.gov/myncbi/andre.ballesteros-tato.1/bibliography/43527269/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

R01AI110480-01, NIH/NIAID Ballesteros-Tato, Andre (PI) 2015/01/21-2019/12/31
Regulation of T cell dependent B cell responses to influenza
The goal of this study is to determine the mechanisms by which Dendritic Cells prime Tfh cell responses after influenza infection and how IL-2 signaling modulates this process.
Role: PI

U19 AI109962, NIH/NIAID Randall, Troy (PI) 2014/05/01-2019/04/01
Virus-induced Cell Fate Decisions in Anti-Viral Immunity
The goal of this project is to determine how cell fate decisions in CD4 T cells, CD8 T cells, B1 B cells and B2 B cells are regulated during antiviral immunity
Role: Co-Investigator

Ballesteros-Tato, Andre (PI) 2015/04/01-2016/04/28
CFAR Vaccine Concept Proposal, UAB Center for AIDS Research
Novel Ab/citrullination-dependent mechanism of vaccination to HIV
The goal of this study is to apply a Ab/citrullination-dependent mechanism of vaccination to promote high quality HIV–specific memory CD8 T cells.
Role: PI

Completed Research Support

Ballesteros-Tato, Andre (PI) 2012/11/01-2014/08/31
Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center, Rheumatic Diseases Core Center and P30 AR048311 (Mountz, PD/PI)
New rIL-2 based therapy to SLE
Role: PI

R21 AI097876, NIH/NIAID Randall, Troy (PI) 2012/02/01-2014/01/31
Role of CCR1 in Cytokine Storm & Immunopathology after influenza infection.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Krista Casazza

eRA COMMONS USER NAME (credential, e.g., agency login): kristac

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Florida, Gainesville, FL	BS	12/1995	Zoology/Education
University of Florida, Gainesville, FL	MS	05/1997	Animal Physiology
Florida International University, Miami, FL	PhD	05/2006	Dietetics and Nutrition
University of Alabama at Birmingham	Postdoctoral Fellow	02/2011	Nutrition Sciences

A. Personal Statement

I have the expertise, leadership, training and motivation necessary to successfully carry out the proposed research project. I have a broad background in physiology and metabolism, with specific training and expertise in the intersection of nutrient delivery and utilization and the musculoskeletal system in pediatrics. My research largely has centered on investigating the reciprocal relationship between fat and bone to study the cross-talk between tissues during the pubertal transition. As PI or co-investigator on several university- and NIH-funded grants, I laid the groundwork for the proposed research by routinely employing a variety of body composition assessment techniques such as magnetic resonance imaging, peripheral quantitative tomography and dual-energy x-ray absorptiometry for robust assessment of body composition and by establishing dietary and exercise programs in this age group for the potential to optimize musculoskeletal health and feed forward effects across systems. In addition, I successfully administered the projects (e.g. staffing, research protections, budget), collaborated with other researchers and produced several peer-reviewed publications from each project. As a result of these previous experiences, I am aware of the importance of frequent communication among project members and constructing a realistic plan, timeline and budget. The current application builds logically on my prior work.

The foundation for the progression of my research interests was largely ground in improvement of insulin sensitivity and beta cell function and underlying racial differences in these outcomes in children. In order to embark upon this lofty aspiration, our group sought to understand and characterize the metabolic milieu of puberty and key factors which may uniquely interact in this critical developmental stage. This work is exemplified in a publication featured in JCEM.[1] We noted higher insulin was associated with higher estrogen levels in pre-/peri-pubertal adolescent girls, and reproductive maturation appeared to be associated with an acceleration of fat deposition among African American girls, in particular. Moving forward, these findings were utilized in subsequent studies which behavioral interventions were sought after to effectively improve metabolic health during critical windows of development. This investigation primarily guided the development of a successfully funded, highly regarded NIH Research Scientist Development Award K99/R00, entitled “Puberty Related Intervention to Improve Metabolic Outcomes - The PRIMO Pilot Study,” aiming to lead investigation towards non-pharmacologic improvements in metabolic health in female adolescents. The findings resulting from the first phase of the grant were detailed in a publication.[2] Throughout this project, an understanding began to solidify of a reciprocal fat-bone relationship. In the interim, we secured internal funding to implement our designed exercise intervention to optimize the accelerated structural skeletal property changes accompanying early childhood, which may have profound impact on traversal through the linear growth spurt. Our findings, summarized in our manuscript published in Bone[3] highlighted bone qualitative improvements after just ten weeks of participation in a moderate intensity physical activity intervention. Previously thought to be an inert organ, the skeleton and its metabolic importance became even greater apparent after discovery of

its participation in endocrine regulation, particularly crosstalk with the pancreas through release of the bone-specific osteokine, osteocalcin. The group then focused on characterizing the relationship between osteocalcin and metabolic parameters in our cohorts of adults and children. Specifically, the publication featured in JCEM confirmed a positive association of osteocalcin with glucose tolerance, and led to the understanding of a unique association of the nutrient (vitamin K)-dependent fraction, undercarboxylated osteocalcin, and β-cell function in individuals with impaired fasting glucose. The intricate interplay between bone and the pancreas has further proven to extend beyond these organs. The musculoskeletal system as a whole must be taken into account, as skeletal muscle has a unique set of specifically expressed and secreted endocrine factors, which this project will build upon.

[1] **Casazza K**, Goran MI, Gower BA. Associations among insulin, estrogen, and fat mass gain over the pubertal transition in African American and European American girls. *J Clin Endo Metab*. 2008, Jul; 93(7):2610-5. PMCID: PMC2453051
[2] **Casazza K**, Cardel M, Dulin-Keita A, Hanks LJ, Gower BA, Newton AL, Wallace S. Reduced carbohydrate diet to improve metabolic outcomes and decrease adiposity in obese peripubertal African American girls. *J Pediatr Gastroenterol Nutr* Mar;54(3):336-42 2012).
[3]**Casazza K**, Hanks LJ, Hidalgo B, Hu HH, Affuso O. Short-term physical activity intervention decreases femoral bone marrow adipose tissue in young children: a pilot study 2011
[4]Gower BA, Pollock NK, **Casazza K**, Clemens TL, Goree LL, Granger WM. Associations of total and undercarboxylated osteocalcin with peripheral and hepatic insulin sensitivity and β-cell function in overweight adults. *J Clin Endocrinol Metab*. 2013 Jul;98(7):E1173-80)

B. Positions and Honors

Employment

1995-1997	Graduate Research Assistant, University of Florida, Gainesville, FL
1997-2002	Broward County Public Schools Science Faculty, Ft. Lauderdale, FL
1999	Palm Beach Community College, Adjunct Faculty, West Palm Beach, FL
1999-2006	Broward Community College, Adjunct Faculty, Davie, FL
2002-2005	Teaching Assistant, Florida International University, Miami, FL
2003-2004	Graduate Assistant, Florida International University, Miami, FL
2006-2011	Postdoctoral Fellow, University of Alabama at Birmingham (UAB) Department of Nutrition Sciences, Birmingham, AL
2011-2014	Assistant Professor, UAB, Department of Nutrition Sciences, Birmingham, AL
2014-present	Associate Professor, UAB, Department of Pediatrics, Division of General Pediatrics and Adolescent Medicine

Other Experience and Professional Memberships

2006-present	Member, American Diabetes Association
2003-2006	Member, American Society for Nutrition Sciences
2003-2007	Member, American Dietetic Association
2004-present	Member, American Diabetes Association
2001-present	Member, TOS, The Obesity Society

Honors & Awards

2003-2006	Pre-Doctoral Fellowship: Florence Bayuk Foundation Graduate Fellowship in Health
2006	Outstanding Dietetics Student Award, American Dietetic Association
2007	Body Weight, Adiposity, Energetics, and Longevity Symposium Travel Award
2009	Endocrine Society- Endocrine Trainee Day Travel Award
2010	Minority Health & Health Disparities Research Center, 1st Place Poster Competition
2010	American Dietetic Association Huddleson Award for Best Paper
2010	Florida International University Torch Award for Distinguished Alumni
2011	Endocrine Society Early Investigator's Award
2012	ASBMR John Haddad Young Investigator Award
2013	The Obesity Society Fellow

C. Contribution to Science

1. My early focus directly addressed metabolic perturbations apparent in obese children and adolescents, with particular emphasis on racial differences in insulin resistance. These findings have helped to recognize and appreciate why greater degrees of insulin resistance in African-American children might cause earlier attainment of pubertal milestones relative to their Caucasian counterparts. Further the race-specific role of diet and physical activity in metabolic outcomes has spurned investigations leading to the understanding of macronutrient-specific contribution to cardiometabolic risk factors in at-risk overweight/obese African American children.[1] Moreover, our work[2] has provided insight into other aspects of metabolism (metabolic balance studies) impacted by biomarkers we have race-specifically characterized (cited by Palacios et al AJCN 2013 "Magnesium retention from metabolic-balance studies in female adolescents: impact of race, dietary salt, and calcium"). Additionally, outcomes identified by the conduction of the K99/R00 NIH Research Scientist Development Award has guided work seeking to systematically compare effectiveness of childhood obesity prevention programs in order to guide health plans, providers, purchasers, government programs, and the health care system as a whole.

[1]Sharma S et al Macronutrient intakes and cardio metabolic risk factors in high BMI African American children *Nutr Metab* 2009
[2]**Casazza K**, Higgins PB, Fernández JR, Goran MI, Gower BA. Longitudinal analysis of the insulin-like growth factor system in African American and European American children and adolescents. J Clin Endocrinol Metab. 2008, 93: 4917–4923. PMCID: PMC2626444

2. While seeking to unravel the racial differences in the metabolic milieu and body composition interface, it was immediately understood that genetic determinants must be considered. In collaboration with experts in the field, I comprehensively focused attention in this regard. This work contributed to the characterization of distinct obesity phenotypes based upon genetic makeup identification of candidate obesity susceptibility genes responsible for heritability of obesity phenotypes and anthropological studies verifying that gene–environment interactions are responsible for marked differences among populations genetically susceptible to weight gain. Our findings of individual genetic ancestries as determined by ancestry informative markers have led insight into multiple traits and/or susceptibility to various other diseases (e.g., cardiovascular, immunological, and pulmonary indices and conditions). Notably, we illustrated that among African American, Hispanic American, and European American children, a greater African admixture proportion is associated with lower fat mass, lower total abdominal adipose tissue, lower intra-abdominal adipose tissue, lower subcutaneous abdominal adipose tissue, and higher bone mineral content, independent of multiple potential confounding factors. Interrogating the relationships between ancestry components and biological traits and diseases help our understanding of prevalence and degree of severity among specific ethnic groups, and thus direct scientific discovery. Understanding of population differences in pediatric obesity will depend on our ability to take into account the continuous and cumulative process of fat accumulation and acquisition in individuals. Precise and population-specific classification of body composition will provide clarity to research endeavors, toward the identification of possible underlying physiological mechanisms, and ultimately improved prevention strategies.

3. Excess adipose tissue and subsequent increased synthesis and release of its adipokines have been the major focus of disease etiology guiding pediatric obesity research. Initial adaptation of this commonly held adipocentric view of body composition in terms metabolic consequences (i.e., glycemic control), largely guided my early work. Clear influence by dietary and genetic factors provided further direction into this realm of study. The increasing understanding and appreciation of the skeletal system in endocrine participation, and integral relay involved in energy homeostasis, has expanded my research focus to include skeletal participation in the bone-fat-pancreas axis. Pioneered by the Karsenty laboratory, understanding of the skeletal-derived endocrine hormone, osteocalcin, became underway. After securing various sources of intramural funding, we began investigations centering this hormone in ongoing and prospective cohorts. These studies led to the indication that specific osteocalcin molecules differ in metabolic activity, with the undercarboxylated but not carboxylated fraction. Insight has been shed regarding the sequence of events that occurs with insulin resistance, such as type 2 diabetes, with our human and rodent data and that from others supporting that these patients have lower serum concentrations of osteocalcin, perhaps reduced skeletal loading, and reduced bone strength as evidenced by microindentation studies. Extending qualitative characterization of bone properties, studies led by the Rosen laboratory based on the fact that bone and fat cells that arise from the same progenitor, implicated the bone marrow compartment as dynamic, metabolically pertinent and dependent

upon metabolic homeostasis, hematopoiesis, and osteogenesis. Our findings have helped lay groundwork for further understanding of the bone marrow niche and its impact of skeletal disease, diabetes, and obesity.

4. The skeleton cannot be evaluated in isolation from the musculoskeletal component. Despite substantial strides towards identifying effective and sustainable healthy lifestyle interventions to improve metabolic health in obese children/adolescents, continued and accelerated progress has been limited. Funding through the NIH/NIDDK K99/R00 facilitated testing a dietary weight-loss intervention aimed at inducing fat-loss prior to pubertal maturation in an effort to optimize musculoskeletal development among overweight/obese early pubertal girls. Whereas the intervention we implemented as well as other involving dietary restriction or aerobic activity can be efficacious among individuals with strict protocol adherence, long-term sustainability may not be practical, particularly in the context of growth and development. To accelerate the research needed to discover solutions, innovative ideas and transformational approaches are necessary. In addition to the contributions described above, with a team of collaborators, we have begun to lay the groundwork for the necessity of capitalizing on the beneficial endocrine effects of the musculoskeletal system through strength improvement strategies. These studies emphasized factors synthesized and released from muscle and bone in response to resistant forces not only promote strength-structural properties but also systemic communicative capacity of the musculoskeletal system. Collectively preliminary studies have served to establish, evaluate and refine an acceptable, age-appropriate protocol for pediatric resistance training interventions, including compliance and adequacy of duration of study for detection of observed changes as reported by Patel SJ et al[1]. The body of work amassed through numerous designed and implemented studies discusses the possibility of crosstalk between muscle, bone, adipose tissue, the liver, and the pancreas. These findings have suggested that signaling of FGF21, an evidenced 'myokine' among other tissue-derived sources, may differ in its association with body composition and glucose regulatory capacity depending on sex and weight status in pre- and early pubertal males[2].

[1]Journal of Diabetes Research & Clinical Metabolism 2015
[2] Hanks LJ Clin Endocrinol, 2014; Hanks et al J Pediatr 2015

5. An all-encompassing focus of my research interests has been and continues to identify which of the many beliefs about obesity are supported by scientific evidence in order to yield informed policy decisions, accurate clinical and public health recommendations, and a productive allocation of resources to direct attention towards useful, evidence-based information. In a concerted effort with established leaders in the field, we compiled a review that calls into question common beliefs about obesity that, although accepted as fact, may not be supported by scientific evidence. This review has sparked ongoing interactive discussion and interest in the matter, leading to an array of publications from our group and numerous others. Topics span beliefs about mode, timing and type of feeding practices to behaviors affecting energy balance. This has ignited studies across institutions, universities and laborites, as well as within our own. For example, given the importance of musculoskeletal development during this period one would expect bioactive components unique to human breast milk to have functional relevance in infant musculoskeletal development. To date, much of the investigations evaluating a protective effect of breastfeeding on infant body composition has focused on obesity prevention. While a modest protective effect of breastfeeding on offspring adipose tissue has been reported, two primary issues remain. Importantly, confounding due to maternal BMI attenuates the protective effect in offspring. Further, the infant musculoskeletal health, specifically the biomechanical efficiency which may set the stage for strength-structural properties which may underlie maintenance of musculoskeletal function and thus healthy aging is often overlooked. Mechanisms by which milk components affect all aspects of infant development are in their infancy. However, it is becoming increasingly clear that at-risk infants have special nutritional needs and that, for such infants, the current uniform breastfeeding recommendations are sub-optimal and may seriously impact the information available to health care providers and families alike.

D. RESEARCH SUPPORT

Active:

MCH Nutrition Leadership Program (PI) (2013-2018)
Major Goals: Promotes public health nutrition for children, adolescents, women, and families by providing graduate training to nutritionists and registered dietitians. In addition, short-term training focused on clinical and public health approaches to maternal and child nutrition is provided to professionals from a variety of fields.

MCH Leadership Education in Adolescent Health (Co-PI) (2012-2017)

Major Goals: To train emerging leaders to improve the health status of adolescents, via interdisciplinary leadership education of adolescent health professionals in a model center of excellence in training, research and service that is adolescent-centered/family-involved, culturally competent and community-based.

NIH (Barnes) Role on Project: Co-I 07/01/12-06/30/17
"Metabolomics Workshop: From Design to Discovery"
Major Goals: To offer an annual short course each year for 4 consecutive years on metabolomics methods and data analysis to approximately 50 graduate students, post-doctoral fellows, junior investigators and experienced investigators pursuing research in metabolomics.

K99/R00 DK83333- Casazza (PI) 06/01/2009-05/31/2015 NCE
National Institutes of Health/National Institute of Diabetes and Digestive and Kidney Diseases
Puberty Related Intervention to Improve Metabolic Outcomes - The PRIMO Pilot Study
To examine the effectiveness of a diet developed specifically for the unique metabolic characteristics of lean and obese peripubertal European and African American girls as they traverse puberty.

Completed:

No Number Assigned – Casazza- PI 06/01/11-05/31/2012
American Cancer Society
Cycles - Contribution of adiposity during childhood to breast cancer risk ($40,000)
To investigate the bidirectional crosstalk between breast cancer cells and adipose tissue, particularly in the bone marrow compartment, and that adipogenesis in early childhood is a key factor in breast cancer progression.

No Number Assigned (PI)Diabetes Research Center Pilot/Feasibility ($50,000) 03/01/12-02/28/13
Diseasome of Physical Inactivity
To compare the effects of one day of prolonged sitting/non-ambulation versus one day of engaging in physical activity/ambulation on myokine concentration, glucose/insulin dynamics, lipid profile, and inflammation status in overweight 7-11 year old girls and 2) Compare these effects with compensatory decrease in energy intake (prolonged sitting with 500kcal/d deficit).

No Number Assigned- Casazza (Co-I) 10/01/09-09/30/10
MHRC Charles Barkley Health Disparities Fund ($30,000) Bad genes or genes behaving badly
To examine the associations among genetic admixture, candidate genes/pathways and body composition/distribution in Hispanic children aged 3-7 years after controlling for dietary intake.

No Number Assigned – Casazza (PI) 06/2008-06/2009
UAB Center for Women's Reproductive Health Pilot program ($30,000)
A specialized diet for the Unique Metabolic Characteristics of African American girls
To examine the effectiveness of a diet developed specifically for the unique metabolic characteristics of AA girls as they traverse puberty. Major outcomes decreased insulin response, thereby decreasing estradiol concentration in peripubertal girls.

No Number Assigned – Casazza (PI) 06/2008-06/2010
Thrasher Foundation New Researcher Award ($25,000)
A specialized diet for the Unique Metabolic Characteristics of African American girls
To examine the effectiveness of a diet developed specifically for the unique metabolic characteristics of AA girls as they traverse puberty. Major outcomes decreased insulin response, thereby improving lipid profile and body composition, and reducing inflammation and stress response.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Maria Ioana Danila

eRA COMMONS USER NAME (credential, e.g., agency login): mdanila

POSITION TITLE: Assistant Professor of Medicine

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Carol Davila Univ of Medicine and Pharmacy, Bucharest	MD	09/1999	Medicine
University of Victoria, BC	MS	04/2003	Microbiology
University of Alabama at Birmingham, Birmingham, Alabama	OTH	08/2014	Epidemiology - Clinical and Translational Science
University of Illinois , Chicago, Illinois	Resident	06/2006	Internal Medicine
University of Alabama at Birmingham, Birmingham	Fellow	06/2008	Rheumatology

A. PERSONAL STATEMENT

Dr. Danila is an investigative rheumatologist with a particular focus in personalizing care of patients with rheumatic diseases. Her research is aimed at understanding the relationship between the human genome, environment and the development and outcomes of complex rheumatic diseases. She is interested in developing prediction models for disease outcomes in rheumatoid arthritis and other rheumatic diseases using clinical, proteomic and genetic data.

A. Cui X1, Yu S, Tamhane A, Causey ZL, Steg A, **Danila MI**, Reynolds RJ, Wang J, Wanzeck KC, Tang Q, Ledbetter SS, Redden DT, Johnson MR, Bridges SL Jr. 2015. Simple regression for correcting ΔCt bias in RT-qPCR low-density array data normalization. BMC Genomics. 16(1):1274-1. PMID: 25765554

B. Tang Q, **Danila MI** (co-first author), Cui X, Parks L, Baker B, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR; CLEAR Investigators, Bridges SL. 2015. Expression of interferon-gamma receptor genes in PBMCs is associated with rheumatoid arthritis and its radiographic severity in African Americans. Arthritis Rheumatol. Feb 23. PMID: 25708927

C. Reynolds RJ, Ahmed AF, **Danila MI**, Hughes LB; Consortium for the Longitudinal Evaluation of African Americans with Early Rheumatoid Arthritis Investigators, Gregersen PK, Raychaudhuri S, Plenge RM, Bridges SL Jr. 2014. HLA-DRB1-associated rheumatoid arthritis risk at multiple levels in African Americans: hierarchical classification systems, amino acid positions, and residues. Arthritis Rheumatol. Dec;66(12):3274-82. PMID: 25524867

D. Aslibekyan S, Sha J, Redden DT, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Reynolds RJ, **Danila MI**, Bridges SL Jr. 2014. Gene-body mass index interactions are associated with methotrexate toxicity in rheumatoid arthritis. Ann Rheum Dis. 73(4): 785-6. PMCID: PMC3970399

B. POSITIONS AND HONORS

Positions and Employment

2000 - 2000 General Medicine Internship, Dr. I. Cantacuzino Hospital, Bucharest
2000 - 2000 Instructor, Carol Davila University of Medicine and Pharmacy, Bucharest

2000 - 2002 Academic Assistant, University of Victoria
2003 - 2006 Residency in Internal Medicine, University of Illinois at Chicago-Advocate Christ Medical Center, Oak Lawn, IL
2006 - 2008 Clinical Rheumatology Fellow, University of Alabama at Birmingham, Birmingham, AL
2008 - Assistant Professor of Medicine, University of Alabama at Birmingham, Birmingham, AL
2011 - 2013 Assistant Clinical Director, Div. of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL
2013 - Medical Director, The Kirklin Clinic at UAB Rheumatology, Birmingham, AL
2014 - Rheumatology Fellows Clinical Competency Committee, Div. of Clinical Immunology and Rheum., Univeristy of Alabama at Birmingham, Birmingham, AL
Other Experience and Professional Memberships
1996 - 1997 Member, European Medical Students Association, Belgium
1997 - 1999 Member, Scientific Organization of Medical Students, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
1997 - 2000 Member, Romanian Society of Immunology
2000 - 2003 Member, Graduate Students' Society, University of Victoria, Victoria, BC, Canada
2003 - 2006 Associate Member, American College of Physicians
2006 - Member, Alabama Society of Rheumatic Diseases
2007 - Member, UAB Working Group - ACR Recommendations for the Use of Biologics in the Treatment of Rheumatoid Arthritis, Birmingham, AL
2007 - 2009 Trainee Member, American College of Rheumatology
2008 - 2009 Member, International Society for Clinical Densitometry
2008 - 2009 President, Alabama Society for the Rheumatic Diseases
2009 - Member, American Medical Association
2010 - Fellow, American College of Rheumatology
2011 - Fellow, American College of Physicians
2012 - Member, American College of Rheumatology Insurance Subcommittee
2014 - Member, Alliance for Academic Internal medicine, Association of Specialty Professors
2015 - Member, The Honor Society of Phi Kappa Phi

Honors

1998 Travel Award, 9th European Students Conference of the Charite, Berlin, Germany
1999 Scholarship, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
2002 Scholarship, University of Victoria Fellowship, Victoria, BC. Canada
2002 Graduate Teaching Fellowship, University of Victoria, Victoria, BC, Canada
2002 Teaching Assistant Fellowship, University of Victoria, Victoria, BC, Canada
2002 Howard E. Petch Research Scholarship, University of Victoria, Victoria, BC, Canada
2007 Fellow in Training Travel Award, American College of Rheumatology
2008 Clinical Investigator Fellowship Award, University of Alabama at Birmingham, Al
2009 President, Alabama Society for Rheumatic Diseases
2010 ACR Notable Poster, ACR/AHRP Annual Meeting, Atlanta, GA
2012 Early Women Faculty Professional Development Award, AAMC
2015 Best Doctors Award, Best Doctors of America
2015 Learning Health System Research Learner Award, AAMC, Washington, DC
2015 Quality Academy Award, University of Alabama at Birmingham, Al
2015 Initiated in the Honor Society, Phi Kappa Phi

C. Contribution to Science

1. My early recent efforts focused on poxvirus genomics and aimed to investigate poxvirus evolution. In one of the projects, my colleagues and I sequenced and analyzed the genomic sequence of ectromelia virus, the causative agent of mousepox, in order to explain at the cellular and molecular level the well-characterized features of the ectromelia virus natural life cycle. Using bioinformatics techniques we identified 175 potential genes and 29 regions containing sequences related to genes predicted in other poxviruses, but unlikely to encode for functional proteins in ectromelia virus. In a second project we investigated the evolutionary relationship between rabbitpox virus and vaccinia virus and found that among orthopoxviruses rabbitpox virus is most closely related to vaccinia virus.

A. N. Chen, **Maria I. Danila**(co-first author), Z. Feng, R.M.L. Buller, C .Wang, X. Han, E.J. Lefkowitz, C. Upton - The genomic sequence of ectromelia virus, the causative agent of mousepox. Virology. 317: 165-186, 2003. (*co-first author)

B. G. Li, N. Chen, R.L. Roper, Z. Feng, A. Hunter, **Maria I. Danila**, R.M. Buller, C. Upton – Complete coding sequences of the rabbitpox virus genome. J Gen Virol. 86: 2969-2977, 2005.

2. During my rheumatology training, my research focused on understanding the factors affecting survival in patients with systemic lupus erythematous. These publications found that the renal domain of the systemic lupus erythematosus damage index is associated with a shorter time to death when poverty is excluded from the model; and that hydroxychloroquine retards renal damage occurrence.

A. **Maria I. Danila**, G.J. Pons-Estel, J. Zhang, L.M. Vilá, J.D. Reveille, G.S. Alarcón. Renal damage is the most important predictor of mortality within the damage index: data from LUMINA LXIV, a multiethnic US cohort. Rheumatology (Oxford) 48:542-545, 2009.

B. G.J. Pons-Estel, G.S. Alarcón, G. McGwin Jr., Maria I. Danila, J. Zhang, H.M. Bastian, J.D. Reveille, L.M. Vilá. Lumina Study Group. Protective effect of hydroxychloroquine on renal damage in patients with lupus nephritis: LXV, data from a multiethnic US cohort. Arthritis Rheum 61:830-839, 2009. PMC: PMCID2722801

3. In addition to the contribution above, we have also studied the role of genetics in susceptibility and severity of RA in African Americans, a minority group underrepresented in clinical research in US. These studies were performed using CLEAR (Consortium for the Longitudinal Evaluation of African Americans with RA), a large clinical database and biorepository, funded by NIH. My colleagues and I found that unlike in European and Asian populations, genetic variants in STAT4 are not associated with RA in African Americans. We also described that IL4R single-nucleotide polymorphisms is associated with rheumatoid nodules in African Americans with rheumatoid arthritis. In addition more recent work reported that although the genetic risk conferred by HLA-DRB1 in African Americans is similar to that in individuals of European ancestry, there are some notable differences: the amino acid position 57 was associated with RA in African Americans, but positions 71 and 74 were not. In addition, this work found that Asp11 corresponding HLA-DRB1*09:01 allele is associated with RA risk in African Americans, but not in individuals of European descent.

A. J.M. Kelley, L.B. Hughes, A. Malik, **Maria I. Danila**, Y. Edberg, G.S. Alarcón, D.L. Conn, B.L. Jonas, L.F. Callahan, E.A. Smith, R. D. Brasington, J.C. Edberg, R. P. Kimberly, L.W. Moreland, S.L. Bridges Jr. Genetic variants of STAT4 associated with rheumatoid arthritis in persons of Asian and European ancestry do not replicate in African Americans. Ann Rheum Dis. 69:625-626, 2010. PMCID: PMC3133745

B. P.I. Burgos, Z.L. Causey, A. Tamhane, J.M. Kelley, E.E. Brown, L.B. Hughes, **Maria I. Danila**, A. van Everdingen, D.L. Conn, B.L. Jonas, L.F. Callahan, E.A. Smith, R.D. Brasington Jr, L.W. Moreland, D.M. van der Heijde, G.S. Alarcón, S.L. Bridges Jr. Association of IL4R single-nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. Arthritis Res Ther. 12:R75, 2010. PMC: PMCID2911851

C. R.J. Reynolds, A.F. Ahmed, **Maria I. Danila**, L.B. Hughes, Consortium for the Longitudinal Evaluation of African Americans with Early Rheumatoid Arthritis Investigators, PK Gregersen, S Raychaudhuri, RM Plenge, SL Bridges Jr. HLA-DRB1-associated rheumatoid arthritis risk at multiple levels in African Americans: hierarchical classification systems, amino acid positions, and residues. Arthritis Rheumatol. 2014 Dec;66(12):3274-3282. PMID: 25524867

4. In addition to the contributions above I have contributed to the field of clinical informatics by annotating the human genome with Disease Ontology, a versatile resource with application in cohort identification, gene-disease association and for projects that employ clinical natural language processing.

A. J.D. Osborne, J. Flatow, M. Holko, S.M. Lin, W.A. Kibbe, L.J. Zhu, **Maria I. Danila**, G. Feng, R.L. Chisholm. Annotating the human genome with Disease Ontology. BMC Genomics 10 Suppl 1:S6, 2009. PMC: PMCID2898742

D. RESEARCH SUPPORT

ACTIVE

K23 AR062100 (Danila - PI) 06/01/12 – 05/31/17
NIH/NIAMS
Genetic Architecture of Rheumatoid Arthritis in African Americans
Goals: 1) to determine whether genetic markers of autoimmunity validated in European and Asian populations influence the risk of developing RA in African Americans; 2) to determine whether the genetic markers of susceptibility to RA play a role in radiographic severity of RA in African Americans; 3) to develop and test predictive models for RA risk and outcome using clinical and genetic data in African Americans.

R01 AR062376 (Bridges, PI) 09/01/11 – 08/31/15
NIH/NIAMS subsumed under K award
Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis
Goals: 1) To examine associations of serum ACPA to a variety of specific citrullinated epitopes and of serum anti-PAD4 Abs with clinical, genetic, and radiographic features in Af-Amer with anti-CCP+ RA. 2) To examine associations of periodontitis and exposure to P. gingivalis with serum ACPA profiles and anti-PAD4 Abs in Af-Amer with anti-CCP+ and anti-CCP-neg RA. 3) To compare the degree of clonality and mutation patterns of peripheral blood B cells from Af-Amer with and without anti-CCP Ab, ACPA, anti-PAD4 Abs; and to assess the reactivity of antibodies from citrullinated protein-specific and PAD4-specific B lymphocytes in RA.

P60 AR048095 (Bridges, PI; Curtis, Embi, MPI, Project 2) 09/16/13 – 07/31/18
NIH/NIAMS subsumed under K award
UAB Multidisciplinary Clinical Research Center – Project 2 ($191,667 Annual Direct Costs)
Facilitating Treat-to-Target Using Novel Health Technology with Decision Support
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.
Role: Co-Investigator

P60 AR048095 (Bridges, PI; Elson, Project 3) 09/16/13 – 07/31/18
NIH/NIAMS subsumed under K award
UAB Multidisciplinary Clinical Research Center – Project 3 ($191,667 Annual Direct Costs)
Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis
The overall goal for the UAB Multidisciplinary Clinical Research Center (UAB-MCRC) is to improve the healthcare of patients with arthritis and musculoskeletal diseases by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in clinical investigation and translational research.
Role: Co-Investigator

No number (Danila, PI) 01/01/15 - 06/30/15
UAB/Dept. of Medicine
Impact of medical scribes to support medical documentation on efficiency, physician satisfaction, and cost: a proof of concept study
Role: PI

PENDING

Winter Pragmatic Clinical Trials (Saag, Curtis, MPI) 12/1/15 – 11/30/20
PCORI
Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)

OVERLAP – None

COMPLETED

P60 AR048095 (Kimberly, PD; Bridges, PI Proj 3) 03/15/02 – 06/30/13
NIH/NIAMS subsumed under K award
NIAMS Multidisciplinary Clinical Research Center
Predictors of RA Severity in African-Americans (Project 3)
Goals: To identify differences in gene expression patterns and serologic factors between African-American RA patients with radiographic damage and those without damage at 3 years' disease duration; and to determine the relative contributions of baseline clinical, genetic, serologic, socioeconomic, environmental factors, and treatment on radiographic severity of RA in African-Americans at 3 years' disease duration.
Role: Co-investigator

R01 AR057202 (Bridges, PI) 09/25/09 – 07/31/14
NIH/NIAMS subsumed under K award
Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis
Goals: 1) to perform a GWAS in 800 African-Americans (Afr-Am) with anti-CCP + RA and 800 controls to identify novel genetic associations; 2) to replicate these putative associations susceptibility to CCP+ RA among Afr-Am in independent set of 800 African-American CCP+ RA patients and 800 matched controls; and 3) To further characterize genetic regions associated RA in African-Americans and to analyze genome-wide associations with radiographic severity; BMD in early RA and healthy controls; and eQTLs of genes expressed in PBMC, particularly those associated with radiographic severity.
Role: Co-investigator.

No number (Curtis, Danila, PIs) 06/01/12 - 10/01/12
AMC21 Innovation board/UAB HSF
RA Clinic Optimization Project
Role: Co - PI

No number (Danila, PI) 02/28/12 - 04/28/12
Amgen Inc $7,500
Update in Rheumatology
Role: PI

No number (Danila, PI) 04/03/12 - 04/28/12
UCB
Update in Rheumatology
Role: PI

NIH UAB (K30) (LW Moreland, PI) 07/01/07 - 06/30/08
Clinical Investigative Fellowship Award
Role: Trainee

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: León Ruiz, Beatriz

eRA COMMONS USER NAME (agency login): Bea_Leon

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Complutense University, Madrid	BS	06/2002	Biology
Autónoma University, Madrid	PHD	02/2007	Microbiology and Immunology
Trudeau institute, Inc, Saranac Lake, NY	Postdoctoral	09/2008	Microbiology and Immunology
University of Rochester, Rochester, NY	Postdoctoral	02/2012	Microbiology and Immunology

A. PERSONAL STATEMENT

I have a broad background in Immunology, with specific training and expertise in studying in vivo regulation of T cell responses by dendritic cells, including the control of effector CD4 and CD8 T cells responses and the modulation of memory T cells. In this regard, we are exploring mechanism to either improve antigen presentation by dendritic cells to elicit extensive T-cell responses with therapeutic effects or to alter dendritic cells function to abrogate unwanted effector T-cell function in vivo. I've recently been awarded my first R01 from the NIH/NIAID, entitled “Regulation of T cell responses to allergens and environmental microbes" (start date of 02/10/2015).

I am in the process of hiring my first postdoc to start in August 2015 and I am planning to train her in basic, clinical and translational in infectious and immunology research.

1. **León B**, López-Bravo M, Ardavín C. Monocyte-derived dendritic cells formed at the infection site control the induction of protective T helper 1 responses against Leishmania. Immunity. 2007 Apr;26(4):519-31. PubMed PMID: 17412618.
2. **León B**, Ballesteros-Tato A, Browning JL, Dunn R, Randall TD, et al. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.
3. **León B**, Bradley JE, Lund FE, Randall TD, Ballesteros-Tato A. FoxP3+ regulatory T cells promote influenza-specific Tfh responses by controlling IL-2 availability. Nat Commun. 2014 Mar 17;5:3495. PubMed PMID: 24633065; PubMed Central PMCID: PMC4013682.
4. **León B**, Ballesteros-Tato A, Randall TD, Lund FE. Prolonged antigen presentation by immune complex-binding dendritic cells programs the proliferative capacity of memory CD8 T cells. J Exp Med. 2014 Jul 28;211(8):1637-55. PubMed PMID: 25002751; PubMed Central PMCID: PMC4113940.

B. POSITIONS AND HONORS

Positions and Employment

05/99-12/02	Trainee fellowship with Dr. Carlos Ardavín, Complutense University, Madrid, Spain
01/03-08/04	Predoctoral Fellow with Dr. Carlos Ardavín, Complutense University, Madrid, Spain
10/03-11/04	Visiting predoctoral fellow, University of Nice-Sophia, Valbonne, France
09/04-05/07	Predoctoral Fellow with Dr. Carlos Ardavín, Autónoma University, Madrid, Spain
06/07-02/08	Postdoctoral Fellow with Dr. Carlos Ardavín, Autónoma University, Madrid, Spain
03/08-09/08	Postdoctoral Fellow with Dr. Frances E. Lund, Trudeau Institute, Saranac Lake, NY
10/08-02/12	Postdoctoral Fellow with Dr. Frances E. Lund, University of Rochester, Rochester NY
03/12-10/12	Postdoctoral Fellow with Dr. Frances E. Lund, University of Alabama at Birmingham,AL
11/12-present	Assistant Professor, University of Alabama at Birmingham,AL

Other Experience and Professional Memberships

07-2012-present	Member of American Association of Immunologists
11-2012-present	Member of the UAB Comprehensive arthritis musculoskeletal and autoimmunity center (CAMBAC)
11-2012-present	Reviewer for *Clinical and Experimental Immunology, Immunology and Cell Biology, eLife*

Honors

01/2002-12/2002	Undergraduate research scholarship from Ministry of Science and Education of Spain
01/2003-12/2006	Graduate fellowship from Ministry of Science and Education of Spain
2007	Recipient, A “cum laude” “Extraordinary Ph.D in biology” Award; Autónoma University, Madrid, Spain
2012	Recipient, Keystone Symposia Scholarship Award; A1, Breckenridge, CO
2013	Recipient of a 2013 AAI Early Career Faculty Travel Grant. IMMUNOLOGY 2013TM Honolulu, HI

C. Contribution to Science

1. I have more than 10 yrs experience exploring the phenotypic and functional specialization of different dendritic cell (DC) subsets during inflammatory responses. My early publications focused in the definition and characterization of DC subpopulations present in the secondary lymphoid and non-lymphoid peripheral organs of the mouse and their central role as modulators of the T cell-mediated immune responses. As a result of these studies, I acquired extensive experience with the in vivo mouse models of Inflammation, particularly with analyzing DC and T cell response dynamics.
   a. **León B**, Martínez del Hoyo G, Parrillas V, Vargas HH, Sánchez-Mateos P, et al. Dendritic cell differentiation potential of mouse monocytes: monocytes represent immediate precursors of CD8- and CD8+ splenic dendritic cells. Blood. 2004 Apr 1;103(7):2668-76. PubMed PMID: 14630812.
   b. **León B**, López-Bravo M, Ardavín C. Monocyte-derived dendritic cells formed at the infection site control the induction of protective T helper 1 responses against Leishmania. Immunity. 2007 Apr;26(4):519-31. PubMed PMID: 17412618.
   c. **León B**, Ardavín C. Monocyte migration to inflamed skin and lymph nodes is differentially controlled by L-selectin and PSGL-1. Blood. 2008 Mar 15;111(6):3126-30. PubMed PMID: 18184867.
   d. **León B**, Ardavín C. Monocyte-derived dendritic cells in innate and adaptive immunity. Immunol Cell Biol. 2008 May-Jun;86(4):320-4. PubMed PMID: 18362945.

2. In addition to the contributions described above, I specifically study how DC subsets controlled T helper type 2 cell priming. I showed that DCs responding to parasitic infection express CXCR5 and home to interfollicular(IF)/T:B areas in response to CXCL13, where they prime interleukin 4 (IL-4)-producing type 2 T cell responses. As a result of this work, I have acquired extensive experience with the analysis of in vivo type 2 T follicular helper cell (TFH) and T helper effector type 2 responses and in vivo dynamic localization of DC and T cells.
   a. **León B**, Ballesteros-Tato A, Browning JL, Dunn R, Randall TD, et al. Regulation of T(H)2 development by CXCR5+ dendritic cells and lymphotoxin-expressing B cells. Nat Immunol. 2012 May 27;13(7):681-90. PubMed PMID: 22634865; PubMed Central PMCID: PMC3548431.
   b. **León B**, Ballesteros-Tato A, Misra RS, Wojciechowski W, Lund FE. Unraveling effector functions of B cells during infection: the hidden world beyond antibody production. Infect Disord Drug Targets. 2012 Jun;12(3):213-21. PubMed PMID: 22394173.
   c. **León B**, Ballesteros-Tato A, Lund FE. Dendritic cells and B cells: unexpected partners in Th2 development. J Immunol. 2014 Aug 15;193(4):1531-7. PubMed PMID: 25086176; PubMed Central PMCID: PMC4233146.

3. Recently, I have begun to study the cellular interactions and the molecular mechanisms that regulate TFH differentiation. As a part of these studies, I recently published two manuscripts showing how excessive in vivo IL-2 signaling inhibits TFH cell responses.
   a. Ballesteros-Tato A, **León B**, Graf BA, Moquin A, Adams PS, et al. Interleukin-2 inhibits germinal center formation by limiting T follicular helper cell differentiation. Immunity. 2012 May 25;36(5):847-56. PubMed PMID: 22464171; PubMed Central PMCID: PMC3361521.
   b. **León B**, Bradley JE, Lund FE, Randall TD, Ballesteros-Tato A. FoxP3+ regulatory T cells promote influenza-specific Tfh responses by controlling IL-2 availability. Nat Commun. 2014 Mar 17;5:3495. PubMed PMID: 24633065; PubMed Central PMCID: PMC4013682.

4. I have also studied in vivo regulation of memory T cell responses by DC. In this regard, we are exploring mechanism to either improve antigen presentation by DC to elicit extensive T-cell responses with therapeutic effects.
   a. Ballesteros-Tato A, **León B**, Lund FE, Randall TD. Temporal changes in dendritic cell subsets, cross-priming and costimulation via CD70 control CD8(+) T cell responses to influenza. Nat Immunol. 2010 Mar;11(3):216-24. PubMed PMID: 20098442; PubMed Central PMCID: PMC2822886.
   b. Ballesteros-Tato A, **León B**, Lund FE, Randall TD. CD4+ T helper cells use CD154-CD40 interactions to counteract T reg cell-mediated suppression of CD8+ T cell responses to influenza. J Exp Med. 2013 Jul 29;210(8):1591-601. PubMed PMID: 23835849; PubMed Central PMCID: PMC3727323.
   c. Ballesteros-Tato A, **León B**, Lee BO, Lund FE, Randall TD. Epitope-specific regulation of memory programming by differential duration of antigen presentation to influenza-specific CD8(+) T cells. Immunity. 2014 Jul 17;41(1):127-40. PubMed PMID: 25035957; PubMed Central PMCID: PMC4233138.
   d. **León B**, Ballesteros-Tato A, Randall TD, Lund FE. Prolonged antigen presentation by immune complex-binding dendritic cells programs the proliferative capacity of memory CD8 T cells. J Exp Med. 2014 Jul 28;211(8):1637-55. PubMed PMID: 25002751; PubMed Central PMCID: PMC4113940.

Complete List of Published Work in My Bibliography:

http://www.ncbi.nlm.nih.gov/sites/myncbi/14sGhiJHJo65x/bibliography/43527305/public/?sort=date&direction=ascending

D. RESEARCH SUPPORT

Ongoing Research Support

2015/02/10-2020/01/31
R01AI116584, NIH/NIAID
León Ruiz, Beatriz (PI)
Regulation of T cell responses to allergens and environmental microbes
The major goal of this project is determine whether co-exposure to allergens and environmental endotoxin or other microbial products in childhood can influence development of long-lived memory type-2 T cells and therefore asthma severity in adults.
Role: PI

2013/03/15-2018/02/28
R01AI104725, NIH/NIAID
Lund, Frances E. (PI)
Controlling Th2 Immunity by Tuning CXCL13 Dependent DC Migration in Lymph Nodes
The major goal of this project is to determine how dendritic cells are programmed to induce T helper type 2 responses during Leishmania major infection.
Role: Co-Investigator

2015/04/01-2016/04/28
CFAR Vaccine Concept Proposal, UAB Center for AIDS Research
León Ruiz, Beatriz (PI)
Novel Ab/citrullination-dependent mechanism of vaccination to HIV
The goal of this study is to apply a Ab/citrullination-dependent mechanism of vaccination to promote high quality HIV–specific memory CD8 T cells.
Role: PI

Completed Research Support

2012/09/01-2014/08/31
P30 AR048311, Rheumatic Diseases Core Center
León Ruiz, Beatriz (PI)
Development of a new technology for auto-reactive B cell identification and characterization in rheumatoid arthritis.
This is a multidisciplinary program designed enable application of innovative , scientifically rigorous approaches and state-of-the-art techniques to important questions in biomedical sciences, thereby laying the basis for advances in the diagnosis and treatment of patients with arthritis and musculoskeletal diseases.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.

Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Navarro-Millán, Iris

eRA COMMONS USER NAME (agency login): IYNAVARRO

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Puerto Rico-Mayaguez Campus, Mayaguez	BS	05/2001	Biology
Universidad Autonoma de Guadalajara School of Medicine, Guadalajara, Jalisco	MD	06/2005	Medicine
University of Alabama at Birmingham, Birmingham, AL	OTH	12/2014	MSPH, Outcomes Research
New York Medical College, Valhalla, New York	Graduate Student	06/2006	Pre-Internship
Carraway Methodist Medical Center, Birmingham, AL	Resident	10/2008	Internal Medicine
Baptist Health System, Birmingham, AL	Resident	07/2009	Internal Medicine
University of Alabama at Birmingham, Birmingham, AL	Fellow	06/2011	Rheumatology
Outcomes and Comparative Effectiveness, University of Alabama at Birmingham, Birmingham, AL	Fellow	06/2012	Postdoctoral Fellowship, Research

A. PERSONAL STATEMENT

I am an Assistant Professor in the Division of Clinical Immunology and Rheumatology at the University of Alabama at Birmingham since 2012. My overall career goal is to become an independent investigator conducting extramurally funded health services research focusing on improving cardiovascular (CV) outcomes among patients with rheumatoid arthritis (RA), developing and testing patient-centered interventions to be used in real-world settings and designed to reduce CV risk in RA patients. At this stage of my career, I have acquired expertise in secondary data analysis of large databases through my post-doctoral T32 fellowship in health services research including an MSPH. My research career is in the early stages and focusses on developing and testing theory-driven, patient-engaged interventions with the purpose of optimization of modifiable CV risk factors among patients with RA and other inflammatory arthritides with high CV burden such as psoriatic arthritis and ankylosing spondylitis. I am also developing instruments for patients to track their disease activity at home and ways on how to improve collection of patient reported data.
In summary, my career is in the early stages but with a very detailed plan towards becoming a financially and scientifically independent physician investigator generating new evidence on how to reduce CV risk among patients with RA, other inflammatory arthritides.

a. **Navarro-Millán I**, Yang S, DuVall SL, Chen L, Baddley J, Cannon GW, Delzell ES, Zhang J, Safford M, Patkar NM, Mikuls TR, Singh JA, Curtis JR. Association of hyperlipidaemia, inflammation and serological status and coronary heart disease among patients with rheumatoid arthritis: data from the National Veterans Health Administration. Ann Rheum Dis. Jan 21 2015.

b. Zhang J, Chen L, Delzell E, Muntner P, Hillegass WB, Safford MM, **Navarro-Millán I**, Crowson CS, Curtis JR. The Association between Inflammatory Markers, Serum Lipids and the Risk of Cardiovascular Events in Patients with Rheumatoid Arthritis. Ann Rheum Dis. Ann Rheum Dis. Jul 2014;73(7):1301-1308.

c. **Navarro-Millán I**, Charles-Schoeman C, Yang S, Bathon J, Bridges L, Chen L, Cofield S, Dell'talia LJ, Moreland L, O'Dell JR, Paulus HE, Curtis JR. 2013. Changes in Lipoproteins Associated with MTX, MTX + Etanercept, and Triple DMARD Therapy among Early RA Patients in the TEAR Trial. Arthritis Rheum. 65(6):1430-8. PMCID:PMC3672346

B. POSITIONS AND HONORS

Positions and Employment

2012 -	Assistant Professor , Dept. of Medicine, Div. of Clinical Immunology and Rheumatology, University of Alabama at Birmingham, Birmingham, AL

Other Experience and Professional Memberships

2006 - 2009	Associate Member, American College of Physicians
2009 -	Fellow Member, American College of Rheumatology
2009 - 2010	Member of House Staff Council, University of Alabama at Birmingham
2012 -	Reviewer, Arthritis Care and Research Journal
2012 -	Reviewer, Career Development Research Awards/Grants for the American College of Rheumatology/Research and Research Foundation (ACR/RRF)
2014 -	Reviewer, The American Journal of the Medical Sciences

Honors

1997	High School Salutatorian, Colegio Santisima Trinidad, Ponce, Puerto Rico
1999	Honor Society, Golden Key Honor Society
2001	Honor Society, Beta Beta Beta Biology Honor Society
2001	B.S. Biology Conferred magna cum laude, University of Puerto Rico-Mayaguez Campus, Mayaguez, Puerto Rico
2011	Gene V. Ball Award for best case presentation, University of Alabama at Birmingham, Birmingham, AL
2011	Research Transition Award, Arthritis Foundation

C. Contribution to Science

1. 1. My post-doctoral training as a researcher focused on answering several relevant questions including early aspects of the prevalence, risk factors, and durability of remission in RA using the American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) remission definition using data from the Consortium of Rheumatology Researchers of North America (CORRONA) cohort. Another aspect was examining predictors of clinical response in RA in clinical trials and observational data.
    a. Curtis JR, Yang S, Chen L, Park GS, Bitman B, Wang B, **Navarro-Millan I**, Kavanaugh A. Predicting low disease activity and remission using early treatment response to antitumour necrosis factor therapy in patients with rheumatoid arthritis: exploratory analyses from the TEMPO trial. Ann Rheum Dis. 2012 Feb;71(2):206-12. PubMed PMID: 21998118; PubMed Central PMCID: PMC3698970.
    b. Curtis JR, McVie T, Mikuls TR, Reynolds RJ, **Navarro-Millán I**, O'Dell J, Moreland LW, Bridges SL Jr, Ranganath VK, Cofield SS. Clinical response within 12 weeks as a predictor of future low disease activity in patients with early RA: results from the TEAR Trial. J Rheumatol. 2013 May;40(5):572-8. PubMed PMID: 23588939; PubMed Central PMCID: PMC3694569.
    c. **Navarro-Millán I**, Chen L, Greenberg JD, Pappas DA, Curtis JR. Predictors and persistence of new-onset clinical remission in rheumatoid arthritis patients. Semin Arthritis Rheum. 2013 Oct;43(2):137-43. PubMed PMID: 23742957; PubMed Central PMCID: PMC4184191.

2. 2. In addition to the contribution above using secondary data analyses, I conducted several literature systematic reviews using the most rigorous methods. The topics of these reviews were relevant because 1) it reviewed the evidence and outcomes of tocilizumab clinical trials, that at the time of the review was a newly FDA approved medication for RA; 2) another of the systematic reviews consisted of the discontinuation studies of anti-TNFs among patients with RA, which at the moment, was also one of the first reviews that addressed this topic in systematic way; 3) summarize the newest literature regarding biologics therapy among patients with RA.

a. **Navarro-Millán I**, Singh JA, Curtis JR. Systematic review of tocilizumab for rheumatoid arthritis: a new biologic agent targeting the interleukin-6 receptor. Clin Ther. 2012 Apr;34(4):788-802.e3. PubMed PMID: 22444783; PubMed Central PMCID: PMC3805022.

b. **Navarro-Millán I**, Curtis JR. Newest clinical trial results with antitumor necrosis factor and nonantitumor necrosis factor biologics for rheumatoid arthritis. Curr Opin Rheumatol. 2013 May;25(3):384-90. PubMed PMID: 23511719; PubMed Central PMCID: PMC4041208.

c. **Navarro-Millán I**, Sattui SE, Curtis JR. Systematic review of tumor necrosis factor inhibitor discontinuation studies in rheumatoid arthritis. Clin Ther. 2013 Nov;35(11):1850-61.e1. PubMed PMID: 24156821; PubMed Central PMCID: PMC3917677.

3. 3. In addition to study clinical and cardiovascular outcomes in RA, my initial collaborations and contributions were in the area of Lupus. During this time I collaborated with the validation of a self-assessed lupus organ damage instrument. My bilingual skills (English and Spanish) were of valuable contribution to these projects since this validation was conducted among both, English and Spanish speaking patients. This broaden the spectrum of patients that this instrument can reach, especially in a disease such as Lupus where many patients with high disease activity and damage are Hispanics.

   a. Pons-Estel BA, Sánchez-Guerrero J, Romero-Díaz J, Iglesias-Gamarra A, Bonfa E, Borba EF, Shinjo SK, Bernatsky S, Clarke A, García MA, Marcos JC, Duarte A, Berbotto GA, Scherbarth H, Marques CD, Onetti L, Saurit V, Souza AW, Velozo E, Catoggio LJ, Neira O, Burgos PI, Ramirez LA, Molina JF, De La Torre IG, Silvariño R, Manni JA, Durán-Barragán S, Vilá LM, Fortin PR, Calvo-Alén J, Santos MJ, Portela M, Esteva-Spinetti MH, Weisman M, Acevedo EM, Segami MI, Gentiletti SB, Roldán J, **Navarro I**, Gonzalez E, Liu JM, Karlson EW, Costenbader KH, Wolfe F, Alarcón GS. Validation of the Spanish, Portuguese and French versions of the Lupus Damage Index questionnaire: data from North and South America, Spain and Portugal. Lupus. 2009 Oct;18(12):1033-52. PubMed PMID: 19762375; PubMed Central PMCID: PMC2933049.

   b. Costenbader KH, Khamashta M, Ruiz-Garcia S, Perez-Rodriguez MT, Petri M, Elliott J, Manzi S, Karlson EW, Turner-Stokes T, Bermas B, Coblyn J, Massarotti E, Schur P, Fraser P, **Navarro I**, Hanly JG, Shaver TS, Katz RS, Chakravarty E, Fortin PR, Sanchez ML, Liu J, Michaud K, Alarcón GS, Wolfe F. Development and initial validation of a self-assessed lupus organ damage instrument. Arthritis Care Res (Hoboken). 2010 Apr;62(4):559-68. PubMed PMID: 20391512; PubMed Central PMCID: PMC3179258.

4. 4. In addition to the contributions above I have contributed to the field of molecular biology by using restriction fragment length polymorphism to trace the ancestry of the Puerto Rican population. Another work that I contributed to in the area of molecular biology involved the development of a point-of-care assay to assess anticoagulation status from enoxaparin among patients that were undergoing coronary artery bypass graft surgery with to goal to potentially identify risks for post-operative bleeding.

   a. Martínez-Cruzado JC, Toro-Labrador G, Viera-Vera J, Rivera-Vega MY, Startek J, Latorre-Esteves M, Román-Colón A, Rivera-Torres R, **Navarro-Millán IY**, Gómez-Sánchez E, Caro-González HY, Valencia-Rivera P. Reconstructing the population history of Puerto Rico by means of mtDNA phylogeographic analysis. Am J Phys Anthropol. 2005 Sep;128(1):131-55. PubMed PMID: 15693025.

   b. Inchiosa MA Jr, Pothula S, Kubal K, Sanchala VT, **Navarro I**. Toward development of a point-of-care assay of enoxaparin anticoagulant activity in whole blood. J Thromb Thrombolysis. 2011 Jul;32(1):47-53. PubMed PMID: 21213019.

D. RESEARCH SUPPORT

Ongoing Research Support

2014/09/01-2016/08/31

DTIR, Rheumatology Research Foundation

Navarro-Millán, Iris (PI)

PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes

This pilot study will facilitate the parent trial and change RA management by demonstrating the clinical safety and immunogenicity of the live zoster vaccine among current anti-TNF users. Rheumatologists and other providers will be able to improve the care, outcomes, and quality of life for RA patients, substantially decreasing the morbidity of herpes zoster and its complications over a lifetime
Role: PI

2012/09/01-2015/08/31
R01 AR062376-S1, NIH/NIAMS
S. Louis Bridges, MD (PI)
Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis
The goal of this study is to examine the role of periodontal disease (gingivitis); exposure to bacteria causing gingivitis, smoking, and genetic factors (HLA-DRB-1) in the generation of autoantibodies in RA in African-Americans. These novel studies will provide important new information on the pathogenesis of RA in African-American and may lead to innovative ways to diagnose, treat, or prevent this disease.
Role: Co-Investigator

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Richard J Reynolds

eRA COMMONS USER NAME (credential, e.g., agency login): RichardReynoldsIV

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Rhodes College	B.S.	05/1996	Biology
Texas State University	M.S.	12/2000	Biology
University of Maryland	Ph.D.	08/2008	Biology

A. Personal Statement

I am a junior Ph.D. faculty member funded under a NIAMS K01 training grant to study the complex genetics of inflammatory diseases. I have a strong commitment to training and mentoring students and fully realize its critical importance for developing the next generation of medical scientists. I have been very fortunate and privileged to have had excellent mentors at all stages of my career, including Dr. S. Louis Bridges, Jr., the PI of the T32 proposal. During my relatively short time in the Division of Rheumatology I have jointly mentored three medical students with Dr. Bridges. The students were performing scholarly activity in our laboratory, and all three became co-authors on manuscripts published in Arthritis and Rheumatology. Altan Ahmed, M.D. and I published recently a comprehensive analysis of the association of certain variants of the class II major histocompatibility gene, *HLA DRB1*, with rheumatoid arthritis in African Americans (a). I have worked closely with Vincent Laufer, an MD, Ph.D. student, helping him to develop and submit his F30 training grant, also mentored by Dr. Bridges. Mr. Laufer and I are also working diligently on genome-wide association studies of RA in African Americans, which will soon be submitted for publication. I worked closely with two other medical students, Brandi Baker and Lauren Parks, on a project involving the gene expression of IFNγ and its association with radiographic severity in RA (b). My early training was in evolutionary biology and during my Ph.D. I mentored several undergraduates who were funded under an NSF funded research experience for undergraduates (REU) grant. These collaborations have resulted in numerous publications with the REU students as co-authors, e.g. (c). Based on my training, experience and expertise, and my direct and recent mentoring of undergraduate and graduate students, I am well qualified to serve as a mentor in training and/or content mentor for this T32.

a. **Reynolds, RJ**, Ahmed, AF, Danila, MI, Hughes, LB, Brasington, RD Jr.,Callahan, LF, Conn, DL, Jonas, BL, Moreland, LW, Smith, EA, Gregersen PK, Raychaudhuri, S, Plenge, RM, Bridges, SL Jr. HLA-DRB1 rheumatoid arthritis risk in African Americans at multiple levels: Hierarchical classification systems, amino acid positions and residues. Arthritis and Rheumatology 2014; 66(12):3274-82. PMID: 25524867; PMCID: PMC4273668

b. Tang, Q., Danila, M.I., Cui, X., Parks, L.M., Baker, B.J., **Reynolds, R.J.**, Raman, C., Wanzeck, K.C., Redden, Conn, D., Jonas, B., Callahan, L., Smith, E., Moreland, L, Brasington, R. and S.L. Bridges. Expression of Interferon-gamma Receptor Genes in PBMCs is Associated with Rheumatoid Arthritis and Its Radiographic Severity in African Americans. Arthritis Rheumatol. 2015; 67(5):1165-70. PMID: 25708927.

c. Fenster, C.B., **Reynolds, R.J**., Williams, C.W.,Makowski, R., and M.R. Dudash. Quantifying hummingbird preference for floral trait combinations: the role of selection on trait interactions in the evolution of pollination syndromes. Evolution. 2015; 69(5):1113-27. PMID: 25765062

B. Positions and Honors

2010-present
Assistant Professor, Department of Medicine, Division of Clinical Immunology and Rheumatology, University of Alabama at Birmingham

2010-present
Scientist, Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center, University of Alabama at Birmingham

Other Experience and Professional Memberships
2010-2015
Associate Editor, Arthritis and Rheumatology

Honors

2006 Travel award, American Society of Naturalists
2009 Third Place, Postdoctoral presentation, UAB School of Public Health Research Day.
2010 Third Place, UAB Department of Medicine Trainee Research Symposium.
2010 Science Unbound Foundation best scientific paper award in the area of statistical genetics
2013 Poster of merit award, Annual Meeting, Federation of Clinical Immunology Scientists, Boston, MA, 2013

C. Contribution to Science

My scientific contributions are multidisciplinary, encompassing diverse fields from evolutionary biology to genetic epidemiology. The common thread connecting all my research endeavors is the application and development of advanced biostatistical models, approaches and techniques. The explosive progress in genotyping technology has made it feasible to study DNA polymorphisms from very large samples of people and relate the pattern of genetic and phenotypic variation. I have been fortunate to have used these technologies and combined with my statistical expertise, to make important contributions to understanding the genetic basis of rheumatoid arthritis susceptibility (a,b,c) and severity (d) in African Americans. My recent work in genetic epidemiology has been to compare and contrast the genetic risk of rheumatoid arthritis in African Americans with that observed in European populations (b,c). Admixed populations have complex haplotype structure and variation in allele frequencies and thus their study offers an excellent opportunity to refine our knowledge of disease associated alleles. One locus of particular interest in autoimmune diseases is *HLA-DRB1*, a class II major histocompatibility complex gene expressed by lymphocytes to bind foreign antigen. This locus is extremely polymorphic with hundreds of segregating alleles. I have recently published a comprehensive analysis of the role of *HLA-DRB1* as a risk gene for rheumatoid arthritis in African Americans (c). With solid evidence from statistical permutation procedures our lab recently discovered a novel risk allele for RA in African Americans, *HLA:DRB1* *09:01, only known as a risk allele in Korean populations, and demonstrated that the aspartic acid residue at amino acid position 11 comprises the source of its risk. While there are important differences in genetic risk with Caucasians there are also similarities. The position 11 valine residue has the largest effect on RA susceptibility, which is consistent with the result from the Caucasian population. Knowledge of the position effects adds additional functional significance of the finding. For example both residues associated with RA in African Americans are in the HLA-DRB1's peptide binding groove. Our lab has many additional ongoing projects in the genetic epidemiology of RA. These discoveries advance the study of human health by establishing transethnic similarities and differences in the genetic etiology of RA.

a. **Reynolds, R.J**., J. Kelley, L. Hughes, N. Yi, and S.L. Bridges. 2010. Genetic association of htSNPs across the major histocompatibility complex with rheumatoid arthritis in an African American population. Genes and Immunity 11:94-97.
b. Hughes, L.B., **R.J. Reynolds**, E. E. Brown, B. Thomson, D.L. Conn, B.L. Jonas et al. Most Common SNPs Associated with Rheumatoid Arthritis in Subjects of European Ancestry Confer Risk of Rheumatoid Arthritis in African-Americans. Arthritis and Rheumatism. 2010. 62:3547-3553.
c. **Reynolds, RJ**, Ahmed, AF, Danila, MI, Hughes, LB, Brasington, RD Jr.,Callahan, LF, Conn, DL, Jonas, BL, Moreland, LW, Smith, EA, Gregersen PK, Raychaudhuri, S, Plenge, RM, Bridges, SL Jr. 2014. HLA-DRB1 rheumatoid arthritis risk in African Americans at multiple levels: Hierarchical classification systems, amino acid positions and residues. Arthritis and Rheumatology. 66: 3274-82.

d. **Reynolds, R.J**., X. Cui, L.K. Vaughan, D.T. Redden, Z. Causey, E. Perkins, T. Shah, L.B. Hughes, CLEAR Investigators, A. Damle, M. Kern, P.K. Gregersen, M.R. Johnson, S.L. Bridges, Jr.. 2012. Gene Expression Patterns in Peripheral Blood Cells Associated with Radiographic Severity in African-Americans with Early Rheumatoid Arthritis. Rheumatology International. DOI: 10.1007/s00296-011-2355-3

Stemming from my PhD work in natural selection I have made important contributions to the development of methods for phenotypic selection analysis. Phenotypic selection is defined as differential survivorship and reproduction within a population corresponding to a change in the mean or variance of a trait distribution. Phenotypic selection can be measured as the coefficients of a regression of fitness on the traits. I have developed methods that allow one to make more powerful inference on the nonlinear form of selection on a set of multivariate characters (a,b). In addition the method allows the testing of significant phenotypic selection on trait combinations, also called correlational selection. This type of selection is important to quantify as it measures directly the evolutionary force creating genetic (and thus phenotypic) correlations between characters. The methods I have utilized to quantify selection on trait interactions can also be used in experimental settings (c). In ongoing projects I and my colleagues have developed a novel framework for testing the hypothesis that selection varies among populations (d).

1. **Reynolds, R.J**., M.R. Dudash, C.B. Fenster. 2010. Multi-year study of multivariate linear and nonlinear phenotypic selection on floral traits of hummingbird-pollinated Silene virginica. Evolution. 64: 358–369.
2. **Reynolds, R.J**., D. Childers, and N. Pajewski. 2010. The distribution and hypothesis testing of eigenvalues from the canonical analysis of the gamma matrix of quadratic and correlational selection gradients. Evolution 64: 1076-1085.
3. Fenster, C.B., **Reynolds, R.J**., Williams, C.W.,Makowski, R., and M.R. Dudash. Quantifying hummingbird preference for floral trait combinations: the role of selection on trait interactions in the evolution of pollination syndromes. Evolution. in press.
4. **Reynolds, R.J**., de los Campos, G, Egan, S.P., and J.R. Ott. Modeling heterogeneity among fitness functions using random regression. In review, Methods in Ecology and Evolution.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/45490689/?sort=date&direction=ascending

D. Research Support

Active

K01 AR060848 Reynolds (PI) 04/01/11 - 03/31/16
NIH/NIAMS
Discovering Novel Genetic and Environmental Risk Factors for RA in African Americans
Role: PI

Completed Research Support

WS2425009 Reynolds (PI) 02/01/13 - 02/01/15
Pfizer
Evaluating genetic heterogeneity of HLAB and HLA DRB1-risk alleles with rheumatoid arthritis in African Americans: Is classical allelic and amino acid sequence level genetic risk conditional on European or African ancestry? (Re-defining the Contribution of the MHC Region in African Americans with Rheumatoid Arthritis: The Association of HL)
Role: PI

T32-HL-072757 Allison (PI)
NIH/NHLBI
UAB Statistical Genetics Post-Doctoral Training Program.
Role: Trainee

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Wang, Lizhong

eRA COMMONS USER NAME (credential, e.g., agency login): lizhongw

POSITION TITLE: Assistant Professor of Genetics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
China Medical University, P. R. China	M. D.	07/88	Medicine
China Medical University, P. R. China	M.S.	07/96	Human Cancer Genetics
Akita University School of Medicine, Japan	Ph.D.	03/02	Human Cancer Genetics
Ohio State University	Post-doc	06/06	Molecular Genetics

A. Personal Statement

I have a broad background in cancer and autoimmune genetics and genomics with more than fifteen years of experience, including specific training and expertise in key research areas. I have published more than 40 original research papers in peer-reviewed journals since 2000. I was responsible for supervision of research performed by technical staff, postdoctoral fellows, and graduate and undergraduate students. As a tenure-track assistant professor in the Department of Genetics at the University of Alabama at Birmingham (UAB), I have received startup funding to help me develop my independent research program. As PI or co-Investigator on Institute- and NIH-funded grants, I have successfully administered projects, collaborated with other researchers, and produced several peer-reviewed publications. Now I am leading an independent research program with my collaborators to explore the molecular mechanisms of human cancers at the UAB. As my previous experiences, I am aware of the importance of frequent communication among project members and of constructing a realistic research plan, timeline, and budget. I have developed a strong network of investigators to provide collaboration and consultation, including faculty in our department, other departments at UAB, and multiple UAB research centers. They are experts in their respective fields and have broad experience in genetics/epigenetics, cell biology, biochemistry, pathology, bioinformatics and biostatistics. Collaboration with these experts will enhance the research environment by combining complimentary sets of expertise for this project. Currently, I also focus on the base of knowledge in autoimmune genetics for post-doctoral fellows. Two post-doctoral fellows are working and fours will be coming at my lab. All of them also focus on genetics/epigenetics in cancer and autoimmune diseases. In summary, I have a demonstrated record of successful and productive research projects. I will continue to draw upon my expertise, experiences and skills to lead our team in autoimmune genetics. I believe in my research team's ability to successfully expand the base of knowledge in autoimmune genetics.

1. **Wang L**, Lin S, Rammohan KW, Liu Z, Liu JQ, LiuRH, Guinther N, Lima J, Zhou Q, Wang T, Zheng X, Birmingham DJ, Rovin BH, Hebert LA, Wu Y, Lynn DJ, Cooke G, Yu CY, Zheng P, Liu Y. A Di-nucleotide Deletion in CD24 Confers Protection against Autoimmune Diseases. PLoS Genetics, 2007 Apr 6;3:508-17. PMID: 17411341; PMCID: PMC1847692.
2. **Wang L***, Liu R, Ye P, Wong C, Chen GY, Zhou P, Sakabe K, Zheng X, Wu W, Zhang P, Jiang T, Bassetti MF, Jube S, Sun Y, Zhang Y, Zheng P, Liu Y*. Intracellular CD24 disrupts the ARF-NPM interaction and enables mutational and viral oncogene-mediated p53 inactivation. *Nature communications*. 2015;6:5909. PubMed PMID: 25600590; PMCID: 4300525.
3. Liu R, Liu C, Chen D, Yang WH, Liu X, Liu CG, Dugas CM, Tang F, Zheng P, Liu Y, **Wang L***. FOXP3 controls an miR-146/NFkappaB negative feedback loop that inhibits apoptosis in breast cancer cells. *Cancer research*. 2015. in press. PubMed PMID: 25712342.

4. Liu R, Yi B, Wei S, Yang WH, Hart KM, Chauhan P, Zhang W, Mao X, Liu X, Liu CG, **Wang L***. FOXP3-microRNA-146-NF-kappaB axis and therapy for precancerous lesions in prostate. *Cancer research*. 2015. in press. PubMed PMID: 25712341.

* Corresponding author

B. Positions and Honors

Positions and Employment

1988-1993 Resident, China Medical University, Shenyang, P. R. China
1996-1997 Instructor, China Medical University, Shenyang, P. R. China
1997-1998 Visiting Scholar, Department of Urology, Akita University School of Medicine, Japan
2002-2004 Research Associate, Department of Urology, Akita University School of Medicine, Japan
2006-2012 Research Scientist, Department of Surgery, University of Michigan, MI
2012-Current **Tenure-track Assistant Professor**, Department of Genetics, University of Alabama at Birmingham, AL
2012-Current Associate Scientist, Comprehensive Cancer Center, University of Alabama at Birmingham, AL
2013-Current Associate Scientist, Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center, University of Alabama at Birmingham, AL
2014-Current Associate Scientist, Comprehensive Neuroscience Center, University of Alabama at Birmingham, AL

Other Experience and Professional Memberships

2005- Member, American Association for the Advancement of Science
2009- Member, American Association for Cancer Research

Honors

1997 International Student Fellowship of Japanese Culture Ministry, Japan
2003 Research Award from the Ministry of Education, Science, Sports and Culture of Japan
2010 Highly Rated Award Presentation, 101st the American Association for Cancer Research (AACR) 2010 Annual Meeting in Washington D.C.
2015 Pittman Scholar Award, University of Alabama at Birmingham

C. Contribution to Science

1. In autoimmune genetics, as a major contributor, I have also carried out molecular and genetic approaches to identify the genetic susceptibility genes or loci in human autoimmune and infectious diseases. Mice with targeted mutation of *CD24* are resistant to experimental autoimmune encephalomyelitis (EAE). CD24 promotes local expansion of autoreactive T cells in the central nervous system. Furthermore, CD24 also plays a significant role in T cell homeostatic proliferation, a process likely critical for pathogenesis of autoimmune diseases. In addition, *CD24* was not mapped correctly in human genome until very recently, and since none of the *CD24* genetic variants were included in any GWAS studies. Our data put *CD24* among a very selective group of genetic modifiers of autoimmune and infectious disease susceptibility, with supporting data from human subjects, which may bring about important new insights in the pathogenesis of autoimmune and infectious diseases.

    a. **Wang L**, Lin S, Rammohan KW, Liu Z, Liu JQ, Liu RH, Guinther N, Lima J, Zhou Q, Wang T, Zheng X, Birmingham DJ, Rovin BH, Hebert LA, Wu Y, Lynn DJ, Cooke G, Yu CY, Zheng P, Liu Y. A dinucleotide deletion in CD24 confers protection against autoimmune diseases. *PLoS Genet*. 2007;3(4):e49. PubMed PMID: 17411341; PMCID: 1847692.

    b. Li D, Zheng L, Jin L, Zhou Y, Li H, Fu J, Shi M, Du P, **Wang L**, Wu H, Chen GY, Zheng P, Liu Y, Wang FS, Wang S. CD24 polymorphisms affect risk and progression of chronic hepatitis B virus infection. *Hepatology*. 2009;50(3):735-42. PubMed PMID: 19610054.

    c. **Wang L**, Liu R, Li D, Lin S, Fang X, Backer G, Kain M, Rammoham K, Zheng P, Liu Y. A hypermorphic SP1-binding CD24 variant associates with risk and progression of multiple sclerosis. *Am J Transl Res*. 2012;4(3):347-56. PubMed PMID: 22937211; PMCID: 3426393.

2. As a major contributor, I have participated to identify the new concept of FOXP3 as the first X-linked tumor suppressor gene. This identification has challenged the Knudson's "two-hit inactivation" hypothesis in autosomal tumor suppressor genes, introducing the novel theory that a single-hit can cause loss of X-linked tumor suppressor function. Importantly, this identification also has clinical potential in the reactivation of X-linked tumor suppressor gene for the treatment of breast cancer. In addition to the contributions described above with a team of collaborators, I have also taken a new research direction, based on my preliminary observations, to pursue innovative projects in the FOXP3-mediated miRNA regulation and its dysregulation in cancer cells. As a PI, I recently identified a novel FOXP3-miRNA-146-NF-κB axis *in vitro* and *in vivo* as well as its molecular mechanism of miRNA-146 family regulation in cancer cells. Because miRNA-146 family negatively regulates NF-κB activity, defective FOXP3 function provides a rationale for the constitutive NF-κB activity observed in tumor cells, which is still largely unexplained. Thus, our identification not only advances the collective understanding of tumorigenesis but also suggests new therapeutic targets for treating patients who have cancer with either FOXP3 or miRNA-146 defects.

    a. Zuo T, **Wang L**, Morrison C, Chang X, Zhang H, Li W, Liu Y, Wang Y, Liu X, Chan MW, Liu JQ, Love R, Liu CG, Godfrey V, Shen R, Huang TH, Yang T, Park BK, Wang CY, Zheng P, Liu Y. FOXP3 is an X-linked breast cancer suppressor gene and an important repressor of the HER-2/ErbB2 oncogene. *Cell*. 2007;129(7):1275-86. PubMed PMID: 17570480; PMCID: 1974845.

    b. **Wang L**, Liu R, Li W, Chen C, Katoh H, Chen GY, McNally B, Lin L, Zhou P, Zuo T, Cooney KA, Liu Y, Zheng P. Somatic single hits inactivate the X-linked tumor suppressor FOXP3 in the prostate. *Cancer Cell*. 2009;16(4):336-46. PubMed PMID: 19800578; PMCID: 2758294.

    c. Liu R, Liu C, Chen D, Yang WH, Liu X, Liu CG, Dugas CM, Tang F, Zheng P, Liu Y, **Wang L***. FOXP3 controls an miR-146/NFkappaB negative feedback loop that inhibits apoptosis in breast cancer cells. *Cancer research*. 2015. in press. PubMed PMID: 25712342.

    d. Liu R, Yi B, Wei S, Yang WH, Hart KM, Chauhan P, Zhang W, Mao X, Liu X, Liu CG, **Wang L***. FOXP3-microRNA-146-NF-kappaB axis and therapy for precancerous lesions in prostate. *Cancer research*. 2015. in press. PubMed PMID: 25712341.

    * Corresponding author

3. My early publications identified a series of prostate cancer susceptibility gene, such as *cyclin D1*, *IGF-I* and *CYC19*, etc. Prostate cancer is the most common cancer in men and the second leading cause of cancer mortality. Epidemiologic studies suggest that prostate cancer patients may have genetic predisposition, however, the genes contributing to the disease genetics remain elusive. We observed that the genetic variants of susceptibility genes were significantly associated with the risk of prostate cancer onset and progression, especially tumor metastasis. The identification of these susceptibility genes, loci and variants will not only help in understanding the genetic role in the formation and progression of prostate cancer, but will also provide useful information for predicting high risk population of prostate cancer to improve disease prevention.

    a. **Wang L**, Habuchi T, Mitsumori K, Li Z, Kamoto T, Kinoshita H, Tsuchiya N, Sato K, Ohyama C, Nakamura A, Ogawa O, Kato T. Increased risk of prostate cancer associated with AA genotype of cyclin D1 gene A870G polymorphism. *Int J Cancer*. 2003;103(1):116-20. PubMed PMID: 12455063.

    b. **Wang L**, Habuchi T, Tsuchiya N, Mitsumori K, Ohyama C, Sato K, Kinoshita H, Kamoto T, Nakamura A, Ogawa O, Kato T. Insulin-like growth factor-binding protein-3 gene -202 A/C polymorphism is correlated with advanced disease status in prostate cancer. *Cancer research*. 2003;63(15):4407-11. PubMed PMID: 12907612.

    c. **Wang L**, Mitoma J, Tsuchiya N, Narita S, Horikawa Y, Habuchi T, Imai A, Ishimura H, Ohyama C, Fukuda M. An A/G polymorphism of core 2 branching enzyme gene is associated with prostate cancer. *Biochemical and biophysical research communications*. 2005;331(4):958-63. PubMed PMID: 15882971.

    d. Tsuchiya N, **Wang L**, Suzuki H, Segawa T, Fukuda H, Narita S, Shimbo M, Kamoto T, Mitsumori K, Ichikawa T, Ogawa O, Nakamura A, Habuchi T. Impact of IGF-I and CYP19 gene polymorphisms on

the survival of patients with metastatic prostate cancer. *J Clin Oncol*. 2006;24(13):1982-9. PubMed PMID: 16648498.

4. In addition, CD24 is overexpressed in nearly 70% human cancers, whereas *TP53* is the most frequently mutated tumor-suppressor gene that functions in a context-dependent manner. Understanding the cellular context of p53 mutant function may help restore its tumor-suppressor function. Recently, as a multi-PI, I first reported that CD24 disrupts the ARF-NPM interaction and enables mutational and viral oncogene-mediated p53 inactivation in prostate cancer. These data provide a general mechanism for functional inactivation of ARF, and reveal an important cellular context for genetic and viral inactivation of TP53, which is very important in understanding the mechanism of p53 frequent inactivation in human cancer. As p53 is among the most commonly inactivated tumor suppressors, a major challenge in tumor therapy is how to restore p53 tumor-suppressor activity. Since silencing CD24 restores at least part of the tumor-suppressor activity of p53 mutants, our data also provide a potential approach to restore p53 function in cancer.

    a. **Wang L***, Liu R, Ye P, Wong C, Chen GY, Zhou P, Sakabe K, Zheng X, Wu W, Zhang P, Jiang T, Bassetti MF, Jube S, Sun Y, Zhang Y, Zheng P, Liu Y*. Intracellular CD24 disrupts the ARF-NPM interaction and enables mutational and viral oncogene-mediated p53 inactivation. *Nature communications*. 2015;6:5909. PubMed PMID: 25600590; PMCID: 4300525.

* Corresponding author

Complete list of my published work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1BCOlfq48wzkk/bibliography/43154619/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

DoD/PCRP/Idea Award PC130594 Wang (PI) 09/01/14 – 08/31/17
Title: Synergistic action of FOXP3 and TSC1 pathways during tumor progression
Our overall goal is to define the molecular mechanisms of the cross-talk between Foxp3 and Tsc1 and provide a novel effective approach for prostate cancer therapy.
Role: PI

NIH/NCI/R21 CA179282 Wang (PI) 04/01/14 – 03/31/16
Title: MicroRNAs for monitoring tumor progression and predicting response to therapy
Our overall goal of this project is to test our hypothesis that circulating miR-200c/141 and miR-155 are useful biomarkers for early detection of breast tumor progression and predicting response to therapies.
Role: PI

NIH/NCI/U54 CA118948 MSM-TU-UAB CCC Pre-Pilot Award Wang (PI) 07/01/14-06/30/15
Title: Association of CD24 and Progression of Prostate Cancer in African-Americans
Our overall goal is to identify the genetic factor(s) of aggressive prostate cancers in African-Americans.
Role: PI

Completed Research Support

NIH/NCI/R21 CA164688 Wang (PI) 07/01/12 – 03/01/15
Title: FOXP3-MICRORNA146-NFKB AXIS IN TUMOR SUPPRESSION
Our overall goal of this project is to establish the principle of tumor suppressor relay between FOXP3 and miR-146-mediated NF-kB.
Role: PI

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Amy S. Weinmann, Ph.D.

eRA COMMONS USER NAME (credential, e.g., agency login): weinmann

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Minnesota, Morris, MN	B.A.	1992-1995	Biology
University of California, Los Angeles, CA	Ph.D.	1995-2000	Microbiology & Immunology
University of Wisconsin, Madison, WI	Postdoctoral	2000-2003	Oncology

A. Personal Statement

My laboratory studies the mechanisms by which lineage-specifying transcription factors regulate cell fate decisions in development. A major focus of the research in my lab is on the T-box and BTB-ZF transcription factor families, which are required to promote cellular transitions in numerous developmental systems, ranging from early embryogenesis to immune cell fate. Significantly, mutations in T-box and BTB-ZF factors are associated with birth defects, autoimmunity, pathogenic immune responses and cancer. By studying T-bet's role in helper T cell differentiation, we have defined a novel role for the T-box transcription factor family in establishing the epigenetic states that are required for cellular transitions. We discovered that through physical interactions with epigenetic-modifying proteins, T-bet functionally mediates both the removal of the repressive H3K27me3 modification and the addition of the permissive H3K4me2 mark during Th1 differentiation. We then demonstrated that this functional activity is conserved for members of the T-box family and that mutations in T- box factors that disrupt these interactions are found in a variety of human birth defects. Thus, our research has discovered a novel mechanism that is absolutely required in human development and has been widely cited in both immunology and developmental biology. Another aspect of our recent research studies have discovered that the co-expression of T-bet and Bcl-6, two opposing helper T cell lineage-specifying transcription factors, functionally regulates the activities of both factors and creates flexibility between Th1 and Tfh-signature genes as well as between the expression of metabolic gene profiles in effector and memory-like settings. Notably, the interaction between T-bet and Bcl-6 allows T-bet to control Bcl-6 activity in effector Th1 cells because T- bet-Bcl-6 complex formation masks the Bcl-6 DNA binding domain while leaving the T-bet DNA binding domain exposed. This means that when there is a high ratio of T-bet to Bcl-6, such as in effector Th1 cells, Bcl-6 cannot repress its direct target genes. However, Bcl-6 expression remains responsive to changes in environmental IL-2 in $CD4^+$ and $CD8^+$ T cells, with low IL-2 conditions inducing Bcl-6 expression in T cells, allowing Bcl-6 to bypass T-bet-mediated control and repress its direct target gene *Prdm1* (Blimp1) as well as many glycolysis pathway genes. Notably, our current data suggest that the Bcl-6-dependent repression of glycolysis pathway genes is important in regulating the effector to memory cell transition. Understanding these molecular principles in normal immune responses are leading to new hypotheses for how environmental stimuli can alter the levels of the key lineage-specifying factors, changing their intricate balances and ultimately creating flexibility in gene expression potential and the functional capacity of the cell.

B. Positions and Honors

Positions and mployment

1995-2000	Graduate Student (Mentor: Dr. Stephen T. Smale), Department of Microbiology, Immunology, and Molecular Genetics, University of California, Los Angeles, CA
2000-2003	Postdoctoral Fellow (Mentor: Dr. Peggy J. Farnham), McArdle Laboratory for Cancer Research, University of Wisconsin-Madison, Madison, WI
2003-2009	Assistant Professor, Department of Immunology, University of Washington, Seattle, WA
2009-2014	Associate Professor with tenure, Department of Immunology, University of Washington
2014-present	Associate Professor with tenure, Department of Microbiology, University of Alabama at Birmingham

Other Experience and Professional Membership

2006-2009	American Diabetes Association Grant Review Committee
Member 2007	American Society of Microbiology Member
2008-present	American Association of Immunologists
2010-11,2013,14	Ad Hoc Member CMIA Study Section
2012-2014	Ad Hoc Member and Mail-in Reviewer for Special Emphasis Study Sections
NIH 2012	Mail-in Reviewer Lupus Research Institute
2004-2014	Reviewer for peer-review journals such as *Nature, Nature Immunology, Science, J. Exp. Med., Plos Genetics, Journal of Immunology, PNAS, Mol. Cell. Biol.*, and others.
2013-2016	American Association of Immunologists Education Committee member
2013-2016	*Genes and Immunity* Editorial Board Member

C. Contributions to Science

1. Graduate and Postdoctoral research: defining epigenetic states and developing ChIP-based gene discovery approaches

Each cell of the body, whether it is a nerve, skin, or heart cell, starts out with the exact same DNA content. Yet, the interpretation of that material, that is, cellular gene expression patterns, are unique to each cell type. An emerging research area is determining how the same DNA content can be uniquely interpreted in each cell type. Understanding the processes of epigenetic regulation that account for differential gene expression patterns has been the main focus of my research. During my graduate training, I demonstrated the importance of the TLR-dependent induction of a chromatin-remodeling complex in the inducible regulation of transcription in macrophages. My postdoctoral research project focused on generating technological advances to study transcription factor binding patterns on a genome-wide level in mammalian cells. We modified the traditional chromatin immunoprecipitation procedure to analyze the content of ChIP samples in an unbiased manner in pioneering work that demonstrated the feasibility of the ChIP-on-chip assay in mammalian cells. Based upon our early advances, genome-wide studies have now become common practice to examine both transcription factor binding and epigenetic patterns which has revolutionized our interpretations of the genome. My independent research has built upon my past experience and we have now provided a new paradigm by which the developmentally important T-box transcription factor family regulates the epigenetic states of target genes through the coordinated, but physically separable recruitment of both demethylase and methyltransferase activities. Importantly, this novel mechanism is essential in human development as T-box-mediated genetic disease mutations disrupt these activities.

a. Trinh, L.A., R. Ferrini, B.S. Cobb, **A.S. Weinmann**, K. Hahm, P. Ernst, I.P. Garraway, M. Merkenschlager, and S.T. Smale. Down-Regulation of TDT Transcription in CD4(+)CD8(+) Thymocytes by Ikaros Proteins in Direct Competition with an Ets Activator. *Genes & Dev*., 15: 1817-1832, 2001.

b. **Weinmann, A.S.**, D.M. Mitchell, S. Sanjabi, M.N. Bradley, A. Hoffmann, H.C. Liou, and S.T. Smale. Nucleosome Remodeling at the IL-12 p40 Promoter Is a TLR-dependent, Rel-independent Event. *Nat. Immunol*., 2: 51-57, 2001.

c. **Weinmann, A.S.**, S.M. Bartley, T. Zhang, M.Q. Zhang, and P.J. Farnham. Use of Chromatin Immunopre- cipitation to Clone Novel E2F Target Promoters. *Mol. Cell. Biol*., 21: 6820-6832, 2001.

d. **Weinmann, A.S.**, P.S. Yan, M.J. Oberley, T.H.-M. Huang, and P.J. Farnham. Isolating Human Transcription Factor Targets by Coupling Chromatin Immunoprecipitation and CpG Island Microarray Analysis. *Genes & Dev*., 16: 235-244, 2002.

2. Defining new role for how T-bet recruits epigenetic modifying complexes to Th1-signature genes and common mechanisms for the T-box transcription factor family in development.

One of the major findings from my independent laboratory was that T-bet promotes Th1 differentiation by physically recruiting epigenetic modifying complexes to Th1-signature genes to create permissive chromatin states. We showed that conserved amino acids in the T-box DNA binding domain of T-bet are required for recruiting H3K4-methyltransferase and H3K27-demethylase complexes to T-bet target genes. We then went on to demonstrate in a study published in *Molecular Cell* that T-bet also recruits a Brg1-containing ATP- dependent chromatin-remodeling complex to Th1-signature genes. This functional activity of T-bet is mediated through its association with the H3K27-demethylase Jmjd3. This is because we demonstrated for the first time that the H3K27-demethylase family, which includes Jmjd3, UTX and UTY, has the capacity to associate with Brg1-containing chromatin remodeling complexes in a manner that is independent from the H3K27- demethylase enzymatic activity of this family. During the course of these studies with T-bet, we discovered that these mechanistic activities are conserved for the T-box transcription factor family. Studies from many independent groups have cited this work, showing similar mechanistic strategies are indeed utilized by the T- box family in different developmental contexts to initiate cellular specification events. Our work is also highly cited in studies defining similar demethylase-independent roles for Jmjd3, UTX and UTY in diverse developmental contexts. Thus, our mechanistic studies defining T-bet's role in Th1 differentiation have elucidated mechanisms that are conserved in diverse cellular specification processes and suggest there are common themes for lineage-specification events, broadening the impact of the studies on these protein families.

a. Lewis, M.D., S.A. Miller, M.M. Miazgowicz, K.M. Beima, and **A.S. Weinmann**. T-bet's ability to regulate individual target genes requires the conserved T-box domain to recruit histone methyltransferase activity and a separate family member specific transactivation domain. *Mol. Cell. Biol.* 27: 8510-8521, 2007. PMCID: 2169399

b. Miller, S.A., A.C. Huang, M.M. Miazgowicz, M.M. Brassil, and **A.S. Weinmann**. Coordinated, but physically separable interaction with H3K27-demethylase and H3K4-methyltransferase activities are required for T- box protein-mediated activation of developmental gene expression. *Genes & Dev.* 22: 2980-93, 2008. PMCID: 2577798

c. Miller, S.A., S.E. Mohn, and **A.S. Weinmann**. Jmjd3 and Utx play a demethylase-independent role in chromatin remodeling to regulate T-box family member-dependent gene expression. *Mol. Cell* 40: 594- 605, 2010. PMCID: 3032266.

d. Miller, S.A. and **A.S. Weinmann**. Molecular mechanisms by which T-bet regulates T-helper cell commitment. *Immunol. Rev.* 238: 223-46, 2010. PMCID: PMC2988494

3. Defining how the balance between T-bet and Bcl-6 creates flexibility between helper T cell gene programs

The dogma in the $CD4^+$ T cell field for decades was that the differentiation of naïve $CD4^+$ T cells into specialized subtypes was akin to a developmental cell fate decision. Thus, this newly discovered interaction between T-bet and Bcl-6 was quite surprising because Bcl-6 was the factor required for an alternative specialized helper T cell fate choice, the T follicular helper (Tfh) cell. This led us to explore the new hypothesis that there is more flexibility between specialized helper T cell programs than previously appreciated and that the balance between helper T cell lineage-specifying transcription factors plays a key role in mediating this potential. In a study published in *Nature Immunology*, we defined how

the molecular balance between T-bet and Bcl-6 creates flexibility between specialized helper T cell gene expression profiles. We first showed that T- bet-Bcl-6 complex formation masks the Bcl-6 DNA binding domain and effectively prevents Bcl-6 from associating with its own direct target genes when it is in complex with T-bet. This is because the DNA binding zinc fingers of Bcl-6 are required for its interaction with T-bet, whereas the C-terminal protein-protein interaction domain of T-bet mediates its interaction with Bcl-6. Importantly, the underlying properties of this mechanistic interaction create what can be thought of as a molecular balance between these two lineage- specifying transcription factors. When T-bet levels are significantly higher than Bcl-6, such as will be the case in effector Th1 cells, the balance will favor T-bet, promoting T-bet-Bcl-6 complex formation and preventing Bcl- 6 from repressing its own direct target gene program. However, if environmental conditions induce Bcl-6 expression, this allows Bcl-6 to overwhelm T-bet-mediated control, and excess Bcl-6 becomes available to initiate a Bcl-6-dependent program. Thus, from a simplified view, our data support the hypothesis that the effective ratio between T-bet and Bcl-6 influences their functional activities and ability to create specialized gene expression programs. We then defined natural environmental conditions that alter the balance between T-bet and Bcl-6 in the context of Th1 cells. We found that Bcl-6 expression remains responsive to environmental IL-2 conditions in the context of Th1 cells, with low IL-2 conditions promoting Bcl-6 expression, whereas high IL-2 conditions inhibit Bcl-6 expression. This allows for flexibility between the T-bet-dependent effector Th1 gene program and aspects of the Bcl-6-dependent Tfh-like or memory-like gene programs.

a. Kao, C., K.J. Oestreich, M.A. Paley, A. Crawford, J.M. Angelosanto, M.A.A. Ali, A.M. Intlekofer, J.M. Boss, S.L. Reiner, **A.S. Weinmann**, E.J. Wherry. T-bet represses expression of PD-1 and sustains virus-specific CD8 T cell responses during chronic infection. *Nat. Immunol.* 12: 663-671, 2011. PMCID: 3306165.

b. Oestreich, K.J. and **A.S. Weinmann**. T-bet employs diverse regulatory mechanisms to repress transcription. *Trends Immunol*. 33: 78-83, 2012. PMCID: PMC3273642.

c. Oestreich, K.J., S.E. Mohn, and **A.S. Weinmann**. Molecular mechanisms that control the expression and activity of Bcl-6 in Th1 cells to regulate flexibility with a Tfh-like gene profile. *Nat. Immunol.* 13: 405-411, 2012. PMCID: PMC3561768.

d. Oestreich, K.J. and **A.S. Weinmann**. Mastor regulators or lineage-specifying? Changing views on $CD4^+$ T cell transcription factors. *Nat. Rev. Immunol.* 12: 799-804, 2012. PMCID: PMC3584691.

4. Defining new role for Bcl-6: repressing the glycolysis pathway gene program

Previous research in the field has indicated there is a reciprocal relationship between the ratio of T-bet and Bcl- 6 in effector versus memory cell populations and this ratio, as well as the effector versus memory cell differentiation programs, are sensitive to IL-2-signaling. However, how the balance between T-bet and Bcl-6 potentially impacts effector versus memory cell potential was unknown. In a study we recently published in *Nature Immunology*, we identified the glycolysis pathway as a novel pathway that is regulated by this balance. This is notable because many elegant studies have shown that the glycolytic potential of T cells dramatically changes in effector versus memory-like cell states. Studies have shown that the metabolic program of $CD8^+$ T cells is sensitive to IL-2-signaling, with the characteristic high rates of glycolysis in effector $CD8^+$ T cells sustained by strong IL-2-signaling. Thus, our research defines one mechanism that contributes to how the metabolism pathway is established in memory T cell development.

1. Oestreich, K.J., K.A. Read, S.E. Gilbertson, K.P. Hough, P.W. McDonald, V. Krishnamoorthy, **A.S. Weinmann**. Bcl-6 directly represses the gene program of the glycolysis pathway. *Nat. Immunol.* 15: 957- 964, 2014. PMCID: PMC4226759.
*News and Views written about paper in *Nat. Immunol*. and research highlight in *Nat. Rev. Immunol.*

Full list of publications:

http://www.ncbi.nlm.nih.gov/pubmed/?term=weinmann+as

D. Research Support

ONGOING RESEARCH SUPPORT

R01 AI061061 (A. Weinmann, PI) 06/01/2004-01/31/2015 (no cost extension 1/31/16) NIH/NIAID
Molecular Characterization of T-bet's Role in Immunity
The goal of this project is to better understand the role of the T-box transcription factor T-bet in unique cell types of the immune system. This project is also focused on understanding the role for T-bet in regulating epigenetic events and other regulatory events in Th1 cell development.
*Competitive renewal application submitted in November 2014.

R21 AI113026 (A. Weinmann, PI) 07/01/2014-6/30/2016
NIH/NIAID
Tet1 activity and function in helper T cells
The discovery of the ten-eleven-translocation (TET) protein family provided the first evidence that cytosine methylation could be broken down by a cellular enzyme into a hydroxymethylated state, with the potential to then be successively converted to the unmethylated state. Notably, mutations in TET proteins are found in a number of blood cancers, highlighting the importance of this protein family in immune cell development. In this proposal, we will for the first time define the mechanisms that target Tet1 to specific genomic loci in helper T cells and its importance in the immune response. These studies will form the basis for understanding the site- specific targeting of Tet1 to loci in helper T cell development and how this impacts cellular transitions as well as the functional potential of the cells during an immune response to viral infection.

R01 AI110480 (Ballesteros-Tato, PI) 04/01/15 – 03/31/20 NIH/NIAID
Regulation of T-cell dependent B cell responses to influenza
This proposal will determine the mechanisms by which Dendritic Cells prime Tfh cell response after influenza infection and how IL-2 signaling modulates this process.
(Co-Investigator with 1.2 calendar months effort)

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Yusuf, Nabiha

eRA COMMONS USER NAME (credential, e.g., agency login): NABIHA

POSITION TITLE: Assistant Professor of Dermatology (Tenure Track)

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
RD University, Jabalpur, India	MS	1992	Microbiology
AM University, Aligarh, India	PhD	2000	Immunology
Dermatology, UAB, Birmingham AL	Post-Doc	2001-2005	Immunodermatology
UAB CCTS, Birmingham AL	Diploma	2010	Clinical Research

A. PERSONAL STATEMENT

The focus of my research is to evaluate the role of innate immune responses mediated by Toll like receptor-4 (TLR4) in UVB induced cutaneous DNA damage and tumor development. I have also determined the role of inflammation in mice that lack the tumor suppressor gene *p16^{INK4a}* which is a common mutation found in melanoma. As a graduate student, I characterized the autoantibodies in dilated cardiomyopathy and systemic lupus erythematosus. I have 13+ years of experience in evaluating the role of innate and adaptive immune responses in environmental skin carcinogenesis. As a postdoctoral fellow in Dr. Craig Elmets' laboratory in UAB, I determined the role of T-cell mediated immune responses against chemical carcinogens and their role in skin cancer. As a co-investigator on Dr. Elmets' VA Merit Review grant, I evaluated the role of antigenic tolerance on cutaneous tumor development. I also evaluated the role of cell mediated immune responses generated by chemical carcinogens to mutant H-ras peptide. My studies on TLR4 have been funded by extramural and intramural grant mechanisms. I am currently studying mechanisms involved in regulation of cytokine genes in psoriasis. I currently serve as course master for Cancer Immunology course (GBS774) and Cancer Immunology Journal Club (GBS747) for graduate students at UAB. During my research tenure, I have mentored several medical and graduate students, and postdoctoral fellows, and have produced several peer-reviewed publications from their projects. Some of the relevant publications are listed below:

1. **Yusuf N**✉, Nasti TH, Huang CM, Huber BS, Jaleel T, Lin HY, Xu H, Elmets CA. 2009. Heat shock proteins HSP27 and HSP70 are present in the skin and are important mediators of allergic contact hypersensitivity. *J Immunol* 182:675-83.
2. Lewis W, Simanyi E, Li H, Thompson CA, Nasti TH, Jaleel T, Xu H, **Yusuf N**. 2011. Regulation of ultraviolet radiation induced cutaneous photoimmunosuppression by Toll like receptor-4. *Arch. Biochem. Biophys* 508: 171-177. PMCID: PMC3115632.
3. Ahmad I, Simanyi E, Guroji P, Tamimi IA, delaRosa HJ, Nagar A, Nagar P, Katiyar SK, Elmets CA, **Yusuf N**. 2013. Toll-Like Receptor-4 deficiency enhances repair of ultraviolet radiation induced cutaneous DNA damage by nucleotide excision repair mechanism. *J Invest Dermatol.* 134:1710-1717.PMCID PMC4020975.
4. Burns EM, **Yusuf N**. 2014. Toll like receptors and skin cancer. *Front Immunol*. 5:135. PMCID PMC3978350.

B. POSITIONS AND EMPLOYMENT

2000 Junior Bacteriologist, New Delhi Tuberculosis Centre, New Delhi, INDIA
2001-2005 Post Doctoral Fellow, Dermatology, UAB School of Medicine, Birmingham, AL

2005-2009 Instructor, Dermatology, UAB School of Medicine
2005-present Scientist, Veteran Affairs Medical Center, Birmingham, AL
2008-present Associate Scientist, Chemoprevention Program, UAB Comprehensive Cancer Center
2008-present Associate Scientist, UAB Comprehensive Arthritis, Musculoskeletal and Autoimmunity Center
2009-present Member, UAB Center for Nanoscale Materials & Biointegration (CNMB)
2009-present Assistant Professor, Dermatology, UAB School of Medicine
2009-present Faculty, UAB Graduate School
2009-present Faculty, UAB Program in Immunology
2010-present Faculty, UAB Graduate Biomedical Sciences program
2012 Faculty, UAB Undergraduate Neurosciences program
2012 Faculty, UAB Beckman Scholar's Program 2012
2013-present Mentor, UAB Cancer Prevention and Control Training (CPCTP) program
2011-present Course Master, Cancer Immunology course (GBS774)
2013-present Course Master, Cancer Immunology Journal Club (GBS747)

Memberships

2004-present Member, Society of Investigative Dermatology (SID)
2008-present Active Member, American Association for Cancer Research (AACR)
2008-2009 Professional Member, American Association for the Advancement of Science (AAAS)
2015 Active Member, American Association of Immunologists (AAI)
2014-present Ad-hoc reviewer, NIH ACTS Study section
2013-present Ad-hoc reviewer, UAB Comprehensive center ACS pilot grants

Honors and Awards

2007 Albert F Kligman travel award for Society of Investigative Dermatology (SID), Los Angeles, CA
2009, 2010 Research Career Development Award from Dermatology Foundation USA

C. CONTRIBUTION TO SCIENCE

My early publications address the role of cell mediated immune responses in prevention of cutaneous chemical carcinogenesis using the carcinogen 7,12-dimethylbenz(a)anthracene (DMBA). These studies demonstrated that contact hypersensitivity response to DMBA conferred protection against cutaneous tumors induced by high doses of the same carcinogen. We also demonstrated that DMBA could induce melanocytic nevi in mice that had the propensity to progress into melanoma. I served as a corresponding author or co-investigator in all these studies.

1. Elmets CA, **Yusuf N**, Hamza S, Iranikhah N, Smith J, Volk AL, Skelton H, Smith K. 2004. Topical application of Dimethylbenz(a)anthracene results in the generation of multiple melanocytic nevi in C3H/HeN mice. *Toxicol Appl Pharmacol*195:355-60.
2. **Yusuf N**✉ , Nasti TH, Katiyar SK, Jacobs MK, Seibert MD, Ginsburg AC, Timares L, Xu H, Elmets CA. 2008. Antagonistic roles of $CD4^+$ and $CD8^+$ T-Cells in 7,12-dimethylbenz(a)anthracene cutaneous carcinogenesis. *Cancer Res* 68:3924-30. PMCID: PMC3769418.
3. Sharma SD, Meeran SM, Katiyar N, Tisdale B, **Yusuf N**, Xu H, Elmets CA, Katiyar SK. 2009. IL-12-deficiency suppresses 12-O-tetradecanoylphorbol-13-acetate-induced skin tumor development in 7, 12-dimethylbenz(a)anthracene-initiated mouse skin through inhibition of inflammation. *Carcinogenesis* 30:1970-7. PMCID: PMC2783006.
4. Nasti TH, Cochran JB, Tsuruta Y, **Yusuf N**, McKay KM, Athar M, Timares L, Elmets CA. 2015. A murine model for the development of melanocytic nevi and their progression to melanoma*. Mol Carcinog*. Mar 18. doi. 10.1002/mc.22310 (Epub ahead pf print).

During my postdoctoral training, I developed an interest in Toll like receptor-4 (TLR4) which is an important member of the family of innate immune receptors, and is involved in innate and adaptive immune response. Studies from our laboratory demonstrated a protective role for TLR4 mediated immune responses against development of skin and breast tumors induced by chemical carcinogen, DMBA. I also collaborated on studies evaluating the role of IL-17 in inflammation induced tumor development.

1. **Yusuf N**✉, Nasti TH, Long JA, Naseemuddin M, Lucas AP, Elmets CA. 2008. Protective role of TLR4 during the initiation stage of cutaneous chemical carcinogenesis. *Cancer Res* 68: 615-622. PMCID: PMC3568948.
2. **Yusuf N**✉, Nasti TH, Meleth S, Elmets CA. 2009. Resveratrol enhances cell-mediated immune response to DMBA through TLR4 and prevents DMBA induced cutaneous carcinogenesis. *Mol. Carcinog* 48:713-23. PMCID: PMC2760377.
3. Naseemuddin M, Iqbal A, Nasti TH, Ghandhi JL, Kapadia AD, **Yusuf N**✉. 2011. Cell mediated immune responses through TLR4 prevents DMBA-induced mammary carcinogenesis in mice. *Int J Cancer*. 130:765-74. PMCID: PMC3760716.
4. Nasti TH, Iqbal O, Geise JT, Katiyar SK, **Yusuf N**✉. 2011. Differential roles of T-cell subsets in regulation of ultraviolet radiation induced cutaneous photocarcinogenesis. *Photochem Photobiol* 87: 387-398. PMCID: PMC3049951.

Complete List (31) of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/myncbi/collections/bibliography/44199310/?reload=publicURL

D. Research Support

Active Projects

Department of Defense PRCRP New Investigator Award PI:Yusuf
10/01/10-09/14/15 (After NCE)
Regulation of Ultraviolet Radiation-Induced Cutaneous Photodamage and Nucleotide Excision Repair by Toll-Like Receptor-4
Role: Principal Investigator
Goal: To evaluate the role of TLR4 in UVB induced cutaneous DNA damage and nucleotide excision repair (NER), and to study whether TLR4 mediated tumor development is dependant on NER mechanism.

American Skin Association PI:Simanyi, Mentor: Yusuf
Role of p53 in modulation of Toll like receptor mediated ultraviolet radiation induced cutaneous responses
Role: Mentor 07/01/2013-06/30/2015 (After NCE)
Medical Student Grant to Ms. Eva Simanyi
Goal: To evaluate p53 plays a role in TLR mediated UVB induced cutaneous photodamage.

Completed Projects

Pilot and Feasibility Study, Skin Disease Research Center PI:Yusuf
08/15/09-07/31/11
Role of the innate immune system in regulation of UVB induced skin carcinogenesis
Role: Principal Investigator
Goal: To evaluate the role of innate immune system in UVB induced cutaneous immunosuppression and tumor development.

18-103-02 Elmets (PI) VA Merit Review PI:Elmets
10/01/06-09/30/10
Host Defense Mechanisms in Polyaromatic Hydrocarbon Carcinogenesis
Role: Co-Investigator
Goal: To evaluate whether host mediated immune responses have a protective effect on chemically induced cutaneous tumor development.

Dermatology Foundation PI:Yusuf
07/01/09-08/31/10
Photoimmunological role of Toll like receptor-4 (TLR4) in skin
Role: Principal Investigator (Research Career Development Award)
Goal: To evaluate the role of TLR4 in UVB induced cutaneous immunosuppression.
(Salary support only)

UAB Faculty Development Grant Program PI:Yusuf

08/15/09-07/31/10
Regulation of UVB induced skin cancer by Toll like receptor-4
Role: Principal Investigator
Goal: To evaluate the role of TLR4 in UVB induced cutaneous tumor development.

Department of Defense PRCRP Concept Award PI:Yusuf
09/01/10-08/31/11
Role of *p16INK4a* in Ultraviolet Radiation Induced Inflammation and Photocarcinogenesis
Role: Principal Investigator
Goal: To evaluate whether *p16INK4a* deficiency augments UVB induced cutaneous inflammation and tumor development.

R03 AR057483 National Institute of Health NIAMS PI:Yusuf
Photodermatological effects of Toll like Receptor-4 06/01/10-06/31/13 (After NCE)
Role: Principal Investigator
Goal: To assess whether regulatory T-cells develop in TLR4 knockout mice after UVB radiation exposure, and, if so, characterize their phenotype and cytokine profile.

American Skin Association PI:Simanyi, Mentor: Yusuf
Regulation of Ultraviolet Radiation-Induced Photodamage and Repair by Toll-Like Receptors
Role: Mentor 01/01/2012-12/31/2012
Medical Student Grant to Ms. Eva Simanyi
Goal: To evaluate the specificity of TLR4 mediated responses in UVB induced cutaneous photodamage.

OMB No. 0925-0001/0002 (Rev. 08/12 Approved Through 8/31/2015)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Ping Zhang

eRA COMMONS USER NAME (credential, e.g., agency login): ZHANGPING

POSITION TITLE: Assistant Professor of Pediatric Dentistry

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Hubei Medical University, China	D.D.S.	05/92	Stomatology
Hubei Medical University, China	Ph.D.	05/97	Oral Biology
Univ. of Alabama at Birmingham, Alabama	Postdoc	05/00-11/04	Immunology

A. Personal Statement

I have a broad background in immunology, with specific training and expertise in using in vivo and in vitro biochemical, cellular and genetic approaches to investigate the signaling mechanisms involved in host immune responses to invading pathogens of various infectious diseases, including periodontal diseases and dental caries. I am specifically interested in understanding the innate regulation of inflammation and bone loss in the pathogenesis of periodontitis. As PI or co-Investigator on several university- and NIH-funded grants, I have successfully administered the projects, collaborated with other researchers, and produced peer-reviewed publications from each project. I have published 51 peer-reviewed articles, 21 of which I am the first author or corresponding/co-corresponding author. I have mentored or co-mentored 5 graduate students, 1 postdoctoral fellow and 3 visiting scientists, and several dental residents.

a. **Zhang, P**., Martin, M., Yang, Q-B., Michalek, S.M., and Katz, J. (2004). Role of B7 costimulatory molecules in immune responses and T-helper cell differentiation to recombinant HagB from *Prophyromonas gingivalis*. Infect. Immun. 72: 637-644. PMCID: PMC321589
b. **Zhang P.**, Martin M., Michalek S.M. and Katz J. (2005) Role of mitogen-activated protein kinases and NF-κB in the regulation of pro- and anti-inflammatory cytokines by *Porphyromonas gingivalis* Hemagglutinin B. Infect. Immun. 73:3990-3998. PMCID: PMC1168622.
c. **Zhang, P.**, Lewis, J.P., Michalek, S.M**.,** and Katz, J. (2007). Role of CD80 and CD86 in host immune responses to the recombinant hemagglutinin domain of *Porphyromonas gingivalis* gingipain and in the adjuvanticity of cholera toxin B and monophosphoryl lipid A. Vaccine 25: 6201-6210. PMCID17629367
d. Xu Q., Katz J., **Zhang P.**, Ashtekar A.R., Gaddis D.E., Fan M., Michalek S.M. (2011) Contribution of a *Streptococcus mutans* antigen expressed by a *Salmonella* vector vaccine in dendritic cells activation. Infect. Immun. 79:3792-3800. PMCID:PMC3165457.

B. Positions and Honors

Positions and Employment

1997 Visiting Scholar, Specialized Caries Research Center, School of Dentistry, University of Alabama at Birmingham (UAB), AL
1997-1999 Assistant Professor, Department of Cariology & Endodontics, School of Stomatology, Hubei Medical University, China
1999-2000 Associate Professor, Department of Cariology & Endodontics, School of Stomatology, Hubei Medical University, China
2000-2004 Postdoc/Research Associate, Department of Microbiology, University of Alabama at Birmingham, Birmingham, AL

2004-Present Assistant Professor, Department of Pediatric Dentistry, School of Dentistry, University of Alabama at Birmingham, Birmingham, AL
2009-Present Associate Scientist, Center for Metabolic Bone Disease, UAB, AL

Other Experience and Professional Memberships

2000- Member, American Association for Dental Research
2002- Member, American Society for Microbiology
2002- Member, Society for Mucosal Immunology
2006- Ad hoc reviewer for *Journal of Immunology*, *Infection and Immunity*, *Journal of Leukocyte Biology*, *Molecular Oral Microbiology, PLOS One,* and *Vaccine*
2008- Research Advisor Committee, School of Dentistry, UAB, AL

Honors

1997 Outstanding Ph.D. Dissertation Award, State Department of Education, Hubei, China
1998 Outstanding Junior Faculty Award, Hubei Medical University, China
1999 Excellent Paper Award, Chinese Stomatological Association
1999 Young Investigator Award, National Science Foundation of China
2000 Chengguang Young Investigator Award, Board of Science and Technology, Wuhan, China
2000 Distinguished Achievement Award in Science and Technology, State Government, Hubei, China
2007 Faculty Research Development Award, School of Dentistry, UAB, AL

C. Contribution to Science

1. One of my research interests involves the development of potential mucosal vaccines for the induction of protective immune responses against infectious diseases including periodontitis. The basis of these studies is the use of recombinant genetic vaccines consisting of unique microbial antigens from periodontal pathogen *Porphyromonas gingivalis*. Studies also involve vaccine vectors and the characterization and use of mucosal adjuvants. We have demonstrated the effectiveness of quillajia saponin (QS) derivative GPI-100 as both a systemic and mucosal adjuvant and support its potential use in the development of vaccines against periodontal, as well as other pathogens. Current efforts are directing to develop novel structurally defined QS-based synthetic adjuvants, as well as to understand the molecular mechanisms by which QS saponins work. Our continuous efforts in this field will accelerate the development of a new generation of saponin-based adjuvants with enhanced favorable adjuvant properties for clinical use and as molecular probes for mechanistic studies.

    a. **Zhang, P**., Yang, Q-B., Marciani, D.J., Martin, M., Clements, J.D., Michalek, S.M., and Katz, J. (2003) Effectiveness of the quillaja saponin semi-synthetic analog GPI-0100 in potentiating mucosal and systemic responses to recombinant HagB from *Porphyromonas gingivalis*. Vaccine 21: 4459-4471. PMICD14505929.
    b. **Zhang, P**., Yang, Q-B., Balkovetz, D., Lewis, J.P., Clements, J.D., Michalek, S.M., and Katz, J. (2005). Effectiveness of the B subunit of cholera toxin in potentiating immune responses to the recombinant hemagglutinin/adhesin domain of the gingipain Kgp from *Porphyromonas gingivalis*. Vaccine 23:4734-4744. PMICD15955601.
    c. Yang D., Chen Q., Su S.B., **Zhang P.,** Kurosaka K., Caspi R.R., Michalek S.M., Rosenbrg H.F., Zhang N. and Oppenheim J.J. (2008) Eosinophil-derived neurotoxin acts as an alarmin to activate the TLR2-MyD88 signal pathway in dendritic cells and enhances Th2 immune responses. J. Exp. Med. 205: 79-90. PMCID: PMC2234357.
    d. Wang P., Dai Q., Thogaripally P., **Zhang P**., Michalek SM. (2013) Synthesis of QS-21-based immunoadjuvants. J Org Chem. 78:11525-534. PMCID:PMC3937867.

2. In addition to the contributions described above, with a team of collaborators, I have been working on studies to identify the downstream signaling pathways activated by the innate Toll-like receptors and the role of TLR signaling pathways in regulating host inflammatory response to *Francisella tularensis*, the causative agent of tularemia. Our studies demonstrated that TLR, as well as downstream GSK3 and mTOR signaling pathways are essential for host response to *F. tularensis*. Understanding the precise signaling mechanisms involved in regulating host inflammatory responses to invading pathogens is essential for the targeted development of sustainable prevention and control strategies for infectious diseases.

a. Katz J., **Zhang P.**, Martin M., Vogel S.N. and Michalek S.M. (2006) Toll-like receptor 2 is required for inflammatory responses to *Francisella tularensis* LVS. Infect. Immun. 74: 2809-2816. PMCID: PMC1459727.
b. Ashtekar A.R., **Zhang P.**, Katz J., Deivanayagam C.C., Rallabhandi P., Vogel S.N. and Michalek S.M. (2008) TLR4-mediated activation of dendritic cells by heat shock protein DnaK from *Francisella tularensis*. J. Leukoc. Biol. 84:1434-1446. PMCID: PMC2614597.
c. **Zhang P.**, Katz J. and Michalek S.M. (2009) Glycogen synthase kinase-3β (GSK3β) inhibition suppresses the inflammatory response to *Francisella* infection and protects against tularemia in mice. Mol. Immunol. 46:677-687. PMCID: PMC3033759
d. Edwards, MW, Aultman JA, Harber G, Bhatt JM, Sztul E, Xu Q, **Zhang P**, Michalek SM and Katz J. (2014) Role of mTOR downstream effector signaling molecules in *Francisella tularensis* internalization by murine macrophages. PLOS One. 8:e83226. PMCID:PMC3849438.

3. Although infection and inflammation are prerequisites for periodontal bone loss, the precise mechanisms maintaining the chronicity of periodontal inflammation and triggering alveolar bone resorption are still not complete understood. One of my recent areas of research is focused on understanding the underlying signaling events regulating the functional interactions between inflammation and osteoclastogenesis in the context of infection with periodontal pathogens. Our studies reveal a novel biphasic role of TLR signaling in regulating osteoclastogenesis, and a differential regulation of osteoclastogenesis by IL-1 signaling. Most importantly, we have also demonstrated a novel homeostatic mechanism involved in negative regulation of inflammation during osteoclast differentiation. Knowledge from these studies should offer new insight into mechanisms of periodontal bone loss. And a more complete appreciation of the interactions between immune and bone cells should lead to better therapeutic strategies for diseases that affect either or both systems.

a. Liu J., Wang S., **Zhang P.**, Said-Al-Naief N., Michalek S.M. and Feng X. (2009) Molecular mechanism of the bifunctional role of lipopolysaccharide in osteoclastogenesis. J. Biol. Chem. 284:12512-12523. PMCID: PMC2673317.
b. **Zhang P.***, Liu J., Xu Q., Harber G, Feng X, Michalek SM, and Katz J. (2011) TLR2-dependent modulation of osteoclastogenesis by *Porphyromonas gingivalis* through differentiation induction of NFATc1 and NF-κB. J. Biol. Chem. 286:24159-24169. PMCID:PMC3129197 **(*corresponding author).**
c. Jules J, **Zhang P**, Ashley JW, Wei S, Shi Z, Liu J, Michalek SM and Feng X. (2012) Molecular basis of the requirement of RANK signaling for interleukine-1 (IL-1)-mediated osteoclastogenesis. J. Biol. Chem. 2012; 287: 15728-15738. PMCID:PMC3346127.

List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/bibliography/43845515/

D. Research Support

Ongoing Research Support

R03 DE022401 Zhang (PI) 07/01/12 – 06/30/15
NIH/NIDCR
Molecular Mechanisms of the Innate Regulation of Osteoclastogenesis
The objective of the proposed study is to define the functional interaction between RANK and TLR signaling pathways in regulating inflammation and osteoclastogenesis following *P. gingivalis* infection.
Role: PI

Completed Research Support

The UAB College of Arts and Sciences Wang (PI) 05/04/13 – 05/31/14
Design, Synthesis, and Evaluation of Structurally Defined Vaccine Adjuvants
The goal of this project is to develop QS-21-based structurally defined adjuvants to address the need for stronger, safer, and easier-to-access vaccine adjuvants.
Role: Co-PI

R01 DE009081 Michalek (PI) 02/1/96 – 01/31/14
NIH/NIDCR
Genetically Engineered Oral Vaccines and Caries Immunity
The overall goal of the studies proposed is to define the regulatory roles of Toll-like receptors that mediate the adaptive immune response following mucosal immunization with a complex *Salmonella* vector vaccine expressing a cloned virulence antigen of *S. mutans*.
Role: Investigator

R01 DE014215 Katz (PI) 09/01/01 – 06/30/13
NIH/NIDCR
Mechanisms of Immune Modulation and Periodontal Disease
The overall goals of the present studies are to delineate if mucosal and/or systemic immune responses or tolerance induced by specific *P. gingivalis* antigens are protective, and the role of B7-1/B7-2 costimulatory molecules in such processes, thus in the pathogenesis of periodontal disease.
Role: Investigator

UAB CMBD Pilot & Feasibility Zhang (PI) 11/01/09 – 5/31/11
Center for Metabolic Bone Disease
Porphyromonas gingivalis in RANKL-Mediated Osteoclastogenesis
The overall goal of this project is to characterize the direct effect of periodontal pathogen *P. gingivalis* on RANKL-induced osteoclastogenesis and the involvement of Toll-like receptors in regulating the effect.
Role: PI

Table 1. Membership of Participating Departments and Programs (New Applications)

BYC STRC = Biochemistry and Structural Biology; CNCER BY = Cancer Biology; CELL MOL = Cellular and Molecular Biology; GENE GEN = Genetics and Genomic Sciences; IMMUN = Immunology; MICBY = Microbiology; NEUR SC = Neurosciences; PATH MOL = Pathobiology & Molecular Medicine; MSTP = Medical Scientist Training Program (MD/PhD)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Participating Department or Program	Faculty Members In Department or Program	Faculty Members Participating in This Application	Predoctoral Trainees in Department* or Program [Supported by Any NIH Training Grant]	Predoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank	Postdoctoral Trainees in Department or Program [Supported by Any NIH Training Grant]	Postdoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank
Graduate Biomedical Sciences Themes *(2015 entry)*								
BYC STRC PHD	86	8	7	na		na	na	
CNCER BY PHD	91	17	7	na		na	na	
CELL MOL PHD	156	26	9	na		na	na	
GENE GEN PHD	98	23	7	na		na	na	
IMMUN PHD	85	33	2	na		na	na	
MICBY PHD	66	16	7	na		na	na	
NEUR SC PHD	88	5	15	na		na	na	
PATH MOL PHD	156	34	6	na		na	na	
MSTP	177	32	7	na		na	na	
Departments								
Biology & Molec Gen	28	1	21[2]	2(1) 0/0/x		15[0]	4(1) 0/0/x	

Participating Department or Program	Faculty Members In Department or Program	Faculty Members Participating in This Application	Predoctoral Trainees in Department* or Program [Supported by Any NIH Training Grant]	Predoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank	Postdoctoral Trainees in Department or Program [Supported by Any NIH Training Grant]	Postdoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank
Biology	15	1	24[0]	6(3) 2/0/x		4[0]	0(0) 0/0/x	
Biomed Eng	16	3	24[0]	0(0) 0/0/x		1[0]	1(1) 0/0/x	
Biostatistics	22	7	23[4]	10(7) 1/0/x		2[2]	1(1) 1/0/x	
Cell, Devlop & Interative Biol***	51	7	37[6]	10(7) 0/0/x		8[2]	3(3) 0/0/x	
Dermatology	15	1	0[0]	0(0) 0/0/x		5[1]	1(1) 0/0/x	
Epidemiology	22	3	24[0]	4(2) 1/0/x		1[1]	1(1) 0/0/x	
Genetics	26	5	9[1]	2(2) 0/0/x		4[0]	0(0) 0/0/x	
Health Behavior	11	1	21[0]	4(3) 1/0/x		0[0]	0(0) 0/0/x	
Medicine	301	34	42[5]	20(17) 2/0/x		62[22]	14(9) 3/0/x	
Microbiology	33	9	29[3]	9(9) 2/0/x		24[3]	6(3) 0/0/x	
Neurology	35	1	15[3]	4(4) 0/0/x		8[0]	2(2) 0/0/x	

Participating Department or Program	Faculty Members In Department or Program	Faculty Members Participating in This Application	Predoctoral Trainees in Department* or Program [Supported by Any NIH Training Grant]	Predoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank	Postdoctoral Trainees in Department or Program [Supported by Any NIH Training Grant]	Postdoctoral Trainees With Participating Faculty Total (TGE) A/B/C**	Leave Column Blank
Oral & Maxillofacial Surgery	5	4	5[1]	2(2) 0/0/x		6[3]	6(4) 1/0/x	
Pathology	79	10	26[3]	8(7) 1/0/x		23[4]	8(4) 0/0/x	
Pediatrics	125	5	8[2]	2(2) 1/0/x		5[0]	0(0) 0/0/x	
Pediatric Dentistry	25	3	3[0]	3(2) 0/0/x		1[1]	1(1) 1/0/x	
Physical Medicine and Rehabilitation	19	2	3[1]	2(2) 1/0/x		2[0]	2(2) 0/0/x	
Psychology	26	1	15[0]	0(0) 0/0/x		5[0]	2(0) 0/0/x	
Surgery	122	4	1[0]	1(1) 0/0/x		4[2]	0(0) 0/0/x	
Totals	Need not sum	Need not sum	330[31]	89(71) 12/0/x		179[41]	52(32) 5/0/x	

** The Total numbers reflect the total number of students affiliated with faculty members holding primary appointments in the designated departments; since faculty may participate in multiple PhD-granting programs, these students may derive from several distinct PhD-granting programs.*

*** Among training grant eligible (TGE) individuals - A, individuals who are underrepresented minorities; B, individuals with disabilities; C, individuals from disadvantaged backgrounds; Group C definition does not typically apply to trainees beyond undergraduate level and is indicated by an "x" here. Disability information is provided by the UAB Office of Disability Support Services, by the UAB Physician Resource Office and by UAB Human Resources.*

**** Reorganized from the Depts of Cell Biology and of Physiology, 2012*

Table 2. Participating Faculty Members (Alphabetically by Faculty Member)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Devin Absher, PhD	Associate Professor	HudsonAlpha; Adjunct UAB Genetics	Content	High-throughput genetic analyses of rheumatic diseases
David B. Allison, PhD	Distinguished Professor	School of Public Health Dean's Office; (Biostatistics)	Content	Admixture Mapping of Human Traits and Conditions
Donna Arnett, PhD	Professor	Epidemiology	Core; Executive Committee	Pharmacogenetics of Methotrexate Response
Stella Aslibekyan, PhD	Asst Professor	Epidemiology	Mentors in Training	Epidemiology of Chronic Disease
T. Prescott Atkinson, MD, PhD	Professor	Pediatrics Chair Office; (Medicine – Clinical Immunology & Rheumatology)	Content	Primary Immunodeficiency
Andre Ballesteros-Tato, PhD	Asst Professor	Medicine – Clinical Immunology & Rheumatology	Mentors in Training	Therapeutic use of IL-2 in SLE
Marcas Bamman, PhD	Professor	Cell, Developmental, & Integrative Biology; (Medicine - Gerontology, Geriatrics, & Palliative Care)	Core	Skeletal muscle mass regulation in aging, disease, & exercise medicine
Susan Bellis, PhD	Professor	Cell, Developmental, & Integrative Biology; (Biomedical Engineering) (Cell Biology)	Core	Adhesion Receptors in Immunity
Tim Beukelman, MD	Associate Professor	Pediatrics Chair Office – Pediatric Rheumatology (Medicine – Clinical Immunology & Rheumatology)	Content	Optimization of treatment of juvenile idiopathic arthritis (JIA)
Laurence Bradley, PhD	Professor	Medicine - Clinical Immunology & Rheumatology	Content	Measurement of Pain and Psychological Variables
S. Louis Bridges, Jr., MD, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Microbiology)	Core; Director	Genetic Influences on Susceptibility, Severity, and Treatment Response in Rheumatoid Arthritis
Elizabeth E. Brown, PhD	Professor	Pathology Chair Office (Medicine – Clinical Immunology & Rheumatology)	Core	B-cell mediated clinical phenotypes
Daniel Bullard, PhD	Professor	Genetics Chair Office (Cell, Developmental, & Integrative Biology)	Content	Roles of Adhesion Molecules in the Pathogenesis of SLE, Psoriasis, and Vasculitic Disorders

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Krista R. Casazza, PhD	Associate Professor	Pediatrics Chair Office	Mentors in Training	Optimization of Musculoskeletal System During Puberty
Yabing Chen, PhD	Professor	Pathology Chair Office	Core	Gene Regulation and Function in the Pathogenesis of Vasculopathy and Vascular Calcification
David Chaplin, MD, PhD	Professor	Microbiology (Medicine – Pulmonary, Allergy & Critical Care Medicine	Content; Executive Committee	Interplay Between Innate and Adaptive Immunity in Asthmatic Inflammation
W. Winn Chatham, MD	Professor	Medicine - Clinical Immunology & Rheumatology	Content	Clinical Trials of Investigational New Drugs in SLE
Yabing Chen, PhD	Professor	Pathology Chair Office	Core	Gene Regulation and Function in the Pathogenesis of Disease
Randy Q. Cron, MD, PhD	Professor	Pediatrics Chair Office ((Medicine – Clinical Immunology & Rheumatology)	Content	Macrophage activation Syndrome
Xiangqin Cui, PhD	Associate Professor	Biostatistics (Genetics)	Content	Statistical Genetics
Jeffrey R. Curtis, MD	Professor	Medicine - Clinical Immunology & Rheumatology (Epidemiology)	Core	Safety, Efficacy and Outcomes of RA Biologics
Gary Cutter, PhD	Professor	Biostatistics	Content	Bioinfomatics and Epidemiology of Disease
Maria Danila, MD	Assistant Professor	Medicine - Clinical Immunology & Rheumatology	Mentors in Training	Personalized Medicine/Outcomes in Rheumatoid Arthritis
Randall Davis, MD	Professor	Medicine – Hematology/Oncology (Biochemistry & Molecular Genetics) (Microbiology)	Core	Developmental Immunology of Lymphocytes and Immunoreceptor Biology
Alan W. Eberhardt, PhD	Professor	School of Engineering Dean's Office (Civil, Construction and Environ. Eng.) (Materials Science Eng.) (Mechanical Eng.)	Content	Biomechanics of Pelvic Injury and Joint Replacement-
Jeffrey C. Edberg, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Microbiology)	Content	Genetic Polymorphisms in Wegener’s Granulomatosis
Charles O. Elson, III, MD	Professor	Medicine - Gastroenterology & Hepatology (Medicine – Clinical Immunology & Rheumatology)	Core	Mucosal Immunity in Response to Microbiota

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Xu Feng, PhD	Professor	Pathology Chair Office	Core	The RANKL/RANK/OPG System in Health and Disease-
Candace Floyd, PhD	Associate Professor	Physical Medicine & Rehabilitation	Content	Neuronal-Glial Interactions in Traumatic Brain and Spinal Cord Injury
Kevin Fontaine, PhD	Professor	Health Behavior	Content	Outcomes of Dietary and Physical Activity Intervention
Mona Fouad, MD	Professor	Medicine – Preventive Medicine (Nursing Graduate Programs)	Content; IAC	Primary Cancer Prevention in Minorities
Angelo Gaffo, MD	Assistant Professor	Medicine - Clinical Immunology & Rheumatology	Content	Crystalline Arthritis and Systemic Vasculitis
James George, PhD	Professor	Surgery Chair Office – Cardiovascular/ Thoracic (Medicine – Cardiology) (Microbiology)	Content	Immune Regulation of Post-transplant Vascular Disease and Allograft Rejection
Shawn Gilbert, MD	Associate Professor	Surgery Chair Office – Orthopaedic (Cell, Developmental & Integrative Biology)	Content	Bone and Blood Vessel Development and Repair in the Skeleton
Paul Goepfert, MD	Professor	Medicine – Infectious Diseases (Microbiology)	Content	Determining the Mechanisms Allowing T cells to Control HIV Replication In Vivo
Orlando M. Gutierrez	Associate Professor	Medicine – Nephrology (Epidemiology)	Core	Mineral Metabolism and Outcomes
Laurie Harrington, PhD	Associate Professor	Cell, Developmental & Integrative Biology	Content	Effector CD4 T cell Subsets During Chronic Inflammatory Disorders
George Howard, PhD	Professor	Biostatistics (Medicine – Preventive Medicine)	Content	Development and Application of Statistical Methods in Epidemiological Studies and Clinical Trials
Hui-Chen Hsu,PhD	Associate Professor	Medicine - Clinical Immunology & Rheumatology	Core	Development of Autoantibodies and Autoimmunity in Mouse Models
Laura B. Hughes, MD	Associate Professor	Medicine - Clinical Immunology & Rheumatology	Content; IAC	Biomarkers of Treatment Response in RA; Musculoskeletal Ultrasound
Amjad Javed, PhD	Professor	Oral & Maxillofacial Surgery (Biomedical Engineering)	Core	Genetic and Molecular Signaling for Cellular Differentiation and Skeletogenesis
Ho-Wook Jun, PhD	Associate Professor	Biomedical Engineering	Core	Nanostructured Biomaterials, Stem Cells, Tissue Engineering

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
John F. Kearney, PhD	Professor	Microbiology (Medicine - Clinical Immunology & Rheumatology) (Pathology)	Core	Lymphocyte Development and B Cell Clonal Diversity
Robert P. Kimberly, MD	Professor	Medicine - Clinical Immunology & Rheumatology (Cell, Developmental & Integrative Biology) (Genetics) (Microbiology)	Content; IAC	Functional Significance of Genetic Variants in Autoimmune and Immune-Mediated Inflammatory Diseases
Bruce Korf, MD	Professor	Genetics Chair Office (Neurobiology) (Pediatrics)	Content	Genetics and Management of Neurofibromatosis Type 1
Elliot J. Lefkowitz, PhD	Professor	Microbiology (Computer Information Science) (Genetics)	Content	Microbial Genomics and Evolution; Bioinformatics, and Clinical Informatics
Beatriz León-Ruiz, PhD	Assistant Professor	Microbiology	Mentors in Training	In Vivo Regulation of T cell and B cell Responses in Rheumatoid Arthritis
Yi-Ping Li, PhD	Professor	Pathology Chair Office	Core; Associate Director	Osteoclast Function, Skeletal Development and Osteoporosis
Nianjun Liu, PhD	Associate Professor	Biostatistics	Content	Statistical Genetics
Robinna Lorenz, MD, PhD	Professor	Pathology Chair Office – Laboratory Medicine (Medical Education) (Microbiology)	Content; IAC	Mucosal and Systemic Immune Systems Response to Gastrointestinal Microbiota
Frances Lund, PhD	Professor	Microbiology (Medicine - Clinical Immunology & Rheumatology)	Core; IAC	Immune Responses to Pathogens, Autoantigens and Allergens
Peter Mannon, MD	Professor	Medicine – Gastroenterology & Hepatology (Microbiology)	Core	Endotypes of IBD
Amie McLain, MD	Professor	Physical Medicine & Rehabilitation	Content	
Sarah Morgan, MD	Professor	Medicine - Clinical Immunology & Rheumatology	Content	Nutrition and Arthritis, Nutritional Support, Osteoporosis and Bone Densitometry
John D. Mountz, MD, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Medicine – Gerontology, Geriatrics & Palliative Care)	Core; Executive Committee	Lymphocyte Development in Autoimmunity and Inflammation

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Paul Muntner, PhD	Professor	Epidemiology (Medicine – Epidemiology)	Content	
Joanne Murphy-Ullrich, PhD	Professor	Pathology Chair Office	Content	Extracellular Matrix Control of Cell and Growth Factor Function
Richard Myers, PhD	Adjunct Professor	Genetics Chair Office	Content	Human Genetics & Genomics in Inflammatory Disease
Dobrawa Napierala, PhD	Assistant Professor	Oral & Maxillofacial Surgery (Cell, Developmental & Integrative Biology)	Core	Molecular Mechanisms of Skeletal Development
Iris Navarro-Millán, MD	Asst Professor	Medicine - Clinical Immunology & Rheumatology	Mentors in Training	CV Outcomes Among Patients with RA
Jan Novak, PhD	Professor	Microbiology	Content	Pathogenesis and Treatment of Chronic and Autoimmune Diseases
Brent Ponce, MD	Associate Professor	Surgery Chair Office	Content	Biomechanics of the Shoulder
Selvarangan Ponnazhagan, PhD	Professor	Pathology Chair Office – Molecular & Cellular Pathology	Core	Adeno-Associated Virus Gene Therapy/Experimental Therapeutics of Breast and Prostate Cancers
Chander Raman, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Microbiology)	Core	Lymphocyte Differentiation, Activation, Immune Tolerance and Autoimmunity
Sasanka Ramanadham, PhD	Professor	Cell, Developmental & Integrative Biology	Content	Role of Lipid Mediators in Signal Transduction
Troy Randall, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Microbiology)	Core	Immune Responses to Pathogens, and Allergens, Immune Tolerance, Autoimmunity
David T. Redden, PhD	Professor	Biostatistics	Content	Statistical Methodologies
Richard Reynolds, PhD	Asst Professor	Medicine - Clinical Immunology & Rheumatology (Biostatistics)	Mentors in Training	Genetics of Inflammatory Diseases
Kenneth G. Saag, MD	Professor	Medicine - Clinical Immunology & Rheumatology (Epidemiology)	Core; Associate Director	Outcomes Research with Expertise in Pharmacoepidemiology and Quality of Life Research
Monika Safford, MD	Professor	Department of Medicine Chair Office (Medical Education)	Content	Eliminating Health Disparities in Cardiometabolic Disease Outcomes
Isabel Scarinci-Searles, PhD	Professor	Medicine – Preventive Medicine	Content	Cancer Disparities Associated with Socioeconomic Status and Race/Ethnicity

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Harry W. Schroeder, Jr., MD, PhD	Professor	Medicine - Clinical Immunology & Rheumatology (Genetics) (Microbiology)	Core; Executive Committee	Genetics of Immune Dysfunction (Immune Deficiency and Autoimmunity)
Lisa M. Schwiebert, PhD	Professor	Cell, Developmental & Integrative Biology (Cell Biology) (Medicine – Pulmonary, Allergy & Critical Care Medicine)	Content; IAC	Airway inflammation; Lung Function; Asthma and Exercise-
Rosa Serra, PhD	Professor	Cell, Developmental & Integrative Biology	Core	Mechanism of TGF-ß Action in Developmental and Disease Processes
Jasvinder Singh, MD	Professor	Medicine - Clinical Immunology & Rheumatology	Content	Treatment and Patient Outcomes in Gout and Other Rheumatic Diseases
David Standaert, MD, PhD	Professor	Neurology Chair Office (Cell, Developmental & Integrative Biology) (Neurobiology) (Pharmacology & Toxicology)	Content	Innate immunity and Parkinson's Disease
Claude Henry (Chad) Steele, PhD	Professor	Medicine – Pulmonary, Allergy & Critical Care Medicine (Microbiology) (Pathology)	Content	Immune Responses to Fungal Pathogens of the Lung
Matthew Stoll, MD	Associate Professor	Pediatrics Chair Office Pediatric Rheumatology ((Microbiology)	Content	Mucosal Immunity and Spondyloarthritis
Alexander J. Szalai, PhD	Professor	Medicine - Clinical Immunology & Rheumatology	Core	C-reactive protein in Inflammation and Autoimmunity
Victor Thannickal, MD	Professor	Medicine – Pulmonary, Allergy & Critical Care Medicine (Pathology)	Core	Mechanisms of Cellular Senescence, Oxidative Stress and Aging Associated with Chronic Lung Disease
Steven M. Theiss , MD	Professor	Surgery Chair Office - Orthopaedic	Content	Outcomes and Treatment of Spine Trauma and Deformity-
Hemant Tiwari, PhD	Professor	Biostatistics	Content	Genetic Linkage Analysis in Autoimmunity and Inflammation
Trygve Tollefsbol, PhD	Professor	Biology (Vision Sciences)	Content	Role of Epigenetics in Cancer, Aging and Nutrition
Tim Townes, PhD	Professor	Biochemistry & Molecular Genetics (Genetics) (Medicine – Hematology/Oncology)	Content	Developmental Regulation of Gene Expression
Hubert Tse, PhD	Assistant Professor	Microbiology	Content	The Role of Oxidative Stress on Autoimmune Type 1 Diabetes

Name/Degree(s)	Rank	Primary (& Secondary) Appointment(s)	Role in Program	Research Interest
Peter D. Waite, DDS	Professor	Oral & Maxillofacial Surgery (Surgery)	Content	Musculoskeletal Neurologic Function of the Jaw
Mark Walter, PhD	Professor	Microbiology (Biochemistry & Molecular Genetics) (Cell, Developmental & Integrative Biology)	Content	Structure, Biochemistry, and Function of Cytokines involved in Viral pathogenesis and Autoimmunity-
Lizhong Wang, PhD	Asst Professor	Genetics Research Div	Mentors in Training	Genetics and Epigenetics of Cancer
Amy Warriner, MD	Associate Professor	Medicine - Endocrinology, Diabetes & Metabolism	Content	Treatment and Outcomes in Osteoporosis
Casey Weaver, MD	Professor	Anatomic Pathology (Medicine – Clinical Immunology & Rheumatology) (Microbiology)	Core	Immune Regulation by CD4 T cells
Amy Weinmann, PhD	Associate Professor	Microbiology	Mentors in Training	Regulation of Immune Cell Fate
Timothy Wick, PhD	Professor	Biomedical Engineering	Content	Orthopaedic and Cardiovascular Tissue Engineering and Regenerative Medicine
Yang Yang PhD	Associate Professor	Molecular & Cellular Pathology	Content	Translational Research in Multiple Myoloma
Jarred Younger, PhD	Associate Professor	Psychology (Anesthesiology) (Medicine – Clinical Immunology & Rheumatology)	Core	Immune Contributions in Chronic Pain and Fatigue
Nabiha Yusuf, PhD	Assistant Professor	Dermatology	Mentors in Training	Mechanisms Involved in Regulation of Cytokine Genes in Psoriasis
Majd Zayzafoon, MD, PhD	Associate Professor	Molecular & Cellular Pathology (Cell, Developmental & Integrative Biology)	Content; Executive Committee	Tumor-stroma Interaction and Regulation of Tumor Microenvironment
Ping Zhang, PhD	Research Asst Professor	Pediatric Dentistry	Mentors in Training	Mechanisms of Periodontal Bone Loss

Table 2 Instructions: List each training faculty member with his/her degree(s), academic rank, primary departmental affiliation and secondary appointments, role in the proposed training grant program, and research interests that are relevant to the proposed program.

Summarize these data in the Background Section 2.2 of the Research Training Program Plan. Use the narrative to comment on the distribution of mentors by academic rank and department, to discuss areas of research emphasis, and the rationale for the selection of participating faculty.

Rationale: This information allows reviewers to assess the distribution of junior versus senior faculty and clinical versus basic scientists participating in the training program, as well as their distribution by department. The data concisely summarize the scientific areas of the training faculty.

Table 3. Institutional Training Grant Support Available to Participating Faculty Members, Department(s), or Program(s)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Active								
Interdisciplinary Training in Kidney Related Research	NIH/NIDDDK T32DK007545-27 (Active)	04/01/14 – 03/31/19	Anupam Agarwal, MD (Medicine, School of Medicine)	0	3	0	35 (8)	Bullard, Daniel Chen, Yabing George, James Gutierrez, Orlando Muntner, Paul Murphy-Ullrich, Joanne Novak, Jan Szalai, Alex
UAB Obesity Training Program	NIH/NIDDK T32DK062710-11 (Active)	07/01/14 – 06/30/19	David Allison, PhD (Dean's Office, School of Public Health)	0	4	6	18 (3)	Allison, David Arnett, Donna Bamman, Marcas
UAB Pre-Doctoral Training Program in Obesity-Related Research	NIH/NHBLI T32HL105349-05 (Active)	09/22/10-08/31/15	David Allison PhD (Dean's Office, School of Public Health)	8	0	0	16 (2)	Allison, David, Fontaine, Kevin
Interdisciplinary Training in Pathobiology and Rehabilitation Medicine	NIH/NICHD T32HD071866-04 (Active)	09/04/12 – 04/30/17	Marcas Bamman, PhD (Cell, Developmental & Integrative Biology, Joint Health Sciences)	2	3	0	27 (7)	Bamman, Marcas Floyd, Candace McLain, Amie Ramanadham, Sasanka Schwiebert, Lisa Standaert, David Zayzafoon, Majd

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Training Program in Cardiovascular Pathophysiology	NIH/NHLBI T32HL007918-16 (Active)	07/01/14-08/31/18	Victor Darley-Usmar, PhD (Pathology, Joint Health Sciences)	6	0	0	28 (6)	Allison, David Bellis, Susan Bullard, Daniel Chen, Yabing Murphy-Ullrich, Joanne Tiwari, Hemant
Research Training Program in Basic and Translational Oncology	NIH/NCI T32CA1A183926-01 (Active)	04/01/14 – 03/31/19	Pran Datta, PhD (Medicine, School of Medicine)	0	2	0	39 (8)	Brown, Elizabeth Davis, Randall Fouad, Mona Lund, Frances Myers, Richard Ponnazhagan, Selvarangan Weaver, Casey Yang, Yang
Medical Scientist Training Program	NIH/NIGMS T32GM008361-23 (Active)	07/07/10-06/30/15	Robinna G. Lorenz, MD/PhD (Pathology, Joint Health Sciences)	14	0	0	237 (47)	Allison, David Arnett, Donna Atkinson, T. Prescott Bamman, Marcas. Bellis, Susan Bridges,S Louis Brown, Elizabeth Bullard, Daniel Cron, Randy Davis, Randall Dobrawa, Napierala

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
								Eberhardt, Alan Edberg, Jeffrey Elson, Charles Feng, Xu Floyd Candace George, James Goepfert ,Paul Howard, George Hsu, Hui-Chen Javed, Amjad Jun, Ho-Wook Kearney, John Kimberly, Robert Lefkowitz, Elliot Li, Yi-Ping Lorenz, Robinna Lund, Francis Mountz, John Murphy-Ullrich, Joanne Ponnazhagan, Selvarangan Raman, Chander Ramanadham, Sasanka Schroeder, Harry W Schwiebert, Lisa Standaert, David Steele, Chad Thannickal, Victor

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
								Townes, Tim Tse, Hubert Walter, Mark Wang, Lizhong Weaver, Casey Wick, Timothy Yang, Yang Yusuf, Nabiha Zayzafoon, Majd
Dental Academic Student Training Program	NIH/NIDCR T90DE022736-03 (Active)	07/01/12 - 06/30/17	MacDougall, Mary, PhD (Oral & Maxillofacial Surgery, School of Dentistry)	5	5	0	47 (16)	Bellis, Susan Chaplin, David Chen, Yabing Feng, Xu Fouad, Mona Gilbert, Shawn Javed, Amjad Jun, Ho-Wook Kimberly, Robert Korf, Bruce Murphy-Ullrich, Joanne Napierala, Dobrawa Ponnazhagan, Selvarangan Waite, Peter Zayzafoon, Majd Zhang, Ping
Basic Mechanisms in AIDS Pathogenesis	NIH/NIAID T32AI007493-20 (Active)	07/01/10 – 08/31/15	Casey Morrow, PhD (Cell, Developmental	4	3	0	22 (3)	Cron, Randy Goepfert, Paul Steele, Chad

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
			& Integrative Biology, Joint Health Sciences)					
Mechanisms of Hypertension and Cardiovascular Diseases	NIH/NHBLI T32HL007457-34 (Active)	07/01/11 - 06/30/16	Suzanne Oparil, MD (Medicine, School of Medicine)	0	6	0	36 (8)	Allison, David Arnett, Donna Bellis, Susan Chen, Yabing Muntner, Paul Murphy-Ullrich, Joanne Szalai, Alexander Townes, Tim
UAB Health Services and Outcomes Research Training Program	NIH/AHQR T32HS013852-12 (Active)	07/01/13 – 06/30/18	Kenneth Saag, MD (Medicine, School of Medicine)	4	5	0	32 (7)	Curtis, Jeffrey Fouad, Mona Howard, George Muntner, Paul Safford, Monika Saag, Kenneth Scarinci, Isabel
Immunologic Diseases and Basic Immunology	NIH/NIAID T32 AI007051-37 (Active)	06/05/13 – 05/31/18	Harry Schroeder, MD, PhD (Medicine, School of Medicine)	7	3	0	57 (28)	Atkinson, T. Prescott Bridges, S Louis Brown, Elizabeth Bullard, Daniel Chaplin, David Cron, Randall Davis, Randall Elson, Charles George, James

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
								Goepfert, Paul Hsu, Hui-Chen Hughes, Laura Kearney, John Kimberly, Robert Lefkowitz, Elliott Li, Yi-Ping Lorenz, Robinna Lund, Frances Mannon, Peter Mountz, John Raman, Chander Randall, Troy Schroeder, Harry Schwiebert, Lisa Steele, Chad Tse, Hubert Weaver, Casey Weinmann, Amy
UAB Infectious Diseases Training Grant	NIH/NIAID T32AI052069-11 (Active)	07/01/14 – 06/30/19	Jane Schwebke, MD (Medicine, School of Medicine)	0	2	0	29 (2)	Goepfert Paul Steele Chad
Training Program in the Neurobiology of Cognition and Cognitive Disorders	NIH/NINDS T32NS061788-07 (Active)	07/01/13 - 06/30/18	David Sweatt, PhD (Neurobiology, Joint Health Sciences)	6	0	0	46 (3)	Floyd, Candace Korf, Bruce Standaert, David

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Training Program in Lung Biology and Translational Medicine	NIH/NHLBI T32HL105346-05 (Active)	09/20/10 – 08/31/15	Victor Thannickal, MD, (Pulmonary, Allergy, & Critical Care Medicine, School of Medicine)	0	5	0	27 (7)	Allison, David Fouad, Mona Murphy-Ullrich, Joanne Schwiebert, Lisa Steele, Chad Tiwari, Hemant Thannickal, V
UAB Statistical Genetics Post-Doctoral Training Program	NIH/NHLBI T32HL072757-12 (Active)	07/12/13 – 07/11/18	Hemant Tiwari, PhD (Biostatistics, School of Public Health)	0	6	0	32 (9)	Allison, David Arnett, Donna Cui, Xiangqin Howard George Liu, Nianjun Redden, David Safford, Monika Thannickal, Victor Tiwari, Hemant
UAB Biostatistics Pre-doctoral Training Program	NIH/NHLBI T32HL079888-10 (Active)	09/01/10 – 08/31/15	Hemant Tiwari, PhD (Biostatistics, School of Public Health)	8	0	0	31 (9)	Allison, David Arnett, Donna Cui, Xiangqin Cutter, Gary Howard, George Liu, Nianjun Redden, David Safford, Monika Tiwari, Hemant
UAB Predoctoral Training in Cell and Molecular Biology	NIH/NIGMS T32GM008111-27 (Active)	07/01/13-06/30/18	Bradley Yoder, PhD (Cell, Developmental & Integrative Biology, Joint	8	0	0	63 (6)	Bamman, Marcas Bellis, Susan Chen, Yabing Javed, Amjad

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
			Health Sciences)					Li, Yi-Ping Murphy-Ullrich, Joanne
Other training								
Short Term Training in Health Professional Schools	NIH/NHLBI T35HL007473-33 (Active)	07/17/13 - 04/30/18	Robin Lorenz, MD/PhD, (Pathology, Joint Health Sciences)	0	0	30	107 (16)	Arnett, Donna Bamman, Marcas Bridges, S Louis Chen, Yabing George, James Gilbert, Shawn Goepfert, Paul Lorenz, Robinna Novak, Jan Ponce, Brent Safford, Monika Standaert, David Steele, Chad Thannickal, Victor Townes, Tim Weaver, Casey
Preparation for Graduate and Medical Education (PreGAME) Program	NIH/NHLBI R25HL120883-01 (Active)	04/01/14 – 03/31/19	Robin Lorenz, MD/PhD, (Pathology, Joint Health Sciences)	0	0	5	34 (6)	Arnett, Donna Chen, Yabing Lorenz, Robinna Safford, Monika Steele, Chad Thannickal, Victor
UAB Neuroscience Roadmap Scholars	NIH/NINDS R25RNS089463	10/1/14 – 10/1/19	Lori McMahon,	0	0	0	22 (1)	Standaert David

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Program	A -01		PhD (CDIB, Joint Health Sciences)					
Cancer Prevention and Control Training Program	NIH/NCI R25CA047888-26 (Active)	09/11/12 - 06/30/17	Karen Meneses, PhD (School of Nursing)	4	3	0	56 (5)	Allison, David. Brown, Elizabeth Fouad, Mona Scarinci, Isabel Tollefsbol, Trygve
UAB K12 in Patient Centered Outcomes Research	AHQR K12HS023009-01 (Active)	01/04/14 – 31/03/19	Kenneth Saag, MD (Medicine, School of Medicine)	0	3	0	35 (7)	Curtis, Jeffrey Fouad, Mona Howard, George Muntner, Paul Saag, Kenneth Safford, Monika Scarinci, Isabel
Mentored Experiences in Research Instruction and Teaching (MERIT) Program	NIH/NIGMS K12GM088010-06 (Active)	09/01/14 - 06/30/19	Lisa, Schwiebert, PhD (Cell, Developmental & Integrative Biology, Joint Health Sciences)	0	6	0	9 (1)	Schwiebert, Lisa
UAB Research and Education Program in Neurology, Neurosurgery, and Neuropathology	NIH/NINDS R25 NS079188-03 (Active)	04/1/12 – 03/31/17	David Standaert, MD, PhD (Neurology, School of Medicine)	0	1	0	19 (3)	Howard, George Korf, Bruce Standaert, David

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Pending								
UAB Pre-Doctoral Training in Obesity Related Research	NIH/NHLBI T32HL105349 (Pending, to be funded)	08/01/15 – 07/31/20	David B. Allison, PhD (Nutrition Obesity Research Center, & SOPH Dean's Office)	8	0	0	16 (2)	Allison, David Fontaine, Kevin
Postdoctoral Training at the Interface of Energetics, Aging, and Body Composition	NIH/NIA T32AG049678 (Pending)	07/01/15– 06/30/20	David B. Allison, PhD (School of Public Health Dean's Office) and Steven Austad, PhD (Biology, College of Arts and Sciences)	0	6	0	11 (3)	Allison, David Bamman, Marcas Tollefsbol, Trygve
UAB/SRI HIV Translational Research Program	1T32AI120873-01 (Pending)	07/01/15-06/30/20	Olaf Kutsch, (Medicine-Infectious Diseases)	4	4	0	45 (10)	Ballesteros-Tato, Andre Cron, Randy Goepfert, Paul Leon-Ruiz, Beatriz Lund, Frances Mountz, John Novak, Jan Raman, Chander Randall, Troy Tse, Hubert

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Medical Scientist Training Program	NIH/NIGMS T32GM008361-24 (Pending, to be funded)	07/1/15 – 06/30/20	Robinna G. Lorenz, MD/PhD (Pathology, Joint Health Sciences)	15	0	0	102 (23)	Bamman, Marcas Bellis, Susan Bridges, S Louis Davis, Randall Elson, Charles George, James Goepfert, Paul Jun, Ho-Wook Kearney, John Kimberly, Robert Lorenz, Robinna Lund, Frances Mountz, John Murphy-Ullrich, Joanne Myers, Richard Ponnazhagan, Selvarangan Raman, Chander Schroeder, Harry W Standaert, David Thannickal, Victor Townes, Tim Weaver, Casey Wick, Timothy
Mechanisms of Hypertension and Cardiovascular	NIH/NHBLI T32HL007457-34 (Pending)	07/01/16 – 06/30/21	Suzanne Oparil, MD (Medicine, School of	0	6	0	35 (9)	Allison, David Arnett, Donna Bellis, Susan

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Diseases			Medicine)					Chen, Yabing Howard George Muntner, Paul Safford Monika Szalai, Alexander Townes, Tim
Translational and Molecular Science Training Program	NIH/NIGMS T32GM109780-01 (Pending, to be funded)	07/01/15-06/30/20	Rakesh Patel, PhD (Pathology, Joint Health Sciences)	3	0	0	42 (13)	Allison, David Bamman, Marcas Bellis, Susan Feng, Xu Floyd, Candace Kimberly, Robert Lorenz, Robinna Ponnazhagan, Selvarangan Steele, Chad Thannickal, Victor Townes, Tim Tse, Hubert Zayzafoon, Majd
Basic and Translational Science in Heart Failure	NIH/NHLBI T32HL129948-01 (Pending)	07/01/16 – 06/30/21	Sumanth Prabhu, MD (Medicine, School of Medicine)	0	6	0	40 (9)	Allison, David Arnett, Donna Bamman, Marcus Chen, Yabing George, James Howard, George Muntner, Paul Safford, Monika Townes, Tim

Title of Training Grant	Funding Source Including Identifying Number	Active or Pending Project Period	Program Director (Department)	Predoctoral Trainees Supported This Year	Postdoctoral Trainees Supported This Year	Short-Term Trainees Supported This Year	Total No. of Participating Faculty (Number Overlapping)	Names of Overlapping Faculty
Training Program in Lung Biology and Translational Medicine	NIH/NHLBI T32HL105346-06 (Pending, to be funded)	9/01/15-8/31/20	Victor Thannickal, MD (Pulmonary, Allergy, & Critical Care Medicine, School of Medicine)	0	5	0	31 (10)	Allison, David Fouad, Mona Lund, Frances Murphy-Ullrich, Joanne Randall, Troy Schroeder, Harry W. Schwiebert, Lisa Steele, Chad Thannickal, Victor Tiwari, Hemant
UAB Biostatistics Pre-Doctoral Training Program	NIH/NHLBI T32HL079888-11 (Pending)	9/01/15-8/31/20	Hemant Tiwari, PhD (Biostatistics, School of Public Health)	6	0	0	45 (10)	Allison, David Arnett, Donna Cui, Xiangqin Cutter, Gary Howard, George Liu, Nianjun Redden, David Safford, Monika Thannickal, Victor Tiwari, Hemant
Totals	N/A	N/A	N/A	116	89	41	N/A	N/A

Table 4. Grant and Contract Support of the Participating Faculty Members (Alphabetically by Faculty Member)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
ABSHER, Devin	Co-Director, Analytical Genomics and Transgenics Core; Rheumatic Diseases Research Core Centers	NIH/NIAMS; P30 AR048311 (Mountz, PD/PI; Kesterson, Core Director); Active	09/01/01 - 08/31/17	$90,846
ABSHER, Devin	Subaward PI; Genome-Wide Association Study in African-Americans With Rheumatoid Arthritis	NIH/NIAMS; R01 AR057202 (Bridges); Active	09/25/09 - 07/31/15 NCE	
ABSHER, Devin	PI; Integrative genomics and risk of CHD and related phenotypes in the WHI	NIH; HHSN268201300006C; Active	05/01/13 – 04/30/16	
ABSHER, Devin	Subaward PI; A genome-wide methylation study of epigenetic contributions to multiple myeloma	NIH/NCI; R21 CA155951 (Brown); Active	04/01/11 – 06/30/15	$73,975
ABSHER, Devin	Subaward PI; Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate	NIH/NHLBI; R01 HL104135 (Arnett); Active	08/15/10-05/31/15 NCE	
ALLISON, David B	PD/PI & Core Leader, Administrative Core; UAB Nutrition Obesity Research Center	NIH/NIDDK; P30 DK056336; Active	07/01/07 - 05/31/17	$159,876
ALLISON, David B	PD/PI & Core Leader, Administrative Core; UAB Nutrition Obesity Research Center Administrative Supplement	NIH/NIDDK; P30 DK056336-13S1; Active	07/01/07 - 05/31/17	$66,088
ALLISON, David B	PD/PI & Core Leader, NORC Enrichment Program; UAB Nutrition Obesity Research Center Administrative Supplement	NIH/NIDDK; P30 DK056336; Active	07/01/07 - 05/31/17	$76,299
ALLISON, David B	PI; Body Composition, Energetics, and Longevity	NIH/NIA; R01 AG033682; Active	3/15/10 – 2/29/16 NCE	
ALLISON, David B	PI; Energetics, Disparities, & Lifespan A unified hypothesis	NIH/NIA; R01 AG043972; Active	09/15/12 - 5/31/17	$62,697
ALLISON, David B	PI; Energetics, Disparities, & Lifespan A unified hypothesis - Administrative Supplement	NIH/NIA; R01 AG043972-03S1; Active	09/15/12 - 5/31/17	$1,349,343
ALLISON, David B	PI; Energetics, Disparities, & Lifespan A unified hypothesis – Administrative Supplement	NIH/NIA; R01 AG043972-03S2; Active	09/15/12 - 5/31/17	$68,027
ALLISON, David B	PI; The Mathematical Sciences in Obesity Research	NIH/NIDDK; R25 DK099080; Active	07/01//13 – 6/30/18	$101,366
ALLISON, David B	PI; Strengthening Causal Inference in Behavioral Obesity Research	NIH/NHLBI; R25 HL124208; Active	08/15/14 - 06/30/18	$189,552

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
ALLISON, David B	Co-Investigator; A photographic method for human body composition assessment	NIH/NHLBI R01 HL107916 (Affuso); Active	06/01/12 – 04/30/17	$344,474
ALLISON, David B	Co-Investigator; Factors Affecting Prediction Accuracy of Complex Human Traits and Diseases	NIH/NIGMS; R01 GM099992 (de los Campos); Active	09/01/12 - 06/30/16	$155,855
ALLISON, David B	Collaborator; UAB Metabolomics Workshop: From Design to Decision	NIH/NIGMS; R25 GM103798 (Barnes); Active	09/18/12 - 08/31/17	$99,993
ALLISON, David B	Collaborator; Physical Activity to Reduce Cancer Risk and Related Health Disparities	American Cancer Society; MRSG-13-156-01 – CPPB (Pekmezi); Active	07/01/13 - 06/30/18	$135,000
ALLISON, David B	Co-Investigator; The role of Protein in regulating ad libitum energy intake in humans	Egg Nutrition Research Center; (Dhurandhar); Active	12/01/14 – 11/30/16	$62,947
ALLISON, David B	PI; Beyond textbook, yet simple, statistical tools for reproducible animal research	NIH/NIGMS; R25 GM116167; Pending*	07/01/15 – 06/30/17	$138,889 TDC
ALLISON, David B	PI; Role of Expectations in Weight Loss Outcomes	NIH/NIDDK; R01 DK107476 (Fontaine); Pending*	07/01/15 – 06/30/20	$2,201,035 TDC
ALLISON, David B	Core Leader, Comparative Data Analytics Core; Comparative Energetics and Aging	NIH/NIA; P30 AG050886 (Austad, PD/PI);Pending*	07/01/15 – 06/30/20	$3,000,000 TDC
ALLISON, David B	Primary Mentor; Research Reporting Fidelity within Dietary Weight Loss Supplement Scientific Literature	NIH/NIDDK; F32 DK107157 (Kroeger); Pending *	07/01/15 – 06/30/18	$210,186 TDC
ALLISON, David B	PI; RefMAN	Christian-Albrechts-Universitat Zu Kiel (Kiel University); Pending*	04/01/16 - 03/31/18	$120,000 TDC
ALLISON, David B	PI; The In Silico Reverse Engineering of Human Nutrient-Energy Physiology using the "Body-as-Ecosystem" Framework and Agent-Based Modeling	W. M. Keck Foundation; Pending*	06/02/15 - 06/01/17	$83,250 TDC
ALLISON, David B	Primary Mentor; Influence of Ambient Temperature on food Intake in a Sedentary US Population	NIH/NIDDK; F31 DK105710 (Richardson); Pending*	04/01/16 - 03/31/18	$89,056 TDC
ALLISON, David B	Co-Investigator; A Telescopic Algorithm for Two-Dimensional Hidden Markov Models with Application to Genetic Studies	National Science Foundation; (Lou, X-Y); Pending*	07/01/15 - 06/30/20	$1,359,541 TDC
ALLISON, David B	Co-Investigator, Administration and Program Enhancement Core; Comparative Energetics and Aging	NIH/NIA; P30 AG050886 (Austad, PD/PI);Pending*	07/01/15 – 06/30/20	$3,000,000 TDC
ALLISON, David B	Co-Investigator; Examination of Perceived Social Status as a Contributor to Obesity	NIH/NIDDK; R01 DK102742 (Dhurandhar,);Pending*	07/01/15 – 06/30/19	$1,084,698 TDC

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
ALLISON, David B	Co-Investigator; Epigenome modification by a dietary pattern rich in polyunsaturated fatty acids	University of Alaska Fairbanks/ NIH/NIDDK; R01 DK104347 (Tiwari);Pending*	12/01/15 - 11/30/19	$452,037 TDC
ARNETT, Donna	PI; VEF Fellowship Support and Professional Development	Vietnam Education Foundation; Active	07/20/14 – 07/19/16	$28,500
ARNETT, Donna	PI; Assessing Disparities in Childhood Obesity Interventions Across Latino Subgroups in the US	Johnson (Robert Wood) Foundation; Active	09/01/14 - 08/31/16	$43,800
ARNETT, Donna	PI; HyperGEN: Genetics of Left Ventricular Hypertrophy	NIH/NHLBI; R01 HL055673; Active	08/10/96 - 04/30/17	$1,385,205
ARNETT, Donna	PI; Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate	NIH/NHLBI; R01 HL104135; Active	08/15/10 - 05/31/15 NCE	
ARNETT, Donna	PI; Epigenetic Determinants of Left Ventricular and Function in Hypertensive African Americans	American Heart Association; 15GPSPG23890000; Active	02/01/15 - 01/31/17	$227,273
ARNETT, Donna	PI; Genomewide Association Study of Lipid Response to Fenofibrate and Dietary Fat	NIH/NHLBI; R01 HL091357; Active	04/01/15 - 02/28/19	$699,303
ARNETT, Donna	Subaward PI; Prospective Meta-analyses of Drug-Gene Interactions: CHARGE GWAS Consortium	University of Washington/NIH/NHLBI; R01 HL103612 (Psaty); Active	08/10/11 - 05/31/15	$55,885
ARNETT, Donna	Subaward PI; Training Interventions and Genetics of Exercise Response (TIGER)	University of Texas at Austin/NIH; R01 DK062148 (Bray); Active	08/01/13 – 05/31/15	$157,551
ARNETT, Donna	Training in Primary Care Medicine Interdisciplinary and Interprofessional Graduate Joint Degree Program	HHS/HRSA; T85 HP24469 (Harrington); Active	08/01/14 – 07/31/15	$313,743
ARNETT, Donna	Co-Investigator; Functional GWAS for LVH using iPS-derived Cardiomycytes: The Hypergen-CiPS Study	Medical College of Wisconsin/NIH; U01 HL107437 (Broeckel, PD/PI; Lewis, Subaward PI); Active	07/05/11 – 06/30/16	$1,462,159
ARNETT, Donna	Subaward PI; Genome Studies to Mitigate Disparities in Personalized Medicine	Vanderbilt University Medical Center/NIH; Pending*	11/01/15 - 10/31/19	$1,024,435 TDC
ARNETT, Donna	Subaward PI; Determinants, Trajectories, and Consequences of Abnormal Cardiac Mechanics	Northwestern University/NIH; Pending*	09/01/15 - 08/31/19	$38,171 TDC
ARNETT, Donna	Primary Mentor; Local Ancestry and Atherosclerosis in Admixed African Americans	American Heart Association; 5PRE24480116; Pending*	07/01/15 - 06/30/16	$26,000 TDC
ARNETT, Donna	Co-Investigator; The Role of Metabolic Syndrome and DNA Methylation in Aggressive Breast Cancer	DoD; (Akinyemiju); Pending*	10/01/15 - 09/30/18	$375,000 TDC

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
ARNETT, Donna	Co-Investigator; Integrating Multi-Layer Omics for Disease-Risk Assessment	Michigan State University/NIH; (Shrestha, Site PI); Pending*	09/01/15 – 08/31/19	$190,266 TDC
ARNETT, Donna	Co-Investigator; Training Physician Assistant Students and Clinical Educators in Public Health for Delivery of Quality Primary Care in Rural and Underserved Areas	Health Resources and Services Administration; (Baddley); Pending*	07/01/15 - 06/30/20	$1,595,899 TDC
ARNETT, Donna	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
ARNETT, Donna	Co-Investigator; Analysis of Whole Genome Sequence Data for CKD and Renal Traits in African Americans	University of North Carolina/NIH; (Irvin); Pending*	07/01/15 – 06/30/20	$1,106,511TDC
ASLIBEKYAN, Stella	PI; Genetic and Epigenetic Determinants of Trimethylamine-N-Oxide	American Heart Association; 14CRP18060003; Active	01/01/14 - 12/31/15	$65,000
ASLIBEKYAN, Stella	Co-Investigator; HyperGEN: Genetics of Left Ventricular Hypertrophy	NIH/NHLBI; R01 HL055673 (Arnett); Active	06/01/13 - 04/30/17	$1,385,205
ASLIBEKYAN, Stella	Co-Investigator; UAB Multidisciplinary Clinical Research Center Methodology Core	NIH/NIAMS; P60 AR064172 (Bridges); Active	09/16/13 - 07/13/15	$156,212
ASLIBEKYAN, Stella	Co-Investigator; Genomewide Association: Triglyceride Response to Fenofibrate and Dietary Fat	NIH/NHLBI; R01 HL091357 (Arnett); Active	04/01/15 - 02/28/19	$699,304
ASLIBEKYAN, Stella	Co-Investigator; Metabolomic Markers of Dietary Patterns in the Costa Rica Study	University of Michigan/ NIH; Pending*	07/01/15 – 06/30/16	$11,400
BALLESTEROS-TATO, Andre	PI; Regulation of T cell dependent B cell responses to influenza	NIH/NIAID; R01 AI110480; Active	01/21/15 – 12/31/19	$250,000
BALLESTEROS-TATO, Andre	Co-Investigator, Project 1: Control of Anti-Viral Tfh Responses Via IL-2 Signaling and Availability; Virus-induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962 (Randall, PD/PI; Randall, Project Leader); Active	08/01/14 - 07/31/19	$233,989
BALLESTEROS-TATO, Andre	Co-Investigator; Molecular characterization of the role for T-bet and Bcl-6 in immune cell metabolism and differentiation	NIH/NIAID; R01 AI061061 (Weinmann); Pending*	07/01/15 – 06/30/20	$1,250,000 TDC

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BAMMAN, Marcas M	Co-PI; Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement	NIH/ NICHD; R01 HD084124 (Bamman & Bridges, MPI); Active	04/15/15 – 02/28/20	$371,179
BAMMAN, Marcas M	Co-PI; Novel Actions of Metformin to Augment Resistance Training Adaptations in Older Adults	University of Kentucky/NIH/ NICHD; R01 AG046920 (Peterson, Bamman, & Kern, MPIs); Active	09/30/14 - 05/31/19	$217,918
BAMMAN, Marcas M	Primary Mentor; Using in vitro Approaches to Improve Muscle Regrowth in Atrophied Older Humans	NIH/NIA; F31 AG044109 (Stec); Active	09/12/12 – 09/11/15	$42,676
BAMMAN, Marcas M	Co-Investigator; Exercise Intensity, Metabolic Rate, and Insulin Sensitivity	NIH/NIDDK; R01 DK049779 (Hunter); Active	09/30/10 - 07/31/15 NCE	
BAMMAN, Marcas M	Co-Investigator; Race - Adiposity Interactions Regulate Mechanisms Determining Insulin Sensitivity	NIH/NIDDK; R01 DK096388 (Gower); Active	09/19/13 - 06/30/18	$371,196
BAMMAN, Marcas M	PD/PI; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851; Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
BAMMAN, Marcas M	PI; Myofiber Type Grouping in Neurogenic Muscle Atrophy: Challenging the Dogma	NIH; R21; Pending*	07/01/15 - 06/30/17	$275,000 TDC
BELLIS, Susan L	PI; Role of receptor sialylation in the ovarian tumor cell phenotype	NIH/NIGMS; R01 GM111093; Active	05/15/14-03/31/17	$190,000
BELLIS, Susan L	PI; Coupling osteoinductive factors to graft materials to promote osteoregeneration	NIH/NIDCR; R01 DE024670; Active	08/01/14 - 07/31/19	$250,000
BELLIS, Susan L	PI; Glycan control of stem cell-associated pathways in pancreatic cancer	NIH/NCI; R21 CA192629; Active	01/01/15 - 12/31/16	$130,500
BELLIS, Susan L	PI; Glycosylation-dependent control of TNFR1 signaling in macrophage survival	American Heart Association; 14GRNT20380114; Active	07/01/14 - 06/30/16	$75,000
BELLIS, Susan L	Co-Investigator; TGF-β in the pathology and development of the spine	NIH/NIAMS; R01 AR053860 (Serra); Active	07/01/06 – 03/31/18	$212,500
BELLIS, Susan L	Co-Investigator; Targeted Delivery of Osteoinductive Molecules To Calcium Phosphate Dental Implant Surfaces	Biomet, Inc; (Abou-Arraj); Active	03/17/14 - 11/30/15	
BELLIS, Susan L	Co-Investigator; Effects of ITGAM Genetic Variation on Mac-1 Medicated Inflammatory Responses	NIH/NIAMS; R01 AR068315 (Szalai); Pending*	07/01/15 – 06/30/20	$1,250.000 TDC

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BEUKELMAN, Timothy G	Scientific Director, The Childhood Arthritis and Rheumatology Research Alliance (CARRA) Registry	Childhood Arthritis and Rheumatology Research Alliance; Research Agreement; Active	09/26/14 – 09/25/17	$18,499
BEUKELMAN, Timothy G	PI; The Effectiveness of Methotrexate to Prevent Extension of Early Limited JIA	NIH/NIAMS; U34 AR064496; Active	09/01/14 – 08/31/15	$276,235
BEUKELMAN, Timothy G	Subaward PI; Childhood Arthritis and Research Alliance Network (CARRANet): Juvenile Dermatomyositis Consensus Treatment Plan	Duke Clinical Research Institute/Friends of CARRA; Active	03/21/13 - 06/30/15	$900
BEUKELMAN, Timothy G	Subaward PI; Patients, Advocates, and Rheumatology Teams Network for Research and Service (PARTNERS) Consortium	Duke Clinical Research Institute/PCORI; (Schanberg); Active	03/14/14 – 09/13/15	$8,313
BEUKELMAN, Timothy G	PI, Project 4: Assessing Comparative Effectiveness of Biologics and Communicating Risk in Juvenile and Adult Inflammatory Arthritis; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (Saag, PD/PI); Active	09/01/11 – 08/31/16	$96,973
BEUKELMAN, Timothy G	Subaward PI; Childhood Arthritis and Rheumatology Research Alliance ("CARRA Registry")	Duke University/Arthritis Foundation; Active	09/01/12 – 08/31/15	$8,000
BEUKELMAN, Timothy G	Co-Investigator; PARTNERS Phase II	Duke Clinical Research Center/PCORI; Pending	10/01/15 09/30/18	
BRADLEY, Laurence A	Subaward PI; Ethnic Differences in Responses to Painful Stimuli	University of Florida/NIH/NIA; R37 AG033906 (Fillingim); Active	09/01/14 - 04/30/19	$373,366
BRADLEY, Laurence A	Subaward PI, Metabolomics Center Supplement; Ethnic Differences in Responses to Painful Stimuli	University of Florida/NIH/NIA; R37 AG033906-S1 (Fillingim); Pending*	05/01/15 - 04/30/19	$100,000 TDC
BRADLEY, Laurence A	Co-Investigator; Objective Sleep and Pain Modulation in non-Hispanic White and Black Individuals with Knee Osteoarthritis	Arthritis National Research Foundation; (No Number Provided); Pending*	06/01/15 - 05/31/16	$100,000 TDC
BRADLEY, Laurence A	Subaward PI; Association of Objective Sleep on Pain Sensitivity and Inhibition in Knee Osteoarthritis	Arizona State University/NIH; R03 (Petrov); Pending*	04/01/15 – 03/31/17	$9,357 TDC
BRIDGES, Jr., S. Louis	PI; Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376; Active	09/01/11 - 08/31/15	$319,689
BRIDGES, Jr., S. Louis	PI; Genome-Wide Association Study in African-Americans With Rheumatoid Arthritis	NIH/NIAMS; R01 AR057202; Active	09/25/09 - 07/31/15 NCE	

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BRIDGES, Jr., S. Louis	Co-PI; Overcoming TWEAK Signaling to Fully Restore Muscle Mass and Mobility Function after Total Joint Arthroplasty	NIH/NICHD; R01 HD084124 (Bamman & Bridges, MPI); Active	04/15/15 – 02/28/20	$371,179
BRIDGES, Jr., S. Louis	Subaward PI; The Rheumatoid Arthritis Synovial Tissue Network (REASON)	Northwestern University/ NIAMS; UH2 AR067687 (Pope); Active	09/26/14 - 08/31/15	$17,959
BRIDGES, Jr., S. Louis	PD/PI & Core Leader, Administrative Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; Active	09/16/13 - 07/31/18	$79,945
BRIDGES, Jr., S. Louis	Co-PD/PI & Co-Core Leader, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
BRIDGES, Jr., S. Louis	Co-Investigator, Project 3: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI; Singh, Project PI); Active	09/01/12 - 08/31/17	$215,873
BRIDGES, Jr., S. Louis	Associate Director, Administrative Core; Rheumatic Diseases Core Centers	NIH/NIAMS; P30 AR048311 (Mountz); Active	09/28/01 - 08/31/17	$107,403
BRIDGES, Jr., S. Louis	Co-Investigator; ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)	Global Healthy Living Foundation/PCORI; PPRN-1306-04811-A (Ginsberg & Curtis, MPI); Active	03/12/14 – 09/11/15	$264,604
BRIDGES, Jr., S. Louis	Co-Investigator; Safety and Effectiveness of Live Zoster Vaccine in Anti-TNF Users (VERVE Trial)	NIH/NIAMS; UM1 AR065705; Active	09/1/14 – 08/31/19	$437,212
BRIDGES, Jr., S. Louis	PI; Pfizer Medical and Academic Partnerships (MAP) Program 2014-2015 Visiting Professorship in Rheumatology	Pfizer; Active	01/01/15 - 12/31/15	$8,000
BRIDGES, Jr., S. Louis	Primary Preceptor; Interferon gamma in pathogenesis of rheumatoid arthritis	Rheumatology Research Foundation; Medical Student Research Preceptorship (Vinod; Bridges and Raman, Co-mentors); Active	05/015/15 - 04/30/16	$4,000
BRIDGES, Jr., S. Louis	Primary Mentor; An Analytical Framework for the Genetics of Rheumatoid Arthritis in African Americans	NIH/NIAMS; F30 AR069414 (Laufer); Pending*	09/01/15 - 08/31/19	$156,353 TDC

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BRIDGES, Jr., S. Louis	Subaward PI; Novel Biomarkers to Predict Treatment Responses in RA	Duke University/NIH R01 (Pisetsky, PD/PI); Pending*	07/01/15 - 06/30/20	$53,565 TDC
BRIDGES, Jr., S. Louis	Co-PI; Interferon Gamma and Disease Severity in Rheumatoid Arthritis	NIH/NIAMS; R21 AR068246 (Raman & Bridges, MPI); Pending*	07/01/15 - 06/30/17	$275,000 TDC
BRIDGES, Jr., S. Louis	Co-Investigator, Admin Oversight Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; Bamman, Component Leader); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
BRIDGES, Jr., S. Louis	Component Lead, Pilot Projects Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
BRIDGES, Jr., S. Louis	Co-Investigator, Administrative and Recruitment Core; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly, PD/PI); Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
BRIDGES, Jr., S. Louis	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
BROWN, Elizabeth E	PI; Molecular Characterization of Myeloma and Related Asymptomatic Precursor States	NIH/NCI; R01 CA186646; Active	07/01/14 – 06/30/19	$458,052
BROWN, Elizabeth E	PI; The Role of Exosome Heparanase and miRNAs as Biomarkers for Myeloma	NIH/NCI; R21 CA182861; Active	07/01/14 – 06/30/15	$85,011
BROWN, Elizabeth E	PI; Association of Genetic and Autoantibody Signatures with SLE Clinical Course	NIH/NIAMS; R01 AR064820; Active	08/26/14 – 06/30/19	$482,631
BROWN, Elizabeth E	PI; A Genome-Wide Methylation Study of Epigenetic Contributions to Multiple Myeloma	NIH/NCI; R21 CA155951; Active	07/07/11 – 06/30/15 NCE	
BROWN, Elizabeth E	Co-Investigator; Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR057202 (Bridges); Active	09/25/09 - 07/31/15 NCE	
BROWN, Elizabeth E	Co-Investigator; HLA Region and KIR Genomics in Common Variable Immune Deficiency	NIH/NIAID; U01 AI090902 (Schroeder); Active	08/01/10 - 07/31/15	$365,085
BROWN, Elizabeth E	Collaborator, Major Program Leaders; Comprehensive Cancer Center Core Support Grant	NIH/NCI; P30 CA013148 (Partridge); Active	09/01/11 - 03/31/16	$121,267
BROWN, Elizabeth E	Co-Investigator; Heparanase Regulation of Myeloma Metastasis: Mechanism and Therapy	NIH/NCI; R01 CA138340 (Sanderson); Active	07/03/09 - 04/30/19	$225,000

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BROWN, Elizabeth E	Component Leader, Cancer Control and Population Sciences Program; Comprehensive Cancer Center Core Support Grant	NIH/NCI; (Partridge, PD/PI; Brown, Component Leader): Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
BROWN, Elizabeth E	Co-Investigator; Heparanase Regulation of Cancer Progression: Mechanism and Therapy	NIH/NCI; R35 CA197255 (Sanderson); Pending*	07/01/15 – 06/30/22	$ 5,286,237 TDC
BROWN, Elizabeth E	Co-Investigator; HLA Region and KIR Genomics in Common Variable Immune Deficiency	NIH/NIAID; U01 AI090902 (Schroeder); Pending*	07/01/15 - 06/30/20	$2,909,545 TDC
BULLARD, Daniel	Co-Investigator; Glycan control of stem cell-associated pathways in pancreatic cancer	NIH/NCI; R21 CA192629 (Bellis); Active	01/01/15 - 12/31/16	$130,500
BULLARD, Daniel	Co-Investigator, Project 2: Regulation of anti-viral CD8+ T Cell responses via adhesion molecules; Virus-induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962 (Randall, PD/PI; Zajac, Project Leader); Active	08/01/14 - 07/31/19	$239,914
BULLARD, Daniel	Co-Investigator; Glycosylation-dependent control of TNFR1 signaling in macrophage survival	American Heart Association; GRNT20380114 (Bellis); Active	07/01/14 - 06/30/16	$75,000
BULLARD, Daniel	PI: Impact of SLE-associated ITGAM variants on dendritic cell function	NIH/NIAMS; R21 AR069295; Pending*	10/1/15 - 9/30/17	$275,000 TDC
CASAZZA, Krista	PI; Puberty-Related Intervention to Improve Metabolic Outcomes	NIH/NIDDK; K99/R00DK083333; Active	06/01/09 - 05/31/15 NCE	
CASAZZA, Krista	Co-Investigator; Leadership Education in Adolescent Health (LEAH)	Health Resources and Services Administration / Maternal and Child Health Bureau; T71MC24209 (Simpson); Active	07/01/12 - 06/30/17	$380,260
CASAZZA, Krista	PI; Leadership Education Excellence in Pediatric Nutrition	Health Resources and Services Administration / Maternal and Child Health Bureau; T79MC00011; Active	07/01/13 - 06/30/18	$191,630
CASAZZA, Krista	Primary Mentor; Attentional Bias to Body and Food Stimuli in Eating Disordered Females	NIH/NIMH; F31 MH109239 (Lorch); Pending*	09/01/15 - 08/31/17	$86,240 TDC
CASAZZA, Krista	Co-Investigator; Building Academic and Community Relationships to Eliminate Disparities in Adolescent Sexual Health Outcomes (Project DASH)	NIH/NICHD; R13 HD085953 (Simpson); Pending*	07/01/15 - 06/30/16	$30,000

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CHAPLIN, David	Co-Director; UAB Skin Diseases Research Center	NIH/NIAMS P30 AR050948 (Elmets); Active	04/01/04 – 08/31/15	$340,143
CHAPLIN, David	Collaborator; Asthma Cohort Support Contract	NIH/NICHD; HHSN275201300014C (Biggio); Active	09/26/13 - 09/25/23	$158,666
CHAPLIN, David	Component Lead; UAB Center for Clinical and Translational Science (CCTS)	NIH/NCATS; U54TR001005 (Kimberly); Active	07/01/13 – 06/30/18	$3,349,010
CHAPLIN, David	Component Lead; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
CHEN, Yabing	PI; O-GlcNAcylation regulates vascular smooth muscle cells in diabetic vasculopathy	NIH/NIDDK; R01 DK100847; Active	04/01/14 - 02/28/18	$222,500
CHEN, Yabing	PI; Molecular Signaling in Oxidative Stress-Induced Vascular Calcification	NIH/NHLBI; R01 HL092215; Active	04/01/09 - 03/31/16 NCE	
CHEN, Yabing	PI, Project 2 & Director, Molecular Pathology Core; Novel regulators for vascular disease	Veterans Administration; 1IP1BX001595 (Sanders); Active	10/01/12 - 09/30/16	$162,192
CHEN, Yabing	PI; Death Receptor Signaling in Pancreatic Cancer: Mechanisms and Therapeutic Targets	Veterans Administration; 1I01BX002296; Active	09/01/14 - 08/31/16	$43,104
CHEN, Yabing	Co-Investigator; C-Src Kinase-Calmodulin Interaction: A Therapeutic Target For Pancreatic Cancer	NIH/NCI; R21 CA176267 (Krishna); Active	07/01/13 - 06/30/15	$275,000 TDC
CHEN, Yabing	PI; Molecular Signaling in Oxidative Stress-Induced Vascular Calcification	NIH/NHLBI; R01 HL092215; Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
CRON, Randall	Co-Investigator, Project 3: Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; (Bridges, PD/PI; Elson, Project Leader); Active	09/16/13 – 07/31/18	$165,151
CRON, Randall	PI; Genetics of Macrophage Activation Syndrome	Kaul Pediatric Research Institute; Active	02/1/13 - 012/31/15 NCE	

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CRON, Randall	PI; A Randomized, Double-Blind, Placebo Controlled, Withdrawal Study of Flare Prevention of Canakinumab (ACZ885) In Patients with Systemic Juvenile Idiopathic Arthritis (SJIA) and Active Systemic Manifestations	Novartis Pharmaceuticals Corp.; ACZ885G2301; Active	04/01/10 - 03/31/17	$29,765
CRON, Randall	Subaward PI; Lymphoma Risk: A Consequence of Immune Suppression or Stimulation? Sub-title: Cancer Risk in Pediatric-Onset Rheumatic Disease	McGill University/Canadian Arthritis Network; Active	09/19/12 - 08/31/17	$683
CRON, Randall	Co-PI; Treatment of Macrophage Activation Syndrome with Anakinra	SOBI; Active pending start date	2 years	$150,000
CRON, Randall	PI; Inhibition of HIV-! Expression by Regulatory CD4 T Cells	NIH; R21; Pending*	04/01/16 – 03/31/18	$275,000 TDC
CRON, Randall	PI; Careers in Immunology Fellowship	American Association of Immunologists; Pending*	09/01/15 – 08/31/16	$22,920 TDC
CUI, Xiangqin	Core Leader, Methodology Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/P); Active	09/16/13 - 07/31/18	$151,018
CUI, Xiangqin	Co-Investigator; Epigenetics of Early Life Exposure to Cancer Preventive Cruciferous Vegetables	American Institute for Cancer Research/Department of Agriculture; (Tollefsbol); Active	12/01/14 - 11/30/16	$75,000
CUI, Xiangqin	Co-Investigator; The Role of Exosome Heparanase and miRNAs as Biomarkers for Myeloma	NIH/NCI; R21 CA182861 (Brown); Active	07/01/14 - 06/30/16	$85,011
CUI, Xiangqin	Co-Investigator; Molecular Characterization of Myeloma and Related Asymptomatic Precursor States	NIH/NCI; R01 CA186646 (Brown); Active	07/01/14 - 05/31/19	$458,052
CUI, Xiangqin	Co-Investigator; Combinatorial Epigenetic-Based Prevention of Breast Cancer	NIH/NCI; R01 CA178441 (Tollefsbol); Active	04/01/14 - 02/28/19	$208,649
CUI, Xiangqin	Co-Investigator; Prostaglandins in C. Elegans Fertilization	NIH/NIGMS; R01 GM085105 (Miller); Active	05/01/14 - 02/28/18	$180,000
CUI, Xiangqin	Co-Investigator; Mechanisms of C3 Effects in ARPKD Pathogenesis	NIH/NIDDK; R01 DK097423 (Mrug); Active	08/05/13 - 06/30/18	$217,500
CUI, Xiangqin	Co-Investigator; Ulcerative Colitis - Regulation of the IL-13 Receptor System	NIH/NIDDK; R01 DK097107 (Mannon); Active	08/01/13 - 06/30/17	$200,000

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CUI, Xiangqin	Co-Investigator, Administrative Core; UAB/UCSD O'Brien Core Center for Acute Kidney Injury Research	NIH/NIDDK; P30 DK079337 (Agarwal); Active	09/20/13 - 07/31/18	$134,698
CUI, Xiangqin	Co-Investigator; Vascular Abnormalities in Patients Receiving a Dialysis Access	NIH/NIDDK; R01 DK085207 (Allon); Active	07/01/10 - 06/30/15 NCE	
CUI, Xiangqin	Co-Investigator; Mechanisms Linking Maternal Soybean Genistein to Fetal Breast Cancer Intervention	American Institute for Cancer Research; (Li); Pending*	01/01/16 - 12/31/17	$225,000 TDC
CUI, Xiangqin	Co-Investigator; The Role of Metabolic Syndrome and DNA Methylation in Aggressive Breast Cancer	DoD; (Akinyemiju); Pending*	10/01/15 - 09/30/18	$375,000 TDC
CUI, Xiangqin	Co-Investigator; Combinatorial Chemoprevention of the Initiation of Breast Cancer	NIH/NCI; R21 CA182033 (Tollefsbol); Pending*	07/01/15 - 06/30/17	$275,000 TDC
CUI, Xiangqin	Co-Investigator; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
CUI, Xiangqin	Co-Investigator; Endophenotypes of Treatment Resistance in Ulcerative Colitis: Clinical Activity of Interferon-Beta Therapy (The ETRUsCAn Trial)	DoD; (Mannon); Pending*	07/01/15 – 06/30/20	$4,347,590 TDC
CUI, Xiangqin	Co-Investigator; Post-Breast Cancer Weight Loss Alters Methylation, Gene Expression and Biomarkers	NIH/NCI; R01 CA199715 (Demark-Wahnefried); Pending*	07/01/15 – 06/30/19	$1,998,990 TDC
CUI, Xiangqin	Co-Investigator; Lowering Breast Cancer Risk during Adolescence: Soy Isoflavones, Microbiome, Metabolism and Epigenetics	NIH/NCI; U01 CA199356 (Barnes); Pending*	07/01/15 – 06/30/20	$2,441,840 TDC
CUI, Xiangqin	Co-Investigator; Developing Therapy for the Treatment of Cholangiocarcinoma	NIH/NCI; R21 CA187735 (Yoon); Pending*	07/01/15 – 06/30/17	$275,000 TDC
CUI, Xiangqin	Co-Investigator; Smad Signaling in Skeletal Muscle as a Biomarker of Disease Progression in ALS	NIH/NINDS; R01 NS092651 (King); Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
CUI, Xiangqin	Co-Investigator, Administrative Core; UAB Botanicals Research Center for Healthy Aging	NIH; P50 AT008665 (Barnes); Pending*	07/01/15 – 06/30/20	$6,492,000 TDC
CURTIS, Jeffrey	PI; Denosumab Global Safety Assessment among Women with Postmenopausal Osteoporosis (PMO) Using Multiple Observational Databases	Amgen; 20090522; Active	02/21/11 – 12/31/22	$994,396

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CURTIS, Jeffrey	PI; Safety and Effectiveness of Live Zoster Vaccine in Anti-TNF Users (VERVE Trial)	NIH/NIAMS; UM1 AR065705; Active	09/1/14 – 08/31/19	$437,212
CURTIS, Jeffrey	Project Leader, Project 2: Facilitating Treat-to-Target Using Novel Health Technology with Decision Support; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI; Curtis & Embi, MPI Project 2); Active	09/16/13 – 07/31/18	$164,285
CURTIS, Jeffrey	PI; Enhancing Comparative Effectiveness and Health Outcomes Research Through Linkages between CMS Data and External Data Sources: TNF-blocker utilization in the Medicare population – treatment patterns, costs and effectiveness	Amgen, Inc,; Research Agreement; Active	11/30/12 – 11/29/15 NCE	
CURTIS, Jeffrey	PI; A Pilot Study of the Safety and Effectiveness of the Live Zoster Vaccine in Anti-TNF Users	Rheumatology Research Foundation; Disease Targeted Research Initiative; Active	07/1/13 – 06/30/15	$159,862
CURTIS, Jeffrey	Co-PI; ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)	Global Healthy Living Foundation/PCORI; PPRN-1306-04811-A (Ginsberg & Curtis, MPI); Active	03/12/14 – 09/11/15	$264,604
CURTIS, Jeffrey	PI; Capturing Patient Reported Outcomes in RA to Improve Quality of Care & Outcomes in Real-World Settings	Pfizer, Inc.; Research Agreement; Active	01/01/14 – 12/31/16	$79,365
CURTIS, Jeffrey	PI; The Long Term Safety and Efficacy of Anti-Rheumatic Disease Therapies in the CORRONA Cohort	CORRONA; Research Agreement; Active	05/13/08 - 05/12/16	$76,254
CURTIS, Jeffrey	Project Leader, Project 4: A Novel Centralized 'Virtual' Gout Clinic for Chronic Gout Management; Centers of Research Translation: Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Bridges & Saag, MPI; Curtis & Mikuls, Project MPI); Active	09/01/12 – 08/31/17	$313,607
CURTIS, Jeffrey	PI; Psoriasis Standing Cohort	Pfizer Research Agreement; Active	10/01/12 – 03/31/16 NCE	
CURTIS, Jeffrey	PI; Selected Adverse Events Related to Psoriasis Medication Among Patients Diagnosed with Psoriasis	Amgen, Inc.; Research Agreement; Active	11/17/14 – 12/31/16	$145,073
CURTIS, Jeffrey	PI; Risk of secondary fracture among post-menopausal women in the United States	Amgen, Inc.; Research Agreement; Active	08/01/14 – 12/31/15	$81,632

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CURTIS, Jeffrey	Subaward PI; Patient Valued Comparative Effectiveness of Corticosteroids Versus Anti-TNF Alpha Therapy for Inflammatory Bowel Disease	University of Pennsylvania/ PCORI; CE-12-11-4143 (Lewis)	09/30/13 – 09/29/16	$49,474
CURTIS, Jeffrey	Co-Investigator; UAB/Amgen Project in Psoriasis: Medication Utilization and Treatment Pattern Among Patients Diagnosed with Psoriasis from Different Data Systems	Amgen, Inc.; Research Agreement (Yun); Active	01/01/15 – 07/31/15	$124,109
CURTIS, Jeffrey	Co-Investigator, Administrative Core; Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (Saag); Active	09/30/11 – 08/31/16	$272,587
CURTIS, Jeffrey	Co-Investigator; PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes	Rheumatology Research Foundation RRF; Disease Targeted Innovative Research award (Navarro-Millán); Active	09/01/14 – 08/31/16	$174,368
CURTIS, Jeffrey	Subaward PI; Privacy Preserving Analytic and Data-Sharing Methods for Clinical and Patient-Powered Data Networks	Harvard Pilgrim Health Care/PCORI; ME-1403-11305 (Toh); Awarded Pending execution	01/01/15 – 12/31/17	$27,248
CURTIS, Jeffrey	Subaward PI; Making PROMIS Meaningful to Patients and Providers in Clinical Practice	Johns Hopkins University/ PCORI; Research Agreement (Bingham); Awarded Pending execution	12/01/14 – 11/30/16	$51,138
CURTIS, Jeffrey	Co-PI; AR-PoWER	Global Healthy Living Foundation/PCORI; PCORnet PPRNs Phase II (Ginsberg & Curtis, MPIs); Pending*	10/01/15 – 09/30/18	$616,766 TDC
CURTIS, Jeffrey	Co-Investigator; Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)	PCORI; Winter Pragmatic Clinical Trials (Saag); Pending*	12/01/15 – 11/30/20	$9,999,318 TDC
CURTIS, Jeffrey	Co-Investigator, Tech Developments Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI); Pending*	09/01/15 – 08/31/20	$3,750,000 TDC
CURTIS, Jeffrey	Subaward PI; Comparative Effectiveness and Safety of Inhaled Corticosteroids and Antimicrobial Compounds for Non-CF Bronchiectasis	Oregon Health and Science University/PCORI; Methods (Winthrop); Pending*	11/01/15 – 10/31/18	$150,828 TDC
CURTIS, Jeffrey	Co-Investigator, Promo/Dissemination Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; K. Saag, Component Leader); Pending*	09/01/15 – 08/31/20	$3,750,000 TDC

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CURTIS, Jeffrey	Subaward PI; Enhancing patient ability to understand and utilize complex information concerning medication self-management	University of North Carolina at Chapel Hill/PCORI; Communication & Dissemination (Blalock); Pending*	11/01/15 – 10/31/18	$11,000 TDC
CUTTER, Gary	PI; Thymectomy in NonThymomatous Myasthenia Gravis Patients on Prednisone	NIH/NINDS; U01 NS042685; Active	09/23/05 – 07/31/15	$744,084
CUTTER, Gary	Director, Biostatistics Core; UAB Center for AIDS Research	NIH/NIAID; P30 AI027767 (M. Saag); Active	06/01/14 – 05/31/19	$84,263
CUTTER, Gary	PI; Chronic Hypertension and Pregnancy (CHAP): Data Coordinating Center	NIH/NHLBI; U01 HL119242; Active	09/01/14 – 05/31/20	$426,203
CUTTER, Gary	PI; Early Biomarkers of Autism Spectrum Disorders in Infants with Tuberous Sclerosis	Children's Hospital (Boston); RSTFD0000596370 (Bebin); Active	09/01/13 – 08/31/17	$34,825
CUTTER, Gary	PI, DiSCIS Biostatistics & Bioinformatics Core; UAB AC STI Clinical Research Consortium	NIH/NIAID; U19 AI113212; Active	06/15/14 - 05/31/19	$183,087
CUTTER, Gary	PI; North American Research Consortium on Multiple Sclerosis (NARCOMS)	Consortium of MS Centers (CMSC); Active	07/01/08 - 12/31/15	$134,364
CUTTER, Gary	Co-Investigator; Neurofibromatosis Clinical Consortium Award	DoD; W81XWH-12-1-0155 (Korf); Active	05/15/12 – 05/14/17	$388,770
CUTTER, Gary	Co-Investigator; Collaborative Assessment of Pediatric Transverse Myelitis: Understand, Reveal, Educate (CAPTURE)	University of Texas Southwestern Medical Center at Dallas/ PCORI; (Greenberg); Active	09/01/13 – 08/31/17	
CUTTER, Gary	Co-Investigator; Effectiveness of DiscontinuinG BisphosphonatEs Study (EDGE)	NIH/NAIMS; U34 AR062891 (K. Saag); Active	04/15/13 – 03/31/16 NCE	
CUTTER, Gary	Co-Investigator, Administrative Core; UAB/UCSD O'Brien Core Center for Acute Kidney Injury Research	NIH/NIDDK; P30 DK079337 (Agarwal); Active	09/20/13 – 07/31/18	$976,357
CUTTER, Gary	Co-Investigator; Innate Immunity and Viral Renal Allograft Injury	NIH/NIAID; R01 AI101138 (Shimamura); Active	08/08/13 – 07/31/18	$250,000
CUTTER, Gary	Co-Investigator; Caesarean Section Optimal Antibiotic Prophylaxis (C/SOAP) Trial	NIH/NICHD; R01 HD064729 (Tita); Active	04/01/10 – 07/31/15 NCE	
CUTTER, Gary	Co-Investigator; Functional Change in Mild Cognitive Impairment (COINS)	NIH/NIA; R01 AG021927 (Marson); Active	07/01/10 – 06/30/15	$408,775

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CUTTER, Gary	Co-Investigator, CombiRx Statistical and Data Management Center; Extension of Combination Therapy in Multiple Sclerosis (eCombiRx)	Mt. Sinai Medical Center/NIH; U01 NS45719 (Lublin); Active	12/01/07 - 11/30/15 NCE	
CUTTER, Gary	Co-Investigator, An Adaptive, Sequential Study Evaluation Prevention of Neonatal Herpes Simplex Virus Disease: Detection of Maternal Herpes Simplex Virus Shedding at Delivery; Targeted Clinical Research to Address Select Viral Infections	NIH/NIAID; HHSN272201100034C (Whitley); Active	09/28/11 - 09/27/16	1,040,273
CUTTER, Gary	Co-Investigator, A Phase II Randomized Six Weeks of Oral Valganciclovir Therapy in CMV Infants with Hearing Loss; Targeted Clinical Research to Address Select Viral Infections	NIH/NIAID; HHSN272201100035C (Whitley); Active	09/28/11 - 09/27/16	852,741
CUTTER, Gary	Co-Investigator, Safety, Tolerability and Pharmacokinetic Properties of CMX001 in Renal Transplant Recipients with BK Viremia; Targeted Clinical Research to Address Select Viral Infections	NIH/NIAID; HHSN272201100036C (Whitley); Active	09/28/11 - 09/27/16	
CUTTER, Gary	Co-Investigator, Pharmacokinetic, Pharmacodynamic and Resistance Evaluation of Intravenous Ganciclovir in Premature Infants; Targeted Clinical Research to Address Select Viral Infections	NIH/NIAID; HHSN272201100037C (Whitley); Active	09/28/11 - 09/27/16	589,584
CUTTER, Gary	Co-Investigator, An Adaptive Pharmacokinetic, Pharmacodynamic, Concentration Response Investigation of CMX-001 in the Infants with Neonatal Herpes (HSV) Followed by Randomized Assessment; Targeted Clinical Research to Address Select Viral Infections	NIH/NIAID; HHSN272201100038C (Whitley); Active	09/28/11 - 09/27/16	647,489
CUTTER, Gary	Co-Investigator; Discontinuation of Disease Modifying Therapies (DMTs) in Multiple Sclerosis (MS)	University of Colorado/PCORI; Pending*	11/01/15 - 10/31/18	$315,480 TDC
CUTTER, Gary	Co-Investigator; Effectiveness of DiscontinuinG BisphosphonatEs Study (EDGE)	PCORI; (Saag); Pending*	12/01/15 - 11/30/20	$26,147,611 TDC
DANILA, Maria	PI; Genetic Architecture of Rheumatoid Arthritis in African Americans	NIH/NIAMS; K23 AR062100; Active	06/01/12 – 05/31/17	$123,700

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DANILA, Maria	PI; Administrative Supplement to Genetic Architecture of Rheumatoid Arthritis in African Americans	NIH/NIAMS; K23 AR062100-S1; Active	12/16/14 – 05/31/15	$891
DANILA, Maria	Collaborator; Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376; Active	09/01/11 – 08/31/15	$265,723
DANILA, Maria	Collaborator, Project 2: Facilitating Treat-to-Target Using Novel Health Technology with Decision Support; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI; Curtis & Embi, MPI Project 2); Active	09/16/13 – 07/31/18	$164,285
DANILA, Maria	Collaborator, Project 3: Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; (Bridges, PD/PI; Elson, Project Leader); Active	09/16/13 – 07/31/18	$165,151
DANILA, Maria	PI; Impact of medical scribes to support medical documentation on efficiency, physician satisfaction, and cost: a proof of concept study	Institutional/DOM; No number; Active	01/01/15 – 06/30/15	$50,000
DANILA, Maria	Co-Investigator; Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)	PCORI; Winter Pragmatic Clinical Trials (Saag); Pending*	12/1/15 – 11/20/20	$26,147,611 TDC
DAVIS, Randall	PI; Roles of FCRL Molecules in Innate Immunity	NIH/NIAID; R56 AI110553; Active	07/18/14 – 06/30/15	$250,000
DAVIS, Randall	PI; Cellular and Biologic Origins of CLL	NIH/NCI; R21 CA175912; Active	01/01/14 – 12/31/15	$130,500
DAVIS, Randall	PI; Biological Role of FCRL Molecules in SLE Pathogenesis	Lupus Research Institute; Active	01/01/13 -12/31/15	$100,000
DAVIS, Randall	PI; Modeling FCRL6 Regulation and Function in Transgenic Mice	NIH/NIAID; R21 AI097729; Active	08/21/12 - 07/31/15 NCE	
DAVIS, Randall	PI; Validating a novel biomarker of clinical progression and survival in CLL	NIH/NCI; R33 CA161731; Active	08/19/11 – 07/31/15 NCE	
DAVIS, Randall	PI; Targeting FCRL B Cell Regulation and Immunopathology	NIH/NCI; R01 CA197868; Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
DAVIS, Randall	PI; FCRL Regulation of Humoral Host Defense	NIH/NNIAID; R01 AI121133; Pending*	09/01/15 – 08/31/20	$1,250,000 TDC
DAVIS, Randall	PI; Validating the prognostic role of FCRL2 in CLL	NIH/NCI; UH2 CA202962; Pending*	12/01/15 – 11/30/20	$1,025,000 TDC
DAVIS, Randall	PI; Targeting FCRL 1 for treatment in CLL	Leukemia and Lymphoma Society; Pending*	10/01/15 – 09/30/16	$540,055 TDC
EBERHARDT, Alan	PI; Engineering Design Projects to Aid Persons With Disabilities An Engineering Business Alliance	NSF; CBET-1263941; Active	08/01/13 – 07/31/18	$16,963

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EBERHARDT, Alan	PI; Enhanced Senior Design Through Clinical Industrial Immersion And Entrepreneurship	NIH/NICHD; R25 HD078327; Active	04/01/13 – 03/31/18	$19,440
EBERHARDT, Alan	PI; UAB Epicenter of Engineering Innovation and Entrepreneurship	National Center for Engineering Pathways to Innovation (EPICENTER); Active	01/15/15 - 01/14/16	$915
EBERHARDT, Alan	PI; An Industrial Scholars Program for Innovation and Commercialization	Venturewell; Pending*	09/01/15 - 08/31/18	$50,000 TDC
EDBERG, Jeffrey	Co-Investigator; Ethnic Differences in Responses to Painful Stimuli	University of Florida/ NIH/NIA; R37 AG033906 (Fillingim, PD/PI; Bradley, Site PI); Active	09/15/14 - 04/30/19	$373,366
EDBERG, Jeffrey	Co-Investigator; Association of Genetic and Autoantibody Signatures with SLE Clinical Course	NIH/NIAMS; R01 AR064820 (Brown); Active	08/26/14 - 06/30/19	$482,631
EDBERG, Jeffrey	Co-Director, Analytical Genomics and Transgenics Core; Rheumatic Diseases Research Core Centers	NIH/NIAMS; P30 AR048311 (Mountz, PD/PI; Kesterson, Core Director); Active	09/01/01 - 08/31/17	$90,846
EDBERG, Jeffrey	Core Director; UAB Center for Clinical and Translational Science	NIH/NCATS; U54 TR001005 (Kimberly); Active	09/01/14 - 08/31/15	$ 3,349,010
EDBERG, Jeffrey	Co-Investigator, Metabolomics Center Supplement; Ethnic Differences in Responses to Painful Stimuli	University of Florida/NIH/NIA; R37 AG033906-S1 (Fillingim, PD/PI; Bradley, Subaward PI); Pending*	05/01/15 - 04/30/19	$100,000
EDBERG, Jeffrey	Co-Investigator; Effects of ITGAM Genetic Variation on Mac-1 mediated Inflammatory Responses	NIH/NIAMS; R01 AR068315 (Szalai); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
EDBERG, Jeffrey	Co-Investigator; Impact of SLE-associated ITGAM variants on dendritic cell function	NIH/NIAMS; R21 AR069295 (Szalai); Pending*	09/01/15 - 08/31/17	$275,000 TDC
EDBERG, Jeffrey	Co-Investigator, RIP; UAB Center for Clinical and Translational Science (CCTS) (3 Linked Awards UL1, KL2, TL1)	NIH/NCATS; U54TR001368 (Kimberly, PD/PI; Frank, Component Leader); Pending*	09/01/15 - 08/31/20	$35,397,604 TDC
EDBERG, Jeffrey	Co-Investigator; Role of FC Gamma Receptors in Kawasaki Disease	Seattle Children's Hospital/ NIH; (Shrestha); Pending*	07/01/15 - 06/30/19	$993,276 TDC
ELSON, Charles	PD/PI & Core Leader, Administrative Core; Innate and Adaptive Microbial Immunity in IBD	NIH/NIDDK; P01 DK071176; Active	08/01/10 - 07/31/15	$44,768
ELSON, Charles	Core Leader, Animal Model Core; Innate and Adaptive Microbial Immunity in IBD	NIH/NIDDK; P01 DK071176; Active	08/01/10 - 07/31/15	$260,451

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ELSON, Charles	PI, Project 1: Innate and Adaptive Immunity to Microbial Flagellins in IBD; Innate and Adaptive Microbial Immunity in IBD	NIH/NIDDK; P01 DK071176; Active	08/01/10 - 07/31/15	$655,365
ELSON, Charles	PI, Project 3: Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; (Bridges, PD/PI); Active	09/16/13 – 07/31/18	$165,151
ELSON, Charles	Subaward PI; Ulcerative Colitis Genetics Initiative	Washington University; Crohn's and Colitis Foundation of America; Active	10/01/14 - 09/30/17	$227,055
ELSON, Charles	Co-Investigator; Exploration of the Gut Microbiome in Spondyloarthritis	American College of Rheumatology; (Stoll); Active	07/01/13 - 06/30/15	$115,741
ELSON, Charles	Co-Investigator; Interactions Between AHR Ligands and the Gut Microbiota in Murine Arthritis	NIH/NIEHS; R21 ES02441 (Stoll); Active	08/01/14 - 07/31/16	$125,000
ELSON, Charles	Co-Investigator; Endophenotypes of Treatment Resistance in Ulcerative Colitis: Clinical Activity of Interferon-Beta Therapy (The ETRUsCAn Trial)	DoD; (Mannon); Pending*	07/01/15 – 06/30/20	$4,347,590 TDC
FENG, Xu	PI; RANK Signaling in Osteoclast Formation and Function	NIH/NIAMS; R01 AR047830; Active	04/01/01 - 03/31/17	$225,000
FENG, Xu	Co-Investigator; Targeted Stem Cell Therapy Coupling Angiogenesis and Osteogenesis for Bone Defect	NIH/NIAMS; R01 AR060948 (Ponnazhagan); Active	09/01/11 - 08/31/16	$220,500
FLOYD, Candace	PI; Role of dentate gyrus gating and neurogenesis in the pathophysiology of mild TBI	NIH/NINDS; R01 NS075162; Active	07/01/12 - 06/31/17	$213,837
FLOYD, Candace	Co-PI; Opioid Abuse after Traumatic Brain Injury: Evaluation Using Rodent Models	DoD Army Medical Research Acquisition Activity; W81XWH-11-1-0373; Active	07/01/11 - 06/30/15	$315,003 TDC
FLOYD, Candace	PI; Treatment of Neuropathic Pain after SCI with a Catalytic Oxidoreductant	DoD Army Medical Research Acquisition Activity; W81XWH-13-0482; Active	10/01/13 - 09/30/16	$279,088
FLOYD, Candace	Primary Mentor; Effects of Catalytic Oxidoreductant on Repair and Neurogenesis After Repeated Mild Traumatic Brain Injury	NIH/NINDS; F31 NS093717 (Nichols); Pending*	07/01/15 - 06/30/18	$112,219 TDC

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FLOYD, Candace	PI; Assessment of Long-Term Effects of Spinal Cord Perfusion Management Strategies Using a Porcine Acute Spinal Cord Injury Model	DoD; Pending*	07/01/15 - 06/30/18	$1,500,000 TDC
FLOYD, Candace	Subaward PI; Prevention of Spinal Cord Injury-Induced Neuropathic Pain and Functional Deficits with Cannabidiol	California Pacific Medical Center Research Institute/ DoD; Pending*	07/01/15 - 06/30/18	$813,385 TDC
FONTAINE, Kevin	PI; Does an Egg-Rich Diet Improve Meatbolism and Health in Obese Older Adults?	American Egg Board ; Active	01/01/15 - 12/31/17	$75,066
FONTAINE, Kevin	Co-PI; Strengthening Causal Inference in Behavioral Obesity Research	NIH/NHLBI; R25 HL124208 (Allison & Fontaine, MPIs); Active	08/15/14 - 06/30/19	$189,552
FONTAINE, Kevin	Co-Investigator; Dose-Response Effects of Transformative Exercise in Improving Health and Function in Adults with Spinal Cord Injury and Multiple Sclerosis	Department of Education; H133A130044 (Rimmer); Active	10/01/13 - 09/30/18	$422,047
FONTAINE, Kevin	Co-Investigator: POWERSforID: A Telehealth Weight Management System for Adults with ID	University of Illinois, Chicago/Department of Education; H133B130007 (Rimmer); Active	10/01/13 - 09/30/15	$65,217
FONTAINE, Kevin	PI; Targeted Disruption to Cancer Metabolism and Growth through Dietary Macronutrient Modification	Institutional Funds/UAB Cancer Center; Active	03/05/14 - 03/14/15	$40,000
FONTAINE, Kevin	Co-PI: Role of Expectations in Weight Loss Outcomes	NIH/NIDDK; R01 DK107476 (Fontaine & Allison, MPIs); Pending*	07/01/15 - 06/30/20	$2,201,035 TDC
FONTAINE, Kevin	Co-Investigator; Trends in Mortality and Disability Associated with Obesity and the Role of Cardiometabolic Medications	NIH/NIDDK; R21 DK108129 (Mehta); Pending*	09/01/15 - 08/31/17	$275,000 TDC
FONTAINE, Kevin	Co-Investigator; Trends in Mortality and Disability Associated with Obesity, Diabetes, and the Role of Cardiometabolic Medications	American Diabetes Association; (Mehta); Pending*	04/01/16 - 03/31/19	$539,713 TDC
FONTAINE, Kevin	PI; Developing and Exploring Using Interactive Voice Response System in Postpartum Smoking Relapse: A Pilot RCT Study	American Lung Association; Pending*	07/01/15 - 06/30/16	$21,000 TDC
FONTAINE, Kevin	Co-Investigator: Targeted Disruption of Cancer Cell Metabolism and Growth through Dietary Reduction in Insulin	American Institute for Cancer Research; (Gower); Pending*	01/01/15 - 12/31/16	$100,000

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FONTAINE, Kevin	Co-Investigator; Diet Interventions to Reduce Inflammatory Cytokines and Increase Mobility in Older Adults	NIH/NIA; U01 AG050528 (Sorge); Pending*	07/01/15 - 06/30/18	$2,112,890 TDC
FONTAINE, Kevin	Co-Investigator; Fixed Versus Variable Energy Reduction during Behavioral Obesity Treatment	NIH/NIDDK; R01 DK103863 (Dutton); Pending*	07/01/15 - 06/30/20	$2,286,268 TDC
FOUAD, Mona	PI; Birmingham REACH for Better Health	NCCDPHP/CDC; U58 DP005814; Active	09/30/14 – 09/29/17	$758,391
FOUAD, Mona	PI, Research Project 1; Gulf States Collaborative Center for Health Policy Research (Gulf States CC)	Bayou La Batre Clinic/NIH/ NIMHD; U54 MD008602 (Benjamin, PD/PI); Active	07/01/13 – 06/30/18	$261,730
FOUAD, Mona	Core Director, Pilot Project Core; Gulf States Collaborative Center for Health Policy Research (Gulf States CC)	Bayou La Batre Clinic/NIH/ NIMHD; U54 MD008602 (Benjamin, PD/PI); Active	07/01/13 – 06/30/18	$109,287
FOUAD, Mona	PD/PI, Mid-South Transdisciplinary Collaborative Center for Health Disparities Research	NIH/NIMHD; U54 MD008176; Active	09/26/12 – 07/31/17	$2,343,050
FOUAD, Mona	Investigator & Core Director, Collaboration and Partnership Core; National Transdisciplinary Collaborative Center for African American Men's Health	NIH/NIMHD; U54 MD008620; Active	10/15/13 – 06/30/18	$153,165
FOUAD, Mona	Investigator & Core Director, Pilot Projects Core; National Transdisciplinary Collaborative Center for African American Men's Health	NIH/NIMHD; U54 MD008620 (Vickers & Konety & Shikany, MPIs); Active	10/15/13 – 06/30/18	$712,855
FOUAD, Mona	Co-PI, UAB K12 in Patient Centered Outcomes Research	AHRQ; K12 HS023009 (Saag & Fouad, MPIs); Active	04/01/14 – 03/31/19	$485,518
FOUAD, Mona	Central Data Collection Center (CDCC) - Continued Follow-Up of PLCO Participants	Westat, Inc./NIH; Active	09/01/14 - 02/28/16	$13,175
FOUAD, Mona	Co-Investigator; Morehouse School of Medicine/Tuskegee University/University of Alabama Cancer Center Partnership	NIH/NCI; U54 CA118948 (Manne & Blumenthal & Turner, MPIs); Active	09/30/05 – 08/31/16	$729,247
FOUAD, Mona	Co- PD/PI; Enhancing Minority Participation in Clinical Trials (EMPaCT): Phase II	NIH/NIMHD; U24 MD006970 (Vickers & Fouad & Durant, MPIs); Active	09/19/11 – 05/31/16	$828,940
FOUAD, Mona	Core Leader, Recruitment & Retention Shared Facility; Comprehensive Cancer Center Core Support Grant	NIH/NCI; P30 CA13148 (Partridge); Active	03/28/97 – 03/31/16	$96,983

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FOUAD, Mona	PD/PI & Core Director, Administrative Core; Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III	NIH/NIMHD; P60 MD000502; Active	09/30/03 – 03/31/17	$128,616
FOUAD, Mona	PD/PI & Core Director, Research Training Core; Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III	NIH/NIMHD; P60 MD000502; Active	09/30/03 – 03/31/17	$89,686
FOUAD, Mona	PD/PI & Core Director, Community Engagement Core; Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III	NIH/NIMHD; P60 MD000502; Active	09/30/03 – 03/31/17	$185,072
FOUAD, Mona	PI; Transdisciplinary Collaborative Center (TCC) for Colorectal Cancer Research	National Academy of Sciences; Pending*	10/01/15 - 09/30/17	$173,874 TDC
FOUAD, Mona	Core Leader, Recruitment and Retention Shared Facility; Comprehensive Cancer Center Sore Support Grant	NIH; (Partridge, PD/PI); Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
FOUAD, Mona	Co-Investigator; Racial Disparities: Pain in Women Treated for Breast Cancer	NIH/NCI; R01 CA195060 (Wesselmann); Pending*	09/01/15 - 08/31/20	$1,250,000 TDC
FOUAD, Mona	Co-Investigator, Administrative and Bioinformatics Components; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly, PD/PI); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
FOUAD, Mona	Core Leader, Recruitment and Retention Shared Facility; Comprehensive Cancer Center Core Support Grant	NIH/NCI; (Partridge, PD/PI): Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
FOUAD, Mona	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 - 06/30/20	$10,771,928 TDC
GAFFO, Angelo	Co-Investigator, Project 2: Effects of Urate Lowering Therapy on Inflammation, Endothelial Function, and Blood Pressure; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI; Saag & Calhoun, Project MPIs); Active	09/01/12 - 08/31/17	$185,927

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
GEORGE, James	Role of Heme Oxygenase-1 in Doxorubicin-Induced Cardiac Toxicity	American Heart Association; 13PRE17000013; Active	07/01/13 - 06/30/15	$26,000
GEORGE, James	The Role of Heme Oxygenase-1 in the Immune Response	NIH/NIDDK; R01 DK083390; Active	09/20/11 - 08/31/15	$217,500
GEORGE, James	Co-Investigator, Core B: Resource for Pre-clinical Studies of AKI (Animal Models/Imagine/Renal Physiology); UAB-UCSD O'Brien Core Center for Acute Kidney Injury Research (Anupam Agarwal PI)	NIH/NIDDK; P30 DK079337 (Agarwal, PD/PI; Sanders, Core Leader); Active	09/01/13 - 08/30/18	$181,722
GEORGE, James	Co-Investigator; Innate Immunity and Viral Renal Allograft Injury	NIH/NIAID; R01 AI101138 (Shimamura); Active	08/08/13 – 07/31/18	$250,000
GEORGE, James	Co-Investigator; C-reactive protein in acute kidney injury	NIH/NIDDK; R01 DK099092 (Szalai); Active	04/01/14 - 03/31/18	$217,500
GEORGE, James	Co-Investigator; Splenic Marginal Zone Macrophages in Chronic Ischemic Heart Failure	NIH/NHLBI; R01 HL125735 (Prabhu); Active	04/10/15 – 03/30/20	$250,000
GEORGE, James	Co-Investigator; Role of Regulatory T-Lymphocytes in Chronic Heart Failure	Veterans Administration; (Prabhu); Active	05/01/15 – 4/30/20	$200,000
GEORGE, James	PI; Mechanisms of Protection against Chemotherapy Induced Cardiac Toxicity by Heme Oxygenase-1	NIH/NHLBI; R01 HL129124; Pending*	09/01/15 - 08/31/20	$1,669,105 TDC
GEORGE, James	PI; Pericardial Inflammation and Oxidative Stress after Cardiac Surgery	American Heart Association; Pending*	07/01/15 - 06/30/17	$150,000 TDC
GEORGE, James	PI; Inflammation and Oxidative Stress in Pericardial Space after Cardiac Surgery	NIH/NHLBI; R01 HL130962; Pending*	09/01/15 - 08/30/20	$1,250,000 TDC
GEORGE, James	Co-Investigator; Bioenergetic Biomarkers for Complications in Elderly Cardiac Surgery Patients	NIH/NIA; R21 AG051911 (Darley-Usmar); Pending*	09/01/15 - 08/31/17	$275,000 TDC
GEORGE, James	Co-Investigator; Human Heme Oxygenase-1 Gene Regulation in Renal Injury	NIH/NIDDK; R01 DK059600 (Agarwal); Pending*	12/01/15 - 11/30/20	$1,923,552 TDC
GEORGE, James	Co-Investigator; Targeting Mitochondrial DNA and Bio-energetic Health to prevent Metabolic Diseases - MitoFIT	King's College London/ European Commission; (Darley-Usmar); Pending*	10/01/15 - 09/30/20	$899,545 TDC
GILBERT, Shawn R	PI; Effects of Obesity on the Physis (Gilbert PI)	Pediatric Orthopaedic Society of North America; Active	06/01/14 – 05/31/15	$30,000
GILBERT, Shawn R	Co-Investigator; A Hybrid Nanosack for the Enhanced Islet Engraftment in the Omentum	NIH; R03 EB017344 (Jun); Active	07/15/13 – 06/30/15	$49,779

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GILBERT, Shawn R	Co-Investigator; Cell and Gene Therapy for Nonunion Bone Fracture	NIH/NIAMS; R01 AR068480 (Ponnazhagan); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
GOEPFERT, Paul A	PI; A Rational Approach for HIV Vaccine T Cell Epitope Selection	NIH/NIAID; R01 AI112566 Active	07/15/14 - 06/30/18	$361,537
GOEPFERT, Paul A	Co-PI; Kinomic Analysis of Host Cell Factors Controlling Latent HIV-1 Infection	NIH/NIAID; R21 AI116188 (Kutsch & Goepfert); Active	09/19/14 - 08/31/16	$150,000
GOEPFERT, Paul A	Core Director, Developmental Core; UAB Center for AIDS Research	NIH/NIAID P30 AI027767 (M. Saag, PD/PI); Active	06/01/14 - 05/31/19	$2,995,049
GOEPFERT, Paul A	Executive Committee Member, Administrative Core; UAB Center for AIDS Research	NIH/NIAID P30 AI027767 (M. Saag, PD/PI); Active	06/01/14 - 05/31/19	$199,543
GOEPFERT, Paul A	PI; HIV-1 Cryptic Epitopes: Implications for Vaccine Design	NIH/NIAID; R01 AI084772; Active	09/11/09 - 08/31/15 NCE	
GOEPFERT, Paul A	Co-Director, Clinical Core; UAB Center for AIDS Research	NIH/NIAID P30 AI027767 (M. Saag, PD/PI; Mugavero, Core Leader); Active	06/01/14 - 05/31/19	$135,568
GOEPFERT, Paul A	Primary Mentor; Oxidative Stress and T Cell Balance: Effect on Pulmonary Tuberculosis During HIV	NIH/NHLBI; F32 HL121924 (Seu); Active	09/15/14 - 09/14/17	$59,594
GOEPFERT, Paul A	Subaward PI; Effector and Regulatory Activities of HLA-E-Restricted HIV-Specific αβ CD8 T Cells	University of Texas El Paso/ NIH/NIAID; R01 AI102663 (Kan-Mitchell); Active	08/01/12 - 06/30/16	$32,751
GOEPFERT, Paul A	Site Leader; UAB HVTN Protocol Funding	Fred Hutchinson Cancer Research Center/NIH/NIAID; Active	12/01/14 - 11/30/15	$274,408
GOEPFERT, Paul A	Subaward PI; CTL and HIV Polymorphisms in Heterosexual Transmission	Emory University/NIH/NIAID; R01 AI064060 (Hunter); Active	02/01/05 - 03/31/16 NCE	
GOEPFERT, Paul A	Scientific Liaison; Alabama-Clinical Trials Unit	NIH/NIAID; UM1 AI069452 (M. Saag); Active	02/01/07 – 11/30/20	$1,093,661
GOEPFERT, Paul A	Site PI, Administrative Task; Vaccine and Treatment Evaluation Units	Vanderbilt University/NIH; Active	02/01/14 - 09/15/23	Funding is determined upon assignment of protocols. Individual awards are based on a competitive task order proposal process.

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GOEPFERT, Paul A	Subaward PI; CTL and HIV Polymorphisms in Heterosexual Transmission	NIH/NIAID/Emory University R01 AI064060 (Hunter); Pending *	07/01/15 - 06/30/20	$1,081,416 TDC
GOEPFERT, Paul A	Co-Investigator, Task Area B-D TO 14-0107.B1C1D1.0023 - Protocol Development; Vaccine and Treatment Evaluation Units	Vanderbilt University/NIH; (Overton); Pending*	02/01/14 - 09/15/23	Individual awards are based on a competitive task order proposal process.
GOEPFERT, Paul A	PI, Task Area C TO13-0034.C1.0015 - Protocol Development and Implementation; Vaccine and Treatment Evaluation Units	Vanderbilt University/NIH; Pending*	02/01/14 - 09/15/23	Individual awards are based on a competitive task order proposal process.
GUTIERREZ, Orlando	PI; Impact of Disordered Mineral Metabolism on Stroke and Cognitive Impairment	NIH/NINDS; R01 NS080850; Active	10/01/12 – 09/30/17	$173,515
GUTIERREZ, Orlando	PI; Phosphorus-Based Food Additives, Mineral Metabolism and Cardiovascular Health	NIH/NIDDK; R03 DK095005; Active	06/01/12 - 05/30/15	$125,000
GUTIERREZ, Orlando	Co-Investigator, Administrative Core; UAB/UCSD O'Brien Core Center for Acute Kidney Injury Research	NIH/NIDDK; P30 DK079337 (Agarwal, PD/PI); Active	08/01/13 – 07/31/18	$33,654
GUTIERREZ, Orlando	PI; Characterization of HDL subfractions by APOL1 risk status in African Americans	Institutional; Active	02/01/15 - 12/31/15	$50,000
GUTIERREZ, Orlando	Subaward PI; Phosphate and GFG23: Dietary and Molecular Mediators of Health Disparities in Cardiovascular and Kidney Diseases	Northwestern University/ American Heart Association; Pending*	07/01/15 - 06/30/19	$831,672 TDC
GUTIERREZ, Orlando	Subaward PI; Identifying Individuals at High Risk of Renal Disease and CVD at low BPA Exposure	Vanderbilt University/NIH; Pending*	12/01/15 - 11/30/19	$246,044 TDC
GUTIERREZ, Orlando	PI; Bioavailable Vitamin D, Immunity and Sepsis	NIH/NIGMS; R01 GM114334; Pending*	09/01/15 - 08/31/20	$2,732,851 TDC
GUTIERREZ, Orlando	Subaward PI: Development of a Kidney Tubule Health Panel in Population-Based Cohorts	Tufts New England Medical Center; Pending*	07/01/15 - 06/30/20	$176,930 TDC
GUTIERREZ, Orlando	PI; Bioavailable Vitamin D and Cardiovascular Disease	NIH/NHLBI; R01 HL128345; Pending*	07/01/15 - 06/30/19	$1,777,555 TDC
GUTIERREZ, Orlando	Co-Investigator; Interaction Between Magnesium and Vitamin D and Risk of Cardiovascular Disease	Vanderbilt University; (Judd); Pending*	07/01/15 - 06/30/18	$115,627 TDC

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HOWARD, George	PI; Etiology of Geographic and Racial Differences in Stroke (REGARDS)	NIH/NINDS; U01 NS041588; Active	09/01/01 – 11/30/17	$4,052,671
HOWARD, George	PI, Statistical and Data Coordinating Center; Carotid Revascularization Endarterectomy versus Stenting Trial 2 (CREST-2)	NIH/NINDS; U01 NS080165; Active	03/15/14 – 02/28/21	$849,691
HOWARD, George	Co-Investigator; Risk Factors for Sepsis in the Community	NIH/NINR; R01 NR012726 (Wang); Active	07/15/11 – 04/30/16	$336,745
HOWARD, George	Co-Investigator; Incorporation of a Hypertension Working Group into the Jackson Heart Study	NIH/NHLBI; R01 HL117323 (Muntner, Ogedegbe & Shimbo, MPIs); Active	07/15/13 – 06/30/16	$271,528
HOWARD, George	Co-Investigator; Caregiving and Health Care Utilization After Stroke Among Medicare Beneficiaries	Johns Hopkins University/ NIH/NINDS; R01 NS075047 (Roth; Judd, Subaward PI); Active	09/01/11 – 06/30/16	$167,985
HOWARD, George	Co-Investigator; Cardiovascular Disease, Prevention, Treatment, and Outcomes	AMGEN, INC.; Muntner; Active	01/23/14 – 02/27/15	$1,054,376
HOWARD, George	Executive Committee Member, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
HOWARD, George	Co-Investigator; Fractional Flow Reserve for the Assessment of Coronary Bifurcation Lesions (CCC)	NIH/NHLBI; R01 HL120678 (Leesar); Pending*	04/01/15 – 03/31/20	$4,896,369 TDC
HOWARD, George	Co-Investigator; SLIMMED: Sleeve Gastrectomy Versus Intensive Medical Weight Management to Eliminate Diabetes	Ethicon, Inc; (Lewis); Pending*	03/01/15 - 02/28/22	$8,802,885 TDC
HOWARD, George	Co-Investigator; Characteristics and Prognosis of Myocardial Infarction as a Secondary Diagnosis	NIH/NHLBI; R01 HL125523 (Levitan); Pending*	04/01/15 - 03/31/19	$1,000,000 TDC
HOWARD, George	Co-Investigator; Women's Carotid Artery Stenosis Trial (W-CAST)	University of Miami/PCORI; (McClure, Subaward PI); Pending*	10/01/15 - 09/30/20	$1,612,141 TDC
HOWARD, George	Subaward PI; Explanation for Regional and Racial Differences in Venous Thromboembolism in the U.S.	NIH/ University of Vermont; Pending*	09/01/15 - 08/31/20	$723,276 TDC
HOWARD, George	Co-Investigator; Eliminate Cardiovascular Disease (CVD) Disparities	American Heart Association; (Safford, PD/PI); Pending*	07/01/15 - 06/30/19	$3,391,542 TDC
HOWARD, George	Co-Investigator; Collaboration to Improve Blood Pressure (BP) in the US Black Belt - Addressing the Triple Threat	NIH/NHLBI; UH2 HL130691 (Safford); Pending*	09/01/15 - 08/31/20	$8,347,487 TDC

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HOWARD, George	Mobility Among Older African Americans and Whites	NIH/NIA; R01 AG015062 (Brown); Pending*	09/01/15 - 08/31/20	$2,435,820 TDC
HOWARD, George	Maximizing Efficiency and Validation of Patient Reported Outcome Data to Support Comparative Effectiveness Research	PCORI; (Yun); Pending*	07/01/15 - 06/30/18	$749,954 TDC
HSU, Hui-Chen	PI; Entry of antigen-presenting B cells into the follicle directed by IFN-α and IL-17	NIH/NIAID; R01 AI083705; Active	05/15/11 - 04/30/16	$250,000
HSU, Hui-Chen	Co-Investigator; Follicular Exclusion 0f Self Antigens Prevents Development of Autoantibodies	NIH/NIAID; R01AI071110 (Mountz); Active	02/01/14 - 01/31/19	$250,000
HSU, Hui-Chen	PI; Repopulation of tolerogenic B cells post B cell depletion therapy in lupus	Lupus Research Institute; Pending*	01/01/16 – 12/31/18	$300,000 TDC
HUGHES, Laura B	Co-Investigator; Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376 (Bridges); Active	09/01/11 - 08/31/15	$319,689
HUGHES, Laura B	Co-Investigator, Project 3: Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; (Bridges, PD/PI; Elson, Project Leader); Active	09/16/13 – 07/31/18	$165,151
HUGHES, Laura B	Co-Investigator; The Rheumatoid Arthritis Synovial Tissue Network (REASON)	Northwestern University/ NIAMS; UH2 AR067687 (Pope, PD/PI; Bridges, Subaward PI); Active	09/26/14 - 08/31/15	$17,959
HUGHES, Laura B	Co-Investigator; Ethnic Differences in Responses to Painful Stimuli	University of Florida/NIH/NIA; R37 AG033906 (Fillingim, PD/PI; Bradley, Subaward PI); Active	09/01/14 - 04/30/19	$373,366
JAVED, Amjad	PI; Sp7 Mediated Control of Runx2 Function for Osteoblast Differentiation	NIH-NIAMS; R01 AR062091; Active	03/01/12 - 02/28/17	$225,000
JAVED, Amjad	Primary Mentor; Osteoblast and Odontoblast Specific Regulatory Action of Runx2 for Bone and Tooth Formation	NIH/NIDCR; F30 DE022693 (Adhami); Active	07/01/12 – 05/31/16	$46,186
JAVED, Amjad	Co-Investigator; Heparanase Regulation of Osteolysis in Multiple Myeloma	NIH/NCI; R01 CA151538 (Yang); Active	07/01/11 - 06/30/16	$189,817
JAVED, Amjad	PI; Molecular Circuitry in Functional Development and Degeneration of TMJ	NIH/NIDCR; R21 DE025737; Pending*	12/01/15 - 11/30/17	$275,000 TDC

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JAVED, Amjad	PI/MPI; The Role of Osteoblast-derived Runx2 and Osteocytes in Multiple Myeloma	NIH/NCI; R01 CA200729 (Yang); Pending*	09/01/15 - 08/31/20	$1,271,372 TDC
JAVED, Amjad	Primary Mentor; Regulatory Control of Adiposity and Energy Homeostasis by Runx2	NIH/NIDDK; K99 DK107873 (Ding); Pending*	12/01/15 - 11/30/20	$930,699 TDC
JUN, Ho-Wook	PI; Prohealing Multifunctional Endothelium Nanomatrix Coated Stent	NIH/NHLBI; R01 HL125391; Active	01/15/15 – 12/31/19	$250,000
JUN, Ho-Wook	PI; CAREER: The Bioactive Hybrid Nanomatrix for Intervertebral Disk Regeneration	NSF; CBET-0952974; Active	07/15/10 – 06/30/15	$55,578
JUN, Ho-Wook	Subaward PI; Cell Therapy for Diabetic Peripheral Neurovascular Complications	Emory University/ NIH/NIDDK; DP3 DK094346 (Yoon); Active	09/30/11 – 08/31/16	$35,000
JUN, Ho-Wook	PI; Biochemical Characterization of Cells and Extracellular Matrix Components Derived from Human Amniotic Membrane, Amniotic Fluid, and Amniotic Fluid/Tissue Based Products	NuTech Medical Inc.; Active	04/01/12 – 03/31/16	$26,250
JUN, Ho-Wook	PI; A Hybrid Nanosack for the Enhanced Islet Engraftment in the Omentum	NIH; R03 EB017344; Active	07/15/13 – 06/30/15	$49,779
JUN, Ho-Wook	Subcontract PI; Cardiac Regeneration with Bioengineered Human Stem Cells	Emory University/ NIH; Pending*	07/01/16 – 06/30/19	$60,000 TDC
JUN, Ho-Wook	Subcontract PI; Stem Cell-Based Therapy for Lymphedema	Emory University/ NIH; Pending*	07/01/16 – 06/30/19	$60,000 TDC
JUN, Ho-Wook	PI; To Evaluate Multifunctional Endothelium-Simulating Nanomatrix Coated Stents in Bioreactor and Rabbit Lliac Artery Models	American Heart Association; Pending*	07/01/15 – 06/30/17	$52,000 TDC
JUN, Ho-Wook	Subcontract PI; Effects of Reprogrammed and Engineered MSCs on Diabetic Complications	Emory University/ NIH; Pending*	12/01/15 – 11/30/18	$75,000 TDC
JUN, Ho-Wook	Subcontract PI; Vascular Regeneration with Engineered Stem Cell Derived Endothelial Cells	Emory University; Pending*	12/01/16 – 11/30/19	$60,000 TDC
KEARNEY, John F	PI; Regulation of B Cell Clonal Diversity and Its Role in Disease	NIH/NIAID; R01 AI014782; Active	03/01/011 - 02/29/16	$250,000
KEARNEY, John F	PI; Effects of neonatal microbial exposure on anti-polysaccharide B cell development	NIH/NIAID; R01 AI100005; Active	03/01/12 – 02/28/17	$211,519

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KEARNEY, John F	PI; Analysis of human and mouse antibodies to beta cell antigens bearing N-acetyl glucosamine post-translational modifications and their potential to prevent human type 1 diabetes.	Juvenile Diabetes Research Foundation International; 2-SRA-2014-300-Q-R; Active	10/01/14 – 09/30/16	$118,182
KEARNEY, John F	PI; Role of Aryl Hydrocarbon Receptor in B Cell Development and Function	American Heart Association; 15POST22640004; Active	01/01/15 - 12/31/16	$51,820
KEARNEY, John F	Primary Mentor; Protective Effects of Anti-BclA Antibodies in Bacillus Anthracis Infection	NIH/NIAID; F31 AI094961 (Rodriguez Barrantes); Active	03/01/11 – 02/29/16	$34,982
KEARNEY, John F	Co-Investigator; Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376 (Bridges); Active	09/01/11 - 08/31/15	$319,689
KEARNEY, John F	Primary Mentor; Commensal-Dependent Maturation of the Natural IgM Repertoire	NIH/NIAID; F31 AI120500 (James S. New); Pending*	07/01/15 - 06/30/18	$105,294 TDC
KEARNEY, John F	Co-Investigator, Administrative and Recruitment Core; B Cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly); Pending*	09/01/15 - 08/31/20	$8,696,843 TDC
KEARNEY, John F	Co-Investigator; Environmental Influence on B Cell Mediated Intestinal Immunity in Neonates	American Pediatric Surgical Association Foundation; (Martin); Pending*	06/01/15 - 06/30/16	$25,000 TDC
KEARNEY, John F	Co-Investigator; Environmental Influence on B Cell Mediated Intestinal Immunity in Neonates	Johnson (Robert Wood) Foundation; (Martin); Pending*	01/01/16 - 12/31/19	$375,000 TDC
KEARNEY, John F	PI; Antibody Induction by Group B Streptococcal Vaccines for Protection Against Fungal Infections	NIH; R21; Pending*	07/01/15 - 06/30/17	$275,000 TDC
KEARNEY, John F	PI; Regulation of B Cell Clonal Diversity and Its Role in Disease	NIH/NIAID; R01 AI14782; Pending*	03/01/016 - 02/28/21	$1,250,000 TDC
KIMBERLY, Robert P	PI; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1)	NIH/NCATS; U54 TR001005; (Active)	09/01/14 – 08/31/15	$3,349,010
KIMBERLY, Robert P	PI; Innovation and Economic Development in Clinical and Translational Science (PI)	Alabama Department of Commerce; Active	10/01/12 – 09/30/15	$1,079,272
KIMBERLY, Robert P	Executive Committee Member, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
KIMBERLY, Robert P	Co-Investigator; Individualized Patient Decision Making for Treatment Choices Among Minorities with Lupus	PCORI; CE-1304-6631 (Singh); Active	01/01/14 – 12/31/16	$381,466
KIMBERLY, Robert P	PD/PI; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368; Pending*	09/01/15 – 08/31/20	$35,397,604 TDC

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KIMBERLY, Robert P	PD/PI; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366; Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
KIMBERLY, Robert P	Subaward PI; Comprehensive Analysis of the TGF-beta/BMP Pathways in Colorectal Cancer	Wake Forest University/NIH; Pending*	02/01/16 - 01/31/21	$223,495 TDC
KIMBERLY, Robert P	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
KORF, Bruce R	PI; The Neurofibromatosis Clinical Consortium Award	DoD Army Medical Requisition Activity; W81XWH-12-1-0155; Active	05/15/12 - 05/14/17	$1,671,899
KORF, Bruce R	PI; TSC Natural History Database	Tuberous Sclerosis Alliance; Active	01/01/14 - 12/31/15	$ 33,700
KORF, Bruce R	PI; Characterizing Novel NF-1 Mouse Models and Developing New Therapeutic Interventions	Children's Tumor Foundation; Active	07/01/13 - 06/30/15	$ 54,000
KORF, Bruce R	Co-Investigator; Early Biomarkers of Autism Spectrum Disorders in Infants with Tuberous Sclerosis	Children's Hospital (Boston); RSTFD0000596370 (Bebin, PD/PI; Cutter, Site PI); Active	09/01/13 – 08/31/17	$34,825
KORF, Bruce R	PI; UAB/HudsonAlpha/Iowa Center for Mendelian Genomics	NIH/NHGRI; UM1 HG008897; Pending*	05/15/15 - 12/31/18	$16,562,572 TDC
KORF, Bruce R	Subaward PI; Overcoming Barriers to Anti-Epileptogenic Drug Trials Targeting the mTOR Pathway in Tuberous Sclerosis Complex	Cincinnati Children's Hospital /NIH; Pending*	07/01/15 - 06/30-20	$115,215 TDC
KORF, Bruce R	Co-Investigator; NF-1 Premature Stop Mutations: Nonsense Suppression Therapies Assessed in Translational Mouse Models	DoD; (Kesterson); Pending*	09/30/15 - 09/29/18	$525,000 TDC
KORF, Bruce R	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
KORF, Bruce R	Co-Investigator; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly); Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
LEFKOWITZ, Elliot	Co-Investigator and Director, Biomedical Informatics Component; UAB Center for Clinical and Translational Science	NIH/NCATS; U54 TR001005 (Kimberly); Active	09/01/14 – 08/31/15	$3,349,010

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LEFKOWITZ, Elliot	Co-Investigator and Director, Molecular Genetic Bioinformatics Facility, Genomics Core; UAB Center for AIDS Research	NIH/NIAID; P30 AI027767 (M. Saag, PD/PI; Morrow, Core Leader); Active	06/01/14 - 05/31/19	$102,786
LEFKOWITZ, Elliot	Co-Investigator, Methodology Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI; Cui, Core Leader); Active	09/16/13 - 07/31/18	$151,018
LEFKOWITZ, Elliot	Co-Investigator ; DiSCIS Biostatistics & Bioinformatics Core; UAB AC STI Clinical Research Consortium	NIH/NIAID; U19 AI113212 (Cutter); Active	06/15/14 - 05/31/19	$183,087
LEFKOWITZ, Elliot	Co-Investigator; Epigenetics, neurodevelopment, and emotional behavior	NIH/NIMH; R01 MH105447 (Clinton); Active	01/01/15 - 11/30/19	$250,000
LEFKOWITZ, Elliot	Co-Investigator; Exploration of the gut microbiome in Spondyloarthritis	American College of Rheumatology; (Stoll); Active	07/01/13 – 06/30/16	$115,741
LEFKOWITZ, Elliot	Co-Investigator; Enteric Flora in Newly Diagnosed Spondyloarthritis: A Collaborative Study	FRIENDS OF CARRA; (Stoll) Active	10/01/13 – 09/30/15	$25,000
LEFKOWITZ, Elliot	Co-Investigator; UAB Infrastructure for Storage and Analysis of Next-Generation Sequence Data	Institutional Funds/University of Alabama Health Services Foundation; (Basu); Active	11/01/13 - 10/31/15	$ 44,694
LEFKOWITZ, Elliot	Co-Investigator; Prematurity Prevention and Research Related to the Microbiome (PREPARE-M)	Institutional Funds/University of Alabama Health Services Foundation; (Edwards);Active	11/01/13 - 10/31/15	$56,622
LEFKOWITZ, Elliot	Co-Investigator and Director, Biomedical Informatics Component; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
LEFKOWITZ, Elliot	Co-Investigator; Mucosal Microbiome Core; Model Gastric and Intestinal Mucosa to Elucidate Microbe Pathogenesis	NIH/NIAID; U19 AI116489 (Smith & Smythies, PD/PI; Morrow, Core Leader); Pending*	05/01/15 - 04/30/20	$4,810,612 TDC
LEFKOWITZ, Elliot	Co-Investigator; Translating Science into Curriculum Based Oral Health Literacy and Practice to Reduce Oral Health Disparities in Children	NIH/NIDCR; UH2 DE025495 (Childers); Pending*	09/01/15 – 08/31/20	$3,324,819 TDC
LEÓN RUIZ, Beatriz	PI; Regulation of T cell responses to allergens and environmental microbes	NIH/NIAID; R01 AI116584; Active	02/10/15 - 01/31/20	$250,000

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LEÓN RUIZ, Beatriz	Co-Investigator; Controlling Th2 Immunity by Tuning CXCL13 Dependent DC Migration in Lymph Nodes	NIH/NIAID; R01 AI104725 (Lund); Active	03/15/13 - 02/28/18	$250,000
LEÓN RUIZ, Beatriz	Co-Investigator; Project 3: Role of cytokine-producing effector B cells in autoimmunity; B cells in Health and Disease	NIH/NIAID; P01 AI078907 (Sanz, PD/PI; Lund, Project PI); Active	08/01/10 - 07/30/15	$258,848
LEÓN RUIZ, Beatriz	Co-Investigator; Molecular characterization of the role for T-bet and Bcl-6 in immune cell metabolism and differentiation	NIH/NIAID; R01 AI061061 (Weinmann); Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
LEÓN RUIZ, Beatriz	Co-Investigator; Impact of SLE-Associated ITGAM Variants on Dendritic Cell Function	NIH/NIAID; R21 AR069295 (Szalai & Bullard); Pending*	09/01/15 – 08/31/17	$275,000 TDC
LI, Yi-Ping	PI; Inhibiting Periodontitis by Targeting Cathepsin K and Attenuating TLR Signaling.	NIH/NIDCR; R01 DE023813; Active	01/01/14 - 11/30/18	$250,000
LI, Yi-Ping	PI; Transcription Regulation of Osteoclast Lineage Commitment and Differentiation	NIH/NIAMS; R01 AR044741; Active	04/01/12 - 03/31/17	$250,000
LI, Yi-Ping	PI; Targeting Atp6v1c1 to Inhibit Lung Cancer Growth and Metastasis by Reducing Cancer Microenvironment Conditions and F-Actin Polymerization Simultaneously	DoD; Pending*	10/01/15 - 09/30/16	$100,000 TDC
LI, Yi-Ping	Co-Investigator; Negative Regulators of Osteoclast Differentiation and Function	NIH/NIAMS; R01 AR068302 (Chen); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
LI, Yi-Ping	Co-Investigator; Role of Runx1 in Bone Homeostasis and Aging Bone	NIH/NIAMS; R01 AR068971 (Chen); Pending*	09/01/15 - 08/31/20	$1,250,000 TDC
LI, Yi-Ping	Co-Investigator; Regulation of Novel Alpha2A Adrenergic Receptor Signaling by Spinophilin	NIH/NIMH; R01 MH081917 (Wang); Pending*	12/01/15 - 11/30/20	$1,264,898 TDC
LIU, Nianjun	Co-Investigator; Genetic and Clinical Predictors of Response to Warfarin and Novel Anticoagulants	NIH/NHLBI; R01 HL092173 (Limdi): Active	02/01/14 – 01/31/19	$492,580
LIU, Nianjun	Co-Investigator, Methodology Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI; Cui, Core Leader); Active	09/16/13 - 07/31/18	$151,018
LIU, Nianjun	Co-Investigator; Mitochondrial Nuclear Interactions and CVD Susceptibility	NIH/NHLBI; R01 HL103859 (Ballinger); Active	07/19/11 - 04/30/16 NCE	
LIU, Nianjun	Co-Investigator; Ozone ApoE4, Aging, and Alzheimer's Disease	NIH/NIA; R21 AG046701 (R-M Liu); Active	09/30/15 – 06/30/15	$125,000

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LIU, Nianjun	PI; High-Dimensional Statistical Genetic Methods for Dental Caries and Orofacial Clefts	NIH/NIDCR; R03 DE025646; Pending*	04/01/16 – 03/31/18	$300,000 TDC
LIU, Nianjun	PI; Statistical Methods for Family-Based Next Generation Sequencing Data	NIH/ NHGRI; R21 HG008740; Pending*	09/01/15 – 08/31/17	$275,000 TDC
LIU, Nianjun	PI; Secondary Analysis and Risk Prediction of Dental Caries and Oral Clefts	NIH/NIDCR; R03 DE024198; Pending*	07/01/15 – 06/30/17	$330,764 TDC
LIU, Nianjun	Co-Investigator; Design and Analysis of Whole-Genome Sequencing Studies for Complex Diseases	NIH/NHGRI; R21 HG008922 (Zhang); Pending*	04/01/16 - 03/31/18	$275,000 TDC
LIU, Nianjun	Co-Investigator; PAI-1 and Aging-Related Susceptibility to Lung Fibrosis	NIH/NIA; R01 AG049830 (R-M Liu); Pending*	09/01/15 - 08/31/20	$1,570,175 TDC
LIU, Nianjun	Co-Investigator; Regulation of APP by Adrenergic Signaling	NIH/NINDS; R01 NS095264 (Wang); Pending*	10/01/15 - 09/30/20	$1,250,000 TDC
LIU, Nianjun	Co-Investigator; Bayesian Methods for Incorporating Biological Information into Prognostic and Predictive Modeling	NIH/NHGRI; R01 HG008739 (Yi); Pending*	09/01/15 - 08/31/20	$1,125,000 TDC
LIU, Nianjun	Co-Investigator; A Telescopic Algorithm for Two-Dimensional Hidden Markov Models with Application to Genetic Studies	National Science Foundation; (X-Y Lou); Pending*	07/01/15 - 06/30/20	$1,359,541 TDC
LORENZ, Robinna	PI; Antimicrobial Molecule Expression in the FVB.mdr1a Model of Colitis	Crohn's & Colitis Foundation of America; Active	07/01/14 – 06/30/15	$2,500
LORENZ, Robinna	PI; Preparation for Graduate and Medical Education (PreGAME) Program	NIH/NHLBI; R25 HL120883; Active	04/01/14 – 03/31/19	$60,000
LORENZ, Robinna	PI; Southeastern Medical Scientist Symposium	NIH/NIGMS; R13 GM109532; Active	05/01/14 – 01/31/17	$5,000
LORENZ, Robinna	Co-Investigator: Interactions Between AhR Ligands and the Gut Microbiota in Murine Arthritis	NIH/NIEHS; R21 ES024413 (Stoll); Active	08/01/14 - 07/31/16	$150,000
LORENZ, Robinna	PI; Impact of Bacterial Stimulation of Antimicrobial Peptide Expression in P-glycoprotein Models of Colitis	Crohn's & Colitis Foundation of America; Pending*	06/01/15 – 08/24/15	$2,500 TDC
LORENZ, Robinna	Co-Investigator; Environmental Influence on B Cell Mediated Intestinal Immunity in Neonates	American Pediatric Surgical Association Foundation; (Martin); Pending*	06/01/15 - 06/30/16	$25,000 TDC
LORENZ, Robinna	Co-Investigator; Environmental Influence on B Cell Mediated Intestinal Immunity in Neonates	Johnson (Robert Wood) Foundation; (Martin); Pending*	01/01/16 - 12/31/19	$375,000 TDC

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LORENZ, Robinna	Co-Investigator; A Total-Immersion, Informatics and Big Data Analytics Beginner Bootcamp	NIH/NHGRI; R25 HG008826 (Park); Pending*	12/01/15 – 11/30/18	$240,972 TDC
LUND, Frances E	PI, Project 3: Role of cytokine producing effector B cells in autoimmunity; B cells in Health and Disease	Emory University/NIH/NIAID; P01 AI078907 (Sanz, PD/PI); Active	08/01/10 - 07/30/15	$258,848
LUND, Frances E	PI, Controlling TH2 immunity by tuning CXCL13 dependent DC migration in Lymph Nodes	NIH/NIAID; R01 AI104725; Active	03/15/13 - 02/28/18	$250,000
LUND, Frances E	PI, Control of anti-viral B cell responses by IFN□, T-bet and Eomes	NIH/NIAID; R01 AI110508; Active	02/14/14 - 01/31/19	$145,886
LUND, Frances E	PI, Project 3: Control of anti-viral B cell responses by Tbox family proteins; Virus induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962 (Randall, PD/PI); Active	08/01/14 - 07/31/19	$236,002
LUND, Frances E	Core Leader, Core B: Viral stocks and reagents; Virus induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962 (Randall, PD/PI); Active	08/01/14 - 07/31/19	$141,050
LUND, Frances E	Co-Investigator; Central and Effector B Cells in the Lung	NIH/NIAID; R01 AI097357 (Randall); Active	05/11/12 - 04/30/17	$250,000
LUND, Frances E	PI; The Mechanism Whereby CD38 Deficiency Inhibits Alzheimer's Disease Pathology in a Mouse Model	United States - Israel Binational Science Foundation; Active	10/01/12 – 09/30/16	$6,261
LUND, Frances E	Core Leader, B Cell Subset Isolation and Characterization Core; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly, PD/PI); Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
LUND, Frances E	Primary Mentor; Regulation of Anti-Viral B Memory Responses by T-Bet	NIH//NIAID; F30 AI115878 (Stone); Pending*	07/01/15 – 11/30/18	$144,313 TDC
MANNON, Peter J	PI; Ulcerative Colitis - Regulation of the IL-13 Receptor System	NIH/NIDDK; R01 DK097107; Active	08/01/13 - 06/30/17	$200,000
MANNON, Peter J	PI; Role of the Gut Microbiome in Post-transplant Obesity	Angus Cooper Comprehensive Transplant Institute Award in Transplant Immunology; Active	01/01/14 - 12/31/15	$40,000
MANNON, Peter J	Subaward PI; IBD Gene Mapping by Clinical And Population Subset	Johns Hopkins University/ NIH/NIDDK; U01 DK062431 (Brant, PD/PI); Active	09/24/12 - 08/31/15	$8,000

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MANNON, Peter J	Co-Investigator; Ulcerative Colitis Genetics Initiative	Washington University; Crohn's and Colitis Foundation of America; (Elson, Subaward PI); Active	10/01/14 - 09/30/17	$227,055
MANNON, Peter J	PI; Endophenotypes of Treatment Resistance in Ulcerative Colitis: Clinical Activity of Interferon-Beta Therapy (The ETRUsCAn Trial)	DoD; Pending*	07/01/15 – 06/30/20	$4,347,590 TDC
McLAIN, Amie Brown	PI; UAB SCI Model System	Department of Education; H133N110008 (McLain); Active	10/01/11 – 09/30/16	$374,801
McLAIN, Amie Brown	Co-Investigator, Collaborative Opportunities Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; Cutter, Component Lead); Pending*	09/01/15 – 08/31/20	$3,750,000 TDC
McLAIN, Amie Brown	Co-Investigator, Administrative Oversight Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI); Pending*	09/01/15 – 08/31/20	$3,750,000 TDC
McLAIN, Amie Brown	Co-Investigator; Scale Up Evaluation of a Physical Activity Program for Adults with Physical Disability	NIH; (Rimmer); Pending*	07/01/15 06/30/20	$2,487,294 TDC
McLAIN, Amie Brown	Co-Investigator; Impact of Exercise Training Followed by Subsequent Detraining or Maintenance Training on Muscle Mass Regulation and Health After Spinal Cord Injury	DoD; (Bickel); Pending*	06/01/15 - 05/31/19	$1,588,881 TDC
MORGAN, Sarah L	Co-Investigator; A patient activation intervention to enhance bone health in older adults	University of Iowa/NIH/NIA; R01 AG033035 (Wolinksy, PD/PI; K. Saag, Site PI); Active	04/01/11 – 03/31/16 NCE	
MORGAN, Sarah L	PI; Does Raloxifene Alter Methotrexate Metabolism in Rheumatoid Arthritis?	NIH/NIAMS; R21 AR069264; Pending*	09/01/15 – 08/31/17	$275,000 TDC
MORGAN, Sarah L	PI; Does Methotrexate and Folic Acid Treatment for RA Predispose to B12 Deficiency?	NIH/NIAMS; R21 AR068563; Pending*	07/01/15 – 06/30/17	$275,000 TDC
MOUNTZ, John D	PI; Follicular Exclusion 0f Self Antigens Prevents Development of Autoantibodies	NIH/NIAID; R01 AI071110; Active	02/01/14 - 01/31/19	$250,000
MOUNTZ, John D	PD/PI & Core Leader, Administrative Core; Rheumatic Diseases Research Core Centers	NIH/NIAMS; P30 AR048311; Active	09/01/12 – 08/31/17	$107,404

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MOUNTZ, John D	PD/PI & Core Leader, Comprehensive Flow Cytometry Core; Rheumatic Diseases Research Core Centers	NIH/NIAMS; P30 AR048311; Active	09/01/12 – 08/31/17	$86,107
MOUNTZ, John D	Co-Investigator; Inhibiting Periodontitis by Targeting Cathepsin K and Attenuating TLR Signaling	NIH/NIDCR; R01 DE023813 (Y-P Li); Active	01/01/14 – 11/30/18	$250,000
MOUNTZ, John D	PI; Laser and Filter Upgrade for the Flow Cytometers in CFCC at Shelby	University of Alabama Health Services Foundation; Active	11/01/14 – 10/31/16	$86,167
MOUNTZ, John D	PI; Correction of Mechanosensing Signaling Defects to Normalize Clearance of Apoptotic Cells in Lupus	Alliance for Lupus Research; Pending*	07/01/15 – 06/30/18	$200,000 TDC
MOUNTZ, John D	PI; Induction of Apoptotic Cell Reactive B Cells by Type I IFN in BXD2 Mice	Lupus Foundation of America, Inc; Pending*	05/01/15 – 04/30/16	$4,000 TDC
MOUNTZ, John D	Co-Investigator; Preventing Periodontitis by Targeting Rgs10 and Regulating TLR-GPCR Signaling	NIH/NIDCR; R01 DE024551 (Chen); Pending*	04/01/16 – 03/31/21	$1,250,000 TDC
MOUNTZ, John D	Co-Investigator; Repopulation of tolerogenic B cells post B cell depletion therapy in lupus	Lupus Research Institute; Pending*	01/01/16 – 12/31/18	$300,000 TDC
MUNTNER, Paul	PI; Incorporation of a Hypertension Working Group into the Jackson Heart Study	NIH/NHLBI; R01 HL117323; Active	07/15/13 – 06/30/16	$274,196
MUNTNER, Paul	PI; Cardiovascular Collaboration: Cardiovascular Disease, Prevention, Treatment and Outcomes	Amgen, Inc.; 200709284; Active	03/01/12 – 01/31/16	$652,745
MUNTNER, Paul	Site PI; George M. O'Brien Kidney Research Core Centers	Duke University/NIH/NIDDK; P30 DK096493; Active	08/15/12 – 06/30/17	$13,605
MUNTNER, Paul	PI; Visit-to-visit variability of blood pressure and CVD and renal outcomes	NIH/NHLBI; R01 HL110993; Active	05/01/12 – 04/30/16 NCE	
MUNTNER, Paul	Co-Investigator; Activating Patients to Reduce Osteoporosis (APROPOS)	NIH/NIAMS; R01 AR060240 (K. Saag); Active	07/01/11 – 03/31/16	$516,049
MUNTNER, Paul	Co-Investigator, Myocardial Infarction 2; REasons for the GeogrAphic and Racial Differences in Stroke	NIH/NHLBI; R01 HL080477 (Safford); Active	09/30/11 – 08/31/16	$621,301
MUNTNER, Paul	PI, Project 2: A Novel Tool and Multi-Modal Intervention for Improving Osteoporosis Treatment Adherence; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (K. Saag); Active	09/01/11 – 08/31/16	$112,710

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MUNTNER, Paul	Co-Investigator; Coronary Artery Risk Development in Young Adults (CARDIA): Birmingham Alabama Field Center	NIH/NHLBI N01 HC48047; HHSN268201300026C (Lewis); Active	12/30/08 – 06/30/18	$1,313,771
MUNTNER, Paul	Co-Investigator; Trace Elements Levels and Risk of Stroke: A Reason for 'Stroke Belt'	Indiana University/NIH/NIEHS R01 ES021735 (McClure); Active	10/01/12 – 06/30/17	$80,864
MUNTNER, Paul	Executive Committee Member, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
MUNTNER, Paul	PI; Race, ambulatory blood pressure phenotypes, and subclinical CVD and renal disease	NIH/NHLBI; R01 HL125394; Pending*	07/01/15 – 06/30/16	$1,955,149 TDC
MUNTNER, Paul	PI, Project 1: Racial Differences and US Population Estimates of Nocturnal Hypertension and Non-Dipping; University of Alabama at Birmingham Strategically Focused Hypertension Research Center	American Heart Association; Pending*	04/01/15 – 03/31/19	$528,000 TDC
MUNTNER, Paul	PI; Use of Medicare Inpatient Claims Data for the Identification of Myocardial Infraction: Data from the REGARDS Study	American Heart Association; 15PRE2553004; Pending*	07/01/15 - 06/30/17	$52,000 TDC
MUNTNER, Paul	Co-Investigator; Analysis of Whole Genome Sequence Data for CKD and Renal Traits in African Americans	University of North Carolina at Chapel Hill; (Irvin); Pending*	07/01/15 - 06/30/20	$1,106,511 TDC
MUNTNER, Paul	Primary Mentor; Racial Disparities in the Maintenance of Healthy Lifestyles and Their Effect on Cumulative Blood Pressure Burden and Left Ventricular Mass in African Americans and Whites: Data from the CARDIA Study	NIH/NHLBI; F31 HL129701 (Booth); Pending*	07/01/15 – 06/30/17	$78,822 TDC
MUNTNER, Paul	Co-Investigator; Development of a Kidney Tubule Health Panel in Population-Based Cohorts	Tufts New England Medical Center; (Gutierrez); Pending*	07/01/15 - 06/30/20	$176,930 TDC
MUNTNER, Paul	Co-Investigator; Innovative Research in HIV in Kidney, Urology and Hematology	NIH/NIDDK; R01 DK108438 (Overton); Pending*	12/01/15 - 11/30/20	$2,686,040 TDC
MUNTNER, Paul	Co-Investigator; Project 1: Reaching the Hardly-Reached to Eliminate Disparities in Cardiovascular Disease; Eliminate Cardiovascular Disease (CVD) Disparities	American Heart Association; (Safford, PD/PI; Carson, Project PI); Pending*	07/01/15 - 06/30/19	$3,391,542 TDC

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MUNTNER, Paul	Co-Investigator; Project 4, Center Core; Eliminate Cardiovascular Disease (CVD) Disparities	American Heart Association; (Safford, PD/PI, Core Leader); Pending*	07/01/15 - 06/30/19	$3,391,542 TDC
MURPHY-ULLRICH, Joanne	PI; The Thrombospondin1-TGF-Beta Axis in Multiple Myeloma	NIH/NCI; R01 CA175012; Active	07/01/14 - 06/30/19	$515,979
MURPHY-ULLRICH, Joanne	PI; The Endoplasmic Reticulum Stress Protein Calreticulin in Diabetic Chronic Kidney Disease	DoD Army Medical Research Acquisition Activity; W81XWH-14-1-0203; Active	07/01/14 - 06/30/17	$245,841
MURPHY-ULLRICH, Joanne	Subaward PI; Role of TSP1-TGF-beta in biomechanical remodeling in glaucoma	Eyesight Foundation of Alabama; 38-2009-633; Active	12/31/13 - 12/30/15	$70,000
MURPHY-ULLRICH, Joanne	Collaborator; Thrombospondin-1/calreticulin binding in regulation cell intermediate adhesion and collagen expression	NSF; CBET-1159859 (Song); Active	10/01/12 - 09/30/15	$10,000
MURPHY-ULLRICH, Joanne	P & F Director, Administrative Core; UAB Hepatobiliary Fibrocystic Diseases Research and Translational Core Center	NIH/NIDDK; P30 DK074038 (Yoder, PD/PI); Active	10/01/10 - 06/30/15	$10,000
MURPHY-ULLRICH, Joanne	Collaborator; Microvascularized 3D Breast Cancer Constructs for Drug Testing and Development	DoD Army Medical Research Acquisition Activity; W81XWH-13-1-0292 (Berry); Active	09/30/13 - 09/29/16	$7,000
MURPHY-ULLRICH, Joanne	PI; TSP1-TGF-Beta Antagonists in the Myeloma Microenvironment	NIH/NCI; R21 CA197883; Pending*	07/01/15 – 06/30/17	$275,000 TDC
MURPHY-ULLRICH, Joanne	Collaborator; Epithelial Stimulation of Myofibroblast Activation in CF Lung Disease	Parker B. Francis Foundation; (Harris); Pending*	07/01/15 - 06/30/18	$156,000 TDC
MURPHY-ULLRICH, Joanne	Co-Investigator; MRI: Acquisition of a Bioplotter for 3D Tissue Engineering	National Science Foundation; (Sethu); Pending*	09/01/15 - 08/31/17	$237,397 TDC
MURPHY-ULLRICH, Joanne	Co-Investigator; PAI-1 and Aging-Related Susceptibility to Lung Fibrosis	NIH/NIA; R01 AG049830 (R-M Liu); Pending*	09/01/15 - 08/31/20	$1,570,175 TDC
MYERS, Richard M.	PD/PI; Toward a comprehensive functional annotation of the human genome	NIH/NHGRI; U54 HG006998; Active	09/21/12 - 07/31/16	$1,012,140
MYERS, Richard M.	Collaborator; Genome-Wide Association Study in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR057202 (Bridges); Active	09/25/09 - 07/31/15 NCE	
MYERS, Richard M.	Collaborator; Epigenetic Determinants of Lipid Response to dietary Fat and Fenofibrate	NIH/NHLBI; R01 HL104135 (Arnett); Active	08/15/10 - 05/31/15 NCE	

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MYERS, Richard M.	Site PI; Whole Genome and Exome Sequencing for Bipolar Disorder in the GPC	University of Michigan at Ann Arbor/NIH/NIMH; U01 MH105653 (Boehnke, PD/PI); Active	09/19/14 – 06/30/18	$24,248
MYERS, Richard M.	Co-PD/PI; Genomic Diagnosis in Children with Developmental Delay	NIH/NHGRI; UM1 HG007301 (Cooper & Myers, MPIs); Active	06/14/13 - 05/31/17	$1,312,080
MYERS, Richard M.	PI; Genomic profiling of ER+ breast cancer to identify signatures of therapy response	Susan G. Komen for the Cure; IIR13265422; Active	09/01/13 - 06/30/17	$191,892
MYERS, Richard M.	Collaborator; A genome-wide methylation study of epigenetic contributions to multiple myeloma	NIH/NCI; R21 CA155951 (Brown); Active	04/01/11 – 06/30/15	$73,975
MYERS, Richard M.	Collaborator; Regulation of LXR alpha by glucose & cholesterol in diabetes and atherosclerosis	New York University SOM/NIH/ NHLBI; R01 HL117226 (Fisher & Garabedian, MPIs); Active	12/01/13 - 11/30/18	$24,248
MYERS, Richard M.	Collaborator; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly, PD/PI); Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
NAPIERALA, Dobrawa	PI; Transcriptional Regulation of Dentin Mineralization	NIH/NIDCR; R01 DE023083; Active	04/10/14 - 03/31/19	$250,000
NAPIERALA, Dobrawa	PI; A pilot investigation of cellular responses after cyclic forces during orthodontic treatment	OrthoAccell Technologies Inc.; Active	03/21/14 - 03/20/16 NCE	
NAPIERALA, Dobrawa	Primary Mentor; Defining the Role of Trps1 in Phosphate Mediated Mineralization	NIH/NIDCR; F31 DE024926 (Kuzynski); Active	01/26/15 – 01/25/18	$37,520
NAVARRO-MILLÁN, Iris	PI; PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes	Rheumatology Research Foundation; Disease Targeted Innovative Research Award; Active	09/01/14 – 08/31/16	$174,368
NAVARRO-MILLÁN, Iris	Co-Investigator; Dissection of the ACPA response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376-S1; Active	09/01/12 – 08/31/15	$75,373
NAVARRO-MILLÁN, Iris	PI; Optimization of hyperlipidemia management in patients with rheumatoid arthritis: A patient-centered intervention development	NIH/NIAMS; K23 AR068449; Pending*	04/01/16 – 03/31/21	$601,250 TDC
NAVARRO-MILLÁN, Iris	PI; Optimization of hyperlipidemia management in patients with rheumatoid arthritis: A patient-centered intervention development	Rheumatology Research Foundation; Career Development K-Bridge Funding award; Pending*	07/01/15 – 06/30/16	$75,000 TDC

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NOVAK, Jan	PI; Molecular Basis of Pathogenicity of IgA1-containing Immune Complexes	NIH/NIDDK; R01 DK078244; Active	06/01/07 – 07/31/17	$150,000
NOVAK, Jan	MPI; IgA Nephropathy: Interventions with Generation of Nephritogenic Immune Complexes	NIH/NIDDK; R01 DK099228 (Mestecky & Novak); Active	07/01/14 – 04/30/17	$259,876
NOVAK, Jan	Collaborator; GDCN Clinical Center - Advancing Clinical Research in Primary Glomerular Diseases	University of North Carolina at Chapel Hill/NIH; (Julian); Active	06/01/14 - 05/31/18	$14,363
NOVAK, Jan	PI; Evaluation of the Effects of BAFF and Blisibimod in IgA1 - and IgG-producing Cell Lines and in Primary Human Peripheral-Blood Cells	Anthera Pharmaceuticals, Inc; Active	03/25/15 - 03/24/16	$73,117
NOVAK, Jan	Subaward PI; Smoke Induced Airway in the Lung	Columbia University/NIH; Active	09/15/14 - 06/30/19	$236,370
NOVAK, Jan	MPI; Elucidating IgA Nephropathy Through Genetic Studies of IgA1 Glycosylation	Columbia University/NIH/NIDDK; R01 DK082753 (Gharavi & Novak); Active	05/01/09 – 06/30/19	$202,245
NOVAK, Jan	Co-Investigator; Analytical Tools for the Analysis of Clustered O-Glycans in Clinical Samples	NIH/NIGMS; R01 GM098539 (Renfrow); Active	09/15/11 - 08/31/15	$219,804
NOVAK, Jan	Subaward PI; Genetic causes of IgA nephropathy by integrative network-based association studies	Columbia University/NIH/NIDDK; R01 DK105124 (Kiryluk); Pending*	04/01/15 - 03/31/20	$389,440 TDC
NOVAK, Jan	PI; Abnormal STAT3 Signaling and Aberrant O-Glycosylation of IgA1 in IgA Nephropathy	NIH/NIDDK; K01 DK106341; Pending*	07/01/15 – 06/30/20	$696,500 TDC
NOVAK, Jan	Co-Investigator; Analytical Tools for the Analysis of Clustered O-Glycosylation in Clinical Samples	NIH/NIGMS; R01 GM098539 (Renfrow); Pending*	09/01/15 - 08/31/20	$ 1,685,680 TDC
NOVAK, Jan	Co-Investigator; Synthetic Peptide Standards for O-Glycoform Selective Screening	NIH/NCI; R21 CA199851 (Placzek); Pending*	08/01/15 - 07/31/17	$400,000 TDC
NOVAK, Jan	Co-Investigator; Dissecting Anti-HIV IgG and IgA Isotype Competition in Genital and Systemic Sites	NIH; (Smith); Pending*	09/01/15 - 08/31/20	$2,544,090 TDC
NOVAK, Jan	Co-Investigator; Waters Synapt-G2I Ion Mobility TOF MS with EDT Capability	NIH – Office of the Director; (Renfrow); Pending*	04/01/15 - 03/31/16	$600,000 TDC
PONCE, Brent A	PI; Enhancement of Surgical Skills Training for Undergraduate and Graduate Medical Education	Institutional Funds/University of Alabama Health Services Foundation; Active	11/01/14 – 10/31/16	$137,00
PONCE, Brent A	PI; Should Outcomes Clinical Study (SHOUT)	Tornier Corp.; Active	01/28/15 – 01/27/35	$2,990
PONCE, Brent A	Fellowship Director; Orthopaedic Research Fellowship 2015-2016	Tornier Corp.; Pending*	08/01/15 – 07/31/16	$27,100 TDC

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PONCE, Brent A	Co-Investigator; The Effect of Traction on Neuroma Formation	Plastic Surgery Foundation; (Meyer); Pending*	07/01/15 – 06/30/16	$7,761 TDC
PONNAZHAGAN, Selvarangan	PI; Gene-Engineered and Targeted Stem Cell Therapy for Myeloma	NIH/NCI; R01 CA133737; Active	05/01/09 – 03/31/16 NCE	
PONNAZHAGAN, Selvarangan	PI; Targeted Stem Cell Therapy Coupling Angiogenesis and Osteogenesis for Bone Defect	NIH/NIAMS; R01 AR060948; Active	09/01/11 – 08/31/16	$220,500
PONNAZHAGAN, Selvarangan	PI; Targeted Therapy for Breast Cancer with Osteolytic Bone Damage	NIH/NCI; R01 CA184770; Active	03/01/15 - 02/29/20	$228,750
PONNAZHAGAN, Selvarangan	PI, Pilot Project 2; 1/2 The Alabama State University/UAB Comprehensive Cancer Center Partnership	NIH/NCI; P20 CA192973 (Manne/ Scarinci, MPIs); Active	09/23/14 - 08/31/18	$29,500
PONNAZHAGAN, Selvarangan	Co-Investigator; A Specific Screening Strategy to Reduce Prostate Cancer Mortality	DoD Army Medical Research Acquisition Activity; W81XWH-12-1-0356 (Zinn); Active	08/15/12 - 08/14/15	$125,000
PONNAZHAGAN, Selvarangan	Co-Investigator; Heparanase Regulation of Myeloma Metastasis: Mechanism and Therapy	NIH/NCI; R01 CA138340 (Sanderson); Active	07/03/09 - 04/30/19	$225,000
PONNAZHAGAN, Selvarangan	PI; Mechanism and Therapeutic Significance of Endostatin for CRPC	NIH/NCI; R01 CA202039; Pending*	09/01/15 - 08/31/20	$1,250,000 TDC
PONNAZHAGAN, Selvarangan	PI; Cell and Gene Therapy for Nonunion Bone Fracture	NIH/NIAMS; R01 AR068480; Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
PONNAZHAGAN, Selvarangan	PI; Osteoclast Functions and Therapeutic Targeting of MDSCs in Osteolytic Malignancies	NIH/NCI; R01 CA198481; Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
PONNAZHAGAN, Selvarangan	PI; Androgen Receptor Targeted Novel Combination Therapy for CRPC	DoD; Pending*	10/01/15 – 09/30/18	$375,000 TDC
PONNAZHAGAN, Selvarangan	PI; Osteoimmune Mechanisms of Segmental Bone Fracture Healing and Therapy	DoD; Pending*	10/01/15 – 03/31/17	$200,000 TDC
PONNAZHAGAN, Selvarangan	Co-Investigator; The Role of Non-Canonical Translation in Metastasis to the Bone	NIH; R21 (Thompson); Pending*	07/01/15 - 06/30/17	$275,000 TDC
PONNAZHAGAN, Selvarangan	Collaborator; nNav1.5 Blockers for Breast Cancer Metastasis Prevention	NIH/NCI; R03 CA201766 (Velu); Pending*	12/01/15 - 11/30/17	$100,000 TDC
RAMAN, Chander	PI; Role of TGFBR3 in T-Cell Development and Immune Response	NIH/NIAID; R21 IA107748; Active	08/01/14 – 07/31/16	$150,000

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RAMAN, Chander	Co-Preceptor; Interferon gamma in pathogenesis of rheumatoid arthritis	Rheumatology Research Foundation; Medical Student Research Preceptorship (Vinod; Bridges & Raman, Co-mentors); Active	05/015/15 - 04/30/16	$4,000
RAMAN, Chander	PI; T Cell Intrinsic Activity of TGFBR3 (Betaglycan) in Regulation of Inflammation	National Multiple Sclerosis Society; Pending*	07/01/14 - 06/30/15	$40,000 TDC
RAMAN, Chander	Co-Investigator; Endophenotypes of Treatment Resistance in Ulcerative Colitis: Clinical Activity of Interferon-Beta Therapy (The ETRUsCAn Trial)	DoD; (Mannon); Pending*	07/01/15 – 06/30/20	$4,347,590 TDC
RAMAN, Chander	PI; Interferon Gamma and Disease Severity in Rheumatoid Arthritis	NIH/NIAMS; R21 AR068246 (Raman & Bridges, MPI); Pending*	07/01/15 – 06/30/17	$275,000 TDC
RAMAN, Chander	Co-Investigator; Pericyte Regulation of T Cell Infiltration in Multiple Sclerosis	National Multiple Sclerosis Society; (DeSilva); Pending*	10/01/15 - 09/30/19	$ 727,648 TDC
RAMAN, Chander	Co-Investigator; Mechanisms Elicited by Type I Interferons in Cutaneous Photocarcinogensis	NIH; R01 (Yusuf); Pending*	04/01/16 - 03/31/21	$1,250,000 TDC
RAMANADHAM, Sasanka	PI; Interplay Between Lipid Signals and Transcription Events in Triggering Beta-Cells Apoptosis	American Diabetes Association, Inc; Pending*	04/01/16 – 03/31/19	$313,635
RAMANADHAM, Sasanka	PI; Calcium-Independent PLA2Beta in Beta-Cell Apoptosis	NIH/NIDDK; R01 DK069455; Pending*	07/01/15 – 06/30/20	$1,700,490
RAMANADHAM, Sasanka	Primary Mentor; Involvement of iPLA,ß-Derived Lipids in Bone Formation	NIH/NIA; F31 AG051361 (Hancock); Pending*	07/01/15 – 06/30/17	$73,812
RAMANADHAM, Sasanka	Co-PI; Preserving β-cell survival by regulating Bcl-x splicing mediated by iPLA2β-derived lipids	NIH; R01; Pending*	07/01/15 – 06/30/20	$1,250,000
RANDALL, Troy D	PI; Unique aspects of respiratory immunity	NIH/NHLBI; R01 HL069409; Active	08/15/01 – 05/31/16	$258,072
RANDALL, Troy D	PI, Pulmonary Immunity To Pathogens In Neonates	NIH/NIAID; R01 AI100127; Active	03/03/12 – 02/28/17	$218,052
RANDALL, Troy D	PI; Central and effector memory B cells in the lung	NIH/NIAID; R01 AI097357; Active	05/11/12 – 04/30/17	$250,000
RANDALL, Troy D	Co-Director, Comprehensive Flow Cytometry Core; Rheumatic Disease Core Center	NIH/NIAMS; P30 AR048311 (Mountz, PD/PI; Mountz, Core Leader); Active	09/28/01 – 08/31/17	$86,107

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RANDALL, Troy D	PD/PI; Director, Administrative and Biostatistics Core; Virus-induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962; Active	08/01/14 – 07/31/19	$77,215
RANDALL, Troy D	PD/PI; PI, Project 1: Control of Anti-Viral Tfh Responses Via IL-2 Signaling and Availability; Virus-induced cell fate decisions in anti-viral immunity	NIH/NIAID; U19 AI109962; Active	08/01/14 – 07/31/19	$233,989
RANDALL, Troy D	PI; UAHSF General Endowment fund Scholar	Institutional Funds/University of Alabama Health Services Foundation; Active	08/01/12 - 07/31/15	$100,000
RANDALL, Troy D	Primary Mentor; Establishment and Metabolic Control of Influenza-Specific Lung-Resident Memory B Cells	NIH/NIAID; F32 AI120508 (Allie); Active	06/01/15 – 05/31/18	$167,895
RANDALL, Troy D	Co-Investigator; B Cells in Health and Disease	Emory University/NIH/NIAID; P01 AI078907 (Sanz, PD/PI; Lund, Site PI); Active	08/01/10 - 07/31/16	$258,848
REDDEN, David T	Co-Investigator, Methodology Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI; Cui, Core Leader); Active	09/16/13 – 07/31/18	$151,018
REDDEN, David T	Co-Investigator; UAB Center for Clinical and Translational Science (CCTS)	NIH/NCATS; U54TR001005 (Kimberly); Active	07/01/13 – 06/30/18	$3,349,010
REDDEN, David T	Co-Investigator - Combined Behavioral and Drug Treatment of Overactive Bladder in Men	NIH/NIDDK; R01 DK082548 (Burgio); Active	08/06/12 – 07/31/15	$286,504
REDDEN, David T	Co-Investigator, Project 3: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI; Singh, Project PI); Active	09/01/12 - 08/31/17	$215,873
REDDEN, David T	Executive Committee Member, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014

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REDDEN, David T	Co-Investigator, Project 2: Effects of Urate Lowering Therapy on Inflammation, Endothelial Function, and Blood Pressure; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI; Saag & Calhoun, Project MPIs); Active	09/01/12 - 08/31/17	$185,927
REDDEN, David T	Co-Investigator; UAB Deep South Arthritis and Musculoskeletal CERTs	Agency for Healthcare Research and Quality; U19 HS021110 (K. Saag); Active	09/30/11 – 08/31/16	$650,970
REDDEN, David T	Co-Investigator; UAB SCI Model System	Department of Education; H133N110008 (McLain); Active	10/01/11 – 09/30/16	$374,801
REDDEN, David T	Co-Investigator; Activating Patients to Reduce Osteoporosis (APROPOS)	NIH/NIAMS; R01 AR060240 (K. Saag); Active	09/01/11 – 08/31/16	$516,049
REDDEN, David T	Co-Investigator; The Effectiveness of Methotrexate to Prevent Extension of Early Limited JIA	NIH/NIAMS; U34 AR064496 (Beukelman); Active	09/01/14 - 08/31/15	$ 276,235
REDDEN, David T	Co-Investigator; Ethnic Differences in Responses to Painful Stimuli	University of Florida/ NIH/NIA; R37 AG033906 (Fillingim, PD/PI; Bradley, Site PI); Active	09/15/14 - 04/30/19	$373,366
REDDEN, David T	Co-Investigator; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
REDDEN, David T	Co-Investigator; A Pragmatic Video Intervention to Promote African American Organ Donor Registration at the Department of Motorized Vehicles	NIH/NIDDK; R03 DK106432 (Dubay); Pending*	07/01/15 – 06/30/17	$100,000 TDC
REDDEN, David T	Co-Investigator; Does Raloxifene Alter Methotrexate Metabolism in Rheumatoid Arthritis?	NIH/NIAMS; R21 AR069264 (Morgan); Pending*	09/01/15 – 08/31/17	$275,000 TDC
REDDEN, David T	Co-Investigator; Does Methotrexate and Folic Acid Treatment for RA Predispose to B12 Deficiency?	NIH/NIAMS; R21 AR068563 (Morgan); Pending*	07/01/15 – 06/30/17	$275,000 TDC
REYNOLDS, IV, Richard J	PI; Discovering Novel Genetic and Environmental Risk Factors for RA in African Americans	NIH/NIAMS; K01 AR060848; Active	04/01/11 – 03/31/16	$118,700
REYNOLDS, IV, Richard J	Co-Investigator; HLA Region and KIR Genomics in Common Variable Immune Deficiency	NIH/NIAID; U01 AI090902 (Schroeder, Jr.); Pending*	07/01/15 - 06/30/20	$2,909,545 TDC
SAAG, Kenneth G	PI; Midcareer Investigator Award in Patient-Oriented Research	NIH/NIAMS; K24 AR052361; Active	06/01/05 – 05/31/15	$183,313

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SAAG, Kenneth G	PI; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110; Active	09/30/11 – 08/31/16	$635,406
SAAG, Kenneth G	PD/PI & Core Leader, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
SAAG, Kenneth G	PI, Project 2: Effects of Urate Lowering Therapy on Inflammation, Endothelial Function, and Blood Pressure; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI; Saag & Calhoun, Project MPIs); Active	09/01/12 - 08/31/17	$185,927
SAAG, Kenneth G	PI; Activating Patients to Reduce Osteoporosis (APROPOS)	NIH/NIAMS; R01 AR060240; Active	09/01/11 – 08/31/16	$516,049
SAAG, Kenneth G	Co-Core Leader, Administrative Core; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172 (Bridges, PD/PI); Active	09/16/13 - 07/31/18	$79,945
SAAG, Kenneth G	PI; UAB K12 in Patient Centered Outcomes Research	AHRQ; K12 HS023009; Active	08/01/14 – 07/31/19	$485,286
SAAG, Kenneth G	PI, Optimizing Patient Engagement in Recommended Health Care: A Patient-Centered Approach	Institutional Funds/UAB SOM; Active	06/01/15 – 05/31/15	$112,500
SAAG, Kenneth G	PI; Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)	NIH/NIAMS; U34 AR06289i; Active	04/15/13 – 03/31/16 NCE	
SAAG, Kenneth G	Co-Investigator; UAB Center for Clinical and Translational Science (CCTS)	NIH/NCATS; U54TR001005 (Kimberly); Active	07/01/13 – 06/30/18	$3,349,010
SAAG, Kenneth G	Co-Investigator; Individualized Patient Decision Making for Treatment Choices among Minorities with Lupus	PCORI; CE-1304-6631 (Singh); Active	10/01/13-12/31/16	$381,466
SAAG, Kenneth G	Co-Investigator; ARthritis patient Partnership With Comparative Effectiveness Researchers (AR-PoWER PPRN)	Global Healthy Living Foundation /PCORI; PPRN-1306-04811 (Curtis, Ginsberg, MPIs); Active	03/12/14 – 09/11/15	$264,604
SAAG, Kenneth G	PI; Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)	PCORI; Winter Pragmatic Clinical Trials; Pending*	12/1/15 – 11/20/20	$26,147,611 TDC
SAAG, Kenneth G	Component Lead, Promo/Dissemination Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC

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SAAG, Kenneth G	Co-Investigator, Admin Oversight Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; Bamman, Component Leader); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
SAAG, Kenneth G	Co-Investigator; UAB Center for Clinical and Translational Science (CCTS) (3 linked awards: UL1, KL2, TL1	NIH/NCATS; U54 TR001368 (Kimberly); Pending*	09/01/15 – 08/31/20	$35,397,604 TDC
SAFFORD, Monika	PI; Improving Medication Adherence in the Alabama Black Belt	PCORI; AD-1306-03565; Active	05/01/14 – 12/31/16	$498,467
SAFFORD, Monika	Project PI, Improving Stroke Outcomes for African Americans; Comprehensive Minority and Health Disparities Research Center – Phase III	NIH/NIMHD; P60 MD000502 (Fouad, PD/PI); Active	09/30/12 – 03/31/17	$130,756
SAFFORD, Monika	PI; Building the Infrastructure to Enhance QI Research in the UAB Health System	Association of American Medical Colleges; Active	01/01/14 - 06/30/15	$10,000
SAFFORD, Monika	PI; Building Capacity for Cardiometabolic Outcomes Research	NIH/NHLBI; K24 HL111154; Active	07/01/12 – 04/30/17	$103,711
SAFFORD, Monika	PI, Myocardial Infarction 2; REasons for the GeogrAphic and Racial Differences in Stroke; (REGARDS-MI-2) Study	NIH/NHLBI; R01 HL080477; Active	04/01/05 – 07/31/16	$621,301
SAFFORD, Monika	PI; Advances in the RA Treatment Armamentarium: Forum Pathophysiology to Treatment Options	Pfizer, Inc,; Active	01/05/15 - 09/30/15	$178,409
SAFFORD, Monika	Co-Investigator; Cardiovascular Collaboration: Cardiovascular Disease, Prevention, Treatment and Outcomes	Amgen, Inc.; 200709284 (Muntner); Active	03/01/12 – 01/31/16	$652,745
SAFFORD, Monika	Co-Investigator; Physician Nominal Groups on Beta-Blocker Use in Patients with Heart Failure	Amgen Inc.; (Levitan); Active	03/25/15 – 02/15/16	
SAFFORD, Monika	Co-Investigator; Beta-Blocker Use Survey Among REGARDS Participants with Heart Failure	Amgen Inc.; (Levitan); Active	03/26/15 – 03/31/16	
SAFFORD, Monika	Co-Investigator; Understanding Racial and Ethnic Differences in Weight Loss Maintenance and Regain	NIH/NIDDK; R03 DK101795 (Dutton); Active	04/01/14 – 03/31/16	$50,000
SAFFORD, Monika	Co-Investigator; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (K. Saag); Active	09/30/11 – 08/31/16	$650,790
SAFFORD, Monika	Co-Investigator; Risk Factors for Sepsis in the Community	NIH/NINR R01 NR012726 (Wang); Active	07/15/11 – 04/30/16	$336,745

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SAFFORD, Monika	Component Lead, Enrichment Program, Administrative Core; UAB Diabetes Research Center	NIH/NIDDK; P30 DK079626 (Garvey, PD/PI & Core Leader); Active	03/25/13 – 02/28/18	$272,774
SAFFORD, Monika	Co-investigator; Etiology of Geographic and Racial Differences in Stroke	NIH/NINDS; U01 NS041588 (Howard); Active	09/24/01 – 11/30/17	$4,052,671
SAFFORD, Monika	Co-Investigator; Southern Consortium Node of the Clinical Trials Network	Medical University of South Carolina/NIH; MUSC12-029 (Mugavero, Site PI); Active	02/01/12 - 08/31/15	$48,823
SAFFORD, Monika	Co-Investigator; Action for Health in Diabetes Continuation (Look AHEAD)	NIH/NIDDK; U10 DK057008 (Lewis); Active	09/01/13 – 07/31/15	$140,836
SAFFORD, Monika	Co-Investigator; PROs in Inflammatory Arthritis: Electronic Capture to Improve Patient Outcomes	Rheumatology Research Foundation RRF; Disease Targeted Innovative Research award (Navarro-Millán); Active	09/01/14 – 08/31/16	$174,368
SAFFORD, Monika	Co-Investigator; An Intervention to Address Racial Bias in Non-Physician Healthcare Staff	NIH/NHLBI; R21 HL113746 (Cherrington); Active	08/15/16 – 04/30/16 NCE	
SAFFORD, Monika	Collaborator; Optimizing Peri-Operative Communication about Surgical Outcomes: A Pilot Study	Genentech; (Heslin); Active	03/04/15 – 09/03/16	$43,627
SAFFORD, Monika	PI; Collaboration to Improve Blood Pressure(BP) in the US Black Belt- Addressing the Triple Threat	NIH/NHLBI; UH2 HL130691; Pending*	09/01/15 - 08/31/20	$8,347,487 TDC
SAFFORD, Monika	PI; The Patient Activated Learning System (PALS) for Rheumatoid Arthritis Patients	AbbVie, Inc.; Pending*	04/15/15 – 09/30/16	$246,800 TDC
SAFFORD, Monika	PD/PI & Project PI, Project 2: Treating the Hard-to-Treat to Eliminate Disparities in CVD; Eliminate Cardiovascular Disease (CVD) Disparities	American Heart Association; Pending*	07/01/15 – 06/30/19	$3,391,542 TDC
SAFFORD, Monika	PD/PI, Project 4: Center Core; Eliminate Cardiovascular Disease (CVD) Disparities	American Heart Association; Pending*	07/01/15 – 06/30/19	$3,391,542 TDC
SAFFORD, Monika	Subcontract PI; Androgens and Ischemic Events Among Whites and African-American in REGARDS	University of Michigan/NIH; Pending*	07/01/15 - 06/30/20	$222,883 TDC
SAFFORD, Monika	Subcontract PI; Communities Designed to Support Cardiovascular Health for Older Adults	Columbia University/NIH; Pending*	07/01/15 – 06/30/19	$175,145 TDC
SAFFORD, Monika	Co-Investigator; Early Fetal Anatomy Sonograms in Obese Women: A Randomized Controlled Trial	PCORI; (Harper); Pending*	11/01/15 – 10/31/18	$2,524,553 TDC

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SAFFORD, Monika	Co-Investigator; Primary Care Obesity Management in the Southeast_PROMISE	NIH/NIDDK; R01 DK106041 (Dutton); Pending*	09/01/15 – 08/31/20	$2,438,730 TDC
SAFFORD, Monika	Co-Investigator; AR-PoWER	Global Healthy Living Foundation/PCORI; PCORnet PPRNs Phase II (Ginsberg & Curtis, MPIs); Pending*	10/01/15 – 09/30/18	$616,766 TDC
SAFFORD, Monika	Co-Investigator, Promo/Dissemination Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; K. Saag, Component Lead); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
SAFFORD, Monika	Co-Investigator; Identifying Individuals at High Risk of Renal Disease and CVD at low BPA Exposure	Vanderbilt University/NIH; (Gutierrez, Site PI); Pending*	12/01/15 – 11/30/19	$246,044 TDC
SAFFORD, Monika	Co-Investigator, Project 1: Racial Differences and US Population Estimates of Nocturnal Hypertension and Non-Dipping; University of Alabama at Birmingham Strategically Focused Hypertension Research Center	American Heart Association; (Muntner); Pending*	04/01/15 – 03/31/19	$528,000 TDC
SAFFORD, Monika	Co-Investigator; Bioavailable Vitamin D and Cardiovascular Disease	NIH/NHLBI; R01 HL128345 (Gutierrez); Pending*	07/01/15 - 06/30/19	$1,777,555 TDC
SAFFORD, Monika	Co-Investigator; Interaction Between Magnesium and Vitamin D and Risk of Cardiovascular Disease	Vanderbilt University; (Judd, Site PI); Pending*	07/01/15 - 06/30/18	$115,627 TDC
SCARINCI, Isabel	PI; Tobacco Control Network among Women in Parana, Brazil - II	NIH/Fogarty International Center; R01 TW009272; Active	08/01/12 - 07/31/17	$282,264
SCARINCI, Isabel	Core Director, Evaluation Core; Gulf States Collaborative Center for Health Policy Research (Gulf States CC)	Bayou La Batre Clinic/NIH/ NIMHD; U54 MD008602 (Benjamin, PD/PI); Active	07/01/13 – 06/30/18	$71,341
SCARINCI, Isabel	Component Leader, Training and Education; 1/2 The Alabama State University/UAB Comprehensive Cancer Center Partnership	NIH/NCI; P20 CA192973 (Manne, PI); Active	09/23/14 – 08/31/18	$20,778
SCARINCI, Isabel	Subaward PI; New Mexico HPV Outcomes, Practice Effectiveness and Surveillance (NM-HOPES)	New Mexico Health Sciences Center/NIH; U54 CA164336 (Wheeler, PI); Active	09/23/11 – 05/31/16	$15,216
SCARINCI, Isabel	PI, Alabama HPV Vaccination Coalition Supplement; Comprehensive Cancer Center Core Support Grant	NIH/NCI; P30 CA013148-S2 (Partridge, PD/PI); Active	09/01/11 - 03/31/16	$96,041

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SCARINCI, Isabel	PI; Sowing the Seeds of Health: Latina Lunches III	Susan G. Komen Breast Cancer Foundation; CGA-2014-AL100-UNDP73-00009; Active	04/01/14 - 03/31/16 NCE	
SCARINCI, Isabel	Subaward PI; Parkland-UT Southwestern PROSPR Center: Colon Cancer Screening in a Safety-net; (Supplement Title: "PROSPR – Revisions to Enhance the Collection of Cervical Cancer Screening Data")	University of Texas Southwestern Medical Center at Dallas/NIH/NCI; U54 CA0163308 (Skinner & Halm, MPIs); Active	07/30/14 - 05/31/16	$20,518
SCARINCI, Isabel	Co-Investigator, Investigator Development Core; Deep South Resource Center for Minority Aging Research (RCMAR)	NIH/NIA; P30 AG031054 (Burgio & Scarinci, MPIs); Active	09/30/07 - 06/30/17	$127,132
SCARINCI, Isabel	Co-PD/PI, Administrative Core; Deep South Resource Center for Minority Aging Research (RCMAR)	NIH/NIA; P30 AG031054 (Burgio & Scarinci, MPIs); Active	09/30/07 - 06/30/17	$181,485
SCARINCI, Isabel	PI, Project 2, HPV Vaccination Among Daughters of Latina Immigrants; Comprehensive Minority and Health Disparities Research Center (MHDRC) – Phase III	NIH/NIMHD; P60 MD000502 (Fouad, PD/PI); Active	09/30/12 – 03/31/17	$130,756
SCARINCI, Isabel	Co-Core Leader, Pilot Project Program Core; Mid-South Transdisciplinary Collaborative Center for Health Disparities Research (Mid-South TCC)	NIH/NIMHD; U54 MD008176 (Fouad, PI); Active	09/26/12 – 07/31/17	$2,343,050
SCARINCI, Isabel	Co-Core Leader, Evaluation Core; Mid-South Transdisciplinary Collaborative Center for Health Disparities Research (Mid-South TCC)	NIH/NIMHD; U54 MD008176 (Fouad, PI); Active	09/26/12 – 07/31/17	$2,343,050
SCARINCI, Isabel	Evaluation Leader, Administrative Core; National Transdisciplinary Collaborative Center for African American Men's Health	NIH/NIMHD; U54 MD008620 (Vickers & Konety & Shikany, MPIs); Active	10/15/13 – 06/30/18	$712,855
SCARINCI, Isabel	Investigator, Project 1, Patient Navigation to Reduce Readmissions among Black Men with Heart Failure (NAVI-HF); National Transdisciplinary Collaborative Center for African American Men's Health	NIH/NIMHD; U54 MD008620 (Vickers & Konety & Shikany, MPIs; Durant, Project PI); Active	10/15/13 – 06/30/18	$712,855
SCARINCI, Isabel	Core Co-Leader, Training Core; Deep South Network for Cancer Control	NIH/NCI; U54 CA153719 (Partridge, PI); Active	09/07/10 - 08/31/15	$943,503
SCARINCI, Isabel	Co-Investigator, Research Project 1; Gulf States Collaborative Center for Health Policy Research (Gulf States CC)	Bayou La Batre Clinic/NIH/ NIMHD; U54 MD008602 (Benjamin, PD/PI; Fouad, Project PI); Active	07/01/13 – 06/30/18	$261,730

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SCARINCI, Isabel	Co-Investigator; Morehouse School of Medicine/Tuskegee University/University of Alabama Cancer Center Partnership	NIH/NCI; U54 CA118948 (Manne & Blumenthal & Turner, MPIs); Active	09/30/05 - 08/31/16	$729,247
SCARINCI, Isabel	Co-Investigator; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (K. Saag); Active	09/30/11 – 08/31/16	$650,790
SCARINCI, Isabel	PI; Smoking Cessation among Rural Young Adult African American Men	American Cancer Society; (Scarinci & Carroll, MPIs); Pending*	07/01/15 - 06/30/18	$703,465 TDC
SCARINCI, Isabel	PI; Self-Sampling for HPV Testing in African American Women - Mississippi Delta	American Cancer Society; Pending*	01/01/16 - 12/31/18	$1,198,100 TDC
SCARINCI, Isabel	PI; Access to Tobacco Products and Perceptions of Harm among Rural African American Men	NIH/NCI; R01 CA196609 (Scarinci & Carroll, MPIs); Pending*	07/01/15 - 06/30/19	$1,885,357 TDC
SCARINCI, Isabel	Subaward PI; Examination of Adolescent Latinas' Sexual Health and HIV-Preventive Service Needs	Emory University/NIH; Pending*	08/01/15 - 07/31/17	$128,012 TDC
SCARINCI, Isabel	Co-Investigator; Transdisciplinary Collaborative Center (TCC) for Colorectal Cancer Research	National Academy of Sciences; (Fouad, PI); Pending*	10/01/15 - 09/30/17	
SCARINCI, Isabel	PI, Administrative Supplement to Stimulate Collaborative HIV Malignancies in Low-Middle Income Countries, Title: Prevalence and Genotype Distribution of Cervical and Oral HPV Infection in HIV+ Brazilian Women; UAB Comprehensive Cancer Center Core Support Grant	NIH; (Partridge, PI); Pending*	09/01/15 - 08/31/17	$327,665 TDC
SCARINCI, Isabel	Co-Investigator, Administrative Component; Comprehensive Cancer Center Core Support Grant	NIH/NCI; (Partridge, PD/PI): Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
SCHROEDER, Jr., Harry W	PD/PI; HLA Region and KIR Genomics in Common Variable Immune Deficiency	NIH/NIAID; U01 AI090902; Active	08/01/10 - 07/31/15	$365,085
SCHROEDER, Jr., Harry W	Co-Investigator; Dissection of the ACPA Response in African-Americans with Rheumatoid Arthritis	NIH/NIAMS; R01 AR062376 (Bridges); Active	09/01/11 - 08/31/15	$319,689
SCHROEDER, Jr., Harry W	Collaborator; Analysis of Human and Mouse Antibodies to Beta Cell Antigens Bearing N-Acetyl Glucosamine Post-Translations Modifications and their Potential to Prevent Human Type 1 Diabetes	Juvenile Diabetes Research Foundation International; 2-SRA-2014-300-Q-R (Kearney); Active	10/01/14 - 09/30/16	$118,182

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SCHROEDER, Jr., Harry W	Collaborator; Clinical Testing for Zoster-035	GlaxoSmithKline; (Nahm); Active	04/02/15 - 12/31/16	$287,536
SCHROEDER, Jr., Harry W	PI; The Pre-BCR CDR-H3 Sensing Site and H Chain Selection	NIH/NIAID; R21 AI117703; Pending*	07/01/15 – 06/30/17	$275,000 TDC
SCHROEDER, Jr., Harry W	PI; Role of Conserved D-beta Sequence in Regulating T Cell Development and Function	NIH/NIAID; R01 AI120551; Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
SCHROEDER, Jr., Harry W	PD/PI; HLA Region and KIR Genomics in Common Variable Immune Deficiency	NIH/NIAID; U01 AI090902; Pending*	07/01/15 - 06/30/20	$2,909,545 TDC
SCHWIEBERT, Lisa M	PD/PI; Mentored Experiences in Research, Instruction, and Teaching (MERIT) Program	NIH/NIGMS; K12 GM088010; Active	09/01/14 - 06/30/19	$502,155
SCHWIEBERT, Lisa M	Co-Investigator; Effects of Aerobic Exercise on Asthmatic Responses in Obese Adults	University of Arizona; pilot; Active	2014 - 2015	$30,000
SCHWIEBERT, Lisa M	PD/PI; UAB Experiential Learning for Career Enhancement in the Sciences (EXPERIENCES) Program	Burroughs Wellcome Fund; Pending*	07/01/15 – 06/30/16	$49,188 TDC
SERRA, Rosa A	PI; Chondrocytic Cilia and Mechano-Sensation	United States - Israel Binational Science Foundation; Active	10/01/12 - 09/30/16	$19,565
SERRA, Rosa A	PI; TGF-β in the Pathology and Development of the Spine	NIH/NIAMS; R01 AR053860; Active	04/01/13 - 03/31/18	$212,500
SERRA, Rosa A	PI; Mechanism of TGF-βR2 in Chondroprotection	NIH/NIAMS; R01 AR062507; Active	04/01/13 - 03/31/18	$212,500
SERRA, Rosa A	Co-Investigator; Effects of Obesity on the Physis	Pediatric Orthopaedic Society of North America; (Gilbert); Active	06/01/14 – 05/31/15	$30,000
SINGH, Jasvinder	Associate Director, Administrative Core; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$119,014
SINGH, Jasvinder	PI, Project 3: Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments; Centers of Research Translation (CoRT): Gout and Hyperuricemia: from Bench to Bedside to Backyard	NIH/NIAMS; P50 AR060772 (Saag & Bridges, MPI); Active	09/01/12 - 08/31/17	$215,873

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SINGH, Jasvinder	PI; Individualized Patient Decision Making for Treatment Choices Among Minorities with Lupus	PCORI; CE-1304-6631; Active	01/01/14 – 12/31/16	$381,466
SINGH, Jasvinder	PI, Project 1: Comparative Effectiveness of NSAIDs versus Narcotics after Joint Replacement Surgery; UAB Deep South Arthritis and Musculoskeletal CERTs	AHRQ; U19 HS021110 (K. Saag); Active	09/30/11 – 08/31/16	$150,671
SINGH, Jasvinder	Co-Investigator; Multicenter Osteoarthritis Study (MOST) Renewal	NIH/NIA; U01 AG018947 (Lewis, PD/PI); Active	09/15/08 - 12/31/15 NCE	
SINGH, Jasvinder	Co-Investigator; Overcoming TWEAK Signaling to Fully Restore Muscle Mass and Mobility Function after Total Joint Arthroplasty	NIH/NICHD; R01 HD084124 (Bamman & Bridges, MPI); Active	04/15/15 – 02/28/20	$371,179
SINGH, Jasvinder	Co-Investigator; Multicenter Osteoarthritis Study (MOST) Second Renewal, UAB Clinical Center	NIH/NIA; U01 AG018947 (Lewis, PD/PI); Pending *	04/01/15 - 03/31/20	$5,481,789 TDC
SINGH, Jasvinder	Co-Investigator; Underuse and overuse of Knee Arthroplasty Among Osteoarthritis Patients in the US	Cornell University/NIH; Pending*	07/01/15 – 06/30/18	$30,744 TDC
SINGH, Jasvinder	Co-Investigator; Effectiveness of DiscontinuinG bisphosphonatEs (EDGE)	PCORI; Winter Pragmatic Clinical Trials (Saag); Pending*	12/01/15 – 11/30/20	$9,999,318 TDC
STANDAERT, David George	PI; APDA Advanced Center for Parkinson's Research	American Parkinson Disease Association; Active	09/01/06 - 08/31/15	$113,500
STANDAERT, David George	PI; UAB Bachmann-Straus Dystonia and Parkinson's Disease Center of Excellence	Bachmann-Strauss Dystonia & Parkinson Foundation, Inc; Active	08/20/13 - 09/14/16	$172,174
STANDAERT, David George	PI; The Parkinson's Progression Marker's Initiative (PPMI)	Fox (Michael J.) Foundation for Parkinson's Research; Active	07/27/10 – 06/30/15	$98,619
STANDAERT, David George	PI; Validation of the Class II MHC Transactivator (CIITA) in Models of PD	Fox (Michael J.) Foundation for Parkinson's Research; Active	01/01/13 – 10/31//15	$100,000
STANDAERT, David George	PD/PI; PD Neuroprotection Clinical Trial Center	NIH/NINDS U10 NS044547; Active	01/01/13 – 11/30/15	$74,115
STANDAERT, David George	PD/PI; UAB Research and Education Program in Neurology, Neurosurgery, and Neuropathology	NIH/NINDS; R25 NS079188; Active	07/01/12 - 06/30/17	$104,435
STANDAERT, David George	Primary Mentor; Role of MicroRNAs in Modulating Inflammation in Alpha-Syn Mediated Models of PD	NIH/NINDS; F31 NS084722 (Thome); Active	04/01/14 - 03/31/17	$33,530
STANDAERT, David George	PI; UAB Cannabidol Program	Alabama Department of Commerce; Active	04/01/14 – 09/30/15	$1,000,000

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STANDAERT, David George	PI; BTK Inhibitors and Their Potential Role in Inhibiting the Pro-Inflammatory Microenvironment Associated with Neurodegeneration	Acerta Pharma B.V.; Active	12/05/14 – 12/04/15	$100,679
STANDAERT, David George	Co-Investigator; Mechanisms of LRRK2 Mediated Neurotoxicity	NIH/NINDS; R01 NS064934 (West); Active	09/01/10 – 08/31/15	$212,231
STANDAERT, David George	Co-Investigator: LRRK2 and Other Novel Exosome Proteins in Parkinson's Disease	NIH/NINDS; U18 NS082132 (West); Active	09/30/12 – 12/31/15	$200,000
STANDAERT, David George	Co-Investigator; Collaborative MS Research Center Award	National Multiple Sclerosis Society; (Benveniste); Active	11/01/09 - 07/31/15 NCE	
STANDAERT, David George	Co-Investigator; Creatine Safety, Tolerability, & Efficacy in Huntington's Disease (CREST-E)	Massachusetts General Hospital/NIH; (Sung, Site PI)); Active	07/01/14 - 06/30/15	$71,249
STANDAERT, David George	Co-Investigator; Targeting the JAK/STAT Pathway in the Treatment of Parkinson's Disease	Fox (Michael J.) Foundation for Parkinson's Research; (Benveniste); Active	03/18/15 - 03/17/16	$68,182
STANDAERT, David George	Collaborator, Enroll-HD: A Prospective Registry Study in a Global Huntington's Disease Cohort; A CHDI Foundation Project	CHDI Foundation; (Sung); Active	05/10/12 - 04/30/17	$393,358
STANDAERT, David George	Co-Investigator; Fox Investigation for New Discovery of Biomarkers (BioFIND)	Fox (Michael J.) Foundation for Parkinson's Research; (Amara); Active	02/21/14 - 12/31/15	$95,260
STANDAERT, David George	Co-Investigator; Causes, Treatment, and Prevention of Corticobasal Degeneration	University of California, San Francisco/Karin & Sten Mortstedt CBD Solutions AB; (Roberson, Site PI); Active	07/01/14 - 06/30/15	$30,242
STANDAERT, David George	Collaborator; UAB Pediatric CBD Program	GW Research LTD.; (Bebin); Active	12/11/14 - 12/10/18	
STANDAERT, David George	Collaborator; UAB Adult CBD Program	GW Research LTD.; (Szaflarski); Active	12/11/14 - 12/10/18	
STANDAERT, David George	PI; Evaluation of the effects of a novel nicotinic agonist, AZD1446, on neurochemical and electrophysiologic endpoints in DYT1 mouse models	Dystonia Medical Research Foundation; Active	03/01/15 - 02/29/16	$50,000

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STANDAERT, David George	Co-Investigator; Modeling X-linked Dystonia Parkinsonism Using BAC Transgenesis	Massachusetts General Hospital/ Collaborative Center for X-linked Dystonia Parkinsonism (XDP); (Gray); Active	01/01/15 – 12/31/15	$139,358
STANDAERT, David George	PI, Project 3: Cholinergic and dopaminergic mechanisms in mouse models of dystonia	Massachusetts General Hospital/NIH; P01 NS087997 (X. Breakefield, PD/PI); Active	04/01/15 - 03/31/20	$230,000
STANDAERT, David George	PD/PI & Core Leader, Administrative Core; Innate and Adaptive Immunity in Parkinson Disease	NIH/NINDS; P20 NS092530; Pending*	03/01/15 - 02/28/17	$500,000 TDC
STANDAERT, David George	PI, Project 3: Role of Myeloid Cells in Human Parkinson Disease; Innate and Adaptive Immunity in Parkinson Disease	NIH/NINDS; P20 NS092530; Pending*	03/01/15 - 02/28/17	$500,000 TDC
STANDAERT, David George	PI; University of Alabama at Birmingham_The Edmond J. Safra Fellowship in Movement Disorders	Fox (Michael J.) Foundation for Parkinson's Research; Pending*	07/01/16 - 06/30/18	$180,000 TDC
STANDAERT, David George	Subaward PI; Gene Therapy for Early Onset DYT1 Dystonia	Massachusetts General Hospital/NIH; Pending*	07/01/15 - 06/30/17	$100,000 TDC
STANDAERT, David George	Subaward PI; Role of HLA/MHCII in Parkinson's Disease Pathogenesis	Emory University/NIH; Pending*	12/01/15 - 11/30/20	$107,848 TDC
STANDAERT, David George	Co-Investigator; Stress Reactivity and Quality of Life in Psychogenic Nonepileptic Seizures	NIH/NINDS; (Allendorfer); Pending*	10/01/15 - 09/30/18	$623,850 TDC
STANDAERT, David George	Co-Investigator; Admin Oversight Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; Bamman, Component Leader); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
STANDAERT, David George	Co-Investigator; Pilot Projects Component; National Resource Center for High-Impact Clinical Trials in Medical Rehabilitation	NIH/NICHD; P2C HD086851 (Bamman, PD/PI; Bridges, Component Leader); Pending*	09/01/15 - 08/30/20	$3,750,000 TDC
STANDAERT, David George	Co-Investigator; Involvement of JAK/STAT Signaling Pathway in Parkinson's Disease	NIH/NINDS; R01 NS092656 (Benveniste); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
STANDAERT, David George	Co-Investigator; Myofiber Type Grouping in Neurogenic Muscle Atrophy: Challenging the Dogma	NIH; R21 (Bamman); Pending*	07/01/15 - 06/30/17	$275,000 TDC
STANDAERT, David George	Primary Mentor; Effect of Nicotinic Acetylcholine Receptors in Dystonia Mouse Models	NIH/NINDS; F31 NS093951 (Thompson); Pending*	07/01/15 - 06/30/18	$113,955 TDC
STANDAERT, David George	Primary Mentor; Genetic Susceptibility and Epigenetic Modulation in Levodopa Induced Dyskinesia	NIH/NINDS; F31 NS090641 (Figge); Pending*	07/01/15 - 06/30/18	$113,955 TDC

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STEELE, Chad	PI; Adaptive immunity against *Pneumocystis*	NIH/NIHLBI; R01 HL119770; Active	09/01/13 –06/30/17	$245,000
STEELE, Chad	PI; Immunopathogenesis during fungal asthma	NIH/NIHLBI; R01 HL122426; Active	12/01/14 –11/30/18	$319,400
STEELE, Chad	Co-Investigator; Urokinase, Neutrophil Activation and Acute Lung Injury	NIH/NHLBI; R01 HL076206 (G. Liu); Active	02/01/11 - 01/31/16	
STEELE, Chad	Co-Investigator; C-reactive protein in acute kidney injury	NIH/NIDDK; R01DK 099092 (Szalai); Active	04/01/14 - 03/31/18	$ 217,500
STEELE, Chad	Collaborator; Asthma Cohort Support Contract	NIH/NICHD; HHSN275201300014C (Biggio); Active	09/26/13 - 09/25/23	$158,666
STEELE, Chad	Co-Investigator; Central Role of Heme Oxygenase in Reversing Bromine Morbidity and Mortality	NIH/NIEHS; R21 ES025423 (Matalon); Active	09/22/14 - 08/31/16	
STEELE, Chad	Co-Investigator, Project 3; Pharmacogenomic Predictors of Efficacy; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi, PD/PI; R. Mannon, Project PI); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
STEELE, Chad	Co-Investigator; Endophenotypes of Treatment Resistance in Ulcerative Colitis: Clinical Activity of Interferon-Beta Therapy (The ETRUsCAn Trial)	DoD (Mannon); Pending*	07/01/15 – 06/30/20	$4,347,590 TDC
STEELE, Chad	Co-Investigator; Molecular Pathogenesis and Phenotype of Acquired CFTR Dysfunction in COPD	NIH/NHLBI; R01 HL105487 (Rowe); Pending*	07/01/15 – 06/30/20	
STOLL, Matthew	PI; Identification of Target Antigens in Children with Spondyloarthritis	Kaul Pediatric Research Institute; Active	01/01/13 - 12/31/15	$60,000
STOLL, Matthew	PI; Exploration of the gut microbiome in spondyloarthritis	American College of Rheumatology; Active	07/01/13 – 06/30/16	$115,741
STOLL, Matthew	PI; Enteric Flora in newly diagnosed spondyloarthritis: a collaborative study	Friends of CARRA; Active	10/01/13 – 09/30/15	$25,000
STOLL, Matthew	PI; Interactions between AHR ligands and the gut microbiota in murine arthritis	NIH/NIEHS; R21 ES024413; Active	07/01/14 – 06/30/16	$125,000
STOLL, Matthew	Co-Investigator, Project 3: Adaptive immune responses to gut microbiota in juvenile & adult spondyloarthritis; UAB Multidisciplinary Clinical Research Center	NIH/NIAMS; P60 AR064172; (Bridges, PD/PI; Elson, Project Leader); Active	09/16/13 – 07/31/18	$165,151

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STOLL, Matthew	Co-Investigator; Lowering breast cancer risk during adolescence: soy isoflavones, microbiome, metabolism, and epigenetics	NIH/NCI; U01 CA199356 (Barnes, PI); Pending*	07/01/15 – 06/30/20	$2,441,840 TDC
STOLL, Matthew	PI; Functional Assessment and Manipulation of the Microbiota in Arthritis	Arthritis Foundation; Pending*	09/01/15 – 08/31/17	$240,740 TDC
SZALAI, Alexander J	PI; C-reactive protein in acute kidney injury	NIH/NIDDK; R01DK 099092; Active	04/01/14 - 03/31/18	$217,500
SZALAI, Alexander J	Co-Investigator; Mechanisms of C3 effects of ARPKD pathogenesis	NIH/NIDDK; R01 DK097423 (Mrug); Active	08/05/13 - 06/30/18	$217,500
SZALAI, Alexander J	Primary Mentor; C-reactive Protein, Autoimmunity, and Inflammation in the Central Nervous System	NIH/NINDS; F31 NS081903 (Wright); Active	07/01/13 - 09/30/15	$31,514
SZALAI, Alexander J	Collaborator; Inflammatory, Cholesterol and Genetic Characteristics in Older Adults in Normal Retinal Health as Potential Biomarkers for the Incident Development of Early Age-Related Maculopathy	EyeSight Foundation of Alabama; (Owsley); Active	07/01/10 - 06/30/15 NCE	
SZALAI, Alexander J	Co-PI; Effects of ITGAM Genetic Variation on Mac-1 mediated Inflammatory Responses.	NIH/NIAMS; R01 AR068315; Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
SZALAI, Alexander J	Co-PI; Impact of SLE-associated ITGAM variants on dendritic cell function	NIH/NIAMS; R21 AR069295; Pending*	09/01/15 - 08/31/17	$275,000 TDC
SZALAI, Alexander J	PI; A CRP-targeting strategy to inhibit tumor-promoting MDSCs in the kidney	American Association for Cancer Research/KURE-IT; Pending*	07/01/15 - 06/30/17	$227,273 TDC
THANNICKAL, Victor J	PD/PI & Core Leader, Administrative and Biostatistics Core; Therapeutic Targeting of the Myofibroblast in Fibrotic Lung Disease	NIH/NHLBI; P01 HL114470; Active	09/16/13 – 07/31/18	$78,501
THANNICKAL, Victor J	PD/PI & PI, Project 3: NOX4 as a Therapeutic Target in IPF; Therapeutic Targeting of the Myofibroblast in Fibrotic Lung Disease	NIH/NHLBI; P01 HL114470; Active	09/16/13 – 07/31/18	$284,957
THANNICKAL, Victor J	PI; Myofibroblast Senescence in Pulmonary Fibrosis	NIH/NIA; R01 AG046210; Active	09/01/14 - 05/31/19	$225,000
THANNICKAL, Victor J	PI; Study of Nfr2 Activation in Lung Fibrosis	Biogen IDEC, Inc.; Active	09/15/14 - 09/14/16	$109,341

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THANNICKAL, Victor J	Co-PI; Mass Spectrometry-Based Biomarker Discovery	University of Michigan/ NIH/ NHLBI; R01 HL094230 (Pennathur & Thannickal, MPIs); Active	08/01/09 – 5/31/15 NCE	
THANNICKAL, Victor J	Co-Investigator, Animal and Therapeutics Core; Therapeutic Targeting of the Myofibroblast in Fibrotic Lung Disease	NIH/NHLBI; P01 HL114470 (Thannickal, PD/PI; R-M Liu, Core Leader); Active	09/16/13 – 07/31/18	$198,344
THANNICKAL, Victor J	Co-Investigator; miR-21 and Lung Fibrosis	NIH/NHLBI; R01 HL105473 (G. Liu); Active	04/01/11 – 02/29/16	$246,250
THANNICKAL, Victor J	Co-Investigator; The Role of Biomechanical Signaling in Lung Fibrosis	NIH/NHLBI; R01 HL124076 (Zhou); Active	12/01/14 - 11/30/18	$250,000
THANNICKAL, Victor J	Co-Investigator; Role of Mechanosensitive ITGA6 in Myofibroblast Invasion and Lung Fibrosis	American Heart Association; 14GRNT20180023 (Zhou); Active	07/01/14 - 06/30/16	$75,000
THANNICKAL, Victor J	Co-Investigator; Idiopathic Pulmonary Fibrosis Prospective Outcomes Registry (IPF_Pro)	Duke University; (de Andrade, Subaward PI); Active	08/28/14 - 08/27/19	$15,480
THANNICKAL, Victor J	PI; AMPK in the Resolution of Age-Related Lung Fibrosis	Pulmonary Fibrosis Foundation; Pending*	07/01/15 – 06/30/17	$43,479 TDC
THANNICKAL, Victor J	Co-Investigator; AMPK Activation in Asbestosis	NIH/NIEHS; R01 ES026216 (Zmijewski); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Co-Investigator; PAI-1 and Aging-Related Susceptibility to Lung Fibrosis	NIH/NIA; R01 AG049830 (R-M Liu); Pending*	09/01/15 – 08/31/20	$1,570,175 TDC
THANNICKAL, Victor J	Co-Investigator; Dispersant-Induced Injury of the Respiratory Epithelium in Mammals and Aquatic Animals	Gulf of Mexico Research Initiative (Antony); Pending*	01/01/16 - 12/31/18	$1,500,000 TDC
THANNICKAL, Victor J	Co-Investigator; Transforming Growth Factor- Beta Signaling in Newborn Lung	NIH/NHLBI; R01 HL126610 (Ambalavanan); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Co-Investigator; Myeloid-Derived Regulatory Cells in Asthma	NIH/NHLBI; R01 HL128502 (Deshane); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Co-Investigator; Modulation of Resident Cardiac Mesenchymal Stem Cells by TNF-TNFR Signaling Axis and Immune Cell Interactions in Heart Failure	NIH/NHLBI; R01 HL125711 (Hamid); Pending*	12/01/15 - 11/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Collaborator; Role of Metabolic Reprogramming in the Persistence of Lung Fibrosis in Aging	NIH/NIA; R03 AG052042 (Bernard); Pending*	09/01/15 - 08/31/17	$100,000 TDC
THANNICKAL, Victor J	Co-Investigator; Myeloid-Derived Regulatory Cells in Asthma	American Asthma Foundation; (Deshane); Pending*	07/01/15 - 06/30/18	$450,000 TDC

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THANNICKAL, Victor J	Co-Investigator; Hybrid MPO-VPO1 with Selective Binding and Enhanced Killing of Pathogens	NIH/NIAID; R01 AI118909 (G. Cheng); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Co-Investigator; Histone H4 Lysine 16 Acetylation in Aging and Lung Fibrosis	NIH/NIA; R01 AG050567 (YY Sanders); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
THANNICKAL, Victor J	Collaborator; Epithelial Stimulation of Myofibroblast Activation in CF Lung Disease	Parker B. Francis Foundation; (Harris); Pending*	07/01/15 - 06/30/18	$156,000 TDC
TIWARI, Hemant K	PI; Short Course on Statistical Genetics and Genomics	NIH/NIGMS; R25 GM093044; Active	08/01/10 – 05/31/15	$200,000
TIWARI, Hemant K	PI; Short Course on Next-Generation Sequencing Technology and Statistical Methods	NIH/NHGRI; R25 HG006110; Active	04/27/11 – 01/31/17	$49,968
TIWARI, Hemant K	Co-PI; UAB Metabolomics workshop: From decision to design	NIH/NIGMS; R25 GM103798 (Barnes); Active	09/18/12 – 08/31/17	$99,993
TIWARI, Hemant K	Co-Investigator; HyperGEN: Genetics of left ventricular hypertrophy	NIH/NHLBI; R01 HL055673 (Arnett); Active	08/10/96 - 04/30/17	$1,385,205
TIWARI, Hemant K	Co-Investigator: Epigenetic Determinants of Lipid Response to Dietary Fat and Fenofibrate	NIH/NHLBI; R01 HL104135 (Arnett); Active	08/15/10 - 05/31/15 NCE	
TIWARI, Hemant K	Co-Investigator; Genome-Wide Association Study in African-Americans With Rheumatoid Arthritis	NIH/NIAMS; R01 AR057202 (Bridges); Active	09/25/09 - 07/31/15 NCE	
TIWARI, Hemant K	Co-Investigator; Statistical Tools for Whole-Genome Prediction of Complex Traits and Disease	NIH/NIGMS; R01 GM101219 (de los Campos); Active	03/01/12 - 01/31/16 NCE	
TIWARI, Hemant K	Collaborator; NSF EPSCoR Research Infrastructure Improvement Award Year 3-5	Tuskegee University/NSF; (Lawson, Site PI); Active	09/27/11 - 08/31/15	$225,680
TIWARI, Hemant K	Co-Investigator; Association of Genetic and Autoantibody Signatures with SLE Clinical Course	NIH/NIAMS; R01 AR064820 (Brown); Active	08/26/14 - 06/30/19	$482,631
TIWARI, Hemant K	Co-Investigator; Genome-wide Association Study of Lipid Response to Fenofibrate and Dietary Fat	NIH/NHLBI; R01 HL091357 (Arnett); Active	04/01/15 – 02/28/19	$699,303
TIWARI, Hemant K	Co-Investigator; Epigenetic Determinants of Left Ventricular Structure and Function in Hypertensive African Americans	American Heart Association; 15GPSPG23890000 (Arnett); Active	02/01/15 - 01/31/17	$227,273
TIWARI, Hemant K	Co-Investigator; A Genome-Wide Methylation Study of Epigenetic Contributions to Multiple Myeloma	NIH/NCI; R21 CA155951 (Brown); Active	07/07/11 - 06/30/15 NCE	
TIWARI, Hemant K	Co-Investigator; Genetic Architecture of Rheumatoid Arthritis in African-Americans	NIH/NIAMS; K23 AR062100 (Danila); Active	06/01/12 - 05/31/17	$123,700

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TIWARI, Hemant K	Principal Investigator: Short Course on Statistical Genetics and Genomics	NIH/NIGMS; R25 GM093044; Pending*	08/01/15 – 07/31/20	$1,000,000 TDC
TIWARI, Hemant K	Subaward PI; Epigenome Modification by a Dietary Pattern Rich in Polyunsaturated Fatty Acids	University of Alaska Fairbanks; Pending*	12/01/15 - 11/30/19	$452,037 TDC
TIWARI, Hemant K	Subaward PI; Compound Screen for left ventricular hypertrophy using human iPSC cardiomyocytes	Medical College of Wisconsin/ NIH/NIGMS; R01; Pending*	07/01/15 - 06/30/20	$540,709 TDC
TIWARI, Hemant K	Co-Investigator; Post-Breast Cancer Weight Loss Alters Methylation, Gene Expression and Biomarkers	NIH/NCI; R01 CA199715 (Demark-Wahnefried); Pending*	07/01/15 - 06/30/19	$1,998,990 TDC
TIWARI, Hemant K	Co-Investigator; Genome Studies to Mitigate Disparities in Personalized Medicine	Vanderbilt University Medical Center/NIH; (Arnett, Site PI); Pending*	11/01/15 - 10/31/19	$1,024,435 TDC
TIWARI, Hemant K	Co-Investigator, Administrative Core; UAB Research Center for Pharmacogenomics in Precision Transplant Medicine	NIH/NIGMS; P50 GM115324 (Limdi); Pending*	07/01/15 – 06/30/20	$10,771,928 TDC
TIWARI, Hemant K	Co-Mentor; An Analytical Framework for the Genetics of Rheumatoid Arthritis in African Americans	NIH/NIAMS; F30 AR069414 (Laufer); Pending*	09/01/15 – 08/31/19	$156,353 TDC
TOLLEFSBOL, Trygve	PI; Combinatorial epigenetic-based prevention of breast cancer	NIH/NCI; R01 CA178441; Active	04/01/14 – 02/28/19	$208,649
TOLLEFSBOL, Trygve	PI; Epigenetics of early life exposure to cancer preventive cruciferous vegetables	American Institute for Cancer Research; Active	01/01/15 - 12/31/16	$75,000
TOLLEFSBOL, Trygve	PI; Cell Senescence Culture Facility	Institutional Funds/UAB Center for Aging; Active	14th year of support; Non-competing continuation	$5,000
TOLLEFSBOL, Trygve	Co-Investigator; Maternal Epigenetic Dietary Effects on Early Breast Cancer Prevention	NIH/NCI; R03 CA176766 (Y. Li); Active	09/17/13 – 08/31/15	$50,000
TOLLEFSBOL, Trygve	PI; Combinatorial Chemoprevention of the Initiation of Breast Cancer	NIH/NCI; R21 CA182033; Pending*	07/01/15 – 06/30/17	$275,000 TDC
TOLLEFSBOL, Trygve	Project PI, Project 3: Promotion of Disease Latency by Botanicals that Function through Epigenetic Mechanisms; UAB Botanicals Research Center for Healthy Aging	NIH; P50 AT008665 (Barnes, PD/PI); Pending*	07/01/15 – 06/30/20	$6,492,000 TDC

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TOLLEFSBOL, Trygve	Co-PI; Lowering Breast Cancer Risk during Adolescence: Soy Isoflavones, Microbiome, Metabolism and Epigenetics	NIH/NCI; U01 CA199356 (Barnes & Tollefsbol, MPIs); Pending*	07//01/15 -06/30/20	$487,399 TDC
TOLLEFSBOL, Trygve	Co-Investigator; Histone H4 Lysine 16 Acetylation in Aging and Lung Fibrosis	NIH/NIA; R01 AG050567 (YY Sanders); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
TOLLEFSBOL, Trygve	Co-Investigator; High-Fat Diet Promotes UV-Carcinogenesis: DNA Hypermethylation, Immunosuppression	NIH/NCI; R01 CA196716 (Katiyar); Pending*	07/01/15 - 06/30/20	$1,250,000 TDC
TOLLEFSBOL, Trygve	Co-Investigator; Role of Syndecan in Fat Cell Homeostasis and Senescence	NIH/; R21 (DeLuca); Pending*	07/01/15 - 06/30/17	$275,000 TDC
TOLLEFSBOL, Trygve	Co-Investigator; Mechanisms Linking Maternal Soybean Genistein to Fetal Breast Cancer Intervention	American Institute for Cancer Research; (Y. Li); Pending*	01/01/16 - 12/31/17	$150,000 TDC
TOWNES, Tim M	PI; Human Globin Gene Regulation During Development	NIH/NIDDK; R01 DK073391; Active	07/15/12 - 06/30/16	$150,000
TOWNES, Tim M	Subaward PI; High-Throughput Screen for Small Compounds that Reactivate Fetal Hemoglobin in Adults Cells Synthesizing Sickle Hemoglobin	Southern Research Institute; Active	11/15/13 – 11/14/16 NCE	
TOWNES, Tim M	Co-Investigator; Targeted Delivery of iPS-Endothelial Cells for the Repair of Cardiovascular Injury	NIH/NHLBI; R01 HL116727 (Y-Y Chen); Active	08/01/13 – 03/31/17	$246,250
TOWNES, Tim M	Co-Investigator; Production of T Cells from Human Inducible Pluripotent Stem Cells (hIPS) Expressing a Chimeric Antigen Receptor (CAR) Against Precursor-B Leukemia Cells	Hyundai Hope on Wheels; (Goldman); Active	01/01/14 - 12/31/16	$125,000
TOWNES, Tim M	PI; Pig Models of SCID and Sickle Cell Disease	NIH/NHLBI; R01 HL129791 Pending*	07/01/15 – 06/30/20	$2,495,000 TDC
TOWNES, Tim M	PI; CRISPR/Cas Enhanced Gene Replacement for Sickle Cell Disease	NIH/NHLBI; R01 HL130794 Pending*	09/01/15 – 08/31/19	$1,200,000 TDC
TOWNES, Tim M	PI; CRISPR/Cas Enhanced Gene Replacement For Wiskott-Aldrich Syndrome	NIH/NHLBI; R01 HL131027; Pending*	09/01/15 – 08/31/19	$1,200,000 TDC
TOWNES, Tim M	Co-Investigator; Sickle Cells Target Hypoxic Tumor Niches and Induce Innate & Adaptive Anti-Tumor Responses	NIH/NHLBI; R01 HL129791 (Terman); Pending*	07/01/15 – 06/30/20	$1,250,000 TDC

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TOWNES, Tim M	Co-Investigator; Targeted Delivery of iPS-Endothelial Cells for the Repair of Cardiovascular Injury in Pig	American Heart Association; (Y-F Chen); Pending*	07/01/15 - 06/30/17	$150,000 TDC
TOWNES, Tim M	Co-Investigator; Using iPC-ECs for Targeted Cell Therapy to Repair Cardiovascular Injury in Pig Model	NIH/NIA; R21 AG052159 (Y-F Chen); Pending*	12/01/15 - 11/30/17	$275,000 TDC
TSE, Hubert M	PI; Synergism of Innate Immune-Derived ROS and T cell Effector Responses in T1D	American Diabetes Association 7-12-CD-11; Active	07/01/12 – 06/30/17	$135,000
TSE, Hubert M	PI; Redox Regulation of Anti-Viral Responses in Type 1 Diabetes	NIH/NIDDK; R01 DK099550; Active	07/01/14 – 06/30/19	$217,500
TSE, Hubert M	Co-PI; Treatment of Neuropathic Pain after SCI with a Catalytic Oxidoreductant	DoD Army Medical Research Acquisition Activity; W81XWH-13-1-0482 (Floyd & Tse, MPIs); Active	09/30/13 – 09/29/16	$118,728
TSE, Hubert M	Co-PI; Immunomodulatory Ultrathin Coatings for Pancreatic Islet Transplantation	National Science Foundation; DMR 1306110 (Kharlampieva); Active	07/01/13 – 06/30/16	$191,000
TSE, Hubert M	Co-Investigator, Administrative Core; UAB Diabetes Research and Training Center	NIH/NIDDK; P30 DK079626 (Garvey)	03/01/13 – 02/28/18	$272,774
TSE, Hubert M	Co-Investigator; Glucose Regulation of Bacterial Virulence in Diabetes and Hyperglycemia	NIH/NIAID; R21 AI103769 (Yother); Active	04/15/13 03/31/16 NCE	
TSE, Hubert M	Co-Investigator; Effect of GABA or Combination GABA/GAD on the Progression of Type 1 Diabetes Mellitus in Children	Diamyd Medical AB; (McCormick); Active	11/10/14 - 11/09/16	$71,249
TSE, Hubert M	Co-Investigator; Analysis of Human and Mouse Antibodies to Beta Cell Antigens Bearing N-Acetyl Glucosamine Post-Translations Modifications and their Potential to Prevent Human Type 1 Diabetes	Juvenile Diabetes Research Foundation International; 2-SRA-2014-300-Q-R (Kearney); Active	10/01/14 - 09/30/16	$118,182
TSE, Hubert M	PI: Islet Encapsulation with Immunomodulatory Nanothin Coatings	Juvenile Diabetes Research Foundation; 1-SRA-2015-42-A-N; Pending*	06/01/15 – 05/30/16	$135,812 TDC
TSE, Hubert M	Primary Mentor; Macrophage-Derived Free Radicals Contribute to Coxsackievirus-Induced Type 1 Diabetes	NIH/NIDDK; F31 DK107201 (Burg); Pending*	07/01/15 – 06/30/17	$35,252 TDC
WALTER, Mark	PI, Single Cell Detection of IFN'S in Lupus Patients	Lupus Research Institute; Active	01/01/15 - 12/31/17	$100,000

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WALTER, Mark	Co-PI, Vaccine-mediated Targeting of Viral IL10 to Control HCMV Shedding and Reinfection	University of California, Davis/ NIH/NIAID; R01 AI097629 (Barry & Walter, MPIs); Active	12/01/11 - 11/30/16	$164,340
WALTER, Mark	Co-PI; Prevention of Primary HCMV Infection by Vaccinating against HCMV-Encoded IL-10	NIH/NIAID; R01 AI049342 (Barry & Walter, MPIs); Active	02/01/13 - 01/31/18	$170,923
WANG, Lizhong	PI; MicroRNAs for monitoring tumor progression and predicting response to therapy	NIH/NCI; R21 CA179282; Active	05/01/14 – 04/30/16	$130,500
WANG, Lizhong	PI; Synergistic action of FOXP3 and TSC1 pathways during tumor progression	DoD Army Medical Research Acquisition Activity; W81XWH-14-1-0580; Active	09/29/14 – 09/28/17	$82,747
WANG, Lizhong	PI, Pre-Pilot Project: Association of CD24 and Progression of Prostate Cancer in African-Americans; Morehouse School of Medicine/Tuskegee University/University of Alabama Cancer Center Partnership	NIH/NCI; U54 CA118948 (Manne, PD/PI); Active	07/01/14 – 06/30/15	$15,000
WANG, Lizhong	PI; Developing Targeted X-Linked Gene Reactivation for Breast Cancer Therapy	DoD; Pending*	09/30/15 – 09/29/18	$270,117 TDC
WANG, Lizhong	PI; Roles of SEMA6D in Breast Cancer Metastasis	DoD; Pending*	09/30/15 – 09/29/18	$134,275 TDC
WANG, Lizhong	PI: Epigenetic Editing of Androgen Receptor for Effective Therapy in Castration-Resistant Prostate Cancer	DoD; Pending*	09/30/15 – 09/29/16	$75,000 TDC
WANG, Lizhong	PI; Roles of CD24 in Lung Cancer Drug Resistance	DoD; Pending*	09/30/15 – 09/29/16	$100,000 TDC
WANG, Lizhong	PI; Targeted X-Linked Gene Reactivation for Breast Cancer Therapy	DoD; Pending*	09/30/15 – 09/29/18	$350,000 TDC
WANG, Lizhong	Co-Investigator; Effects of CD24-RCC2 Signaling on Prostate Cancer Metastasis	DoD; (R. Liu); Pending*	09/30/15 – 09/29/18	$225,000 TDC
WANG, Lizhong	Co-Investigator; Roles of Semaphorin Signaling in Breast Cancer Racial Disparities	NIH/NCI; R21 CA199586 (Jiao); Pending*	07/01/15 – 06/30/17	$275,000 TDC
WANG, Lizhong	Co-Investigator; Roles of SEMA6D in Breast Cancer Metastasis	DoD; (Jiao); Pending*	09/30/15 – 09/29/18	$215,725 TDC
WANG, Lizhong	Co-Investigator; Developing Targeted X-Linked Gene Reactivation for Breast Cancer Therapy	DoD; (Challa); Pending*	09/30/15 – 09/29/18	$79,883 TDC

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WANG, Lizhong	Co-Investigator; USP49, A Newly Identified Histone H2B Deubiquitinase, Regulates Alternative Transcription in Tumorigenesis of Breast Cancer	DoD; (Z. Zhang); Pending*	01/01/16 - 12/31/20	$1,250,000 TDC
WANG, Lizhong	USP49, A Newly Identified Histone H2B Deubiquitinase, Regulates Alternative Transcription in Tumorigenesis of Breast Cancer	NIH/NCI; R01 CA196899 (Z. Zhang); Pending*	01/01/16 - 12/31/18	$750,000 TDC
WARRINER, Amy H	Co-Investigator; Activating Patients to Reduce Osteoporosis (APROPOS)	NIH/NIAMS; R01 AR060240 (K. Saag); Active	07/01/11 – 03/31/16	$516,049
WARRINER, Amy H	Co-Investigator; SLIMMED: Sleeve Gastrectomy Versus Intensive Medical Weight Management to Eliminate Diabetes	Ethicon, Inc; (Lewis); Pending*	03/01/15 - 02/28/22	$8,802,885 TDC
WARRINER, Amy H	Co-Investigator; Effectiveness of DiscontinuinG BisphosphonatEs Study (EDGE)	PCORI; (Saag); Pending*	12/01/15 - 11/30/20	$26,147,611 TDC
WEAVER, Casey T	PI; Interplay of T Cell Subsets in IBD Pathogenesis	Crohn's & Colitis Foundation of America; Active	07/01/14 - 06/30/17	$105,300
WEAVER, Casey T	PI; JT Pharma (JTP) – UAB Immune-Mediated Disease Program	JT Pharma, Inc; Active	06/18/13 – 06/17/15	$518,789
WEAVER, Casey T	PI; Molecular Regulation of MS Susceptibility Genes	NIH/NIAID; R01 AI107759; Active	06/10/13 – 05/31/17	$250,000
WEAVER, Casey T	PI, Project 3: ; Innate and Adaptive Immunity in IBD	NIH/NIDDK; P01 DK071176 (elson, PD/PI); Active	08/01/10 - 07/31/15	$210,908
WEAVER, Casey T	PI; Factors Controlling Effector T Cell Maintenance in the Pathogenesis of Colitis	NIH/NIDDK; R01 DK093015; Active	09/20/11 -07/31/16	$217,500
WEAVER, Casey T	Primary Mentor; Mechanistic Studies of Interleukin 10 Gene Regulation in Intestinal CD4 T Cells	NIH/NIDDK; F30 DK098911 (Moseley); Active	06/30/13 – 06/09/17	$33,640
WEAVER, Casey T	Primary Mentor; Role of Rorγt Positive Innate Lymphoid Cells in Neonatal Intestinal Barrier Development	NIH/NIDDK; F30 DK105680 (Singer); Active	02/01/15 - 01/31/16	$34,458
WEAVER, Casey T	Co-Investigator; Regulation of T Cell Activity during Chronic Infections	NIH/NIAID; R01 AI049360 (Zajac); Active	01/01/15 – 12/31/19	$104,167
WEAVER, Casey T	Co-Investigator; Immunopathogenesis in Fungal Asthma	NIH/NIHLBI; R01 HL122426 (Steele); Active	12/01/14 –11/30/18	$319,400
WEAVER, Casey T	Co-Investigator, Animal Model Core; Innate and Adaptive Immunity in IBD	NIH/NIDDK; P01 DK071176 (Elson, PD/PI); Active	08/01/10 - 07/31/15	$199,685

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WEAVER, Casey T	Collaborator, Major Program Leaders; Comprehensive Cancer Center Core Support Grant	NIH/NCI; P30 CA013148 (Partridge); Active	09/01/11 - 03/31/16	$121,267
WEAVER, Casey T	PI; Th17 Pathway Plasticity in the Pathogenesis of Inflammatory Bowel Disease	NIH/NIDDK; R01 DK103744; Pending*	07/01/15 – 06/30/20	/$1,250,000 TDC
WEAVER, Casey T	PI; Gene Regulatory Networks Controlling Effector and Regulatory T Cell Balance in IBD	NIH/NIDDK; R01 DK106343; Pending*	12/01/15 – 11/30/20	$1,996,589 TDC
WEAVER, Casey T	PI; IL-1-Mediated Regulation of the Th17 Developmental Program and Its Role in IBD	Crohn's & Colitis Foundation of America; Pending*	07/01/15 – 06/30/18	$270,000 TDC
WEAVER, Casey T	Primary Mentor; A Potential Role for Insulin-Like Growth Factors in the Pathogenesis of Multiple Sclerosis	NIH/NIAID; F30 AI115874 (DiToro); Pending*	07/01/15 – 06/30/19	$170,032 TDC
WEAVER, Casey T	Co-Investigator, Inflammation, Immunology and Immunotherapeutics Program; Comprehensive Cancer Center Core Support Grant	NIH; (Partridge, PD/PI; Buchsbaum, Component Leader); Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
WEAVER, Casey T	Co-Investigator, Microbiome and Gnotobiotics Shared Facility; Comprehensive Cancer Center Core Support Grant	NIH; (Partridge, PD/PI; Morrow, Component Leader); Pending*	04/01/16 - 03/31/21	$20,833,280 TDC
WEAVER, Casey T	Co-Investigator, Administrative and Recruitment Core; B cells in SLE: Genetic and Genomic Mechanisms	NIH/NIAID; P01 AI110366 (Kimberly, PD/PI & Core Leader); Pending*	09/01/15 – 08/31/20	$8,696,843 TDC
WEINMANN, Amy	PI; Tet1 Activity and Function in Helper T Cells	NIH/NIAID; R21 AI113026; Active	08/01/14 – 07/31/16	$125,000
WEINMANN, Amy	PI; Molecular Characterization of T-beta's Role in Immunity	NIH/NIAID; R01 AI061061; Active	02/01/14 – 01/31/16	$152,349
WEINMANN, Amy	PI; UAHSF General Endowment fund Scholar	Institutional Funds/University of Alabama Health Services Foundation; Active	06/01/14 - 05/31/17	$83,333
WEINMANN, Amy	Co-Investigator; Regulation of T cell dependent B cell responses to influenza	NIH/NIAID; R01 AI110480; Active	01/21/15 – 12/31/19	$250,000
WEINMANN, Amy	PI; Molecular Characterization of the Role for T-Bet and Bcl-6 in Immune Cell Metabolism and Differentiation	NIH/NIAID; R01 AI061061; Pending*	07/01/15 – 06/30/20	$1,250,000 TDC
WICK, Timothy M	PI, Assessment of Osteoinductive and Antimicrobial Properties of Photofunctionalized Biomaterials	BioHorizons, Inc;	01/01/15 - 12/31/16	$10,000

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WICK, Timothy M	Subaward PI; Development of a Drug Eluting Band/Glove for Treatment of Osteoarthritis	Southern Research Institute; Active	11/29/12 – 11/28/15	$12,500
WICK, Timothy M	Co-investigator; Mechanism of TgfβR2 in Chondroprotection	NIH R01 AR062507 (Serra); Active	4/1/13 – 3/31/18	$212,500
WICK, Timothy M	Co-Investigator; Prolhealing Multifunctional Endothelium Nanomatrix Coated Stent	NIH R01 HL125391(H-W Jun); Active	10/01/14 – 09/30/19	$250,000
WICK, Timothy M	Co-Investigator, Interactive Exercise Technologies and Exercise Physiology for People with Disabilities; Rehabilitation Engineering Research Center	NIDRR Grant H133E120005 (Rimmer, PD/PI); Active	10/01/12 – 09/30/17	$828,860
WICK, Timothy M	Co-PI; MRI: Acquisition of a Bioplotter for 3D Tissue Engineering	National Science Foundation; (Sethu & Wick, MPIs); Pending*	09/01/15 - 08/31/17	$237,397 TDC
YANG, Yang	PI; The Role of Myeloma Cell-Derived Runx2 in Myeloma Metastasis: Focus on Bone Microenvironment	International Myeloma Foundation; Active	01/01/15 – 12/31/15	$72,727
YANG, Yang	PI; Heparanase Regulation of Osteolysis in Multiple Myeloma	NIH/NCI; R01 CA151538; Active	07/01/11 – 06/30/16	$188,542
YANG, Yang	PI; The Role of Myeloma Cell-Derived Runx2 in Myeloma Metastasis to Bone	Institutional Funds/UAB Center for Metabolic Bone Disease Pilot Grant; Active	08/01/14 - 07/31/15	$30,000
YANG, Yang	Co-Investigator; The thrombospondin1-TGF-beta axis in multiple myeloma	NIH/NCI; R01 CA175012 (Murphy-Ullrich); Active	07/01/14 – 06/30/19	$515,979
YANG, Yang	PI; The role of osteoblast-derived Runx2 and osteocytes in multiple myeloma	NIH/NCI; R01 CA200729; Pending*	09/01/15 – 08/31/20	$1,271,372 TDC
YOUNGER, Jarred W	PI; Daily Immune Monitoring in Chronic Fatigue Syndrome	NIH/NIAID; R01 AI107655; Active	09/12/14 - 02/28/19	$301,179
YOUNGER, Jarred W	PI; Moral Elevation and the Brain	John E. Fetzer Institute; Active	02/01/15 – 08/31/16	$90,909
YOUNGER, Jarred W	Primary Mentor; Neuroimmodulatory Pharmacotherapy in Pain: Therapy and Outcomes	International Association for the Study of Pain International Trainee Fellowship; (Parkitny); Active	07/14/14 – 07/13/15	$29,855
YOUNGER, Jarred W	Subaward PI; Use of Naltrexone to Reduce Inflammation and Improve Gait in Older Adults	Georgetown University/NIH; Pending*	07/01/15 – 06/30/18	$456,182 TDC

Faculty Member	Faculty Member Role on Project and Grant Title	Source of Support Grant Number and Status	Project Period	Current Year Direct Costs Awarded (Total Direct Costs for Awards With Substantial Future Changes)
YUSUF, Nabiha	PI; Regulation of Ultraviolet Radiation-Induced Cutaneous Photodamage and Nucleotide Excision Repair by Toll- Like Receptor-4	DoD Army Medical Research Acquisition Activity; W81XWH-10-1-0763; Active	09/01/10 - 09/15/15 NCE	
YUSUF, Nabiha	Primary Mentor; Role of p53 in modulation of Toll like receptor mediated ultraviolet radiation induced cutaneous responses	American Skin Association Medical Student Grant; Active	07/01/13 - 06/30/15	$7,000
YUSUF, Nabiha	PI; Mechanisms Elicited by Type I Interferons in Cutaneous Photocarcinogensis	NIH; Pending*	04/01/16 – 03/31/21	$1,250,000 TDC
YUSUF, Nabiha	PI; Association of Vitamin D Receptor and Toll-Like Receptor-4 with Skin Cancer Risk	NIH; Pending*	07/01/15 – 06/30/17	$100,000 TDC
YUSUF, Nabiha	PI; Preventive Effects of Tualang Honey against Photodamage and Photocarcinogenesis	NIH/NCI; R03 CA198814; Pending*	07/01/15 – 06/30/17	$100,000 TDC
YUSUF, Nabiha	Co-Investigator; A CRP-targeting strategy to inhibit tumor-promoting MDSCs in the kidney	American Association for Cancer Research/KURE-IT; (Szalai); Pending*	07/01/15 - 06/30/17	$227,273 TDC
ZAYZAFOON, Majd	Subaward PI and Core Leader, Pathology and High Resolution Imaging Core; Prostate Cancer Bone Metastasis: Biology and Targeting	Cedars-Sinai/NIH/NCI; P01 CA098912 (Chung & Zayzafoon, MPIs); Active	12/01/02 - 02/29/20	$112,200
ZAYZAFOON, Majd	PI; International Advanced Clinical Training Program		07/01/14 – 06/30/15	$650,000
ZHANG, Ping	PI; Molecular Mechanisms of the Innate Regulation of Osteoclastogenesis	NIH/NIDCR; R03 DE022401; Active	07/01/12 - 06/30/15 NCE	
ZHANG, Ping	PI; Osteoclast precursors and Chronic Periodontits	NIH/NIDCR; R01 DE025282; Pending*	07/01/15 – 06/30/20	$1,250,000
ZHANG, Ping	Co-Investigator; Induction of Negative Immune Regulators by Porphyromonas Gingivalis Infection	NIH/NIDCR; R21 DE024810 (Katz); Pending*	07/01/15 – 06/30/17	$275,000 TDC
ZHANG, Ping	Co-investigator; Development of Structurally Defined QS-17/18-based Vaccine Adjuvants	NIH/NIAID; R21 AI121586 (P. Wang); Pending*	09/01/15 – 08/31/17	$275,000 TDC
ZHANG, Ping	Co-Investigator; Development of Quillajia Saponaria Saponin-based Vaccine Adjuvants	NIH/NIAID; R01 AI116526 (P. Wang); Pending*	09/01/15 – 08/31/19	$1,000,000 TDC

Table 4 Instructions: For each participating faculty member, **list active and pending research grant and contract support from all sources (including Federal, non-Federal, and institutional research grant and contract support)** that will provide the context for research training

experiences. Exclude research training grants. If none, state "None." Include the role of the participating faculty member (PD/PI, co-investigator, etc.) in the grant and grant title; source of support, grant number, and status (use an asterisk (*) to indicate pending sources of support); dates of the entire project period; and the current year annual direct costs. If the source of support is part of a multiple project grant (for example, a P01), additionally identify the PD/PI of the overall project, and provide the above information for that component of the grant with which the faculty member is associated. For grants with major budget changes in future years such as clinical trials, include the total direct costs of the award in parentheses. Do not list grants that have expired unless a pending continuation application has been submitted.

Summarize these data in the Program Plan Section 2.3.b Program Faculty. Analyze the data in terms of total and average grant support. Comment on the inclusion of faculty without research grant support and explain how the research of students that may work with them would be supported.

Rationale: This table provides evidence of the strength of the research environment, the availability of funds to support research conducted by the trainees, and the appropriateness of the participating faculty members in terms of their active research support.

Table 5A. Predoctoral Trainees of Participating Faculty Members
(Alphabetically by Faculty Member for the Past Ten Years)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ALLISON, David B	Current	Bernhard, Molly (UAB)	2013-present (PhD)	UAB	MPH	2013	Ambient temperature and energetic responses	UAB Pre-doctoral Fellow NIH T32 HL105349
ALLISON, David B	Current	Chusyd, Daniella (UAB)	2013-present (PhD)	Herzliya, Israel	MA	2010	diet influence on body composition and the impact on metabolic and physiological processes in African elephants (Loxodonta africana), as well as energetics.	UAB Pre-doctoral Fellow NIH T32 HL105349
ALLISON, David B	Past (Co-Mentor)	Carson (Cox), Tiffany* (UAB)	2009-2011 (PhD)	UAB	MPH	2005	Design of obesity treatment trials	Assistant Professor, UAB DOM, Division of Preventive Medicine
ALLISON, David B	Past	Giddings, Matt* (UAB)	2007-2011 (PhD)	UAB	BS	2005	Hormetic effects of hunger	Unknown
ALLISON, David B	Past	Keith, Scott W.* (UAB)	2004-2008 (PhD)	University of New Orleans	MS	2004	Statistical methodology	Assistant Professor, Thomas Jefferson University
ALLISON, David B	Past	Loop, Matthew* (UAB)	2010-2011 (pHD)	University of Alabama	BS	2010	Treatment heterogeneity in obesity RCTs	UAB Postdoctoral fellow, NIH T32 HL007457
ALLISON, David B	Past	Mehta, Tapan (UAB)	2011-2013 (PhD)	UAB	MS	2004	longitudinal and meta-analytic frameworks, risk prediction and bayesian hierarchical modeling	Assistant Professor, UAB Physical Therapy
ALLISON, David B	Past	Robertson, Henry* (UAB)	2008-2011 (PhD)	Univ of Michigan, Ann Arbor	MS	2006	Survival analysis	Scientist, Seton Health Care
ARNETT, Donna	Past	Bielinski, S. (UMN)	2003-2005 (PhD)	University of Minnesota	MPH	2000	Genetics and Environmental Determinants of Post Prandial Lipemia	Assistant Professor, Mayo Clinic

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ARNETT, Donna	Past	Cantrell, R. (UAB)	2004-2008 (PhD)	UAB	MPH	1998	Heterogeneity of Treatment Effects, Primarily in Diabetes and Osteoporosis	Research Scientist, Epidemiology Center of Excellence within Global Health Outcomes, Lilly Research Laboratories
ARNETT, Donna	Past	Jenkins, Todd M. (UAB)	2004-2008 (PhD)	UAB	MPH	2000	Hospice Use in Alabama: A Cross-Sectional Assessment	Assistant Professor, Cincinnati Children's Hospital Medical Center Depts of Pediatrics & Surgery; Deputy Director, Data Coordinating Center
ARNETT, Donna	Past	Limdi, Nita (UAB)	2005-2007 (PhD)	Samford University	PharmD MSPH	1994 2005	Pharmacogenetics of Warfarin	Associate Professor, UAB Dept. of Neurology
ARNETT, Donna	Past	Lynch, Amy I. (UMN)	2002-2005 (PhD)	University of Minnesota	MPH	2002	Gene Environment Interactions Determining Pulse Pressure	Research Associate, UAB
ARNETT, Donna	Past	Megazzini, Karen M (UAB)	2006-2008 DrPH	Copenhagen University	MS	2001	Provision of Rapid HIV Testing and Nevirapine Administration in Zambian Labor Wards to Improve Population Antiretrovial Coverage of HIV-infected Women and their HIV-exposed Infants	Sr Study Director/Sr. Epidemiologist, Westat, Inc
ARNETT, Donna	Past	Potter, Dara G. (UAB)	2002-2006 (DrPH)	Univ of Tulsa Oklahoma State Univ	BS MBA	1994 1990	Antenatal Syphilis Management in Sun-Saharan Africa: Public Health Management Challenges and the Impact of New HIV Programs in Zambia	Program Officer, National Institutes of Health (NIH/NIAID/DAIDS), Washington, D.C.
ARNETT, Donna	Past	Sahasrabuddhe, Vikrant (UAB)	2003-2006 (DrPH)	UAB University of Pune, India	MPH MBBS	2003	Cervical Cancer Screening for HIV-infected Women in Zambia	Research Associate Professor, Epidemiology, Vanderbilt Institute for Global Health, Nashville
ARNETT, Donna	Past	Sherva, Richard (UMN)	2003-2006 (PhD)	Univ of MN Gustavus Adolphus College, St Peter, MN	MPH BA	2001 1998	Gene Treatment Interactions in Relation to Stroke Incidence	Research Assistant Professor, Boston University, Biomedical Genetics

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ARNETT, Donna	Past	Xiao, Yan (UAB)	2005-2006	Peking Union Medical College	MPH	1999	Risk Factors for HIV/AIDS in Yunnan Province, China, Near the Myanmar Border	CDC of China
ASLIBEKYAN, Stella	Past	Tran, Ngan (UAB)	2014 (MS)	unknown	unknown	unknown	PCSK9 variation and association with blood pressure in African Americans : preliminary findings from the HyperGEN and REGARDS studies	Pharmacy PhD student at the University of Minnesota
ATKINSON, T. Prescott	Current	Totten, Arthur (UAB)	2012-present (PhD)	Rochester Institute of Technology	BS	2010	Effect of Allergic Sensitization on the Immune Response to *Mycoplasma pneumoniae* Infection	Internal funds, UAB PhD Student, Microbiology
BAMMAN, Marcas M	Current	Kelly, Neil A.* (UAB)	2011-present	College of New Jersey University of Connecticut	BS MS	2009 2011	Neuromuscular rehabilitation in Parkinson's Disease	UAB PhD Student, Pathobiology and Molecular Medicine T32 HD071866
BAMMAN, Marcas M	Current	Stec, Michael J.* (UAB)	2010-present	College of New Jersey Bloomsburg University	BS MS	2009 2010	Skeletal muscle stem cell biology in rehabilitation and disease	UAB PhD Student, Pathobiology and Molecular Medicine Individual Fellowship F31 AG044109
BAMMAN, Marcas M	Past	Kosek, David J.* (UAB)	2003-2007 (PhD)	Birmingham Southern College Univ of S. Alabama	BS BS	2002 1999	Aging and cellular adaptations to resistance training	PhD (UAB, 2007); DMD (Univ of Florida, 2011); Officer, General Dentist, U.S. Navy
BAMMAN, Marcas M	Past	Mayhew, David L.* (UAB)	2005-2010 (MD/PhD)	Truman State University	BS	2002	Molecular regulation of muscle protein synthesis	PhD received in 2010; MD received in 2012; Currently Holman Research Pathway Resident, 3rd Year, UAB Radiation Oncology

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
BELLIS, Susan L	Current	Chakraborty, Asmi (UAB)	2015-present (PhD0	Dr. D. Y. Patil University	M.Tech	2013	Role of glycosylation in chemoresistance	UAB PhD student, Cancer Biology; 1st-year support from UAB GBS
BELLIS, Susan L	Current	Curry, Andrew (UAB)	2014-present (PhD)	Mississippi State Univ.	BS	2014	Drug delivery by cargo-bearing nanocages	UAB PhD student, Biomedical Engineering; 1st –year support from UAB Dept of BME
BELLIS, Susan L	Current	Dorsett, Kaitlyn (UAB)	2015-present (PhD)	Birmingham Southern College	BS	2014	Role of glycosylation in stem cell behavior	UAB PhD student, Cancer Biology; 1st-year support from UAB GBS
BELLIS, Susan L	Current	Holdbrooks, Andrew (UAB)	2014-present (PhD)	Jacksonville State Univ.	BS	2010	Glycosylation-dependent control of TNF signaling	R UAB PhD Student, Pathobiology and Molecular Medicine R01 GM111093
BELLIS, Susan L	Current	Jones, Robert Brent (UAB)	2015-present (PhD)	Georgia College and State Univ.	MS	2014	Cancer stem cell biomarkers	UAB PhD student, Cancer Biology; 1st-year support from UAB GBS
BELLIS, Susan L	Current	Pensa, Nicholas (UAB)	2014-present (PhD)	UAB	BS	2014	Functionalization of biomaterials for bone tissue engineering	UAB PhD student, Biomedical Engineering; 1st –year support from UAB Dept of BME
BELLIS, Susan L	Past	Bonvallet, Paul (UAB)	2009-2014 (PhD)	Clemson Univ	BS	2008	Electrospun scaffolds for dermal wound healing	Senior Scientist - Skin Applied Research at L'Oréal, New Jersey
BELLIS, Susan L	Past	Clem, William (UAB)	2004-2008 (PhD)	Univ of Michigan Lipscomb University	MSBME BS	2002 2001	Mesenchymal stem cell interaction with ultra-smooth nanostructured diamond and microwave-plasma nitrided titanium alloy for wear-resistant biomedical implants	Sr. Research Engineer, Wright Medical Technology, Inc., Memphis
BELLIS, Susan L	Past	Mowry, Bonnie (nee Culpepper) (UAB)	2008-2013 (PhD)	UAB Mississippi State Univ	MSBME BS	2010 2008	Evaluation of mesenchymal stem cell adhesion to HA biomaterials	Sr Research Director, NuTech Medical, Birmingham, AL
BELLIS, Susan L	Past	Hennessy-McDonald, Kristin (UAB)	2004-2008 (PhD)	University of Notre Dame	BS	2003	Functionalizing HA biomaterials with biomimetic peptides	Science Faculty at St. Benedict at Auburndale; High School Biology Teacher, Memphis, TN

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
BELLIS, Susan L	Past	Phipps, Matthew (UAB)	2009-2012 (PhD)	Notre Dame University	BS	2008	Engineering porosity into electrospun scaffolds	Equity Research Associate at William Blair & Co.
BELLIS, Susan L	Past	Sawyer, Amber (UAB)	2002-2005 (PhD)	UAB	MS	2000	Modifying orthopedic biomaterials with adhesive peptides to promote bone formation	Postdoctoral Research Fellow at IMCB, A*STAR, Agency for Science, Technology & Research, Singapore
BELLIS, Susan L	Past	Schultz, Matthew (UAB)	2010-2015 (PhD)	University of Georgia	BS	2008	Role of receptor sialylation in ovarian cancer	Postdoctoral Fellow, UAB Cell, Deveopmental & Integrative Biology
BELLIS, Susan L	Past	Shaikh, Faheem (UAB)	2004-2008 (MD)	B.J. Medical College, India	MD	2008	Role of integrin sialylation in promoting colon cancer metastasis	Private clinical practice, Internal Medicine, Birmingham AL
BELLIS, Susan L	Past	Swindall, Amanda (UAB)	2008-2012 (PhD)	University of Alabama	BS	2006	Role of sialylation in regulating the Fas death receptor	Assistant Professor, Biology, Jefferson State Community College, AL
BELLIS, Susan L	Past	Woodard-Grice, Alencia (UAB)	2004-2008 (PhD)	Vanderbilt University	BSBME	2002	Role of variantly-sialylated integrins in myeloid differentiation	Innovation Testing Research Manager (New Platform & Technology Development) at Halyard Health, Atlanta, GA
BRADLEY, Laurence A	Current	Bulls, Hailey* (UAB)	2012-present (PhD)	University of Florida	BA	2006-2010	Associations Among Perceived Stress, Pain Sensitivity, and Physiological Reactivity Following an Acute Noxious Stressor	UAB PhD student, Psychology R37 AG033906
BRADLEY, Laurence A	Past	Byington, Katherine (UAB)	2009-2011 (PhD)	University of Alabama	BA	2005-2008	Effects of Mobile Internet Use on Pedestrian Injury Risk	Private Practice, Clinical Child & Adolescent Therapist Birmingham AL
BRADLEY, Laurence A	Past	Herbert, Matthew* (UAB)	2011-2014 (PhD)	California State Univ., San Bernadino	MA	2008-2010	Cortisol Regulation, Perceived Discrimination, and Ethnic Differences in Pain Responses among Persons with Knee Osteoarthritis	Post-Doctoral Fellow University of California-San Diego, VA Center for Excellence in Stress and Mental Health

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
BRADLEY, Laurence A	Past	Okonkwo, Renata* (UAB)	2005-2008 (PhD)	Hope College	BA	1999-2003	Ethnic Differences in Stressor-Evoked Changes in Pain Responses	Assistant Professor, University of Wisconsin Dept of Psychiatry/ Health Psychology
BRIDGES, Jr., S. Louis	Current	Boland, Molly (UAB) Co-Mentor with C. Raman	2014-present (PhD)	Millsaps College	BS	2014	Interferon gamma and disease severity in rheumatoid arthritis	UAB PhD Student, Pathobiology and Molecular Medicine
BRIDGES, Jr., S. Louis	Current	Carmona-Moran, Carlos A. (UAB)	2013-present (PhD)	UAB	MSBME	2010	Novel Transdermal Transport Systems for Therapeutic Agents in Arthritis	UAB PhD Student, Biomedical Engineering
BRIDGES, Jr., S. Louis	Current	Laufer, Vincent (UAB)	2013-present (MD/PhD)	University of Notre Dame	BA	2005	An Analytical Framework for the Genetics of Rheumatoid Arthritis in African Americans	UAB Medical Scientist Training Program (MD-PhD program)
BRIDGES, Jr., S. Louis	Current	Tang, Qi (UAB)	2013-2014 (MD)					Visiting Medical Student, Second Xiangya Hospital of Central South Univ, Changsha, China
BRIDGES, Jr., S. Louis	Current	Vinod, Surabhi (UAB)	2015 (MD)		BS		Interferon gamma in pathogenesis of rheumatoid arthritis	UAB Medical Student; Rheumatology Research Foundation Medical Student Research Preceptorship
BRIDGES, Jr., S. Louis	Past	Ahmed, Altan F. Co-mentor with R Reynolds (UAB)	2011 (MD)	Tulane Univ University of Alabama	MS BS	2009 2008	HLA-DRB1 and RA susceptibility in African Americans with RA	MD received in 2013, UAB SOM; Specializes in Diagnostic Radiology, Gainesville, FL
BRIDGES, Jr., S. Louis	Past	Alkurabi, Sawsan (UAB)	2009 (MD)	unknown	unknown	unknown		MD received in 2012, UAB SOM; 3rd Yr Resident, UA, Huntsville, Internal Med

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
BRIDGES, Jr., S. Louis	Past	Hu, Liangyuan (UAB)	2009-2012 (PhD)	Fudan Univ	BSc	2007	The role of CCL and CCR gene variants on HIV-1 transmission and acquisition	PhD; Ryan White Part B HIV Care and Services Program Data Manager, Arizona Department of Health Services
BRIDGES, Jr., S. Louis	Past	Jones, Nicholas** (UAB)	2009-2012 (PhD)	Bradley University	BSc.	2006	The Role of CRP in Arthritic Disease	Application Support Specialist, Envision contract with Monsanto
BRIDGES, Jr., S. Louis	Past	Morrison, Dahliann (UAB)	2005-2007				The HLA–DRB1 Shared Epitope Is Associated With Susceptibility to Rheumatoid Arthritis in African Americans Through European Genetic Admixture	Deceased
BRIDGES, Jr., S. Louis	Past	Parks, Lauren Co-mentor with R Reynolds (UAB)	2012 (MD)	Univ of Virginia	BS	2010	IFNγ and radiographic severity in RA	MD received 2015; Internal Medicine Resident, Weill Cornell Medical College
BRIDGES, Jr., S. Louis	Past	Patel, Keval	2007 (MD)	unknown	unknown	unknown		MD received 2010; Internal Medicine, Memphis TN
BRIDGES, Jr., S. Louis	Past	Perkins, Elizabeth* (UAB)	2010-2012 (PhD)	UAB	BS	2009	Genetic Influences on Rheumatoid Arthritis Susceptibility and Severity in African-Americans	unknown
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (UAB)	2010-2012 (DrPH)	UAB Univ of Mumbai India; University of Mumbai India;	MSPH MD MBBS	2003 1999 1997	Measuring Disease Activity and Use of Complementary and Alternative Medicine in African-Americans with Rheumatoid Arthritis	Clinical Database Manager, UAB DOM, Division of Infectious Diseases
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (UAB) Co-mentor with J Curtis	2006-2010 (PhD)	Univ of KY Sichuan Univ. Chengdu China	MPH BA	2005 2002	Joint Damage and Functional Disability in African-Americans with Recent-Onset Rheumatoid Arthritis	Assistant Professor, UAB, Department of Epidemiology
BROWN, Elizabeth E	Current	Behring, Michael (UAB)	2011-present (PhD)	UAB	MSPH	2011	Molecular and Genetic Epidemiology (iMAGE) Study of Myeloma	Comprehensive Cancer Center Graduate student; Epidemiology

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
BROWN, Elizabeth E	Current	Naik, Gurudatta (UAB)	2011	UAB	MPH	2009		Research Associate, UAB Comprehensive Cancer Center
BROWN, Elizabeth E	Past	Prentice, Heather (UAB)	2009-2013 (PhD)	Univ of KY Colorado State Univ	MPH BA	2009 2006	High density genotyping for immunogenetic polymorphisms associated with transmission and control of HIV-1 infection in Zambian heterosexual serodiscordant couples	Surgical Epidemiologist /Biostatistician, Inova Fairfax Medical Campus, Falls Church Virginia
BULLARD, Daniel	Current	Avery, Justin* (UAB)	2012-present (PhD)	Ursinus College	BS	2007-2011	Mac-1 regulation of SLE pathogenesis	Departmental Funds
BULLARD, Daniel	Past	O'Quinn, Darrell* (UAB)	2001-2005 (PhD)	LSU School of Veterinary Medicine	DVM BS	2000 1995	Roles of the B_2 integrins in IBD	Research Associate, UAB Dept of Pathology
CASAZZA, Krista	Current	Vincent, Danielle (nee Lorch) Co-mentor with K. Fontaine (UAB)	2012-present (PhD)	Loyola Univ of Chicago	MS		Body image dissatisfaction in obese African American and White early pubertal girls	PhD Candidate, UAB Psychology
CASAZZA, Krista	Current	Trotter, Timothy (UAB)	2013-present (PhD)	Univ of Alabama	BS	2012	The role of preadipocytes and osteocytes in multiple myeloma progression	UAB PhD Student, Pathobiology and Molecular Medicine
CASAZZA, Krista	Past	Newton, Annie (UAB)	2011-2014 (PhD)	Auburn Univ Auburn Univ	MS BS	2010 2007	The Interrelationships between obesity, insulin sensitivity, and bone phenotype in early pubertal girls	Edward Via College of Osteopathic Medicine, Auburn University
CHAPLIN, David D	Past	Jung, Yong Woo (UAB)	2001-2007 (PhD)	Korea University	MS	2000	Interface between Innate and Adaptive Immunity in Allergic Airway Inflammation	Associate Professor, Department of Pharmacy, Korea Univ.

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
CHAPLIN, David D	Past	Lai, Jen-Feng (UAB)	2004-2009 (PhD)	National Sun Yat-Sen University, Taiwan	MS	2003	Molecular Regulation of Allergic Airway Disease	Postdoctoral Fellow, Benaroya Research Institute; NIH HL 098067 and NIH AR 059058
CHAPLIN, David D	Past	Le, Thuc-vy* (UAB)	2002-2009 (PhD)	University of Minnesota	BS	2001	B Cell Clonal Abundance and MADCAM-1 Mediate Affinity Maturation and Fate of Germinal Center B Cells	Staff Scientist, NovoAb
CHEN, Yabing	Past	Byon, Chang-Hyun (UAB)	2005-2009 (PhD)	Pohang Univ of Science & Technology, Korea	MS BS	2000 1995	Molecular mechanisms of Oxidative stress-induced vascular calcification	Postdoctoral Fellow, UCLA
CHEN, Yabing	Past	Heath, Jack (UAB)	2009-2014 (PhD)	Birmingham Southern College	BS	2009	Protein O-GlcNAcylation in vascular calcification	Postdoctoral Fellow, Emory University Atlanta
CHEN, Yabing	Past	Pawar, Pritish (UAB)	2004-2008 (PhD)	B.J. Medical College, Univ of Pune, India	MBBS	2000	Regulation of Cholangiocarcinoma tumorigenesis by CaM/FLIP	Neurologist, Brain & Spine Center, Comprehensive Neurological Care, Chandler AZ
CRON, Randy Q	Current	Robinson, Tanya (UAB)	2011-present	Jackson State University	MS BS	2010 2004	The Mechanism by which Regulatory T Cells Inhibit HIV-1 Infection of Polarized Human Monocyte-Derived Macrophages	UAB PhD student, Immunology; Careers in Immunology Fellowship; American Association of Immunologists
CRON, Randy Q	Past	Weiss, Greta (UPenn)	2005 (PhD)	NA	BS	2004	Role of cmaf in HIV-1 Infection	Research Officer, The Burnet Institute, Centre for Biomedical Research, Melbourne, Australia
CUI, Xiangqin	Past	Chen, Lang (UAB)	2006-2008 (PhD)	Beijing Medical Univ	MD	1995	Microarray Data Analysis for SNPs Effects and Inferring Alternative Splicing	Research Associate Statistician (UAB)

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
CUI, Xiangqin	Past	Yang, Celeste (UAB)	2010-2013 (PhD)	Kansas State University	MS	2008	Multi-group High-dimension equivalence methods	BioFire Diagnostics Salt Lake City, UT
CURTIS, Jeffrey R	Past	Kitchin, Elizabeth (UAB)	2009-2011 (DrPH)	Virginia Polytechnic Institute & State Univ James Madison Univ	MS BS	1990 1986	Interventions to improve Osteoporosis Treatment quality	Assistant Professor, UAB School of Health Professions
CURTIS, Jeffrey R	Past	Van Den Bogert, Sander (UAB) CERTs intern	2010-2011 (MSc)	Utrecht University	MSc BSc	2013 1990	Health Belief Model constructs predicting Discontinuation or Continuation of Osteoporosis Treatment	PhD candidate at the Utrecht Insitute of Pharmaceutical Sciences (UIPS, Utrecht University)
CURTIS, Jeffrey R	Past	Yun, Huifeng (UAB) Co-mentor with P. Muntner	2008-2012 (PhD)	Shanxi Med. Univ, China Peking Union Med College UAB	MD MS MSc	1995 1999 2002	Saftey and Effectiveness of Osteoporosis Medications Among Medicare Beneficiaries	Research Assistant Professor, UAB Department of Epidemiology SOPH; PCOR K12 Scholar
CURTIS, Jeffrey R	Past	Zhang, Jie (UAB) Co-mentor with SL Bridges	2006-2010 (PhD)	Univ of KY Sichuan Univ. Chengdu China	MPH BA	2005 2002	Joint Damage and Functional Disability in African-Americans with Recent-Onset Rheumatoid Arthritis	Assistant Professor, UAB, Department of Epidemiology
CUTTER, Gary	Current	Hillegass, Jr., William (UAB)	2008-present (PhD)	Yale Univ Harvard Med School	BA/BA MD MPH	1983 1988 1988	Indirect Adjusted Trial Comparisons: Assessment of Existing Methods & Development of Novel Methods	Receives PhD Spring 2015; Practicing Cardiologist
CUTTER, Gary	Current	Salter, Amber (UAB)	2008-present (PhD)	Univ. of No. Texas Health Univ. of Texas, Austin	MPH BS	2005 2002	Practical Extensions of the Continual Reassessment Method	Receives PhD 2015; COMBIRx
CUTTER, Gary	Current	Wang, Guoqiao “Peter” (UAB)	2010-present (PhD)	Univ of Alabama Yunnan Univ. China	MS MS BS	2009 2007	Application of Longitudinal Data based Adaptive Design Clinical Trials for Alzheimer’s Disease and Mild Cognitive Impairment	Receives PhD 2015; NARCOMS

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CUTTER, Gary	Past	Baier, Monica	1998-2002	Univ. of Arizona	MS	1988	Low Contrast Letter Acuity in MS	Novartis Research Basil
CUTTER, Gary	Past	Frölich, Michael A. (UAB)	2012-2014 (PhD)	UAB Univ of Florida Univ of Vienna	MS MS MD	2012 2004 1988	Spectral Analysis of Block Design fMRI Data	Professor, UAB Dept of Anesthesiology
CUTTER, Gary	Past	Inusah, Seidu	2005-2008 (MS)	Univ. of Cape Coast Univ. of Reno	BS MSc	1995 2003	Effects of Definition and Selection Biases Estimation on Exacerbation Rates	Statistician, Jaeb Center for Health Research, Tampa
CUTTER, Gary	Past	Kruse, Rachel	2009-2012 (MS)	Naval Postgrad School Univ. of Toledo	MS BS	2002 1988	N/A	U. S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC)
CUTTER, Gary	Past	Li, Qing (UAB)	2004-2008 (PhD)	Second Military Med. Univ. UAB	BM MS	1996 2004	Interim Monitoring Efficacy and Safety in Phase III Clinical Trials	Bristol-Myers Squibb
CUTTER, Gary	Past	Liu, Yuliang (UAB)	2011-2012 (PhD)	UAB Peking Union Med. College China Med Univ.	MS MS BM	2002 1999 1993	Competing Risk Models for Survival	Statistician, UAB, Dept of Biostatistics SOPH; supported on 3 Grants
CUTTER, Gary	Past	Nair, Nitin (UAB)	2006-2008 (PhD)	Mumbai Univ Mumbai Univ	MSC BSc	2001 1999	Adaptive Procedures to Detect Treatment Effects Under Unexpected Treatment-Covariate Interactions	Principal Biostatistician at Vertex Pharmaceuticals, Boston
CUTTER, Gary	Past	You, Zhiying	2002-2008	Sun Yatsen Univ. Medical Sciences Hunan Medical College	MS B-MD	1995 1987	Power and Sample Size of Cluster Randomized Trials	Sr. Biostatistician, Michigan State Univ

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DAVIS, Randall	Current	Becker, Eugene* (UAB)	2010-present (PhD)	Louisiana State Univ	BS	2009	Defining the FCRL5 Ligand	UAB PhD Student, Immunology; Lupus Research Institute; R21 AI097729; R56 AI110553
DAVIS, Randall	Past	Schreeder, Daniel M (UAB)	2005-2009 (PhD)	UAB Washington & Lee Univ Lexington VA	MD BS	2007	Characterization of Human FcRH6	UPenn, Hematology/ Oncology Fellowship
DAVIS, Randall	Past	Zhu, Zilu (UAB)	2006-2012 (PhD)	Nanjing Medical Univ, Nanjing, P.R. China	MS		Characterization of FCRL5 Signaling	Sanford-Burnham Medical Research Institute, La Jolla, CA
EBERHARDT, Alan W	Current	Doud, Douglas (UAB)	2015 (MSBME)	Mercer Univ Mercer Univ	MEE BSE	2012 2012	Biomechanical Evaluation of a Novel Sacroiliac Joint Fusion Technique	Graduating 2015
EBERHARDT, Alan W		Pool, Sean (UAB)	2015 (MSBME)	UAB	BBME	2012	On the use of KINECT for interactive gaming for people with disabilities	Graduating 2015
EBERHARDT, Alan W	Past	Atieh, Rana (UAB)	2014 (MSBME)	UAB	BBME	2012	Fatigue testing and microstructural analysis of a high torque dental implant	Research Engineer at BioHorizons
EBERHARDT, Alan W	Past	Butala, Neha B (UAB)	2005 (MSBME)				An Experimental Study of Pelvic Strains in the Presence of a Simulated Metastatic Lesion and Cement Filling	Engineer at medical device company, Chicago, IL
EBERHARDT, Alan W	Past	Hill, Michael (UAB)	2006 (MSBME)				Tribological Investigation of Nanostructured Diamond Coatings on Polyethylene	PhD student, University of Pittsburgh Musculoskeletal Research Ctr (M. Sacks)
EBERHARDT, Alan W	Past	Ibañez Baker, Maribel (UAB)	2009 (MSBME)				Bone properties surrounding hydroxyapatite-coated custom osseous integrated dental implants	
EBERHARDT, Alan W	Past	Lesley, R. Justin (UAB)	2011 (MSBME)	UAB	BSBME	2010	A Comparative Study of Uni- and Bi-cortical Screws for Rotator Cuff Repair	Senior Product Development Engineer at Ideacraft Engineering

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EBERHARDT, Alan W	Past	Li, Zuoping (UAB)	2006 (PhD)				Biofidelic Finite Element Modeling of the Pelvis with Application to Side Impacts and Metastatic lesions	FEA Engineer at Humanetics Innovative Solutions
EBERHARDT, Alan W		Raghava, Parthasarathy (UAB)	2008 (MSBME)	Birla Institute of Technology & Science Birla Institute of Technology & Science	MSc BE	2005 2005	Biomechanical Studies of Shoulder Fixation and Arthroscopy	Senior Research Analyst, Frost & Sullivan, Chennai India
EBERHARDT, Alan W		Ramaswamy, Girish (UAB)	2007 (MSBME)	Birla Institute of Technology & Science	BME	2005	Mechanical & Geometric Characterization of Mouse Cortical Bone with Osteoblast-specific Knockout of Insulin-like Growth Factor Receptor Gene	PhD, UAB BME, 2012; Postdoctoral Fellow, McKay Orthopedic Research Laboratory, UPenn SOM
EBERHARDT, Alan W		Schwertz, Joseph M (UAB)	2012 (MSBME)	LSU	BSE	2010	Mechanical Characterization of Bacterial Cellulose Scaffolds for Tissue Engineering Applications	Recipient of 2011 UAB Ireland Tuition Scholarship; Current PhD candidate
ELSON, Charles O	Current	Zhao, Qing (UAB)	2011-present (PhD)	Shandong University, Shandong, China	BS	2009	Innate and Adaptive Immunity to Microbial Flagellins in IBD	Graduate Student, UAB Microbiology Theme
ELSON, Charles O	Past	Alexander, Katie (UAB)	2011-2015 (PhD)	Birmingham Southern College	BS	2010	Regulation of the Regulatory T cell-Immunoglobulin A Pathway	Postdoctoral Fellow, UAB
ELSON, Charles O	Past	Feng, Ting (UAB)	2008-2010 (PhD)	Wuhan Univ, Wuhan China	BS	2005	Innate and Adaptive Immunity to Microbial Flagellins in IBD	Healthcare Consultant, IMS Consulting Group, Shanghai, China
EDBERG, Jeffrey C	Past	Li, Xinrui (UAB) Co-Mentor with R. Kimberly	2003-2009 (PhD)	Fudan Univeristy	BS	2003	Regulation of B cell biology by Fcγ Receptors	Instructor in Medicine, UAB DOM, Division of Clinical Immunology and Rheumatology

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EDBERG, Jeffrey C	Past	Ptacek, Travis (UAB) Co-mentor with R. Kimberly	2006-2013 (PhD)	UAB UAB	MS BS	2006 2003	The Genetic Complexity of the Human FCγ Receptor 1q23 Locus and its Relationship to Autoimmunity	Post-doctoral Fellow, UAB CCTS Informatics
EDBERG, Jeffrey C	Past	Zhou,Yebin (UAB)	2007-2014 (PhD)	Fudan University	BS	2008	Functional Genomics of ITGAM	Postdoctoral researcher – MedImmune, Washington DC
FENG, Xu	Past	Ashley, Jason W.*	2006-2011 (PhD)	Tulane University)	BS	2006	Significance and Regulation of CD68 Expression in the Osteoclast	Postdoctoral Trainee, UPenn Dept Orthopaedic Surgery
FENG, Xu	Past	Cheng, J.	2008-2010 (PhD)	Medical College, Nanchang University, China	BS	2004	Regulatory Role and Molecular Mechanism of Cytokines in Osteoclastogenesis	Physician Scientist Fellow, Department of Hematology, First Affiliated Hospital of Medical School, Sun Yat-Sen Univ, China
FENG, Xu	Past	Hong, Huixian (UAB)	2011-2013 (MS)	Guangzhou Medical College Dalian Medical Univ	MS B - MD	2013 2010	The role of IL-3 in osteoclastogenesis in vitro	PhD Student, UAB, Pathobiology and Molecular Medicine
FENG, Xu	Past	Jules, Joel* (UAB)	2005-2010 (PhD)	University of Miami	BS	2005	In vitro elucidation of the role and mechanism of RANKL in TNF-and IL-1-mediated osteoclast formation and function	Postdoctoral Trainee, UAB Molecular & Cellular Pathology
FENG, Xu	Past	McCoy, Erin M.* (UAB)	2007-2013 (PhD)	Mississippi State University	BS	2007	Characterizing the Roles and Expression of IL-11 and CD68 in Breast Cancer Bone Metastasis	On family Leave
FLOYD, Candace	Current	Henley, Kathryn Y (UAB)	2012 – present (UAB)	Wake Forest University Gettysburg College	MS BA	2011 2005	Effect of a catalytic oxidoreductant and exercise rehabilitation on recovery after spinal cord injury	UAB PhD Student, Rehabilitation Science T32 HD071866

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FLOYD, Candace	Current	Mohaimany-Aponte, Amanda (UAB)	2013 – present (PhD)	California State Univ San Marcos	BS	2012	Evaluation of cannabidiol as a therapeutic after spinal cord injury in a rodent model	UAB Equity and Diversity Enhancement Program Fellowship (State of Alabama)
FLOYD, Candace	Current	Nichols, Jessica N (UAB)	2013 – present (PhD)	Aurora University	B.S.	2012	Effects of a catalytic oxidoreductant on repair and neurogenesis after repeated mild traumatic brain injury	Phd Candidate, Biomedical Sciences R01 NS075162
FLOYD, Candace	Past	Chaovipoch, Pimonporn (UC Davis)	2003-2005 (PhD)	Mahidol University, Thailand	MS	2003	17b-estradiol mediated protection after spinal cord injury	Assistant Professor, Department of Physical Therapy, Srinakharinwirot University, Thailand
FLOYD, Candace	Past	Day, Nicole (UAB)	2009-2014 (PhD)	UAB	BS	2008	Estrogen as a key element in combinatorial therapeutic approaches to treat TBI	Postdoctoral Fellow Dept of Neurological Surgery, UC San Francisco
FLOYD, Candace	Past	Dunham-Atkins, Kelly (UAB)	2008-2011 (PhD)	University of Iowa	BS	2006	Evaluation of glial activation in cervical spinal cord injury	Clinician-Scientist, Physical Therapy, Lakeshore Rehabilitation Birmingham AL
FLOYD, Candace	Past	Kachadroka, Supatra (UC Davis)	2005-2009 (PhD)	Mahidol University, Thailand	MS	2004	Effect of endogenous androgens on 17b-estradiol protection after spinal cord injury	Lecturer, Department of Anatomy, Mahidol University, Thailand
FLOYD, Candace	Past	Siriphorn, Akkradate (UAB)	2008-2010 (Ph.D)	Mahidol University, Thailand	MS	2007	Effects of estrogen on Schwann cell growth and transplantation after spinal cord injury in rats	Assistant Professor, Dept Physical Therapy, Chulalongkorn, University, Thailand
FONTAINE, Kevin	Current	Hoenemeyer, Teri (UAB)	2012 – 2015 (PhD)	UAB UAB	MS BA	2009 1998	Open-label placebo for cancer-related fatigue	Graduating 2015; Director, Education and Supportive Services, UAB Comprehensive Cancer Center
FONTAINE, Kevin	Current	Howell, Carrie M (UAB)	2014 – present (PhD)	UAB	MPH	Unknown	Obesity and mortality among Hispanics	UAB PhD Student, Dept of Health Behavior

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FONTAINE, Kevin	Current	Vincent, Danielle (nee Lorch) (UAB) Co-mentor with K. Cassazza	2012-present (PhD)	Loyola Univ of Chicago	MS		Body image dissatisfaction in obese African American and White early pubertal girls	PhD Candidate, UAB Psychology
FONTAINE, Kevin	Past	Haaz, Steffany (JHU)	2005-2010 (PhD)	Univ of Maryland Oberlin College	MFA BA		Yoga for RA	Health Behaviorist, Corporate Health Solutions; Director, Yoga For Arthritis
FONTAINE, Kevin	Past	Lin, Elaine (JHU)	2005 (PhD)	Unknown		Unknown	Eating self-efficacy	Unknown
GEORGE, James	Current	Hull, Travis D. (UAB)	2011-2015 (MD/PhD)	Juniata College	BS	2009	Mechanisms of Heme Oxygenase-1-Mediated Protection Against Tissue Injury	American Heart Association Pre-Doctoral Fellowship
GEORGE, James	Past	Frizzell, Carl (UAB)	2010-2012 (MS)	Mississippi State Univ	BS	2009	Role of HO-1 in dendritic cell differentiation and maturation	UAB Physician Assistant Student
GOEPFERT, Paul A	Current	Du, Victor (UAB)	2011-present (PhD)	Georgia Institute of Technology	BS MS	2008	Evaluation of HIV-1 Variant Epitopes as Potential HIV Vaccines	UAB PhD Student, Microbiology R01 AI112566
GOEPFERT, Paul A	Current	Peng, Binghao (UAB)	2013-present (PhD)	University of Missouri	BS	2010	Impacts of MHC class I restricted cryptic epitope recognition on HIV-1 viral adaptation	UAB PhD Student, Immunology R01 AI064060
GOEPFERT, Paul A	Past	Akinsiku, Olusimidele (UAB)	2006-2011 (MD/PhD)	University of Maryland, Baltimore Co MARC Scholar	BS	2004	Qualitative Analysis of HIV-1-Specific CD8 T Cell Responses	MD received in 2014; Pediatric Resident, Baylor College of Medicine
GOEPFERT, Paul A	Past	Barnes, Justin (UAB)	2007 (MS)	Univ of Maine Embry-Riddle Aeronautical University	BS BS	2006 2003	A Comparison of HLA Subclass-Restricted CD8+ T Cell Resposnes to HIV Gag Epitopes	PhD received in 2013; Moleclar and Cellular Pathology; Currently, Director of Assessment Services, CE Outcomes

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GOEPFERT, Paul A	Past	Bet, Anne (UAB)	2008 - 2014 (PhD)	University of Maryland at College Park	BS	2002	HIV-1 Cryptic Epitope: Generation and Recognition	Postdoctoral Research Fellow, Université Pierre et Marie Curie, Sorbonne Universities, Paris, France
GOEPFERT, Paul A	Past	Jackson, Bethany A (UAB)	2006 (MD)	Harding University	BS	2005	HIV-Specific T Cell Responses Following a Candidate Vaccine in Seronegative Adults	MD received in 2009, UABSOM; Endocrinology Diabetes & Metabolism, GA Regents University Augusta, GA
GOEPFERT, Paul A	Past	Leisch, Leah (UAB)	2006 (MD)	Samford University	BA		Evaluation of Polyfunctional CD4 T Cell Responses in HIV Infected Adults	Assistant Professor, Internal Medicine UAB SOM
GOEPFERT, Paul A	Past	Williams, LaTonya (UAB)	2007-2012 (PhD)	Shorter College Rome, GA	BS	2005	The Role of Th17 Cells in HIV Infection	Postdoctoral Associate Tomaras Laboratory Duke Human Vaccine Institute (G. Tomares)
HSU, Hui-Chen	Past	Cartwright, Eva* (UAB)	2010-2011 (MS)	Clarkson University	BS	2010	IFN alpha and IL-17-mediated autoantibody response	MS, 2013, UAB Forensic Science
JAVED, Amjad	Current	King, Kayla R. (UAB)	2014-present (MS)	Birmingham Southern College	BS	2013	Osteoblast and chondrocyte specific contribution of the Runx2 gene during development of Cleidocranial Dysplasia	NIH/NIAMS MS candidate at UAB
JAVED, Amjad	Current	Zein-Sabatto, Hala (UAB)	2015-present (PhD)	Vanderbilt University	BA	2013	SUMOylation mediated functions of Runx2 and Sp7 proteins	UAB PhD Student, Cell, Molecular and Developmental Biology
JAVED, Amjad	Past	Adhami, Mitra (UAB)	2009-2014 PhD/DMD	University of Alabama Huntsville, AL	BS	2008	Osteoblast and odontoblast specific regulatory actions of Runx2 for the development of mineralized tissues	DMD (expected 2017) PhD (2014), Cell, Developmental & Integrative Biology

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JAVED, Amjad	Past	Bae, Jong-Sup (UAB)	2003-2005 (MS)	Kyungpook National Univ, South Korea	BS	2002	Identification of Runx2 domain required for osteogenic differentiation	Assistant Professor Kyungpook National Univ, Daegu, S. Korea
JAVED, Amjad	Past	Clarke, John C. (UAB)	2012-2014 (MS)	Birmingham Southern College	BS	2011	Regulatory control of palatogenesis & odontogenesis by specificity protein 7	DMD student, UAB
JAVED, Amjad	Past	Jackson, Henry W (UAB)	2011-2015 (PhD)	University of Georgia	BS	2010	Zebrafish wnt9b patterns the first pharyngeal arch into D-I-V domains and promotes anterior-medial outgrowth	PhD received in 2015; Postdoctoral fellow UAB, Institute of Oral Health Research
JAVED, Amjad	Past	Rashid, Harunur (UAB)	2009-2014 (PhD)	University of Dhaka, Bangladesh	MS	2001	Molecular and functional interaction of Runx2 and Sp7 for development of the osteoblast phenotype	Postdoctoral fellow UAB, Institute of Oral Health Research
JAVED, Amjad	Past	Saoji, Nachiket A (UAB)	2006-2009 (MS)	Maharashtra Univ of Health Sciences, India	BDS	2005	Effect of bisphosphonate on osteogenic differentiation of pulp and pdl cells	MS, 2015, UPenn Endodontics,
JAVED, Amjad	Past	Sarof, Arjun (UAB)	2007-2009 (MS)	Ambedkar Dental College and Hospital, Bangalore, India	BDS	2006	Runx2 mediated transcriptional regulation of FGF3 in epithelial and mesenchymal cells	MS, Dentistry Technical Product Manager - Digital Dentistry at Nobel Biocare, NY
JAVED, Amjad	Past	Summerford, David C (UAB)	2009-2011 (MS)	University of Alabama	BS	2008	The effects of Runx2 deficiency in cartilaginous and mineralized craniofacial element	DMD, UAB SOD expected 2015
JUN, Ho-Wook	Current	Alexander, Grant (UAB)	2013-present (PhD)	Vanderbilt University	BS	2012	Endothelial mimicking nanomatrix for stents	UAB graduate student, Biomedical Engineering, Translational & Molecular Sci, HHMI med-grad fellowship, NIH R01
JUN, Ho-Wook	Current	Hwang, Patrick (UAB)	2010-present (PhD)	Korea University, Korea	MS	2009	Hybrid nanomatrix to promote islet transplantation	UAB graduate student, Biomedical Engineering, Alabama EPSCoR GRSP Fellowship, NIH R03

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JUN, Ho-Wook	Current	Vines, Jeremy (UAB)	2009-present (MSBME/PhD)	UAB	MS BS	2011 2009	Biphasic nanomatrix for bone tissue regeneration	UAB MSBME, 2011; Research Engineer, NuTech Medical, Inc, and UAB BME PhD student
JUN, Ho-Wook	Past	Anderson, Joel M. (UAB)	2006-2011 (PhD)	UAB Clemson Univ	MS BS	2008 2006	Biomimetic nanomatrix for bone tissue regeneration	Food & Drug Administration
JUN, Ho-Wook	Past	Andukuri, Adinarayana (UAB)	2007-2013 (PhD)	SRM, India	BS	2007	Biomimetic hybrid nanomatrix for cardiovascular applications	PostDoctoral Fellow Emory University, Emergent Behaviors of Integrated Cellular Systems (Yoon lab)
JUN, Ho-Wook	Past	Kushwaha, Meenakshi	2006-2008 (MS)	SASTRA, India/UAB	BS MS	2006 2008	Native endothelium mimicking nanomatrix for drug eluting stent application	2015 expected, Univ of Washington, MPH, Environmental and Occupational Health
JUN, Ho-Wook	Past	Lim, DongJin Daniel (UAB)	2008-2013 (PhD)	Hanyang University, Korea	MS	1998	Biomimetic nanomatrix to promote islet transplantation	PostDoctoral Fellow, Harvard University
KEARNEY, John	Current	Rodriguez Barrantes, Juan B* (UAB)	2009-present (PhD)	Old Dominion University	BS	2007	Protective antibodies against Anthrax	PhD Graduate Student, Pathology; Individual Predoctoral Fellowship F31 AI094961
KEARNEY, John	Current	New, James Stewart** (UAB)	2012-present (PhD)	Univ of Central Florida	BS	2011	Antibodies and Type 1 Diabetes	PhD Graduate Student, Immunology; Juvenile Diabetes Research Foundation
KEARNEY, John	Current	Patel, Preeyam (UAB)	2013-present (PhD)	Univ of North Carolina at Chapel Hill	BS	2011	B Cells Generated as a Result of Early Microbial Exposure Dampen the Development of Allergic Disease Later in Life	PhD Graduate Student, Microbiology; NIH R01 AI014782
KEARNEY, John	Past	Stefanov, Emily* (UAB)	2009-2014 (PhD)	Loyola University	BSc	2008	Antibodies and Asthma	Postdocotral Fellow, UAB Microbiology

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KEARNEY, John	Past	Chen, Yao (UAB)	2004-2010 (PhD)	Nanjing Univ, China	MS	2003	Isoforms of human TdT	Postdoctoral Fellow, GlaxoSmithKline
KEARNEY, John	Past	Dizon, Brian* (UAB)	2005-2012 (MD/PhD)	University of Miami	BS BA	2003	Antibodies and Type 1 Diabetes	University of Rochester, Residency, Pediatrics
KEARNEY, John	Past	Foote, Jeremy* (UAB)	2003-2009 (PhD)	Penn State University	BS	NA	Ig transgenic mice with carbohydrate specificity	PhD (UAB), DVM (Auburn); Kimmel Cancer Center, Dept of Molecular & Comparative Pathobiology
KEARNEY, John	Past	Lisanby, Mark* (UAB)	2004-2009 (PhD)	Huntingdon College	BS	2003	Defensins and anthrax	Research Fellow, US Air Force
KEARNEY, John	Past	Mahmoud, Tamer** (UAB)	2003-2009 (PhD)	Faculty of Pharmacy, Cairo Univ	BS	2000	Determine pattern of mouse TdT expression of its different isoforms and investigate a role for mouse TdT in receptor editing	Scientist, Medimmune Gaithersburg, VA
KEARNEY, John	Past	Swiecki, Melissa* (UAB)	2002-2008 (PhD)	University of Rochester NY	BS	2001	*B. anthracis* spore-host interactions	Postdoctoral Fellow, Washington Univ,
KEARNEY, John	Past	Wharton, Rebekah** (UAB)	2008-2013 (PhD)	Georgia Tech	BS	2008	Antibodies to *Aspergillus fumigatus*	Postdoctoral Fellow, Emory University
KIMBERLY, Robert P	Past	Dong, Chaoling (China/UAB)	2008-2013 (PhD)	Yangzhou Univ, P.R. China	MS	2008	FcR haplotypes affect human IgG binding & association with lupus nephritis in African Americans	Research Assistant, UAB Dept of Neurology, Neuromuscular Immunopathology Research Laboratory (NIRL), Division of Neuromuscular Diseases
KIMBERLY, Robert P	Past	Li, Xinrui (UAB) Co-Mentor with J. Edberg	2003-2009 (PhD)	Fudan Univeristy	BS	2003	Regulation of B cell biology by Fcγ Receptors	Instructor, UAB DOM, Division of Clinical Immunology and Rheumatology

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KIMBERLY, Robert P	Past	Ptacek, Travis* (UAB) Co-Mentor with J. Edberg	2006-2013 (PhD)	UAB UAB	MS BS	2006 2003	The Genetic Complexity of the Human FCγ Receptor 1q23 Locus and its Relationship to Autoimmunity	Post-doctoral Fellow, UAB CCTS Informatics
KIMBERLY, Robert P	Past	Shah, Spandan (UAB)	2009-2013 (PhD)	Univ. Wisconsin, Riverfalls	BS	2005	Fc Receptor variation in Autoimmune Diseases	Postdoctoral Fellow, Columbia University Medical Center
LEFKOWITZ, Elliot	Past	Hatcher, Eneida * (UAB)	2006-2014 (PhD)	Salisbury University; Salisbury, MD	BS	2006	The role of gene fragmentation and loss in poxvirus evolution	PostDoctoral Fellow, UAB
LEFKOWITZ, Elliot	Past	Odom, Mary* (UAB)	2005-2010 (PhD)	University of Georgia	BS	1993	Poxvirus evolution: The role of horizontal gene transfer	Visiting Lecturer, Pellissippi State, Knoxville, TN
LEFKOWITZ, Elliot	Past	Pickett, Brett* (UAB)	2006-2010 (PhD)	Brigham Young University	BS	2005	The contribution of different mechanisms of Viral sequence variation to the evolution of positive-sense single-stranded RNA viruses	Solution Scientist, Thomson Reuters, San Diego, CA
LEFKOWITZ, Elliot	Past	Wang, Chunlin (UAB)	2001-2005 (PhD)	Nanjing Univ, Nanjing, P. R. China	BS	1996	Molecular evolution and genomic analysis of poxviruses	Senior Research Scientist, Stanford University, Stanford, CA
LI, Yi-Ping	Current	Chen, G. (UAB)	2011-present (PhD)	Zhejiang Sci-Tech University	MS	2008	The role of Cnbp in craniofacial development	NIH;NIAMS R01 AR055307
LI, Yi-Ping	Current	Fontenard, Susan Daimia Chantal (UAB)	2011-present (PhD)	Grambling State University	BS	2010	Role of Osteoclast genes in osteoimmunology and Rheumatoid Arthritis	PhD Student, UAB Biochemistry & Structural Biology R01 AR055307
LI, Yi-Ping	Current	McConnell, Matthew * (UAB)	2011-present	University of Kentucky (PhD)	MS BS	2008	Role of osteoclast genes in osteoimmunology and Cancer bone metastasis.	PhD Graduate Student, UAB Cancer Biology R01 AR055307
LI, Yi-Ping	Current	Wang, Y	2008-present	Zhejiang Univ.	BS	2008	Gna13 function in osteoclast differentiation and activation	R01 AR055307

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LI, Yi-Ping	Current	Wu, Hui (UAB)	2011-present	Shanghai Institutes for Biol Sciences	BS	2009	Role of Atp6v0d2 in the osteoclast-specific proton pump and in extracellular acidification	PhD Graduate Student UAB Microbiology R01 AR055307
LI, Yi-Ping	Past	Ci, H. (Forsyth Instititute)	2000-2006	Beijing Normal Univ.	DDS	2004	Expression and Function Analysis of a novel mouse gene BTB/zinc finger gene Bsg6	Assistant Professor, Scientist, Introgen
LI, Yi-Ping	Past	Edris, A. (Forsyth Instititute.)	2002-2005	Harvard School of Dental Med	DDS	2003	Molecular Mechanism of Forebrain Formation.	Assistant Professor, College of Dentistry, KSU, Saudi Arabia
LI, Yi-Ping	Past	Feng, S. (Forsyth Instititute)	2005-2008	Funda Univ.	MD	2003	Atp6v1c1 is an essential component of the osteoclast proton pump and in F-actin ring formation in osteoclasts	Assistant Professor, Jiao Tong University, China
LI, Yi-Ping	Past	Tucker, B.* (UAB / Forsyth Instititute)	2009-2011	University of Oklahoma	DDS	2007	Reprogrammed stem cells and scaffolding biomaterial and maxillofacial repair	Assistant Professor, Jiao Tong University, China
LI, Yi-Ping	Past	Wu, Mengrui (UAB)	2008-2014	Zhejiang Univ.	BS	2008	TANK role in osteoclast differentiation and activation	Postdoctoral Fellow, UAB Molecular & Cellular Pathology
LIU, Nianjun	Past	Yan, Qi (UAB)	2011-2014 (PhD))	UAB Beijing Institute of Technology	MS MSBME BSBME	2011 2009 2007	Statistical Methods for Set-based Association Tests in Genetic Studies	Postdoctoral Fellow, University of Pittsburgh SOM
LORENZ, Robinna	Past	Daft, Joseph G.* (UAB)	2009	Juniata College	BS	2007	Impact of the Microbiota on Diabetes	Assistant Professor, Biology and Health Science, Lee University, Cleveland, TN
LORENZ, Robinna	Past	Durham, Carolyn.* (UAB)	2007-2010 (PhD)	Clemson University	BS	2006	Role of the GI Ecosystem in Allergic Asthma	VP of Research and Development, The Repairion Group, Inc.
LORENZ, Robinna	Past	Schmitz, Julia M.* (UAB)	2004-2008 (PhD)	Sweetbriar College	BS	2003	Role of Mucin alterations in the development of Helicobacter-induced gastric carcinoma	Assistant Professor, Biology, Piedmont College, Athens, GA

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LORENZ, Robinna	Past	Staley, Elizabeth M.* (UAB)	2005-2009 (PhD)	University. of Missouri	BS	2003	Role of P-glycoprotein in the development of colitis	Clinical Pathology Resident, UAB
LORENZ, Robinna	Past	Tanner, Scott M.* (UAB)	2008-2012 (PhD)	Indiana University	BS	2007	The effect of gender on regulatory T cell function in inflammatory bowel disease	Asst Prof, Biological, Earth, and Physical Sciences, Limestone College, Gaffney, SC
LORENZ, Robinna	Past	Wolf, Kyle J.* (UAB)	2009-2013 (PhD)	Southern Illinois Univ., Edwardsville	BS	2008	The role of intestinal microbiota in development of Type 1 Diabetes	Postdoctoral Fellow, Saint Louis University
LUND, Frances	current	Schultz, Michael * (Trudeau Institute and UAB)	2005-present (PhD)	Univ. of Wisconsin, Superior	BS BS	2013	Regulation of anti-viral B cell responses by Eomes	UAB PhD student, Immunology U19 AI109962 (Lund)
LUND, Frances	current	Stone, Sara* (UAB)	2013-present (MD/PhD)	Auburn Univ	BS	2009	Regulation of anti-viral memory B cell responses by T-bet	R01 AI110508 (Lund) UAB Medical Scientist Training Program
LUND, Frances	past	Dadali, Tulin* (Univ of Rochester and UAB)	2008-2014	Rochester Institute of Technology	BS MS	2004 2011	The role of CD38 in regulating NAD metabolism, oxidative stress responses and activity of NAD consuming enzymes	Cancer Metabolism Division, Berg Health LLC in Framingham MA
MANNON, Peter	Past	Sethi, Jaskirat (UAB)	2014 (MD)		BA		Identifying Althernative Cellular Sources of IL-13 Production in Ulcerative Colitis	UAB SOM T35 Medical Student Summer Research Program, MD expected 2017
MANNON, Peter	Past	Williams, Grant (UAB)	2013	Birmingham Southern College+	BA		IL-13Ralpha1 Expression by Colonic Cells in Human Ulcerative Colitis	Crohn's & Colitis Foundation of America fellowhip grantee

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MCLAIN, Amie	Current	Kathryn Y. Henley	Current	Gettysburg College	BA, health profession	2007	Combination Therapy for Early Functional Motor and Sensory Recovery after Spinal Cord Injury	T-32 Grant: Interdisciplinary Training in Pathobiology and Rehabilitation Medicine
MOUNTZ, John D	Current	Hamilton, Jennie (UAB)	2013-present (PhD)	Middle Tennessee State Univ	MS	2007	Tetramer analysis of autoreactive B cells	PhD Graduate Student UAB Immunology Supported by NIH RO1
MOUNTZ, John D	Past	Ding, Yanna (UAB)	2009-2013	Peking Union Medical College	MS	2007	T follicular helper cells	Research Fellow, UAB DOM, Division of Clinical Immunology and Rheumatology
MOUNTZ, John D	Past	Job, G.	2005-2007 (MS)	Univ of Wisconsin (Milwaukee)	MS	2001	Generation of dominant negative AID	Research Assistant, St. Jude Children's' Hospital
MOUNTZ, John D	Past	Li, Hao (UAB)	2008-2013	UMass Medical School	MS	2005	IL-23 in autoimmunity	Post-doctoral Fellow, Beth Israel Deaconess Medical Center (Tsokos Lab
MOUNTZ, John D	Past	Wang, J.**	2005-2009 (PhD)	UC Berkeley	BS	2000	Autoreactive T cells from BXD2 mice	Intern in Pathology, Cedars Sinai, Los Angeles, CA; Residency, Internal Medicine, Loma Linda Univ. Medical Ctr
MUNTNER, Paul	Current	Booth III, John (UAB)	2012-present (PhD)	UAB	MPH	2012	Sleep patterns, blood pressure, and cardiovascular disease	Research Assistant
MUNTNER, Paul	Current	Bromfield, Samantha (UAB)	2012-present (PhD)	University of Wisconsin School of Medicine and Public Health	MS	2009	Ambulatory blood pressure in adults with diabetes	Research Assistant

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MUNTNER, Paul	Current	Colantonio, Lisandro (UAB)	2012-present (PhD)	Universidad Nacional de La Plata Universidad de Buenos Aires	MD MSc	2002 2012	Lipid control for the prevention of cardiovascular disease	Research Assistant
MUNTNER, Paul	Past	Iqbal, Shahed (Tulane)	2006 (PhD)	Tulane University	MPH	2002	Low Level Lead Exposure in US Children	Associate Director, Epidemiology; Daiichi Sankyo
MUNTNER, Paul	Past	Menke, Andy (Tulane)	2003-2007 (PhD)	Tulane University	MPH	2006	Lead and cadmium and CVD	Epidemiologist; S3
MUNTNER, Paul	Past	Reynolds, Kristi (Tulane)	2005 (PhD)	Tulane University	MPH	2007	End-stage Renal Disease in China	Research Scientist; Kaiser Permanente Southern California
MUNTNER, Paul	Past	Tanner, Rikki (UAB)	2010-2014 (PhD)	UAB	MPH PhD	2010 2014	Blood pressure phenotypes in chronic kidney disease	Research Assistant; UAB, Epidemiology
MUNTNER, Paul	Past	Yun, Huifeng (UAB) Co-mentor with J. Curtis	2009-2012 (PhD)	Shanxi Med. University China Peking Union Med College UAB	MD MS MSc	1995 1999 2002	Safety and Effectiveness of Osteoporosis Medication among Medicare Beneficiaries	Assistant Professor; UAB, Department of Epidemiology PCOR K12 Scholar
MURPHY-ULLRICH, Joanne E	Past	Dubose, Kimberly B. * (UAB)	2002-2006 (PhD)	UAB	MS	2001	Fibrosis Encapsulation of biomaterials	Medtronic, Inc, Sr. R & D Engineer
MURPHY-ULLRICH, Joanne E	Past	Elzzie, Carrie Ann* (UAB)	2002-2006 (PhD)	Lenior-Rhyne College	BS	2000	TSP and cell survival	Asst. Professor of Eastern Virginia Medical School
MURPHY-ULLRICH, Joanne E	Past	Graham, Lauren Van Duyn* (UAB)	2005-2011 (MD, PhD)	Duke University	BS	2003	Calreticulin regulation of fibillar collagens	Dematology Resident, Northwestern University

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MURPHY-ULLRICH, Joanne E	Past	Roden, Melissa T.* (UAB)	2004-2012 DMD/PhD	University of Alabama	BS	2002	TSP regulation of COMP in Periodontal ligament	DMD received in 2011; Did not complete PhD; Currently Adjunct faculty, UAB School of Dentistry
MURPHY-ULLRICH, Joanne E	Past	Sweetwyne, Maria* (UAB)	2004-2009 (PhD)	University of Washington	BS	2002	TSP and the foreign body response	Postdoctoral fellow, UPenn, Penn-Port Program, Philadelphia
MURPHY-ULLRICH, Joanne E	Past	Young, Geoffrey* (UAB)	2002-2006 (MD/PhD)	Duke University	BS	2002	Structural basis of TSP-LAP interactions	Physician, Mayo Clinic Florida, Department of Otolarynagology
MURPHY-ULLRICH, Joanne E	Past	Zimmerman, Kurt* (UAB)	2009-2014 (PhD)	University of Wisconsin Eau Claire	BS	2009	CRT regulation of TGF-β signaling	UAB MERIT program Postdoctoral Fellow
MYERS, Richard M	Current	Agee, Joy* (HudsonAlpha Institute of Biotechnology and UA, Huntsville)	2010-present (PhD)	Spelman College	BS	2008	Functional genomic studies of nuclear receptors	Graduate Student, HudsonAlpha Institute of Biotechnonology and University of Alabama, Huntsville
MYERS, Richard M	Past	Brown, Alayne* (Stanford University)	2004-2009 (PhD)	Pacific Lutheran University	BS	2004	Genome-wide analysis of DNA methylation patterns in the human	Postdoctoral Fellow, Stanford University (now Alayne Brunner)
MYERS, Richard M	Past	Casto, Amanda* (Stanford University)	2007-2008 (PhD)	Darwin College	BS	2007	Human population genetics	Graduate Student, Stanford University
MYERS, Richard M	Past	Collins, Patrick* (Stanford University)	2003-2008 (PhD)	Pomona College	BS	2002	Genomic analysis of the human ets transcription factor GABP	Scientist, SwitchGear Genomics
MYERS, Richard M	Past	Cooper, Sara* (Stanford University)	2001-2006 (PhD)	University of Wisconsin-Madison	BS	2001	Genomic and genetic analysis of human transcriptional promoters	Faculty Investigator, Hudson Alpha Institute

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MYERS, Richard M	Past	Force, Shelley* (Stanford University)	2002-2007 (PhD)	University of California, Davis	BS	2002	Genome-wide analysis of human transcription promoters	Founder, SwitchGear Genomics
MYERS, Richard M	Past	Garcia, Sarah* (Stanford University)	2005-2010 (PhD)	UCLA	BS	2004	Functional analysis of the protocadherin gene cluster	Graduate Student, Medical Genetics Training Program, Stanford University
MYERS, Richard M	Past	Kobayashi, Yuya (Stanford University)	2005-2010 (PhD)	University of Washingto	BS	2004	Epigenetic analysis of prostate cancer	Postdoctoral Fellow, Stanford University
MYERS, Richard M	Past	Lasseigne, Brittany* (HudsonAlpha Institute of Biotechnology and UA, Huntsville)	2009-2013 (PhD)	Mississippi State University	BS	2008	Genomic and genetic analysis of renal cell carcinoma	Graduate Student, HudsonAlpha Institute of Biotechnology and University of Alabama, Huntsville
MYERS, Richard M	Past	Leeper, Evonne* (Stanford University)	2005-2010 (PhD)	MIT	BS		Transcription factor NRSF	Postdoctoral Fellow, Switzerland
MYERS, Richard M	Past	Marticke, Simone* (Stanford University)	2005-2010 (PhD)	Stanford University	BS	2005	Genomic analysis of the FoxP2 transcription factor	Grants Officer, Canary Foundation
MYERS, Richard M	Past	Noonan, James* (Stanford University)	2002-2007 (UAB)	SUNY	BS	2000	Genetic and genomics of the protocadherin gene cluster	Assistant Professor, Yale University
MYERS, Richard M	Past	Schroeder, Diane* (Stanford University)	2003-2008 (PhD)	Iowa State University	BS	2003	Transcriptional control of the FoxP2 gene	Postdoctoral Fellow, UC Davis

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MYERS, Richard M	Past	Strehlow, Anne* (Stanford University)	2002-2007 (PhD)	Washington State Univ	BS	2001	Functional analysis of the Huntington disease protein	No longer in science
MYERS, Richard M	Past	Tabor, Holly* (Stanford University)	2000-2005 (PhD)	Harvard University	BS	1999	Genomic and genetic studies of cardiovascular disease in humans	Assistant Professor, University of Washington
MYERS, Richard M	Past	Trinklein, Nathan* (Stanford University)	2002-2007 (PhD)	Wake Forest University	BS	2002	Genomic analysis of human transcriptional regulation	Founder, SwitchGear Genomics
MYERS, Richard M	Past	You, Alan (HudsonAlpha Institute of Biotechnology)	2008-2010 (BS)	Stanford University (with summer research spent at HudsonAlpha Institute)			Validation of genome-wide transcription factor binding analyses	Medical Student, University of Alabama Medical School
NAPIERALA, Dobrawa	Current	Kuzynski, Maria (UAB)	2012-present (PhD)	University of Wisconsin-Stevens Point	BS	2011	Defining the Role of Trps1 in Phosphate Mediated Mineralization.	UAB PhD Student Cell, Molecular & Developmental Biology F31 DE024926
NOVAK, Jan	Current	Knoppova, Barbora (Palacky Univ)	2014-present (PhD)	Palacky Univ Olomouc, Czech Republic	MS	2011	Differential HIV-1 Env glycosylation	PhD student at Palacky University Olomouc, Czech Republic
NOVAK, Jan	Current	Stewart, Tyler J. (Co-mentor with Dr. Renfrow)	2012-present		BS		Initiating enzymes of O-glycosylation in IgA nephropathy	UAB PhD Student Biochemistry, Structural & Stem Cell Biology
NOVAK, Jan	Past	Cahlikova, Romana (Palacky Univ)	2013 (PhD)	Palacky Univ Olomouc, Czech Republic	MS		Analysis of subcellular localization of specific glycosyltransferases	PhD student at Palacky University Olomouc, Czech Republic

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NOVAK, Jan	Past	Calcatera, Shannon	2006 (MD)	University of Dayton	NA		Glomerulonephritis in patients with chronic liver diseases	UAB SOM T35 Medical Student Summer Research Program; MD received in 2011
NOVAK, Jan	Past	Czernekova, Lydie (Palacky Univ)	2012-2012 (PhD)	Palacky Univ Olomouc, Czech Republic	MS		Detection of HIV-1-specifi antibodies	PhD student at Palacky University Olomouc, Czech Republic
NOVAK, Jan	Past	Elliot, M.	2008 (MD)	Auburn University	BS	2007	Glycosylation of gp120 and antibody reactivity	Medical student, Univ. Chicago
NOVAK, Jan	Past	Holder, G.	2007-2008 (MS)	UAB			ELISA in research	MS student
NOVAK, Jan	Past	Horynova, M. (Univ of Olumouc)	2009-2011	Palacky Univ Olomouc, Czech Republic	MS		Glycosyltransferases of IgA1 O-glycans	Received PhD in 2014 at the University of Olomouc, Czech Republic
NOVAK, Jan	Past	Jones, T.	2008-2009	UAB	NA		Analysis of circulating immune complexes in IgA nephropathy	MS graduate school
NOVAK, Jan	Past	Kasperova, Alena (Univ of Olumouc)	2011-2011	Palacky University Olomouc, Czech Republic	BS		Interference with IgA1-containig immune complexes	Received PhD in 2014 at the University of Olomouc, Czech Republic
NOVAK, Jan	Past	McCorkle, H.	2005		BS	NA	Characterization of circulating immune complexes in IgA nephropathy patients using proteomics approaches	NA
NOVAK, Jan	Past	Nichols, C. UAB	2007-2010	UAB	NA		Biomarkers of IgA nephropathy	MD, fellow at UAB, Dept Nephrology
NOVAK, Jan	Past	Novakova, J. (Palacky Univ)	2012-2012	Palacky University Olomouc, Czech Republic	MS		Intracellular localization of O-glycosyltransferases in IgA1-secreting cells	PhD student at Palacky University Olomouc, Czech Republic

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NOVAK, Jan	Past	Salazar, C.	2005	NA	NA	NA	Analysis of IgA1 and IgA1-containing immune complexes from sera of patients with IgA nephropathy and HSP nephritis	Dental student
PONNAZHAGEN, Selvarangan	Current	Cha, Ha Ram (UAB)	2010-present (PhD)	Kyung-Hee University, S. Korea	BS	2009	Immunomodulatory effects of CRAMP in prostate cancer	UAB PhD Student, Cancer Biology Predoctoral trainee - NIH
PONNAZHAGEN, Selvarangan	Current	Higgs, Jerome (UAB)	2008-present (PhD)	Voorhees college, Bahamas	BS	2008	Genetically-engineered mMesenchymal stem cell therapy for myeloma	UAB PhD Student, Dept of Physical Therapy
PONNAZHAGEN, Selvarangan	Current	Levy, S.*	2009-present (PhD)	University of Massachusets -Amherst	BS	2009	Immnology and therapy of non-union bone fracture	Predoctoral trainee - GIBSON HOLDEN TRUST RESEARCH FUND
PONNAZHAGEN, Selvarangan	Past	Hensel, J.*	2007-2011 (PhD)	Northern Arizona University	BS	1988	Role of LL-37/CRAMP in prostate cancer	Postdoctoral fellow, University of Colorado
PONNAZHAGEN, Selvarangan	Past	Moore, L.*	2004-2007	St. Xavier University of Louisiana, LA	BS	2003	Role of TGF-beta in breast cancer metastasis	Medical School Student
PONNAZHAGEN, Selvarangan	Past	Yang, S.	2006-2010	Haverford College, Haverford, PA	BS	2003	Conditionally-replicating adenovirus for ovarian cancer gene therapy	Resident
RAMAN, Chander	Current	Boland, Molly (UAB) Co-Mentor with SL Bridges	2014 – present (PhD)	Millsaps College	BS	2014	Interferon gamma and disease severity in rheumatoid arthritis	Phd Graduate Student, UAB Pathobiology and Molecular Medicine
RAMAN, Chander	Past	Axtell, R. (UAB)	2001-2007 (PhD)	Idaho State University	MS	2001	Role of CD5 in immunopathogenesis of EAE	Assistant Professor, OMRF/Okalhoma
RAMAN, Chander	Past	Buel, Amber (UAB)	2009-2013 (PhD)	St. Mary's College of Maryland	BS	2008	GSK3 in immunopathogenesis of EAE	Postdoctoral fellow UAB

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RAMAN, Chander	Past	Cashman, Kevin (UAB)	2008-2013 (PhD)	Bellarmine U.Louisville, KY	BS	2007	CD5+ CD1d+ regulatory B-cells	Postdoctoral fellow UAB/Emory
RAMAN, Chander	Past	McGuire, Don (UAB).	2008-2013 (PhD)	Idaho State University	BS	2007	CD5 regulation of T-regulatory cell biology in EAE	Postdoctoral Fellow, Emory
RAMANADHAM, Sasanka	Current	Hancock, William (UAB)	2011-present (PhD)	Birmingham-Southern College	BS	2002	Bone Formation and $iPLA_2$	UAB PhD Student, Biochemistry, Structural & Cell Biology
RAMANADHAM, Sasanka	Past	Bone, Robert N (UAB)	2011-2014 (PhD)	Southern Illinois Univ	BS	2006	T1D and $iPLA_2$	Research Associate, UAB Cell, Developmental & Invtegrative Biology
RAMANADHAM, Sasanka	Past	Emani, Bharghavi (VCU)	2008-2010 (MSc.)	Osmania Univ	Msc	2007	Alternate Splicing Events	Stay-at-home mother
RAMANADHAM, Sasanka	Past	Jain, Nikhita	2011-2012	High School	N/A		NSMase induction by lipids	EMSAP 3rd Program/UAB
RAMANADHAM, Sasanka	Past	Shiminaka, Hiroko (Kyoto Univ Japan)	2010-2011 (MSc.)	Kyoto Univ, Japan	MPH	2010	ER Stress and Akita Mouse	Novartis, Japan
RAMANADHAM, Sasanka	Past	Tsai, Winnie C.	2011-2012	High School	N/A		$iPLA_2$ Immunofluorescence	EMSAP 3rd Program/UAB
RANDALL, Troy D	Current	Bowlin, Marvin, (UAB)	2015-present (PhD)	Mississippi College	BS	2013	Role of IL-2 in controlling Tfh differentiation	UAB PhD Student, Biochemistry, Structural & Cell Biology
RANDALL, Troy D	Current	Hwang, Ji Young (Univ of Rochester and UAB)	2009-present (PhD)	University, Seoul, Korea	BS	2008	Role of iBALT in the pathogenesis of asthma	UAB PhD Student, Microbiology

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REDDEN, David T	Current	Dawson, Erica (UAB)	2011-present (PhD)	Iowa State	MS	2010	Comparison of Sandwich Estimators for Heteroskedatic Regressions	T32HL079888 - NHLBI Institutional National Research Service Award (T32) grant application for Pre-Doctoral Training in Biostatistics
REDDEN, David T	Current	Rembert, Nicole (UAB)	2011-present (PhD)	Iowa State	MS	2010	Efficient Designs for Non-Inferority	T32HL079888 - NHLBI Institutional National Research Service Award (T32) grant application for Pre-Doctoral Training in Biostatistics
REDDEN, David T	Current	Turley, Falynn (UAB)	2010-2015 (PhD)	Jacksonville State	MS	2009	Statistical Properties of Propesity Scores	Instructor (Jacksonville State(
REDDEN, David T	Past	Li, Peng (UAB)	2011-2014 (PhD)	Univeristy of Alabama Birmingham	MS	2004	Properties of Statistical Tests for Small Cluster Randomized Trials	Research Associate (Univeristy of Alabama at Birmingham)
REYNOLDS, IV, Richard	Past	Ahmed, Altan (UAB) Co-Mentor with SL Bridges	2011 (MD)	Tulane Univ University of Alabama	MS BS	2009 2008	HLA-DRB1 and RA susceptibility in African Americans with RA	MD received in 2013, UAB SOM; Specializes in Diagnostic Radiology, Gainesville, FL
REYNOLDS, IV, Richard	Past	Cridland, Julie (UMD)	(BS)	University of Maryland	N/A	2001-2005	Quantifying rates of pollen removal and deposition by the pollinators of Silene virginica, stellata, and caroliniana	Post doctoral fellow, UC Davis
REYNOLDS, IV, Richard	Past	Parks, Lauren Co-mentored with Dr. SL Bridges (UAB)	2012 (MD)	Univ of Virginia	BS	2010	IFNγ and radiographic severity in RA	MD received 2015; Internal Medicine Resident, Weill Cornell Medical College
REYNOLDS, IV, Richard	Past	Williams, Christopher (Mountain Lake Biol Station/ UVA)	(BS)	Frostburg State University	N/A	2002-2006	Quantifying hummingbird visitation to arrays of artificial flowers: The role of selection on trait combinations	IRTA postdoctoral fellow NIH:NIDDK

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SAAG, Kenneth	Past	Kitchin, E (UAB)	2008-2012 (PhD)	James Madison Virginia Tech, Blacksburg	BS MS	1986 1990	A health behavior intervention for osteoporosis management in a Medicare home health population	Assistant Professor; UAB, School of Health Professions
SAAG, Kenneth	Past	McRoy, Luceta (UAB)	2010-2012 (PhD)	Kent State Hartford-Connecticut	MBA BA	1993 1988	The effects of DTCA on health care use of Medicaid children with asthma	Postdoctoral Fellow Morehouse School of Medicine
SAAG, Kenneth	Past	Yun, Huifeng (UAB)	2010-2012 (PhD)	Shanxi Med. China Peking Union Med College UAB	MD MS MSc	1995 1999 2002	Osteoporosis and Related Fractures among Older Americans	Assistant Professor; UAB, Department of Epidemiology
SAFFORD, Monika	Current	Andreae, Lynn	2014-2016	UAB	MS		Patient-centered medication adherence	Program Coordinator, UAB DOPM
SAFFORD, Monika	Current	Andreae, Susan	2014-2016	UAB	MPH BS	2010 2004	Enhancing physical activity in people with chronic medical conditions	Program Manager, UAB DOPM
SAFFORD, Monika	Current	Ballard, Sarah	2013-2015	UAB			Factors that influence the timing of disability applications.	T32 Predoctoral Fellow, UAB
SAFFORD, Monika	Current	Dowla, Shima	2014-2017				Peer support to eliminate racial disparities in health outcomes	Graduate student trainee, UAB, MD/PhD Program
SAFFORD, Monika	Current	Lewis, Marquita	2013-2015	UAB Southern Illinois Univ Univ of North Carolina	BS MS MHP	2005 2007 2011	Peer support to improve chronic disease health outcomes in underserved minority communities	Research Assistant, UAB DOM, Division of Preventive Medicine
SAFFORD, Monika	Current	Loop, Matthew	2013-2015	UAB	BS MS	2010 2012	Spatial statistics to study air particulate matter and cardiovascular disease outcomes	Research Associate, UAB School of Public Health Biostatistics
SAFFORD, Monika	Current	Varley, Allyson	2014-2016	UAB	MPH BA	2009 2011	Evaluation of peer support programs	Graduate student trainee, UAB, Health Education

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SAFFORD, Monika	Past	Allen, Shauntice	2009-2013	UAB	PhD		A Validation Study Examining Health Information-Seeking Behaviors of Stroke Education Among African-Americans	Research Assistant, UAB School of Public Health
SAFFORD, Monika	Past	Campbell, Caresse	2010-2014	Univ of Rochester Emory Univ	BA MPH	2003 2006	Cost-effectiveness of peer advisor intervention to improve diabetes in rural Alabama	T-32 Pre-Doctoral Fellow, UAB
SAFFORD, Monika	Past	Frazier, Elizabeth	2006-2008	PhD			Post-Traumatic Stress Disorder Among Women Veterans and Cardiovascular Risk	Post-doctoral intern, San Francisco VA Hospital
SAFFORD, Monika	Past	McRoy, Luceta	2009-2011	UAB	MPH	2009	Racial disparities in hysterectomy	T-32 Pre-Doctoral Fellow, UAB
SAFFORD, Monika	Past	Perkins, Martinique	2009-2010	UAB	PhD		Effects of Care Giving Strain on All-Cause Mortality	Assistant Professor, UAB SOPH
SAFFORD, Monika	Past	Phadris, Milind A.	2010-2011	UAB	PhD	2009	Bivariate Regression on Logrank Scores for Modeling Competing Risks Data with Covariates	Research Assistant, UAB SOPH
SAFFORD, Monika	Past	Sharman, Donald	2005-2010				Health communication	Grants Management Specialist, CDC, Atlanta, GA
SCARINCI, Isabel	Current	Bittencourt, Lorna	2011-present	Federal University of Bahia	BS MS	2007 2010	Tobacco control among women	Student Research Asst, UAB DOM Division of Preventive Medicine
SCARINCI, Isabel	Current	Garcia, Roman	2012-present	UAB	BA	2008	Health disparities in oral health	Undergraduate student (second career)
SCARINCI, Isabel	Current	Ocampo, Michelle	2012-present	UAB	BA	2013	Cancer and Latina immigrants	Research Assistant, UAB DOM, Division of Preventive Medicine
SCARINCI, Isabel	Current	Ortiz, Etzael	2013-present	UAB	NA		Health disparities in Latinos	Undergraduate student
SCARINCI, Isabel	Current	Theodorovicz, Fernanda	2013-present	Pontifícia Universidade Católica do Paraná, Brazil	BA	2003	Tobacco control among women	Undergraduate student Psychology (second career)

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
SCARINCI, Isabel	Past	Barreto, Partricia	2007-2008 (PhD)	UAB	BS	2007	Health promotion among Latinos	Clinical Psychologist in Private Practice
SCARINCI, Isabel	Past	Drewry, Jonathan	2008	Univ. of Texas Health Sciences	MPH	2001	Cancer and Latina immigrants	PhD student, UAB
SCARINCI, Isabel	Past	Flores, Bertha	2012	Univ of Texas Health Science Ctr Houston	MSN BSN	1994 1987	A model of health literacy: culture, media, cervical cancer screening amongst older Mexican-American women	Student, Clinical Assistant Professor, Univ of Texas, San Antonio
SCARINCI, Isabel	Past	Garces, Isabel	2003-2009 (DrPH)	Universidad Javeriana (Colombia) UAB UAB	BS MPH DrPH	1996 2003 2009	Cancer epidemiology and disparities	Instructor, Universidad de Antioquia (Colombia)
SCARINCI, Isabel	Past	Heersink, Juanita	2008	UAB	BS MD	2004 2011	Cancer survivorship	Unknown
SCARINCI, Isabel	Past	Hidalgo, Bertha A.	2008	Univ Southern California; Stanford Univ	MPH BA	2007 2000	Pap Test utilization among Hispanics in the US: A case control study	PostDoctoral Fellow, Dept of Epidemiology, UAB SOPH
SCARINCI, Isabel	Past	Holmes, Cheri	2008-2009 (PhD)	UAB	MPH	2003	Cancer prevention and control among African Americans	Unknown
SCARINCI, Isabel	Past	Litton, Allison	2010-2012 (DrPH)	UAB	Dr PH MPH	2012, 2003	HPV Vaccination in Vulnerable Populations	Allison Litton Evaluation Consulting; Adjunct Assistant Professor, Dept. of Epidemiology, UAB SOPH
SCARINCI, Isabel	Past	Neely, David	2007	Auburn University	BS	2006	Community based participatory research	Unknown
SCARINCI, Isabel	Past	Niesciur, Naiara	2011-2013	Pontifícia Universidade Católica do Paraná, Brazil	High School	2008	Smoking prevalence among health sciences students in Curitiba.	Enrolled in a Master's Program in Dentistry

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
SCARINCI, Isabel	Past	Wingo, Elizabeth	2009	Rhodes College	BS	2008	Cancer and Latina immigrants	Medical Student
SCHROEDER, Jr., Harry W	Current	Levinson, Michael* (UAB)	2011-present	Univ of CA, San Diego	BS	2009	Development of the TCR Repertoire	T32 AI 07051
SCHROEDER, Jr., Harry W	Current	Wang, Yuge (UAB)	2012-present	Tsinghua University, Beijing, China	MS	2012	Role of CDR-H3 in the Control of Epitope Recognition	U01 AI090902
SCHROEDER, Jr., Harry W	Current	Watkins, Leticia* (UAB)	2010-2013	Virginia Commonwealth Univ Richmond	BS	2009	Role of CDR-H3 in the Hetero-subtypic Immunity to Influenza Virus	Student Counselor
SCHROEDER, Jr., Harry W	Past	Jones, Bobby* (UAB Merit Program)	2011-2012	UAB	BS	2010	Development of the Antibody Repertoire	Graduate Student, Fiske/Vanderbilt MS→PhD Program
SCHROEDER, Jr., Harry W	Past	Khass, Mohamed (UAB)	2008-present	Zagazig Univ, Sagazig Egypt	MS	2007	Development of the Antibody Repertoire	Post Doctoral Fellow, UAB, Birmingham, AL
SCHROEDER, Jr., Harry W	Past	Szymanska, Ewa* (UAB)**	2009-present	Utica College, Utica, NY	BS	2008	Genetics of Common Variable Immune Deficiency	Post Doctoral Fellow, UAB, Birmingham, AL
SCHROEDER, Jr., Harry W	Past	Vale, Andre M (UFRJ & UAB)	2008 (PhD)	Federal Univ of Minas Gerais UFMG, Belo Horizonte Brazil	BS	2002	Development of the Antibody Repertoire	Assistant Professor, Federal University of Rio de Janeiro, Brazil
SCHWIEBERT, Lisa M	Past	Hewitt, Matt (UAB)	2004-2008 (PhD)	Goucher College	BA	2000-2004	Role of aerobic exercise on airway hyperreactivity in the asthmatic lung	Staff Scientist, Galleon Inc.
SERRA, Rosa	Current	Appelboom, Brittany	2014-present	Wesleyan	BS	2013	TGF-ß and Sox9 in development of the Axial Skeleton	R01 AR053860

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
SERRA, Rosa	Current	Ban, Ga I.	2014-present	Dan-Kook University, Korea	MS	2009	Non-canonical TGF-ß signaling in the axial skeleton.	R01 AR053860
SERRA, Rosa	Current	Chavez, Dalton	2013-present	Cal Poly Tech	MS	2012	Modeling OA for drug screening	R01 AR053860
SERRA, Rosa	Current	Coricor, George	2013-present	Seton Hall	MS	2012	Regulation of Sox9 by TGF-ß	R01 AR053860
SERRA, Rosa	Current	Killion, Christy	2015-present	Auburn	BS	2008	Role of mechanical load and cilia in growth plate organization.	US-Israel Bi-national Science Foundation
SERRA, Rosa	Past	Baffi, Michael (UAB)	2002-2005 (PhD)	University of Cincinnati	(MS)	2001	TGF-b in the axial skeleton	Strategy & Corporate Development, Life Technologies
SERRA, Rosa	Past	Baxley, Sarah (UAB)	2007-2010 (PhD)	Davidson U. NC	(BS)	2004	Wnt5a in mammary development and cancer	OB-Gyn resident, UT Galveston, TX
SERRA, Rosa	Past	Chang, Ching Fang	2007-2012	Taiwan	MS	2006	Cilia in mechanotransduction	Post-doc, Children's Hospital, Cincinnati, Plastic Surgery
SERRA, Rosa	Past	Cox, Megan	2007-2013	U. Mass., Amherst	BS	2004	Tissue engineering skeletal tissue	Post-doc, Genzyme, MA
SERRA, Rosa	Past	Easter, Stephanie	2010-2014	U. of OK	BS	2008	TGF-ß and Wnt5a in tumor stem cells.	Analyst, clinical and scientific assessment, Kantar
SERRA, Rosa	Past	Mitchell, Elizabeth	2009-2014	Florida State U.	BS	2008	Primary cilia in breast cancer.	Post-doc, Oregon Health Science Univ
SERRA, Rosa	Past	Ramaswamy, Girish	2008-2012	UAB	MS	2006	Biomechanical properties of articular cartilage	Post-doc, UPenn, Orthopaedic Surgery
SERRA, Rosa	Past	Roarty, Kevin (UAB)	2004-2008 (PhD)	UAB	MS	2003	TGF-b in breast cancer	Faculty, Baylor
SERRA, Rosa	Past	Seo, Hwa Seon (UAB)	2004-2008 (PhD)	Korea	BS	2002	TGF-b in early chondrogenesis	Post-doc, University of Alabama

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
SERRA, Rosa	Past	Song, Buer (UAB)	2004-2006 (PhD)	China	MD	2003	Mono cilia in growth plate development	Pathology resident, SUNY Buffalo
STANDAERT, David	Current	Allen, H.* (UAB)	2010-present	Emory University	BS/BA	2008	Immune Modulation of Parkinson's disease in Mice and Humans	Philanthropic funds Previously - NIH F31 NS07601
STANDAERT, David	Current	Figge, D.* (UAB)	2013-present	Marquette University	BS	2009	Epigenetic Regulation of Levodopa-induced Dyskinesia	Philanthropic funds
STANDAERT, David	Current	Moehle, M.* (UAB) (co-mentored)	2011-present	Centenary College of Louisiana	BS	2010	LRRK2 in Neuroinflammation	NIH F31 NS01963
STANDAERT, David	Current	Thome, A.* (UAB)	2012-present	Texas A&M University	BS	2008	Micro RNAs in Inflammation	NIH F31 NS084722
STANDAERT, David	Current	Thompson, C.* (UAB)	2013-present	Millersville University of Pennsylvania	BS	2012	Nicotine Receptors in Dystonia	Philanthropic funds
STANDAERT, David	Past	Cao, S. (UAB)	2008-2012 (PhD)	Fudan Univ, Shanghi China	BS	2007	Pro-inflammatory cytokine profile of activated microglia in a mouse model of Parkinson's Disease	Postdoctoral fellow, Univ of Massachusetts Medical School
STANDAERT, David	Past	Lewis, T.* (UAB)	2007-2011 (MD/PhD)	Washington University	BA	2002	Development of a novel model for Parkinson’s disease therapeutics	Neurology resident, UPenn; Previously – F30 NS065661
STANDAERT, David	Past	Steidinger, T.* (UAB)	2007-2012 (PhD)	Illinois State University	BS	2003	Angiogenin in models of Parkinson Disease	Medical school, Southern Illinois University
STEELE, Chad	Current	Garth, Jaleesa* (UAB)	2013-present	Northwestern State University	BS	2010	Regulation of IL-22 after fungal exposure	CMFSDP Fellow R01 HL119770
STEELE, Chad	Current	Godwin, Matthew* (UAB)	2015-present	Mississippi College	BS	2012	IL-1 family members in fungal asthma	R01 HL119770

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
STEELE, Chad	Current	Reeder, Kristen* (UAB)	2013-present	Indiana University	BS	2012	Innate lymphoid cells and fungal exposure	R01 HL119770
STEELE, Chad	Past	Gessner, Melissa* (UAB)	2009-2014	University of Alabama	BS	2009	Innate immune mechanisms controlling IPA	Post-doctoral fellow, Benaroya Research Institute
STEELE, Chad	Past	Lilly, Lauren* (UAB)	2009-2013 (PhD)	University of Illinois	BS	2008	Generation of IL-17A responses during IPA	Scientist, FDA
STEELE, Chad	Past	Nelson, Mike* (UAB)	2008-2012 (PhD)	Cedarville University	BS	2005	Role of Src tyrosine kinases in Pneumocystis host defense	Post-doctoral fellow UAB MERIT Program
STEELE, Chad	Past	Werner, Jessica* (UAB)	2007-2011 (PhD)	University of Pugent Sound	BS	2005	Role of Dectin-1 in *A. fumigatus* host defense	Postdoctoral Fellow, Univ of Michigan
STOLL, Matthew	Past	Arvonen, Miika	2013-2013 (MD/PhD)	University of Oulu (Oulu, Finland)	None	None	Intestinal immune activation in Juvenile Idiopathic Arthritis	Sr Consultant Pediatrician, Kuopio Univ Hospital, Pediatric Dept, Finland / Scandinavian Rheumatology Foundation
SZALAI, Alexander J	Current	Jimenez, Rachel V.* (UAB)	2015-2020 (PhD)	Austin College	BA	2014	none	Equity and Diversity Enhancement Program Fellowship R01 DK099092
SZALAI, Alexander J	Current	Wright, Tyler T. (UAB)	2010-2015 (PhD)	Texas A & M	MSc	2006	C-Reactive Protein, Autoimmunity and Inflammation in the Central Nervous System	Individual Fellowship F31 NS081903 R01 DK099092
SZALAI, Alexander J	Past	Jones, Nicholas R. (UAB)	2007-2012 (PhD)	Bradley University	BSc	2006	The Effect of C-Reactive Protein in Arthritic Disease	Application Support Specialist, Envision contract with Monsanto

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
SZALAI, Alexander J	Past	Nakhla, Anthony N. (Memorial University Newfoundland)	1992-1995 (PhD)	(Memorial University Newfoundland)	BSc	1995	Incorporation of the bacterial lipopolysaccharide from Aeromonas salmonicida into liposomes and the effects on antibody responses in rainbow trout (Oncorhynchus mykiss).	Director Regulatory Affairs, Premier Research; Adjunct Asst Professor, Dept of Pharmaceutical Sci, Univ of New Mexico, College of Pharmacy
SZALAI, Alexander J	Past	Pegues, Melissa A. (UAB)	2010-2015 (PhD)	University of Alabama	BSc	2009	The Role of C-Reactive Protein in Acute Kidney Injury	Seeking postdoc American Heart Association Individual Predoctoral Fellowship
THANNICKAL, Victor	Current	Kurundkar, Ashish	2011-present	Government Medical College UAB	MBBS MPH	2004 2012	Matricellular protein CCN1 in fibrosis	Graduate Student/NHLBI PPG
THANNICKAL, Victor	Current	Locy, Morgan	2014-present	Capital University	BA	2009	Extracellular matrix cross-linking	MSTP (MD/PhD) Student/NIA R01
TIWARI, Hemant K	Current	Balena, Boreman* (UAB)	2013-present	UAB	MS	2013		
TIWARI, Hemant K	Current	Jones, Lindsay W.* (UAB)	2010-present	University of Michigan, Ann Arbor, MI	MS	2010	Statistical Methodology for DNA Methylation Array Data Analysis	Part time Statistical Analyst at HudsonAlpha Institute of Biotechnology
TIWARI, Hemant K	Current	Laufer, Vincent* (UAB)	2013-present	University of Notre Dame	BA	2005	An Analytical Framework for the Genetics of Rheumatoid Arthritis in African Americans	UAB Medical Scientist Training Program (MD-PhD program)
TIWARI, Hemant K	Past	Arora, Tarun (UAB)	2005-2007	Auburn University	MS	2005	Critical Evaluation of Rank Based Regression Procedures	Statistician II, University of Alabama at Birmingham
TIWARI, Hemant K	Past	Lemas, Dominick* (University of Alaska at Fairbanks and UAB)	2007-1012	University of Vermont, Burlington	BS	2006	Gene-by=environment interactions and obesity among Yup'ik people living in southwest Alaska	Post-doctoral Fellow, University of Colorado, Denver

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
TIWARI, Hemant K	Past	Stein, Catherine* (Case Western University)	2000-2004	John Carrol University	MS	1999	Genetic and environmental influences on tuberculosis susceptibility	Associate Professor, Case Western University
TIWARI, Hemant K	Past	Wineinger, Nathan E.* (UAB)	2006-2011	Grinnell College, Grinnell, IA	MS	2006	CNVs methodology & applications to HLB phenotypes	Associate Faculty, Director of Biostatistics, Scripps Translational Science Institute, La Jolla, CA
TOLLEFSBOL, Trygve	Current	Daniel, Michael	2012-present (PhD)	UAB	BS	2010	Telomerase gene regulation and epigenetics	NIH Training Award (Cancer Prevention and Control)
TOLLEFSBOL, Trygve	Current	Gao, Yifeng	2011-present (PhD)	China Agricultural University	BS	2011	Chemoprevention of breast cancer with epigenetic dietary approaches	Current; Departmental TA Stipend
TOLLEFSBOL, Trygve	Current	Kala, Rishabh (UAB)	2010-present (PhD)	Pravara Institute for Medical Sciences, India	MS	2011	Resveratrol in the prevention of aging and cancer	Current; Departmental TA Stipend
TOLLEFSBOL, Trygve	Current	Paul, Bidisha	2012-present (PhD)	West Bengal University of Technology, India	BS	2011	Epigenetics of breast cancer	Current: Program Project with the UAB Comprehensive Cancer Center
TOLLEFSBOL, Trygve	Current	Peek, Gregory (UAB)	2010-present (PhD)	UAB	BS	2010	Transcriptional epigenetic regulation in response to dietary factors	Current; Departmental TA Stipend
TOLLEFSBOL, Trygve	Current	Royston, Kendra	2013-present (PhD)	Stillman College, Alabama	BS	2013	Cancer disparities and epigenetics	Current: NSF Graduate Research Fellowship
TOLLEFSBOL, Trygve	Past	Berletch, Joel (UAB)	2002-2007 (PhD)	UAB	BS	2002	Phytochemicals in cancer prevention	Instructor, Univ. of Washington
TOLLEFSBOL, Trygve	Past	Chen, Huaping (UAB)	2008-2012 (PhD)	Central China Agricultural University	MS	2007	Epigenetics and chemotherapy of ovarian cancer	Postdoctoral Fellow; Department of Obstetrics and Gynecology, UAB

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
TOLLEFSBOL, Trygve	Past	DeAngelis, J. Tyson (UAB)	2006-2010 (PhD)	UAB	BS	2006	Cancer chemoprevention and epigentics	Scientist, Hudson Alpha, Huntsville, Alabama
TOLLEFSBOL, Trygve	Past	Phipps, Sharla (UAB)	2002-2007 (PhD)	Tulane University	BS	2002	Epigenetics of stem cells	Asst. Prof, Jeff State Univ., Birmingham, Alabama
TOLLEFSBOL, Trygve	Past	Saldanha, Sabita (UAB)	2008-2014 (PhD)	Univ. of Mumbai, India	BS MS	1996	Epigenetics of cancer	Assistant Professor; Department of Biology, Alabama State University, Montgomery, AL
TOWNES, Tim	Current	Li, Chao (UAB)	2007-present		BS			
TOWNES, Tim	Past	Chang, Chia-Wei	2005-2009		BS			UAB Stem Cell Institute
TOWNES, Tim	Past	Lai, Yi-Shin	2004-2011		BS			UAB Stem Cell Institute -
TOWNES, Tim	Past	Svendsen, Andrea	2000-2006		BS			Pitt Graduate School of Public Health
TOWNES, Tim	Past	Wu, Li-Chen	2003-2008		BS			Townes Lab
TSE, Hubert M	Current	Burg, Ashley (UAB)*	2012-present	Michigan State University	BS	2009	Macrophage-Mediated ROS Synthesis Contributes to Anti-Viral Responses	NIH/NIDDK R01 DK099550
TSE, Hubert M	Current	Padgett, Lindsey (UAB)	2009-present	University of South Carolina Aiken	BS	2009	The Role of ROS and Diabetogenic CD4 T cell Responses	T32 AI07051
WAITE, Peter D	current	Racheal Harvey, (UAB SOD)	2014				JIA/TMJ	

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
WALTER, Mark	Past	Yoon, Sung-il	2001-2006	UAB			Structural studies of a viral IL-10 homolog	Assistant Professor, Kangwon National university, Chuncheon Republic of Korea
WANG, Lizhong	Current	Vu, Binh (UAB)	2013-2015 (MD)	University of Alabama	BS		Functional Cooperation of FOXP3 and TSC1 during Tumor Progression	Medical Student
WANG, Lizhong	Past	Dugas, Courtney Mar (UAB)	2013-2014 (MS)	UAB	BS		FOXP3 controls an miR-146/NFκB negative feedback loop that inhibits apoptosis in breast cancer cells.	Technician
WANG, Lizhong	Past	Hart, Karen (UAB)	2013-2014 (MS)	UAB	BS		FOXP3-microRNA-146-NF-κB axis and therapy for precancerous lesions in prostate.	Technician
WANG, Lizhong	Past	Hillman, Katelynn (UAB)	2013-2014 (MD)	UAB	BS		Association of CD24 and Progression of Prostate Cancer in African-Americans	Medical Student
WANG, Lizhong	Past	Wong, Chun-Shu (University of Michigan)	2010-2012 (PhD)	University of Michigan	BS		CD24 polymorphisms in prostate cancer family	Post-doctoral fellow
WEAVER, Casey T.	Past	Mangan, Paul UAB *	2001-2006 PhD	Notre Dame South Bend, IN	BS	1994-1998	Adhesion molecules in T-cell trafficking	Sr. Research Investigator, Bristol Myers Squibb
WEAVER, Casey T.	Past	Luther, Rita UAB*	2003-2009 PhD	University of Montana Missoula, MT	BS	1998-2003	Identification of distal regulatory elements in the IL-2 locus	Postdoctoral Trainee, Sanford Burnham Institute
WEAVER, Casey T.	Past	Dodd, Christopher (UAB)**	2000-2002 (MD/PhD)	Sanford	BS	1995-1999	The role of Antigen Presenting Cells in T cell polarization via specific Interleukin Expression	PhD (UAB; 2008); MD (UAB; 2009) Vanderbilty SOM, Pediatrics
WEAVER, Casey T.	Current	Whitley,Sarah (UAB)*	2005-2013 (MD/PhD)	University of Michigan Ann Arbor, MI	BS	1996-2001	Molecular regulation of the IL-17 gene	Resident Physician at UAB Medical Center

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
WEAVER, Casey T.	Past	Balasubramani, Anand UAB	2006-2010 PhD	Birla Institute of Science and Technology, India	MS	2000-2005	Molecular regulation of the IFN-g gene	Postdoctoral Scholar, La Jolla California, Biotechnology
WICK, Timothy	Current PhD Student	Bhuiyan, Didarul (UAB)	2013-present	Bangladesh Univ of Engineering Technology; Chalmers University of Technology, Sweden	BS MS	2008 2010	Synthesis and Characterization of nano-Hydroxyapatite-g-poly(lactide-co-glycolide)-g-collagen, Resorbable Tri-Block Copolymer for Potential Applications as Scaffolds for Bone Growth	BME Department, School of Engineering
WICK, Timothy	Current PhD Student	Carmona-Moran, Carlos (UAB)	2011-present	UAB	MSBME	2009	Development of a Drug Eluting Band/Glove for Treatment of Osteoarthritis	SRI, UAB
WICK, Timothy	Current PhD Student	Chavez, Robert Dalton (UAB)	2013-present	Cal St. Polytechnic-San Luis (Cal Poly)	BS MS	2012 2012	In Vitro Tissue-Engineered Cartilage Models for Osteoarthritis Drug Testing	R01 AR062507 (PI: Serra)
WICK, Timothy	Past	Amos, Amanda Owings (Georgia Tech)	2002-2006 (PhD)	Auburn	BS	2002	Regulation of Cytokine-Induced Adhesion Molecule Expression and Sickle Erythrocyte Adhesion to Microvascular Endothelial Cells by Intracellular Adenosine 3',5'-Cyclic Monophosphate and Nitric Oxide	Unknown
WICK, Timothy	Past	Carmina-Moran, Carlos (UAB)	2007-2009 (MSBME)	InstitutoTechnologico y de Estudios Superiores de Occidente, A.C.	BS	2004	"Expansion and Differentiation of Human Mesenchymal Stem Cells in a Perfusion and Surface Shear Stress Bioreactor for Tissue Engineered Cartilage"	Biotechnology Product Leader, Laboratorios PiSA (2010-2011); PhD Student UAB BME Department 2011-present
WICK, Timothy	Past	Farooque, Tanya (Georgia Tech)	2003-2008 (PhD)	University of Texas, Austin	BS	2003	Biochemical and Mechanical Stimuli for Improved Material Properties and Preservation of Tissue-Engineered Cartilage	Biomedical Engineer, CDRH/ODE/DCD/CEMB US FDA, Washington, DC

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
WICK, Timothy	Past	Menegazzo, Ingrid (UAB)	2006-2009 (MSBME)	UAB	BS	2006	Nanostructured Biomaterials for Cartilage Tissue Engineering	Physical Testing Lab Manager, Outokumpu
WICK, Timothy	Past	Wagner, Matthew C. (Georgia Tech)	2001-2006 (PhD)	Emory University	BS	2001	"Histamine Stimulation Promotes Sickle Erythrocyte Adherence in a Shear-Dependant Manner"	Current Position: Technical Products Specialist, Sebia-USA, Norcross, GA
YOUNGER, Jarred W.	Current	Campbell, Kelsey A.	2014-present	UAB	BS Psychology	2014	Moral Elevation and the Brain	John E. Fetzer Institute, Inc.
YUSUF, Nabiha	Current	Burns, Erin M.	2013-present MSPH (Epidemiology)	Ohio State University, Columbus, OH	MS PhD	2013	Vitamin D Receptor Polymorphisms and Non-Melanoma Skin Cancer Risks in an Alabama Population	Postdoctoral Fellow, Dermatology, UAB
YUSUF, Nabiha	Past	Bush, Lisa	(MS) (Genetic Counseling)	NA	BS	NA	Vitamin D Receptor Polymorphisms and Non-Melanoma Skin Cancer Risks in an Alabama Population	Genetic Counselor Northside Hospital, Atlanta GA
YUSUF, Nabiha	Past	Jimenez, Hugo	2011-present (PhD) (Cancer Biology)	Rush University, Chicago, IL	MS	2010	Regulation of ultraviolet radiation induced DNA damage and nucleotide excision repair by Toll like receptor-4	PhD student, UAB
ZAYZAFOON, Majd	Current	Daft, Paul (UAB)	2010-2014	Gannon Univ.	BS	2009	Role of Calcium Caldmodulin dependent Kinase two-alpha (α-CaMKII) in the local growth and distant metastasis of human osteosarcoma	Postdoc at Van Andel Institute
ZAYZAFOON, Majd	Past	Choo, Hyeran (UAB)	2005-2006 (MS)	Korea/ UAB	DDS	2002	CAMKII in Osteosarcoma.	Clinical Associate at the U. of Pennsylvania

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Training Period (Degree)	Prior Academic Degree Institution(s)	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ZAYZAFOON, Majd	Past	Dowell, Alexander (UAB)	2010-2011 (PhD In Progress)	U. of Washington	BS	2008	The Role of Non-Canonical Wnt Signaling Pathway in PCA Metastasis	Graduate Student Trainee at the U. of Alabama at Birmingham
ZAYZAFOON, Majd	Past	Spears, Todd (UAB)	2010-2011	U. of Louisiana at Monroe	BS	2008	The role of calcium signaling and mechanical loading in osteocyte differentiation.	Entered a Master's Track Program in October 2012
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (UAB)	2005-2007 (PhD)	Korea	MS	2003	CN/NFAT in Bone Formation.	Senior Scientist in Korea

Table 5A Instructions: For each participating faculty member, list in groups **all past and current predoctoral trainees for whom the faculty member was/is the thesis advisor (past 10 years only).** Indicate in parentheses under the trainee name where the predoctoral training with the faculty member occurred, if at a different institution. Exclude medical interns and residents, unless they are heavily engaged in laboratory research. For each trainee indicate period of predoctoral training and degree received; previous institution, degree, and year awarded prior to entry into training; title of the research project; and for past students, their current positions or for current students, their source of support. **Designate Kirschstein-NSRA training grant eligible trainees (TGE) by an asterisk (*).**

Summarize these data in the Program Plan Section 2.3.b Program Faculty. Analyze the data in terms of the overall experience of the faculty in training predoctoral students. Comment on the inclusion of faculty whose training records may not indicate much recent predoctoral training experience.

Rationale: The data in this table permit an evaluation of the success of the proposed faculty in facilitating the progression of students in their research careers, the ability of the faculty to commit appropriate time to mentoring additional trainees, and the institutions from which their trainees are selected.

Table 5B. Postdoctoral Trainees of Participating Faculty Members (Alphabetically by Faculty Member for the Past Ten Years)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Postdoc Research Training Period	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Prior Academic Degree Institution(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ABSHER, Devin	Current	Day, Kenneth (HudsonAlpha Institute)	2010-present	PhD	2008	UT Southwestern	Epigenetics of Aging	Institutional funding
ABSHER, Devin	Current	Williams, Kelly (UAB)	2014-present	PhD	2008	Iowa State	Epigenetics of lipid metabolism	Institutional funding
ABSHER, Devin	Current	Zhang, Yanfeng (UAB)	2014-present	PhD	2013	Vanderbilt	Genetics and Epigenetics of MHC	Daniels Foundation
ALLISON, David B.	Current	Archer, Ed (UAB)	2014-present	PhD	2012	Univ South Carolina	Intergenerational effects in obesity	NIH T32DK062710
ALLISON, David B.	Current	Capers, Patrice (UAB)	2013-present	PhD	2013	Morehouse SOM	Weight, body composition, and human traits	UAB MERIT program fellow through NIH
ALLISON, David B.	Current	Ejima, Keisuke (UAB)	2014-present	PhD	2014	Univ Tokyo	Mathematical models of obesity	Fellowship: Japan Society for the Promotion of Science
ALLISON, David B.	Current	Goldsby, TaShauna (UAB)	2014-present	PhD	2012	Univ Connecticut	Chronic exercise training interventions, health psychology	NIH T32DK062710
ALLISON, David B.	Current	Kroeger, Cynthia (UAB)	2015-present	PhD	2015	Univ Illinois, Chicago	Research fidelity in caloric restriction research	F32DK107157 fellow (starting in August 2015)
ALLISON, David B.	Current	Pavela, Greg (UAB)	2013-present	PhD	2013	Univ Florida	Interpersonal influences on obesity	NIH T32DK062710
ALLISON, David B.	Current	Schwartz, Tonia (UAB)	2013-present	PhD	2012	Univ Iowa – Ames	Evolution of Molecular Networks and Complex Energetic Traits	PI - James S. McDonnell Foundation Fellowship

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ALLISON, David B.	Past	Brock, David William (UAB)	2006-2007	PhD	2006	Univ Virginia	The Curious Power of Small Weight Losses- Magnitude and Mechanism	Associate Prof of Exercise and Movement Science & Director of Physical Activity and Wellness Research Center, University of Vermont
ALLISON, David B.	Past	Brown, Andrew (UAB)	2012-2014	PhD	2011	Univ Nebraska Lincoln	Investigation and promotion of research reporting integrity in obesity research.	Scientist, UAB Office of Energetics
ALLISON, David B.	Past	Cope, Mark (UAB)	2001-2007	PhD	2001	Univ of Alabama at Birmingham (UAB)	Molecular mechanisms of anti-Psychotic induced Weight gain.	Nutrition Research Scientist, Solae
ALLISON, David B.	Past	Fobian, Aaron Davis (UAB)	2013-2014	PhD	2013	UAB	Assess the effects of increased sleep duration in overweight and obese adolescents	Asst Prof, Department of Psychiatry and Behavioral Neurobiology UAB
ALLISON, David B.	Past	Dawson, John (UAB)	2012-2014	PhD	2012	Univ Wisconsin Madison	Statistical genetics of obesity.	Assistant Professor, Nutritional Sciences Texas Tech University
ALLISON, David B.	Past	Dhurandhar, Emily (UAB)	2011-2014	PhD	2011	LSU	effects on Ad36 on glucose metabolism in cell culture models	Assistant Professor, Department of Health Behavior UAB
ALLISON, David B.	Past	Elobeid, Mai A. (UAB)	2006-2008	PhD	2006	Arkansas State Univ	Obesity	Researcher, King Saud University
ALLISON, David B.	Past	Erickson, Stephen (UAB)	2006-2009	PhD	2006	UCLA	Hierarchical and Empirical BayesianInference, related computational techniques, and applications to genomics	Asst Prof, Biostatistics University of Arkansas Med. Sciences

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ALLISON, David B.	Past	Guyton, Marcus (UAB)	2006-2009	PhD	2006	Alabama A&M	Obesity	Unknown
ALLISON, David B.	Past	Harris, Jacqueline (UAB)	2012-2013	PhD	2010	University of Mississippi	Genetics and health disparities.	Radiology Technologist, UAB Medical West
ALLISON, David B.	Past	Ingram, Katherine (UAB)	2009-2011	PhD	2009	Georgia State Univ.	Design of obesity treatment trials	Asst Prof, Department of Exercise Science and Sport Management, Kennesaw State Univ
ALLISON, David B.	Past	Kaiser, Kathryn (UAB)	2009-2011	PhD	2009	U North Texas	Design of obesity treatment trials	Instructor – UAB School Of Public Health Dean's Office
ALLISON, David B.	Past	Kim, Kyoungmi (UAB)	2003-2005	PhD	2003	Univ Kentucky	Statistical Genetics	Assoc Prof, Univ CA – Davis, Public Health Sciences- Div of Biostatistics
ALLISON, David B.	Past	Klimentidis, Yann C. (UAB)	2009-2011	PhD	2009	Univ New Mexico	Statistical Genetics of obesity and diabetes	Assistant Professor, Epidemiology & Biostatistics Division University of Arizona & recipient K01DK095032
ALLISON, David B.	Past	Lewis, Dwight (UAB)	2012-2014	PhD	2012	Univ Alabama	Cardio-metabolic risk among overweight and obese African American males	Community & Rural Medicine Research Fellow/Visiting Scientist, UA (Tuscaloosa)
ALLISON, David B.	Past	Musani, Solomon K. (UAB)	2003-2006	PhD	2003	Univ Guelph	Statistical Advances in QTL mapping	Asst Prof, Univ Mississippi Med. Center
ALLISON, David B.	Past	Padilla, Miguel Co-mentor with H Tiwari & SL Bridges (UAB)	2005-2008	PhD	2005	University of Florida	Genetic Admixture in African-Americans with RA	Assistant Professor of Psychology, Old Dominion University

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ALLISON, David B.	Past	Pajewski, Nicholas M. (UAB)	2008-2010	PhD	2008	Med College Wisconsin	Application of Bayesian Nonparametric models to genetic data	Asst Prof, Biostatistical Sciences, Wake Forest Univ SOM
ALLISON, David B.	Past	Robertson, Henry (UAB)	2011-2012	PhD	2011	UAB	High dimensional Survival analysis	Statistician, Seton Healthcare Family
ALLISON, David B.	Past	Shriner, Daniel (UAB)	2005-2008	PhD	2003	Univ of Washington	Population Genetics of obesity related traits	NIH Staff Scientist, Center for Research on Genomics and global Health
ALLISON, David B.	Past	Smith, Daniel (UAB)	2007-2010	PhD	2007	Univ VA Charlottesville	Obesity and Longevity	Asst Prof, Nutrition Sciences UAB; PI of grant from the Ellison Foundation.
ALLISON, David B.	Past	Vaughan, Laura Kelly (UAB)	2005-2008	PhD	2005	Texas A&M	Admixture Mapping	Asst Prof of Biology, King University, PI of R03DK096071 grant
ALLISON, David B.	Past	Vázquez, Ana Inés (UAB)	2010-2012	PhD	2010	Univ Wisconsin Madison	Obesity, genes, and cancer	Asst Prof of Epidemiology & Biostatistics, MSU
ALLISON, David B.	Past	Williams, Kirk (UAB)	2009-2011	PhD	2009	Tulane	Genetic methods in obesity research	US Govt Research (classified)
ALLISON, David B.	Past	Zaharkin, Stanislav O. (UAB)	2002-2006	PhD	2002	Univ Arkansas	Statistical genomics	Senior Associate Principal Scientist at Mondelez Global LLC

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ARNETT, Donna	Past	Aslibekyan, Stella (UAB)	2011-2013	PhD	2011	Brown University	Genetic and Environmental Predictors of Myocardial Infarction in the Costa Rica Study	Assistant Professor of UAB Epidemiology, AHA 14CRP18060003 NIH/NHLBI; R01 HL055673 (Arnett); NIH/NIAMS; P60 AR064172 (Bridges); NIH/NHLBI; R01 HL091357 (Arnett)
ARNETT, Donna	Past	Irvin, Ryan (nee Dickson) (UAB)	2008-2011	PhD	2004	University of NC at Chapel Hill	Genetic and Psychiatric Treatment Related Risk Factors for Type 2 Diabetes in Schizophrenia and Schizoaffective Disorder Patients	Assistant Professor, Epidemiology, UAB
ARNETT, Donna	Past	Hidalgo, Bertha (UAB)	2013-2014	PhD	2013	University of Southern California	Genetic and Environmental Predictors of Myocardial Infarction in the Costa Rica Study	Assistant Professor, Epidemiology, UAB
ARNETT, Donna	Past	Liu, Y.	2003-2005	PhD	2003	Creighton U	Genotype-Treatment Interactions determining Triglyceride Levels	Assoc Prof, Informatic Medicine and Personalized Health, Univ. of Missouri -KC
ARNETT, Donna	Past	Wojczynski, Mary (UAB)	2006-2009	PhD	2006	University of NC at Chapel Hill	Genetic Epidemiology of Cardiovascular Disease	Research Assistant Professor at Washington Univ. SOM
ARNETT, Donna	Past	Wood, Alexis (UAB)	2009-2013	PhD	2009	Social Genetic and Development Center of Phychiatry	The use of objective data to refine the ADHD phenotype	Assistant Professor, Pediatrics-Nutrition, Baylor College of Medicine
ATKINSON, T. Prescott	Past	Luo, Danlin	2005-2009	PhD (Molecular Biology)	2001	University of Alabama, Tuscaloosa	Mechanism of Mast Cell Activation by *Mycoplasma pneumoniae*	Epidemiologist, Georgia Dept of Public Health, Atlanta GA
BAMMAN, Marcas M.	Current	Many, G (UAB)	2015-present	MS, PhD	2015	George Washington University	Muscle inflammation susceptibility and exercise rehab after hip/knee arthroplasty	T32 HD071866

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BAMMAN, Marcas M.	Current	Wood, K (UAB)	2015-present	PhD	2013	UAB	Exercise dose-response in Parkinson's disease	T32 HD071866
BAMMAN, Marcas M.	Past	Kim, Jeong-su (UAB)	2003-2006	MS, PhD	2003	Ohio State University	Molecular regulation of resistance training-induced muscle adaptation in young and old	Asst Professor, College of Human Sciences, Florida State University
BAMMAN, Marcas M.	Past	Merritt, Edward K (UAB)	2009	MS, PhD	2009	University of Texas	Regulation of human muscle protein metabolism following burn injury	Asst Prof, Appalachian State University
BAMMAN, Marcas M.	Past	Petrella, John K.	2003-2007	MS, PhD	2003	University of Georgia	Satellite cell activation during myofiber hypertrophy	Asst Prof, Department of Kinesiology, Samford University
BAMMAN, Marcas M.	Past	Thalacker-Mercer, Anna (UAB)	2007-2010	PhD	2007	Purdue University	Genomics and epigenetics of aging muscle and muscle regeneration	Asst Professor, Cornell University
BAMMAN, Marcas M.	Past	Yarar-Fisher, Ceren (UAB)	2011-2014	PT, PhD	2011	Auburn University	Exercise-induced metabolic health in SCI patients with metabolic syndrome	Instructor, Department of Nutrition Sciences, UAB
BELLIS, Susan L.	Current	Schultz, Matthew (UAB)	2015-present	PhD	2015	UAB	Role of glycosylation in tumor cell survival	NIH R01 GM111093
BELLIS, Susan L.	Past	Bain, Jennifer	2011-2014	D.M.D.	2009	Mississippi State University	Enhancing osteoinductivity of bone graft materials	Asst Prof, Periodontics and Preventive Sciences, Mississippi State Univ.
BELLIS, Susan L.	Past	Bonvallet, Paul (UAB)	2014-2015	PhD	2014	UAB	Electrospun scaffolds for dermal wound healing	Senior Research Engineer, L'Oreal, NJ

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BELLIS, Susan L.	Past	Christie, Daniel	2007-2008	MD	2004	UAB	Hypersialylated integrins regulate adhesion, migration & invasion of ovarian cancer cells	Private practice in Orlando, FL
BELLIS, Susan L.	Past	Liu, Zhongyu	2008-2013	PhD	2001	UAB	Role of variantly-sialylated integrins in monocyte differentiation	Research Assoc., Med-Pulmonary/Allergy/Critical Care UAB
BELLIS, Susan L.	Past	Xu, YuanYuan (UAB)	2008-2011	MD	1984	Capitol Institute of Medical Sciences, Beijing, China	Developing bone tissue engineering scaffolds	Research Associate, UAB
BELLIS, Susan L.	Past	Zhuo, Ya	2006-2009	MD	1992	Tongji Medical University	Role of glycosylation in galectin-mediated signaling	Research Biochemist, Merck Research Laboratories
BEUKELMAN, Tim	Past	Mannion, Melissa (UAB)	2012-2014	MD	2004-2008	Eastern Virginia Medical School	Development of a long-term outcome measure in juvenile idiopathic arthritis	Instructor in Pediatrics Rheumatology at UAB
BRADLEY, Laurence A.	Past	Petrov, Megan* (nee Ruiter) (UAB)	2011-2013	PhD	2006-2010	University of Alabama	Objective Sleep and Pain Modulation in Non-Hispanic White and Black Individuals with Knee Osteoarthritis	Assistant Professor, College of Nursing and Health Innovation, Arizona State University
BRADLEY, Laurence A.	Past	Sanden, Shelley H. (UAB)	2010-2011	PsyD	2005-2009	Argosy University/ Georgia School of Professional Psychology	Perceived Racial Discrimination, Predicts Heat Pain Tolerance of African Americans with Symptomatic Knee Osteoarthritis.	Cliinical Psychologist, Veterans Administration Medical Center, Atlanta, Georgia

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BRIDGES, Jr., S. Louis	Past	Aslibekyan, Stella Co-Mentor with D Arnett (UAB)	2011-2013	PhD	2011	Brown University, Providence, RI	Pharmacogenetics of methotrexate in rheumatoid arthritis	Assistant Professor of Epidemiology, University of Alabama at Birmingham, Department of Epidemiology; American Heart Association; 14CRP18060003 NIH/NHLBI; R01 HL055673 (Arnett); NIH/NIAMS; P60 AR064172 (Bridges); NIH/NHLBI; R01 HL091357 (Arnett);
BRIDGES, Jr., S. Louis	Past	Baker, Brandi Co-Mentor with R Reynolds (UAB)	2012	PhD			IFNγ and radiographic severity in RA	UAB Medical Student
BRIDGES, Jr., S. Louis	Past	Burgos, Paula Co-Mentor with G Alarcón (UAB)	2008-2010	MD	1997	Pontificia Universidad Católica de Chile, Santiago, Chile	Genetics of RA in African-Americans	Assistant Professor of Medicine, Pontificia Universidad Católica de Chile, Santiago, Chile
BRIDGES, Jr., S. Louis	Past	Crawford, Monica** Co-Mentor with A Szalai (UAB)	2007-2008	MD	2000	University of California at San Francisco, San Francisco, CA	CRP and Estrogen-mediated modulation of vascular injury repair in cardiovascular disease	Adjunct Assistant Professor – UAB

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BRIDGES, Jr., S. Louis	Past	Danila, Maria (UAB)	2006-2008	MD MS	1999 2003	Internal Medicine Resident, University of Illinois at Chicago, Chicago, IL	Genetics of treatment response in RA	Assistant Professor of Medicine, UAB Division of Clinical Immunology and Rheumatology
BRIDGES, Jr., S. Louis	Past	Dechanuwond, Pornchai (UAB)	2005-2006	MD	2001	Bangkok Metropolitan Administratio n Medical College, Bangkok, Thailand	Genetics of treatment response in RA	Assistant Professor, Bangkok Metropolitan Administration Medical College and Vajira Hospital, Bangkok, Thailand
BRIDGES, Jr., S. Louis	Past	Ding, Yanna Co-Mentor with C Raman & J Mountz (UAB)	2014	PhD MD	2013 2004	UAB; Central South Univ Xiangya Medical School, Changsha, China	The Role of IL-21 and IL-17 in Regulating Follicular T Helper Cells in Germinal Center Response of Autoimmuity	Research Assistant; University of Alabama at Birmingham
BRIDGES, Jr., S. Louis	Past	Faggard, Jeffrey* (UAB)	2006-2007	MD	2002	UAB	SNPs in CTLA4 in African-Americans with RA	Rheumatologist, Mobile Diagnostic and Medical Clinic, Mobile, AL
BRIDGES, Jr., S. Louis	Past	Frost, Jacqueline (UAB and Univ of the Witwatersrand)	2009 (MS)	MS	2009	Univ of the Witwatersrand Johannesburg, S. Africa	Gene expression and Polymorphisms in South Africans with rheumatic diseases (esp. systemic sclerosis)	Received PhD (2014, Barcelona, Spain); currently Medical Scientist and Lecturer, University of the Witwatersrand, Johannesburg, South Africa

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BRIDGES, Jr., S. Louis	Past	Govind , Nimmisha (2012) (UAB and Univ of the Witwatersrand)	2012 (PhD)	MBBCh, FCP (SA) MMed		Univ of the Witwatersrand Johannesburg, S. Africa	Genetics of Rheumatoid Arthritis in Black South Africans	Carnegie PhD Fellow; 2013; Rheumatologist at Chris Hani Baragwanath Hospital, Johannesburg, S Africa
BRIDGES, Jr., S. Louis	Past	Huynh, Bao Quynh (UAB)	2007	MD	2006	Physicians Medical Ctr – Carraway, Birmingham AL	Radiographic severity of RA in African-Americans	Private Practice
BRIDGES, Jr., S. Louis	Past	Kelly, James (UAB)	2006-2010	PhD	2005	PhD, Immunogenetics, and Medical Informatics, Cambridge University, UK	HLA Genetics, Genetic Admixture, Genetics of Susceptibility, Severity, and Treatment Response in RA	Assistant Professor of Pathology, MD Anderson Cancer Center, Houston, TX
BRIDGES, Jr., S. Louis	Past	Malik, Ashima (UAB)	2008	MD	2004	India	Genetics of RA in African-Americans	Medicine Resident, University of Alabama at Birmingham
BRIDGES, Jr., S. Louis	Past	Navarro, Iris Co-Mentor with J Curtis (UAB)	2010-2013	MD	2005	Universidad Autonoma de Guadalajara, School of Medicine, Guadalajara, Jalisco, MEXICO	Cardiovascular Disease in Rheumatoid Arthritis; Anti-PAD4 Antibodies in African-Americans with Rheumatoid Arthritis	Assistant Professor of Medicine, University of Alabama at Birmingham Diversity supplement to NIH R01 AR062376 (SL Bridges, Jr., PI)
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel Co-mentor with D Allison & H. Tiwari (UAB)	2005-2008	PhD	2005	University of Florida	Genetic Admixture in African-Americans with RA	Assistant Professor of Psychology, Old Dominion University, Norfolk, VA

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BRIDGES, Jr., S. Louis	Past	Reynolds, Richard* Co-Mentor with N Yi (UAB)	2008-2010	PhD	2008	University of Maryland, College Park, MD	Genetics of RA in African-Americans	Assistant Professor - University of Alabama at Birmingham
BRIDGES, Jr., S. Louis	Past	Shah, Tishi	2010-2011	MBBS				Visiting Research Scholar, Government Medical College, Veer Narmad South Gujarat University, Surat, India
BRIDGES, Jr., S. Louis	Past	Vaughan, L. Kelly** (UAB)	2005-2008	PhD	2005	Texas A&M	Admixture mapping of human traits and conditions: Applications to immunologic disorders	Assistant Professor, UAB, PI of K01 DK080188 grant; volunteer in Biostatistics
BULLARD, Daniel	Past	He, Xiaodong* (UAB)	2002-2006	MD	1990-1994	Sun Yat-Sen University, China	Role of Mac-1 in T cell-mediated functions	Research Scientist, SouthernBiotech, Birmingham, AL
BULLARD, Daniel	Past	Jarmi, Tambi (UAB) Co-Mentor with A Agarwal	2007-2009	MD	2002-2006	University of Aleppo (Syria)	Role of eNOS in vasculitis	Clinician, Tampa FL
CASAZZA, Krista R.	Current	Margaux Barnes (UAB)	2014-present	PhD		UAB	Exercise interventions in young cancer survivors	Postdoctoral fellow, Dept. of Pediatrics, UAB
CASAZZA, Krista R.	past	Lynae Hanks, (UAB)	2012	PhD		UAB	Kidney –bone crosstalk	Research Associate-Pediatric Endocrinology
CHAPLIN, David D.	Past	Deshane, Jessy*	2007-2010	PhD	2007	UAB	Control of asthmatic inflammation by immature myeloid regulatory cells using free radical pathways	Asst. Prof. of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine, UAB; Flight Attendant Medical Research Institute grant, and institutional startup funds

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CHAPLIN, David D.	Past	Lai, Jen-Feng	2009-2010	PhD	2009	UAB	Role of macrophages in asthma exacerations driven by *Mycoplasma pneumonia*	Post-doctoral trainee/Benaroya Research Institute; institutional funds
CHAPLIN, David D.	Past	Zindl, Carlene*	2003-2008	PhD	2003	Washington University in St. Louis	Role of lymphotoxin in the formation of the splenic marginal sinus	Research associate, Anatomic Pathology, UAB
CHATHAM, W. Winn	Current	Mullen, M. (UAB)	2014-present	MD	2011	Univ of South Florida	Prevalence, Clinical/Laboratory Correlates and Outcomes of Macrophage Activation Syndrome	Rheumatology post-doctoral trainee
CHATHAM, W. Winn	Past	Shakoory, Bita (UAB)	2008-2009	MD	1998	Zanjan Univ (Iran)	Macrophage Activation Syndrome in Adult Patients with Underlying Systemic Lupus Erythematosus (SLE),	Asst Prof.,Director of Elective Rheumatology Rotation Rheumatology Clerkship Director, Temple University
CHATHAM, W. Winn	Past	Teng, G.G. (UAB)	2006-2007	MBBS	1997	Singapore Univ	Utility of D-Dimer is the assessment of antiphospholid antibody associated thrombocytopenia in SLE	Associate Consultant, Natioanl Univ of Singapore
CHEN, Yabing	Current	Youfeng, Yang	2013-present	MD, PhD	1999, 2010	Shangdong University, UAB	Novel regulator of Vascular Disease	VA Program Project, AHA postdoctoral fellowship
CHEN, Yabing	Past	Chen, Jianfeng	2007-2012	Ph.D.	2004	Nanjing Medical University,	RANKL-induced osteoclastogenesis	Research Associate, Department of Medicine at UAB
CHEN, Yabing	Past	Chen, Jianye	2008-2009	PhD	2003	Sichuan University,	Function of Sodium and Potassium channels in vascular calcification	Prof. and Director, Dept of Biochemistry, North Sichuan Medical Univ., Sichuan, PR China
CHEN, Yabing	Past	Ling, Guanghui	2011-2012	MD	1990	Hunan Medical University,	Vascualr calcification in chronic renal failure	Assoc. Prof., Nephrology, Xiangya Medical Univ., China

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CHEN, Yabing	Past	Yuan, Kaiyu	2010-present	MD	1990	Hunan Medical University	Pancreatic cancer resistance	VA Merit Review Award
CHEN, Yabing	Past	Zhan, Xuan	2010-2011	MD	2006	Guiyang Medical University	Molecular mechanisms of oxidative stress-induced vascular calcification	Attending Cardiologist, Cardiology, Guiyang People's Hospital, Guizhou, PR China
CRON, Randy	Current	Mannion, Melissa (UAB)	2010-2014	BS MD	2004 2008	College of William & Mary Eastern Virginia Medical School	Early Use of Anakinra in sJIA	Pediatric Rheumatologist, Instructor, UAB
CRON, Randy	Current	Shakoory, Bita (UAB)	2008-2010	MD	1998	Zanjan University of Medical Sciences, Iran	Macrophage Activation Syndrome in Systemic Lupus Erythematosus	Asst Prof.,Director of Elective Rheumatology Rotation Rheumatology Clerkship Director, Temple University
CRON, Randy	Past	Arabshahi, Bita	2003-2006	BS MD	NA	NA	Intra-articular Steroid Injections of the TMJ in JIA	Staff Rheumatologist, Inova Fairfax Hospital for Children
CRON, Randy	Past	Becker, Mara	2005-2006	BS MD	NA	NA	Methotrexate Dosing and JIA	Associate Prof., Univ. of Kansas SOM
CRON, Randy	Past	Behrens, Ed	2004-2007	BS MD	NA	Univ. of Pennsylvania	Subclinical Macrophage Activation Syndrome in sJIA	Assistant Professor, Pediatric Rheumatology Univ. of Pennsylvania, HHMI, NIH R01

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CRON, Randy	Past	Beukelman, Tim (UAB)	2004-2007	BS MD MSCE	1997 2001 2008	University of Illinois Washington University University of Pennsylvania	Intra-articular Steroid Injections of the Subtalar Joint in JIA	Assoc Prof, Ped – Rheumatology, UAB SOM, NIH U34
CRON, Randy	Past	DeWitt, Esi	2002-2005	BS MD	NA	NA	Intra-articular Steroid Injections of the TMJ in JIA	Assoc. Prof., Dept. of Pediatrics, Univ. of Cincinnati
CRON, Randy	Past	Mehta, Jay	2006-2007	BS MD	NA	NA	NFAT, CD154 Transcription and SLE	Assistant Professor, Schneider Children's Hospital, Bronx, NY
CRON, Randy	Past	Pessler, Frank	2003-2007	MD PhD	NA	NA	HIV and NFAT	Assistant Faculty, Technical University, Dresden, Germany
CRON, Randy	Past	Wright, Tracy	2005-2007	BS MD	NA	NA	Uveitis in JIA	Assistant Professor, Pediatrics, UT Southwestern SOM
CRON, Randy	Past	Weiss, Pam	2005-2007	BS MD MSCE	NA	NA	Methotrexate for Linear Scleroderma	Assistant Professor, Pediatrics, University of Pennsylvania
CUI, Xiangqin	Current	Guichard, Jason (UAB)	2012-present	MD, PhD	2000-2009	Medical University of South Carolina	Role of Mitochondria in heart function	HLBI Postdoctoral Training grant T32 (PI: Tiwari)
CUI, Xiangqin	Past	Karki, Armrit (UAB)	2012	PhD	2012	South Dakota State University	Microarray data analysis	Senior Statistician (Carolinas Healthcare System)

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CUI, Xiangqin	Past	Kennedy, Richard (UAB)	2008-2011	PhD	2002-2008	Virginia Commonwealth University	Gene expression and CNV analyses	Asst Prof, Med-Gerontology/Geriatics/ Pallative Care UAB
CURTIS, Jeffrey R.	Past	Beukelman, Timothy (UAB)	2009-2013	MD, MSCE	MD	Washington University MSCE University of Pennsylvania	The Risk of Serious Infection in Juvenile Idiopathic Arthritis	Associate Professor of Pediatrics, University of Alabama at Birmingham. NIH/NIAMS U34 (PI); PCORI PPRN (Investigator); AHRQ U18 (Investigator)
CURTIS, Jeffrey R.	Past	Narongroeknawin, Pongthorn	2008-2009	MD		Internal Post-doctoral Fellow, UAB CERTs	Musculoskeletal Outcomes Research, Aty[ical Fractures Associated with Bisphosphonate Use, Safety of Biologic Agents	Instructor, Pharmongkutklao Hospital and College of Medicine, Royal Thai Army, Thailand AHRQ
CURTIS, Jeffrey R.	Past	Navarro, Iris Co-Mentor with SL Bridges (UAB)	2010-2012	MD	MSPH	University of Minnesota, Minneapolis, MN	Epidemiology and risk factors of cardiovascular outcomes in RA	Assistant Professor of Medicine UAB T32
CURTIS, Jeffrey R.	Past	Teng, Gim Gee (UAB)	200-2007	MD		Austin Medical Education Program Austin, TX	Rheumatoid Arthritis Biologics Safety and Guidelines (ACR), Methotrexate Toxicity Monitoring in the VA ACR)	Associate Consultant, National University Hospital, Dept. of Medicine, Div. of Rheumatology, Singapore
CURTIS, Jeffrey R	Past	Wright, Nicole (UAB)	2010-2012	PhD MPH BS	2010 2005 2003	Univ of AZ Univ of AZ Elon Univ, NC	Pharmacoepidemiology & Outcomes Research	Assistant Professor, UAB Department of Epidemiology SOPH

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CURTIS, Jeffrey R.	Past	Warriner, Amy	2010-2013	MD		University of Arkansas for Medical Sciences	Fracture and bone Mineral Density in HIV+ Patients Recently Started on Antiretroviral Therapy	Associate Professor Div. of Endocrinology, Diabetes and Metabolism
CUTTER, Gary	Current	Lebensburger, Jeffrey (UAB)	2015-2020	DO MPH	2003 2010	Nova Southeastern UAB	Randomized Trial of Treatment in Nocturnal Dipping in Sickle Cell Disease	Asst. Prof. UAB Ped - Hematology/Oncology/ K23 Awardee NHLBI 2014-2020
CUTTER, Gary	Current	Wang, G. (UAB)	2015-2017	PhD	2015	UAB	Adaptive Designs in Alzheimer's Disease Trials	NARCOMS Fellow/CSMC Awarded Fellowship
CUTTER, Gary	Past	Marrie, R.	2008-2011	MD PhD	2002 2009	McGill Case Western Reserve	Comorbidities in MS	Associate Professor of Internal Medicine and Community Health Sciences at the University of Manitoba.
CUTTER, Gary	Past	Morgan, Charity (UAB)	2008-2011	PhD	2008	Harvard	Estimation of MRI Counts using the Negative Binomial Distribution	Assistant Professor of Biostatistics UAB SOPH (returned after 2 years with FDA)
CUTTER, Gary	Past	Szychowski, Jeffery (UAB)	2008	PhD	2006	Univ of AL	Multicenter randomized trial of cerclage for preterm birth prevention in high-risk women with shortened midtrimester cervical length.	Assoc Professor of Biostatistics UAB School of Public Health
CUTTER, Gary	Past	Zhang, X.	2005	PhD	2004	UCLA	Bayesian Sample Size Estimates	Associate Research Scientist, Cedars Sinai Cancer Center LA
DAVIS, Randall	Past	Aruna, Badiga (UAB)	2005-2008	PhD	2001	Bharathidasan University India	Characterization of mouse FCRL5	St. Joseph's Children's Hospital, Tampa, FL

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DAVIS, Randall	Past	Li, Fu Jun (UAB)	2005-2007	MD, PhD	2005	Yamaguchi University Yamaguchi, Japan	Analysis of FcRHs in B-CLL	Instructor UAB Medicine: Pulmonary/Allergy/Critical Care
DAVIS, Randall	Past	Sangmin, Lee (UAB)	2008	MD	2007	University of Miami	Analysis of FcRHs in B-CLL	Assistant Professor of Medicine at Weill Cornell Medical College, New York, NY
DAVIS, Randall	Past	Satish, Shanbhag (UAB)	2005	MD	2002	Bangalore Medical College Bangalore, India	Analysis of FcRHs in B-CLL	Interim Clinical Director, Oncology at Johns Hopkins Bayview Asst. Prof. of Medicine
DAVIS, Randall	Past	Singh, Preet Paul (UAB)	2009-2011	MBBS	2006	All India Institute of Medical Sciences	FCRL6 Regualtion in CLL	Assit. Prof., Oncology Div. Medical Oncology Section, Washington University School of Medicine St. Louis
DAVIS, Randall	Past	Won, Woong-Jai (UAB)	2007-2008	PhD	2002	UAB	Characterization of mouse FCRL5	Research Assoc., Med - Hematology & Oncology, UAB
EDBERG, Jeffrey C.	Past	Kelley, James (UAB)	2005-2010	PhD	2005	University of Cambridge	Evaluating genetic features of the immune genome	Assistant Professor of Pathology, The University of Texas MD Anderson Cancer Center
EDBERG, Jeffrey C.	Past	Li, Xinrui (UAB)	2009-2012	PhD	2009	UAB	Regulation of B cell biology by Fcγ Receptors	Instructor, Med - Immunology/Rheumatology, UAB
ELSON, Charles O.	Past	Christmann, Benjamin (UAB)	2011-2013	PhD	2009	St. Louis University	Innate and Adaptive Immunity to Microbial Flagellins in IBD	Assistant Professor of Microbiology, Lee Unversity

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ELSON, Charles O.	Past	Jose, Purnima (UAB)	2005-2007	PhD	1999	University of Kentucky, Louisville, KY	Chronic Intestinal Inflammation: Mechanisms and Effects	Instructor, John Tyler Community College, Chester, VA
ELSON, Charles O.	Past	Morris, Brian (UAB)	2004-2005	MD	1999	Eastern VA Medical College, Norfolk, VA	Chronic Intestinal Inflammation: Mechanisms and Effects	Private Practice, Ochsner Children's Health Center, New Orleans, LA
FENG, Xu	Past	Wang, Shunqing	2004-2006 2008-2009	Wannan Medical College, Wannan, Anhui Province, China	MD	1989	Mechanism of Osteoclast Lineage Commitment	Professor and Director, Division of Hematology, Guangzhou Medical College, Guangzhou, Guangdong, China
FONTAINE, Kevin	Past	Manno, Rebecca (JHU)	2008	MD	Unknown	JHU	Strength exercise for RA	Assistant Professor of Medicine, Division of Rheumatology, JHU
FONTAINE, Kevin	Past	Mizelle, Kristi (JHU)	2010	MD	Unknown	UV, SOM	Spirituality and rheumatic disease	Private Practice, Newport News, VA
FONTAINE, Kevin	Past	Sule, Sangeeta (JHU)	2004	MD	Unknown	LSU	Strength exercise for JIA	Assistant Professor, Pediatrics, JHU
FOUAD, Mona	Current	Schoenberger, Yu-Mei (UAB)	2008-2012	PhD MPH BS BS	2005 2001 1999 1997	UAB UAB U of S AL U of S AL	Use of technology in cancer prevention and control. Development of a cancer information text message system to support community health advisors	Assistant Professor; UAB, Department of Medicine, Division of Preventive Medicine/Multiple grants
FOUAD, Mona	Past	Clay, Kimberly	2005-2006	PhD	2004	UAB	Spirituality & religiosity in cancer control	Manager; Georgia's Comprehensive Cancer Control Program

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FOUAD, Mona	Past	Council, Leona	2011	MD BS	2004 1999	Medical College of Georgia University of Georgia	Hepatocellular Carcinoma	Staff Physician; Birmingham VAMC, Pathology & Laboratory Medicine Service
Fouad, Mona	Past	Eloubeidi, Mohamad	2001-2005	MD		American University of Beirut	Colon cancer screening	Assoc. Prof. of Medicine UAB Division of Gastroenterology and Hepatology; Director of the UAB Endoscopic Ultrasound Program and the Co-Director of the Pancreatic-biliary center
FOUAD, Mona	Past	Halanych, Jewell	2003-2008	MD MSc	1998 2003	University of Texas Southwestern Boston University	Diabetes & obesity/ health disparity	Program Director, UAB Montgomery Internal Medicine Residency Program
FOUAD, Mona	Past	Holt, Cheryl	2004-2008	PhD	2001	St. Louis University	Spirituality & religiosity in cancer control	Assoc Prof, Behavioral and Community Health; Director, Community Health Awareness, Messages, and Prevention, University of Maryland
FOUAD, Mona	Past	Katkoori, Venkat	2009	PhD MS BS	1998 1991 1989	Osmania University; Hyderabad, INDIA	Molecular basis for aggressive colorectal cancer in African Americans	Assistant Professor, Michigan State University, Lansing, MI

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FOUAD, Mona	Past	Oliver, JoAnn (UAB)	2008	PhD RN ANP-BC CNE	2007 2001	Georgia State University UAB	Prostate cancer treatment or decision making among rural African American men	Associate Professor; UA, Capstone College of Nursing
GEORGE, James	Current	Walker, Vyvyca (UAB)	2013-present	PhD	2013	Univ. Michigan	The role of sm22 in metabolic syndrome	NIH MERIT Program
GEORGE, James	Past	Abdelkader, Ahmed Ibrahim Kamal	2012-2013	MD	2009	Univ. Cairo	Role of HO-1 in allograft vascular disease	Nephrologist/Egyptian Government
GEORGE, James	Past	Bolisetty, Subhashini	2011-2013	PhD	2010	UAB	Role of HO-1 in allograft vascular disease	Instructor, Division of Nephrology, UAB
GEORGE, James	Past	Braun, Andrea	2005-2006	MD	2002	Univ. of Heidelberg	Role of HO-1 in Regulatory T cell activity	Resident
GEORGE, James	Past	Chen, Bo	2007-2009	MD	2005	Univ. of Kentucky	Cytokine regulation of HO-1	Research Assoc., Div. of Nephrology, UAB
GEORGE, James	Past	Gooden, Christie (UAB)	2005-2007	BS	2003-2004	UAB	Molecular mechanisms of photopheresis	Asst. Clinical Prof., Univ. Of Missouri-KC
GEORGE, James	Past	Kankirawatana, Suthida (UAB)	2008-2012	MD	2007	UAB	Regulatory T cells in Human ECP Recipients	Asst Prof, Pediatric Rheumatologist, UAB
GEORGE, James	Past	Park, Dong Jun	2008-2010	MD	2006	Gyeongsang National University	The role of HO-1 in immunomodulation	Nephrologist, Gyeongsang National University
GEORGE, James	Past	Pinderski, Laura J.	2001-2004	MD, PhD	2000	UCSD	Immunologiv methods of atherosclerosis	Cardiologist UCSD (deceased)
GEORGE, James	Past	Seoh, JiYoung	2007	PhD	Unk	Ewah Univ.	Role of HO-1 in regulatory T cell activity	Dept Chairman. Ewah Univ.

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GOEPFERT, Paul A.	Current	Erdman, Nathan (UAB)	2014-present	MD, PhD	2010	University of Nebraska MC	Immune response in HIV infection and the role of CD4 epitopes	Postdoctoral Fellow Previously T32 under Schwebke Submitting K08 in May 2015
GOEPFERT, Paul A.	Past	Heath, Sonya (UAB)	2004-2006	MD	2000	University of Virginia	Immune Determinats Associate With HIV-1 Control	Associate Professor, Med - Infectious Diseases, UAB
GOEPFERT, Paul A.	Past	Wu, Jian-He	2005-2007	PhD	1984	Fourth Military Medical University	Determine Immune Correlates of AIDS Protection by Analyzing Antigen Specific T Cells in Both Humans and Mice	Postdoctoral Fellow
GUTIERREZ, Orlando M.	Current	Panwar, Bhupesh (UAB)	2013-2014	MD	2008	India	Impact of Vitmain D on Iron homeostasis	Assistant Professor, Med - Nephrology, UAB
GUTIERREZ, Orlando M.	Past	Hanks, Lynae (UAB)	2013-2014	PhD	2012	UAB	Communications between muscle and bone	Research Assistant, Department of Pediatrics, UAB
HOWARD, George	Past	Judd, Suzanne	2005-2006	PhD	2006	Emory	Many projects	Assistant Dean and Professor of Biostatistics
JAVED, Amjad	Current	Chen, Haiyan (UAB)	2006-present	MD, PhD	2002	Nanjing Medical University, Nanjing, China	Chondrocyte and osteoblast specific roles of Runx2 in skeletogenesis	NIH/NIAM
JAVED, Amjad	Current	Ding, Min (UAB)	2012-present	PhD	2011	Dartmouth College, Hanover, NH	Molecular interaction of adipose tissue and skeleton in aging	NIH/NIAM
JAVED, Amjad	Current	Rashid, Harunur (UAB)	2015-present	PhD	2014	University of Alabama at Birmingham, AL	Runx2 role in development of osteoarthritis	NIH/NIAM

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JAVED, Amjad	Past	Afzal, Faiza	2002-2004	PhD	2001	Imperial College School of Medicine, University of London, UK	BMP2 signaling requires Runx2 to promote osteogenic differentiation	NIH/NIAM Researcher, Institute of Child Health, University College London, UK
JAVED, Amjad	Past	Bae, Ji-Myung	2010-2011	DDS, PhD	2003	Yonsei University, Seoul, South Korea	Developmental control of odontogenesis by Osterix	NIH/NIA Associate Professor, College of Dentistry, Wonkwang University Jeonbuk, South Korea
JAVED, Amjad	Past	Essner, Mark	2009-2010	DMD	2005	Creighton University School of Dentistry	The effect of sodium hypochlorite on human pulp cells; an in vitro study	NIH/NIA, Director Essner Endodontist PC clinic. Omaha, Nebraska
JAVED, Amjad	Past	Ghori, Farah	2006-2009	MD	1989	Dow Medical College, Pakistan	Runx2 controlled adipocytic differentiation of mesenchymal cells.	NIH/NIA, Director, The endocrine, diabetes and metabolism clinic. Mountain Brook, AL
JAVED, Amjad	Past	Li, Xiangen	2001-2004	PhD	1995	Shanghai Second Medical University, Shanghai, China	Transcriptional regulation of myeloid MCSF receptor by Runx1	NIH/NIAM Instructor, Mass General Hospital, Harvard University, Boston, MA
JAVED, Amjad	Past	Ma, Changyan	2008-2009	PhD	2003	Nanjing Normal University, Nanjing, China	Functional interaction between Runx2 and Osterix for osteoblast differentiation and bone development.	NIH/NIA Associate Professor, Dept of Cell Bio & Medical Genetics, Nanjing Medical University, China
JAVED, Amjad	Past	Mujeeb, Khawaja	2003-2005	PhD	2002	University of the Punjab, Lahore, Pakistan	Biochemical purification of Runx associated complexes in osteoblast.	NIH/NIAM, Asst. Prof., University of the Punjab, Lahore Pakistan

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KEARNEY, John	Current	Yeramilli, Venkata (UAB)	2013-present	PhD	2010	Loyola University Chicago	Role of AhR in B cell development and function	American Heart Association postdoctoral Fellowship
KEARNEY, John	Past	Balazs, Mercedesz (UAB)	1999-2002	PhD	1999	University Medical School of Pécs, Hungary	The role of dendritic cells in T-independent antibody responses	Principal Scientist, Amgen, San Francisco, CA
KEARNEY, John	Past	Carvalho, Thiago (UAB)	2003-2007	PhD	2003	University of Porto, Brazil	Marginal zone B cells	Head of Graduate Programs, Instituto Gulbenkian de Ciencia
KEARNEY, John	Past	Dong, Shengli (UAB)	2010-2011	PhD	2010	University of Alabama at Birmingham	*Bacillus anthracis* spore-host interactions	Research Associate Tulane University New Orleans
KEARNEY, John	Past	Kin, Nicholas** (UAB)	2008-2011	PhD	2008	Ohio State University	Protective antibodies in Asthma	Assistant Professor, Dept. of Biology Jefferson State University, AL
KEARNEY, John	Past	Mahmoud, Tamer* (UAB)	2010-2012	BS	2009	Faculty of Pharmacy, Cairo University	Determine pattern of mouse TdT expression of its different isoforms and investigate a role for mouse TdT in receptor editing	Research Investigator II, Bristol-Myers Squibb
KEARNEY, John	Past	Martin, Flavius (UAB)	2000-2002	MD	1992	University of Medicine, Timisoara, Romania	MZ B cells in T-independent responses	Vice President Oncology and Inflammation Discovery Research, Amgen
KEARNEY, John	Past	Mengele, Jose (UAB)	2004-2005	MD 1986 PhD 1993	1993	University of San Paulo	NK1 T cells and MZ B cells	Professor, University of San Paulo, Brazil
KEARNEY, John	Past	Oliver, Alyce (UAB)	1997-1998	PhD	1997	University of Alabama at Birmingham	Identification of unique phenotypic and functionally distinct B cell subsets using mouse CD38	Assoc. Prof., Dept. of Pathology, Medical College of Georgia, Augusta, Georgia

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KEARNEY, John	Past	Rafiq, Khadija** (UAB)	2001-2004	PhD	2000	Ku Leuven, Leuven, Belgium	Detailed analysis of B lineage progression by human B cell progenitor cells in an *in vivo* system B lymphopoiesis	Assistant Professor, Thomas Jefferson University
KEARNEY, John	Past	Saunders, Ute (UAB)	2005-2008	PhD	2004	University of Erlangen, Germany	MZ B cells and NOTCH	Research Fellow, University of Muenster, Germany
KEARNEY, John	Past	Shu, Fengyu (UAB)	1996-1999	PhD	1996	University of Alabama at Birmingham	The alpha-4 integrins and lymphocyte development and trafficking in mice	Kaiser Permanente, Hematologist and Oncologist
KEARNEY, John	Past	Thai, To-Ha** (UAB)	2002-2004	PhD	2002	UAB	Characterization of Tdt long form	Assistant Professor, Pathology, Harvard University
KEARNEY, John	Past	Won, Woong-Jai (UAB)	2002-2007	PhD	2002	UAB	Autoantibodies to T cells	Research Associate, Med - Hematology & Oncology, UAB
KIMBERLY, Robert P.	Current	Harms, A.* (UAB)	2010-present	PhD	2010	UT-Southwestern	Role of neuron-microglia signaling as a mechanism to suppress the inflammatory response during the neurodegenerative process	Instructor, Neurology Chair Office, UAB
KIMBERLY, Robert P.	Past	Cafardi, John* (UAB)	2005-2006	MD	2004	Univ. Penn	Susceptibiliity factors in Lupus	Physician, Private Practice
KIMBERLY, Robert P.	Past	Darrington, Eric* (UAB)	2011-2013	PhD	2010	Clark Atlanta University	Molecular mechanisms underlying rituximab-mediated ADCC activity in Natural Killer cells	Assistant Professor of Biology, Paine College
KIMBERLY, Robert P.	Past	Dehghanpisheh, Keivan* (UAB)	2003-2005	MD, PhD	2003	Arizona State Univ: Oregon Health Science Univ.	The role of FcgRIIIa cytoplasmic domain in signaling and cell function	Rheumatologist, Private Practice

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KIMBERLY, Robert P.	Past	Ji, Chaunyi (UAB)	2003-2008	PhD, DVM	1992	Nanjing Agricultural Univ	IgA Fc Receptor Signaling	Instructor in medicine, UAB
KIMBERLY, Robert P.	Past	Kelley, James* (UAB)	2005-2006	PhD	2005	Univ. Cambridge	Genetic and Functional Studies Related to Wegener's Granulomatosis	Assistant Professor of Pathology, MD Anderson Cancer Center, Houston, TX
KIMBERLY, Robert P.	Past	Li, Xin (UAB)	2010-2013	PhD	2009	UAB	FCGR Genomics	Postdoctoral Fellow, John Hopkins University
KIMBERLY, Robert P.	Past	Li, Xinrui (UAB)	2009-2012	PhD	2009	UAB	Inhibitory receptors in SLE	Instructor, Med - Immunology/Rheumatology, UAB
KIMBERLY, Robert P.	Past	Mukhtar, Shahid* (UAB)	2011-2012	PhD	2005	Max-Planck Institute	Regulatory mechanisms of Fc γ receptor II b (FcγRIIb) in Autoimmune Diseases	Assistant Professor, Biology, UAB
KIMBERLY, Robert P.	Past	Reddy, Tim* (HudsonAlpha Institute)	2007-2011	PhD	2007	Stanford University	Genome-wide characterization of glucocorticoids and receptors and application to inflammatory disease	Assistant Professor, Biostatistics & Bioinformatics, Duke University
KORF, Bruce	Current	Kaiwar, Charu (UAB)	2015-present	MD	1999	Univ. Rajashian, Jaipar	Clinical Molecular Genetics	Fellow, UAB Medical Genomics Laboratory
KORF, Bruce	Current	Li, Kairong (UAB)	2013-present	PhD	2007	Peking Univ.	Mutation-guided therapy for NF1	UAB Dept. Genetics Research Associate
KORF, Bruce	Current	Xie, Jing (UAB)	2015-prresent	PhD	2014	UAB	Clinical Molecular Genetics	Fellow, UAB Medical Genomics Laboratory
KORF, Bruce	Past	Boyd, Kevin	2007-2008	MD	2005	U. Missouri	Biology of café-au-lait spots in NF1	Staff, UAB Dept. Dermatology
KORF, Bruce	Past	Burnside, Rachel	2006-2008	PhD	2006	U. Kentucky	Clinical Cytogenetics	Laboratory Director, LabCorp

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KORF, Bruce	Past	Chen, Margaret (UAB)	2005-2007	PhD	2005	U. Minnesota	Clinical Molecular Genetics	Clinical Molecular Geneticist, PreventionGenetics
KORF, Bruce	Past	Dong, Juan	2005-2007	PhD	1998	Univ. Heidelberg	Clinical Molecular Genetics	Clinical Molecular Geneticist, Prevention Genetics
KORF, Bruce	Past	Messiaen, Ludwine	2003-2005	PhD	1990	University of Ghent	Clinical Molecular Genetics	Director, UAB Medical Genomics Laboratory
KORF, Bruce	Past	Mikhail, Fady	2004-2006	MD PhD	1990 2003	U. Alexandria, Egypt	Clinical Cytogenetics	Associate Director, UAB Cytogenetics Lab
KORF, Bruce	Past	Zwereff, Val	2007-2009	MD PhD	1986 2006	MD - Univ. Ukraine PhD - McGill	Clinical Molecular Genetics	Staff, LabCorp
LEFKOWITZ, Elliot	Current	Hatcher, Eneida (UAB)	2014-present	PhD	2014	UAB	Poxvirus Genomics and Evolution	Research Associate, UAB Microbiology
LEFKOWITZ, Elliot	Current	Ptacek, Travis (UAB)	2013-present	PhD	2013	UAB	Analysis of Next Generation Sequence Data	UAB Center for Clinical and Translational Science; NIH/NCATS U54 TR001005
LEFKOWITZ, Elliot	Past	Crutchley, Tamara (UAB)	2007-2010	PhD	2006	UAB	Epidemiology of dengue virus infection	Regulatory Compliance Specialist, Trimble
LI, Yi-Ping	Current	Jules, J. (UAB)	2012-present	PhD	2010	UAB	Transcriptional regulation of osteoclast lineage commitment and differentiation	NIH;NIAMS R01AR044741-11A1S1
LI, Yi-Ping	Current	Tucker, B.* (UAB & The Forsyth Institute)	2009-present	DDS	2005	Harvard School of Dental Medicine	Reprogrammed stem cells and scaffolding biomaterial and maxillofacial repair	NIH;NIAMS; R01 AR055307-01A2S1
LI, Yi-Ping	Current	Wu, M. (UAB)	2014-present	PhD	2014	UAB	TANK role in osteoclast differentiation and activation	NIH;NIAMS R01-AR055307

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LI, Yi-Ping	Past	Ci, H. (The Forsyth Inst.)	2010-2012	PhD	2006	Beijing Normal Univ.	Expression and Function Analysis of a novel mouse gene BTB/zinc finger gene Bsg6	Assistant Professor, Scientist, Introgen
LI, Yi-Ping	Past	Edris, A. (The Forsyth Inst.)	2002-2005	DDS	2003	Harvard School of Dental Medicine	Molecular Mechanism of Forebrain Formation.	Assistant Professor, College of Dentistry, KSU, Saudi Arabia
LI, Yi-Ping	Past	Feng, S. (The Forsyth Inst.)	2011-2012	PhD	2009	Zhejiang Univ.	Atp6v1c1 is an essential component of the osteoclast proton pump and in F-actin ring formation in osteoclasts	Research Associate, Shanghai Jiao Tong University
LI, Yi-Ping	Past	Gao, B. (UAB)	2011-2012	DDS	2009	Sichuan University	Cathepsin K in inflammation and bone resorption associated with endodontic disease	NIH;NIAMS R01-AR055307
LI, Yi-Ping	Past	He, B. (UAB)	2011-2012	MD	2009	Sichuan University	Cathepsin K in inflammation and bone resorption associated with periodontal disease	NIH;NIAMS R01-AR055307
LI, Yi-Ping	Past	Jiang, H. (The Forsyth Institute)	2009-2010	PhD, DDS	2004	Sichuan University of China	The therapeutic effect of ATP6i knockdown for inflammation and bone resorption associated with endodontic disease	Associate Professor, Department of Oral and Maxillofacial Surgery Affiliated Stomatological Hospital, Nanjing Medical Univ, China
LI, Yi-Ping	Past	Ma, J. (The Forsyth Institute)	2009-2010	PhD, DDS	2007	Sichuan University of China	The therapeutic effect of ATP6i knockdown for inflammation and bone resorption associated with endodontic disease	Assistant Professor, College of Stomatology, Nanjing Medical Univ,China
LI, Yi-Ping	Past	Tang, W.* (The Forsyth Inst.)	2008-2010	PhD	1998	Inst Bioch. Cell Biol., Shanghai	Function of CNBP in craniofacial development	Instructor, Children Hospital, Harvard Medical School
LI, Yi-Ping	Past	Tian, F. (UAB)	2010-2011	MD	2009	Shanghai Jiao Tong Univ	The function of Cbfb in osteoblasts	NIH;NIAMS R01-AR055307

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LI, Yi-Ping	Past	Wang, Y. (The Forsyth Inst.)	2003-2005	PhD	1998	Academy of Sciences of China	Molecular Mechanism of Bone Formation	Faculty member, Nakakura Lab, UCSF Comprehensive Cancer Center
LI, Yi-Ping	Past	Yang, S.* (The Forsyth Inst.)	2002-2008	MD, PhD	2000	Henen Medical Univ.	Mechanism of Bone Resoption and Osteoclast differentiation	Associate Professor, Department of Oral Biology, State Univ of New York at -Buffalo
LI, Yi-Ping	Past	Zhao, D. (UAB)	2010-2011	MD	2008	Univ of Chinese Internal Medicine	Runx1 in osteoclasts	NIH;NIAMS R01-AR055307
LIU, Nianjun	Past (co-mentor)	Adragni, Kofi (UAB)	2009-2010	PhD	2009	University of Minnesota	Variable selection in high dimentional data	Asst. Prof., Statistics, Univ. of Maryland Baltimore County
LIU, Nianjun	Past (co-mentor)	Chen, Guo-Bo	2010-2011	PhD	2010	Zhejiang University	Statistical methodology for gene-gene interaction	Postdoctoral fellow, the Univ of Queensland
LIU, Nianjun	Past (co-mentor)	Dawson, John	2012-2014	PhD	2012	University of Wisconsin	Statistical methodologies for genetic assays	Assistant Professor, Dept of Nutrition Sci, Texas Tech Univ
LIU, Nianjun	Past (mentor)	Lin, Wan-Yu	2010-2012	PhD	2010	National Taiwan University	Statistical methodology for genomic studies	Assistant Professor, National Taiwan Univ
LIU, Nianjun	Past (co-mentor)	Sandel, Michael (UAB)	2012-2014	PhD	2012	University of Alabama	Mitochondrial genomic determinants of metabolism, and nuclear-mitochondrial crosstalk	Assistant Professor, Univ of West Alabama
LIU, Nianjun	Past (mentor)	Zhang, Boshao	2009-2011	PhD	2009	Medical University of South Carolina	Statistical methodology for genotype imputation	Biometrician Merck, Beijing, China
LORENZ, Robinna	Past	Dimmitt, Reed*	2005-2008	MD	1996	Saint Louis University	Adaptive Mucosal Immunity in Acute Intestinal Injury	Professor, Pediatrics, UAB

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LUND, Frances	Current	Botta, D. (UAB)	2010-present	PhD	2010	University of Arizona	Role of TRPM2 in regulating pulmonary inflammatory responses	Funded by Alabama Drug Discovery Alliance and Lund start up funds
LUND, Frances	Current	Zumaquero, E. (UAB)	2011-present	PhD	2010	University of Granada, Granada Spain	Generation and Characterization of human Effector B cell subsets	NIH U19 AI109962 NIH P01AI078907
LUND, Frances	Past	Guixiu, S. (Trudeau Institute)	2004-2007	PhD	2004	University of Montreal, Canada	Regulation of cell migration by Gaq-coupled chemokine receptors	Asst. Professor Dept. of Rheumatology, Sichuan University, Chengdu China-
LUND, Frances	Past	Harris, D. (Trudeau Institute)	2002-2005	PhD	1990	University of Aukland, New Zealand	Identification of effector B cells	Senior Scientist, Lexicon, The Woodlands TX
LUND, Frances	Past	Leon, B.	2008-2012	PhD	2007	Universidad Autónoma, Madrid Spain	Role of B cell derived cytokines in regulating DC responses	Asst. Professor, UAB
LUND, Frances	Past	Misra, R.* (Trudeau Institute & Univ Rochester)	2006-2011	PhD	2006	University of Vermont	Requirement for maintenance of flu-specific long-lived plasma cells	Res. Asst. Professor, Univ. Rochester
LUND, Frances	Past	Rivero-Nava, L. (Trudeau Institute)	2002-2007	PhD	2002	CINVESTAV, Mexico City, Mexico	Role of CD38 in allergic disease	No longer in science
LUND, Frances	Past	Wojciechowski, Wojciech (Trudeau Institute & Univ Rochester)	2006-2010	PhD	2002	McGill University, Montreal Canada	Role of B cell derived cytokines in viral and parasitic infections	Senior Instructor, Pediatrics, Univ. Rochester
MANNON, Peter	Past	Khan, Ali (UAB)	2011-2012	MD			Immunohistological Localization of IL-13 and IL-13 Receptors in IBD Muosa	UAB IBD Fellow Currently, Assistant Professor, UAB

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MANNON, Peter	Past	Robison, Lindsay	2010-2011	MD			Family Planning Issues in IBD: Perspective of Patient and Partner	UCB IBD Fellowship project
MANNON, Peter	Past	Yao, Michael	2006-2008	MD		University of Maryland	Translational Research in IBD	GI Training Program fellow
MCLAIN, Amie	Current	Ceren Yarar-Fisher	10/13-10/15	BA PhD	BA, 2005 PhD, 2011	BA: Baskent U, Ankara Turkey PhD-Auburn University	Novel Exercise and Diet Prescription to Improve Body Composition and Metabolic Health in Individuals with Long-Standing Spinal Cord Injury	T-32 Grant: Interdisciplinary Training in Pathobiology and Rehabilitation Medicine
MOUNTZ, John	Current	Li, J. (UAB)	2008-2012	MD PhD	2008	Sun Yat-Sen University, China, UAB	Anti-DR5 as a novel therapy for rheumatoid arthritis	Instructor, Division of Clinical Immunology & Rheumatology, UAB, NIH/RO1 and NIH/P30
MOUNTZ, John	Past	Chen, Jian	2005-2008	PhD	1998	Shandong Medical Univ., China	Immune response to AAV derived gene delivery vector	Medical Intern/ Residency Program, Methodist Hospital, Houston, TX
MOUNTZ, John	Past	Gil, Hwang Yong	2011-2012	MD	1999	Univ Of Ulsan, College of Medicine, South Korea	Vitamin D and T-cell senescence	Physician, Division of Rheumatology, University of Pittsburgh
MOUNTZ, John	Past	Li, Hao (UAB)	2014-2014	PhD	2014	UAB, Birmingham, AL	Marginal zone macrophages in lupus	Post-doctoral Fellow, Beth Israel Deaconess Med Ctr (Tsokos Lab)
MOUNTZ, John	Past	Liu, Z.	2001-2004	MD PhD	2001	Oita Medical University, Oita, Japan	Gene therapy of rheumatoid arthritis	Research Associate, UAB DOM, Division of Pulmonary, Allergy & Critical Care

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MOUNTZ, John	Past	Wang, John	2010-2011	MD PhD	2010	UAB, Birmingham, AL	Autoreactive T cells from BXD2 mice	Intern in Pathology, Cedars Sinai, Los Angeles, CA; Residency in Internal Medicine, Loma Linda Univ. Medical Center, Loma Linda, CA
MOUNTZ, John	Past	Wang, X.	2002-2006	MD	2000	Wuhan Medical School	Gene therapy of T-cell senescence T-cell imaging	Research Associate, UAB School of Dentistry
MOUNTZ, John	Past	Xie, S.	2008-2011	PhD	1998	Sun Yat-Sen Univ, China	IL-17 NF-κB signaling on B cells	Seeking position, Canada
MOUNTZ, John	Past	Xu, X.	2000-2007	MD	2000	Taishan Medical College China	Apoptosis and gene therapy	Assistant Professor, UAB DOM, Division of Pulmonary, Allergy & Critical Care
MOUNTZ, John	Past	Yasunori, Matusuki	1999-2001	MD PhD	1997	National Defense Med. College, Tokyo, Japan	Thymic development	Director and Major General, Department of Defense Hospital, Kumamoto, Japan
MOUNTZ, John	Past	Zang, S.	2008-2009	MD	1998	Peking Union Medical College, Beijing, China; U. of Kentucky, Internal Med	Collagen II arthritis in BXD2 mice	Physician Holston Medical Group, Kingsport, TN
MUNTNER, Paul	Current	Diaz, Keith (UAB)	2012-present	PhD	2012	Temple University	Racial differences in hypertension	Post-doctoral fellow – Columbia University
MUNTNER, Paul	Current	Kent, Shia (UAB)	2013-present	PhD	2011	UAB	Cardiovascular disease prevention, treatment and outcomes	Post-doctoral fellow – Epidemiology,UAB
MUNTNER, Paul	Current	Tajeu, Gabriel (UAB)	2015-present	DrPH	2015	UAB	Health economics of cardiovascular disease	Post-doctoral fellow – Epidemiology, UAB

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MUNTNER, Paul	Past	Baber, Usman (Mount Sinai)	2007-2010	MD	2004	Univ of Texas	Kidney disease and cardiovascular disease	Assistant Professor; Cardiology, Mount Sinai School of Medicine
MUNTNER, Paul	Past	Bowling, C. Barrett (UAB)	2010-2013	MD	2006	Univ of North Carolina	Geriatric-specific reasons for the excess mortality and functional decline among older adults with chronic kidney disease	Assistant Professor – Emory University
MUNTNER, Paul	Past	Carson, April (UAB)	2010-2012	PhD	2009	Univ of North Carolina	Development and validation of risk prediction models	Assoc Prof, Epidemiology, UAB
MUNTNER, Paul	Past	DeSalvo, Karen (Tulane)	2005-2009	MD, MPH MSc	1992 2002	Tulane University Harvard School of Public Health	Added prediction value of general self-rated health	National Coordinator for Health Information Technology – Dept of Health and Human Services
MUNTNER, Paul	Past	Levitan, Emily (UAB)	2010-2012	SM ScD	2004 2006	Harvard University	Dietary patterns and nutrient intake in heart failure	Assoc Prof; Dept of Epidemiology, UAB SOPH
MUNTNER, Paul	Past	Razzouk, Louai (Mount Sinai)	2008-2011	MD	2005	Brown University	CRP and mortality	Instructor, Department of Medicine, New York University
MUNTNER, Paul	Past	Weatherspoon, Janice (UAB)	2009-2010	MD	2003	UAB	Geographic variation in the prevalence of chronic kidney disease	Private practice
MURPHY-ULLRICH, Joanne E	Past	Miao, Mi (UAB)	2007-2009	PhD	2007	Vanderbilt University	TSP and TGF-beta in diabetic wound healing	Moved for family reasons; applying for pathology residency
MURPHY-ULLRICH, Joanne E.	Past	Wang, Shuxia (UAB)	2002-2005	PhD	2000	Peking Union Medical College	Glucose/PKG regulation of TSP1 And TGF-beta	Associate Professor, University of Kentucky
MURPHY-ULLRICH, Joanne E	Past	Zhou, Yong (UAB)	2002-2007	PhD	2002	Kyushu University	Ang II regulation of TSP-TGF-Beta; role of LTBPs and thy-1 in lung fibrosis	Assistant Professor, UAB Pulmonary Divison

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MYERS, Richard M.	Current	Amaral, Michelle (HudsonAlpha Institute)	2014-present	PhD	2008	University of Alabama in Huntsville	Clinical sequencing and analysis of complex neurodevelopmental and psychiatric phenotypes	Senior Postdoctoral Fellow, HudsonAlpha Institute
MYERS, Richard M.	Current	Lasseigne, Brittany (HudsonAlpha Institute)	2013-present	PhD	2013	The University of Alabama in Huntsville	Genetic and genomic analysis of neurodegnerative and complex human diseases	Postdoctoral Fellow, HudsonAlpha Institute
MYERS, Richard M.	Current	Savic, Dan (HudsonAlpha Institute)	2012-present	PhD	2012	University of Chicago	Regulation of gene expression by nuclear receptors and the ENCODE Project	Postdoctoral Fellow, HudsonAlpha Institute
MYERS, Richard M.	Past	Absher, Devin (Stanford Univ)	2001-2005	PhD	2005	Emory University	Animal models of Huntington disease and genomics of cardiovascular disease	Faculty Investigator, Hudson Alpha Institute
MYERS, Richard M.	Past	Bansal, Anita (Hudson Alpha Institute)	2009-2013	PhD	2009	University of Alabama in Huntsville	Genetic approaches for studying human transcription factors	Postdoctoral Fellow, Michigan State University
MYERS, Richard M.	Past	Behn Pauli, Flo (Hudson Alpha Institute)	2009-2010	PhD	2008	Stanford University	Transcriptional control in humans and the ENCODE Project	Research Affairs Coordinator, HudsonAlpha Institute
MYERS, Richard M.	Past	Bowling, Kevin (Hudson Alpha Institute)	2009-2013	PhD	2008	The University of Alabama	Genomic and genetic analysis of Parkinson disease	Senior Scientist, HudsonAlpha Institute
MYERS, Richard M.	Past	Cross, Marie (Hudson Alpha Institute)	2010-2013	PhD	2009	Emory University	Genomic and genetic studies of pancreatic and prostate cancers	Senior Scientist, HudsonAlpha Institute
MYERS, Richard M.	Past	Ford, Shirin (Stanford Univ)	1999-2003	PhD	1999	Rutgers University	Trapping methods to identify human transcriptional promoters	Senior Scientist, Bristol Myers Squibb
MYERS, Richard M.	Past	Gertz, Jay (Hudson Alpha Institute)	2009-2013	PhD	2009	Washington University School of Medicine	The ENCODE Project and studies of the estrogen receptor	Assistant Professor, Oncological Sciences, University of Utah

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MYERS, Richard M.	Past	Grimwood, Jane (Stanford Univ)	2000-2008	PhD	1998	University of Leeds	Large-scale de novo sequencing of the human and other genomes	Faculty Investigator, HudsonAlpha Institute
MYERS, Richard M.	Past	Houseweart, Megan (Stanford Univ)	2002-2006	PhD	2002	University of California, San Diego	Animal models of progressive myoclonus epilepsy	Unknown
MYERS, Richard M.	Past	Jain, Preti (Hudson Alpha Institute)	2009-2013	PhD	2005-2009	University of Alabama in Huntsville	Network analysis of transcriptional control in the human brain	Clinical Medical Genetics Training Program, Oregon Health Sciences Univ
MYERS, Richard M.	Past	Johnson, Dave (Stanford Univ)	2005-2008	PhD	2005	Stanford University	ENCODE Project contributions to understanding human gene regulation	Founder, Biotech Company
MYERS, Richard M.	Past	Li, Jun (Stanford Univ)	1999-2004	PhD	1998	Caltech	Analysis of transcription in post-mortem human brain tissues	Associate Professor, University of Michigan
MYERS, Richard M.	Past	Otillar, Robert (Stanford Univ)	2004-2007	PhD	2003	University of Texas at Austin	Computational analysis of human transcriptional promoters	Computational Biologist, Joint Genome Institute
MYERS, Richard M.	Past	Partridge, Chris (Hudson Alpha Institute)	2008-present	PhD	2002	Auburn University	Functional validation studies for the ENCODE Project	Senior Scientist, HudsonAlpha Institute
MYERS, Richard M.	Past	Reddy, Tim (Hudson Alpha Institute)	2007-2011	PhD	2007	Stanford University	Genome-wide characterization of glucocorticoids and receptors and application to inflammatory disease	Assistant Professor, Biostatistics & Bioinformatics, Duke University
MYERS, Richard M.	Past	Sprouse, Rebekka (Hudson Alpha Institute)	2008-2010	PhD	2008	University of Virginia	Genomic methods for human transcription factor analysis	Postdoctoral Fellow, Cornell University
MYERS, Richard M.	Past	Varley, Katherine (Hudson Alpha Institute)	2009-2013	PhD	2009	Washington Univ School of Medicine	Genomics, genetics and epigenetics of breast cancer and drug responses in breast cancer	Assistant Professor, Oncological Sciences, University of Utah

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MYERS, Richard M.	Past	Williams, Kelly (Hudson Alpha Institute)	2010-2013	PhD	2009	Nutritional Sciences at Iowa State Univ	Toxicogenomics	Senior Scientist, HudsonAlpha Institute
MYERS, Richard M.	Past	Zhang, Fan (Stanford University)	2006-2009	PhD	2000	Univ of Texas at Austin	Genomic and computational methods for understanding human transcription	Scientist, Illumina
NAPIERALA, Dobrawa	Current	Chaudhary, Sandeep (UAB)	2014-present	PhD	2010	Hamdard Univ, New Delhi, India	Molecular mechanisms initiating the mineralization process.	RO1 DE023083
NOVAK, Jan	Current	Bian, Qi (UAB)	2013-2015	MD, PhD	2008	Second Military Medical Univ, Shanghai, China	PDGF signaling in IgA nephropathy	Visiting Scientist, UAB
NOVAK, Jan	Current	Reily, Colin (UAB)	2012-2015	PhD	2012	UAB	Aberrant signaling in IgA1-producing cells in IgA nephropathy	T32 Training grant in Nephrology
NOVAK, Jan	Current	Ueda, Hiroyuki (UAB)	2012-2015	MD PhD	NA	Jikei University School of Medicine, Tokyo, Japan	Heterogeneity of anti-glycan autoantibodies in IgA nephropathy	Visiting Scientist, UAB
NOVAK, Jan	Current	Ueda, Yoshi (UAB)	2013-2015	MD PhD		Jikei Univ School of Medicine, Tokyo, Japan	Aberrant glycosylation of IgA1 in IgA nephropathy	Visiting Scientist, UAB
NOVAK, Jan	Current	Zhang, Xian-wen (UAB)	2013-2015	MD	2008	Shanghai Univ of Traditional Chinese Medicine, Shanghai, China	Characterization of active compounds for treatment of IgA nephropathy	Visiting Scientist, UAB

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NOVAK, Jan	Past	Belickova, Monika	2012-2012	PhD	NA	Institute of hematology and blood transfusion, Prague, Czech Republic	Use of next-gen sequencing for studies of IgA nephropathy	Visiting Scientist, UAB; Charles University, Prague, Czech Republic
NOVAK, Jan	Past	Eison, T.	2009-2010	MD	NA	University of Tennessee	Interaction of mesangial cells with IgA1	Visiting Fellow; Assistant Professor of Medicine, UT Memphis
NOVAK, Jan	Past	Franc, Vojtech	2013		PhD	Palacky Univ Olomouc, Czech Republic	Analysis of IgA1 *O*-glycosylation	Instructor, Palacky University Olomouc, Czech Republic
NOVAK, Jan	Past	Krupka, Michal	2013		PhD	Palacky Univ Olomouc, Czech Republic		Assist Prof, Palacky University Olomouc, Czech Republic
NOVAK, Jan	Past	Lai, Lingyun	2013		MD	Fudan Univ, Huashan Hospital, Shanghai, China	Analysis of IgA1 *O*-glycosylation and pahology of Henoch-Schoenlien nephritis	Assoc. Prof., Fudan University, Huashan Hospital, Shanghai, China
NOVAK, Jan	Past	Maillard, Nicolas	2012-2013	MD		Saint-Etienne Hospital, Saint-Etienne, France	Composition of IgA-containing immune complexes in IgA nephropathy	Visiting Scientist, UAB; Assist Prof, Saint-Etienne Hospital, Saint-Etienne, France
NOVAK, Jan	Past	Maixnerova, D.	2012	MD	NA	Charles University, Prague, Czech Republic	Genetic and biochemical biomarkers of IgA nephropathy	Visiting Scientist; Currently Assoc. Prof. at Dept. of Nephrology, School of Medicine, Charles University, Prague, Czech Republic

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NOVAK, Jan	Past	Raska, M.	2006-present	MD PhD	NA	Palacky Univ Olomouc, Czech Republic	Pathways of aberrant O-glycosylatlon in IgA nephropathy	Visiting Scientist, UAB; Assoc. Prof. at Palacky University Olomouc, Czech Republic
NOVAK, Jan	Past	Suzuki, Hitoshi	2005-2009	MD PhD	NA	Juntendo University, Tokyo, Japan	Subcloning and characterization of IgA1- and IgG-producing B cells from patients with IgA nephropathy and HSP nephritis	Visiting Scientist; Currently Assistant Professor of Medicine, Tokyo, Japan
NOVAK, Jan	Past	Takahashi, Kazuo	2008-2012	NA	NA	Fujita Health University, School of Medicine, Toyoake, Japan	Analytical approaches for analysis of O-glycans	Visiting Scientist; Currently Assistant Professor of Medicine, Fujita Health University, School of Medicine, Toyoake, Japan
NOVAK, Jan	Past	Vick, J.	2011	MD	NA	UNC Chapel Hill	Biomarkers of IgA nephropathy	Assistant Professor of Pediatric Nephrology Fellow, UNC Chapel Hill, NC
NOVAK, Jan	Past	Yamada, K.	2009-2012	MD PhD	NA	Jutendo University Tokyo, Japan	Regulation of aberrant O-glycosylatlon in IgA1-producing cells IgA nephropathy	Visiting Scientist, UAB; Currently Assistant Professor of Medicine, Tokyo, Japan
NOVAK, Jan	Past	Yanagihara, T.	2005-2007	MD PhD	NA	Nippon Medical School, Tokyo, Japan	Interactions of IgA-containing immune complexes with human mesangial cells	Visiting Scientist; Currently Assistant Professor of Medicine, Tokyo, Japan
RAMAN, Chander	Current	Ding, Yanna (UAB)	2014-2015	PhD	2013	UAB	Interferon gamma response in lymphocyte subpopulations from rheumatoid arthritis patients	Research Assistant; University of Alabama at Birmingham

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RAMAN, Chander	Past	Naves, R.	2009-2011	PhD	1999	Universidad de Chile Santiago, Chile	Cooperative regulation of type 1 and type 2 interferons in EAE	Award ended, returned to Chile; Assistant Professor, Pontificia Universidad Católica de Chile Marcoleta 350. Segundo Piso, Santiago, Chile PI-NMSS grant
RAMAN, Chander	Past	Sestero, C.	2006-2012	PhD	2006	Idaho State University	CD5 regulation of B-1a B-cell development and activation	Assistant Professor, University of Montevallo Adjunct Assistant Professor, UAB T32 grant, NIH IRACDA (K12) scholar
RAMAN, Chander	Past	Singh, S.	2008-2010	MD, MPh	2008	UAB	Interferons in pathogenesis of multiple sclerosis	Fellowship in Spinal Cord Injury, Stanford University
RAMANADHAM Sasanka	Past	Ali, Tomader (UAB)	2011-2013				Diabetes and Inflammation	Program Specialist II, Undergrad Research Coordinator, UAB
RAMANADHAM Sasanka	Past	Ashley, Jason (UAB)	2011-2013				Osteocalcin and bone-Islet loop	PDF, Univ. Penn
RAMANADHAM Sasanka	Past	Carper, Michael (WUSM)	2005-2007				HIV-PI-Induced IR	Interviewing for Faculty
RAMANADHAM Sasanka	Past	Lei, Xiaoyong (WUSM)	2006-2010				Beta-Cell Apoptosis	Instructor, Cell, Devp., & Integrative Biology, UAB
RAMANADHAM Sasanka	Past	Richmond, Scott (WUSM)	2007-2010				HIV-PI and FAO	Assistant Prof/MSU
RAMANADHAM Sasanka	Past	Song, Haowei (WUSM)	2005-2007				Proteomics	Research Sc/WUMS

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RAMANADHAM Sasanka	Past	Wang, Zhepeng (WUSM)	2003-2005				Prt-Prt Interactions	Scientist, Dept. Orthopaedic Surgery, Washington University
RANDALL, Troy	Current	Allie, S. (UAB)	2013-present	PhD	2013	Dartmouth University	Characterization of central and effector memory B cells	AI097357
RANDALL, Troy	Current	Meza-Perez, S. (UAB)	2013-present	PhD	2010	National School of Biological Sciences, National Polytechnic Institute, Mexico, D. F. Mexico	Role of omentum in anti-tumor immunity	UAB discretionary funds (Randal)
RANDALL, Troy	Current	Silva-Sanchez, A. (UAB)	2013-present	PhD	2010	National School of Biological Sciences, National Polytechnic Institute, Mexico, D. F. Mexico	Role of IL-22 in BALT development and function	HL069409
RANDALL, Troy	Past	Ballesteros-Tato, A. (University of Rochester)	2008-2012	PhD	2007	Facultad de Ciencias, Universidad Autónoma, Madrid	Role of CD40 signaling in CD8 responses to influenza	Assistant Professor, Med – Immunology & Rheumatology, UAB
RANDALL, Troy	Past	Carragher, D. (Trudeau Institute)	2004-2008	PhD	2003	University of Birmingham, Birmingham, UK	Development and function of BALT	Staff Scientist, MRC, National Institute for Medical Research London

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RANDALL, Troy	Past	Garcia-Hernandez, M.L. (University of Rochester)	2009-2012	PhD	2002	CINVESTAV-IPN, Mexico D.F.	Local lymphoid tissues in anti-tumor immunity	Instructor, University of Rochester
RANDALL, Troy	Past	Kaminski, D.A. (Trudeau Institute)	2006-2008	PhD	2002	UAB	Function of anti-NP antibodies in immunity to influenza	Instructor, University of Rochester
RANDALL, Troy	Past	Lee, B.O. (Trudeau Institute)	1998-2005	PhD	1998	Osaka Univ Medical School, Suita, Japan	Role of CD40 signaling in B cell differentiation	Assistant Professor, La Jolla Vaccine Research Institute
RANDALL, Troy	Past	Moyron-Quiroz, J. (Trudeau Institute)	2002-2006	PhD	2001	CINVESTAV, Mexico DF, Mexico	Role of lymphotoxin in pulmonary immune responses	Staff Scientist, Biolegend
RANDALL, Troy	Past	Rangel-Moreno, J. (Trudeau Institute)	2002-2012	PhD	2001	National School of Biological Sciences, National Polytechnic Institute, Mexico, D. F. Mexico	Role of homeostatic chemokines in local pulmonary immunity	Instructor, University of Rochester
REDDEN, David T.	Past	Divers, Jasmin	2005-2007	PhD	2004	SUNY-Buffalo	Adjusting for Measurement Error in Admixture Estimation	Associate Professor, Wake Forest
REDDEN, David T.	Past	Vaughan, Laura Kelly (UAB)	2006-2008	PhD	2006	Texas AM	Structured Association Tests using Admixture	Assistant Professor - King College
REDDY, Michael S.	Past	Leavitt, Curry	2007-2010	DMD	2003-2007	Temple Univesity	Correlation of bone density by histomorphometric and cone beam computed tomographic analysis	Private Practice Limited to Periodontics, Las Vegas, NV

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REYNOLDS, Richard	Past	Baker, Brandi (UAB)	2012	MD			IFNγ and radiographic severity in RA	UAB Medical Student
SAAG, Kenneth	Current	Warriner, Amy (UAB)	2006-present	MD	2002	UAB	Osteoporosis Epidemiological Methodology	Assoc Prof; UAB, Division of Endocrinology, Diabetes & Metabolism NIAMS
SAAG, Kenneth	Current	Wright, Nicole (UAB)	2010-present	MPH, PhD	2005 2010	Univ of Arizona	Patient complexity and osteoporosis medication prescription	Assistant Professor, UAB Department of Epidemiology SOPH
SAAG, Kenneth	Current	Yun, Huifeng (UAB)	2012-present	PhD	2012	UAB	Osteoporosis Epidemiological Methodology	Asst Prof; UAB, Dept of Epidemiology PCOR K12 Scholar
SAAG, Kenneth	Current	Zhang, Jie (UAB)	2010-present	PhD	2003	UAB	Epidemiology Biostatistics	Asst Prof; UAB, Dept of Epidemiology
SAAG, Kenneth	Past	Beukelman, Timothy (UAB)	2006	MD	2001	Washington Univ	Musculoskeletal Epidemiology	Assoc Prof; UAB, Dept of Pediatrics, Division of Pediatric Rheumatology KL2 Scholar
SAAG, Kenneth	Past	Danila, Maria (UAB)	2006-2008	MD	1999	Univ of Illinois at Chicago	Musculoskeletal outcomes	Asst Prof; UAB, Division of Clinical Immunology and Rheumatology
SAAG, Kenneth	Past	Gaffo, Angelo (UAB)	2007-2009	MD	1999	Univ ersidad Peruana Cayetano Heredia; Lima, Perú	Musculoskeletal outcomes	Asst Prof; UAB, Division of Clinical Immunology and Rheumatology
SAAG, Kenneth	Past	Jones, Charlotte	2009-2011	MD PhD	1994 1993	Univ of Maryland	Pediatric Neurology	Asst Prof; Ohio State Univ
SAAG, Kenneth	Past	Kitchin, Elizabeth	2008-2011	MS, RD, PhD	1990	UAB	Osteoporosis Treatment Quality	Asst Prof; UAB, Dept of Nutrition Sciences

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SAAG, Kenneth	Past	Powell, M. Paige	2006	PhD	2003	Pennsylvania State Univ	Health Policy and Prescription Drug Safety	Asst Prof; University of Memphis, Professor of Health Systems
SAAG, Kenneth	Past	Xi, Juan	2005-2008	PhD, MA, BA	2006	UAB	Statistics and Methodology, Health Disparities	Asst Prof, Sociology, Univ. of Akron
SAFFORD, Monika	Current	Dutton, Gareth (UAB)	2011-present	PhD	2005	Louisiana State Univ	Weight loss to prevent diabetes in primary care	Assoc Prof of Medicine, UAB DOPM
SAFFORD, Monika	Current	Kent, Shia (UAB)	2013-2015	PhD		UAB	Pharmacoepidemiology of lipid lowering agents in large databases	Postdoctoral Trainee
SAFFORD, Monika	Past	Appel, Susan (UAB)	2005-2006	BSN, PhD	2000	UAB	Metabolic syndrome and inflammatory markers in young women	Professor of Nursing, University of Alabama
SAFFORD, Monika	Past	Brown, Todd (UAB)	2006-2008	MD	2001	UAB	Racial differences in metabolic syndrome	Assistant Professor, Med - Cardiovascular Disease, UAB
SAFFORD, Monika	Past	Brown, Todd (UAB)	2009-2014	MD	2001	UAB	CCTS KL2 Award: Life course trajectory of the metabolic syndrome	Assistant Professor, Med - Cardiovascular Disease, UAB
SAFFORD, Monika	Past	Campbell, Caresse	2010-2012	PhD	2014	UAB	Cost-effectiveness of a peer advisor intervention to improve diabetes outcomes in rural Alabama	Steve Teutsch Post-Doctoral Fellow, Atlanta, GA.
SAFFORD, Monika	Past	Clay, Olivia	2006-2007	BS	2006	UAB	Racial Differences in Health Care Utilization Between Older African American and Caucasian Medicare Beneficiaries	Assistant Professor, UAB
SAFFORD, Monika	Past	Elder, Keith	2009-2011	PhD	2007	University of Maryland	Improving hypertension control in young African American men	Associate Professor and Chair, Department of Health Management and Policy, St. Louis, MO

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SAFFORD, Monika	Past	Frazier, Elizabeth	2006-2008	BS	2004	UAB	Post traumatic stress disorder amoung women veterans and cardiovascular risk	Post doctoral Fellow University of San Francisco
SAFFORD, Monika	Past	Jones, Charlotte	2009-2011	MD	1994	University of Maryland, College Park	Home-to-hospital transitions and medical errors	Assistant Professor of Neurology, Nationwide Children's Hospital, Columbus, OH
SAFFORD, Monika	Past	Levine, Deborah	2005-2007	MD, MPH	1998,2005	UAB	Post stroke quality of care in the VA	Assistant Professor Ohio State University School of Medicine
SAFFORD, Monika	Past	Levitan, Emily (UAB)	2010-2013	Post doctoral training	2006-2009	Beth Israel Deaconess Medical Ctr Harvard Med School	Identifying individuals with unrecognized MI for risk stratification	Professor, Med - Preventive Medicine, UAB
SAFFORD, Monika	Past	Lopez, Tercio	2006-2007	MD	2001	UAB	Colorectal cancer screening	Private Practice
SAFFORD, Monika	Past	Perkins, Martinique	2009-2010	PhD			Effects of Care Giving Strain on All-Cause Mortality	Adjunct Asst Prof, Psychology, UAB
SAFFORD, Monika	Past	Phadris, Milind	2010-2011	PhD		UAB	Bivariate Regression on Logrank Scores for Modeling Competing Risks Data with Covariates	Research Assistant Professor, University of Kansas Medical Center
SAFFORD, Monika	Past	Powell, Paige	2006-2008	PhD	2005	UAB	Effect of medication copayment increase on utilization of inpatient and outpatient services in veterans with diabetes	Asst Prof; University of Memphis, Professor of Health Systems
SAFFORD, Monika	Past	Qu, Hayin	2011-2013	PhD		UAB	Racial differences in the quality of care for complex patients	Assistant Professor, UAB SHP
SAFFORD, Monika	Past	Salanitro, Amanda	2007-2010	MD	2004	UAB	Patient complexity and quality of care	VA Quality Scholars
SAFFORD, Monika	Past	Sobko, Heather	2011-2013	RN, PhD	2011	UAB	Health IT and complex patients	CEO of her own healthcare product development company

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SAFFORD, Monika	Past	Sung, Victor	2009-2011	MD	2005	UT-Southwestern, Dallas,TX	Stroke symptom questionnaire validation	Assistant Professor of Neurology, UAB School of Medicine
SAFFORD, Monika	Past	Voinea-Griffin, Andreea	2008-2010	DDS, MBA	1992	Bucharest, Romania	Changing dental practitioner behavior	NIDCR Fellowship
SAFFORD, Monika	Past	Wright, Nicole (UAB)	2010-2012	MPH, PhD	2005,2010	UAB	Patient complexity and osteoporosis medication prescription	Assistant Professor, UAB Department of Epidemiology SOPH
SCARINCI, Isabel	Past	Anderson-Lewis, Charkarra	2005-2006	PhD MPH	2004 2000	UAB School of Public Health	Cancer prevention and control among African Americans	Assistant Professor, University of Florida
SCARINCI, Isabel	Past	Cherrington, Andrea	2006-2012	MD, MPH	1999 2005	Vanderbilt University	Weight control/nutrition among Latino immigrants	Associate Professor, UAB Dept of Medicine, Division of Preventive Medicine
SCARINCI, Isabel	Past	Frazier, Marcela	2007-2010	OD	1999	UAB	Eye care among Latino children	Associate Professor, UAB Department of Optometry
SCARINCI, Isabel	Past	Gambus, Luiz Carlos Carta	2011-2013	PhD MS BS	In progress 2000 1990	Pontificia Universidade Católica do Paraná, Brazil Pontificia Universidade Católica do Paraná, Brazil Universidade Pontificia Universidade Católica do Paraná, Brazil	Factors associated with cigarette smoking among dental students	Professor (Pontifícia Universidade Católica do Paraná, Brazil)

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SCARINCI, Isabel	Past	Garces, Isabel	2009-2010	DrPH	2009	UAB	Cervical cancer prevention among Latina immigrants	Instructor, Universidad de Antioquia, Colombia
SCARINCI, Isabel	Past	Guimarães, Ana Beatriz Pedriali	2011-2013	PhD MS BS	2009 2004 2001	Universidade de São Paulo, Brazil Universidade Federal do Paraná, Brazil Pontificia Universidade Católica do Paraná, Brazil	What are the differences in parental and fraternal influence on initiation of smoking in men and women?	Instructor (Faculdades Integradas do Brasil, UNIBRASIL, Brazil) Professor (Pontifícia Universidade Católica do Paraná, Brazil) Therapist
SCARINCI, Isabel	Past	Halanych, Jewell (Boston Univ. Medical Center)	2005-2012	MD MS	1998 2003	Boston University. School of Public Health	Discrimination in health care	Program Director, UAB Montgomery Internal Medicine Residency Program
SCARINCI, Isabel	Past	Holt, Cheryl	2006-2008	PhD MA	2001 1997	St. Louis University	Spirituality & cancer prevention and control (SIP 5: Use of a Community-Based Intervention to Increase Utilization of Colorectal Cancer Screening Among African-American Women and Men in Urban Areas)	Assoc Prof, Behavioral and Community Health; Director, Community Health Awareness, Messages, and Prevention, University of Maryland
SCARINCI, Isabel	Past	Lebensberger, Jeffrey	2010-2012	DO			Prevention of end organ damage among children with sickle cell disease	Asst. Prof. UAB Ped - Hematology/Oncology
SCARINCI, Isabel	Past	McKendree-Smith, Nancy	2004-2006	PhD	2004	University of Alabama	Ethnic Disparities in total joint replacement	Private Practice/K23

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SCARINCI, Isabel	Past	Meleth, Sreelatha	2007	PhD MS MS MA BS	2001 2001 1995 1993 1979	U of AL U of AL U of Saskatch-hewan Annamalai U Bombay U	Qualitative research methods: develop measure of health empowerment	Senior Research Statistician at RTI International, Atlanta, GA
SCARINCI, Isabel	Past	Okabe, Irene	2011-2013	PhD MS BS	2010 1999 1979	Universidade de São Paulo, Brazil Universidade Estadual de Londrina, Brazil Pontificia Universidade Católica do Paraná, Brazil	Family influence in tobacco use maintenance among men and women	Professor (Pontifícia Universidade Católica do Paraná, Brazil)
SCARINCI, Isabel	Past	Schoenberger, Yu-Mei	2008-2012	PhD MPH BS BS	2005 2001 1999 1997	UAB U of S. AL	Use of technology in cancer prevention and control Development of a cancer information text message system to support community health advisors	Assistant Professor, UAB Dept of Medicine, Division of Preventive Medicine
SCARINCI, Isabel	Past	Silveira, Andréa	2005-2007	PhD MA BS	2007 1999 1995	Pontificia Universidade Catolica de Parana, Brazil Pontifícia Universidade Católica de São Paulo	Tobacco control among Brazilian women	Independent Consultant
SCARINCI, Isabel	Past	White, Kari	2012-2014	PhD MPH MA	2011 2003 2001	Tulane Univ Univ of Arizona	Reproductive Health among Immigrant Women	Assistant Professor, UAB Dept of Health Care Organization and Policy, School of Public Health

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SCHROEDER, Jr., Harry W.	Current	Khass, Mohamed (UAB)	2013 - present	PhD	2013	UAB	Role of the preBCR in Repertoire Development	U01 AI090902 Postdoctoral Fellow, Immunology/Rheumatology, UAB
SCHROEDER, Jr., Harry W.	Past	Buckley, Kevin* (UAB)	2004-2006	MD	1999	University of Florida	Development of the Antibody Repertoire	Asst Prof Pediatrics, Wake Forest Univ
SCHROEDER, Jr., Harry W.	Past	Giannobile, Joseph* (UAB)	2008-2010	MD	2005	LSU Health Sci Ctr New Orleans	Genetics of Common Variable Immune Deficiency	Private Practice, Monroe, LA
SCHROEDER, Jr., Harry W.	Past	Hwangpo, Tracy** (UAB)	2011-2014	PhD MD	2007 2008	Mt. Sinai	Genetics of immunodeficiency	Instructor, Division of Immunology and Rheumatology, UAB
SCHROEDER, Jr., Harry W.	Past	Johnston, Douglas T.* (UAB)	2004-2006	MD	2000	Univ of Med and Dentistry of New Jersey	Genetics of Recurrent Sinopulmonary Infection	Private Practice, Clemson, SC
SCHROEDER, Jr., Harry W.	Past	Silva, Aaron (UAB)	2011-2013	PhD	2010	Instituto Polytecnico Nacional, Mexico City	Role of TCR CDR-B3 in Immune Responses	Post Doctoral Fellow, UAB
SCHROEDER, Jr., Harry W.	Past	Tanner, Jason M.** (UAB)	2004-2005	MD	1998	University of Miami	Development of the Antibody Repertoire	Clinical Asst Professor, Florida State Univ, Tallahassee, FL
SCHROEDER, Jr., Harry W.	Past	Vale, Andre Macedo (UAB)	2009-2012	PhD	2009	Federal Univ of Rio de Janeiro, Brazil	Development of the Antibody Repertoire	Assistant Professor, Federal University of Rio de Janeiro, Brazil
SCHROEDER, Jr., Harry W.	Past	Waldrep, Manda* (UAB)	2004-2008	MD	2002	Texas A&M University	Role of TACI in Common Variable Immune Deficiency	Private Practice, Austin, TX

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SCHWIEBERT, Lisa	Past	Boyd, Amy* (UAB)	2010-2012	MD	2003	Medical College Of Georgia School Of Medicine	Effects of exercise on asthmatic responses in adults	Private Practice, Gainesville, GA
SCHWIEBERT, Lisa	Past	Dugger, Kari** (UAB)	2008-2010	PhD	2007	University of Alabama at Birmingham	Effects of exercise on asthma-related Th cell responses	Assistant Professor, Biomedical Sciences, Univ. of South Alabama
SCHWIEBERT, Lisa	Past	Lowder, Tom* (UAB)	2006-2009	PhD	2006	University of Illinois	Effects of Aerobic Exercise on Treg Responses in Asthma	Assistant Professor, Health and Human Performance, University of Houston
SCHWIEBERT, Lisa	Past	Tucker, Torry* (UAB)	2005-2007	PhD	2004	University of Alabama at Birmingham	Regulation of CD40 Expression in Airway Epithelia	Asst. Prof., Biochemistry , Univ. of Texas at Tyler
SERRA, Rosa	Current	Alkhatib, Bashar (UAB)	2015-present	PhD	2015	McGill U, Montreal	IVD tissue engineering	R01 AR053860
SERRA, Rosa	Current	Peters, Sarah (UAB)	2014-present	PhD	2014	SUNY Albany, NY	Role of TGF-ß in tooth development.	DART T90-DE022736
SERRA, Rosa	Past	Grunda, Jessica	2013-2014	PhD	2009	UAB	MIF and breast cancer.	Volunteer, Cell, Developmntl, & Integrative Biology, UAB
SERRA, Rosa	Past	Jiang, Wen (UAB)	2009-2013	PhD	2008	UAB	Wnt5a in breast cancer metastasis	Assistant Professor, University of Nanjing, China
SERRA, Rosa	Past	Nicola, Teodora (UAB)	2005-2007	MD, PhD	2002	Germany	TGF-b in mammary gland development.	Research Associate, Neonatology, UAB
SERRA, Rosa	Past	Perez, Jessica (UAB)	2010-1014	PhD	2010	UAB	Regulation of Sox9 activity by TGF-ß.	Unknown

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SERRA, Rosa	Past	Wang, Ying (UAB)	2009-2013	PhD	2007	UAB	TGF-b in development of axial skeleton	Pharmacist, MI
STANDAERT, David	Past	Grammatopoulos, T. (MGH)	2004-2006	University of Illinois	PhD	2002	Gene array profiling in a mouse AAV model of PD	Founder, BioEnergetics LLC
STANDAERT, David	Past	Gray, M. (UAB)	2008-2010	Ohio State	PhD	2004	Cell autonomous effects of huntinting	Assistant Professor, UAB
STANDAERT, David	Past	Hallet, Penny (MGH)	2002-2006	University of Manchester, UK	PhD	2003	Trafficking of NMDA receptors in PD	Assistant Professor, McLean Hospital
STANDAERT, David	Past	Harms, A. (UAB)	2010-2015	UT-Southwestern	PhD	2010	Inflammatory Mechanisms in Parkinson Disease	Instructor, Neurology Chair Office, UAB
STANDAERT, David	Past	Jaunarajs, K. (UAB)	2011-2015	State University of NY-Binghamton	PhD	2011	Molecular Etiology of Early Onset Torsion Dystonia	Instructor, Nerology Chair Office, UAB
STANDAERT, David	Past	Ruan, Q. (UAB)	2006-2009	UAB	PhD	2006	VPS41 as a Target for Parkinson's Disease Therapy	Resident in Psychiatry, UT Southwestern
STANDAERT, David	Past	Theodore, S. (UAB)	2006-2009	University of Kentucky	PhD	2006	Viral Vector Models of PD	Research Scientist, Virginia Commonwealth University
STANDAERT, David	Past	Wills, Anne-Marie (MGH)	2005-2006	Columbia University	MD	2001	Sirtuins in aging and PD	Assistant Professor, Massachusetts General Hospital
STANDAERT, David	Past	Yacoubian, Talene (MGH)	2005-2007	Duke University	MD PhD	2001	Role of 14-3-3- proteins in neurodegeneration	Associate Professor, Neurology Chair Office, UAB
STEELE, Chad	Current	Szymanska Mroczek, Eva* (UAB)	2014-present	PhD	2013	UAB		Post-doctoral fellow, T32 AI007493-19

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STEELE, Chad	Past	Carterson, Alex* (Univ of Pitt)	2005-2006	PhD	2005	Tulane Univ.	Gamma delta T cells and *P. Aeruginosa*	Pathology Fellow – Harvard University
STEELE, Chad	Past	Christmann, Ben* (UAB)	2009-2011	PhD	2009	Saint Louis University	Role of STAT4, T-bet and STAT1 in *Pneumocystis* host defense	Assistant Professor, Biology, Lee University
STEELE, Chad	Past	La Hoz, Ricardo	2011-2013	MD	2005	Universidad Peruana Cayetano Heredia	Immunolotherapy for invasive aspergillosis	Assistant Professor, Internal Medicine, UT Southwestern
STEELE, Chad	Past	Mattila, Polly* (Univ of Pitt)	2006-2007	PhD	2006	Univ. of Minnesota	Dectin-1 and *A. fumigatus*	Instructor – Univ. of Pittsburgh
STEELE, Chad	Past	Myers, Riley* (UAB)	2011-2013	PhD	2011	UAB	Role of STAT4 in T an B cell responses during *Pneumocystis*	Scientist, FDA
STEELE, Chad	Past	Pop, Shannon* (Univ of Pitt)	2005-2005	PhD	2005	UNC-Chapel Hill	GM-CSF and defense against *P. carinii*	Assistant Professor, University of Florida School of Dentistry
STEELE, Chad	Past	Trevor, Jennifer* (UAB)	2011-2013	MD	2006	UAB	Alternative macrophage activation during *Pneumocystis*	Assistant Professor, HSF-Pulm/Allergy/Critical Care, UAB
STOLL, Matthew	Lauren Beth Shipman	Shipman, Lauren Beth	2014-present	MD	2007 – 2011	Univ of Arkansas for Medical Sci College of Medicine Little Rock	Early Introduction of TNF-inhibitors in the treatment of JIA	Fellow in pediatric rheumatology
THANNICKAL, V.J.	Current	Bernard, Karen (UAB)	2011-2014	PhD	2004	Univ of Nice Sophia Antipolis (FRANCE)	Clusterin control of mesenchymal phenotypes and extracellular matrix remodeling in lung fibrosis	Assistant Professor of Medicine, Med-Pulmonary, Allergy, Critical Care, UAB

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THANNICKAL, V.J.	Current	Desai, Leena (UAB)	2012-2015	PhD	1998	Univ of Mumbai	Post-translational regulation of NOX4	Instructor, Med-Pulmonary, Allergy, Critical Care, UAB
THANNICKAL, V.J.	Current	Rangarajan, Sunad (UAB)	2014-present	MD	2002	Kempegowda Institute of Medical Sciences Bangalore, India	AMPK in the resolution of age-related lung fibrosis	Post-doctoral Trainee, UAB T32HL105346
THANNICKAL, V.J.	Current	Swamy, Shobha (UAB)	2014-present	PhD	2010	University of Mysore Karnataka, India	Mechanism for the dysregulation Nrf2 activation in aging	Post-doctoral Trainee, UAB R01AG046210
THANNICKAL, V.J.	Past	Cui, Zongbin (Umich)	2002-2005	PhD	1998	Chinese Acad of Sciences	Caveolin-1 regulation by TGF-β	Professor, Chinese Academy of Sciences, Hubei, China
THANNICKAL, V.J.	Past	Griffith, Brian (UMich)	2007-2009	MD	1999	University of Michigan	Epithelial-mesenchymal transition in lung fibrosis	Clinical Professor of Medicine, Michigan State University
THANNICKAL, V.J.	Past	Hecker, Louise (UMich)	2008-2011	PhD	2007	University of Michigan	NOX enzymes in pulmonary fibrosis	Assistant Professor of Medicine, University of Arizona College of Medicine
THANNICKAL, V.J.	Past	Higgins, Peter (UMich)	2007-2009	MD PhD MS	2005 1998	Duke Univ Duke Univ Univ of Michigan	TGF-β signaling in intestinal fibrosis	Assistant Professor, Internal Medicine, University of Michigan
THANNICKAL, V.J.	Past	Horowitz, Jeffrey (UMich)	2002-2009	MD	1998	Rush University-Rush Medical College	Survival signaling in mesenchymal cells	Assistant Professor of Medicine, University of Michigan
THANNICKAL, V.J.	Past	Luckhardt, Tracy (UMich)	2009-2011	MD	2000	Louisiana State Univ	Pro-fibrotic effects of herpes virus infection in lung epithelial cells	Assistant Prof, Med-Pulmonary, Allergy, Critical Care, UAB

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THANNICKAL, V.J.	Past	Vittal, Ragini (UMich)	2003-2008	PhD	2002	Texas Woman's University	Protein kinase inhibitor therapy for fibrotic disease	Assistant Professor of Medicine, Indiana Univ. School of Medicine
TIWARI, Hemant K.	Past	Adragni, Kofi (UAB)	2009-2010	PhD	2009	University of Minnesota	Genome-wide predictive modeling	Assistant Professor, Department of Mathematics & Statistics, University of Maryland, Baltimore, MD
TIWARI, Hemant K.	Past	Erickson, Stephen (joint with Allison at UAB)	2006-2009	PhD	2006	UCLA	Copy Number variations in MZ twins	Assistant Professor, University of Arkansas Medical Sciences, Little Rock, AR
TIWARI, Hemant K.	Past	Hidalgo, Bertha (joint with Arnett at UAB)	2012-2014	PhD	2012	UAB	Cardiovascular diseases and health disparities	Assistant Professor, Epidemiology, UAB
TIWARI, Hemant K.	Past	Holliman, Curtis (UAB)	2011-2014	PhD	2011	Univ of Notre Dame	Statistical Geometry of DNA Sequences	Research Assistant Professor, University of Notre Dame
TIWARI, Hemant K.	Past	Irvin, Margurite Ryan (joint with Arnett at UAB)	2009-2011	PhD	2008	UAB	Genetic risk evaluation of cardiovascular diseases	Assistant Professor, Epidemiology, UAB
TIWARI, Hemant K.	Past	Kennedy, Richard (UAB)	2008-2011	MD PhD	1994, 2008	University of Mississippi Medical Center, Virginia Commonwealth Univ.	Structural variations & Epigenetics	Assistant Professor, Med-Gerontology/Geriatrics/ Palliative Care, UAB

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TIWARI, Hemant K.	Past	Musani, Solomon (joint w/ Allison at UAB)	2003-2005	PhD	2004	University of Guelph, Ontario, Canada	Population Stratification	Assistant Professor, Jackson Heart Study at the University of Mississippi Medical Center
TIWARI, Hemant K.	Past	Padilla, M. Co-mentor with D Allison & SL Bridges (UAB)	2005-2008	PhD	2005	University of Florida, Gainesville, FL	Missing data and Stratification; Genetic Admixture in African-Americans with RA	Assistant Professor, Old Dominion University, Virginia
TIWARI, Hemant K.	Past	Sandel, Michael (joint with Ballinger at UAB)	2012-2015	PhD	2012	University of Alabama, Tuscaloosa	Mitochondrial Data Analysis	Assistant Professor, University of West Alabama
TIWARI, Hemant K.	Past	Tesfaye, M. (joint with Go & Allison at UAB)	2005-2007	PhD	2004	University of Goettington, Germany	Data mining for Ancestry Informative Markers	Assistant Professor, Children's Hospital, University of Cincinnati College of Medicine
TIWARI, Hemant K.	Past	Vaughan, Laura Kelly (joint with Allison and Redden at UAB)	2005-2008	PhD	2005	Texas A & M, TX	Admixture mapping, Pathway Analysis	Assistant Professor, King University
TOLLEFSBOL, Trygve	Past	Hardy, Tabitha (UAB)	2010-2013	Ph.D.	2006-2010	Indiana School of Medicine	Health Disparities and diet	Research Asst. Prof., Biology, UAB.
TOLLEFSBOL, Trygve	Past	Li, Yuanyuan (UAB)	2006-2008	PhD, MD	2002-2006	Peking Union Medical College	Cancer prevention, epigenetics and telomerase	Research Associate, Dept. of Biology, UAB
TOLLEFSBOL, Trygve	Past	Liu, Canhui (UAB)	2007-2008	PhD	1994-1999	Chinese Acad. Sci, Beijing	EGCG in cancer prevention	Research Associate, Univ. of Florida

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TOLLEFSBOL, Trygve	Past	Liu, Liang (UAB)	2002-2005	PhD	1998-2002	Uppsala Univ., Sweden	Epigenetics of cancer	Assistant Professor, Dept. of Medicine, UAB
TOLLEFSBOL, Trygve	Past	Lopatina, Nadejda (UAB)	2000-2003	PhD	1988-1992	Moscow State University	DNA methylation in aging	Instructor, Wallace State Univ., Alabama
TOLLEFSBOL, Trygve	Past	Meeran, Syed (UAB)	2008-2011	PhD	1999-2004	Aligarh Muslim Univ, India	Chemoprevention of cancer with phytochemicals	Scientist EI, Central Drug Research Institute, India
TOLLEFSBOL, Trygve	Past	Pate, Mitchell (UAB)	2002-2004	PhD	1998-2002	UAB	Cellular senescence mechanisms	Biosafety Officer, Southern Research Institute
TOLLEFSBOL, Trygve	Past	Walhal, Sabrian (UAB)	2007-2008	PhD	2002-2007	UAB	DNA methylation in cancer prevention	Assistant Professor, Emory Univ.
TOWNES, Tim	Current	Chang, Chia-Wei (UAB)	2009-present	NA	NA	NA	NA	Postdoctoral Fellow, Biochemistry & Molecular Genetics, UAB
TOWNES, Tim	Current	Ding, Lei (UAB)	2013-present	NA	NA	NA	NA	Postdoctoral Fellow, Biochemistry & Molecular Genetics
TOWNES, Tim	Current	Lai, Yishin (UAB)	2011-present					Biochemistry & Molecular Genetics
TOWNES, Tim	Current	Westin, Erik (UAB)	2010-present	NA	NA	NA	NA	Postdoctoral Fellow, Biochemistry & Molecular Genetics
TOWNES, Tim	Past	Chen, Wen-Yong	1993-1999	BS MS	1988	Zhejiang Univ. Shanghai Univ.	Novel AAU Vectors Designed for Gene Therapy	Assoc. Professor, Cancer Biology, City of Hope
TOWNES, Tim	Past	Ciavatta, D.	2000	BS	1992	Oglethorpe Univ.	Mouse Models of Human Hemoglobinopathies	Chapel Hill

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TOWNES, Tim	Past	Levasseur, D.	2003-2004	BS	1994	Univ of Maine	Correction of a Mouse Model of Sickle Cell Disease Using Cell & Gene Based Therapy	Iowa U., Asst. Professor
TOWNES, Tim	Past	Masuoka, H.	1990-2002	BS MS	1990 1992	Brown Univ. Vanderbilt Univ.	Transcription Factors Required for Human Globin Gene Switching	Asst. Prof. of Clinical Medicine, Indiana University
TOWNES, Tim	Past	Pandya, Kumar (UNC)	1993-2002	BS	1993	Univ. of Utah	Functions of EKLF in Globin Gene Regulation	Research Associate, University of North Carolina
TOWNES, Tim	Past	Sun, J.	1989-1998	BS MS	1994	Chinese Culture Univ.	CIS-Acting Sequences and Trans-Acting Factors Regulating Human Globin Gene Expression	UAB, BMG Asst. Prof.
TOWNES, Tim	Past	Wu, L. C.	2002-2008	BS	1983	National Tsing Hua U.	Correcting Sickle Cell Disease with Homologous Recombination	UAB, BMG Postdoc. Fellow
TOWNES, Tim	Past	Zhou, D.	2002	BS MS	1985 1988	Hunan Agricultural College Jiangxi Agricultural U.	Purification of EKLF Complex *in vivo*	UAB, BMG Asst. Prof.
WAITE, Peter D.	Current	Denson, Douglas Resident (UAB)			DMD			
WAITE, Peter D.	Current	Dina Admin (UAB)			DDS		JIA/TMJ	Saudi Arabic
WAITE, Peter D.	Past	Al Ru Woly, Sulaman (UAB)			DDS		Bio marker OSA	Saudi Arabic
WAITE, Peter D.	Past	Digamathi, Hari Resident						
WAITE, Peter D.	Past	El Sehai, Masia (UAB)			DDS			Saudi Arabic

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WAITE, Peter D.	Past	Everetts, Joshua Resident						
WAITE, Peter D.	Past	Smith, Chris B. Resident			DDS MD			
WALTER, Mark	Past	Deshpande, Ashlesha	2007-2009	PhD	1989	Karnatak Univ Dharwad	Structural analysis of IL-10 and IL-20 cytokine complexes	Research Associate, Microbiology, UAB
WALTER, Mark	Past	Kuruganti, Srilalitha	2010-2012	PhD	2009	University of Tennessee	Role of IFNs in SLE	Project Manager, Boehringer Ingelheim, Saint Louis
WALTER, Mark	Past	Putcha, Kumar (University of Tennessee)	2009-2011	PhD	2007	Madurai Kamaraj Univ India	Structural analysis of EGFR heterodimers	Scientist, Boehringer Ingelheim
WANG, Lizhong	Past	Fan, Xianfeng (University of Michigan)	2008-2009	PhD		Institute of Biophysics, Chinese Acad of Sciences	The molecular genetics and epidemiology of CD24 polymorphisms in multiple autoimmune diseases	Research Associate/ City of Hope, Comprehensive Cancer Center
WANG, Lizhong	Past	Katoh, Hiroto (University of Michigan)	2009-2011	PhD		National Cancer Center, Tokyo, Japan	FOXP3 orchestrates H4K16 acetylation and H3K4 trimethylation for activation of multiple genes by recruiting MOF and causing displacement of PLU-1	Assistant professor/ Medical Research Institute, Tokyo Medical and Dental University, Tokyo, Japan
WANG, Lizhong	Past	Li, Dongling (University of Michigan)	2008-2009	PhD		Institute of Biophysics, Chinese Acad of Sciences	The identification of disease candidate genes and functional genetic variants in human autoimmune disease	Associate professor/ Institute of Biophysics, Chinese Academy of Sciences, Beijing China

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WANG, Lizhong	Current	Wang, Chao (UAB)	2015-present	PhD		Tongji Hospital of Tongji Medical College of Huazhong Univ of Sci & Technology	FOXP3-microRNA-200 pathway in tumor progression	
WANG, Lizhong	Past	Yi, Bing (UAB)	2012-2013	PhD		Tongji Hospital of Tongji Medical College of Huazhong Univ of Sci & Technology	FOXP3-microRNA-146-NF-κB axis and therapy for precancerous lesions in prostate	Associate professor/ Tongji Hospital of Tongji Medical College of Huazhong University of Science and Technology, Wuhan, China
WANG, Lizhong	Current	Zhang, Wei (UAB)	2014-present	PhD		Institute for the Endemic Fluorosis Control, Chinese Center for Endemic Disease Control, Harbin Medical Univ	CD24 is a modulator of p53-driven tumor progression in prostate cancer	
WARRINER, Amy H.	Current	Bano, Kulsum (UAB)	2015-present	MBBS	2010-2014	Deccan College of Medical Sciences	Use of SGLT2 Inhibitors in HIV+ Population	No current funding
WEAVER, Casey T.	Past	Harrington, Laurie (UAB)	2002-2007	PhD	1997-2001	Emory University Atlanta, GA	Regulation of CD4+ T cell development	Associate Professor, UAB Cell, Developmental & Integrative Biology

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Postdoc Research Training Period	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Prior Academic Degree Institution(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
WEAVER, Casey T.	Past	Dugger, Kari (UAB)*	2003-2008	PhD	1999-2003	CentreCollege Danville, KY	CD4+ T cell subset migration patterns	Postdoctoral Trainee UAB
WEAVER, Casey T.	Past	Dodd, Christopher (UAB)**	2008-2009	MD	2000-2004	UAB	Role of IL-23 in innate immune regulation of effector T cell development	PhD (UAB; 2008); MD (UAB; 2009) Vanderbilty SOM, Pediatrics
WEAVER, Casey T.	Past	Maynard, Craig (UAB)*	2012-2014	PhD	1998-2001	Midwestern State University	T Regulatory Cells in Immunoregulation	Instructor, UAB Molecular & Cellular Pathology
WEAVER, Casey T.	Past	Lee, YunKyung (UAB)	2005-2009	PhD	2000-2005	Pohang Univ Pohang, Korea	Molecular basis for Th1 versus Th2 lineage specification	Postdoctoral Scholar
WEAVER, Casey T.	Pastt	O'Quinn, Darrell (UAB)*	2006-2011	DVM/PhD	2000-2005	University of Alabama in Birmingham	Functional roles of IL-6 and IL-23 in regulating Th17-mediated colitis	Research Associate, UAB Anatomic Pathology
WEAVER, Casey T.	Past	Zhang, Feng (UAB)**	2007-2008	PhD	2006	Vanderbilt University Nashville, TN	Identification of a Candidate Gene within a Major Disease Susceptibility Locus for Experimental Colitis	Assistant Professor, Department of Surgery, Univ of Miss Med Ctr.
WEAVER, Casey T.	Past	Helms, Whitney (UAB)*	2006-2008	PhD	1999-2005	University of North Carolina at Chapel Hill	Role of IL-23 in Th17 Induction	Employed by NIH
WEAVER, Casey T.	Past	Palmer, Matthew (UAB)*	2007 - 2011	PhD	2003-2007	University of Alabama at Birmingham	Development of Tregs vs Th17 cells and their regulation in the context of the skin and the phenomena related to vitamins A and D metabolism and UV irradiation	Research Associate, UAB Anatomic Pathology
WEAVER, Casey T.	Past	Basu, Rajatava (UAB)	2009 - 2013	PhD	1998-2004	Jadavpur University, India	Delineation of mechanisms of CD4 T cell development	Research Associate, UAB Anatomic Pathology

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Postdoc Research Training Period	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Prior Academic Degree Institution(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
WEAVER, Casey T.	Current	Winstead, Colleen (UAB)*	2009 - present	PhD	2004-209	University of Minnesota	Studies of CD4 T cell development, with an emphasis on the roles of IL-2 and IL-21 in T cell fate decisions	Postdoctoral Trainee, UAB Anatomic Pathology
WEAVER, Casey T.	Current	Harbour, Stacey (UAB)*	2009 - present	PhD	2006-2009	University of Melbourne	Investigating host regulation of *Helicobacter*-induced pathology	Postdoctoral Trainee, UAB Anatomic Pathology
WEAVER, Casey T.	Past	Zindl, Carlene (UAB)*	2010 - 2014	PhD	1994-2003	Washington University	Studying the basis for CD4 T cell differentiation in mucosal tissues	Research Associate, UAB Anatomic Pathology
YOUNGER, Jarred W.	Current	Lin, Joanne C. (UAB)	2014-present (PhD)	BPharm	2008	Univ. of Auckland	Neuroimaging of Pain	Postdoctoral Trainee, UAB Psychology
YOUNGER, Jarred W.	Current	Parkitny, Luke (UAB)	2014-present (PhD	BPhysio MM(Pain Mgt) PhD	2001 2006 2013	Univ. of Adelaide	Moral Elevation and the Brain Neuroimmodulatory pharmacotherapy in pain: therapy and outcomes	Postdoc Research Fellow John E. Fetzer Institute IASP
YOUNGER, Jarred W.	Past	Stringer, Elizabeth A. (Stanford)	2011-2013 (PhD)	PhD Neuroscience	2010	Vanderbilt University	Neuroimaging of Opioid Use	Postdoc Research Fellow NIH R00 DA023609-03
YUSUF, Nabiha	Current	Burns, Erin M. (UAB)	2013-present	MS, PhD	2013	Ohio State University, Columbus OH	Chemoprevention of ultraviolet radiation induced skin cancer	Postdoctoral Fellow, Dermatology, UAB
YUSUF, Nabiha	Past	Ahmad, Israr (UAB)	2011-2013	MS, PhD	2011	Banaras Hindu Univ, Varanasi, India	Regulation of ultraviolet radiation induced DNA damage and nucleotide excision repair by Toll like receptor-4	Postdoctoral Fellow, Pathology, UAB
YUSUF, Nabiha	Past	Min, Wei (UAB)	2013-2014	MD, PhD	2012	Nanjing Medical Univ, P. R. China	Chemoprevention of ultraviolet radiation induced skin cancer	Associate Sr Doctor, Dept of Dermatology, the First Affiliated Hospital of Soochow Univ., P. R. China

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Postdoc Research Training Period	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Prior Academic Degree Institution(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
YUSUF, Nabiha	Past	Rihan, Heba M. (UAB)	2011-2013	DVM, PhD	2009	Washington State Univ, Seattle, WA	Regulation of ultraviolet radiation induced DNA damage and nucleotide excision repair by Toll like receptor-4	Not available
ZAYZAFOON, Majd	Past	Akhter, Hasina (UAB)	2009-2010	PhD	2008	Kanazawa Univ., Japan	The Role of S100A4-Rage in Prostate Cancer Bone Metastasis	Postdoctoral Fellow at UAB
ZAYZAFOON, Majd	Past	Choo, Min-Kyung (UAB)	2007-2009	PhD	2006	Toyama Medical and Pharmaceutical Univ., Toyama Japan	The Role of S100A4-Rage in Prostate Cancer Bone Metastasis	Postdoctoral Fellow, Harvard University
ZAYZAFOON, Majd	Past	Nagalingam, Arumugam (UAB)	2007	PhD	2000	India	CAMKII in Prostate Cancer	Research Associate at the CDC in Atlanta, GA
ZAYZAFOON, Majd	Past	Okamura, Hirohiko (UAB)	2009-2010	DDS, PhD	2008	The Univ. of Tokushima, Japan	The role of calcium signaling in osteoblast differentiation	Assistant Professor at Dept. Histology and Oral Histology, Institute of Health Biosciences, The Univ of Tokushima Graduate School
ZAYZAFOON, Majd	Past	Okamura, Kaya (UAB)	2009-2010	DDS, PhD	2003	The Univ. of Tokushima, Japan	The role of calcium signaling in osteoblast differentiation	Asst. Prof. at Dept. of Oral Health Care Education, Institute of Health Biosciences, The Univ. of Tokushima Graduate School
ZAYZAFOON, Majd	Past	Prahadeeswaran, Dharmalingam (UAB)	2006	PhD	1997	India	CAMKII in Prostate Cancer	Senior Scientist at the Innovation Depot in Birmingham, AL

Faculty Member	Past / Current Trainee	Trainee Name (Where Training Occurred)	Postdoc Research Training Period	Prior Academic Degree(s)	Prior Academic Degree Year(s)	Prior Academic Degree Institution(s)	Title of Research Project	Current Position of Past Trainees / Source of Support of Current Trainees
ZAYZAFOON, Majd	Past	Yang, Yanping* (UAB)	2010-2011	MD, PhD	2003	Hubei College of Chinese Medicine, Wuhan, China	The Role of stromal AGE in Prostate Cancer Bone Metastasis	Kansas City, Postdoctoral Fellow
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (UAB)	2006-2009	MD	1990	China	CAMKII in Osteosarcoma.	Research Associate at UAB, Department of Pathology
ZHANG, Ping	Current	Chen, Zhu (UAB)	2015-present	DDS, PhD	2011	School of Stomatology, West China University	Induction and function of osteoclast precursors in chronic periodontitis	NIDCR China Scholarship Council
ZHANG, Ping	Past	Cheng, Zhihong (UAB)	2013-2014	DDS, PhD	2012	School of Stomatology, Zhejiang Univ China	Innate regulation of RANKL-induced osteoclastogenesis	Associate Professor, School of Stomatology, Zhejiang University, China
ZHANG, Ping	Past	Yazdani, Gulam (UAB)	2009-2011	BDS	2005	Rajiv Gandhi Univ of Health Science, India	Role of VDR in host response to Porphyronomas gingivalis infection	Drug safty quality reviewer, Sentrx

Table 5B Instructions: For each participating faculty member**, list in groups all past and current postdoctoral trainees for whom the faculty member was/is the sponsor (past 10 years only)**. Indicate in parentheses under the trainee name where the postdoctoral training with the faculty member occurred, if at a different institution. Exclude medical interns and residents unless they are heavily engaged in laboratory research. For each trainee indicate period of postdoctoral training and any degree received; previous institution, degree, and year awarded prior to entry into training; title of the research project; and for past trainees, their current positions; or for current trainees their source of support. **Designate Kirschstein-NSRA training grant eligible trainees (TGE) by an asterisk (*).**

Summarize these data in the Program Plan Section 2.3.b Program Faculty. Analyze the data in terms of the overall experience of the faculty in training postdoctoral trainees. Comment on the inclusion of faculty whose training records may not indicate much recent postdoctoral training experience.

Rationale: The data in this table permit an evaluation of the success of the proposed faculty in facilitating the progression of students in their research careers, the ability of the faculty to commit appropriate time to mentoring additional trainees, and the institutions from which their trainees are selected.

Table 6A. Publications of Research Completed by Predoctoral Trainees (New Applications) (Group Past and Current Trainees Separately, then sort by Year of Entry)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David B.	Current	Bernhard, Molly (2013 – present)	**MC Bernhard,** P Li, DB Allison, and JM Gohlke. A randomized control trial on the influence of ambient temperature on food intake in an office setting. *Frontiers in Nutrition Methodology*. Under Review May 2015.
ALLISON, David B.	Current	Bernhard, Molly (2013 – present)	**MC Bernhard,** MB Evans, ST Kent, ME Sloan, JM Gohlke (2015). Measuring personal heat exposure in an urban and rural environment. *Environmental Research*. 2015 Feb;137:410-8. doi: 10.1016/j.envres.2014.11.002. Epub 2015 Jan 22. PMCID PMC4355189.
ALLISON, David B.	Current	Bernhard, Molly (2013 – present)	**MC Bernhard,** MB Evans, ST Kent, E Johnson, SL Threadgill, S Tyson, SM Becker, JM Gohlke. (2013) Identifying environmental health priorities in underserved populations: a study of rural versus urban communities. *Public Health*. 2013 Nov;127(11):994-1004. doi: 10.1016/j.puhe.2013.08.005. Epub 2013 Nov 14. PMCID PMC3851598
ALLISON, David B.	Past	Cox, Tiffany (2009 – 11)	**Cox, Tiffany L.,** Malpede, Christie Z., Ard, Jamy., Allison, David., Franklin, Frank., Baskin, Monica. Perceived Body Image in African American Girls after an Obesity Prevention Pilot. (2006) *Presentation at NAASO's 2006 Annual Scientific Meeting*, Oct. 20-24, 2006, Boston, Massachusetts, Abstract 716-P Obesity Vol. (14), Supp. A226
ALLISON, David B.	Past	Cox, Tiffany (2009 – 11)	Baskin, Monica., **Cox, Tiffany L.,** Fitzpatrick, Stephanie., Malpede, Christie Z., Ard, Jamy., Franklin, Frank., Allison, David. Primary Outcomes of a Pilot Obesity Prevention Intervention for African American 8- to 10-Year Old Girls and Their Mothers. (2006) P*resentation at NAASO's 2006 Annual Scientific Meeting*, Oct. 20-24, 2006, Boston, Massachusetts, Abstract 766-P Obesity Vol. (14), Supp. A241
ALLISON, David B.	Past	Cox, Tiffany (2009 – 11)	Ard JD, Perumean-Chaney S, Desmond R, Sutton B, **Cox TL**, Butsch WS,et al. (2010) Fruit and vegetable pricing by demographic factors in the Birmingham, Alabama, metropolitan area, 2004-2005. *Prev Chronic Dis 2010*;7(4). http://www.cdc.gov/pcd/issues/2010/jul/09_0180.htm. PMCID: PMC2901576.
ALLISON, David B.	Past	Cox, Tiffany (2009 – 11)	Affuso, O. **Cox, T. L**., Durant, N. H., & Allison, D. B. (2011). Attitudes and Beliefs Associated with Leisure-Time Physical Activity among African American Adults. *Ethnicity & Disease, Winter*;21(1):63-67. PMCID: PMC3074974
ALLISON, David B.	Past	Giddings, Matt (2007 – 2011)	**Giddings, M**., Cox, J., & Allison, D.B. (2008) An Orally Available Ghrelin Agonist Chronically Increases Hunger in Mice. (*210-P Presentation to 2008 The Obesity Society Annual meeting, in Phoenix AZ, October 3 – 7, 2008*. Abstract published in Obesity, 16(S1): S108).

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	**Keith, S**., Redden, D. T., Katzmarzyk, P., Boggiano, M. M., Hanlon, E. C., Benca, R. M., Ruden, D., Pietrobelli, A., Barger, J., Fontaine, K. R., Wang, C., Aronne, L. J., Wright, S., Baskin, M., Dhurandhar, N., Lijoi, M. C., Grilo, C. M., De Luca, M., Westfall, A. O., & Allison, D. B. (2006). Putative Contributors to the Secular Increase in Obesity: Exploring the Roads Less Traveled. *International Journal of Obesity*, 30(11):1585-94.
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Elobeid, M., Desmond, R., **Keith, S**. W., & Allison, D. B. (2007). Waist Circumference Values are Increasing Beyond that Expected from Body Mass Index Increases. *Obesity*, 15(10):2380-2383.
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	**Keith, S**. W. Wang, C., Fontaine, K. R., Cowan, C. D., Allison, D. B. (2008). Body Mass Index and Headache among Women: Results from 11 Epidemiologic Datasets and Over 200,000 Participants. *Obesity*, 16(2):377-383. PMCID: PMC3208164
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Muzumdar, R., Allison, D. B., Huffman, D. M., Ma, X., Atzmon, G., Einstein, F. H., Fishman, S., Poduval, A. D., McVei, T., **Keith, S**. W., & Barzilai, N. (2008). Visceral adipose tissue modulates mammalian longevity. *Aging Cell*, 7, 438-440. PMCID: PMC2504027
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Gadbury GL, Supapakorn T, Coffey CS, **Keith SW**, & Allison DB. (2008). Application of potential outcomes to an intentional weight loss latent variable problem. *Statistics and Its Interface*, 1, 87-98. PMCID: PMC3214637
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Yi N, Ding S, **Keith SW**, Coffey CS, & Allison DB. (2008). Bayesian analysis of the effect of intentional weight loss on mortality rate. *International Journal of Body Composition Research*, Vol. 6 No. 4: 185–192. PMCID: PMC4181669
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	McAllister, E. J., Dhurandhar, N. V., **Keith, S**. W., Aronne, L. J., Barger, J., Baskin, M., Benca, R. M., Biggio, J., Boggiano, M. M., Eisenmann, J. C., Elobeid, M., Fontaine, K. R., Peter Gluckman, P., Hanlon, E. C., Katzmarzyk, P., Pietrobelli, A., Redden, D. T., Ruden, D., Wang, C., Waterland, R. A., Wright, S., & Allison, D. B. (2009). Ten Putative Contributors to the Obesity Epidemic. *Critical Reviews in Food Science and Nutrition*, Nov;49(10):868-913. PMCID – in process PMCID: PMC2932668
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Fontaine K.R., **Keith S.W**., Greenberg J.A., Olshansky J.S., & Allison D.B. (2009). Obesity's Final Toll: Influence on Mortality Rate, Attributable Deaths, Years of Life Lost and Population Life Expectancy. In: VA Preedy and R.R. Watson (Eds.), *Handbook of Disease Burden and Quality of Life Measures*. Heidelberg, Germany: Springer Verlag, pp. 1085-1105. http://www.springerlink.com/content/k772601052n73355/fulltext.html.
ALLISON, David B.	Past	Keith , Scott W. (2004 – 2008)	Brock, D. W., **Keith, S**. W., Elobeid, M. A., Allison, D. B. 2007. Does Intentional Weight Loss Influence Mortality and Other Hard End Points Favorably? Confessions of a Closet Bayesian and Occam-ite. *Proceedings of the 2006 International Congress on Obesity*. [CD-ROM], Sydney Australia, Sep 3-8, 2006. Paper # ISO111.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David B.	Past	Loop, Matthew (2010 – 2011)	none
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	**Mehta T**, McCubrey R, Pajewski NM, Keith SW, Crespo CJ, Allison DB, Fontaine KR. Does Obesity Associate with Mortality among Hispanic Persons?: *Results from the National Health Interview Survey. Obesity* (Silver Spring). 2013 Jul;21(7):1474-7. doi: 10.1002/oby.20105. Epub 2013 Apr 17 PMID: 23596157
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Casazza K, Fontaine KR, Astrup A, Birch L, Brown AW, Brown MM, Durant N, Dutton G, Foster ME, Heymsfield SB, Mclver K, **Mehta T**, Menachemi N, Newby PK, Pate R, Rolls BJ, Sen B, Smith DL Jr, Thomas D, Allison DB. Myths, Legends, and Facts in Obesity. *N Engl J* Med. 2013;368:446-54 [PMID: 23363498].
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Jarboe J, Anderson J, Duarte C, **Mehta T**, Nowsheen S, Hicks P, Witley A, Rohrbach T, McCubrey R, Chiu S, Burleson T, Bonner J, Gillespie Y, Yang E, Willey C. MARCKS Regulates Growth, Radiation Sensitivity and is a Novel Prognostic Factor for Glioma. *Clinical Cancer Research*. 2012 Jun 18(11):3030-41 [PMID: 22619307]
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Duarte CW, Willey CD, Zhi D, Cui X, Harris JJ, Vaughan LK, **Mehta T**, McCubrey RO, Khodarev NN, Weichselbaum RR, Gillespie GY. Expression signature of IFN/STAT1 signaling genes predicts poor survival outcome in glioblastoma multiforme in a subtype-specific manner. *PLoS One*. 2012; 7(1):e29653. PMCID: PMC3252343
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Fontaine KR, McCubrey R, **Mehta T**, Pajewski NM, Keith SW, Bangalore SS, Crespo CJ, Allison DB. Body mass index and mortality rate among Hispanic adults: a pooled analysis of multiple epidemiologic data sets. *Int J Obes* (Lond). 2011 Oct 11. PMCID: PMC3271144
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Keith SW, Fontaine KR, Pajewski NM, **Mehta T**, Allison DB. Use of self-reported height and weight biases the body mass index-mortality association. *Int J Obes* (Lond). 2010 Aug 3. PMCID: PMC3040787.
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Miller SJ, Jessen WJ, **Mehta T**, Hardima n A, Sites E, Kaiser S, Jegga AG, Li H, Upadhyaya M, Giovannini M, Muir D, Wallace MR, Lopez E, Serra E, Nielsen GP, Lazaro C, Stemmer-Rachamimov A, Page G, Aronow BJ, Ratner N. Integrative genomic analyses of neurofibromatosis tumours identify SOX9 as a biomarker and survival gene. *EMBO Mol Med*. 2009 Jul;1(4):236-48. [No NIH Support] PMCID: PMC3378132
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Feugang JM, Kaya A, Page GP, Chen L, **Mehta T**, Hirani K, Nazareth L, Topper E, Gibbs R, Memili E. Two-stage genome-wide association study identifies integrin beta 5 as having potential role in bull fertility. *BMC Genomics*. 2009 Apr 24;10:176. PMCID: PMC2684547.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Guimbellot JS, Erickson SW, **Mehta T**, Wen H, Page GP, Sorscher EJ, Hong JS. Correlation of microRNA levels during hypoxia with predicted target mRNAs through genome-wide microarray analysis. B*MC Med Genomics*. 2009 Mar 25;2:15. PMCID: PMC2667434.
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Chen L, Page GP, **Mehta T**, Feng R, Cui X. Single nucleotide polymorphisms affect both cis- and trans-eQTLs. *Genomics*. 2009 Jun;93(6):501-8. PMCID: PMC4041081
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Ioannidis JP, Allison DB, Ball CA, Coulibaly I, Cui X, Culhane AC, Falchi M, Furlanello C, Game L, Jurman G, Mangion J, **Mehta T**, Nitzberg M, Page GP, Petretto E, van Noort V. Repeatability of published microarray gene expression analyses. *Nat Genet*. 2009 Feb;41(2):149-55. PMID: 19174838
ALLISON, David B.	Past	Mehta, Tapan (2011 – 2013)	Srinivasasainagendra V, Page GP, **Mehta T**, Coulibaly I, Loraine AE. CressExpress: a tool for large-scale mining of expression data from Arabidopsis. *Plant Physiol*. 2008 Jul;147(3):1004-16. PMCID: PMC2442548
ALLISON, David B.	Past	Robertson, Henry (2008 – 2011)	**Robertson, H. T**., & Allison, D. B. (2009). Drugs Associated with More Suicidal Ideations are Also Associated with More Suicide Attempts. *PLoS One*, Oct 2;4(10):e7312. PMCID: PMC2749439.
ALLISON, David B.	Past	Robertson, Henry (2008 – 2011)	Smith, D. L., **Robertson, H.,** Desmond, R., Nagy, T. R., & Allison, D. B. (2010). No compelling evidence that sibutramine prolongs life in rodents despite providing a dosedependent reduction in body weight. *International Journal of Obesity*. 2011 May;35(5):652-7. Epub 2010 Nov 16. PMCID: PMC3091992
ALLISON, David B.	Past	Robertson, Henry (2008 – 2011)	**Robertson, H. T**., Smith, D.L., Pajewski, N. M., Weindruch, R. H., Garland, T. Jr., Argyropoulos, G., Bokov, A., Allison, D.B. (2010). Can Rodent Longevity Studies be Both Short and Powerful? *Journal of Gerontology: Biological Sciences*. 2011 Mar; 66(3):279-86. Epub 2010 Nov 4. PMCID: PMC3041472
ARNETT, Donna	Past	Bielinski, Sue (2003-05)	**Bielinski SJ**, Tang W, Pankow JS, Miller MB, Mosley TH, Boerwinkle E, Olshen RA, Curb JD, Jaquish CE, Rao DC, Weder A, Arnett DK. Genome-wide linkage scans for loci affecting total cholesterol, HDL-C, and triglycerides: the Family Blood Pressure Program. *Hum Genet*. 2006;120:371-80. PMID: 16868761
ARNETT, Donna	Past	Bielinski, Sue (2003-05)	**Bielinski SJ**, Lynch AI, Miller MB, Weder A, Cooper R, Oberman A, Chen YD, Turner ST, Fornage M, Province M, Arnett DK. Genome-wide linkage analysis for loci affecting pulse pressure: the Family Blood Pressure Program. *Hypertension*. 2005;46:1286-93. PMID: 16868761
ARNETT, Donna	Past	Jenkins, T (2004-08)	**Jenkins TM**, Chapman KL, Ritchie CS, Arnett DK, McGwin G Jr, Cofield SS, Maetz HM. Barriers to hospice care in Alabama: provider-based perceptions. *Am J Hosp Palliat Care*. 2011;28:153-60. PMID: 20801920
ARNETT, Donna	Past	Jenkins, T (2004-08)	**Jenkins TM**, Chapman KL, Ritchie CS, Arnett DK, McGwin G, Cofield SS, Maetz HM. Hospice use in Alabama, 2002-2005. *J Pain Symptom Manage*. 2011;41(2):374-82. doi: 10.1016/j.jpainsymman.2010.04.027. PMID: 21236629

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ARNETT, Donna	Past	Limdi, N (2005)	**Limdi NA**, McGwin G, Goldstein JA, Beasley TM, Arnett DK, Adler BK, Baird MF, Acton RT. Influence of CYP2C9 and VKORC1 1173C/T genotype on the risk of hemorrhagic complications in African-American and European-American patients on warfarin. *Clin Pharmacol Ther.* 2008;83:312-21. PMC2683398.
ARNETT, Donna	Past	Limdi, N (2005))	**Limdi NA**, Arnett DK, Goldstein JA, Beasley TM, McGwin G, Adler BK, Acton RT. Influence of CYP2C9 and VKORC1 on warfarin dose, anticoagulation attainment and maintenance among European-Americans and African-Americans. *Pharmacogenomics*. 2008;9:511-26. PMC2757655.
ARNETT, Donna	Past	Limdi, N (2005)	**Limdi NA**, Beasley TM, Crowley MR, Goldstein JA, Rieder MJ, Flockhart DA, Arnett DK, Acton RT, Liu N. VKORC1 polymorphisms, haplotypes and haplotype groups on warfarin dose among African-Americans and European-Americans. *Pharmacogenomics*. 2008;9:1445-58. PMC2586955.
ARNETT, Donna	Past	Lynch, A (2002-05)	Bielinski SJ, **Lynch AI**, Miller MB, Weder A, Cooper R, Oberman A, Chen YD, Turner ST, Fornage M, Province M, Arnett DK. Genome-wide linkage analysis for loci affecting pulse pressure: the Family Blood Pressure Program. *Hypertension*. 2005;46:1286-93. PMID: 16286574
ARNETT, Donna	Past	Lynch, A (2002-05)	**Lynch AI**, Arnett DK, Atwood LD, Devereux RB, Kitzman DW, Hopkins PN, Oberman A, Rao DC. A genome scan for linkage with aortic root diameter in hypertensive African Americans and whites in the Hypertension Genetic Epidemiology Network (HyperGEN) study. *Am J Hypertens*. 2005;18(5 Pt 1):627-32. PMID: 15882545
ARNETT, Donna	Past	Lynch, A (2002-05)	Sherva R, Miller MB, **Lynch AI**, Devereux RB, Rao DC, Oberman A, Hopkins PN, Kitzman DW, Atwood LD, Arnett DK. A whole genome scan for pulse pressure/stroke volume ratio in African Americans: the HyperGEN study. *Am J Hypertens*. 2007;20:398-402. PMC1997287.
ARNETT, Donna	Past	Lynch, A (2002-05)	**Lynch AI**, Arnett DK, Pankow JS, Miller MB, North KE, Eckfeldt JH, Hunt SC, Rao DC, Djoussé L. Sex-specific effects of ACE I/D and AGT-M235T on pulse pressure: the HyperGEN Study. *Hum Genet*. 2007;122:33-40. PMID: 17492314
ARNETT, Donna	Past	Lynch, A (2002-05)	**Lynch AI**, Arnett DK, Davis BR, Boerwinkle E, Ford CE, Eckfeldt JH, Leiendecker-Foster C. Sex-specific effects of AGT-6 and ACE I/D on pulse pressure after 6 months on antihypertensive treatment: the GenHAT study. *Ann Hum Genet*. 2007;71(Pt 6):735-45. PMID: 17608790
ARNETT, Donna	Past	Sherva, R (2003-06)	**Sherva R**, Miller MB, Lynch AI, Devereux RB, Rao DC, Oberman A, Hopkins PN, Kitzman DW, Atwood LD, Arnett DK. A whole genome scan for pulse pressure/stroke volume ratio in African Americans: the HyperGEN study. *Am J Hypertens*. 2007;20:398-402. PMC1997287.
ARNETT, Donna	Past	Sherva, R (2003-06)	**Sherva R**, Ford CE, Eckfeldt JH, Davis BR, Boerwinkle E, Arnett DK. Pharmacogenetic effect of the stromelysin (MMP3) polymorphism on stroke risk in relation to antihypertensive treatment: the genetics of hypertension associated treatment study. *Stroke*. 2011;42:330-5. PMC3859235.
ARNETT, Donna	Past	Sherva, R (2003-06)	**Sherva R**, Miller MB, Pankow JS, Hunt SC, Boerwinkle E, Mosley TH, Weder AB, Curb JD, Luke A, Morrison AC, Fornage M, Arnett DK. A whole-genome scan for stroke or myocardial infarction in family blood pressure program families. *Stroke*. 2008;39:1115-20. PMID: 18323513

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ATKINSON, T. Prescott	Current	Totten, Arthur (2012- 2017)	**Totten AH**, Xiao L, Crabb DM, Ratliff A, Waites KB, Atkinson TP. 2013. Detection of *Mycoplasma pneumoniae* in fresh human lung using reverse transcriptase-quantitative PCR to detect 16S rRNA transcripts*. American Society of Microbiology General Meeting*, Colorado, CO. (Abstract).
ATKINSON, T.Prescott	Current	Totten, Arthur (2012- 2017)	**Totten AH**, Xiao L, Waites KB, Rowe SM, Atkinson TP. 2014. Chronic infection of human lung by *Mycoplasma pneumoniae* in normal and pathological lung states. *American Society of Microbiology General Meeting*, Boston, MA. (Abstract).
ATKINSON, T.Prescott	Current	Totten, Arthur (2012- 2017)	**Totten AH**, Xiao L, Waites KB, Rowe SM, Atkinson TP. 2014. Chronic infection of human lung by *Mycoplasma pneumoniae* in normal and pathological lung states. *International Organization of Mycoplasmology International Congress*, Bleumenau, Brazil. (Abstract).
ATKINSON, T.Prescott	Current	Totten, Arthur (2012- 2017)	**Totten AH**, Xiao L, Luo D, Crabb DM, Waites KB, Atkinson TP. 2015. Differential recruitment of airway eosinophils during *Mycoplasma pneumoniae* infection. *. American Society of Microbiology General Meeting*, New Orleans, LA. (Abstract).
ATKINSON, T.Prescott	Past	Hoek, Kristen (6)	**Hoek KL**, Duffy LB, Cassell GH, Dai Y, Atkinson TP. A role for the *Mycoplasma pneumoniae* adhesin P1 in interleukin (IL)-4 synthesis and release from rodent mast cells. *Microb Pathog*. 2005 Oct;39(4):149-58. PubMed PMID: 16169702.
BAMMAN, Marcas	Current	Kelly, N* (2011-present)	Bamman MM, Ferrando AA, Evans RP, Stec MJ, **Kelly NA**, Gruenwald JM, Corrick KL, Trump JR, Singh JA. Muscle inflammation susceptibility: a prognostic index of recovery potential after hip arthroplasty? *Am J Physiol Endocrinol Metab*. 2015 Feb 10:ajpendo.00576.2014. doi: 10.1152/ajpendo.00576.2014. PMCID:PMC4398830
BAMMAN, Marcas	Current	Kelly, N* (2011-present)	**Kelly NA**, Ford MP, Standaert DG, Watts RL, Bickel CS, Moellering DR, Tuggle SC, Williams JY, Lieb L, Windham ST, Bamman MM. Novel, high-intensity exercise prescription improves muscle mass, mitochondrial function, and physical capacity in individuals with Parkinson's disease. *J Appl Physiol*. 2014 Mar 1;116(5):582-92. PMC4073951.
BAMMAN, Marcas	Current	Kelly, N* (2011-present)	Yarar-Fisher C, Bickel CS, **Kelly NA**, Windham ST, McLain AB, Bamman MM. Mechanosensitivity may be enhanced in skeletal muscles of spinal cord injured (SCI) vs. able-bodied men (AB). *Muscle Nerve*. 2014 Oct;50(4):599-601. PMC4263275.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BAMMAN, Marcas	Current	Kelly, N* (2011-present)	Hoffman JR, Ratamess, NA, Kang J, Rashti SL, **Kelly NA**, Gonzalez AM, Stec MJ, Anderson S, Bailey BL, Yamamoto LM, Hom LL, Kupchak BR, and Maresh CM. Acute L-alanyl-L-glutamine ingestion during short duration, high intensity exercise and a mild hydration stress. *Kinesiol* 43(2): 125-36, 2011. PMCID:PMC2851582
BAMMAN, Marcas	Current	Kelly, N* (2011-present)	Dunn-Lewis C, Kraemer WJ, Kupchak BR, **Kelly NA**, Creighton BC, Luk HY, Ballard KD, Comstock BA, Szivak TK, Hooper DR, Volek JS. A multi-nutrient supplement reduced markers of inflammation and improved physical performance in active individuals of middle to older age: a randomized, double-blind, placebo-controlled study. *Nutr J* 2011 10:90. PMCID: PMC3180350
BAMMAN, Marcas	Current	Stec, M* (2010-present)	Merritt EK*, **Stec MJ***, Thalacker-Mercer A, Windham ST, Cross JM, Shelley DP, Tuggle SC, Kosek DJ, Kim JS, Bamman MM. Heightened muscle inflammation susceptibility may impair regenerative capacity in aging humans. *J Appl Physiol*. 2013 Sep;115(6):937-48. *Contributed equally. PMC3764621.
BAMMAN, Marcas	Current	Stec, M* (2010-present)	Bamman MM, Ferrando AA, Evans RP, **Stec MJ**, Kelly NA, Gruenwald JM, Corrick KL, Trump JR, Singh JA. Muscle inflammation susceptibility: a prognostic index of recovery potential after hip arthroplasty? *Am J Physiol* Endocrinol Metab. 2015 Feb 10:ajpendo.00576.2014. doi: 10.1152/ajpendo.00576.2014. [Epub ahead of print] PMCID: PMC4398830
BAMMAN, Marcas	Current	Stec, M* (2010-present)	Thalacker-Mercer A, **Stec M**, Cui X, Cross J, Windham ST, Bamman MM. Cluster analysis reveals differential transcript profiles associated with resistance training-induced human skeletal muscle hypertrophy. *Physiol Genomics*. 2013 Jun 17;45(12):499-507. PMC3680779.
BAMMAN, Marcas	Current	Stec, M* (2010-present)	Hoffman JR, Ratamess, NA, Kang J, Rashti SL, Kelly NA, Gonzalez AM, **Stec MJ**, Anderson S, Bailey BL, Yamamoto LM, Hom LL, Kupchak BR, and Maresh CM. Acute L-alanyl-L-glutamine ingestion during short duration, high intensity exercise and a mild hydration stress. *Kinesiol* 43(2): 125-36, 2011. PMCID: PMC2851582
BAMMAN, Marcas	Current	Stec, M* (2010-present)	**Stec MJ** and Rawson ES. Estimation of resistance exercise energy expenditure using triaxial accelerometry. *J Strength Cond Res*. 26(5):1413-22, 2012. PMID: 22222328

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BAMMAN, Marcas	Past	Kosek, D* (2003-07)	Merritt EK*, Stec MJ*, Thalacker-Mercer A, Windham ST, Cross JM, Shelley DP, Tuggle SC, **Kosek DJ**, Kim JS, Bamman MM. Heightened muscle inflammation susceptibility may impair regenerative capacity in aging humans. *J Appl Physiol*. 2013 Sep;115(6):937-48. *Contributed equally. PMC3764621.
BAMMAN, Marcas	Past	Kosek, D* (2003-07)	Kim JS, **DJ Kosek**, JK Petrella, JM Cross, and MM Bamman. Resting and load-induced levels of myogenic gene transcripts differ between older adults with demonstrable sarcopenia and young men and women. *J Appl Physiol*. 99:2149-58, 2005.
BAMMAN, Marcas	Past	Kosek, D* (2003-07)	**Kosek DJ**, JS Kim, JK Petrella, JM Cross, and MM Bamman. Efficacy of 3 d/wk resistance training on myofiber hypertrophy and myogenic mechanisms in young versus older adults. *J Appl Physiol*.101:531-44, 2006.
BAMMAN, Marcas	Past	Kosek, D* (2003-07)	Petrella JK, JS Kim, JM Cross, **DJ Kosek**, and MM Bamman. Efficacy of myonuclear addition may explain differential myofiber growth among resistance trained young and older men and women. *Am J Physiol Endocrinol Metab*. 291(5):E937-46, 2006.
BAMMAN, Marcas	Past	Kosek, D* (2003-07)	**Kosek DJ** and MM Bamman. Modulation of the dystrophin-associated protein complex in response to resistance training in young and older men. *J Appl Physiol*. 104(5):1476-84, 2008. PMID: 18356484
BAMMAN, Marcas	Past	Mayhew, D* (2005-10)	**Mayhew DL**, TA Hornberger, HC Lincoln, and MM Bamman. Eukaryotic initiation factor 2Bε induces cap-dependent translation and skeletal muscle hypertrophy. *J Physiol*. 589(Pt 12):3023-37, 2011. PMC3139084.
BAMMAN, Marcas	Past	Mayhew, D* (2005-10)	Petrella JK, JS Kim, **DL Mayhew**, and MM Bamman. Potent myofiber hypertrophy during resistance training in humans is associated with satellite cell-mediated myonuclear addition: a cluster analysis. *J Appl Physiol*. 104(6):1736-42, 2008. PMID: 18436694
BAMMAN, Marcas	Past	Mayhew, D* (2005-10)	Bamman MM, JK Petrella, JS Kim, **DL Mayhew**, and JM Cross. Cluster analysis tests the importance of myogenic gene expression during myofiber hypertrophy in humans. *J Appl Physiol*. 102:2232-9, 2007. PMID: 17395765
BAMMAN, Marcas	Past	Mayhew, D* (2005-10)	**Mayhew DL**, JS Kim, JM Cross, AA Ferrando, and MM Bamman. Translational signaling responses preceding resistance training-mediated myofiber hypertrophy in young and old humans. *J Appl Physiol*. 107(5):1655-62, 2009. PMC2777794.
BELLIS, Susan	Past	Bonvallet, Paul P (2009-2014)	**Bonvallet, PP**, Culpepper, BK, Bain, JL, Schultz, MJ, Thomas, S.J., Bellis, SL (2014) Microporous dermal-like scaffolds promote accelerated skin regeneration. *Tissue Eng*, 20:2434-2445 PMC4161189
BELLIS, Susan	Past	Bonvallet, Paul P (2009-2014)	**Bonvallet, PP**, Schultz MJ, Mitchell EH, Bain JL, Culpepper BK, Thomas SJ, Bellis SL (2015) Microporous dermal-mimetic electrospun scaffolds pre-seeded with fibroblasts promote tissue regeneration in full-thickness skin wounds. *PLos One* 10:e0122359 PMC4368828

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BELLIS, Susan	Past	Clem, William C. (2004-08)	**Clem WC,** Chowdhury S, Catledge SA, Weimer JJ, Shaikh FM, Hennessy KM, Konovalov VV, Hill MR, Waterfeld A, Bellis SL, and Vohra YK. (2008) Mesenchymal stem cell interaction with ultra smooth nanostructured diamond for wear resistant orthopaedic implants. *Biomaterials* 29:3461-3468 PMC2504022
BELLIS, Susan	Past	Clem, William C. (2004-08)	**Clem WC,** Konovalov VV, Chowdhury S, Vohra YK, Catledge SA, and Bellis SL. (2006). Mesenchymal stem cell adhesion and spreading on microwave plasma nitride titanium allow. *J Biomed Mat Res* 76A:279-287. PMCID: 2430511
BELLIS, Susan	Past	Culpepper, Bonnie K (2008-2013)	**Culpepper, BK**, Webb, WM, Bonvallet, PP, Bellis, SL (2014) Tunable delivery of bioactive peptides from HA biomaterials and allograft bone using variable length polyglutamate domains. *J Biomed Mater Res A.*, 102:1008-1016 PMC3808508
BELLIS, Susan	Past	Culpepper, Bonnie K (2008-2013)	**Culpepper BK**, Morris DS, Prevelige PE, Bellis SL. (2013) Engineering nanocages with polyglutamate domains for coupling to hydroxyapatite biomaterials and allograft bone. *Biomaterials*.34:2455-2462 PMC3561465
BELLIS, Susan	Past	Culpepper, Bonnie K (2008-2013)	**Culpepper BK**, Bonvallet PP, Reddy MS, Ponnazhagan S, Bellis SL. (2013) Polyglutamate directed coupling of bioactive peptides for the delivery of osteoinductive signals on allograft bone. *Biomaterials.* 34:1506-1513 PMC3518561
BELLIS, Susan	Past	Culpepper, Bonnie K (2008-2013)	**Culpepper BK,** Phipps, MC, Bonvallet PP and Bellis SL. (2010) Enhancement of peptide coupling to hydroxyapatite and implant osseointegration through collagen mimetic peptide modified with a polyglutamate domain. *Biomaterials* 31:9586-9594. PMC2991135
BELLIS, Susan	Past	Hennessy, Kristin (2004-2008)	**Hennessy KM,** Pollot BE, Clem WC, Phipps MC, Sawyer AA, Culpepper BK, and Bellis SL. (2009) The effect of collagen I mimetic peptides on mesenchymal stem cell adhesion and differentiation and on bone formation at hydroxyapatite surfaces. *Biomaterials* 30:1898-1909. PMC3679919
BELLIS, Susan	Past	Hennessy, Kristin (2004-2008)	**Hennessy KM,** Clem WC, Phipps MC, Sawyer AA, Shaikh FM, and Bellis SL. (2008) The effect of RGD peptides on osseointegration of hydroxyapatite implants. *Biomaterials* 29:3075-3083. PMC2465812
BELLIS, Susan	Past	Phipps, Matthew (2009-2012)	**Phipps, MC**, Xu, Y, and Bellis, SL (2012) Delivery of platelet-derived growth factor as a chemotactic factor for mesenchymal stem cells by bone-mimetic electrospun scaffolds. *PloS One* 7: e40831 PMC3395644
BELLIS, Susan	Past	Phipps, Matthew (2009-2012)	**Phipps, MC**, Clem, WC, Grunda, JM, Clines, GA, and Bellis, SL (2012) Increasing the pore sizes of bone-mimetic electrospun scaffolds comprised of polycaprolactone, collagen I and hydroxyapatite to enhance cell infiltration. *Biomaterial*s 33:524-534 PMC3381740
BELLIS, Susan	Past	Phipps, Matthew (2009-2012)	**Phipps MC,** Clem WC, Catledge SA, Xu Y, Hennessy KM, Thomas V, Jablonsky MJ, Chowdhury S, Stanishevsky AV, Vohra YK, and Bellis SL. (2011) Mesenchymal stem cell responses to bone-mimetic electrospun matrices composed of polycaprolactone, collagen 1 and nanoparticulate hydroxyapatite. *PloS One* 6: e16813. PMC3035635

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BELLIS, Susan	Past	Sawyer, Amber (2002-2005)	**Sawyer AA,** Hennessy KM, and Bellis SL (2007) The effect of adsorbed serum proteins, RGD and proteoglycan-binding peptides on the adhesion of mesenchymal stem cells to hydroxyapatite. *Biomaterials* 28:383-392. PMID: 16952395
BELLIS, Susan	Past	Sawyer, Amber (2002-2005)	**Sawyer AA,** Hennessy KM, and Bellis SL. (2005) Regulation of mesenchymal stem cell attachment and spreading of hydroxyapatite by RGD peptides and adsorbed serum proteins. *Biomaterials* 26:1467-1475. PMID: 15522748
BELLIS, Susan	Past	Sawyer, Amber (2002-2005)	**Sawyer AA,** Weeks DM, Kelpke S, McCracken MC, and Bellis SL. (2005) the effect of the addition of a polyglutamate motif to RGD on peptide tethering to hydroxyapatite and the promotion of mesenchymal stem cell adhesion. *Biomaterials* 26:7046-7056. PMID: 15964067
BELLIS, Susan	Past	Schultz, Matthew (2010-2015)	**Schultz, MJ,** Swindall, AF, Wright JW, Sztul ES, Landen, CN, Bellis SL (2013) The ST6Gal-I sialyltransferase confers cisplatin resistance in ovarian tumor cells. *J Ovarian Res*, 6: 25. PMC3637436
BELLIS, Susan	Past	Schultz, Matthew (2010-2015)	**Schultz MJ,** Swindall AF, and Bellis SL. (2012) Regulation of the metastatic cell phenotype by sialylated glycans. *Cancer Metastasis Rev*, 31:501-518. PMC4079276
BELLIS, Susan	Past	Shaikh, Faheem M. (2004-2008)	**Shaikh FM**, Seales EC, Clem WC, Hennessy KM, Zhuo Y, Bellis SL. (2008) Tumor cell migration and invasion are regulated by expression of variant integrin glycoforms.*Exp Cell Res*. 314:2941-50 PMC2570357
BELLIS, Susan	Past	Shaikh, Faheem M. (2004-2008)	**Shaikh FM**, Seales EC, Woodard-Grice AV, Pooja Aggarwal P, McBrayer AC, Hennessy KM, and Bellis SL. (2005) A PKC/ras/ERK signaling pathway activates myeloid fibronectin receptors by altering β1 integrin sialylation. *J Biol Chem* 280:37610-37615. PMID: 16157583
BELLIS, Susan	Past	Swindall, Amanda (2008-2012)	**Swindall AF,** and Bellis SL. (2011) Sialylation of the Fas death receptor by ST6Gal-I provides protection against Fas-mediated apoptosis in colon carcinoma cells. *J Biol Chem* 286: 22982-22990. PMC3123066
BELLIS, Susan	Past	Swindall, Amanda (2008-2012)	**Swindall AF**, Londoño-Joshi AI, Schultz MJ, Fineberg N, Buchsbaum DJ, Bellis SL (2013) ST6Gal-I protein expression Is upregulated in human epithelial tumors and correlates with stem cell markers in normal tissues and colon cancer cell lines. *Cancer Res*, 73: 2368-2378. PMC4038408
BELLIS, Susan	Past	Woodard-Grice (2004-2008)	**Woodard-Grice** AV**,** McBrayer AC, Wakefield J, Zhuo Y, and Bellis SL. (2008) Proteolytic shedding of ST6Gal-I by BACE1 regulates the glycosylation and function of α4β1 integrins. *J Biol Chem* 283:26364-26373. PMC2546544
BELLIS, Susan	Past	Woodard-Grice (2004-2008)	**Woodard-Grice** AV, Seales EC, Shaikh FM, Pooja Aggarwal P, McBrayer AC, Hennessy KM, and Bellis SL. (2005) A PKC/ras/ERK signaling pathway activates myeloid fibronectin receptors by altering β1 integrin sialylation. *J Biol Chem* 280:37610-37615. PMID: 16157583

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BRADLEY, Laurence	Present	Bulls, Hailey * (2012-Present)	Goodin BR, Anderson AJ, Freeman EL, **Bulls HW**, Robbins MT, Ness TJ. Intranasal oxytocin administration is associated with enhanced endogenous pain inhibition and reduced negative mood states. *Clin J Pain*. 2014, In Press. PMID: 25370147
BRADLEY, Laurence	Present	Bulls, Hailey * (2012-Present)	Herbert MS, Goodin BR, Pero ST 4th, Schmidt JK, Sotolongo A, **Bulls HW**, Glover TL, King CD, Sibille KT, Cruz-Almeida Y, Staud R, Fessler BJ, Bradley LA, Fillingim RB. Pain hypervigilance is associated with greater clinical pain severity and enhanced experimental pain sensitivity among adults with symptomatic knee osteoarthritis. *Ann Behav Med* 2014; 48: 50-60. PMID: 24352850.
BRADLEY, Laurence	Present	Bulls, Hailey * (2012-Present)	Glover TL, Goodin BR, King CD, Sibille KT, Herbert MS, Sotolongo AS, Cruz-Almeida Y, Bartley EJ, **Bulls HW**, Horgas AL, Redden DT, Riley JL 3rd, Staud R, Fessler BJ, Bradley LA, Fillingim RB. A cross-sectional examination of vitamin D, obesity, and measures of pain and function in middle-aged and older adults with knee osteoarthritis. *Clin J Pain* 2015. In Press PubMed PMID: 25569220.
BRADLEY, Laurence	Present	Bulls, Hailey * (2012-Present)	Goodin BR, **Bulls HW**, Herbert MS, Schmidt J, King CD, Glover TL, Sotolongo A, Sibille KT, Cruz-Almeida Y, Staud R, Fessler BJ, Redden DT, Bradley LA, Fillingim RB. Temporal summation of pain as a prospective predictor of clinical pain severity in adults aged 45 years and older with knee osteoarthritis: ethnic differences. *Psychosom Med* 2014; 76: 302-310. PMID: 24804882
BRADLEY, Laurence	Present	Bulls, Hailey * (2012-Present)	Petrov ME, Goodin BR, Cruz-Almeida Y, King C, Glover TL, **Bulls HW**, Herbert M, Sibille KT, Bartley EJ, Fessler BJ, Sotolongo A, Staud R, Redden D, Fillingim RB, Bradley LA. Disrupted sleep is associated with altered pain processing by sex and ethnicity in knee osteoarthritis. *J Pain* 2015. In Press. PMID: 25725172
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	**Herbert MS**, Goodin BR, Pero ST 4th, Schmidt JK, Sotolongo A, Bulls HW, Glover TL, King CD, Sibille KT, Cruz-Almeida Y, Staud R, Fessler BJ, Bradley LA, Fillingim RB. Pain hypervigilance is associated with greater clinical pain severity and enhanced experimental pain sensitivity among adults with symptomatic knee osteoarthritis. *Ann Behav Med* 2014; 48: 50-60. PMID: 24352850.
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	**Herbert MS**, Varley AL, Andreae SJ, Goodin BR, Bradley LA, Safford MM. Association of pain with HbA1c in a predominantly black population of community-dwelling adults with diabetes: a cross-sectional analysis. *Diabet Med* 2013; 30: 1466-1471. PubMed Central PMCID: PMC3935766.
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Goodin BR, Glover TL, Sotolongo A, King CD, Sibille KT, **Herbert MS**, Cruz-Almeida Y, Sanden SH, Staud R, Redden DT, Bradley LA, Fillingim RB. The association of greater dispositional optimism with less endogenous pain facilitation is indirectly transmitted through lower levels of pain catastrophizing. *J Pain*. 2013; 14:126-135. PMID: 23218934.

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BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Cruz-Almeida Y, King CD, Goodin BR, Sibille KT, Glover TL, Riley JL, Sotolongo A, **Herbert MS**, Schmidt J, Fessler BJ, Redden DT, Staud R, Bradley LA, Fillingim RB. Psychological profiles and pain characteristics of older adults with knee osteoarthritis. *Arthritis Care Res* 2013; 65: 1786-1794. PMID: 23861288.
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Goodin BR, Pham QT, Glover TL, Sotolongo A, King CD, Sibille KT, **Herbert MS**, Cruz-Almeida Y, Sanden SH, Staud R, Redden DT, Bradley LA, Fillingim RB. Perceived racial discrimination, but not mistrust of medical researchers, predicts the heat pain tolerance of African Americans with symptomatic knee osteoarthritis. *Health Psychol* 2013; 32: 1117-1126. PMID: 24219416.
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Riley JL 3rd, Cruz-Almeida Y, Glover TL, King CD, Goodin BR, Sibille KT, Bartley EJ, **Herbert MS**, Sotolongo A, Fessler BJ, Redden DT, Staud R, Bradley LA, Fillingim RB. Age and race effects on pain sensitivity and modulation among middle-aged and older adults. *J Pain* 2014;15: 272-282. PMID: 24239561
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Cruz-Almeida Y, Sibille KT, Goodin BR, Petrov ME, Bartley EJ, Riley JL 3rd, King CD, Glover TL, Sotolongo A, **Herbert MS**, Schmidt JK, Fessler BJ, Staud R, Redden D, Bradley LA, Fillingim RB. Racial and ethnic differences in older adults with knee osteoarthritis. *Arthritis Rheumatol* 2014; 66:1800-1810. PMID: 24729357
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Goodin BR, Bulls HW, **Herbert MS**, Schmidt J, King CD, Glover TL, Sotolongo A, Sibille KT, Cruz-Almeida Y, Staud R, Fessler BJ, Redden DT, Bradley LA, Fillingim RB. Temporal summation of pain as a prospective predictor of clinical pain severity in adults aged 45 years and older with knee osteoarthritis: ethnic differences. *Psychosom Med* 2014; 76: 302-310. PMID: 24804882
BRADLEY, Laurence	Past	Herbert, Matthew* (2011-2014)	Glover TL, Goodin BR, King CD, Sibille KT, **Herbert MS**, Sotolongo AS, Cruz-Almeida Y, Bartley EJ, Bulls HW, Horgas AL, Redden DT, Riley JL 3rd, Staud R, Fessler BJ, Bradley LA, Fillingim RB. A cross-sectional examination of vitamin D, obesity, and measures of pain and function in middle-aged and older adults with knee osteoarthritis. *Clin J Pain* 2015. In Press PubMed PMID: 25569220.
BRADLEY, Laurence	Past	Okonkwo, Renata * (2004-2008)	Dolan DC, **Okonkwo R**, Gfullner F, Hansbrough JR, Strobel RJ, Rosenthal L. Longitudinal comparison study of pressure relief (C-Flex) vs. CPAP in OSA patients. *Sleep Breath* 2009; 13: 73-77. PMID: 18551327.
BRADLEY, Laurence	Past	Okonkwo, Renata * (2004-2008)	Dolan DC, Taylor DJ, **Okonkwo R**, Becker PM, Jamieson AO, Schmidt-Nowara W, Rosenthal LD. The Time of Day Sleepiness Scale to assess differential levels of sleepiness across the day. *J Psychosom Res* 2009; 67: 127-133. PMID: 19616139.
BRADLEY, Laurence	Past	Okonkwo, Renata * (2004-2008)	Smith MT, Quartana PJ, **Okonkwo RM**, Nasir A. Mechanisms by which sleep disturbance contributes to osteoarthritis pain: a conceptual model. *Curr Pain Headache* Rep 2009;13: 447-454. PMID: 19889286.

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BRIDGES, Jr., S. Louis	Current	Tang, Qi (2013 - 2014)	**Tang Q,** Danila MI, Parks L, Baker B, Yu S, Tamhane A, Reynolds RJ, Raman C, Ledbetter SL, Wanseck KC, Redden DT, Gregersen PK, Johnson MR, van der Heijde DM, Conn DL, Jonas BL, Callahan LF, Moreland LW, Cui X, Bridges SL Jr. (2015) Expression Levels of Interferon-gamma Receptor Genes in Peripheral Blood Cells Are Associated with Rheumatoid Arthritis and Its Radiographic Severity in African Americans. *Arthritis Rheumatol* 67(5):1165-70. PMCID: PMC4414815
BRIDGES, Jr., S. Louis	Current	Tang, Qi (2013 - 2014)	Cui X, Yu S, Tamhane A, Causey ZL, Steg A, Danila MI, Reynolds RJ, Wang J, Wanseck KC, **Tang Q**, Ledbetter SS, Redden DT, Johnson MR, Bridges SL Jr. (2015) Simple regression for correcting ΔCt bias in RT-qPCR low-density array data normalization. *BMC Genomics*. 16(1):82. PMCID: PMC4335788
BRIDGES, Jr., S. Louis	Past	Ahmed, Altan (2011)	Reynolds RJ, **Ahmed AF**, Danila MI, Hughes LB, CLEAR Investigators, Gregersen PK, Raychaudhuri S, Plenge RM, Bridges SL Jr. (2014) HLA-DRB1 rheumatoid arthritis risk in African Americans at multiple levels: Hierarchical classification systems, amino acid positions and residues. *Arthritis Rheumatol* 66(12):3274-82. PMCID: PMC4273668
BRIDGES, Jr., S. Louis	Past	Morrison, Dahliann (2005 – 2007)	Hughes, L.B., **Morrison, D**., Kelley, J.M., Padilla, M.A., Vaughan, L.K., Westfall, A.O., Dwivedi, H., Mikuls, T.R., Holers, V.M., Parrish, L.A.*, et al.* (2008). The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African Americans through European genetic admixture. *Arthritis Rheum 58*: 349-358. PMCID: PMC3726059
BRIDGES, Jr., S. Louis	Past	Lauren Parks (2012)	Tang Q, Danila MI, Cui X, **Parks L**, Baker BJ, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR, et al. 2015. Expression of Interferon-γ Receptor Genes in Peripheral Blood Mononuclear Cells Is Associated With Rheumatoid Arthritis and Its Radiographic Severity in African Americans. *Arthritis and Rheumatology*. PMC4414815.
BRIDGES, Jr., S. Louis	Past	Perkins, Elizabeth (2010 – 2012)	**Perkins EA**, Landis D, Causey ZL, Edberg YZ, Reynolds RJ, Hughes LB, CLEAR Investigators, Kimberly RP, Edberg JC, Bridges SL Jr. (2012) Association of Single Nucleotide Polymorphisms (SNPs) in *TAGAP* and *TNFAIP3* with Rheumatoid Arthritis in African Americans. *Arthritis & Rheumatism* 64(5):1355-8. PMCID: PMC3299842.
BRIDGES, Jr., S. Louis	Past	Perkins, Elizabeth (2010 – 2012)	Reynolds RJ, Cui X, Vaughan LK, Redden DT, Causey ZL, **Perkins EA**, Shah T, Hughes LB, CLEAR Investigators, Damle A, Kern M, Gregersen PK, Johnson MR, Bridges SL Jr. (2013) Gene Expression Patterns in Peripheral Blood Cells Associated with Radiographic Severity in African-Americans with Early Rheumatoid Arthritis. *Rheumatology International* 33(1):129-37. PMCID: PMC3769702
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	Bridges SL Jr., Causey ZL, Burgos PI, Huynh QN, Hughes LB, Danila MI, van Everdingen A, Ledbetter S, Conn DL, **Tamhane A**, Westfall AO, Jonas BL, Callahan LF, Smith EA, Brasington R, Moreland LW, Alarcón GS, van der Heijde DM. (2010) Radiographic severity of rheumatoid arthritis in African-Americans: Results from the CLEAR Registry. *Arthritis Care & Research* 62(5):624-31. PMCID: PMC3052790.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	Burgos PI, Causey ZL, **Tamhane A**, Kelley JM, Brown EE, Hughes LB, Danila MI, van Everdingen A, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Moreland LW, van der Heijde DM, Alarcón GS, Bridges SL Jr. (2010) Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Research & Therapy* 12(3):R75. PMCID: PMC2911851.
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	**Tamhane A**, Redden DT, McGwin G, Brown EE, Westfall AO, Reynolds RJ, Hughes LB, Conn DL, Callahan LF, Jonas BL, Smith EA, Brasington RD, Moreland LW, Bridges SL, Jr. (2013) Comparison of Disease Activity Score 28 using erythrocyte sedimentation rate and C-reactive protein in African-Americans with rheumatoid arthritis. *Journal of Rheumatology* 40(11):1812-22. PMCID: PMC3987124
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	**Tamhane A**, McGwin G, Redden D, Hughes LB, Brown EE, Westfall AO, Reynolds RJ, Conn DL, Jonas BL, Smith EA, Brasington RD, Moreland LW, Bridges SL, Jr., Callahan LF. (2014) Complementary and Alternative Medicine Use in African-Americans with Rheumatoid Arthritis. *Arthritis Care Res*. 66(2):180-9. PMCID: PMC3977347
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	**Tamhane A**, McGwin G. (2012) Paired-data analysis is required in the study by May et al. *Endoscopy* 44(2):220.
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	**Tamhane A**, McGwin G. (2011) Analytical concerns regarding complications of elective liver resections in a center with low mortality. *Arch Surg*. 146(12):1455
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	Tang Q, Danila MI, Parks L, Baker B, Yu S, **Tamhane A**, Reynolds RJ, Raman C, Ledbetter SL, Wanseck KC, Redden DT, Gregersen PK, Johnson MR, van der Heijde DM, Conn DL, Jonas BL, Callahan LF, Moreland LW, Cui X, Bridges SL Jr. (2015) Expression Levels of Interferon-gamma Receptor Genes in Peripheral Blood Cells Are Associated with Rheumatoid Arthritis and Its Radiographic Severity in African Americans. *Arthritis Rheumatol* 67(5):1165-70. PMCID: PMC4414815
BRIDGES, Jr., S. Louis	Past	Tamhane, Ashutosh (2010 – 2012)	Cui X, Yu S, **Tamhane A**, Causey ZL, Steg A, Danila MI, Reynolds RJ, Wang J, Wanseck KC, Tang Q, Ledbetter SS, Redden DT, Johnson MR, Bridges SL Jr. (2015) Simple regression for correcting ΔCt bias in RT-qPCR low-density array data normalization. *BMC Genomics*. 16(1):82. PMCID: PMC4335788
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Durán S, Apte M, Alarcón GS, Marion MC, Edberg JC, Kimberly RP, **Zhang J**, Langefeld CD, Vilá LM, Reveille JD; Lumina Study Group. (2008) Features associated with, and the impact of, hemolytic anemia in patients with systemic lupus erythematosus: LX, results from a multiethnic cohort. *Arthritis Rheum*. 59(9):1332-40. PMCID: PMC2760833
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Danila MI, Pons-Estel GJ, **Zhang J**, Vilá LM, Reveille JD, Alarcón GS. (2009) Renal damage is the most important predictor of mortality within the damage index: data from LUMINA LXIV, a multiethnic US cohort. *Rheumatology (Oxford*) 48(5):542-5. PMCID: PMC2722801

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Pons-Estel GJ, González LA, **Zhang J**, Burgos PI, Reveille JD, Vilá LM, Alarcón GS. (2009) Predictors of cardiovascular damage in patients with systemic lupus erythematosus: data from LUMINA (LXVIII), a multiethnic US cohort. *Rheumatology (Oxford*) 48(7):817-22. PMCID: PMC2722811
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Pons-Estel, GJ, Alarcon, GS, McGwin, G, Jr, Danila, M, **Zhang, J**, Bastian, HM, Reveille, JD, Vila, LM, Lumina Study Group. (2009) Protective Effect of hydroxychloroquine on renal damage in patients with lupus nephritis: LXV, data from multiethnic US cohort. *Arthritis Rheum* 61(6): 830-9. PMCID: PMC2898742
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Pons-Estel, GJ, Alarcon, GS, Gonzalez, LA, **Zhang, J**, Vila, LM , Reveille, JD, McGwin, G, Jr , Lumina Study Group. (2010) Possible Protective Effect of hydroxychloroquine on delaying othe occurrence of integument damage in lupus: LXXI, date from a multiethnic cohort. *Arthritis Care Res (Hoboken*) 62(3): 393-400. PMCID: PMC3202433
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	**Zhang J,** Redden DT, McGwin G Jr., Callahan LF, Smith EA, Alarcón GS, Moreland LW, van der Heijde DM, Brown EE, Arnett DK, Mikuls TR, Bridges SL Jr., for the CLEAR Investigators. (2010) Generalized bone loss as a predictor of 3-year radiographic damage in African American patients with recent-onset rheumatoid arthritis. *Arthritis & Rheumatism* 62:2219-26. PMCID: PMC2922001.
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	**Zhang J**, Shan Y, Reed G, Kremer J, Greenberg JD, Baumgartner S, Curtis JR. (2011) Thresholds in disease activity for switching biologics in rheumatoid arthritis patients: experience from a large U.S. cohort. *Arthritis Care Res (Hoboken*) 63(12):1672-9. PMCID: PMC3227763
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	**Zhang J**, Delzell E, Xie F, Baddley JW, Spettell C, McMahan RM, Fernandes J, Chen L, Winthrop K, Curtis JR. (2011) The use, safety, and effectiveness of herpes zoster vaccination in individuals with inflammatory and autoimmune diseases: a longitudinal observational study. *Arthritis Res Ther*. 13(5): R174. PMCID: PMC3308109
BRIDGES, Jr., S. Louis	Past	Zhang, Jie (2006-2010)	Moreland LW, O'Dell JR, Paulus HE, Curtis JR, Bathon JM, St. Clair EW, Bridges SL, Jr., **Zhang J,** McVie T, Howard G, van der Heijde DM, Cofield SS. (2012) A Randomized Comparative Effectiveness Study of Oral Triple Therapy versus Etanercept plus Methotrexate in Early, Aggressive Rheumatoid Arthritis. *Arthritis & Rheumatism* 64(9):2824-35. PMCID: PMC4036119.
BROWN, Elizabeth E.	Past	Anderson, LA	**Anderson LA**, Lauria C, Romano N, Brown EE, Whitby D, Graubard BI, Li Y, Messina A, Gafà L, Vitale F, Goedert JJ. Risk factors for classical Kaposi sarcoma in a population-based case-control study in Sicily. *CancerEpidemiol Biomarkers Prev*. 2008 Dec;17(12):3435-43. doi: 10.1158/1055-9965.EPI-08-0671. PubMed PMID:19064559; PubMed Central PMCID: PMC2701388.
BROWN, Elizabeth E.	Past	Brown, BJ	Brown EE and **Brown BJ** (co-first authors), Yeager M, Welch R, Cranston B, Hanchard B, Hisada M. Haplotypes of *IL6* and *IL10* and susceptibility to human T lymphotropic virus type I infection among children. *J Infect Dis*. 2006 Dec 1;194(11):1565-9. Epub 2006 Oct 18. PubMed PMID: 17083041.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BROWN, Elizabeth E.	Past	Burgos, PI	**Burgos PI**, Causey ZL, Tamhane A, Kelley JM, Brown EE, Hughes LB, Danila MI, van Everdingen A, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD Jr, Moreland LW, van der Heijde DM, Alarcón GS, Bridges SL Jr. Association of *IL4R* single-nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Res Ther*. 2010;12(3):R75. doi: 10.1186/ar2994. Epub 2010 May 5. PubMed PMID: 20444266; PubMed Central PMCID: PMC2911851.
BROWN, Elizabeth E.	Past	Burgos, PI	**Burgos PI**, McGwin G Jr, Reveille JD, Vilá LM, Brown EE, Alarcon GS. Is familial lupus different from sporadic lupus? Data from LUMINA (LXXIII), a multiethnic US cohort. *Lupus*. 2010 Oct;19(11):1331-6. doi: 10.1177/0961203310375264. Epub 2010 Aug 9. PubMed PMID: 20696771; PubMed Central PMCID: PMC4078734.
BROWN, Elizabeth E.	Past	Gold, LS	**Gold LS**, De Roos AJ, Brown EE, Lan Q, Milliken K, Davis S, Chanock SJ, Zhang Y, Severson R, Zahm SH, Zheng T, Rothman N, Baris D. Associations of common variants in genes involved in metabolism and response to exogenous chemicals with risk of multiple myeloma. *Cancer Epidemiol*. 2009 Oct;33(3-4):276-80. doi: 10.1016/j.canep.2009.08.005. Epub 2009 Sep 6. PubMed PMID: 19736056; PubMed Central PMCID: PMC2808169.
BROWN, Elizabeth E.	Past	Mroczek, ES	**Mroczek ES**, Ippolito GC, Rogosch T, Hoi KH, Hwangpo TA, Brand MG, Zhuang Y, Liu CR, Schneider DA, Zemli M, Brown EE, Georgiou G, Schroeder HW Jr. Differences in the composition of the human antibody repertoire by B cell subsets in the blood. *Front Immunol*. 2014 Mar 19;5:96. doi: 10.3389/fimmu.2014.00096. eCollection 2014. PubMed PMID: 24678310; PubMed Central PMCID: PMC3958703.
BROWN, Elizabeth E.	Past	Prentice, Heather (2009-2013)	**Prentice HA**, Pajewski NM, He D, Zhang K, Brown EE, Kilembe W, Allen S, Hunter E, Kaslow RA, Tang J. Host genetics and immune control of HIV-1 infection: fine mapping for the extended human MHC region in an African cohort. *Genes Immun*. 2014 Jul-Aug;15(5):275-81. doi: 10.1038/gene.2014.16. Epub 2014 May 1. PubMed PMID: 24784026; PubMed Central PMCID: PMC4111776.
BROWN, Elizabeth E.	Past	Schonfeld, SJ	**Schonfeld SJ**, Bhatti P, Brown EE**,** Linet MS, Simon SL, Weinstock RM, Hutchinson AA, Stovall M, Preston DL, Alexander BH, Doody MM, Sigurdson AJ. Polymorphisms in oxidative stress and inflammation pathway genes, low-dose ionizing radiation, and the risk of breast cancer among US radiologic technologists. *Cancer Causes Control*. 2010 Nov;21(11):1857-66. doi: 10.1007/s10552-010-9613-7. Epub 2010 Aug 15. PubMed PMID: 20711808; PubMed Central PMCID: PMC3076104.
BROWN, Elizabeth E.	Past	Tahane, A	**Tahane A**, Redden DT, McGwin G Jr, Brown EE, Westfall AO, Reynolds RJ 4th, Hughes LB, Conn DL, Callahan LF, Jonas BL, Smith EA, Brasington RD Jr, Moreland LW, Bridges SL Jr. Comparison of the disease activity score using erythrocyte sedimentation rate and C-reactive protein in African Americans with rheumatoid arthritis. *J Rheumatol*. 2013 Nov;40(11):1812-22. doi: 10.3899/jrheum.121225. Epub 2013 Aug 15. PubMed PMID: 23950187; PubMed Central PMCID: PMC3987124.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BROWN, Elizabeth E.	Past	Tahane, A	**Tamhane A**, McGwin G Jr, Redden DT, Hughes LB, Brown EE**,** Westfall AO, Conn DL, Jonas BL, Smith EA, Brasington RD, Moreland LW, Bridges SL Jr, Callahan LF. Complementary and alternative medicine use in African Americans with rheumatoid arthritis. *Arthritis Care Res (Hoboken).* 2014 Feb;66(2):180-9. doi: 10.1002/acr.22148. PubMed PMID: 23983105; PubMed Central PMCID: PMC3977347
BROWN, Elizabeth E.	Past	Tseng, FC	**Tseng FC**, Brown EE, Maiese EM, Yeager M, Welch R, Gold BD, Owens M, Cranston B, Hanchard B, El-Omar E, Hisada M. Polymorphisms in cytokine genes and risk of Helicobacter pylori infection among Jamaican children. *Helicobacter*. 2006 Oct;11(5):425-30. PubMed PMID: 16961803.
BROWN, Elizabeth E.	Past	Zanetti, E	**Zanetti E** and Barozzi P and Brown EE (co-first authors), Bosco R, Vallerini D, Riva G, Quadrelli C, Potenza L, Forghieri F, Montagnani G, D'Amico R, Del Giovane C, Duraes C, Whitby D, Machado JC, Schulz TF, Torelli G, Luppi M. Common vascular endothelial growth factor variants and risk for posttransplant Kaposi sarcoma. *Transplantation*. 2010 Aug 15;90(3):337-8. doi: 10.1097/TP.0b013e3181e4e4d9. PubMed PMID: 20683431.
BROWN, Elizabeth E.	Past	Zarin-Pass, R	Brown EE**,** Zhang M, **Zarin-Pass R**, Bernig T, Tseng FC, Xiao N, Yeager M, Edlin BR, Chanock SJ, O'Brien TR. *MBL2* and hepatitis C virus infection among injection drug users. *BMC Infect Dis*. 2008 May 1;8:57. doi: 10.1186/1471-2334-8-57. PubMed PMID: 18452612; PubMed Central PMCID: PMC2413243.
BROWN, Elizabeth E.	Past	Zhang, J	**Zhang J**, Redden DT, McGwin G Jr, Callahan LF, Smith EA, Alarcón GS, Moreland LW, van der Heijde DM, Brown EE, Arnett DK, Mikuls TR, Bridges SL Jr; Consortium for the Longitudinal Evaluations of African Americans with Early Rheumatoid Arthritis Investigators. Generalized bone loss as a predictor of three-year radiographic damage in African American patients with recent-onset rheumatoid arthritis. *Arthritis Rheum*. 2010 Aug;62(8):2219-26. doi: 10.1002/art.27510. PubMed PMID: 20506234; PubMed Central PMCID: PMC2922001.
BULLARD,Daniel	Current	Avery, Justin* (2012-present)	None
BULLARD,Daniel	Past	O'Quinn, Darrell (2001-2006)	Mangan, P.R., **O'Quinn, D.B**., Harrington, L., Bonder, C.S., Paul Kubes, P., Kucik, D.F., Bullard, D.C., and Weaver, C.T. (2005). Both Th1 and Th2 Cells Require PSGL-1 for Optimal Rolling on Inflamed Endothelium**.** *The American Journal of Pathology,* 167:1661-75. PMCID:PMC1613197
BULLARD,Daniel	Past	O'Quinn, Darrell (2001-2006)	Mangan, P.R., Harrington, L.E., **O'Quinn, D.B**., Helms, W.S., Bullard, D.C**.,** Elson, C.O., Hatton, R.D., Wahl, S.M., Schoeb, T.R., and Weaver, C.T. (2006) Transforming Growth Factor-Beta Induces Development of the TH17 lineage, *Nature*, 441:231-234. PMID: 16648837

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
CASAZZA, Krista R.	Current	Vincent , Danielle Lorch (2012-present)	**Vincent D**, Newton AL, Hanks LJ, Fontaine K, Casazza K. Improvements in body satisfaction among obese pre-adolescent African American girls after participation in a weight-loss intervention. *ICAN: Infant, Child, & Adolescent Nutrition*.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Casazza K, Ashraf A, Fernández JR. (2012). Calcium homeostasis may influence resting energy expenditure, but the effect is attenuated once skeletal development slows. *Acta Paediatrica*. 101(8); e363-368.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Newton AL, Ashraf AP, Gutierrez OM, Casazza K. (2012) Reduced-carbohydrate, weight loss diet is associated with greater bone mineral content in obese African-American girls. *J Diab Res Clin Metab*. 1:http://dx.doi.org/10.7243/2050-0866-1-9.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Ashraf A, Alvarez JA, Beasley TM, Fernández JR, Casazza K.(2013) BMI, but not race contributes to vitamin D-parathyroid hormone axis in peripubertal girls" *ICAN*.5(2); 100-105.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Casazza K, Ashraf AP, Ramanadham S, Ard J, Bray MS, Mark Beasley T, Fernandez JR. (2013). Vitamin D and calcium-sensing receptor polymorphisms differentially associate with resting energy expenditure in peripubertal children. *J Bone Miner Metab*. PMCID: PMC3965256
CASAZZA, Krista R.	Past	Hanks, Lynae	Casazza K, **Hanks LJ**, Clines GA, Tse HM, Eberhardt AW. "Diabetes-related impairment in bone strength is established early in the life course." *World J Diabetes* 2013 Aug 15;4:145-50. PMCID: PMC3746087
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Newton AL, Kondapally P, Casazza K. "Bone marrow adipose tissue in adolescence-protective or pathogenic?" *J Bone Marrow Res* 2013, 1:4
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Ashraf AP, Gower BA, Alvarez JA, Casazza K. "Subclinical markers of skeletal and cardiovascular properties overlap" *Bone Res*. PMCID: PMC4259044
CASAZZA, Krista R.	Past	Hanks, Lynae	Casazza K, **Hanks LJ**, Fields DA. The relationship between bioactive components in breast milk and bone mass in infants. *Bone Research*. PMCID: PMC4189256
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Ashraf AP, Gower BA, Alvarez JA, Casazza K. "Subclinical markers of skeletal and cardiovascular properties overlap" *Bone Res*. PMCID: PMC4259044
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Casazza K, Wallace S, Ashraf A, Gutierrez OM. FGF21 Differs by Obesity Status and Sex in Early Pubertal Children. Clinical Endocrinology. *Clin Endocrinol* (Oxf). 2015 Apr;82(4):550-6. doi: 10.1111/cen.12552. Epub 2014 Aug 8. PMCID: PMC4289452
CASAZZA, Krista R.	Past	Hanks, Lynae	Patel SJ, **Hanks LJ**, Ashraf AP, Gutierrez OM, Bamman MM, Casazza K. Effects of 8 week resistance training on lipid profile and insulin levels in overweight/obese peri-pubertal boys- a pilot study. *Journal of Diabetes Research & Clinical Metabolism*.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Ashraf AP, Bamman M, Casazza K. Bone mineral content as a driver of energy expenditure in prepubertal boys. *Journal of Pediatrics*. PMID: 25841541

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CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Ashraf AP, Gutierrez OM, Casazza K. Circulating levels of fibroblast growth factor-21 increase with age independently of body composition indices among healthy individuals" J*ournal of Clinical & Translational Endocrinology*.
CASAZZA, Krista R.	Past	Hanks, Lynae	**Hanks LJ**, Casazza K, Judd SE, Jenny NS, Gutiérrez OM. "Associations of fibroblast growth factor-23 with markers of inflammation, insulin resistance and obesity in adults." *PLoS One*. In Press. PMID: 25841541
CASAZZA, Krista R.	Past	Newton, Annie	**Newton AL**, Hanks LJ, Davis M, Casazza K. (2013) The relationships among total body fat, bone mineral content and bone marrow adipose tissue in early-pubertal girls. *BoneKEy Reports*. 2(315). doi: 10.1038/bonekey.2013.49.
CASAZZA, Krista R.	Past	Newton, Annie	**Newton AL**, Hanks LJ, Casazza K. "The relationships among total body fat, bone mineral content and bone marrow adipose tissue in early pubertal girls." *Bonekey Rep*. 2013 Apr 10;2:315
CHAPLIN, David D.	Past	Le, Thuc vy (2002)	**Le TV**, Kim TH, Chaplin DD. 2008. Intraclonal competition inhibits the formation of high-affinity antibody-secreting cells. *J Immunol*. 181(9):6027-37. PubMed PMID: 18941192; PubMed Central PMCID: PMC2922957.
CHAPLIN, David D.	Past	Le, Thuc vy (2002)	Hsu HC, Yang P, Wang J, Wu Q, Myers R, Chen J, Yi J, Guentert T, Tousson A, Stanus AL, **Le TV**, Lorenz RG, Xu H, Kolls JK, Carter RH, Chaplin DD, Williams RW, Mountz JD. 2008. Interleukin 17-producing T helper cells and interleukin 17 orchestrate autoreactive germinal center development in autoimmune BXD2 mice. *Nat Immunol*. 9(2):166-75. Epub 2007 Dec 23. PubMed PMID: 18157131.
CHAPLIN, David D.	Past	Le, Thuc vy (2002)	Hsu HC, Yang P, Wu Q, Wang JH, Job G, Guentert T, Li J, Stockard CR, **Le TV**, Chaplin DD, Grizzle WE, Mountz JD. 2011. Inhibition of the catalytic function of activation-induced cytidine deaminase promotes apoptosis of germinal center B cells in BXD2 mice. *Arthritis Rheum*. 63(7):2038-48. doi: 10.1002/art.30257. PubMed PMID: 21305519; PubMed Central PMCID: PMC3379710.
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	Chen Y*, Xu J, Jhala N, Pawar P, **Byon, CH**, McDonald JM. Fas-mediated Apoptosis in Cholangiocarcinoma Cells Is Enhanced by 3,3'-Diindolylmethane through Inhibition of AKT Signaling and FLIP**.** *Am J Pathol* 2006;169:1833-1842. PMCID: PMC1780198
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	**Byon C,** Javed A, Dai Q, Kappes JC, Clemens TL, Darley-Usmar VM, McDonald JM and Chen Y**.** Oxidative stress Induces vascular calcification through modulation of the osteogenic transcription factor Runx-2 by AKT signaling. *J. Biol. Chem.* 2008;283(22):15319-15327.
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	**Byon CH**, Hardy R, Ren C, Ponnazhagan S, Welch D, McDonald JM and Chen Y. "Regulation of Plasminogen activator inhibitor 1 by free fatty acids". *Laboratory Investigation,* 2009**,** 89(11):1221-8. PMID: 19752858.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	**Byon CH**, Sun Y, Chen JF, Mao X, Heath JM, Anderson PG, Tintut Y, Demer LL, Wang D and Chen Y. Runx2-depedent expression of RANKL during calcification of vascular smooth muscle cells promotes migration and osteoclastic differentiation of macrophages. *Arteriosclerosis, Thrombosis and Vascular Biology.* 2011**,** 31(6):1387-96. PMID:21454810
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	Sun Y, **Byon CH**, Yuan K, Chen JF, Mao X, Heath JM, Javed A, Zhang, K, Anderson PG, and Chen Y. Smooth muscle cell-specific Runx2 deficiency inhibits vascular calcification. *Circ Res.* 2012, PMID: 22773442
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	Chen Y, Xu J, Pawar P, **Byon C-H**, Jhala N, McDonald JM. Inhibition of phosphatidylinositol 3-kinase/Akt signaling promotes Fas-induced apoptosis in cholangiocarcinoma*. Proceedings of the 97th Annual Meeting of the American Association for Cancer Research* 2006.
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	**Byon C-H**, Hardy R, Welch DR, McDonald JM, Chen Y. Augmentation of plasminogen activator inhibitor-1 by free fatty acids in breast cancer cells. *Proceedings of the 97th Annual Meeting of the American Association for Cancer Research* 2006. PMCID: PMC2905319
CHEN, Yabing	Past	Byon, Chang-Hyun (2005 – 2009)	Chen Y, Xu X, **Byon C** and Wu H. Toll-like Receptor 2 Mediates Bacteria-induced Plasminogen Activator Inhibitor Type 1 in Vascular Smooth Muscle Cells. *Preceedings of the 35th Annual meeting of the American Association for Dental Research, 2006, #0606.*
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ELSON, III, Charles O.	Past	Alexander, Katie (2011-2015)	Feng, T., Cong, Y., **Alexander, K.**, & Elson, C. O. Regulation of Toll-like receptor 5 gene expression and function on mucosal dendritic cells. *PloS One*, 2012; *7*(4): e35918. PMCID: PMC3335826.
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FLOYD, Candace	Past	Chaovipoch , Pimonporn (2003-2005)	**Chaovipoch P**, Jelks, KA, Gerhold, LM, West EJ, Chongthammakun S, Floyd CL. (2006) 17b-estradiol is protective in spinal cord injury in post- and pre-menopausal rats. *J Neurotrauma 23*(6):830-852. PMID: 16774470.
FLOYD, Candace	Past	Day, Nicole (2009-2014)	**Day N.L.,** Floyd C.L., D'Alessandro T.L., Hubbard W.J. Chaudry I.H. (2013) 17b-estradiol confers protection after traumatic brain injury in the rat and involves activation of G-protein coupled estrogen receptor 1. *Journal of Neurotrauma* 17: 1531-41. PMCID3751264
FLOYD, Candace	Past	Dunham, Kelly (2008-2011)	**Dunham K.A.,** Siriphorn A., Chompoopong S., Floyd, C.L. (2010). Characterization of a graded hemicontusion spinal cord injury in adult male rats. *Journal of Neurotrauma* 27(11):2091-106. PMC2978055.
FLOYD, Candace	Past	Kachadroka, Supatra (2005-2009)	**Kachadroka S,** Hall AM, Niedzielko TL, Chongthammakun S, Floyd CL. (2010). Effect of endogenous adnrogens on 17b-estradiol-mediated protection after spinal cord injury in male rats. *J Neurotrauma* 27(3):611-26. PMID: 20001688.
FLOYD, Candace	Past	Siriphorn, Akkradate (2008-2010)	**Siriphorn, A.,** Chompoopong, S., Floyd, C.L. (2010). 17b-estradiol protects Schwann cells against H202-induced cytotoxicity and increases transplanted Schwann cell survival in a cervical hemicontusion spinal cord injury model. *Journal of Neurochemistry* 115(4):864-72. PMID:20456002
GILBERT, Shawn	Current	Schlitz, Ryne (2013-2016)	Biomechanical Comparison of Screws vs. K-Wires for Lateral Condyle Fractures. **Schlitz RS**, Schwartz J, Eberhardt AE, Gilbert SR**,** *J Peds Ortho*. In press
GILBERT, Shawn	Past	Anderson, Jason (2010-2011)	Biphasic Peptide Amphiphile Nanomatrix Embedded with Hydroxyapatite Nanoparticles for Stimulated Osteoinductive Response. **Anderson JM**, Patterson JL, Vines JB, Javed A, Gilbert SR, Jun HW. *ACS Nano* 2011 Nov 17. [Epub ahead of print]. PMID: 22077993. PMC3691849
GILBERT, Shawn	Past	Backstrom, Ian (2010-2011)	Pediatric Obesity and Traumatic Lower Extremity Long Bone Fracture Outcomes.**Backstrom I**, Rue L, McClendon P, Sawyer J, Gilbert SR. *J Trauma Acute Care Surg.* 2012 Oct; 73(4):966-71. PMID: 22902734 PMCID:PMC3748582
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GILBERT, Shawn	Past	McKay, Jack (2011-2015)	Gunshot-Associated Fractures in Children and Adolescents Treated at Two Level 1Pediatric Trauma Centers. Gilbert SR, Spence DD, Rush JK, Bleakney CA, **McKay JE**, Warner WC, Sawyer JR. *J Peds Ortho.* January 28 2015.[Epub ahead of print] PubMed PMID: 25144885.
GILBERT, Shawn	Past	Shen, Xing (2008-2009)	Activation of the hypoxia-inducible factor-1alpha pathway accelerates bone regeneration. Gilbert SR**,** *Wan C, Wang Y, Cao X, **Shen X**, Ramaswamy G, Jacobsen KA, Alaql ZS, Eberhardt AW, Gerstenfeld LC, Einhorn TA, Deng L, Clemens TL. *Proc Natl Acad Sci* 105(2):686, 2008. (*co-first authors) PMID: 18184809, PMC2206597.

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GILBERT, Shawn	Past	Shen, Xing (2008-2009)	Prolyl Hydroxylase Inhibitors Increase Neoangiogenesis and Callus Formation Following Femur Fracture in Mice. **Shen X**, Wan C, Ramaswamy G, Mavalli M, Wang Y, Duvall CL, Deng LF, Guldberg RE, Eberhardt A, Clemens TL, Gilbert SR. *J Orth Res*. 27:1298, 2009. PMID: 19338032 PMCID:PMC3748583.
GOEPFERT, Paul	Past	Akinsiku, Olusimidele (2006-2011)	Akinsiku OT, Bansal A, Sabbaj S, Heath SL, Goepfert PA. Interleukin-2 production by polyfunctional HIV-1-specific CD8 T cells is associated with enhanced viral suppression. *J Acquir Immune Defic Syndr* 58:132-140, 2011. PMCID: PMC3391567
GOEPFERT, Paul	Past	Bet, Anne (2009-2014)	Bet A, Sterrett S, Sato A, Bansal A, Goepfert PA. Characterization of T-Cell Responses to Cryptic Epitopes in Recipients of a Noncodon-Optimized HIV-1 Vaccine. *J Acquir Immune Defic Syndr*. 2014 Feb 1;65(2):142-50. PMCID: PMC3896890
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JAVED, Amjad	Past	Adhami, Mitra (2009-2014)	**Adhami M**, Ghori FY, Chen H, Gutierrez S, Javed A. "Runx2 regulates gene network associated with insulin signaling and energy homeostasis". *Cells Tissues Organs*. 2011 May;194(2-4):232-237. PMCID: PMC3178084
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JAVED, Amjad	Past	Bae, Jong-Sup (2003-2005)	**Bae JS**, Gutierrez S, Narla R, Pratap J, Devados R, Stein JL., Stein GS, Lian JB, Javed A. Reconstitution of Runx2/Cbfa1 null cells identifies Runx2 functional domains required for osteoblast differentiation. J. Cell. *Biochem*. 2007 Feb 1;100(2):434-49. PMID: 16927309
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JAVED, Amjad	Past	Rashid, Harunur (2009-2014)	Chen H, Ghori FY, **Rashid H**, Serra R, Gutierrez S, Javed A. "Chondrocyte specific regulatory activity of Runx2 is essential for survival and skeletal development". *Cells Tissues Organs*. 2011 May;194(2-4):161-165. PMCID: PMC3178074
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JUN, Ho-Wook	Current	Alexander, Grant (2013- present)	Adinarayana Andukuri, IlJae Min, Patrick Hwang**, Grant Alexander**, Lauren E Marshall, Joel L Berry, Timothy M Wick, Yoon Ki Joung, Young-Sup Yoon, Brigitta C Brott, Dong Keun Han, Ho-Wook Jun. Evaluation of the effect of expansion and shear stress on a self-assembled endothelium mimicking nanomatrix coating for drug eluting stents in vitro and in vivo. *Biofabrication*, 2014, 6, 035019, . PMCID: PMC4156883
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LEFKOWITZ, Elliot J.	Past	Wang, Chunlin (2001-2005)	Grard G, Fair JN, Lee D, Slikas E, Steffen I, Muyembe JJ, Sittler T, Veeraraghavan N, Ruby JG, **Wang C**, Makuwa M, Mulembakani P, Tesh RB, Mazet J, Rimoin AW, Taylor T, Schneider BS, Simmons G, Delwart E, Wolfe ND, Chiu CY, Leroy EM. A novel rhabdovirus associated with acute hemorrhagic fever in central Africa. *PLoS Pathog*. 2012 Sep;8(9):e1002924. doi: 10.1371/journal.ppat.1002924. Epub 2012 Sep 27. PubMed PMID: 23028323; PubMed Central PMCID: PMC3460624.
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LORENZ, Robinna	Past	Daft, J. (2009- 2014)	Staley, EM, Yarbrough, VR, Schoeb,TR, **Daft, JG**, Tanner, SM, Steverson, D., and Lorenz, RG: "Murine P-glycoprotein deficiency alters intestinal injury repair and blunts LPS induced radioprotection". *Radiation Research*. 2012 Sep;178(3):207-16. Epub 2012 Jul 10. PMCID: PMC3474324.
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MOUNTZ, John D.	Past	Li, H. (2008-2014)	Xie S, Hsu H-C, Wang J, Wu Q, **Li H**, Li J, and Mountz JD. IL-17 activates the classical NF-kappaB signaling pathway to upregulate chemokine signal inhibitor molecules RGS16 and RGS13 in autoimmune B cells of BXD2 mice. *J Immunol* 182: 41.9, 2009. PMCID: PMC2849003
MOUNTZ, John D.	Past	Wang, J. (2005-2009)	Hsu H-C, Yang PA, Wu Q, **Wang J**, Godwin J, Guentert T, Li J, Stockard CR, Le T, Chaplin DD, Grizzle WE, and Mountz, JD. Inhibition of the catalytic function of activation-induced cytidine deaminase (AICDA) promotes apoptosis of germinal center B cells. *Arthritis Rheum* 63(7):2038-2048. 2011. PMC3379710
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MOUNTZ, John D.	Past	Wang, J. (2005-2009)	**Wang J**, Li J, Wu Q, Yang P, Pawar RD, Xie S, Timares L, Raman C, Chaplin DD, Lu L, Mountz JD, Hsu HC. Marginal zone precursor B cells as cellular agents for Type I IFN-promoted antigen transport in autoimmunity. *J Immunol*, 184, 442 -451, 2010. PMC2830207
MOUNTZ, John D.	Past	Wang, J. (2005-2009)	Chen J, **Wang J**, Li J, Wu Q, Chu LF, Yang PA, Hsu H-C, Curiel DT, and Mountz JD. Enhancement of cytotoxic T-lymphocyte response in aged mice by a novel treatment with recombinant AdIL-12 and wild-type adenovirus in rapid succession. *Mol Ther*, 16:1500-1506, 2008. PMC2575091
MOUNTZ, John D.	Past	Wang, J. (2005-2009)	Hsu H-C, Yang PA, **Wang J**, Wu Q, Myers R, Chen J, Yi J, Guentert T, Tousson A, Stanus AL, Le TV, Lorenz RG, Xu H, Kolls JK, Carter RH, Chaplin DD, Lu L, Williams RW and Mountz JD. Interleukin 17–producing T helper cells and interleukin 17 orchestrate autoreactive germinal center development in autoimmune BXD2 mice. *Nature Immunol* 9:166-175, 2008. PMID: 18157131
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MUNTNER, Paul	Current	Booth, John III (2012 – present)	Bowling CB, **Booth JN 3rd**, Gutiérrez OM, Kurella Tamura M, Huang L, Kilgore M, Judd S, Warnock DG, McClellan WM, Allman RM, Muntner P. *Clin J Am Soc Nephrol*. 2014 Oct 7;9(10):1737-45. doi: 10.2215/CJN.00880114. Epub 2014 Oct 2. PMID: 25278551 *Nondisease-specific problems and all-cause mortality among older adults with CKD: the REGARDS Study.*
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Irvin MR, **Booth JN 3rd**, Shimbo D, Lackland DT, Oparil S, Howard G, Safford MM, Muntner P, Calhoun DA. *J Am Soc Hypertens*. 2014 Jun;8(6):405-13. doi: 10.1016/j.jash.2014.03.003. Epub 2014 Mar 15. PMID: 24952653 Apparent treatment-resistant hypertension and risk for stroke, coronary heart disease, and all-cause mortality**.**

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Diaz KM, **Booth JN 3rd**, Calhoun DA, Irvin MR, Howard G, Safford MM, Muntner P, Shimbo D. *Hypertension*. 2014 Sep;64(3):465-71. doi: 10.1161/HYPERTENSIONAHA.114.03565. Epub 2014 Jun 9. PMID: 24914189 Healthy lifestyle factors and risk of cardiovascular events and mortality in treatment-resistant hypertension: the Reasons for Geographic and Racial Differences in Stroke study.
MUNTNER, Paul	Current	Booth, John III (2012 – present)	**Booth JN 3rd**, Levitan EB, Brown TM, Farkouh ME, Safford MM, Muntner P. *Am J Cardiol*. 2014 Jun 15;113(12):1933-40. doi: 10.1016/j.amjcard.2014.03.033. Epub 2014 Apr 1. PMID: 24793668 Effect of sustaining lifestyle modifications (nonsmoking, weight reduction, physical activity, and mediterranean diet) after healing of myocardial infarction, percutaneous intervention, or coronary bypass (from the REasons for Geographic and Racial Differences in Stroke Study).
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Calhoun DA, **Booth JN 3rd**, Oparil S, Irvin MR, Shimbo D, Lackland DT, Howard G, Safford MM, Muntner P. *Hypertension*. 2014 Apr;63(4):e84. PMID: 24757730 Response to should more significance be granted to medication response to antihypertensives in patients with resistant hypertension?
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Calhoun DA, **Booth JN 3rd**, Oparil S, Irvin MR, Shimbo D, Lackland DT, Howard G, Safford MM, Muntner P. *Hypertension*. 2014 Mar;63(3):451-8. doi: 10.1161/HYPERTENSIONAHA.113.02026. Epub 2013 Dec 9. PMID: 24324035 Refractory hypertension: determination of prevalence, risk factors, and comorbidities in a large, population-based cohort**.**
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Bowling CB, **Booth JN 3rd**, Safford MM, Whitson HE, Ritchie CS, Wadley VG, Cushman M, Howard VJ, Allman RM, Muntner P. *J Am Geriatr Soc*. 2013 May;61(5):739-46. doi: 10.1111/jgs.12214. Epub 2013 Apr 25. PMID: 23617688 Nondisease-specific problems and all-cause mortality in the REasons for Geographic and Racial Differences in Stroke study**.**
MUNTNER, Paul	Current	Booth, John III (2012 – present)	Shimbo D, Levitan EB, **Booth JN 3rd**, Calhoun DA, Judd SE, Lackland DT, Safford MM, Oparil S, Muntner P. *J Hypertens*. 2013 Feb;31(2):370-6. doi: 10.1097/HJH.0b013e32835b6be7. PMID: 23303356 The contributions of unhealthy lifestyle factors to apparent resistant hypertension: findings from the Reasons for Geographic And Racial Differences in Stroke (REGARDS) study**.**
MUNTNER, Paul	Current	Bromfield, Samantha (2012 – present)	Banach M, **Bromfield S**, Howard G, Howard VJ, Zanchetti A, Aronow WS, Ahmed A, Safford MM, Muntner P. *Int J Cardiol*. 2014 Sep;176(1):219-26. doi: 10.1016/j.ijcard.2014.07.067. Epub 2014 Jul 22. PMID: 25085381 Association of systolic blood pressure levels with cardiovascular events and all-cause mortality among older adults taking antihypertensive medication**.**
MUNTNER, Paul	Current	Bromfield, Samantha (2012 – present)	**Bromfield SG**, Bowling CB, Tanner RM, Peralta CA, Odden MC, Oparil S, Muntner P. *J Clin Hypertens* (Greenwich). 2014 Apr;16(4):270-6. doi: 10.1111/jch.12281. Epub 2014 Mar 12. PMID: 24621268 Trends in hypertension prevalence, awareness, treatment, and control among US adults 80 years and older, 1988-2010.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
MUNTNER, Paul	Current	Bromfield, Samantha (2012 – present)	**Bromfield S**, Muntner P. *Curr Hypertens Rep*. 2013 Jun;15(3):134-6. doi: 10.1007/s11906-013-0340-9. Review. PMID: 23536128 High blood pressure: the leading global burden of disease risk factor and the need for worldwide prevention programs**.**
MUNTNER, Paul	Current	Colantonio, Lisandro (2012 – present)	Alcántara C, Muntner P, Edmondson D, Safford MM, Redmond N, **Colantonio LD**, Davidson KW. *Circ Cardiovasc Qual Outcomes*. 2015 Mar;8(2):146-54. doi: 10.1161/CIRCOUTCOMES.114.001180. Epub 2015 Mar 10. PMID: 25759443 Perfect storm: concurrent stress and depressive symptoms increase risk of myocardial infarction or death**.**
MUNTNER, Paul	Current	Colantonio, Lisandro (2012 – present)	**Colantonio LD**, Baber U, Banach M, Tanner RM, Warnock DG, Gutiérrez OM, Safford MM, Wanner C, Howard G, Muntner P. *J Am Soc Nephrol*. 2015 May;26(5):1173-80. doi: 10.1681/ASN.2014040400. Epub 2014 Nov 13. PMID: 25395432 Contrasting Cholesterol Management Guidelines for Adults with CKD.
MUNTNER, Paul	Current	Colantonio, Lisandro (2012 – present)	Muntner P, **Colantonio LD**, Cushman M, Goff DC Jr, Howard G, Howard VJ, Kissela B, Levitan EB, Lloyd-Jones DM, Safford MM. *JAMA*. 2014 Apr 9;311(14):1406-15. doi: 10.1001/jama.2014.2630. PMID: 24682252 Validation of the atherosclerotic cardiovascular disease Pooled Cohort risk equations.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	O'Neal WT, **Tanner RM**, Efird JT, Baber U, Alonso A, Howard VJ, Howard G, Muntner P, Soliman EZ. *Int J Cardiol*. 2015 Apr 15;185:219-23. doi: 10.1016/j.ijcard.2015.03.104. Epub 2015 Mar 12. PMID: 25797681 Atrial fibrillation and incident end-stage renal disease: The REasons for Geographic And Racial Differences in Stroke (REGARDS) study**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Howard VJ, **Tanner RM**, Anderson A, Irvin MR, Calhoun DA, Lackland DT, Oparil S, Muntner P. *Am J Med*. 2015 Mar 10. pii: S0002-9343(15)00179-5. doi: 10.1016/j.amjmed.2015.02.008. [Epub ahead of print] PMID: 25770032 Apparent Treatment-resistant Hypertension Among Individuals with History of Stroke or Transient Ischemic Attack**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	McMahon GM, Hwang SJ, **Tanner RM**, Jacques PF, Selhub J, Muntner P, Fox CS. *BMC Nephrol*. 2015 Feb 2;16:7. doi: 10.1186/1471-2369-16-7. PMID: 25644490 The association between vitamin B12, albuminuria and reduced kidney function: an observational cohort study**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Panwar B, Hanks LJ, **Tanner RM**, Muntner P, Kramer H, McClellan WM, Warnock DG, Judd SE, Gutiérrez OM. *Kidney Int*. 2014 Dec 17. doi: 10.1038/ki.2014.384. [Epub ahead of print] PMID: 25517912 Obesity, metabolic health, and the risk of end-stage renal disease**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Colantonio LD, Baber U, Banach M, **Tanner RM**, Warnock DG, Gutiérrez OM, Safford MM, Wanner C, Howard G, Muntner P. *J Am Soc Nephrol*. 2015 May;26(5):1173-80. doi: 10.1681/ASN.2014040400. Epub 2014 Nov 13. PMID: 25395432 Contrasting Cholesterol Management Guidelines for Adults with CKD.

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MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Diaz KM, **Tanner RM**, Falzon L, Levitan EB, Reynolds K, Shimbo D, Muntner P. *Hypertension*. 2014 Nov;64(5):965-82. doi: 10.1161/HYPERTENSIONAHA.114.03903. Epub 2014 Jul 28. Review. PMID: 25069669 Visit-to-visit variability of blood pressure and cardiovascular disease and all-cause mortality: a systematic review and meta-analysis**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Carson AP, **Tanner RM**, Yun H, Glasser SP, Woolley JM, Thacker EL, Levitan EB, Farkouh ME, Rosenson RS, Brown TM, Howard G, Safford MM, Muntner P. *Ann Epidemiol*. 2014 Aug;24(8):581-7. doi: 10.1016/j.annepidem.2014.05.007. Epub 2014 May 22. PMID: 24970491 Declines in coronary heart disease incidence and mortality among middle-aged adults with and without diabetes**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Shimbo D, **Tanner RM**, Muntner P. *JAMA Intern Med*. 2014 Aug;174(8):1397-400. doi: 10.1001/jamainternmed.2014.2492. PMID: 24934716 Prevalence and characteristics of systolic blood pressure thresholds in individuals 60 years or older.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Levitan EB, **Tanner RM**, Zhao H, Muntner P, Thacker EL, Howard G, Glasser SP, Bittner V, Farkouh ME, Rosenson RS, Safford MM. *Int J Cardiol*. 2014 Jun 15;174(2):436-9. doi: 10.1016/j.ijcard.2014.04.027. Epub 2014 Apr 13. PMID: 24767755 Secular changes in rates of coronary heart disease, fatal coronary heart disease, and out-of-hospital fatal coronary heart disease**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Bromfield SG, Bowling CB, **Tanner RM**, Peralta CA, Odden MC, Oparil S, Muntner P. *J Clin Hypertens* (Greenwich). 2014 Apr;16(4):270-6. doi: 10.1111/jch.12281. Epub 2014 Mar 12. PMID: 24621268 Trends in hypertension prevalence, awareness, treatment, and control among US adults 80 years and older, 1988-2010.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Tanner RM, Calhoun DA, Bell EK, Bowling CB, Gutiérrez OM, Irvin MR, Lackland DT, Oparil S, McClellan W, Warnock DG, Muntner P. *Am J Kidney Dis*. 2014 May;63(5):781-8. doi: 10.1053/j.ajkd.2013.11.016. Epub 2014 Jan 1. Review. PMID: 24388119 Incident ESRD and treatment-resistant hypertension: the reasons for geographic and racial differences in stroke (REGARDS) study**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Hanks LJ, **Tanner RM**, Muntner P, Kramer H, McClellan WM, Warnock DG, Judd SE, Gutiérrez OM; REGARDS Investigators. *Clin J Am Soc Nephrol*. 2013 Dec;8(12):2064-71. doi: 10.2215/CJN.00140113. Epub 2013 Oct 31. PMID: 24178980 Metabolic subtypes and risk of mortality in normal weight, overweight, and obese individuals with CKD**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	**Tanner RM**, Calhoun DA, Bell EK, Bowling CB, Gutiérrez OM, Irvin MR, Lackland DT, Oparil S, Warnock D, Muntner P. *Clin J Am Soc Nephrol*. 2013 Sep;8(9):1583-90. doi: 10.2215/CJN.00550113. Epub 2013 Jul 18. PMID: 23868902 Prevalence of apparent treatment-resistant hypertension among individuals with CKD.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Brown TM, **Tanner RM**, Carson AP, Yun H, Rosenson RS, Farkouh ME, Woolley JM, Thacker EL, Glasser SP, Safford MM, Muntner P. *Diabetes Care*. 2013 Sep;36(9):2734-40. doi: 10.2337/dc12-2318. Epub 2013 May 1. PMID: 23637349

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MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Plantinga L, Howard VJ, Judd S, Muntner P, **Tanner R**, Rizk D, Lackland DT, Warnock DG, Howard G, McClellan WM. *Int J Health Geogr*. 2013 Mar 21;12:17. doi: 10.1186/1476-072X-12-17. PMID: 23518004 Association of duration of residence in the southeastern United States with chronic kidney disease may differ by race: the REasons for Geographic and Racial Differences in Stroke (REGARDS) cohort study**.**
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	**Tanner RM**, Gutiérrez OM, Judd S, McClellan W, Bowling CB, Bradbury BD, Safford MM, Cushman M, Warnock D, Muntner P. *Am J Kidney Dis*. 2013 Mar;61(3):395-403. doi: 10.1053/j.ajkd.2012.10.018. Epub 2012 Dec 8. PMID: 23228944 Geographic variation in CKD prevalence and ESRD incidence in the United States: results from the reasons for geographic and racial differences in stroke (REGARDS) study.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	**Tanner RM**, Brown TM, Muntner P. *Curr Hypertens Rep*. 2012 Apr;14(2):152-9. doi: 10.1007/s11906-012-0254-y. Review. PMID: 22318504 Epidemiology of obesity, the metabolic syndrome, and chronic kidney disease.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	Muntner P, Bowling CB, Gao L, Rizk D, Judd S, **Tanner RM**, McClellan W, Warnock DG. *Clin J Am Soc Nephrol*. 2011 Sep;6(9):2200-7. doi: 10.2215/CJN.02030311. Epub 2011 Jul 7. PMID: 21737849 Age-specific association of reduced estimated glomerular filtration rate and albuminuria with all-cause mortality.
MUNTNER, Paul	Past	Tanner, Rikki (2010 – 2014)	**Tanner RM**, Baber U, Carson AP, Voeks J, Brown TM, Soliman EZ, Howard VJ, Muntner P. *Am J Cardiol*. 2011 Jul 15;108(2):227-32. doi: 10.1016/j.amjcard.2011.03.026. Epub 2011 Apr 29. PMID: 21530935 Association of the metabolic syndrome with atrial fibrillation among United States adults (from the REasons for Geographic and Racial Differences in Stroke [REGARDS] Study).
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	**Yun H**, Safford MM, Brown TM, Farkouh ME, Kent S, Sharma P, Kilgore M, Bittner V, Rosenson RS, Delzell E, Muntner P, Levitan EB. *J Am Heart Assoc*. 2015 Feb 9;4(2). pii: e001208. doi: 10.1161/JAHA.114.001208. PMID: 25666367 Statin use following hospitalization among Medicare beneficiaries with a secondary discharge diagnosis of acute myocardial infarction**.**
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Rosenson RS, Kent ST, Brown TM, Farkouh ME, Levitan EB, **Yun H**, Sharma P, Safford MM, Kilgore M, Muntner P, Bittner V. *J Am Coll Cardiol*. 2015 Jan 27;65(3):270-7. doi: 10.1016/j.jacc.2014.09.088. PMID: 25614424 Underutilization of high-intensity statin therapy after hospitalization for coronary heart disease.
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Muntner P, **Yun H**, Sharma P, Delzell E, Kent ST, Kilgore ML, Farkouh ME, Vupputuri S, Bittner V, Rosenson RS, Levitan EB, Safford MM. *Am J Cardiol*. 2014 Sep 15;114(6):826-31. doi: 10.1016/j.amjcard.2014.06.009. Epub 2014 Jul 1. PMID: 25103917 Ability of low antihypertensive medication adherence to predict statin discontinuation and low statin adherence in patients initiating treatment after a coronary event.

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MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	**Yun H**, Delzell E, Saag KG, Kilgore ML, Morrisey MA, Muntner P, Matthews R, Guo L, Wright N, Smith W, Colón-Emeric C, O'Connor CM, Lyles KW, Curtis JR. *Clin Exp Rheumatol*. 2014 Jul 28. [Epub ahead of print] PMID: 25068266 Fractures and mortality in relation to different osteoporosis treatments**.**
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Carson AP, Tanner RM, **Yun H**, Glasser SP, Woolley JM, Thacker EL, Levitan EB, Farkouh ME, Rosenson RS, Brown TM, Howard G, Safford MM, Muntner P. *Ann Epidemiol*. 2014 Aug;24(8):581-7. doi: 10.1016/j.annepidem.2014.05.007. Epub 2014 May 22. PMID: 24970491 Declines in coronary heart disease incidence and mortality among middle-aged adults with and without diabetes**.**
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Gamboa CM, Safford MM, Levitan EB, Mann DM, **Yun H**, Glasser SP, Woolley JM, Rosenson R, Farkouh M, Muntner P. *Am J Med Sci*. 2014 Aug;348(2):108-14. doi: 10.1097/MAJ.0000000000000292. PMID: 24892511 Statin underuse and low prevalence of LDL-C control among U.S. adults at high risk of coronary heart disease.
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	**Yun H**, Curtis JR, Guo L, Kilgore M, Muntner P, Saag K, Matthews R, Morrisey M, Wright NC, Becker DJ, Delzell E. *BMC Musculoskelet Disord*. 2014 Apr 1;15:112. doi: 10.1186/1471-2474-15-112. PMID: 24684864 Patterns and predictors of osteoporosis medication discontinuation and switching among Medicare beneficiaries**.**
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Muntner P, Levitan EB, Brown TM, Sharma P, Zhao H, Bittner V, Glasser S, Kilgore M, **Yun H**, Woolley JM, Farkouh ME, Rosenson RS. *Am J Cardiol*. 2013 Sep 1;112(5):664-70. doi: 10.1016/j.amjcard.2013.04.041. Epub 2013 May 29. PMID: 23726177 Trends in the prevalence, awareness, treatment and control of high low density lipoprotein-cholesterol among United States adults from 1999-2000 through 2009-2010.
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	Brown TM, Tanner RM, Carson AP, **Yun H**, Rosenson RS, Farkouh ME, Woolley JM, Thacker EL, Glasser SP, Safford MM, Muntner P. *Diabetes Care*. 2013 Sep;36(9):2734-40. doi: 10.2337/dc12-2318. Epub 2013 May 1. PMID: 23637349
MUNTNER, Paul	Past	Yun, Huifeng (2009-2012)	**Yun H**, Curtis JR, Saag K, Kilgore M, Muntner P, Smith W, Matthews R, Wright N, Morrisey MA, Delzell E. *Pharmacoepidemiol Drug Saf*. 2013 Jan;22(1):55-63. doi: 10.1002/pds.3361. Epub 2012 Nov 8. PMID: 23135758 Generic alendronate use among Medicare beneficiaries: are Part D data complete**?**
MURPHY-ULLRICH, Joanne	Past	* Dubose, Kimberly Bailey (2002-2006)	**Bailey DuBose K**, Zayzafoon M, Murphy-Ullrich JE (2012) Thrombospondin-1 inhibits osteogenic differentiation of human mesenchymal stem cells through latent TGF-β activation*. Biochem Biophys Res Commun*, 422: 488-493. PMC3372697
MURPHY-ULLRICH, Joanne	Past	* Elzie, Carrie Ann (2002-2006)	Pallero MA**, Elzie CA,** Chen J, Mosher DF, Murphy-Ullrich JE. 2008, Thrombospondin1 binding to calreticulin-LRP1 signals resistance to anoikis. *FASEB J 22*: 3868-3879. PMC2574023

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MURPHY-ULLRICH, Joanne	Past	* Graham Lauren Van Duyn (2005-2011)	Lillis AP, **VanDuyn LB**, Murphy-Ullrich JE, Strickland, DK. (2008) The low density lipoprotein receptor-related protein 1 (LRP): unique tissue specific functions revealed by selective gene knockout studies. *Physiologic Reviews* 88:87-918. PMC2744109
MURPHY-ULLRICH, Joanne	Past	* Graham Lauren Van Duyn (2005-2011)	Gold LI, Eggleton P, Sweetwyne MT, **Van Duyn LB**, Greives MR, Naylor SM,Michalak M, Murphy-Ullrich JE.,(2010) Calreticulin:non-endoplasmic reticulum functions in physiology and disease. *FASEB J.* 24(3):665-83. PMC2830142
MURPHY-ULLRICH, Joanne	Past	* Graham Lauren Van Duyn (2005-2011)	**Van Duyn Graham L**, Sweetwyne MT, Pallero MA, Murphy-Ullrich JE.,(2010) Intracellular calreticulin regulates multiple steps in fibrillar collagen expression,trafficking, and processing into the extracellular matrix. *J Biol Chem*Mar 5;285:7067-78 PMC2844156.
MURPHY-ULLRICH, Joanne	Past	* Graham Lauren Van Duyn (2005-2011)	Sweetwyne MT, Pallero MA, Lu A, **Van Duyn Graham L,** Murphy-Ullrich JE., (2010) The Calreticulin binding sequence of thrombospondin 1 regulates collagen expression and organization during tissue tissue and remodeling *Am J Path* Oct; 177(4): 1710-24. PMC2947268
MURPHY-ULLRICH, Joanne	Past	* Graham Lauren Van Duyn (2005-2011)	Zimmerman KA, **Graham LV**, Pallero MA, Murphy-Ullrich JE., Calreticulin regulates transforming growth factor-β-stimulated extracellular matrix production.*J Biol Chem*. 2013 May 17;288(20):14584-98. PMC3656311
MURPHY-ULLRICH, Joanne	Past	*Sweetwyne, Maria (2004-2009)	Gold LI, Eggleton P, **Sweetwyne MT**, Van Duyn LB, Greives MR, Naylor SM,Michalak M, Murphy-Ullrich JE.,(2010) Calreticulin:non-endoplasmic reticulum functions in physiology and disease. *FASEB J*. 24(3):665-83. PMC2830142
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MURPHY-ULLRICH, Joanne	Past	*Sweetwyne, Maria (2004-2009)	**Sweetwyne MT**, Pallero MA, Lu A, Van Duyn Graham L, Murphy-Ullrich JE., (2010) The Calreticulin binding sequence of thrombospondin 1 regulates collagen expression and organization during tissue tissue and remodeling *Am J Path* Oct; 177(4): 1710-24. PMC2947268
MURPHY-ULLRICH, Joanne	Past	*Sweetwyne, Maria (2004-2009)	**Sweetwyne MT**, Murphy-Ullrich JE (2012) Thrombospondin1 in tissue repair and fibrosis: TGF-β dependent and independent mechanisms. *Matrix Biology* 31:178-186 PMC3295861
MURPHY-ULLRICH, Joanne	Past	*Talbert Roden, Melissa (2004-2012)	Pallero MA, **Talbert Roden M**, Chen YF, Anderson PG, Lemons J, Brott BC, Murphy-Ullrich, JE (2009)Stainless steel ions stimulate increased thrombospondin-1-dependent TGF-beta activation by vascular smooth muscle cells: implications for in-stent restenosis.*J Vasc Res* 2010;47(4):309-22. PMC2895758

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
MURPHY-ULLRICH, Joanne	Past	*Zimmerman, Kurt (2009-2014)	Parks BW, Black LL, **Zimmerman KA**, Metz AE, Steele C, Murphy-Ullrich JE, Kabarowski JH. CD36, but not G2A, modulates efferocytosis, inflammation and fibrosis following bleomycin-induced lung injury. *J Lipid Res*. 2013_ Apr;54(4):1114-23 PMC3605987
MURPHY-ULLRICH, Joanne	Past	*Zimmerman, Kurt (2009-2014)	**Zimmerman KA**, Graham LV, Pallero MA, Murphy-Ullrich JE., Calreticulin regulates transforming growth factor-β-stimulated extracellular matrix production.*J Biol Chem*. 2013 May 17;288(20):14584-98. PMC3656311
MYERS, Richard	Past	Brown (Brunner), Alayne (2004-2009)	**Brunner, A. L**., Johnson, D. S., Kim, S. W., Valouev, A., Reddy, T. E., …. and Myers, R. M. (2009). Distinct DNA methylation patterns characterize differentiated human embryonic stem cells and developing human fetal liver. *Genome Res*. PMID: 19273619. PMCID: PMC2694474.
MYERS, Richard	Past	Casto, Amanda (2007-2008)	Li, J. Z., Absher, D. M., Tang, H. Southwick, A. M., **Casto, A. M**., …. and Myers, R. M. (2008). Worldwide human relationships inferred from genome-wide patterns of variation. *Science*. PMID: 18292342.
MYERS, Richard	Past	Collins, Patrick (2003-2008)	**Collins, P. J.**, Kobayashi, Y., Nguyen, L., Trinklein, N. D. and Myers, R. M. (2007). The ets-related transcription factor GABP directs bidirectional transcription. *PLoS Genet*. PMID: 18020712. PMCID: PMC2077898.
MYERS, Richard	Past	Collins, Patrick (2003-2008)	Trinklein, N. D., Karaöz, U., Wu, J., Halees, A., Force Aldred, S., **Collins, P. J**., Zheng, D., Zhang, Z., Gerstein, M., Snyder, M., Myers, R. M. and Weng, Z. (2007). Integrated analysis of experimental datasets reveals many novel promoters in 1% of the human genome. *Genome Res*. PMID: 17567992. PMCID: PMC3098557.
MYERS, Richard	Past	Collins, Patrick (2003-2008)	Lin, J. M., **Collins, P. J**., Trinklein N. D., Fu, Y., Xi, H., Myers, R. M. and Weng, Z. (2007). Transcription factor binding and histone modifications in human bidirectional promoters. *Genome Res*. PMID: 17568000. PMCID: PMC1891341.
MYERS, Richard	Past	Cooper, Sara (2001-2006)	**Cooper, S. J**., Trinklein, N. D., Anton, E. D., Nguyen, L. and Myers, R. M. (2006). Comprehensive analysis of transcriptional promoter structure and function in 1% of the human genome. *Genome Res*. PMID: 16344566. PMCID: PMC1781345.
MYERS, Richard	Past	Cooper, Sara (2001-2006)	Kim, T. H., Barrera, L. O., Qu, C., Van Calcar, S., Trinklein, N. D., **Cooper, S. J**., ….Myers, R. M., and Ren, B. (2005). Direct isolation and identification of promoters in the human genome. *Genome Res*. PMID: 15899964. PMCID: PMC1142473.
MYERS, Richard	Past	Force, Shelley (2002-2007)	Carlson, C. S., **Force Aldred, S.**, Tracy, R. P., Schwartz, S. M., Rieder, M., …. Myers, R. M., Siscovick, D. S., and Reiner, A. P. (2005). Polymorphisms within the C Reactive Protein promoter region are associated with plasma CRP levels. Am. J. Hum. Genet. *Erratum in: Am J Hum Genet*. 2008 PMID: 15897982. PMCID.: PMC1226195

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MYERS, Richard	Past	Force, Shelley (2002-2007)	Trinklein, N. D., Karaöz, U., Wu, J., Halees, A., **Force Aldred, S**., …. Myers, R. M. and Weng, Z. (2007). Integrated analysis of experimental datasets reveals many novel promoters in 1% of the human genome. *Genome Res*. PMID: 17567992. PMCID: PMC3098557.
MYERS, Richard	Past	Garcia, Sarah (2005-2010)	Mortazavi, A., Leeper Thompson, E. C., **Garcia. S. T**., Myers, R. M. and Wold, B. (2006). Comparative genomics modeling of the NRSF/REST repressor network: From single conserved sites to genome-wide repertoire. *Genome Res*. PMID: 16963704. PMCID: PMC1581430.
MYERS, Richard	Past	Kobayashi, Yuya (2005-2010)	Collins, P. J., **Kobayashi, Y**., Nguyen, L., Trinklein, N. D. and Myers, R. M. (2007). The ets-related transcription factor GABP directs bidirectional transcription. *PLoS Genet*. PMID: 18020712. PMCID: PMC2077898.
MYERS, Richard	Past	Kobayashi, Yuya (2005-2010)	Hesselson, S., Matsson, P., Shima, J., Fukushima, H., Yee, S. W., **Kobayashi, Y.,** …. Myers, R. M., Kroetz, D., Kwok, P.Y., and Giacomini, K. (2009). Genetic variation in the proximal promoter of ABC and SLC superfamilies: Liver and kidney specific expression and promoter activity predict variation. *PLos One*. PMID: 19742321. PMCID: PMC2735003.
MYERS, Richard	Past	Kobayashi, Yuya (2005-2010)	Mendoza-Fandino, G. A., Gee, J. M., Ben-Dor, S., Gonzalez-Quevedo, C., Lee, K., **Kobayashi, Y**., Hartiala, J., Myers, R. M., Leal, S. M., Allayee, H. and Patel, P. I. (2010). A Novel g.-1258G>A Mutation in a Conserved Putative Regulatory Element of PAX9 is Associated with Autosomal Dominant Molar Hypodontia. *Clin. Gen*. PMID: 21443745. PMCID: PMC3084526.
MYERS, Richard	Past	Leeper, Evonne (2005-2010)	Mortazavi, A., **Leeper Thompson**, E. C., Garcia. S. T., Myers, R. M. and Wold, B. (2006). Comparative genomics modeling of the NRSF/REST repressor network: From single conserved sites to genome-wide repertoire. *Genome Res*. PMID: 16963704. PMCID: PMC1581430.
MYERS, Richard	Past	Schroeder, Diane (2003-2008)	**Schroeder, D. I.** and Myers, R. M. (2008). Multiple transcription start sites for FOXP2 with varying cellular specificities. *Gene*. PMID: 18316164.
MYERS, Richard	Past	Strehlow, Ann (2002-2007)	**Strehlow, A. T.,** Li, J. Z. and Myers, R. M. (2007). Wild-type huntingtin participates in protein trafficking between the Golgi and the extracellular space. Hum. Molec. *Genet.* PMID: 17189290.
MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	Kim, T. H., Barrera, L. O., Qu, C., Van Calcar, S., **Trinklein, N. D**., Cooper, S. J., Luna, R., Glass, C. K., Rosenfeld, M. G., Myers, R. M., and Ren, B. (2005). Direct isolation and identification of promoters in the human genome. *Genome Res*. PMID: 15899964. PMCID: PMC1142473.
MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	Cooper, S. J., **Trinklein, N. D.,** Anton, E. D., Nguyen, L. and Myers, R. M. (2006). Comprehensive analysis of transcriptional promoter structure and function in 1% of the human genome. *Genome Res*. PMID: 16344566. PMCID: PMC1781345.
MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	Cooper, S. J., **Trinklein, N. D**., Nguyen, L. and Myers, R. M. (2007). Serum Response Factor binding sites differ in three human cell types. *Genome Res*. PMID: 17200232. PMCID: PMC1781345.

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MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	Lin, J. M., Collins, P. J., **Trinklein N. D.**, Fu, Y., Xi, H., Myers, R. M. and Weng, Z. (2007). Transcription factor binding and histone modifications in human bidirectional promoters. *Genome Res*. PMID: 17568000. PMCID: PMC1891341.
MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	**Trinklein, N. D**., Karaöz, U., Wu, J., Halees, A., Force Aldred, S., Collins, P. J., Zheng, D., Zhang, Z., Gerstein, M., Snyder, M., Myers, R. M. and Weng, Z. (2007). Integrated analysis of experimental datasets reveals many novel promoters in 1% of the human genome. *Genome Res*. PMID: 17567992. PMCID: PMC3098557.
MYERS, Richard	Past	Trinklein, Nathan (2002-2007)	Collins, P. J., Kobayashi, Y., Nguyen, L., **Trinklein, N. D**. and Myers, R. M. (2007). The ets-related transcription factor GABP directs bidirectional transcription. *PLoS Genet*. PMID: 18020712. PMCID: PMC2077898.
NAPIERALA, Dobrawa	Current	Kuzynski, Maria (2011-present)	**Kuzynski M**, Goss M, Bottini M, Yadav MC, Mobley C, Winters T, Poliard A, Kellermann O, Lee B, Millan JL, Napierala D., 2014, Role of the Trps1 Transcription Factor in Dentin Mineralization. *Journal of Biological Chemistry*, PMID: 25128529.
NOVAK, Jan	Past	Czernekova, Lydie (2012)	Raska, M., **Czernekova, L.,** Moldoveanu, Z., Zachova, K., Elliott, M.C., Novak, Z., Hall, S., Vrbkova, J., Hoelscher, M., Maboko, L., Brown, R., Tomana, M., Smith, P.D., Mestecky, J., Novak, J. Differential glycosylation of envelope gp120 is associated with differential recognition of HIV-1 by virus-specific antibodies and cell infection. *AIDS Res. Ther.* 11, 23, 2014. PMID: 25120578
NOVAK, Jan	Past	Elliott, M.C. (2008)	Raska, M., Czernekova, L., Moldoveanu, Z., Zachova, K., **Elliott, M.C**., Novak, Z., Hall, S., Vrbkova, J., Hoelscher, M., Maboko, L., Brown, R., Tomana, M., Smith, P.D., Mestecky, J., Novak, J. Differential glycosylation of envelope gp120 is associated with differential recognition of HIV-1 by virus-specific antibodies and cell infection. *AIDS Res. Ther.* 11, 23, 2014. PMID: 25120578
NOVAK, Jan	Past	Gomes, MM	**Gomes, M.M**., Suzuki, H., Tomana, M., Moldoveanu, Z., Mestecky, M., Julian, B.A., Novak, J., Herr, A.B. Molecular basis for the recognition of galactose-deficient *O*-glycans in the hinge region of IgA1 by *N*-acetylgalactosamine-specific snail lectins. *Biochemistry.* 49, 5671-5682, 2010. PMID: 20507092
NOVAK, Jan	Past	Gomes, MM	**Gomes, M.M.,** Walls, S.B., Novak, J., Renfrow, M.B., Herr, A.B. Analysis of IgA1 *N*-glycosylation and its contribution to FcαRI binding. *Biochemistry.* 47, 11285-11299, 2008. PMID: 18826328
NOVAK, Jan	Past	Lu, SE	**Lu, S.-E.**, Novak, J., Austin, F.W., Gu, G., Ellis, D., Kirk, M., Wilson-Stanford, S., Tonelli, M., and Smith, L. Occidiofungin, a unique antifungal glycopeptide produced by a strain of *Burkholderia contaminans*. *Biochemistry*. 48, 8312-8321, 2009. PMCID: PMC2771368
NOVAK, Jan	Past	Walls, SB	Gomes, M.M., **Walls, S.B.**, Novak, J., Renfrow, M.B., Herr, A.B. Analysis of IgA1 *N*-glycosylation and its contribution to FcαRI binding. *Biochemistry.* 47, 11285-11299, 2008. PMID: 18826328

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
PONNAZHAGAN Selvarangan	Past	Hensel, J.A.* (2007-2011)	Depletion of plasmacytoid dendritic cells inhibits tumor growth and prevents bone metastasis of breast cancer cells.Sawant A, **Hensel** JA, Chanda D, Harris BA, Siegal GP, Maheshwari A, Ponnazhagan S.J *Immunol*. 2012 Nov 1;189(9):4258-65. PMCID: PMC3531993
PONNAZHAGAN Selvarangan	Past	Hensel, J.A.* (2007-2011)	LL-37 as a therapeutic target for late stage prostate cancer.**Hensel** JA, Chanda D, Kumar S, Sawant A, Grizzle WE, Siegal GP, Ponnazhagan S.*Prostate*. 2011 May;71(6):659-70. PMCID: PMC3025071
PONNAZHAGAN Selvarangan	Past	Hensel, J.A.* (2007-2011)	Therapeutic potential of adult bone marrow-derived mesenchymal stem cells in prostate cancer bone metastasis.Chanda D, Isayeva T, Kumar S, **Hensel** JA, Sawant A, Ramaswamy G, Siegal GP, Beatty MS, Ponnazhagan S. *Clin Cancer Res*. 2009 Dec 1;15(23):7175-85. PMCID: PMC2943933
PONNAZHAGAN Selvarangan	Past	Moore L* (2004-2007)	Bacteriophage hyaluronidase effectively inhibits growth, migration and invasion by disrupting hyaluronan-mediated Erk1/2 activation and RhoA expression in human breast carcinoma cells.Lee JH, **Moore** LD, Kumar S, Pritchard DG, Ponnazhagan S, Deivanayagam C.*Cancer Lett*. 2010 Dec 8;298(2):238-49. PMID: 20688428
PONNAZHAGAN Selvarangan	Past	Moore L* (2004-2007)	Tumoristatic effects of endostatin in prostate cancer is dependent on androgen receptor status. Isayeva T, **Moore** LD, Chanda D, Chen D, Ponnazhagan S. *Prostate*. 2009 Jul 1;69(10):1055-66. PMID: 19301304
PONNAZHAGAN Selvarangan	Past	Moore L* (2004-2007)	Silencing of transforming growth factor-beta1 in situ by RNA interference for breast cancer: implications for proliferation and migration in vitro and metastasis in vivo. **Moore** LD, Isayeva T, Siegal GP, Ponnazhagan S.*Clin Cancer Res*. 2008 Aug 1;14(15):4961-70. PMID: 18676771
PONNAZHAGAN Selvarangan	Past	Yang, S.W. (2006-2010)	Conditionally replicating adenovirus expressing TIMP2 increases survival in a mouse model of disseminated ovarian cancer.**Yang** SW, Chanda D, Cody JJ, Rivera AA, Waehler R, Siegal GP, Douglas JT, Ponnazhagan S.*PLoS One*. 2011;6(10):e25131. PMCID: PMC3192051
PONNAZHAGAN Selvarangan	Past	Yang, S.W. (2006-2010)	Conditionally replicating adenovirus expressing TIMP2 for ovarian cancer therapy.**Yang** SW, Cody JJ, Rivera AA, Waehler R, Wang M, Kimball KJ, Alvarez RA, Siegal GP, Douglas JT, Ponnazhagan S. *Clin Cancer Res*. 2011 Feb 1;17(3):538-49. PMCID: PMC3816714
RAMAN, Chander	Past	Axtell, R (2001-07)	Bullard, D. C., Hu, X., Schoeb, T. R., **Axtell, R. C.,** Raman, C., Barnum, S. R. Critical requirement of CD11b (Mac-1) on T-cells and Accessory Cells for Development of Experimental Autoimmune Encephalomyelitis. *J. Immunol*. 175:6327-6333. PMID: 16272284
RAMAN, Chander	Past	Axtell, R (2001-07)	**Axtell, R. C**., Xu, L, Barnum, S. R., and Raman, C. 2006. CD5-CK2 Binding/Activation deficient mice are resistant to EAE: Protection is associated with diminished subpopulations of IL-17 expressing T-cells in the CNS. *J. Immunol.* 177: 8542-8549. PMCID:2744950

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RAMAN, Chander	Past	Axtell, R (2001-07)	De Sarno, P., **Axtell, R. C**., Raman, C**.**, Roth, K.A., Alessi, D. R. and Jope, R. S. 2008. Lithium prevents and ameliorates experimental autoimmune encephalomyelitis (EAE). *J. Immunol.* 181:338-345. PMCID:2704026
RAMAN, Chander	Past	Axtell, R (2001-07)	**Axtell, R. C**., de Jong, B. A., Boniface, K., van der Voort,, L. F., Bhat, R., De Sarno, P, Naves, R., Han, M., Zhong, F., Castellanos, J. G., Mair, R., Christakos, T., Kolkowitz, I., Katz, L., Killestein, J., Polman, C. H., de Waal Malefyt, R., Steinman, L and Raman, C. 2010. T-helper types 1 and 17 determine efficacy of interferon-β in multiple sclerosis and experimental encephalomyelitis. *Nat. Medicine.* 16:406:412.(has accompanying N&V article). PMCID:3042885
RAMAN, Chander	Past	Cashman, K (2008 -2013)	Rowse, A., L., Naves, R., **Cashman, K.,S**., McGuire, D.J., Mbana, T., Raman, C., and De Sarno, P. 2012. Lithium controls central nervous system autoimmunity through modulation of IFN-γ signaling. *PLOS ONE*, 7:e52658. PMCID:3532311
RAMAN, Chander	Past	Cashman, K (2008 -2013)	McGuire, D. J., Rowse, A. L., Li, H., Peng, B., Sestero, C., **Cashman, K. S**., De Sarno, P., and Raman, C. 2014. CD5 enhances Th17 cell differentiation by regulating IFN-γ response and RORγt localization. *Eur. J. Immunol.* 44:1137-1142. PMCID:3984608
RAMAN, Chander	Past	McGuire, D (2008-2013)	Sestero, C. S., **McGuire, D.M**., De Sarno, P., Brantley, E. C. Axtell, R. C., and Raman, C. CD5-dependent CK2 activation pathway regulates threshold for T-cell anergy. *J. Immunol*. 189:2918-2930. PMCID:3436980
RAMAN, Chander	Past	McGuire, D (2008-2013)	Rowse, A., L., Naves, R., Cashman, K., S., **McGuire, D.J.**, Mbana, T., Raman, C., and De Sarno, P**.** 2012. Lithium controls central nervous system autoimmunity through modulation of IFN-γ signaling. *PLOS ONE*, 7:e52658. PMCID:3532311
RAMAN, Chander	Past	McGuire, D (2008-2013)	**McGuire, D. J.,** Rowse, A. L., Li, H., Peng, B., Sestero, C., Cashman, K. S., De Sarno, P., and Raman, C. 2014. CD5 enhances Th17 cell differentiation by regulating IFN-γ response and RORγt localization. *Eur. J. Immunol.* 44:1137-1142. PMCID:3984608
RAMAN, Chander	Past	Rowse, A (2009-2013)	**Rowse, A., L**., Naves, R., Cashman, K., S., McGuire, D.J., Mbana, T., Raman, C., and De Sarno, P. 2012. Lithium controls central nervous system autoimmunity through modulation of IFN-γ signaling. *PLOS ONE*, 7:e52658. PMCID:3532311
RAMAN, Chander	Past	Rowse, A (2009-2013)	McGuire, D. J., **Rowse, A. L**., Li, H., Peng, B., Sestero, C., Cashman, K. S., De Sarno, P., and Raman, C. 2014. CD5 enhances Th17 cell differentiation by regulating IFN-γ response and RORγt localization. *Eur. J. Immunol*. 44:1137-1142. PMCID:3984608
RAMAN, Chander	Past	Rowse, A (2009-2013)	Harms, A. S., Cao, S., **Rowse, A. L**., Thome, A. D., Li, X., Cron, R. Q., Raman, C., and Standaert, D. 2013. MHCII is required for Alpha-Synuclein Induced Activation of Microglia, CD4 T Cell Proliferation and Dopaminergic Neurodegeneration. *J. Neuroscience,* 33:9592-9600.PMCID: 3903980.

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RAMAN, Chander	Past	Rowse, A (2009-2013)	Naves, R., Singh, S. P., Cashman, K. S. **Rowse, A. L**. Axtell, R. C., Steinman, L., Mountz, J. D., Steele, C., De Sarno, P and Raman, C. 2013. The interdependent, overlapping and differential roles of type I and type II interferons in the pathogenesis of experimental autoimmune encephalomyelitis. *J. Immunol*. 191:2967-2977 PMCID:3779698
RAMAN, Chander	Past	Rowse, A (2009-2013)	Liu, Y., Holdbrooks, A. T., De Sarno, P., **Rowse, A. L**., Yanagisawa, L. L., McFarlan, B. C., Harrington, L. E., Raman, C., Sabbaj, S., Benveniste, E. N. and Qin, H. 2014. Therapeutic efficacy of suppressing the JAK/STAT pathway in multiple models of neuroinflammation. *J Immunol.* 192:59-72 PMCID:3934829
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	Ali T, Kokotos G, Magrioti V, Bone RN, Mobley JA, **Hancock W**, Lei X, Ramanadham S: Characterization of FKGK18 as Inhibitor of Group VIA Ca^{2+}-Independent Phospholipase A_2 ($iPLA_2\square$): Candidate Drug for Preventing Beta-Cell Apoptosis and Diabetes. *PLoS ONE* 8(8): e71748*. PMCID: PMC3748103*
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	Ramanadham, S, Ali, T, Bone, RN, **Hancock W**, Lei, X. Calcium-Independent Phospholipases A_2 ($iPLA_2$s) and their roles in Biological Processes and Diseases. (*JLR, under revision, April 2015*).
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	Ashley JW, **Hancock W**, Bone RN, Lei X, Ramanadham S. Differential Roles for Group VIA Calcium Independent Phospholipase A_2 ($iPLA_2\square$) in Peritoneal and Bone Marrow Macrophages (JBC, in preparation, April 2015).
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	**Hancock W**, Ramanadham S. Prostaglandin E2 Rescue of Impaired Mesenchymal Stem Cell Differentia CDIB Retreat, Lake Guntersville, Feb. 15, 2013. (3^{rd} Place Grad Student Poster Presentation Award).
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	**Hancock W**, Ashley JW, Clines GA, Ramanadham S. Effects of Calcium-independent Phospholipase A_2 on Differentiation and Activity of Cortical Bone derived Osteoblasts. ASMBR, Baltimore, MD. October 2013
RAMANADHAM Sasanka	Current	Hancock, William (2011-present)	**Hancock W**, Clines GA, Gai Y, Ramanadham S. RA and $iPLA_2\square$. The Role of Calcium-independent Phospholipase $A_2\beta$ in the Fate of Cortical Bone Derived Mesenchymal Stem Cells. 48^{th} *Southeastern Regional Lipid Conference*. Cashiers, NC. November 2013.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Lei X, **Bone RN**, Ali T, Wohltmann M, Gai Y, Goodwin KJ, Bohrer A, Turk, J, Ramanadham S: Genetic Modulation of Islet β-Cell $iPLA_2\beta$ Expression Provides Evidence for its Impact on β-Cell Apoptosis and Autophagy. *Islets* 5(1): 29-44, 2013. *(EPub ahead of print Jan. 1, 2013).* PMC3662380
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ali T, Kokotos G, Magrioti V, **Bone RN**, Mobley JA, Hancock W, Lei X, Ramanadham S: Characterization of FKGK18 as Inhibitor of Group VIA Ca^{2+}-Independent Phospholipase A_2 ($iPLA_2\square$): Candidate Drug for Preventing Beta-Cell Apoptosis and Diabetes. *PLoS ONE* 8(8): e71748*.* PMC3748103

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Lei X, **Bone RN**, Zhang S, Bohrer A, Tse H, Bidasee KR, Ramanadham S: Novel Mechanism for Autoimmune □-Cell Death in Type 1 Diabetes: ER stress and iPLA$_2$□ Activation Participate in Pro-Inflammatory Cytokine-Mediated □-Cell Apoptosis. . *Endocrinology 55(9):3352-64, 2014*.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Kokotos G, Magrioti V, Tse HM, Ramanadham S. Inhibition of iPLA$_2$□ Ameliorates Insulitis and Incidence of Diabetes in NOD. *Diabetes, 64(2):541-554, 2015.*
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ramanadham, S, Ali, T, Bone, RN, Hancock, W, Lei, X. Calcium-Independent Phospholipases A$_2$ (iPLA$_2$s) and their roles in Biological Processes and Diseases. (*JLR, under revision, April 2015*).
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Tse H, Ramanadham S, Autophagy during the progression of insulitis in the Non-Obese Diabetic mouse. 5th *Annual Boshell Diabetes and Metabolic Diseases Research Day*. Auburn, AL. March 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Tse HM, Ramanadham S. Autophagy during the Progression of Insulitis in the Non-Obese Diabetic Mouse. *UAB Diabetes Day*. Birmingham, AL. May 1, 2012. (Oral Presentation).
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Tse HM, Ramanadham S. Autophagy during the Progression of Insulitis in the Non-Obese Diabetic Mouse. *Midwest Islet Conference*. Pittsburgh, PA. May 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ramanadham S, **Bone RN**, Ali T, Tse HM, Barbour SE, Lei X. iPLA$_2$beta and beta-cell apoptosis: Implications in diabetes mellitus. FASEB Summer Research Conference on Phospholipid Metabolism: Disease, Signal Transduction, and Membrane Dynamics Saxtons River, Vermont. July 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Lei X, Ramanadham S. Dysregulation of beta-cell autophagy during type 2 diabetes mellitus. 8th *Annual Pathology Trainee Research Day*, UAB, Birmingham. October 26, 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Lei X, Ramanadham S. Dysregulation of beta-cell autophagy during type 2 diabetes mellitus. *Inaugural Graduate Biomedical Student Outreach Retreat*, UAB, Birmingham. September 22, 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Tse HM, Ramanadham S. Autophagy during the Progression of Insulitis in the Non-Obese Diabetic Mouse. *UAB Diabetes Day*. Birmingham, AL. May 1, 2012. (Oral Presentation).
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Tse HM, Ramanadham S. Autophagy during the Progression of Insulitis in the Non-Obese Diabetic Mouse. *Midwest Islet Conference*. Pittsburgh, PA. May 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Bone RN, Lei X, Ramanadham S. Dysregulation of beta-cell autophagy during type 2 diabetes mellitus. *8th Annual Pathology Trainee Research Day*, UAB, Birmingham. October 26, 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Lei X, Ramanadham S. Dysregulation of beta-cell autophagy during type 2 diabetes mellitus. *Inaugural Graduate Biomedical Student Outreach Retreat*, UAB, Birmingham. September 22, 2012.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ramanadham S, Tse HM, Lei X, **Bone RN**. iPLA$_2$□ and Diabetes. *5Th International Conference on Phospholipase A$_2$ Mediate Signaling in Translational Medicine*. New Orleans, LA, May 2013.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Ramanadham S. Increases in glucose concentrations promote beta-cell autophagy via mTOR-independent mechanism. (*ADA* poster session, 2013)
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Kokotos G, Magrioti V, Tse HM, Ramanadham S. Inhibition of a Ca^{2+}-independent Phospholipase A_2 Attenuates Type 1 Diabetes Development in the Non-obese Diabetic Mouse. *9th Annual Pathology Trainee Research Day*, UAB, Birmingham. October 18, 2013.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ramanadham S, Kokotos G, Magrioti V, Tse HM, Lei X, **Bone RN**. Role of iPLA$_2\beta$ in Immune Response. 13th *International Conference on Bioactive Lipids in Cancer, Inflammation*, and Related Diseases. San Juan, Puerto Rico, November 3-6, 2013. Oral Presentation.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Ali T, Kokotos G, Magrioti V, Tse HM, Ramanadham S. Inhibition of a Ca^{2+}-independen Phospholipase A_2 (iPLA$_2\beta$) by a Novel Fluoroketone Compound Ameliorates iPLA$_2\beta$-Induced Beta-cell Detriments and Type 1 Diabetes Development. 48th *Southeastern Regional Lipid Conference*. Cashiers, NC. November 2013.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Magrioti V, Tse HM, Kokotos G, Ramanadham S. Incidence of Type 1 Diabetes is Reduc Following Neonatal Administration of a Fluoroketone Inhibitor of Ca^{2+}-independent Phospholipase A_2□. 7 Annual *Boshell Diabetes and Metabolic Diseases Research Day*. Auburn, AL. Feb. 28, 2014.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	Ramanadham S, Gai Y, Magrioti, Tse HM, Kokotos G, **Bone RN**, Lei X. Involvement of iPLA$_2$□-Derived S in Immune Responses Leading to Islet Infiltration and Diabetes Development. 15th *International Winter Eicosanoid Conference*. Baltimore, MD, March 9-12, 2014 (Oral Presentation).
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN,** Gai Y, Magrioti V, Tse HM, Kokotos G, Ramanadham S. Reduced Incidence of Type 1 Diabet Following Inhibition of the Ca^{2+}- Independent Phospholipase A_2□ by a Novel Fluoroketone-Based Compo 15th *International Winter Eicosanoid Conference*. Baltimore, MD, March 9-12, 2014.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Magrioti V, Tse HM, Kokotos G, Ramanadham S. Inhibition Of The Ca^{2+}-Independent Phospholipase $A_2\beta$ (iPLA$_2\beta$) by a Novel Fluoroketone-Based Compound Reduces Downstream Products of iPLA$_2\beta$ and Reduced Incidence of Type 1 Diabetes. *UAB Diabetes Day*, Birmingham, AL May 23, 201 (Oral Presentation).
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Kokotos G, Magrioti V, Tse HM, Ramanadham S. Early Administration of a Fluoroketon Inhibitor of Ca^{2+}-independent Phospholipase A_2beta Reduces Type 1 Diabetes Incidence in the NOD Mou ADA, San Francisco, CA, June 2014.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Gai Y, Magrioti V, Tse HM, Kokotos G, Ramanadham S. Inhibition of Group VIA Ca^{2+}-indepen Phospholipase A_2 Prevents Lipid Signaling Products from Contributing to the Development of Type 1 Diab 49th *Southeastern Regional Lipid Conference*. Cashiers, NC. November 2014.
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN,** Gai Y, Magrioti V, Tse HM, Kokotos G, Ramanadham S. Group VIA Ca^{2+}-independent Phosph $A_2\beta$ Derived Lipid Products Contribute to the Development of Type 1 Diabetes. 8th *Annual Boshell Diabe Metabolic Diseases Research Day*. Auburn, AL. Feb. 13, 2015.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
RAMANADHAM Sasanka	Past	Bone, Robert N (2011-2014)	**Bone RN**, Ying Gai Y, Nelson AJ, Magrioti V, Tse HM, Mathews CE, Kokotos G, Ramanadham S. Evidence for the Role of Calcium-independent Phospholipase A2beta During Type 1 Diabetes Pathogenesis in the NOD Mouse. *Midwest Islet Conference*. Chicago, IL. May 2015.
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	Lei X, Zhang S, **Emani B**, Barbour SE, Ramanadham S: A Link between ER Stress-Induced □-Cell Apoptosis and the Group VIA Ca^{2+}-Independent Phospholipase A_2 ($iPLA_2$□). *Diab, Ob Metab* 12(Suppl. 2): 93-98, 2010. PMC3713613
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	Barbour SE, **Emani B**, Lei X, Kambalapalli M, Shultz JC Chalfant, CE, Ramanadham S: (Group VIA Phospholipase A_2 Regulates Bcl-x Splicing in β-cells) Alternate Splicing of Bcl-x is Modulated by $iPLA_2$□ During beta-cell apoptosis. (*JBC*, *November 2013*).
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	**Emani B**, Lei X, Ramanadham S, Barbour SE: Regulation of Pre-mRNA Splicing by Group VIA Phospholipase A_2 ($iPLA_2$□). *Southeast Regional Lipid Conference*, NC, November 2009.
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	Barbour SE, Wilkins P, **Emani B,** Lei X, Gil G, Turk J, Ramanadham S: Calcium-Independent Phospholipase A_2β in Cell and Systemic Lipid Metabolism. *FASEB,* July 2010.
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	**Emani B**, β-Cell apoptosis and Ca^{2+}-Independent Phospholipase A_2, Servier 11th IGIS Symposia. St. Jean Cap Ferrat, FRANCE (Invited Poster).
RAMANADHAM Sasanka	Past	Emani, Bharghavi (2008-2010)	Lei X, **Emani B**, Hambright D, Goodwin KJ, Tse HM, Barbour SE, Ramanadham S: Ca^{2+}-independent Phospholipase A_2 ($iPLA_2$□)-Regulated Alternate Splicing in Beta-Cells During the Development of Diabetes Mellitus. 45th *Southeastern Regional Lipid Conference*. Cashiers, NC. Nov. 2010.
RAMANADHAM Sasanka	Past	Jain, Nikhita (2011-2012)	Tsai W, **Jain N**, Goodwin KJ, Lei X, Ramanadham S: A Proposed Model of Apoptosis of Pancreatic Insulin-Secreting Beta-Cells. *(Inquiro, UAB Undergraduate Journal, Oct. 2011)*.
RAMANADHAM Sasanka	Past	Jain, Nikhita (2011-2012)	Shimanaka H, Lei X, Goodwin KJ, Tsai WC, **Jain N**, Akio Koizumi A, Tse HM, Ramanadham S: Reactive Oxygen Species and Expression of Ca^{2+}-Independent Phospholipase A_2□ ($iPLA_2$□) in Beta-Cells. 45th Southeastern Regional Lipid Conference. Cashiers, NC. Nov. 2010. *(Poster Abstract).*
RAMANADHAM Sasanka	Past	Jain, Nikhita (2011-2012)	Tsai W, **Jain N**, Goodwin KJ, Lei X, Ramanadham S. Lipid Concentration and Duration of Exposure Effect on NSMase Expression. Undergraduate UAB Expo, University of Alabama at Birmingham, AL. April 22, 2011.
RAMANADHAM Sasanka	Past	Shiminaka, Hiroko (2010-2011)	**Shimanaka H**, Lei X, Goodwin KJ, Tsai WC, Jain N, Akio Koizumi A, Tse HM, Ramanadham S: Reactive Oxygen Species and Expression of Ca^{2+}-Independent Phospholipase A_2□ ($iPLA_2$□) in Beta-Cells. 45th Southeastern Regional Lipid Conference. Cashiers, NC. Nov. 2010. *(Poster Abstract).*
RAMANADHAM Sasanka	Past	Tsai, Winnie C (2011-2012)	**Tsai W,** Jain N, Goodwin KJ, Lei X, Ramanadham S: A Proposed Model of Apoptosis of Pancreatic Insulin-Secreting Beta-Cells. *(Inquiro, UAB Undergraduate Journal, Oct. 2011)*.

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RAMANADHAM Sasanka	Past	Tsai, Winnie C (2011-2012)	Shimanaka H, Lei X, Goodwin KJ, **Tsai WC**, Jain N, Akio Koizumi A, Tse HM, Ramanadham S: Reactive Oxygen Species and Expression of Ca^{2+}-Independent Phospholipase A_2 ($iPLA_2$) in Beta-Cells. 45th Southeastern Regional Lipid Conference. Cashiers, NC. Nov. 2010. *(Poster Abstract).*
RAMANADHAM Sasanka	Past	Tsai, Winnie C (2011-2012)	**Tsai W**, Jain N, Goodwin KJ, Lei X, Ramanadham S. Lipid Concentration and Duration of Exposure Effect on NSMase Expression. Undergraduate UAB Expo, University of Alabama at Birmingham, AL. April 22, 2011.
RANDALL, Troy	Current	Hwang, Ji Young (2009-present)	Rangel-Moreno J, Carragher DM, de la Luz Garcia-Hernandez M, **Hwang JY**, Kusser K, Hartson L, Kolls JK, Khader SA, Randall TD. 2011. Induction of BALT in the absence of IL-17. *Nat Immunol*. 13:2. PMCID: PMC3520063
REDDEN, David T.	Past	Li, Peng (2011-2014)	**Li** P, Redden DT. Comparing denominator degrees of freedom approximations for the generalized linear mixed model in analyzing binary outcome in small sample cluster-randomized trials. *BMC Med Res Methodol.* 2015 Apr 23;15(1):38. [Epub ahead of print] PubMed PMID: 25899170.
REDDEN, David T.	Past	Li, Peng (2011-2014)	**Li** P, Redden DT. Small sample performance of bias-corrected sandwich estimators for cluster-randomized trials with binary outcomes. *Stat Med*. 2015 Jan 30;34(2):281-96. doi: 10.1002/sim.6344. Epub 2014 Oct 24. PubMed PMID: 25345738; PubMed Central PMCID: PMC4268228.
REYNOLDS, Richard	Past	Ahmed, Altan (UAB) (2011)	Reynolds RJ, **Ahmed AF**, Danila MI, Hughes LB; Consortium for the Longitudinal Evaluation of African Americans with Early Rheumatoid Arthritis Investigators, Gregersen PK, Raychaudhuri S, Plenge RM, Bridges SL Jr. 2014. HLA-DRB1-associated rheumatoid arthritis risk at multiple levels in African Americans: hierarchical classification systems, amino acid positions, and residues. *Arthritis Rheumatol*. PMC4273668.
REYNOLDS, Richard	Past	Cridland, Julie	Reynolds RJ, Westbrook MJ, Rohde AS**, Cridland JM**, Fenster CB, Dudash MR. 2009. Pollinator specialization and pollination syndromes of three related North American Silene. *Ecology*. PMID: 19739370
REYNOLDS, Richard	Past	Parks, Lauren (UAB) (2012)	Tang Q, Danila MI, Cui X, **Parks L**, Baker BJ, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR, et al. 2015. Expression of Interferon-γ Receptor Genes in Peripheral Blood Mononuclear Cells Is Associated With Rheumatoid Arthritis and Its Radiographic Severity in African Americans. *Arthritis and Rheumatology*. PMC4414815.

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REYNOLDS, Richard	Past	Williams, Christopher	Fenster CB, Reynolds RJ, **Williams CW**, Makowsky R, Dudash MR. 2015. . Quantifying hummingbird preference for floral trait combinations: The role of selection on trait interactions in the evolution of pollination syndromes. *Evolution*. PMID: 25765062
SAAG, Kenneth G.	Past	Kitchin, E. (2008-2012)	**Kitchin, B.,** Morgan, S.L. "Not just calcium and vitamin D: other nutritional considerations in osteoporosis," *Curr. Rheumatol*. Rep. 2007 Apr;9(1):85-92. PMID: 17437673
SAAG, Kenneth G.	Past	Kitchin, E. (2008-2012)	Morgan, S.L., **Kitchin, B.** "Osteoporosis: handy tools for detection, helpful tips for treatment," *J. Fam. Pract*. 2008 May;57(5):311-20. PMID: 18460296
SAAG, Kenneth G.	Past	Kitchin, E. (2008-2012)	Morris, D.M., **Kitchin, E.M**., Clark, D.E., 2009. "Strategies for optimizing nutrition and weight reduction in physical therapy practice: the evidence," *Physiother Theory Pract*. 2009 Jul;25(5-6):408-23. PMID: 19842865
SAAG, Kenneth G.	Past	Kitchin, E. (2008-2012)	Vance, D.E., Kaur, J., Fazeli, P.L., Talley, M.H., Yuen, H.K., **Kitchin, B**., Lin, F. "Neuroplasticity and successful cognitive aging: a brief overview for nursing," *J. Neurosci. Nurs*. 2012 Aug;44(4):218-227. PMCID: PMC3828033
SAAG, Kenneth G.	Past	Kitchin, E. (2008-2012)	Vance, D.E., Dodson, J.E., Gakumo, C.A., Morris, D., **Kitchin, E.,** Schroder, K.E.E. "Successful cognitive aging in HIV: Potential strategies for treatment and research," *Phys Occup Ther Geriatr*. 2012
SAAG, Kenneth G.	Past	McRoy, Luceta (2010-2012)	Elder, K.T., Wiltshire, J.C., **McRoy, L**., Campbell, D., Gary, L.C., Safford, M. "Men and differences by racial/ethnic group in self advocacy during the medical encounter." *Journal of Men's Health*. 2010;7(2):135-44.
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Kilgore, M.L., Morrisey, M.A., Becker, D.J., Gary, L.C., Curtis, J.R., Saag, K.G., **Yun, H.,** Matthews, R., Smith, W., Taylor, A., Arora, T., Delzell, E., 2009. "Health care expenditures associated with skeletal fractures among Medicare beneficiaries, 1999-2005," *J. Bone Miner. Res*., 24(12):2050-5. PMID: 19453260
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Curtis, J.R., Cheng, H., Delzell, E., Fram, D., Kilgore, M., Saag, K., **Yun, H**., Dumouchel, W., 2009. "Adaptation of Bayesian data mining algorithms to longitudinal claims data: coxib safety as an example," *Med. Care*, 46(9):969-75. PMCID: PMC2694945
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Kilgore, M.L., Grabowski, D.C., Morrisey, M.A., Ritchie, C.S., **Yun, H**., Locher, J.L., 2009. "The effects of the Balanced Budget Act of 1997 on home health and hospice in older adult cancer patients," *Med. Care*, 47(3):279-85. PMCID: PMC2759602

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SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Cheng, H., Gary, L.C., Curtis, J.R., Saag, K.G., Kilgore, M.L., Morrisey, M.A., Matthews, R., Smith, W., **Yun, H.,** Delzell, E. "Estimated prevalence and patterns of presumed osteoporosis among older Americans based on Medicare data," *Osteoporos. Int.* 2009 Sep;20(9):1507-15. PMCID: PMC3767011
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Becker, D.J., **Yun, H.,** Kilgore, M.L., Curtis, J.R., Delzell, E., Gary, L.C., Saag, K.G., Morrisey, M.A., 2010. "Health services utilization after fractures: evidence from Medicare," *J. Gerontol. A Biol. Sci. Med. Sci*., 65(9):1012-20. PMID: 20530242
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Warriner, A.H., Patkar, N.M., **Yun, H.,** Delzell, E., 2011. "Minor, Major, Low-Trauma, and High-Trauma Fractures: What Are the Subsequent Fracture Risks and How Do They Vary?" *Curr. Osteoporos. Rep*., 9(3):122-8. PMID: 21698358
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Zhang, J., **Yun, H.,** Wright, N.C., Kilgore, M., Saag, K.G., Delzell, E., 2011. "Potential and pitfalls of using large administrative claims data to study the safety of osteoporosis therapies," *Curr. Rheumatol. Rep.,* 13(3):273-82. PMID: 21312073
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	Taylor, A.J, Gary, L.C., Arora, T., Becker, D.J., Curtis, J.R., Kilgore, M.L., Morrisey, M.A., Saag, K.G., Matthews, R., **Yun, H.,** Smith, W., Delzell, E. "Clinical and demographic factors associated with fractures among older Americans," *Osteoporos. Int.* 2011 Apr;22(4):1263-74. PMCID: PMC3767033
SAAG, Kenneth G.	Past	Yun, Huifeng (2010-2012)	**Yun, H.,** Kilgore, M.L., Curtis, J.R., Delzell, E., Gary, L.C., Saag, K.G., Morrisey, M.A., Becker, D., Matthews, R., Smith, W., Locher, J.L. "Identifying types of nursing facility stays using Medicare claims data: an algorithm and validation," *Health Serv. Outcomes Res*. *Method*. 2010;10(1-2):100-110.
SAFFORD, Monika	Current	Lewis, Marquita (2013-2015)	**Lewis M**, Safford MM, Cherrington A, Gamboa C, Halanych J. Assessing peer advisor intervention fidelity using video skits in a peer support implementation trial. *Health Prom Practice* 2014 Jan 30. [Epub ahead of print] PMCID: PMC4271822
SAFFORD, Monika	Past	McRoy, Luceta (2009 - 2011)	Elder KT, Wiltshire JC, **McRoy L**, Campbell D, Gary LC, Safford MM. Men and differences by racial/ethnic group in self advocacy during the medical encounter. *J Men's Health* 2010;7(2):135-144.
SAFFORD, Monika	Past	Perkins, Martinique (2009-2010)	**Perkins M**, Howard VJ, Wadley VG, Crowe M, Safford MM, Haley WE, Howard G, Roth DL. Caregiving strain and all-cause mortality: evidence from the REGARDS study. *J Gerontol B Psychol Sci Soc Sci* Epub 2012 Oct 2. PMID: 23033358.

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SCARINCI-SEARLES, Isabel	Current	Bittencourt, Lorna (2011-Present)	**Bittencourt L,** Person SD, Cruz RC, Scarinci, IC. Pictorial Health Warnings on Cigarette Packs and the Impact on Women. *Rev Saude Publica*. 2013 Dec; 47(6):1123-9. PMCID: PMC4206097
SCARINCI-SEARLES, Isabel	Current	Bittencourt, Lorna (2011-Present)	**Bittencourt L**, Scarinci IC. Is There a Role for Community Health Workers in Tobacco Cessation Programs? Perceptions of the Administrators and Health Care Professionals. *Nicotine Tob Res*. 2014 May; 16(5):626-31. PMCID: PMC4031567
SCARINCI-SEARLES, Isabel	Current	Bittencourt, Lorna (2011-Present)	Scarinci IC, **Bittencourt L**, Person S, Cruz RC, Moysés ST. Prevalence of tobacco use and associated factors among women in Paraná State, Brazil. *Cadernos de Saude Publica.* 2012 Aug;28(8):1450-8. (Article in Portuguese) PMID: 22892965
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	**Cardel M**, Willig AL, Dulin-Keita A, Casazza K, Mark Beasley T, Fernández JR. Parental feeding practices and socioeconomic status are associated with child adiposity in a multi-ethnic sample of children. *Appetite*. 2012;10;58(1):347-353. PMCID: PMC3264816
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	Casazza K, **Cardel M**, Dulin-Keita A, Hanks LJ, Gower BA, Newton AL, Wallace S. Reduced carbohydrate diet to improve metabolic outcomes and decrease adiposity in obese peripubertal African American girls. *J Pediatr Gastroenterol Nutr*. 2012 Mar;54(3):336-42. PMCID: PMC3288466
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	**Cardel M**. Behavioral Approaches to Weight Loss and Control. *Acad Today*. 2013 Jan;9(1):A9-A10. PMCID: PMC3887548
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	**Cardel M**, Willig AL, Dulin-Keita A, Casazza K, Cherrington A, Gunnarsdottir T, Johnson SL, Peters JC, Hill JO, Allison DB, Fernández JR. Home-schooled children are thinner, leaner, and report better diets relative to traditionally schooled children.*Obesity* (Silver Spring). 2014 Feb;22(2):497-503. PMCID: PMC3946420
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	**Cardel M**, Dulin-Keita A, Casazza K. Contributors to Pediatric Obesity in Adolescence: More than just Energy Imbalance. *Open Obes J*. 2011;3(2):17-26. PMCID: PMC3930161
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	Duarte CW, Klimentidis YC, Harris JJ, **Cardel M**, Fernández JR. A Hybrid Bayesian Network/Structural Equation (BN/SEM) Modeling Approach for Detecting Physiological Networks for Obesity-related Genetic Variants. *Proceedings* (IEEE Int Conf Bioinformatics Biomed). 2011:696-702. PMCID: PMC3272699
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	**Cardel M**, Higgins PB, Willig AL, Keita AD, Casazza K, Gower BA, Fernández JR. African genetic admixture is associated with body composition and fat distribution in a cross-sectional study of children. *Int J Obes* (Lond). 2011 Jan;35(1):60-5. PMCID: PMC3804117

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
SCARINCI-SEARLES, Isabel	Current	Cardel, Michelle I. (2006-Present)	Hanks LJ, Casazza K, Willig AL, **Cardel MI**, Beasley TM, Fernandez JR. Associations among calcium intake, resting energy expenditure, and body fat in a multiethnic sample of children. *J Pediatr*. 2010 Sep;157(3):473-8. PMCID: PMC2926136
SCARINCI-SEARLES, Isabel	Current	Drewry, Jonathan (2008-Present)	**Drewry J**, Sen B, Wingate M, Bronstein J, Foster ME, Kotelchuck M. The Impact of the State Children's Health Insurance Program's Unborn Child Ruling Expansions on Foreign-Born Latina Prenatal Care and Birth Outcomes, 2000–2007. *Matern Child Health J*, 2014 Dec 5 [Epub ahead of print] PMID: 25476607
SCARINCI-SEARLES, Isabel	Current	Drewry, Jonathan (2008-Present)	Van Wagoner NJ, Harbison HS, **Drewry J**, Turnipseed E, Hook EW 3rd. Characteristics of women reporting multiple recent sex partners presenting to a sexually transmitted disease clinic for care. *Sex Transm Dis*. 2011;38(3):210-5. PMID: 20966829
SCARINCI-SEARLES, Isabel	Current	Drewry, Jonathan (2008-Present)	Drewry J, Garcés-Palacio IC, Scarinci I. Awareness and knowledge about human papillomavirus among Latina immigrants. *Ethn Dis*. 2010;20(4):327-33. PMCID: PMC3097024
SCARINCI-SEARLES, Isabel	Current	Heersink, Juanita (2008-Present)	**Heersink JT**, Brown CJ, Dimaria-Ghalili RA, Locher JL. Undernutrition in hospitalized older adults: patterns and correlates, outcomes, and opportunities for intervention with a focus on processes of care. *J Nutr Elder*. 2010 Jan;29(1):4-41. PMID: 20391041
SCARINCI-SEARLES, Isabel	Past	Barreto, Partricia (2007-2008)	Kuo AA, Shetgiri R, Guerrero AD, **Barreto PM**, Perez VH, Fond K, Slusser W. A public health approach to pediatric residency education: responding to social determinants of health. *J Grad Med Educ*. 2011 Jun;3(2):217-23. PMCID: PMC3184909
SCARINCI-SEARLES, Isabel	Past	Barreto, Partricia (2007-2008)	Guerrero AD, Slusser WM, **Barreto PM**, Rosales NF, Kuo AA. Latina mothers' perceptions of healthcare professional weight assessments of preschool-aged children. *Matern Child Health J*. 2011;15(8):1308-15. PMCID: PMC3195685
SCARINCI-SEARLES, Isabel	Past	Flores, Bertha (2012)	Flores BE, Acton GJ. Older Hispanic Women, Health Literacy, and Cervical Cancer Screening. *Clin Nurs Res*. 2013; 22(4):402-415. PMID: 23729023
SCARINCI-SEARLES, Isabel	Past	Garces, Isabel (2003-2009)	See publications under Post-Trainees
SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Aldrich MC, **Hidalgo B**, Widome R, Briss P, Brownson RC, Teutsch SM. The role of epidemiology in evidence-based policy making: a case study of tobacco use in youth. *Ann Epidemiology*. 2015 May; 25(5):360-5. PMCID: PMC4211989
SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Arend RC, Londoño-Joshi AI, Samant RS, Li Y, Conner M, **Hidalgo B**, Alvarez RD, Landen CN, Straughn JM, Buchsbaum DJ. Inhibition of Wnt/β-catenin pathway by niclosamide: a therapeutic target for ovarian cancer. *Gynecol Oncol*. 2014 Jul; 134(1):112-20. PMID: 24736023

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SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Irvin MR, Aslibekyan S, **Hidalgo B**, Arnett D. CPT1A: the future of heart disease detection and personalized medicine? *Clin Lipidol*. 2014; 9(1):9-12. PMCID: PMC4358228
SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Londoño-Joshi AI, Arend RC, Aristizabal L, Lu W, Samant RS, Metge BJ, **Hidalgo B**, Grizzle WE, Conner MB, Forero-Torres A, Lobuglio AF, Li Y, Buchsbaum DJ. Effect of niclosamide on basal-like breast cancers. *Mol Cancer Ther*. 2014 April; 13(4):800-11. PMCID: PMC3981919
SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Carson TL, **Hidalgo B**, Ard JD, Affuso O. Dietary Interventions and Quality of Life: A Systematic Review of the Literature. *J Nutr Educ Behav*. 2014 Mar-Apr; 46(2):90-101. PMCID: PMC3982833
SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	**Hidalgo B**, Irvin MR, Sha J, Zhi D, Aslibekyan S, Absher D, Tiwari HK, Kabagambe EK, Ordovas JM, Arnett DK. Epigenome-Wide Association Study of Fasting Measures of Glucose, Insulin, and HOMA-IR in the Genetics of Lipid Lowering Drugs and Diet Network Study. *Diabetes*. 2014 Feb;63(2):801-7. PMCID: PMC3968438
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SCARINCI-SEARLES, Isabel	Past	Hidalgo, Bertha A. (2008)	Casazza K, Hanks LJ, **Hidalgo B**, Hu HH, Affuso O. Short-term physical activity intervention decreases femoral bone marrow adipose tissue in young children: a pilot study. *Bone*. 2012 Jan;50(1):23-7. PMCID: PMC3246551
SCARINCI-SEARLES, Isabel	Past	Litton, Allison (2010-2012)	Scarinci IC, **Litton AG**, Garcés-Palacio IC, Partridge EE, Castle PE. Acceptability and usability of self-collected sampling for HPV testing among African-American women living in the Mississippi Delta. *Womens Health Issues*. 2013 Mar-Apr;23(2):e123-30. PMCID: PMC3596478

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SCARINCI-SEARLES, Isabel	Past	Litton, Allison (2010-2012)	**Litton A**, Waterbor JW, Chapman K, Abdullah F, Thomas S, Desmond RA. An achievement of professional, public, and patient education: the design and evaluation of a comprehensive cancer control plan for Alabama. *J Cancer Educ*. 2012 Jun;27(3):478-85. PMID: 22528631
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SCHROEDER, Harry W.	Past	Ippolito, Gregory C (5)	**Ippolito, GC***, Schelonka RL, Zemlin M, Ivanov II, Kobayashi R, Zemlin C, Gartland L, Nitschke L, Pelkonnen J, Fujihashi K, Rajewsky K, Schroeder HW Jr. (2006) Forced use of an immunoglobulin D_H encoding positively charged amino acids impairs B cell development and function. *J Exp Med.* 203:1567-1578. PMID: 16754718
SCHROEDER, Harry W.	Past	Ippolito, Gregory C (5)	Schelonka RL, Zemlin M, Kobayashi R, **Ippolito GC**,* Zhuang Y, Gartland GL, Fujihashi K, Rajewsky K, Schroeder HW Jr. (2008) Preferential use of D_H reading frame 2 alters B cell development and antigen-specific antibody production. *J Immunol* 181(12): 8409-8415. PMCID: PMC2679994**.**
SCHROEDER, Harry W.	Past	Ippolito, Gregory C (5)	Zemlin M, Schelonka RL, **Ippolito GC***, Zemlin C, Zhuang Y, Gartland GL, Nitschke L, Pelkonen J, Rajewsky K, Schroeder HW Jr. (2008) Regulation of repertoire development through genetic control of DH reading frame preference. *J Immunol* 181(12): 8416-8424. PMCID: PMC268007**.**
SCHROEDER, Harry W.	Past	Szymanska-Mroczek, Ewa (2009-present)	Schelonka RL, **Szymanska E***, Vale AM, Zhuang Y, Gartland GL, Schroeder HW Jr. (2010) D_H and J_H usage in murine fetal liver demonstrates extensive homology to that of human fetal liver. *Immunogenetics* 62(10):653-66. PMID: 20714894. PMCID: PMC2944024**.**
SCHROEDER, Harry W.	Past	Szymanska-Mroczek, Ewa (2009-present)	Schelonka RL, Ivanov I, Vale AM, **Szymanska E***, Zemlin M, Gartland GL, Schroeder HW Jr. (2010) The CDR-H3 repertoire from TDT deficient adult bone marrow is a close, but not exact, homologue of the CDR-H3 repertoire from perinatal liver. *J Immunol* 185(10):6075-6084. PMCID: PMC3670101**.**
SCHROEDER, Harry W.	Past	Szymanska-Mroczek, Ewa (2009-present)	**Szymanska-Mroczek E***, Ippolito GC, Rogosch T, Hoi KH, Hwangpo TA, Brand MG, Zhuang Y, Liu CR, Schneider DA, Zemlin M, Brown EE, Georgiou G, Schroeder HW Jr. (2014) Differences in the composition of the human antibody repertoire by B cell subsets in the blood. *Front Immunol* 19 March 2014 | doi: 10.3389/fimmu.2014.00096. PMCID: PMC3958703
SCHROEDER, Harry W.	Past	Watkins, Letitia S (2010-2013)	Cha SC, Qin H, Kannan S, Rawal S, **Watkins LS***, Baio FE, Wu W, Ong J, Wei J, Kwak B, Kim S, Popescu MS, Paick DS, Kim K, Luong A, Davis RE, Schroeder HW Jr, Kwak LW, Neelapu SS. (2013) Nonstereotyped lymphoma B cell receptors recognize vimentin as a shared autoantigen. *J Immunol*. PMID 23536634. PMCID: PMC3633696**.**

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SCHWIEBERT, Lisa M.	Past	Hewitt, Matt (2004-2008)	Nicola, T., Hagood, J.S., James, M.L., Macewen, M.W., Williams, T.A., **Hewitt, M.M**., Schwiebert, L., Bulger, A., Oparil, S., Chen, Y.F., and N. Ambalavanan. Loss of Thy-1 inhibits alveolar development in the newborn mouse lung. *Am. J. Physiol.* 296:L738-50, 2009. PMC2681351
SCHWIEBERT, Lisa M.	Past	Hewitt, Matt (2004-2008)	Werner, J., Metz, A., Horn, D., Schoeb, T., **Hewitt, M**., Schwiebert, L., Faro-Trindade, I, Brown, G. D., and C. Steele. Requisite role for the dectin-1 beta-glucan receptor in pulmonary defense against *Aspergillus fumigatus*. *J. Immunol.* 182:4938-46, 2009. PMC3434356
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SERRA, Rosa	Current	Appelboom, Brittany (2014-present)	Cox MK, **Appelboom BL**, Ban GI, Serra R. Erg cooperates with TGF-β to control mesenchymal differentiation. *Experimental Cell Research*, 328 (2): 410-418, 2014. PMC4252592
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SERRA, Rosa	Current	Coricor, George (2013-present)	Wang Y, Cox MK, **Coricor G**, MacDougall M, Serra R. Inactivation of *Tgfbr2* in Osterix-Cre expressing Dental Mesenchyme Disrupts Molar Root Formation, *Developmental Biology*, 382:27-37, 2013. PMC3783640
SERRA, Rosa	Past	Baffi, Michael (2002-2005)	**Baffi MO**, Moran MA and Serra R, Tgfbr2 regulates the maintenance of boundaries in the axial skeleton. *Developmental Biology*, 296:363-374, 2006. PMC1800905
SERRA, Rosa	Past	Baxley, Sarah (2007-2011)	Roarty K, **Baxley SE**, Crowley MR, Frost AR, Serra R. Loss of TGF-ß or Wnt5a results in an increase in Wnt/ ß-catenin activity and redirects mammary tumor phenotype. *Breast Cancer Research* 11: R19 2009. PMC2688948

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SERRA, Rosa	Past	Baxley, Sarah (2007-2011)	Serra R, Easter S, Jiang W, **Baxley SE**. Wnt5a as an effector of TGFβ in mammary development and cancer. In Press, *Journal of Mammary Gland Biology and Neoplasia*, 2011. PMCID: PMC3107509
SERRA, Rosa	Past	Baxley, Sarah (2007-2011)	**Baxley SE**, Jiang W, and Serra R. Overexpression of Wnt5a in mouse mammary gland inhibits the milk ejection response and regulates Cx43 phosphorylation. *Biology of Reproduction*, In Press, 2011. PMID: 21753195
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SERRA, Rosa	Past	Chang, Ching Fang (2007-2012)	**Chang C-F**, Ramaswamy G, Serra R. Depletion of primary cilia in articular chondrocytes results in reduced Gli3 repressor to activator ratio, increased Hedgehog signaling, and symptoms of early osteoarthritis. *Osteoarthritis and Cartilage* 20:152-161, 2011. PMC3260404
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SERRA, Rosa	Past	Cox, Megan (2008-2013)	**Cox MK**, Appelboom BL, Ban GI, Serra R. Erg cooperates with TGF-β to control mesenchymal differentiation. *Experimental Cell Research*, 328 (2): 410-418, 2014. PMC4252592
SERRA, Rosa	Past	Easter, Stephanie (2010-2014)	Serra R, **Easter S**, Jiang W, Baxley SE. Wnt5a as an effector of TGFβ in mammary development and cancer. In Press, *Journal of Mammary Gland Biology and Neoplasia*, 2011. PMCID: PMC3107509
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SERRA, Rosa	Past	Mitchell, Elizabeth (2009-2014)	Jiang W, Crossman D, **Mitchell EH**, Sohn P, Crowley MR, Serra R. Wnt5a inhibits metastasis and alters Cd44 mRNA splicing in breast cancer cells. *PLOS One* 8(3): e58329, 2013. PMC3590134

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SERRA, Rosa	Past	Mitchell, Elizabeth (2009-2014)	Easter SL, **Mitchell EH**, Baxley S, Desmond R, Frost AR, Serra R. Wnt5a suppresses tumor formation and redirects tumor phenotype in MMTV-Wnt1tumors. In Press, *PLOS One* 2014. PMC4234660
SERRA, Rosa	Past	Ramaswamy, Girish (2008-2012)	Chang C-F, **Ramaswamy G**, Serra R. Depletion of primary cilia in articular chondrocytes results in reduced Gli3 repressor to activator ratio, increased Hedgehog signaling, and symptoms of early osteoarthritis. *Osteoarthritis and Cartilage* 20:152-161, 2011. PMC3260404
SERRA, Rosa	Past	Ramaswamy, Girish (2008-2012)	**Ramaswamy G**, Sohn P, Eberhardt A, Serra R. Altered responsiveness to TGF-ß results in reduced Papss2 expression and alterations in the biomechanical properties of mouse articular cartilage. *Arthritis Research and Treatment*. 14:R49, 2012. PMC3446415
SERRA, Rosa	Past	Roarty, Kevin (2004-2008)	**Roarty K** and Serra R. Wnt5a is required for proper mammary gland development and TGF-ß mediated inhibition of ductal growth. *Development* 134:3929-3939, 2007. PMID: 17898001
SERRA, Rosa	Past	Roarty, Kevin (2004-2008)	Johnson E, Nicola T, **Roarty K**, Yoder BK, Haycraft CJ, and Serra, R. A role for cilia in the regulation of mouse ovarian function. *Developmental Dynamics*, 237:2053-2060, 2008. PMID: 18629867
SERRA, Rosa	Past	Roarty, Kevin (2004-2008)	**Roarty K**, Baxley SE, Crowley MR, Frost AR, Serra R. Loss of TGF-ß or Wnt5a results in an increase in Wnt/ ß-catenin activity and redirects mammary tumor phenotype. *Breast Cancer Research* 11: R19 2009. PMC2688948
SERRA, Rosa	Past	Roarty, Kevin (2004-2008)	Qin H, Wang L, Feng T, Elson CO, Niyongere SA, Lee SJ, Reynolds SL, Weaver CT, **Roarty K**, Serra R, Benveniste EN and Cong Y TGF-β Promotes Th17 Cell Development through Inhibition of SOCS3. *The Journal of Immunology* 183, 97-105, 2009. PMC2851540
SERRA, Rosa	Past	Seo, Hwa Seon (2004-2008)	**Seo H-S**, Serra R Deletion of Tgfbr2 in Prx1-cre expressing limb mesenchyme results in defects in the development of the long bone and joints. *Developmental Biology* 310:304-316, 2007. PMC2042108
SERRA, Rosa	Past	Seo, Hwa Seon (2004-2008)	**Seo H-S** and Serra R. Tgfbr2 regulates development of the skull vault. *Developmental Biology*, 334:481-490 2009. PMC2753698
SERRA, Rosa	Past	Song, Buer (2004-2006)	**Song B**, Haycraft CJ, Yoder B, Serra R, Intraflagellar transport proteins are required for post-natal development of the growth plate. *Developmental Biology* 305:202-216, 2007. PMC1931410
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STANDAERT, David	Current	Allen, H.* (2010- present)	Saunders JA, Estes KA, Kosloski LM, **Allen HE**, Dempsey KM, Torres-Russotto DR, Meza JL, Santamaria PM, Bertoni JM, Murman DL, Ali HH, Standaert DG, Mosley RL, Gendelman HE. CD4+ regulatory and effector/memory T cell subsets profile motor dysfunction in Parkinson's disease. *J Neuroimmune Pharmacol*. 2012 Dec;7(4):927-38. PMCID: PMC3515774
STANDAERT, David	Current	Allen, H.* (2010- present)	**Allen Reish HE,** Standaert DG. Role of α-synuclein in inducing innate and adaptive immunity in Parkinson disease. *J Parkinsons Dis*. 2015;5(1):1-19. PMCID: PMC4405142
STANDAERT, David	Current	Moehle, M.* (2011- present)	**Moehle MS**, Webber PJ, Tse T, Sukar N, Standaert DG, DeSilva TM, Cowell RM, West AB. LRRK2 Inhibition Attenuates Microglial Inflammatory Responses. *J Neurosci*. 2012 Feb 1;32(5):1602-11. PMID:22302802. PMCID: PMC3532034
STANDAERT, David	Current	Moehle, M.* (2011-present)	Fraser KB, **Moehle MS**, Daher JP, Webber PJ, Williams JY, Stewart CA, Yacoubian TA, Cowell RM, Dokland T, Ye T, Chen D, Siegal GP, Galemmo RA, Tsika E, Moore DJ, Standaert DG, Kojima K, Mobley JA, West AB. LRRK2 secretion in exosomes is regulated by 14-3-3. *Hum Mol Genet*. 2013 Dec 15;22(24):4988-5000. PMCID: PMC3836478
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STANDAERT, David	Current	Thome, A.* (2012- present)	Harms AS, Cao S, Rowse AL, **Thome AD**, Li X, Mangieri LR, Cron RQ, Shacka JJ, Raman C, Standaert DG. MHCII is required for α-synuclein-induced activation of microglia, CD4 T cell proliferation, and dopaminergic neurodegeneration. *J Neurosci*. 2013 Jun 5;33(23):9592-600. PMCID: PMC3903980
STANDAERT, David	Past	Cao, S. (2008- 2012)	Theodore S, **Cao S,** McLean PJ, Standaert DG. Targeted overexpression of human alpha-synuclein triggers microglial activation and an adaptive immune response in a mouse model of Parkinson disease. *J Neuropathol Exp Neurol.* 2008 Dec; 67(12): 1149-58. PMID: 19018246. PMCID: PMC2753200.

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STANDAERT, David	Past	Lewis, T.* (2007- 2011)	**Lewis TB**, Standaert DG. (2008) Design of clinical trials of gene therapy in Parkinson disease. Exp *Neurol*. Jan;2009(1):41-7. Epub 2007 Aug 31. Review.PMID: 17920590
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STANDAERT, David	Past	Steidinger, T.* (2007-2012)	**Steidinger TU**, Slone SR, Ding H, Standaert DG, Yacoubian TA. Angiogenin in Parkinson disease models: role of Akt phosphorylation and evaluation of AAV-mediated angiogenin expression in MPTP treated mice. *PLoS One*. 2013;8(2):e56092. PMCID: PMC3567051
STEELE, Claude H	Past	Gessner, Melissa (2009 – 2014)	Werner, J.L., **M.A. Gessner**, L.M. Lilly, M.P. Nelson, A.E. Metz, D. Horn, C.W. Dunaway, J. Deshane D.D. Chaplin, G.D. Brown, C.T. Weaver and C. Steele. Neutrophils produce IL-17A in a Dectin-1 and IL-23 dependent manner during invasive fungal infection. *Infection and Immunity* 79:3966-3977 (2011). PMCID: PMC3187263

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STEELE, Claude H	Past	Gessner, Melissa (2009 – 2014)	**Gessner, M.A.**, J.L. Werner, L.M. Lilly, M.P. Nelson, A.E. Metz, C.W. Dunaway, Y.R. Chan, W. Ouyang, G.D. Brown, C.T. Weaver and C. Steele. Dectin-1 dependent IL-22 contributes to early innate lung defense against *Aspergillus fumigatus*. *Infection and Immunity* 80:410-417 (2012).
STEELE, Claude H	Past	Gessner, Melissa (2009 – 2014)	Lilly, L.M., **M.A. Gessner**, C.W. Dunaway, A.E. Metz, L.M. Schwiebert, C.T. Weaver, G.D. Brown and C. Steele. The beta-glucan receptor Dectin-1 promotes immunopathology during fungal allergy via IL-22. *Journal of Immunology* 189:3653-60 (2012).
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STEELE, Claude H	Past	Lilly, L.M.* (2009 – 2013)	Werner, J.L., M.A. Gessner, **L.M. Lilly**, M.P. Nelson, A.E. Metz, D. Horn, C.W. Dunaway, J. Deshane D.D. Chaplin, G.D. Brown, C.T. Weaver and C. Steele. Neutrophils produce IL-17A in a Dectin-1 and IL-23 dependent manner during invasive fungal infection. *Infection and Immunity* 79:3966-3977 (2011). PMID:21807912
STEELE, Claude H	Past	Lilly, Lauren* (2009 – 2013)	Gessner, M.A., J.L. Werner, **L.M. Lilly**, M.P. Nelson, A.E. Metz, C.W. Dunaway, Y.R. Chan, W. Ouyang, G.D. Brown, C.T. Weaver and C. Steele. Dectin-1 dependent IL-22 contributes to early innate lung defense against *Aspergillus fumigatus*. Infection and Immunity 80:410-417 (2012). PMID: 22038916.
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TOLLEFSBOL, Trygve	Past	Chen , Huaping (2008-2012)	**Chen H**, Li Y, Tollefsbol TO. Cell Senescence Culturing Methods. *Methods Mol Biol*. 2013; 1048: 10.1007/978-1-62703-556-9_1. doi: 10.1007/978-1-62703-556-9_1PMCID: PMC3873382
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TOLLEFSBOL, Trygve	Past	Chen , Huaping (2008-2012)	**Chen H**, Landen CN, Li Y, Alvarez RD, Tollefsbol TO. Enhancement of Cisplatin-Mediated Apoptosis in Ovarian Cancer Cells through Potentiating G2/M Arrest and p21 Upregulation by Combinatorial Epigallocatechin Gallate and Sulforaphane. *J Oncol*. 2013; 2013: 872957. Published online 2013 February 17. doi: 10.1155/2013/872957 PMCID: PMC3588178

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
TOLLEFSBOL, Trygve	Past	Chen , Huaping (2008-2012)	**Chen H**, Landen CN, Li Y, Alvarez RD, Tollefsbol TO. Epigallocatechin gallate and sulforaphane combination treatment induce apoptosis in paclitaxel-resistant ovarian cancer cells through hTERT and Bcl-2 down-regulation. *Exp Cell Res*. 2013 Mar 10;319(5):697-706. doi: 10.1016/j.yexcr.2012.12.026. Epub 2013 Jan 16. PMID: 23333498
TOLLEFSBOL, Trygve	Past	DeAngelis, J. Tyson (2006-2010)	**DeAngelis, J.T**., Berletch, J.B., Andrews, L.G. and Tollefsbol, T.O. Hypermethylation and oncogenesis. In: *Cancer Epigenetics* (Tollefsbol, T.O., ed.), CRC Press, Boca Raton, FL, pp. 39-49, 2008.
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TOLLEFSBOL, Trygve	Past	DeAngelis, J. Tyson (2006-2010)	**DeAngelis, J.T.** and Tollefsbol, T.O. The role of epigenetics in long-term memory loss in aging. *In: Epigenetics of Aging* (Tollefsbol, T.O., ed.), Springer-Verlag, New York, NY, pp. 275-281, 2010.
TOLLEFSBOL, Trygve	Past	DeAngelis, J. Tyson (2006-2010)	Love WK, **DeAngelis JT**, Berletch JB, Phipps SM, Andrews LG, Brouillette WJ, Muccio DD, Tollefsbol TO. The Novel Retinoid, 9cUAB30, Inhibits Telomerase and Induces Apoptosis in HL60 Cells. *Transl Oncol*. 2008 Sep;1(3):148-52. PMCID: PMC2533143
TOLLEFSBOL, Trygve	Past	DeAngelis, J. Tyson (2006-2010)	**DeAngelis JT**, Li Y, Mitchell N, Wilson L, Kim H, Tollefsbol TO. 2D difference gel electrophoresis analysis of different time points during the course of neoplastic transformation of human mammary epithelial cells. *J Proteome Res*. 2011 Feb 4;10(2):447-58. Epub 2010 Dec 20. PMCID: PMC3390236
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TOLLEFSBOL, Trygve	Past	Phipps, Sharla (2002-2007)	**Phipps, S.M.O**., Love, W.K., Mott, T.E., Andrews, L.G., and Tollefsbol, T.O. Differential expression of epigenetic modulators during human embryonic stem cell differentiation. *Molecular Biotechnology* 41, 201-207, 2009. PMCID: PMC2629501
TOLLEFSBOL, Trygve	Past	Phipps, Sharla (2002-2007)	**Phipps, S.M**., Love, W.K., White, T., Andrews, L.G., and Tollefsbol, T.O. Retinoid-induced histone deacetylation inhibits telomerase activity in estrogen receptor-negative breast cancer cells. *Anticancer Research* 29, 4959-4964, 2009. PMCID: PMC2888005
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TOLLEFSBOL, Trygve	Past	Phipps, Sharla (2002-2007)	Hansen NJ, Wylie RC, **Phipps SM**, Love WK, Andrews LG, Tollefsbol TO. The low-toxicity 9-cis UAB30 novel retinoid down-regulates the DNA methyltransferases and has anti-telomerase activity in human breast cancer cells. *Int J Oncol*. 2007 Mar;30(3):641-50. PMID: 17273765 [PubMed - indexed for MEDLINE] PMCID: PMC2435481

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TOLLEFSBOL, Trygve	Past	Saldanha, Sabita (2008-present)	**Saldanha, SN**, McCollum, A, Tollefsbol, TO. Environmental Effects on Age-Associated Epigenetics. *In: Epigenetics of Aging* (Tollefsbol, T.O., ed.), Springer-Verlag, New York, NY, pp. 417-429, 2010.
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TSE, Hubert	Current	Burg, Ashley (2012 – current)	Seleme MC, Lei W, **Burg AR**, Goh KY, Metz A, Steele C, and Tse HM (2012). Dysregulated TLR3-Dependent Signaling and Innate Immune Activation in Superoxide-Deficient Macrophages from Non-Obese Diabetic Mice. *Free Radical Biology and Medicine* 52(9):2047-2056. *With editorial commentary. PMC3711256

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TSE, Hubert	Current	Padgett, Lindsey (5 years)	Thayer TC, Delano M, Liu C, Chen J, **Padgett LE**, Tse HM, Annamali M, Piganelli JD, Moldawer L, and Mathews CE (2011). Superoxide Production by Macrophages and T cells is Critical for the Induction of Autoreactivity and Type 1 Diabetes. *Diabetes* 60(8):2144-2151. PMC3142064
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WANG, Lizhong	Past	Dugas, Courtney Mar (2013-2014)	Liu R, Liu C, Chen D, Yang WH, Liu X, Liu CG, **Dugas CM**, Tang F, Zheng P, Liu Y, Wang L. FOXP3 controls an miR-146/NFκB negative feedback loop that inhibits apoptosis in breast cancer cells. *Cancer Res*. 2015 in press.
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WEAVER, Casey T.	Past	Mangan, Paul 2001-2006	Weaver CT, Hatton RD, **Mangan PR**, Harrington LE. IL-17 family cytokines and the expanding diversity of effector T cell lineages. Annu Rev Immunol. 2007 25:821-52. Review. PMID:17201677
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WEAVER, Casey T.	Past	Mangan, Paul 2001-2006	Harrington LE, Hatton RD, **Mangan PR**, Turner H, Murphy TL, Murphy KM, Weaver CT. Interleukin 17-producing CD4+ effector T cells develop via a lineage distinct from the T helper type 1 and 2 lineages. Nat Immunol. 2005 6(11):1123-32. PMID:16200070

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WEAVER, Casey T.	Past	Mangan, Paul 2001-2006	**Mangan PR**, O'Quinn D, Harrington L, Bonder CS, Kubes P, Kucik DF, Bullard DC, Weaver CT. Both Th1 and Th2 cells require P-selectin glycoprotein ligand-1 for optimal rolling on inflamed endothelium. Am J Pathol. 2005 167(6):1661-75. PMCID:PMC1613197
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WEAVER, Casey T.	Past	Mangan, Paul 2001-2006	Sonnenberg GF, **Mangan PR**, Bezman NA, Sekiguchi DR, Luning Prak ET, Erikson J, Maltzman JS, Jordan MS, Koretzky GA. Mislocalization of SLP-76 leads to aberrant inflammatory cytokine and autoantibody production. Blood. 2010 115(11):2186-95. PMCID:PMC2920203
WEAVER, Casey T.	Past	Luther, Rita 2003-2009	Deshane J, Zmijewski JW**, Luther R**, Gaggar A, Deshane R, Lai JF, Xu X, Spell M, Estell K, Weaver CT, Abraham E, Schwiebert LM, Chaplin DD. Free radical-producing myeloid-derived regulatory cells: potent activators and suppressors of lung inflammation and airway hyperresponsiveness. Mucosal Immunol. 2011 4(5):503-18. PMID:21471960
WEAVER, Casey T.	Past	Luther, Rita 2003-2009	Hatton RD, Harrington LE, **Luther RJ**, Wakefield T, Janowski KM, Oliver JR, Lallone RL, Murphy KM, Weaver CT. A distal conserved sequence element controls Ifng gene expression by T cells and NK cells. Immunity. 2006 25(5):717-29. PMID:17070076
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WEAVER, Casey T.	Past	Luther, Rita 2003-2009	Pierson W, Cauwe B, Policheni A, Schlenner SM, Franckaert D, Berges J, Humblet-Baron S, Schönefeldt S, Herold MJ, Hildeman D, Strasser A, Bouillet P, Lu LF, Matthys P, Freitas AA, **Luther RJ**, Weaver CT, Dooley J, Gray DH, Liston A. Antiapoptotic Mcl-1 is critical for the survival and niche-filling capacity of Foxp3^{+} regulatory T cells. Nat Immunol. 2013 Sep;14(9):959-65. PMID: 23852275; PMCID: PMC4128388
WEAVER, Casey T.	Past	Luther, Rita 2003-2009	Amado IF, Berges J, **Luther RJ**, Mailhé MP, Garcia S, Bandeira A, Weaver C, Liston A, Freitas AA. IL-2 coordinates IL-2-producing and regulatory T cell interplay. J Exp Med. 2013 Nov 18;210(12):2707-20. PMID: 24249704; PMCID: PMC3832933

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WEAVER, Casey T.	Past	Dodd, Christopher 2000-2002	Matsuki Y, Zhang HG, Hsu HC, Yang PA, Zhou T, **Dodd CH**, Cecconi F, Gruss P, Tadakuma T, Mountz JD. Different role of Apaf-1 in positive selection, negative selection and death by neglect in foetal thymic organ culture. Scand J Immunol. 2002 56(2):174-84. PMID:12121437
WEAVER, Casey T.	Past	Dodd, Christopher 2000-2002	**Dodd, C.H.**, Hsu, H.C., Chu, W.J., Yang, P., Zhang, H.G., Mountz, J.D., Zinn, K., Forder, J., Josephson, L., Weissleder, R.*, et al.* (2001). Normal T-cell response and in vivo magnetic resonance imaging of T cells loaded with HIV transactivator-peptide-derived superparamagnetic nanoparticles. J Immunol Methods *256*, 89-105.
WEAVER, Casey T.	Past	Dodd, Christopher 2000-2002	Hsu, H.C., Mountz, J.D., Williams, R.W., Shelton, B.J., Yang, P.A., Matsuki, Y., Xu, X., **Dodd, C.H.**, Li, L., Geiger, H.*, et al.* (2002). Age-related change in thymic T-cell development is associated with genetic loci on mouse chromosomes 1, 3, and 11. Mech Ageing Dev *123*, 1145-1158.
WEAVER, Casey T.	Past	Dodd, Christopher 2000-2002	Hsu, H.C., Shi, J., Yang, P., Xu, X., **Dodd, C**., Matsuki, Y., Zhang, H.G., and Mountz, J.D. (2001). Activated CD8 (+) T cells from aged mice exhibit decreased activation-induced cell death. Mech Ageing Dev *122*, 1663-1684.
WEAVER, Casey T.	Past	Whitley,Sarah 2005- 2013	Mukasa R, Balasubramani A, Lee YK, **Whitley SK**, Weaver BT, Shibata Y, Crawford GE, Hatton RD, Weaver CT. Epigenetic instability of cytokine and transcription factor gene loci underlies plasticity of the T helper 17 cell lineage. Immunity 2010 32(5):612-27. PMCID: PMC3129685
WEAVER, Casey T.	Past	Whitley,Sarah 2005- 2013	Basu R, **Whitley SK**, Bhaumik S, Zindl CL, Schoeb TR, Benveniste EN, Pear WS, Hatton RD, Weaver CT. IL-1 signaling modulates activation of STAT transcription factors to antagonize retinoic acid signaling and control the TH17 cell-iTreg cell balance. Nat Immunol. 2015 Mar;16(3):286-95. PMID: 25642823
WEAVER, Casey T.	Past	Balasubramani, Anand 2006-2010	Mukasa R, **Balasubramani A**, Lee YK, Whitley SK, Weaver BT, Shibata Y, Crawford GE, Hatton RD, Weaver CT. Epigenetic instability of cytokine and transcription factor gene loci underlies plasticity of the T helper 17 cell lineage. Immunity 2010 32(5):612-27. PMCID: PMC3129685
WEAVER, Casey T.	Past	Balasubramani, Anand 2006-2010	**Balasubramani A**, Shibata Y, Crawford GE, Baldwin AS, Hatton RD, Weaver CT. Modular utilization of distal cis-regulatory elements controls Ifng gene expression in T cells activated by distinct stimuli. Immunity. 2010 Jul 23;33(1):35-47. PMID: 20643337; PMCID: PMC2994316
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WEAVER, Casey T.	Past	Balasubramani, Anand 2006-2010	**Balasubramani A**, Winstead CJ, Turner H, Janowski KM, Harbour SN, Shibata Y, Crawford GE, Hatton RD, Weaver CT. Deletion of a conserved cis-element in the Ifng locus highlights the role of acute histone acetylation in modulating inducible gene transcription. PLoS Genet. 2014 Jan;10(1):e1003969. PMID: 24415943; PMCID: PMC3886902

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WICK, Timothy	Current	Bhuiyan, Didarul (20013-present)	**Bhuiyan, D**., M.J. Jablonsky, I. Kolesov, J. Middleton, T.M. Wick, and R. Tannenbaum, "Novel Synthesis and Characterization of a Collagen-based Biopolymer Initiated by Hydroxyapatite Nanoparticles", *Acta Biomaterialia*. 2014 Dec 3. pii: S1742-7061(14)00547-9. doi: 10.1016/j.actbio.2014.11.044. [Epub ahead of print]. PMID: 25481742
WICK, Timothy	Past	Carmona-Moran, Carlos (2007-2009)	**Carmona-Moran, C.A**. and T.M. Wick, "Identification and Validation of Growth Factor Regimen for Chondrogenesis of Human Mesenchymal Stem Cells in a Shear and Perfusion Bioreactor", *Cellular and Molecular Bioengineering*, (In Press) DOI: 10.1007/s12195-015-0387-6
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WICK, Timothy	Past	Wagner, Matthew C. (2001-2006)	**Wagner, M.C**., J.R. Eckman, and T.M. Wick, "Histamine Increases Sickle Erythrocyte Adherence to Endothelium." *British Journal of Haematology*, 132:512-522 (2006). PMID: 16412024
YOUNGER, Jarred	Current	Campbell, Kelsey A. (2014-present)	Lin JC, Chu LF, Stringer EA, Baker KS, Sayyid Z, **Campbell KA**, Younger JY. (under review). One month of oral morphine decreases right amygdalar gray matter volume in individuals with low back pain: Confirmation of previously reported magnetic resonance imaging results.
YOUNGER, Jarred	Current	Campbell, Kelsey A. (2014-present)	Schwarb, H., Watson, P., **Campbell, K.,** Shander, C., Monti, J., Cooke, G., Wang, J., Kramer, A. & Cohen, N. (2013). *Competition and cooperation among relational memory representations*. (Manuscript in preparation)
YOUNGER, Jarred	Current	Campbell, Kelsey A. (2014-present)	**Campbell, K.**, Schwarb, H., Watson, P.D., Wang, J.X., Voss, J.L., & Cohen, N.J. (2013, February). *Context-guided memory retrieval: Understanding medial temporal lobe and prefrontal cortex interactions using eye tracking*. Poster presented at the Neuroscience Program Open House at the University of Illinois, Urbana-Champaign, IL.(Conference Presentation)
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YUSUF, Nabiha	Past	Jimenez, Hugo (2011-current)	Ahmad I, **Jimenez H**, Yaacob NS, Yusuf N. 2012. Tualang Honey protects keratinocytes from ultraviolet radiation induced inflammation and DNA damage(†).*Photochem Photobiol* 88:1198-204. PMCID: PMC3375347.

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YUSUF, Nabiha	Past	Lewis, Wesley	**Lewis W**, Simanyi E, Li H, Thompson CA, Nasti TH, Jaleel T, Xu H, Yusuf N. 2011. Regulation of ultraviolet radiation induced cutaneous photoimmunosuppression by Toll like receptor-4. *Arch. Biochem. Biophys* 508: 171-177. PMCID: PMC3115632.
YUSUF, Nabiha	Past	Thompson, Camilla	Lewis W, Simanyi E, Li H, **Thompson CA**, Nasti TH, Jaleel T, Xu H, Yusuf N. 2011. Regulation of ultraviolet radiation induced cutaneous photoimmunosuppression by Toll like receptor-4. *Arch. Biochem. Biophys* 508: 171-177. PMCID: PMC3115632.
ZAYZAFOON, Majd	Past	Choo, Hyeran (2005-2006)	Chung KR, **Choo H**, Kim SH, Ngan P. Timely relocation of mini-implants for uninterrupted full-arch distalization. *Am J Orthod Dentofacial Orthop*. 2010 Dec;138(6):839-49. Non-NIH PMID: 21130344
ZAYZAFOON, Majd	Past	Choo, Hyeran (2005-2006)	Mah JK, Huang JC, **Choo H**. Practical applications of cone-beam computed tomography in orthodontics. *J Am Dent Assoc*. 2010 Oct;141 Suppl 3:7S-13S. Non-NIH PMID: 20884934
ZAYZAFOON, Majd	Past	Choo, Hyeran (2005-2006)	Chung KR, Kim SH, **Choo H**, Kook YA, Cope JB. Distalization of the mandibular dentition with mini-implants to correct a Class III malocclusion with a midline deviation. *Am J Orthod Dentofacial Orthop*. 2010 Jan;137(1):135-46. Non-NIH PMID: 20122441
ZAYZAFOON, Majd	Past	Choo, Hyeran (2005-2006)	Kim GT, Kim SH, Choi YS, Park YJ, Chung KR, Suk KE, **Choo H**, Huang JC. Cone-beam computed tomography evaluation of orthodontic miniplate anchoring screws in the posterior maxilla. *Am J Orthod Dentofacial Orthop*. 2009 Nov;136(5):628.e1-10; discussion 628-9. Non-NIH PMID: 19892272
ZAYZAFOON, Majd	Past	Choo, Hyeran (2005-2006)	**Choo H**, Kim SH, Huang JC. TAD, a misnomer? *Am J Orthod Dentofacial Orthop*. 2009 Aug;136(2):145-6. PMCID not required, Letter. PMID: 19651331
ZAYZAFOON, Majd	Past	Daft, Paul (2010-2014)	**Daft PG,** Yuan K, Warram JM, Klein MJ, Siegal GP, Zayzafoon M. Alpha-CaMKII plays a critical role in determining the aggressive behavior of human osteosarcoma. *Mol Cancer Res.* 2013; 11(4):349-59 PMCID: PMC3631297.
ZAYZAFOON, Majd	Past	Daft, Paul (2010-2014)	**Daft PG**, Yang Y, Napierala D, Zayzafoon M. The Growth and Aggressive Behavior of Human Osteosarcoma Is Regulated by a CaMKII-Controlled Autocrine VEGF Signaling Mechanism. *PLoS One.* 2015;(4):e0121568. PMID: 25860662
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (2005-2007)	**Yeo H**, McDonald JM, Zayzafoon M. NFATcl: A novel anabolic therapeutic target for osteoporosis. *Ann N Y Acad Sci* 2006; 1068:564-567, PMID: 16831953.
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (2005-2007)	**Yeo H**, Beck L, McDonald JM, Zayzafoon M. Cyclosporin A Elicits Dose-Dependent Biphasic Effects on Osteoblast Differentiation and Bone Formation. *Bone* 2007; 40:1502-1516, PMID: 17392048.
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (2005-2007)	**Yeo H**, Beck L, Thompson SR, Farach-Carson MC, McDonald JM, Clemens TL, Zayzafoon M. Conditional dysruption of calcineurin B1 in osteoblasts increases bone formation and reduces bone resorption. *J Biol Chem* 2007; 282:35318-35327, PMID: 17884821.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (2005-2007)	Choo MK, **Yeo H**, Zayzafoon M. NFATc1 mediates HDAC-dependent transcriptional repression of osteocalcin expression during osteoblast differentiation. *BONE.* 2009 45(3):579-89. PMCID: PMC2732115.
ZAYZAFOON, Majd	Past	Yeo, Hyeonju (2005-2007)	Noh M, **Yeo H**, Ko J, Kim HK, Lee CH. MAP17 is associated with the T-helper cell cytokine-induced down-regulation of filaggrin transcription in human keratinocytes. *Exp Dermatol*. 2010 Apr;19(4):355-62. Epub 2009 Jul 8. Non-NIH PMID: 19601982

Table 6A Instructions: For New (Type 1) Applications

Read FOA, SF424 (R&R) Application Guide Section 8, and Introduction to NRSA Data Tables first.

List publications of representative previous predoctoral trainees and of ALL current predoctoral trainees of the proposed mentors. Only include previous trainees over the last ten years and only trainees who would have been considered for appointment, if this program had been supported by an NIH training grant during their period of training. Sort trainees by Mentor. For each mentor, group past trainees separately from current trainees. Sort each group by the year of entry into the graduate program. In parenthesis, include the year the trainee started graduate studies, and if appropriate, when they completed their training. Designate Kirschstein-NSRA training grant eligible trainees (TGE) by an asterisk (*). List all publications of trainees resulting from their period of training in the faculty member's laboratory or in association with the training program, through completion of their doctoral degree regardless of when the publication actually appeared. List abstracts **only** if a more complete publication has not appeared and label these clearly as abstracts. List publications followed by abstracts in chronological order. Boldface the trainee's name in the author list.

When citing articles that fall under the Public Access Policy, were authored or co-authored by the trainee and arose from NIH support, provide the NIH Manuscript Submission reference number (e.g., NIHMS97531) or the PubMed Central (PMC) reference number (e.g., PMCID234567) for each article. If the PMCID is not yet available because the Journal submits articles directly to PMC on behalf of their authors, indicate "PMC Journal - In Process." A list of these Journals is posted at: http://publicaccess.nih.gov/submit_process_journals.htm.

Summarize these data in the body of the proposal. For example, what is the average number of papers published by trainees, how many as first author, how many trainees graduate without any first author publication.

Rationale: This information provides an indicator of the ability of the mentor to foster trainee productivity and allows assessment of the research quality and authorship priority of previous predoctoral trainees.

Table 6B. Publications of Research Completed by Postdoctoral Trainees (New Applications) (Group Past and Current Trainees Separately, then sort by Year of Entry)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ABSHER, Devin	Current	Day, Kenneth (2010-present)	**Day K**, Waite LL, Thalacker-Mercer A, West A, Bamman MM, et al. Differential DNA methylation with age displays both common and dynamic features across human tissues that are influenced by CpG landscape. *Genome Biol*. 2013;14(9):R102. PubMed PMID: 24034465; PubMed Central PMCID: PMC4053985.
ABSHER, Devin	Current	Day, Kenneth (2010-present)	**Day K**, Song J, Absher D. Targeted sequencing of large genomic regions with CATCH-Seq.*One*. 2014 Oct 30;9(10):e111756 PMCID: PMC4214737
ABSHER, Devin	Current	Day, Kenneth (2010-present)	**Day K,** Irvin MR, Zhi D, Joehanes R, Mendelson M, Aslibekyan S, et al. Epigenome-wide association study of fasting blood lipids in the Genetics of Lipid-lowering Drugs and Diet Network study. *Circulation*. 2014 Aug 12;130(7):565-72. PubMed PMID: 24920721; PubMed Central PMCID: PMC4209699.
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.,** Blair, S.N. (2015). Implausible data, false memories, and the status quo in dietary assessment. *Advances in Nutrition*. 2015;6(2):229-230. PMCID: PMC4352183
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.** (2015) Phenotypic Regenesis and the Inheritance of Acquired Characteristics: Obesity and Type II Diabetes Mellitus as Exemplars. Poster presented at *ISHPSSB* 2015, Montreal, Canada. NIH Public Access Policy N/A, Poster Presentation.
ALLISON, David	Current	Archer, Ed (2014 – present)	McDonald, S.M., Liu, J., Wilcox, S. Lau, E., **Archer, E.** (2015) Does exercise dose matter? The association between exercise and weight gain during pregnancy: A systematic review of literature. *Journal of Science and Medicine in Sport* (In press). NIH Public Access Compliance: In process at NIHMS: NIHMS685252
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.,** Pavela, G., Lavie, CJ., Blair, SN. The Inadmissibility of 'What We Eat In America' (WWEIA) and NHANES Dietary Data in Nutrition & Obesity Research and the Scientific Formulation of National Dietary Guidelines. *Mayo Clinical Proceedings*. Under review.
ALLISON, David	Current	Archer, Ed (2014 – present)	Chung, M., Wang, D.D., **Archer, E.,** et al., (2015) Future Research Needs on Sugars and Health Outcomes. (Under revision: Journal of Nutrition)
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.** (2015). The Mother of All Problems. New Scientist. London, England: *Reed Business Information*, Ltd.; 2015; issue 3010:32-33. NIH Public Access Policy N/A, not peer-reviewed.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.,** (2015) The Childhood Obesity Epidemic as a Result of Nongenetic Evolution: The Maternal Resources Hypothesis. *Mayo Clinic Proceedings*; 90(1):77-92. PMCID: PMC4289440
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer E.** (2015) In reply - maternal, paternal, and societal efforts are needed to 'cure' child obesity [letter]. *Mayo Clin Proc*. 2015;90(4):p-p. PMCID: PMC4289440.
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer E.** (2015) In reply - the Childhood Obesity Epidemic as a Result of Nongenetic Evolution: The Maternal Resources Hypothesis. [letter]. Mayo Clin Proc. 2015;90(5). *Method A Journal*- In process. PMCID: PMC4289440
ALLISON, David	Current	Archer, Ed (2014 – present)	Singer, R. H., Stoutenberg, M., **Archer, E**., et al. (2015) Occupational Physical Activity and Body Mass Index: Results from the Hispanic Community Health Study / Study of Latinos. (*PlosOne*: Under review).
ALLISON, David	Current	Archer, Ed (2014 – present)	Schoeller D, **Archer E.,** Dawson JA., Heymsfield S. (2015) Implausible Results from the Use of Invalid Methods. The Journal of Nutrition. 2015;145(1):150. *Method A Journal*- In Process. PMID: 25527670
ALLISON, David	Current	Archer, Ed (2014 – present)	Lavie, C.J., **Archer, E**., Shook, R.P., Blair, S.N. (2015) "Metabolically Healthy Obesity, Fitness, and Prognosis." *The Ochsner Journal*, (In press). NIH Public Access Policy N/A, not peer reviewed.
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.** (2014). "The Obesity Epidemic as a Result of Maternal Effects and Phenotypic Evolution." Poster presented at the 2014 *National Academies Keck Futures Initiative*, Irvine, CA. NIH Public Access Policy N/A, poster presentation. PMCID: PMC4289440
ALLISON, David	Current	Archer, Ed (2014 – present)	N. Liu, **Archer, E**., Srinivasasainagendra, V., Allison, D.B. (2015). A Statistical Framework for Testing Fetal Drive Effects: Illustration in a Human Dataset. (Front *Genet*. 2014;5:464.). PMCID: PMC4292723
ALLISON, David	Current	Archer, Ed (2014 – present)	Lewis, D.W., **Archer, E**., Allison, D.A. (2014) The plausible health benefits of nuts: associations, causal conclusions, and informed decisions. *AJCN*. PMCID: PMC4144115
ALLISON, David	Current	Archer, Ed (2014 – present)	Lau, E., Liu, J., McDonald, S.M., **Archer, E.,** (2014). Maternal weight gain in pregnancy and risk of obesity among offspring: A systematic review. *Journal of Obesity*. 2014:16. PMCID: PMC4202338
ALLISON, David	Current	Archer, Ed (2014 – present)	Lau, E., Lau, W.C., Bo, C. **Archer, E.,** (2014). The effects of text message content on the use of an Internet-based physical activity intervention in Hong Kong Chinese adolescents. (In Press, *Journal of Health Communication*). NIH Public Access Compliance N/A, no NIH Support.
ALLISON, David	Current	Archer, Ed (2014 – present)	Hardee, J.P., Porter, R.R., Sui, X., **Archer, E.,** et al. (2014). "The Role of Resistance Exercise on All-cause Mortality in Cancer Survivors." *Mayo Clin Proc*. Aug;89(8):1108-1115. PMCID: PMC4126241
ALLISON, David	Current	Archer, Ed (2014 – present)	Lavie, C.J., De Schutter, A., **Archer,** E. et al., (2014). Obesity and Prognosis in Chronic Diseases – Impact of Cardiorespiratory Fitness in the Obesity Paradox. *Current Sports Medicine Reports*; Jul-Aug;13(4):240-5.. NIH Public Access Policy N/A,, no NIH support.
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.,** Thomas, D.M., McDonald, S.M., et al., (2014). "Trends in the Validity of US Nutritional Surveillance: USDA Loss-Adjusted Food Availability Data Series 1971-2010." (*Under review PlosOne*).

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.** (2014). "Reverse Engineering of Human Energy Metabolism and Lipogenic Postprandial Nutrient Partitioning using Agent-Based Modeling." Abstract presented at the 2014 AlaSim Conference, Huntsville, AL. NIH Public Access Policy N/A, poster presentation.
ALLISON, David	Current	Archer, Ed (2014 – present)	**Archer, E.** (2014). "The Obesity Epidemic as a Result of Maternal Effects and Phenotypic Evolution." Abstract presented at the 2014 *Experimental Biology Conference* San Diego, CA. NIH Public Access Policy N/A, poster presentation.
ALLISON, David	Current	Capers, Patrice (2013 – present)	**Capers PL,** Fobian AD, Kaiser KA, Borah R, Allison DB. A systematic review and meta-analysis of randomized controlled trials if the impact of sleep duration on adiposity and components of energy balance. Accepted to *Obesity Reviews*. NIHMSID 683081.
ALLISON, David	Current	Capers, Patrice (2013 – present)	**Capers PL,** Brown AW, Dawson J and Allison DB (2015). Double sampling with multiple imputation to answer large sample meta-research questions: Introduction and illustration by evaluating adherence to two simple CONSORT guidelines. April 2015 *The FASEB Journal* 29 (1) Supplement 735.1 (Abstract).
ALLISON, David	Current	Capers, Patrice (2013 – present)	**Capers PL,** Brown AW, Dawson J and Allison DB (2015). Double sampling with multiple imputation to answer large sample meta-research questions: Introduction and illustration by evaluating adherence to two simple CONSORT guidelines. *Front. Nutr.* 2:6. doi: 10.3389/fnut.2015.00006. NIHMSID 683984.
ALLISON, David	Current	Capers, Patrice (2013 – present)	**Capers PL,** Hyacinth HI, Cue S, Chappa P, Vilkulina T, Roser-Page S, Weitzmann MN, Archer DR, Newman GW, Quarshie A, Hibbert JM. Body composition and grip strength are improved in transgenic sickle mice fed a high protein diet. *J Nutr Sci*, 4, e6 doi: 10.1017/jns.2014.63. NIHMSID 685450.
ALLISON, David	Current	Capers, Patrice (2013 – present)	Gareth Dutton, Kevin Fontaine, Amy Thomas, John Dawson, **Patrice Capers**, David Allison. Randomized Controlled Trial Examining Expectancy Effects on the Accuracy of Weight Measurement. *Clinical Obes* 2015 Feb 5 (1): 38-41. PMCID: PMC4304908.
ALLISON, David	Current	Capers, Patrice (2013 – present)	Hyacinth HI, **Capers PL**, Archer DR, Hibbert JM.TNF-a, IFN-g, IL-10 and IL-4 levels are elevated in a murine model of human sickle cell anemia maintained on a high protein/calorie diet. *Exp Biol Med* (Maywood) 2014 Jan 239 (1):65-70. PMCID: PMC4164018.
ALLISON, David	Current	Capers, Patrice (2013 – present)	Manci EA, Hyacinth HI, **Capers PL**, Archer DR, Pitts S, Ghosh S, Patrickson J, Titford ME, Ofori-Acquah SF, Hibbert JM. High protein diet attenuates histopathologic organ damage and vascular leakage in transgenic murine model of sickle cell anemia. *Exp Biol Med* (Maywood) 2014 May 19; 239 (8):966-974. PMCID: PMC4237702.
ALLISON, David	Current	Goldsby, TaShauna (2014 – present)	Zalewski BM, Chmielewska A, Szajewska H, Keithley JK, Li P , **Goldsby TU** , and Allison DB. (in press) Letter to the Editor: Correction of Data Errors and Reanalysis of "The Effect of Glucomannan on Body Weight in Overweight or Obese Children and Adults: A systematic Review of Randomized Control Trials. Nutrition. http://dx.doi.org/10.1016/j.nut.2015.02.008. (NIH Public Access Policy N/A, not peer reviewed).

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Current	Goldsby, TaShauna (2014 – present)	George BJ, **Goldsby TU,** Brown AW, Li P, Allison DB. Unsubstantiated Conclusions from Improper Statistical Design and Analysis of a Randomized Controlled Trial *IJOY*. [Letter: SUBMITTED]
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**. Neighborhood Educational Attainment and BMI in Later Life. (2013). *The Gerontologist*. 53:541(Abstract)
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**, DB Allison. Longitudinal spousal correlation in BMI. (2013). Poster presentation at *The Obesity Society Meeting,* Atlanta, GA. (Abstract).
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**., Wiener, H., Fontaine, K. R., Fields, D. A., Voss, J. D., & Allison, D. B. "Packet Randomized Experiments for Eliminating Classes of Confounders."(2014). *European Journal of Clinical Investigation*. PMCID: PMC4314392
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**. Do Neighborhood Characteristics Explain the Association Between Childhood Socioeconomic Status and Adult BMI? (2014). *The Gerontologist* 54:679 (Abstract)
ALLISON, David	Current	Pavela, Greg (2013 – present)	Latham, K., Clarke, P. J., **& Pavela, G.** "Social Relationships, Gender, and Recovery From Mobility Limitation Among Older Americans." (2015). *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. [No NIH support]
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**. "Functional Status and Social Contact Among Older Adults." (2015). *Research on Aging*. NIHMSID 681186. PMID: 25651594
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**. and Latham, K. "Childhood Conditions and Comorbid Accumulation among Older Americans." (2014). *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. In press NIHMSID 681186
ALLISON, David	Current	Pavela, Greg (2013 – present)	Archer, E, **G. Pavela**, C. Lavie, and S.Blair The Inadmissibility of 'What We Eat In America' (WWEIA) and NHANES Dietary Data in Nutrition & Obesity Research and the Scientific Formulation of National Dietary Guidelines. *Mayo Clinical Proceedings*. Under review.
ALLISON, David	Current	Pavela, Greg (2013 – present)	**Pavela, G**. "Lifecourse Socioeconomic Status, Neighborhood Characteristics, and Adult Obesity." (2015). Manuscript submitted to *Social Science and Medicine*.
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	**Schwartz TS**, Bronikowski AM. Dissecting molecular stress networks: identifying nodes of divergence between life-history phenotypes. *Mol Ecol*. 2013 Feb;22(3):739-56. PMID: 22988821. NIH Public Access – Not Applicable.
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	Shaffer HB, Minx P, et al, **Schwartz T**, Sethuraman A, Spinks PQ, Storey KB, Thane N, Vinar T,Zimmerman LM, Warren WC, Mardis ER, Wilson RK. The western painted turtle genome,a model for the evolution of extreme physiological adaptations in a slowly evolving lineage. *Genome Biol*. 2013 Mar 28;14(3):R28. PMID: 23537068. NIH Public Access – Not Applicable PMCID: PMC4054807

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	Ungvari Z, Sosnowska D, Mason JB, Gruber H, Lee SW, **Schwartz TS,** Brown MK, Storm NJ, Fortney K, Sowa J, Byrne AB, Kurz T, Levy E, Sonntag WE, Austad SN, Csiszar A, Ridgway I. Resistance to genotoxic stresses in *Arctica islandica*, the longest living noncolonial animal: is extreme longevity associated with a multistress resistance phenotype? *J Gerontol A Biol Sci Med Sci*. 2013 May;68(5):521-9. PMCID: PMC3623481.
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	Allison, DB, Antoine LH, Ballinger SW, Bamman MM, Biga P, Darley-Usmar VM, Fisher G, Gohlke JM, Halade GV, Hartman JV, Hunter GH, Messina JL, Nagy TR, Plaisance EP, Powell ML, Roth KA, Sandel MW, **Schwartz TS,** Smith DL, Sweatt JD, Tollefsbol TO, Watts SA, Yang Y, Zhang J, Austad SA. 2014. Aging and Energetics 'Top 40' Future Research Opportunities 2010-2013. *F1000Research* 3:219 PMCID: PMC4197746
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	**Schwartz TS**, Bronikowski AM. In Press. Gene expression of components of the insulin/insulin-like signaling pathway in response to heat stress in the garter snake, *Thamnophis elegans*. *Iowa Academy of Science.* NIH Public Access – Not Applicable
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	**Schwartz TS,** Carter S, Wyss JM, Johnson MS, Dohm. ED, Gainer R, Allison DB. In Press. Second-hand eating? Perception of the food environment affects reproductive investment in mice. *Obesity.* NIHMSID: 658181 PMCID: PMC4414731
ALLISON, David	Current	Schwartz, Tonia (2013 – present)	McGaugh S, Bronikowski AM, Kuo C-H, Reading DM, Addis EA, Flagel LE, Janzen FJ, **Schwartz TS.** In Press. Rapid molecular evolution across amniotes of the IIS/TOR network (Insulin and Insulin-like Signaling/Target of Rapamycin). *PNAS.*
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Capers PL, ***Brown AW***, Dawson JA, Allison DB.. Double sampling with multiple imputation to answer large sample meta-research questions: Introduction and illustration by evaluating adherence to two simple CONSORT guidelines *Front. Nutr.* 2:6. [Original Research; NIHMSID 683984]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Dhurandhar NV, Schoeller D, ***Brown AW***, Heymsfield SB, Thomas D, Sorensen TIA, Speakman JR, Jeansonne M, Allison DB. Energy Balance Measurement: When Something is NOT Better than Nothing. *Int J Obes (Lond).* 2014 Nov 13. doi: 10.1038/ijo.2014.199. [Epub ahead of print]. [Critical Review; NIHMS643264] PMID: 25394308
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Ioannidis JPA, Cope MB, Bier DM, Allison DB. Unscientific Beliefs about Scientific Topics in Nutrition. *Adv Nutr* September 2014 5(5): 563-565. [Proceedings; PMC4188234]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Allison DB. Using crowdsourcing to evaluate published scientific literature: methods and example. *PLoS One.* 2014 Jul 2;9(7):e100647. [Original Research; PMC4079692]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Kaiser KA, ***Brown AW***, Bohan Brown MM, Shikany JM, Mattes RD, Allison DB. Increased fruit and vegetable intake has no discernible effect on weight loss: a systematic review and meta-analysis. *Am J Clin Nutr.* 2014 Jun 25;100(2):567-576. [Systematic Review; PMC4095660]

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Casazza K, ***Brown AW***, Astrup A, Bertz F, Baum C, Bohan Brown M, Dawson J, Durant N, Dutton G, Fields DA, Fontaine KR, Levitsky D, Mehta T, Menachemi N, Newby P, Pate R, Raynor H, Rolls BJ, Sen B, Smith DL Jr, Thomas D, Wansink B, Allison DB. Weighing the Evidence of Common Beliefs in Obesity Research. *Crit Rev Food Sci Nutr.* 2014 Jun 20:0. [Critical Review; PMC4272668]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Bohan Brown MM, Allison DB. Belief beyond the evidence: using the proposed effect of breakfast on obesity to show 2 practices that distort scientific evidence. *Am J Clin Nutr.* 2013 Nov;98(5):1298-308.. [Original Research; PMC3798081]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Allison DB. Unintended consequences of obesity-targeted health policy. *Virtual Mentor.* 2013 Apr 1;15(4):339-46.[Critical Review; NIH PAC N/A] PMID: 23566784
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Casazza K, Fontaine KR, Astrup A, Birch LL, ***Brown AW***, Bohan Brown MM, Durant N, Dutton G, Foster EM, Heymsfield SB, McIver K, Mehta T, Menachemi N, Newby PK, Pate R, Rolls BJ, Sen B, Smith DL Jr, Thomas DM, Allison DB. Myths, presumptions, and facts about obesity. *N Engl J Med.* 2013 Jan 31;368(5):446-54. doi: 10.1056/NEJMsa1208051. [Critical Review; PMC3606061]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Li P, ***Brown AW***, Dawson JA, Kaiser KA, Bohan Brown MM, Keith SW, Oakes JM, Allison DB. Concerning Sichieri R, Cunha DB: Obes Facts 2014;7:221-232. The Assertion that Controlling for Baseline (Pre-Randomization) Covariates in Randomized Controlled Trials Leads to Bias Is False. *Obes Facts* 2015;8:127-129. [Letter] PMID: 25871982
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Hall KD, Thomas D, Dhurandhar NV, Heymsfield SB, Allison DB. Order of Magnitude Mis-estimation of Weight Effects of Children's Meal Policy Proposals. *Childhood Obesity.* December 2014, 10(6): 542-545. [Letter] PMID: 25496036
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Bohan Brown MM, ***Brown AW***, Allison DB. Linear extrapolation results in erroneous overestimation of plausible stressor-related yearly weight changes. *Biological Psychiatry. In Press*. [*Letter*] PMID: 25842201
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Levitsky DA, ***Brown AW***, Hansen BC, Atkinson RL, Byrne N, Cheskin LJ, Allison DB. An Unjustified Conclusion from Self-Report-Based Estimates of Energy Intake. *Am J Med* 2014;127(12):e33. [Letter] PMID: 25481208
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***. HUMAN NUTRITION | Nutraceuticals *In book:* Encyclopedia of Meat Sciences (Second Edition), Publisher: Academic Press, Editors: Michael Dikeman, Carrick Devine, pp.130-134. [Chapter]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Bohan Brown MM, Allison DB. Reply to RA Mekary and E Giovannucci. *Am J Clin Nutr.* 2014 Jan;99(1):213. [Letter] PMID: 24363261
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Bohan Brown MM, ***Brown AW***, Allison DB. Nutritional epidemiology in practice: learning from data or promulgating beliefs? *Am J Clin Nutr.* 2013 Jan;97(1):5-6. [Editorial; PMC3522139]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Sievenpiper JL, Kyle TK, Kaiser KA. Communication of randomized, controlled trial results must match the study focus. *Journal of Nutrition*. [Letter: ACCEPTED] PMID: 25934665

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	***Brown AW***, Li P, Bohan Brown MM, Kaiser KA, Keith SW, Oakes JM, Allison DB. Best (but oft forgotten) practices: designing, analyzing, and reporting cluster randomized controlled trials *American Journal of Clinical Nutrition*. [Narrative Review: ACCEPTED]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	Archer E, Thomas DM, McDonald SM, ***Brown AW***, Kell KP, Lavie C, Hill JO, Blair SN. Trends in the Validity of US Nutritional Surveillance: USDA Loss-Adjusted Food Availability Data Series 1971-2010. *PLoS One*. [Original Research: SUBMITTED]
ALLISON, David	Past	Brown, Andrew (2012 – 2014)	George BJ, Goldsby TU, ***Brown AW***, Li P, Allison DB. Unsubstantiated Conclusions from Improper Statistical Design and Analysis of a Randomized Controlled Trial *IJOY*. [Letter: SUBMITTED]
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, Causey ZL, Tamhane A, Kelley JM, Brown EE, Hughes LB, Danila MI, van Everdingen A, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Moreland LW, van der Heijde DM, Alarcón GS, Bridges SL Jr. (2010) Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Research & Therapy* 12(3):R75. PMCID: PMC2911851.
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	Bridges SL Jr., Causey ZL, **Burgos PI,** Huynh BQ, Hughes LB, Danila MI, van Everdingen A, Ledbetter S, Conn DL, Tamhane A, Westfall AO, Jonas BL, Callahan LF, Smith EA, Brasington R, Moreland LW, Alarcón GS, van der Heijde DM. (2010) Radiographic severity of rheumatoid arthritis in African-Americans: Results from the CLEAR Registry. *Arthritis Care & Research* 62(5):624-31. PMCID: PMC3052790.
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, McGwin G Jr, Reveille JD, Vilá LM, Alarcón GS. (2010) Factors predictive of thrombotic events in LUMINA, a multi-ethnic cohort of SLE patients (LXXII). *Rheumatology (Oxford*) 49(9):1720-5. PMCID: PMC2948827
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, Alarcón GS. (2010) Preventive health services for systemic lupus erythematosus patients: whose job is it? *Arthritis Res Ther*. 12(3):124. PMCID: PMC2911897
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, McGwin G Jr, Reveille JD, Vilá LM, Brown EE, Alarcon GS. (2010) Is familial lupus different from sporadic lupus? Data from LUMINA (LXXIII), a multiethnic US cohort. *Lupus* 19(11):1331-6. PMCID: PMC4078734
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, McGwin G Jr, Pons-Estel GJ, Reveille JD, Alarcón GS, Vilá LM. (2011) US patients of Hispanic and African ancestry develop lupus nephritis early in the disease course: data from LUMINA, a multiethnic US cohort (LUMINA LXXIV*). Ann Rheum Dis*. 70(2): 393-4. PMCID: PMC3764916
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI,** Vilá LM, Reveille JD, Alarcón GS. (2009) Peripheral vascular damage in systemic lupus erythematosus: data from LUMINA, a large multi-ethnic U.S. cohort (LXIX). *Lupus* 18(14):1303-8. PMCID: PMC3758688
BRIDGES, Jr., S. Louis	Past	Burgos, Paula (2008-2010)	**Burgos PI**, Alarcón GS. (2009) Thrombosis in systemic lupus erythematosus: risk and protection. Expert *Rev Cardiovasc Ther*. 7(12):1541-9. PMID: 19954316
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI,** Patkar NM, Curtis JR, Saag KG, Teng GG. (2008) Biologics and heart failure in rheumatoid arthritis: are we any wiser? *Curr Opin Rheumatol*. 20(3): 327-33. PMCID: PMC4097098
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Saag KG, Teng GG, Patkar NM, Anuntiyo J, Finney C, Curtis JR, Paulus HE, Mudano A, Pisu M, Elkins-Melton M, Outman R, Allison JJ, Suarez Almazor M, Bridges SL Jr, Chatham WW, Hochberg M, MacLean C, Mikuls T, Moreland LW, O'Dell J, Turkiewicz AM, Furst DE; American College of Rheumatology. (2008) American College of Rheumatology 2008 recommendations for the use of nonbiologic and biologic disease-modifying antirheumatic drugs in rheumatoid arthritis. *Arthritis Rheum*. 59(6): 762-84. PMID: 18512708

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BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI**, Hughes LB, Bridges SL Jr. (2008) Pharmacogenetics of etanercept in rheumatoid arthritis. *Pharmacogenomics* 9:1011-5. PMCID: PMC3746504
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI,** Bridges SL Jr. (2008) Update on the pathogenic mechanisms of systemic necrotizing vasculitis. *Current Rheumatology Reports* 10(6): 430-5.
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI**, Pons-Estel GJ, Zhang J, Vilá LM, Reveille JD, Alarcón GS. (2009) Renal damage is the most important predictor of mortality within the damage index: data from LUMINA LXIV, a multiethnic US cohort. *Rheumatology (Oxford*). 48(5): 542-5. PMCID: PMC2722801
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Burgos PI**, Danila MI,** Kelley JM, Hughes LB, Bridges SL Jr. (2009) Understanding personalized medicine in rheumatoid arthritis: A clinician's guide to the future. *Therapeutic Advances in Musculoskeletal Disease* 1: 97-105. PMCID: PMC3383485.
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Pons-Estel GJ, Alarcón GS, McGwin G Jr, **Danila MI**, Zhang J, Bastian HM, Reveille JD, Vilá LM; Lumina Study Group. (2009) Protective effect of hydroxychloroquine on renal damage in patients with lupus nephritis: LXV, data from a multiethnic US cohort. *Arthritis Rheum*. 61(6): 830-9. PMCID: PMC2898742
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Osborne JD, Flatow J, Holko M, Lin SM, Kibbe WA, Zhu LJ, **Danila MI**, Feng G, Chisholm RL. (2009) Annotating the human genome with Disease Ontology. *BMC Genomics* 10 Suppl 1:S6. PMCID: PMC2709267
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI**, Hughes LB, Brown EE, Morgan SL, Baggott JE, Arnett DK, Bridges SL Jr. (2010) Measurement of erythrocyte methotrexate polyglutamate levels: Ready for clinical use in rheumatoid arthritis? *Current Rheumatology Reports* 12(5):342-7. PMCID: PMC3769795
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Burgos PI, Causey ZL, Tamhane A, Kelley JM, Brown EE, Hughes LB, **Danila MI**, van Everdingen A, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Moreland LW, van der Heijde DM, Alarcón GS, Bridges SL Jr. (2010) Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Research & Therapy* 12(3):R75. PMCID: PMC2911851.
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Narongroeknawin P, **Danila MI**, Humphreys LG Jr, Barasch A, Curtis JR. (2010) Bisphosphonate-associated osteonecrosis of the jaw, with healing after teriparatide: a review of the literature and a case report. *Spec Care Dentist*. 30(2):77-82. PMCID: PMC4097110
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Bridges SL Jr., Causey ZL, Burgos PI, Huynh BQ, Hughes LB, **Danila MI,** van Everdingen A, Ledbetter S, Conn DL, Tamhane A, Westfall AO, Jonas BL, Callahan LF, Smith EA, Brasington R, Moreland LW, Alarcón GS, van der Heijde DM. (2010) Radiographic severity of rheumatoid arthritis in African-Americans: Results from the CLEAR Registry. *Arthritis Care & Research* 62(5):624-31. PMCID: PMC3052790.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Kelley JM, Hughes LB, Malik A, **Danila MI**, Edberg Y, Alarcón GS; Conn DL; Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Edberg JC; Kimberly RP, Moreland LW, Bridges SL Jr. (2010) Genetic variants of *STAT4* associated with rheumatoid arthritis in persons of European and Asian ancestry do not replicate in African-Americans. *Annals of the Rheumatic Diseases* 69:625-6. PMCID: PMC3133745
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Halilova KI, Brown EE, Morgan SL, Bridges SL. Jr., Hwang M-H, Arnett DK, **Danila MI**. (2012) Markers of Treatment Response to Methotrexate in Rheumatoid Arthritis: Where Do We Stand? *International Journal of Rheumatology* 2012:978396. PMCID: PMC3400362.
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	**Danila MI,** Reynolds RJ, Tiwari HK, Bridges SL Jr. (2013) Ethnic-specific genetic analyses in rheumatoid arthritis: Incremental gains but valuable contributions to the big picture. *Arthritis & Rheumatism* 65(12):3014-6. PMCID: PMC3987110
BRIDGES, Jr., S. Louis	Past	Danila, Maria I. (2006-2010)	Aslibekyan S, Sha J, Redden DT, Moreland LW, O'Dell JR, Curtis JR, Curtis JR, Mikuls TR, Reynolds RJ, **Danila MI**, Bridges SL Jr.. (2014) Gene-body mass index interactions are associated with methotrexate toxicity in rheumatoid arthritis. *Ann Rheum Dis* 73(4):785-6. PMCID: PMC3970399.
BRIDGES, Jr., S. Louis	Past	Ding, Yanna (2014)	**Ding Y,** Mountz JD, Hsu HC. (2015) Identification of follicular T helper cells in tissue sections. *Methods Mol Biol*. 1291:13-25. PMID: 25836298
BRIDGES, Jr., S. Louis	Past	Faggard, Jeffrey (UAB)* (2006 – 2007)	Saag KG, Teng GG, Patkar NM, Anuntiyo J, Finney C, Curtis JR, Paulus HE, Mudano A, Pisu M, Elkins-Melton M, Outman R, Allison JJ, Suarez Almazor M, Bridges SL Jr, Chatham WW, Hochberg M, MacLean C, Mikuls T, Moreland LW, O'Dell J, Turkiewicz AM, Furst DE; American College of Rheumatology. (2008) American College of Rheumatology 2008 recommendations for the use of nonbiologic and biologic disease-modifying antirheumatic drugs in rheumatoid arthritis. *Arthritis Rheum*. 59(6): 762-84. PMID: 18512708
BRIDGES, Jr., S. Louis	Past	Frost, Jacqueline (2009)	Govind N, Choudhury A, Hodkinson B, Ickinger C, **Frost J,** Lee A, Gregersen PK, Reynolds RJ, Bridges SL Jr., Hazelhurst S, Ramsay M, Tikly M. (2014) Immunochip Identifies Novel and Replicates Known Genetic Risk Loci for Rheumatoid Arthritis in Black South Africans. *Mol Med.* 20:341-9. PMCID: PMC4153842
BRIDGES, Jr., S. Louis	Past	Frost, Jacqueline (2009)	Tikly M, Govind N, **Frost J**, Ramsay M. (2010) The PTPN22 R620W polymorphism is not associated with systemic rheumatic diseases in South Africans. *Rheumatology (Oxford*). 49(4):820-1. PMID: 20008090
BRIDGES, Jr., S. Louis	Past	Frost, Jacqueline (2009)	**Frost J**, Ramsay M, Mia R, Moosa L, Musenge E, Tikly M. (2012) Differential gene expression of MMP-1, TIMP-1 and HGF in clinically involved and uninvolved skin in South Africans with SSc. *Rheumatology (Oxford*) 51(6):1049-52. PMID: 22286923
BRIDGES, Jr., S. Louis	Past	Govind , Nimmisha (2012)	**Govind N,** Choudhury A, Hodkinson B, Ickinger C, Frost J, Lee A, Gregersen PK, Reynolds RJ, Bridges SL Jr., Hazelhurst S, Ramsay M, Tikly M. (2014) Immunochip Identifies Novel and Replicates Known Genetic Risk Loci for Rheumatoid Arthritis in Black South Africans. *Mol Med.* 20:341-9. PMCID: PMC4153842

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BRIDGES, Jr., S. Louis	Past	Govind , Nimmisha (2012)	May A, Hazelhurst S, Li Y, Norris SA, **Govind N**, Tikly M, Hon C, Johnson KJ, Hartmann N, Staedtler F, Ramsay M. (2013) Genetic diversity in black South Africans from Soweto. BMC Genomics 14:644. PMCID: PMC3850641
BRIDGES, Jr., S. Louis	Past	Huynh, Bao Quynh (UAB) (2007)	Bridges SL Jr., Causey ZL, Burgos PI**, Huynh BQ**, Hughes LB, Danila MI, van Everdingen A, Ledbetter S, Conn DL, Tamhane A, Westfall AO, Jonas BL, Callahan LF, Smith EA, Brasington R, Moreland LW, Alarcón GS, van der Heijde DM. (2010) Radiographic severity of rheumatoid arthritis in African-Americans: Results from the CLEAR Registry. *Arthritis Care & Research* 62(5):624-31. PMCID: PMC3052790.
BRIDGES, Jr., S. Louis	Past	Hwang, Min-Ho (2011 – 2013)	Halilova KI, Brown EE, Morgan SL, Bridges SL. Jr., **Hwang M-H**, Arnett DK, Danila MI. (2012) Markers of Treatment Response to Methotrexate in Rheumatoid Arthritis: Where Do We Stand? *International Journal of Rheumatology* 2012:978396. PMCID: PMC3400362.
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Ptacek T, Li X, **Kelley JM**, Edberg JC. (2008) Copy number variants in genetic susceptibility and severity of systemic lupus erythematosus. *Cytogenet Genome Res*. 123(1-4): 142-7. PMCID: PMC2826785
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Hughes, L.B., Morrison, D., **Kelley, J.M.,** Padilla, M.A., Vaughan, L.K., Westfall, A.O., Dwivedi, H., Mikuls, T.R., Holers, V.M., Parrish, L.A.*, et al.* (2008). The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African Americans through European genetic admixture. *Arthritis Rheum* 58: 349-358. PMCID: PMC3726059
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley, J.M**., Hughes, L.B., Feng, R., Liu, N., Padilla, M.A., Vaughan, L.K., and Bridges, S.L. Jr. (2008). Evaluating linkage disequilibrium and recombination provides a haplotype-tagging SNP panel of the major histocompatibility complex in African Americans. *Genes Immun* 9: 271-273. PMID: 18305489
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley JM**, Hughes LB, Bridges SL Jr. (2008) Does gamma-aminobutyric acid (GABA) influence the development of chronic inflammation in rheumatoid arthritis? *Journal of Neuroinflammation* 5:1. PMCID: PMC2235846
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Bridges SL Jr., **Kelley JM**, Hughes LB. (2008) The *HLA-DRB1* shared epitope in Caucasians with rheumatoid arthritis: A lesson learned from tic-tac-toe. *Arthritis & Rheumatism* 58:1211-15. PMCID: PMC3768277
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Bridges SL Jr., **Kelley JM**, Hughes LB. (2008) Reply to letter by van der Helm- van Mil et al commenting on the association of HLA-DRB1 alleles and rheumatoid arthritis, particularly the issue of protective alleles. *Arthritis & Rheumatism* 58: 3635-6.
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Burgos PI, Danila MI**, Kelley JM**, Hughes LB, Bridges SL Jr. (2009) Understanding personalized medicine in rheumatoid arthritis: A clinician's guide to the future. *Therapeutic Advances in Musculoskeletal Disease* 1: 97-105. PMCID: PMC3383485.

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BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley JM**, Edberg JC, Kimberly RP. (2010) Wegener's granulomatosis: a model of auto-antibodies in mucosal autoimmunity. *Clin Immunol*. 134(2):104-12. PMCID: PMC2817984
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Reynolds RJ, **Kelley JM**, Hughes LB, Yi N, Bridges SL Jr., for the CLEAR Investigators. (2010) Genetic association of htSNPs across the major histocompatibility complex with rheumatoid arthritis in an African American population. *Genes and Immunity* 11: 94-7. PMCID: PMC2809137.
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley JM**, Edberg JC, Kimberly RP. (2010) Pathways: Strategies for susceptibility genes in SLE. *Autoimmun Rev.* 9(7):473-6. PMCID: PMC2868085
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Burgos PI, Causey ZL, Tamhane A, **Kelley JM**, Brown EE, Hughes LB, Danila MI, van Everdingen A, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Moreland LW, van der Heijde DM, Alarcón GS, Bridges SL Jr. (2010) Association of IL4R single nucleotide polymorphisms with rheumatoid nodules in African Americans with rheumatoid arthritis. *Arthritis Research & Therapy* 12(3): R75. PMCID: PMC2911851.
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley JM**, Hughes LB, Malik A, Danila MI, Edberg Y, Alarcón GS; Conn DL; Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Edberg JC; Kimberly RP, Moreland LW, Bridges SL Jr. (2010) Genetic variants of *STAT4* associated with rheumatoid arthritis in persons of European and Asian ancestry do not replicate in African-Americans. *Annals of the Rheumatic Diseases* 69:625-6. PMCID: PMC3133745
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	Hughes LB, Reynolds RJ, Brown EE, **Kelley JM,** Thomson B, Conn DL, Jonas BL, Westfall AO, Padilla MA, Callahan LF, Smith EA, Brasington RD Jr., Edberg JC, Kimberly RP, Moreland LW, Plenge RM, Bridges SL Jr. (2010) Most common SNPs associated with rheumatoid arthritis in subjects of European ancestry confer risk of rheumatoid arthritis in African-Americans. *Arthritis & Rheumatism* 62(12):3547-53. PMCID: PMC3030622.
BRIDGES, Jr., S. Louis	Past	Kelley, James (UAB) (2006-2010)	**Kelley JM**, Monach PA, Ji C, Zhou Y, Wu J, Tanaka S, Mahr AD, Johnson S, McAlear C, Cuthbertson D, Carette S, Davis JC Jr, Dellaripa PF, Hoffman GS, Khalidi N, Langford CA, Seo P, St Clair EW, Specks U, Stone JH, Spiera RF, Ytterberg SR, Merkel PA, Edberg JC, Kimberly RP. (2011) IgA and IgG antineutrophil cytoplasmic antibody engagement of Fc receptor genetic variants influences granulomatosis with polyangiitis. *Proc Natl Acad Sci U S A*. 108(51): 20736-41. PMCID: PMC3251158
BRIDGES, Jr., S. Louis	Past	Malik, Ashima (2008)	Kelley JM, Hughes LB, **Malik A**, Danila MI, Edberg Y, Alarcón GS; Conn DL; Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Edberg JC; Kimberly RP, Moreland LW, Bridges SL Jr. (2010) Genetic variants of *STAT4* associated with rheumatoid arthritis in persons of European and Asian ancestry do not replicate in African-Americans. *Annals of the Rheumatic Diseases* 69:625-6.
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán IY**, Alarcón G S: "*Lippincott's Primary Care Rheumatology".* Book Chapter: "Overlap Syndromes and Unclassified or Undifferentiated Connective Tissue Disease" Lippincott, Williams & Wilkins. 2011: ISBN/ISSN: 9781609138080

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BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	Curtis JR, Chen L, Luijtens K, **Navarro-Millán I**, Goel N, Gervitz L, Weinblatt M: (2011) Dose escalation of certolizumab pegol from 200 mg to 400 mg every other week provides no additional efficacy in rheumatoid arthritis: an analysis of individual patient-level data. *Arthritis Rheum.* 63(8):2203-8. PMID: 21484766
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BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I,** Charles-Schoeman C, Yang S, Bathon JM, Bridges SL Jr., Chen L, Cofield SS, Dell'Italia LJ, Moreland LW, O'Dell JR, Paulus HE, Curtis JR. (2013) Changes in Lipoproteins Associated with Treatment with Methotrexate or Combination Therapy in Early Rheumatoid Arthritis: Results from the TEAR Trial. *Arthritis & Rheumatism* 65(6):1430-8. PMCID: PMC3672346.
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I,** Curtis JR. (2013) Newest clinical trial results with antitumor necrosis factor and nonantitumor necrosis factor biologics for rheumatoid arthritis. *Curr Opin Rheumatol*.25(3): 384-90. PMCID: PMC4041208
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	Curtis JR, McVie T, Mikuls TR, Reynolds RJ, **Navarro-Millán I,** O'Dell J, Moreland LW, Bridges SL Jr, Ranganath VK, Cofield SS. (2013) Clinical response within 12 weeks as a predictor of future low disease activity in patients with early RA: results from the TEAR Trial. *J Rheumatol*. 40(5): 572-8. PMCID: PMC3694569
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I**, Chen L, Greenberg JD, Pappas DA, Curtis JR. (2013) Predictors and persistence of new-onset clinical remission in rheumatoid arthritis patients. *Semin Arthritis Rheum*. 43(2):137-43. PMCID: PMC4184191
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I,** Sattui SE, Curtis JR. (2013) Systematic review of tumor necrosis factor inhibitor discontinuation studies in rheumatoid arthritis. *Clin Ther.* 35(11): 1850-61.e1. PMCID: PMC3917677
BRIDGES, Jr., S. Louis	Past	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I**, Yang S, DuVall SL, Chen L, Baddley J, Cannon GW, Delzell ES, Zhang J, Safford MM, Patkar NM, Mikuls TR, Singh JA, Curtis JR. (2015) Association of hyperlipidaemia, inflammation and serological status and coronary heart disease among patients with rheumatoid arthritis: data from the National Veterans Health Administration. *Ann Rheum Dis* Jan 21. pii: annrheumdis-2013-204987. doi: 10.1136/annrheumdis-2013-204987. [Epub ahead of print]. PMID: 25609412

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Redden, D.T., Divers, J., Vaughan, L.K., Tiwari, H.K., Beasley, T.M., Fernández, J.R., Kimberly, R.P., Feng, R., **Padilla, M.A**., Liu, N.*, et al.* (2006) Regional admixture mapping and structured association testing: conceptual unification and an extensible general linear model. *PLoS Genet* 2: e137. PMCID: PMC1557785
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Divers, J., Vaughan, L.K., **Padilla, M.A**., Fernandez, J.R., Allison, D.B., and Redden, D.T. (2007) Correcting for measurement error in individual ancestry estimates in structured association tests. *Genetics* 176: 1823-1833. PMCID: PMC1931538
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Shriner D, Vaughan LK, **Padilla MA**, Tiwari HK. (2007) Problems with genome-wide association studies. Science 316(5833):1840-2. PMID: 17600199
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Kelley, J.M., Hughes, L.B., Feng, R., Liu, N., **Padilla, M.A.,** Vaughan, L.K., and Bridges, S.L. Jr. (2008) Evaluating linkage disequilibrium and recombination provides a haplotype-tagging SNP panel of the major histocompatibility complex in African Americans. *Genes Immun* 9: 271-273. PMID: 18305489.
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Tiwari HK, Barnholtz-Sloan J, Wineinger N, **Padilla MA,** Vaughan LK, Allison DB. (2008) Review and evaluation of methods correcting for population stratification with a focus on underlying statistical principles. *Hum Hered*. 66(2):67-86. PMCID: PMC2803696
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Hughes, L.B., Morrison, D., Kelley, J.M., **Padilla, M.A**., Vaughan, L.K., Westfall, A.O., Dwivedi, H., Mikuls, T.R., Holers, V.M., Parrish, L.A.*, et al.* (2008) The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African Americans through European genetic admixture. *Arthritis Rheum* 58: 349-358. PMCID: PMC3726059.
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Shriner D, Baye TM, **Padilla MA,** Zhang S, Vaughan LK, Loraine AE. (2008) Commonality of functional annotation: a method for prioritization of candidate genes from genome-wide linkage studies. *Nucleic Acids Res*. 36(4):e26. PMCID: PMC2275105
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Elobeid MA, **Padilla MA**, McVie T, Thomas O, Brock DW, Musser B, Lu K, Coffey CS, Desmond RA, St-Onge MP, Gadde KM, Heymsfield SB, Allison DB. (2009) Missing data in randomized clinical trials for weight loss: scope of the problem, state of the field, and performance of statistical methods. *PLoS One* 13; 4(8):e6624. PMCID: PMC2720539
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	**Padilla, M.A**., Divers, J., Vaughan, L.K., Allison, D.B., and Tiwari, H.K. (2009) Multiple imputation to correct for measurement error in admixture estimates in genetic structured association testing. *Hum Hered* 68: 65-72. PMCID: PMC2716289
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Vaughan, L.K., Divers, J., **Padilla, M**., Redden, D.T., Tiwari, H.K., Pomp, D., and Allison, D.B. (2009) The use of plasmodes as a supplement to simulations: A simple example evaluating individual admixture estimation methodologies. *Comput Stat Data Anal* 53: 1755-1766. PMC2678733

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Hughes LB, Reynolds RJ, Brown EE, Kelley JM, Thomson B, Conn DL, Jonas BL, Westfall AO, **Padilla MA**, Callahan LF, Smith EA, Brasington RD Jr., Edberg JC, Kimberly RP, Moreland LW, Plenge RM, Bridges SL Jr. (2010) Most common SNPs associated with rheumatoid arthritis in subjects of European ancestry confer risk of rheumatoid arthritis in African-Americans. *Arthritis & Rheumatism* 62(12):3547-53. PMCID: PMC3030622.
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Divers, J., Redden, D.T., Rice, K.M., Vaughan, L.K., **Padilla, M.A.**, Allison, D.B., Bluemke, D.A., Young, H.J., and Arnett, D.K. (2011) Comparing self-reported ethnicity to genetic background measures in the context of the Multi-Ethnic Study of Atherosclerosis (MESA). *BMC Genet* 12: 28. PMCID: PMC3068121
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	**Padilla MA**, Elobeid M, Ruden DM, Allison DB. (2010) An examination of the association of selected toxic metals with total and central obesity indices: NHANES 99-02. *Int J Environ Res Public Health* 7(9):3332-47. PMCID: PMC2954548
BRIDGES, Jr., S. Louis	Past	Padilla, Miguel (2005-2008)	Elobeid MA, **Padilla MA**, Brock DW, Ruden DM, Allison DB. (2010) Endocrine disruptors and obesity: an examination of selected persistent organic pollutants in the NHANES 1999-2002 data. *Int J Environ Res Public Health* 7(7):2988-3005. PMCID: PMC2922741
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Mikuls TR, Sayles H, Yu F, LeVan T, Gould KA, Thiele GM, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD Jr. Moreland LW, **Reynolds RJ,** Bridges SL Jr. (2010) Associations of cigarette smoking with rheumatoid arthritis in African Americans. *Arthritis & Rheumatism* 62(12):3560-8. PMCID: PMC2995845.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Hughes LB, **Reynolds RJ**, Brown EE, Kelley JM, Thomson B, Conn DL, Jonas BL, Westfall AO, Padilla MA, Callahan LF, Smith EA, Brasington RD Jr., Edberg JC, Kimberly RP, Moreland LW, Plenge RM, Bridges SL Jr. (2010) Most common SNPs associated with rheumatoid arthritis in subjects of European ancestry confer risk of rheumatoid arthritis in African-Americans. *Arthritis & Rheumatism* 62(12):3547-53. PMCID: PMC3030622.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	**Reynolds RJ,** Kelley JM, Hughes LB, Yi N, Bridges SL Jr., for the CLEAR Investigators. (2010) Genetic association of htSNPs across the major histocompatibility complex with rheumatoid arthritis in an African American population. *Genes and Immunity* 11:94-7. PMCID: PMC2809137.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	**Reynolds RJ**, Childers DK, Pajewski NM. (2010) The distribution and hypothesis testing of eigenvalues from the canonical analysis of the gamma matrix of quadratic and correlational selection gradients. *Evolution* 64(4):1076-85. PMCID: PMC2857515
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Perkins EA, Landis D, Causey ZL, Edberg YZ, **Reynolds RJ**, Hughes LB, CLEAR Investigators, Kimberly RP, Edberg JC, Bridges SL Jr. (2012) Association of Single Nucleotide Polymorphisms (SNPs) in *TAGAP* and *TNFAIP3* with Rheumatoid Arthritis in African Americans. *Arthritis & Rheumatism* 64(5):1355-8. PMCID: PMC3299842.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Mikuls TR, Levan T, Gould KA, Yu F, Thiele GM, Bynote KK, Conn D, Jonas BL, Callahan LF, Smith E, Brasington R, Moreland LW, **Reynolds R**, Gaffo A, Bridges SL Jr. (2012) Impact of interactions of cigarette smoking with NAT2 polymorphisms on rheumatoid arthritis risk in African Americans. *Arthritis Rheum*. 2012 Mar;64(3):655-64. PMCID: PMC3272109
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Kurreeman FA, Stahl EA, Okada Y, Liao K, Diogo D, Raychaudhuri S, Freudenberg J, Kochi Y, Patsopoulos NA, Gupta N; CLEAR investigators, Sandor C, Bang SY, Lee HS, Padyukov L, Suzuki A, Siminovitch K, Worthington J, Gregersen PK, Hughes LB, **Reynolds RJ**, Bridges SL Jr, Bae SC, Yamamoto K, Plenge RM. (2012) Use of a multiethnic approach to identify rheumatoid- arthritis-susceptibility loci, 1p36 and 17q12. *Am J Hum Genet*. 90(3):524-32. PMCID: PMC3309197
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	**Reynolds RJ**, Cui X, Vaughan LK, Redden DT, Causey ZL, Perkins EA, Shah T, Hughes LB, CLEAR Investigators, Damle A, Kern M, Gregersen PK, Johnson MR, Bridges SL Jr. (2013) Gene Expression Patterns in Peripheral Blood Cells Associated with Radiographic Severity in African-Americans with Early Rheumatoid Arthritis. *Rheumatology International.* 33(1):129-37. PMCID: PMC3769702
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Tamhane A, Redden DT, McGwin G Jr, Brown EE, Westfall AO, **Reynolds RJ 4th**, Hughes LB, Conn DL, Callahan LF, Jonas BL, Smith EA, Brasington RD Jr, Moreland LW, Bridges SL Jr. (2013) Comparison of the disease activity score using erythrocyte sedimentation rate and C-reactive protein in African Americans with rheumatoid arthritis. *J Rheumatol*. 40(11):1812-22. PMCID: PMC3987124
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Curtis JR, McVie T, Mikuls TR, **Reynolds RJ,** Navarro-Millán IY, O'Dell JR, Moreland LW, Bridges SL Jr., Ranganath VK, Cofield SS. (2013) Clinical Response within 12 Weeks as a Predictor of Future Low Disease Activity in Early RA Patients: Results from the TEAR Trial. *Journal of Rheumatology* 40(5):572-8. PMCID: PMC3694569.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Danila MI, **Reynolds RJ**, Tiwari HK, Bridges SL Jr. (2013) Ethnic-specific genetic analyses in rheumatoid arthritis: Incremental gains but valuable contributions to the big picture. *Arthritis & Rheumatism* 65(12):3014-6.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Aslibekyan S, Brown EE, **Reynolds RJ**, Redden DT, Morgan SL, Baggott JE, Sha J, Moreland LW, O'Dell JR, Curtis JR, Mikuls TR, Bridges SL Jr., Arnett DK. (2014) Genetic variants associated with methotrexate efficacy and toxicity in early rheumatoid Arthritis: Results from the Treatment of Early Aggressive Rheumatoid Arthritis Trial. *Pharmacogenomics Journal*, *Pharmacogenomics J*. 14(1): 48–53. PMCID: PMC3701736.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Aslibekyan S, Sha J, Redden DT, Moreland LW, O'Dell JR, Curtis JR, Curtis JR, Mikuls TR, **Reynolds RJ,** Danila MI, Bridges SL Jr.. (2014) Gene-body mass index interactions are associated with methotrexate toxicity in rheumatoid arthritis. *Ann Rheum Dis* 73(4):785-6. PMCID: PMC3970399.
BRIDGES, Jr., S. Louis	Past	Reynolds, Richard (2008-2010)	Govind N, Choudhury A, Hodkinson B, Ickinger C, Frost J, Lee A, Gregersen PK, **Reynolds RJ**, Bridges SL Jr., Hazelhurst S, Ramsay M, Tikly M. (2014) Immunochip Identifies Novel and Replicates Known Genetic Risk Loci for Rheumatoid Arthritis in Black South Africans. *Mol Med*. 20:341-9. PMCID: PMC4153842

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	Shah, Tishi (2010– 2011)	Reynolds RJ, Cui X, Vaughan LK, Redden DT, Causey ZL, Perkins EA, **Shah T**, Hughes LB, CLEAR Investigators, Damle A, Kern M, Gregersen PK, Johnson MR, Bridges SL Jr. (2013) Gene Expression Patterns in Peripheral Blood Cells Associated with Radiographic Severity in African-Americans with Early Rheumatoid Arthritis. *Rheumatology International.* 33(1):129-37. PMCID: PMC3769702
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	**Stoll ML**, Good J, Sharpe T, Beukelman T, Young D, Waite PD, Cron RQ. (2012) Intra-articular corticosteroid injections to the temporomandibular joints are safe and appear to be effective therapy in children with juvenile idiopathic arthritis. *J Oral Maxillofac Surg*. 70(8): 1802-7. PMID: 22265164
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	DeWitt EM, Kimura Y, Beukelman T, Nigrovic PA, Onel K, Prahalad S, Schneider R, **Stoll ML**, Angeles-Han S, Milojevic D, Schikler KN, Vehe RK, Weiss JE, Weiss P, Ilowite NT, Wallace CA; Juvenile Idiopathic Arthritis Disease-specific Research Committee of Childhood Arthritis Rheumatology and Research Alliance. (2012) Consensus treatment plans for new-onset systemic juvenile idiopathic arthritis. *Arthritis Care Res (Hoboken*) 64(7):1001-10. PMCID: PMC3368104
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	**Stoll ML**, Sharpe T, Beukelman T, Good J, Young D, Cron RQ. (2012) Risk factors for temporomandibular joint arthritis in children with juvenile idiopathic arthritis. *J Rheumatol*. 39(9): 1880-7. PMID: 22589268
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	**Stoll ML**, Morlandt AB, Teerawattanapong S, Young D, Waite PD, Cron RQ. (2013) Safety and efficacy of intra-articular infliximab therapy for treatment-resistant temporomandibular joint arthritis in children: a retrospective study. *Rheumatology (Oxford*) 52(3):554-9. PMID: 23221325
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	Tambralli A, Beukelman T, Weiser P, Atkinson TP, Cron RQ, **Stoll ML**. (2013) High doses of infliximab in the management of juvenile idiopathic arthritis. *J Rheumatol*. 40(10):1749-55. PMID: 23950184
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	Vaid YN, Dunnavant FD, Royal SA, Beukelman T, **Stoll ML**, Cron RQ. (2014) Imaging of the temporomandibular joint in juvenile idiopathic arthritis. *Arthritis Care Res (Hoboken*) 66(1):47-54. PMID: 24106204
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	**Stoll ML**, Cron RQ. (2013) Treatment of juvenile idiopathic arthritis in the biologic age. *Rheum Dis Clin North Am*. 39(4):751-66. PMID: 24182853
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	**Stoll ML,** Cron RQ. (2014) Treatment of juvenile idiopathic arthritis: a revolution in care. *Pediatr Rheumatol Online J.* 12:13. PMCID: PMC4003520
BRIDGES, Jr., S. Louis	Past	Stoll, Matthew (2011–2014)	Tambralli A, Beukelman T, Cron RQ, **Stoll ML**. (2015) Safety and efficacy of rituximab in childhood-onset systemic lupus erythematosus and other rheumatic diseases. *J Rheumatol*. 42(3):541-6. PMID: 25593242

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BRIDGES, Jr., S. Louis	Past	Tikly, Mohammed (2011)	Niewold TB, Kelly JA, Kariuki SN, Franek BS, Kumar AA, Kaufman KM, Thomas K, Walker D, Kamp S, Frost JM, Wong AK, Merrill JT, Alarcón-Riquelme ME, **Tikly M**, Ramsey-Goldman R, Reveille JD, Petri MA, Edberg JC, Kimberly RP, Alarcón GS, Kamen DL, Gilkeson GS, Vyse TJ, James JA, Gaffney PM, Moser KL, Crow MK, Harley JB. (2012) IRF5 haplotypes demonstrate diverse serological associations which predict serum interferon alpha activity and explain the majority of the genetic association with systemic lupus erythematosus. *Ann Rheum Dis.* 71(3):463-8. PMCID: PMC3307526
BRIDGES, Jr., S. Louis	Past	Tikly, Mohammed (2011)	Frost J, Ramsay M, Mia R, Moosa L, Musenge E, **Tikly M**. (2012) Differential gene expression of MMP-1, TIMP-1 and HGF in clinically involved and uninvolved skin in South Africans with SSc. *Rheumatology (Oxford*) 51(6):1049-52. PMID: 22286923
BRIDGES, Jr., S. Louis	Past	Tikly, Mohammed (2011)	May A, Hazelhurst S, Li Y, Norris SA, Govind N, **Tikly M**, Hon C, Johnson KJ, Hartmann N, Staedtler F, Ramsay M. (2013) Genetic diversity in black South Africans from Soweto. *BMC Genomics* 14:644. PMCID: PMC3850641
BRIDGES, Jr., S. Louis	Past	Tikly, Mohammed (2011)	Govind N, Choudhury A, Hodkinson B, Ickinger C, Frost J, Lee A, Gregersen PK, Reynolds RJ, Bridges SL Jr., Hazelhurst S, Ramsay M, **Tikly M**. (2014) Immunochip Identifies Novel and Replicates Known Genetic Risk Loci for Rheumatoid Arthritis in Black South Africans. *Mol Med*. 20:341-9. PMCID: PMC4153842
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Redden, D.T., Divers, J., **Vaughan, L.K.,** Tiwari, H.K., Beasley, T.M., Fernández, J.R., Kimberly, R.P., Feng, R., Padilla, M.A., Liu, N.*, et al.* (2006) Regional admixture mapping and structured association testing: conceptual unification and an extensible general linear model*. PLoS Genet* 2: e137. PMCID: PMC1557785
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Shriner, D, **LK Vaughan,** M. Padilla, HK Tiwari. (2007) Letters: Problems with Genome Wide Association Studies. *Science* 316(5833):1840-42. PMID 17600199
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Divers, J., **Vaughan, L.K**., Padilla, M.A., Fernandez, J.R., Allison, D.B., and Redden, D.T. (2007) Correcting for measurement error in individual ancestry estimates in structured association tests. *Genetics* 176: 1823-1833. PMCID: PMC1931538
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Redden, DT, J Divers, **LK Vaughan**, M Padilla, S Musani, HK Tiwari & DB Allison. (2007) Methodologic Challenges in Genetic Studies of Obesity. In Obesity Genomics & Postgenomics. Clément & Sørensen, eds. Informa Healthcare, NY. Pgs 229-246.
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Tiwari, H.K., Barnholtz-Sloan, J., Wineinger, N**.**, Padilla, M.A., **Vaughan, L.K**., and Allison, D.B. (2008) Review and evaluation of methods correcting for population stratification with a focus on underlying statistical principles. *Hum Hered* 66: 67-86. PMCID: PMC2803696
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Shriner, D, TM Baye, M Padilla, S Zhang, **LK Vaughan**, & AE Loraine. (2008) Commonality of functional annotation: a method for prioritization of candidate genes from genome-wide linkage studies. *Nucleic Acids Research* 36(4):e26. PMCID: PMC2275105.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Hughes, L.B., Morrison, D., Kelley, J.M**.,** Padilla, M.A., **Vaughan, L.K**., Westfall, A.O., Dwivedi, H., Mikuls, T.R., Holers, V.M., Parrish, L.A*., et al.* (2008) The HLA-DRB1 shared epitope is associated with susceptibility to rheumatoid arthritis in African Americans through European genetic admixture. Arthritis Rheum *58*, 349-358. PMCID: PMC3726059
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Kelley, J.M., Hughes, L.B., Feng, R., Liu, N., Padilla, M.A., **Vaughan, L.K**., and Bridges, S.L. Jr. (2008) Evaluating linkage disequilibrium and recombination provides a haplotype-tagging SNP panel of the major histocompatibility complex in African Americans*. Genes Immun* 9: 271-273. PMID: 18305489
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Sadasivam RS, G Sundar, **LK Vaughan**, MM Tanik, & DK Arnett. (2009) Genetic Region Characterization (Gene RECQuest) - Software to Assist in Identification and Selection of Candidate Genes from Genomic Regions. *BMC Research Notes* 2:201. PMCID: PMC2760569
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	**Vaughan, L.K**., Divers, J., Padilla, M., Redden, D.T., Tiwari, H.K., Pomp, D., and Allison, D.B. (2009) The use of plasmodes as a supplement to simulations: A simple example evaluating individual admixture estimation methodologies. *Comput Stat Data Anal* 53: 1755-1766. PMCID: PMC2678733
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Padilla, M.A., Divers, J., **Vaughan, L.K.**, Allison, D.B., and Tiwari, H.K. (2009) Multiple imputation to correct for measurement error in admixture estimates in genetic structured association testing. Hum Hered *68*, 65-72. PMC2716289
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Shikany, J.M., **Vaughan, L.K.**, Baskin, M.L., Cope, M.B., Hill, J.O., and Allison, D.B. (2010) Is dietary fat "fattening"? A comprehensive research synthesis. *Crit Rev Food Sci Nutr* 50: 699-715. PMID: 20830632
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Casazza, K, N Natour, J Divers, **LK Vaughan**, AW Bigham, B A Gower, G Hunter & JR Fernández. (2010) Triglyceride concentration is independently associated with variation in the LPL gene in African American and European American women. *The Open Obesity Journal* 1:23-31.
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Divers, J., Redden, D.T., Rice, K.M., **Vaughan, L.K.,** Padilla, M.A., Allison, D.B., Bluemke, D.A., Young, H.J., and Arnett, D.K. (2011) Comparing self-reported ethnicity to genetic background measures in the context of the Multi-Ethnic Study of Atherosclerosis (MESA). *BMC Genet* 12: 28. PMC3068121
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Divers, J, **LK Vaughan**, M Padilla, DT Redden, DB Allison, & DK Arnett. (2011) Comparing self-reported ethnicity to genetic background measures in the context of the Multi-Ethnic Study of Atherosclerosis (MESA). *BMC Genetics* 12:28. PMCID: PMC3068121
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Shriner, D & **LK Vaughan**. (2011) Powerful, flexible, and efficient multilocus genome-wide association testing reveals pathways involved in Parkinson Disease. *BMC Genomics* 12:89. PMCID: PMC3040731
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Irvin MR, Shrestha S, Chen YD, Wiener HW, Haritunians T, **Vaughan LK**, Tiwari HK, Taylor KD, Scherzer R, Saag MS, Grunfeld C, Rotter JI, Arnett DK. (2011) Genes linked to energy metabolism and immunoregulatory mechanisms are associated with subcutaneous adipose tissue distribution in HIV-infected men. *Pharmacogenet Genomics* 21(12):798-807. PMCID: PMC3210910

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BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Arnett DK, Meyers KJ, Devereux RB, Tiwari HK, Gu CC, **Vaughan LK**, Perry RT, Patki A, Claas SA, Sun YV, Broeckel U, Kardia SL. (2011) Genetic variation in NCAM1 contributes to left ventricular wall thickness in hypertensive families. *Circ Res*. 108(3):279-83. PMCID: PMC3328104
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Wineinger NE, Pajewski NM, Kennedy RE, Wojczynski MK, **Vaughan LK,** Hunt SC, Gu CC, Rao DC, Lorier R, Broeckel U, Arnett DK, Tiwari HK. (2011) Characterization of autosomal copy-number variation in African Americans: the HyperGEN Study. *Eur J Hum Genet*. 19(12):1271-5. PMCID: PMC3230358
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Shriner D, **Vaughan LK**. (2011) A unified framework for multi-locus association analysis of both common and rare variants. *BMC Genomics* 12:89. PMCID: PMC3040731
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Duarte CW, Willey CD, Zhi D, Cui X, Harris JJ, **Vaughan LK**, Mehta T, McCubrey RO, Khodarev NN, Weichselbaum RR, Gillespie GY. (2013) Expression signature of IFN/STAT1 signaling genes predicts poor survival outcome in glioblastoma multiforme in a subtype-specific manner. *PLoS One* 7(1):e29653. PMCID: PMC3252343
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Reynolds RJ, Cui X, **Vaughan LK**, Redden DT, Causey ZL, Perkins EA, Shah T, Hughes LB, CLEAR Investigators, Damle A, Kern M, Gregersen PK, Johnson MR, Bridges SL Jr. (2013) Gene Expression Patterns in Peripheral Blood Cells Associated with Radiographic Severity in African-Americans with Early Rheumatoid Arthritis. *Rheumatology International* 33(1):129-37. PMCID: PMC3769702
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Lynch, AI, Irvin MR, Boerwinkle E, Davis BR, **Vaughan LK**, Ford CE, Aissani B, Eckfeldt JH, Arnett DK, Shrestha S. (2013) RYR3 gene polymorphisms and cardiovascular disease outcomes in the context of antihypertensive treatment. *Pharmacogenomics J*. 13(4):330-4. PMCID: PMC3435442
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	**Vaughan LK**, Srinivasasainagendra V. (2013) Where in the genome are we? A cautionary tale of database use in genomics research. *Front Genet*. 4:38. PMCID: PMC3604632
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	Aslibekyan S, **Vaughan LK**, Wiener HW, Lemas DJ, Klimentidis YC, Havel PJ, Stanhope KL, O'Brien DM, Hopkins SE, Boyer BB, Tiwari HK. (2013) Evidence for novel genetic loci associated with metabolic traits in Yup'ik people. *Am J Hum Biol.* 25(5):673-80. PMCID: PMC3785243
BRIDGES, Jr., S. Louis	Past	VAUGHAN, Laura K., (2005 - 08)	**Vaughan LK**, Wiener HW, Aslibekyan S, Allison DB, Havel PJ, Stanhope KL, O'Brien DM, Hopkins SE, Lemas DJ, Boyer BB, Tiwari HK. (2015) Linkage and association analysis of obesity traits reveals novel loci and interactions with dietary n-3 fatty acids in an Alaska Native (Yup'ik) population. *Metabolism* 64(6):689-97. PMCID: PMC4408244
BROWN, Elizabeth E.			None
BULLARD,Daniel	Past	He, Xiaodong* (2002-2006)	**He, X**., Schoeb, T.R., Panoskaltsis-Mortari, A., Zinn, K.R., Kesterson, R.A., Zhang, J., Samuel, S., Hicks, M.J., Hickey, M.J., and Bullard, D.C. (2006). Deficiency of P-selectin or P-selectin Glycoprotein Ligand-1 Leads to Accelerated Development of Glomerulonephritis and Increased Expression of CC Chemokine Ligand 2 in Lupus-Prone Mice, *The Journal of Immunology*, 177:8748-56.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
BULLARD,Daniel	Past	He, Xiaodong* (2002-2006)	Ruth, J.H., Amin, M.A., Woods, J.M., **He, X**., Samuel, S.L., Yi, N., Haas, C.S., Koch, A.E., and Bullard, D.C. (2005). Accelerated Development of Arthritis in Mice Lacking Endothelial Selectins, *Arthritis Research & Therapy*, 7:R959-R970. PMCID:PMC1257424
BULLARD,Daniel	Past	Jarmi, Tambi (2007-2009)	Schoeb, T.R., **Jarmi, T.,** Hicks, M.J., Henke, S., Zarjou, A., Suzuki, H., Kramer, P., Novak, J., Agarwal, A., and Bullard, D.C. (2012). eNOS Inhibits the Development of Autoimmune-Mediated Vasculitis in Mice, *Arthritis and Rheumatism*, 64:4114-4124. PMCID:PMC3510336
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	**Deshane J**, Chaplin DD. 2010. Follicular dendritic cell makes environmental sense. Immunity. 33(1):2-4. doi: 10.1016/*j.immuni*.2010.07.008. PubMed PMID: 20643332; PubMed Central PMCID: PMC2919488.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Anderson JT, Zeng M, Li Q, Stapley R, Moore DR 2nd, Chenna B, Fineberg N, Zmijewski J, Eltoum IE, Siegal GP, Gaggar A, Barnes S, Velu SE, Thannickal VJ, Abraham E, Patel RP, Lancaster JR Jr, Chaplin DD, Dransfield MT, **Deshane JS**. 2011. Elevated levels of NO are localized to distal airways in asthma. Free Radic Biol Med. 50(11):1679-88. doi: 10.1016/j.*freeradbiomed.*2011.03.015. Epub 2011 Mar 16. Erratum in: Free Radic Biol Med. 2013 May;58:45. PubMed PMID: 21419218; PubMed Central PMCID: PMC3124865.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	**Deshane J**, Zmijewski JW, Luther R, Gaggar A, Deshane R, Lai JF, Xu X, Spell M, Estell K, Weaver CT, Abraham E, Schwiebert LM, Chaplin DD. 2011. Free radical-producing myeloid-derived regulatory cells: potent activators and suppressors of lung inflammation and airway hyperresponsiveness. *Mucosal Immunol*. 4(5):503-18. doi: 10.1038/mi.2011.16. Epub 2011 Apr 6. PubMed PMID: 21471960; PubMed Central PMCID: PMC3694614.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Zmijewski JW, Bae HB, **Deshane JS**, Peterson CB, Chaplin DD, Abraham E. 2011. Inhibition of neutrophil apoptosis by PAI-1. *Am J Physiol Lung Cell Mol Physiol*. 301(2):L247-54. doi: 10.1152/ajplung.00075.2011. Epub 2011 May 27. PubMed PMID: 21622848; PubMed Central PMCID: PMC3154633.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Werner JL, Gessner MA, Lilly LM, Nelson MP, Metz AE, Horn D, Dunaway CW, **Deshane J**, Chaplin DD, Weaver CT, Brown GD, Steele C. 2011. Neutrophils produce interleukin 17A (IL-17A) in a dectin-1- and IL-23-dependent manner during invasive fungal infection. *Infect Immun*. 79(10):3966-77. doi: 10.1128/IAI.05493-11. Epub 2011 Aug 1. PubMed PMID: 21807912; PubMed Central PMCID: PMC3187263.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Bae HB, Zmijewski JW, **Deshane JS**, Tadie JM, Chaplin DD, Takashima S, Abraham E. 2011. AMP-activated protein kinase enhances the phagocytic ability of macrophages and neutrophils. *FASEB J.* 25(12):4358-68. doi: 10.1096/fj.11-190587. Epub 2011 Sep 1. PubMed PMID: 21885655; PubMed Central PMCID: PMC3236633.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Bae HB, Zmijewski JW, **Deshane JS**, Zhi D, Thompson LC, Peterson CB, Chaplin DD, Abraham E. 2012. Vitronectin inhibits neutrophil apoptosis through activation of integrin-associated signaling pathways. *Am J Respir Cell Mol Biol*. 46(6):790-6. doi: 10.1165/rcmb.2011-0187OC. Epub 2012 Jan 26. PubMed PMID: 22281987; PubMed Central PMCID: PMC3380283.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Tadie JM, Bae HB, **Deshane JS**, Bell CP, Lazarowski ER, Chaplin DD, Thannickal VJ, Abraham E, Zmijewski JW. 2012. Toll-like receptor 4 engagement inhibits adenosine 5'-monophosphate-activated protein kinase activation through a high mobility group box 1 protein-dependent mechanism. *Mol Med*. 18:659-68. doi: 10.2119/molmed.2011.00401. PubMed PMID: 22396017; PubMed Central PMCID: PMC3388138.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	Alberti MO, **Deshane JS**, Chaplin DD, Pereboeva L, Curiel DT, Roth JC. 2013. A myeloid cell-binding adenovirus efficiently targets gene transfer to the lung and escapes liver tropism. *Gene Ther*. 20(7):733-41. doi: 10.1038/gt.2012.91. Epub 2012 Nov 22. PubMed PMID: 23171918; PubMed Central PMCID: PMC3764611.
CHAPLIN, David D.	Past	Deshane, Jessy S. (2007-2010)	**Deshane JS**, Redden DT, Zeng M, Spell ML, Zmijewski JW, Anderson JT, Deshane RJ, Gaggar A, Siegal GP, Abraham E, Dransfield MT, Chaplin DD. 2015. Subsets of airway myeloid-derived regulatory cells distinguish mild asthma from chronic obstructive pulmonary disease. *J Allergy Clin Immunol*. 135(2):413-424.e15. doi: 10.1016/j.jaci.2014.08.040. Epub 2014 Oct 25. PubMed PMID: 25420684; PubMed Central PMCID: PMC4323991.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	Nabe T, **Zindl CL**, Jung YW, Stephens R, Sakamoto A, Kohno S, Atkinson TP, Chaplin DD. 2005. Induction of a late asthmatic response associated with airway inflammation in mice. *Eur J Pharmacol*. 521(1-3):144-55. Epub 2005 Sep 22. PubMed PMID: 16182277.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	Chaplin DD, **Zindl CL**. 2006. Taking control of follicular dendritic cells. *Immunity*. 24(1):13-5. PubMed PMID: 16413918.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	**Zindl CL**, Kim TH, Zeng M, Archambault AS, Grayson MH, Choi K, Schreiber RD, Chaplin DD. 2009. The lymphotoxin LTalpha(1)beta(2) controls postnatal and adult spleen marginal sinus vascular structure and function. Immunity. 30(3):408-20. doi: 10.1016/*j.immuni*.2009.01.010. PubMed PMID: 19303389; PubMed Central PMCID: PMC2874947.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	Jung YW, Zindl CL, Lai JF, Weaver CT, Chaplin DD. 2009. MMP induced by Gr-1+ cells are crucial for recruitment of Th cells into the airways. *Eur J Immunol*. 39(8):2281-92. doi: 10.1002/eji.200838985. PubMed PMID: 19593770; PubMed Central PMCID: PMC2994262.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	**Zindl CL**, Chaplin DD. 2010. Immunology. Tumor immune evasion. Science. 7;328(5979):697-8. doi: 10.1126/*science*.1190310. PubMed PMID: 20448171; PubMed Central PMCID: PMC4123868.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	Lai JF, **Zindl CL**, Duffy LB, Atkinson TP, Jung YW, van Rooijen N, Waites KB, Krause DC, Chaplin DD. 2010. Critical role of macrophages and their activation via MyD88-NFκB signaling in lung innate immunity to Mycoplasma pneumoniae. *PLoS One*. 23;5(12):e14417. doi: 10.1371/journal.pone.0014417. PubMed PMID: 21203444; PubMed Central PMCID: PMC3009709.
CHAPLIN, David D.	Past	Zindl, Carlene L. (2003-2008)	**Zindl CL**, Lai JF, Lee YK, Maynard CL, Harbour SN, Ouyang W, Chaplin DD, Weaver CT. 2013. IL-22-producing neutrophils contribute to antimicrobial defense and restitution of colonic epithelial integrity during colitis. *Proc Natl Acad Sci U S A*. 110(31):12768-73. doi: 10.1073/pnas.1300318110. Epub 2013 Jun 18. PubMed PMID: 23781104; PubMed Central PMCID: PMC3732935.

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CHATHAM, W. Winn	Past	Teng, GG (2006-2007)	Saag KG[1], Teng GG, Patkar NM, Anuntiyo J, Finney C, Curtis JR, Paulus HE, Mudano A, Pisu M, Elkins-Melton M, Outman R, Allison JJ, Suarez Almazor M, Bridges SL Jr, Chatham WW, Hochberg M, MacLean C, Mikuls T, Moreland LW, O'Dell J, Turkiewicz AM, Furst DE; *American College of Rheumatology*. American College of Rheumatology 2008 recommendations for the use of nonbiologic and biologic disease-modifying antirheumatic drugs in rheumatoid arthritis. PMID: 18512708
CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	**Chen JF**, Sun Y, Mao X, Liu Q, Wu H and Chen Y. RANKL Up-regulates Brain-type Creatine Kinase *via* Poly(ADP-ribose) Polymerase-1 during Osteoclastogenesis**.** *J. Biol. Chem.,* 2010, 285(47):36315-21. PMID: 20837480
CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	Byon CB, Sun Y, **Chen JF**, Mao X, Heath JM, Anderson PG, Tintut Y, Demer LL, Wang D and Chen Y. Runx2-depedent expression of RANKL during calcification of vascular smooth muscle cells promotes migration and osteoclastic differentiation of macrophages. *Arteriosclerosis, Thrombosis and Vascular Biology.* 2011, 31(6):1387-96. PMID:21454810
CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	**Chen JF**, Yuan K, Mao X, Miano JM, Wu H and Chen Y. Serum response factor regulates bone formation by IGF-1 and Runx2 axis. *J Bone Miner Res.* 2012**,** PMID: 22434656
CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	Sun Y, Byon CB, Yuan K, **Chen JF**, Mao X, heath JM, Javed A, Zhang, K, Anderson PG, and Chen Y**.** Smooth muscle cell-specific Runx2 deficiency inhibits vascular calcification. *Circ Res.* 2012**,** PMID: 22773442
CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	Byon C, **Chen JF**, McDonald JM and Chen Y. Bridging atherosclerosis and osteoporosis, the role of the receptor activator of nuclear factor κB ligand. *Proceedings of Annual Meeting of American Society for Bone and Mineral Research 2008*
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CHEN, Yabing	Past	Chen, Jianfeng (2007-2012)	Byon C, **Chen JF**, McDonald JM and Chen Y**.** Regulation and function of RANKL in vascular calcification. *Proceedings of Atherosclerosis Thrombosis Vascular Biology* 2009
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Jing G, **Yuan K,** Amy Turk, Zhang K, McDonald JM and Chen Y. Tamoxifen enhances therapeutic effects of gemcytbine on cholangiocarcinoma tumorigenesis. *Lab Investigation,* 2011**,** Jun;91(6):896-904. Epub 2011 Apr 4. PMID:21464824
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	**Yuan K,** Jing G, Chen J, Liu H, Zhang K, Li Y, Wu H, McDonald JM and Chen Y**.** Fas-induced Src activation promotes cell survival in FADD-independent pancreatic cancer cells. *J. Biol. Chem.* 2011, Jul 15;286(28):24776-84. Epub 2011 May 25. PMID:21613217
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Jing G, **Yuan K,** Liang Q, Sun Y, Mao X, McDonald JM and Chen Y. Reduced CaM/FLIP binding by a single point mutation in c-$FLIP_L$ modulates Fas-mediated apoptosis and decreases tumorigenesis. *Lab Investigation.* 2012**,** 92(1):82-90 PMID:21912376

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
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CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Mao X, DeBenedittis P, Sun Y, Chen J, **Yuan K**, Jiao K and Chen Y**.** Function of Vascular Smooth Muscle Cell Smad4 gene on Mouse Embryo Development. *Arterioscler. Thromb Vasc Biol.* 2012, PMID: 22772757
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Sun Y, Byon CB, **Yuan K**, Chen JF, Mao X, heath JM, Javed A, Zhang, K, Anderson PG, and Chen Y. Smooth muscle cell-specific Runx2 deficiency inhibits vascular calcification. *Circ Res.* 2012, PMID: 22773442
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	**Yuan K,** Sun Y, Zhou T, McDonald JM, Chen Y. PARP-1 regulates resistance of pancreatic cancer to TRAIL therapy. *Clin Cancer Res.* 2013, 19(17):4750-9. PMID: 23833311. PMCID: PMC4050702
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** Bradley WE, Litovsky S, Dell'Italia LJ, Chatham JC, Wu H and Chen Y. O-GlcNAc modification and activation of AKT induces diabetic vascular calcification. *Circ Res.* 2014, Mar 28;114(7):1094-102. PMCID: PMC24526702
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Sun Y, Byon CH, **Yuan K,** Mao X, Chen J, Yu S, Kabarowski JH and Chen Y. Calcified vascular smooth muscle cells promote macrophage infiltration in atherosclerosis. *Circulation*, 2010S
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	**Yuan K** Ma L, Ambalavana N, Jahla N, Dell'Italia L, Sun Y, Michalek S, Wu H, Anderson PG, Wang D, Benza RL and Chen Y**.** TLR4 deficiency in mice promotes pulmonary hypertension. *Proceedings of Annual Meeting of Atherosclerosis Thrombosis Vascular Biology* 2011
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	**Yuan K,** Jing G, Chen J and Chen Y**.** Calmodulin modulates Fas-induced survival signals in pancreatic cancer. *Proceedings of the American Association for Cancer Research Conference* 2011
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Increased O-GlcNAc modification induces vascular calcification by activation of AKT. *Proceedings of the 23rd Annual Vascular Biology and Hypertension Symposium*
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Increased O-GlcNAc modification induces vascular calcification by activation of AKT. *Circulation* 2012S (Selected for oral presentation)
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	**Yuan K,** Zhou T, McDonald JM, Chen Y. Calmodulin binding to death receptor-5 regulates pancreatic cancer apoptosis. *Proceedings of the American Association for Cancer Research Conference* 2012
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Diabetic vascular calcification requires O-GlcNAc modification." *Proceedings of the 2013 UAB GBS Student Spring Research Retreat (Selected for oral presentation)*
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Diabetic vascular calcification requires O-GlcNAc modification. 4th Annual UAB Diabetes Research Day, 2013 *(Selected for oral presentation, honorable mention)*

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Increased O-GlcNAc modification induces vascular calcification by activation of AKT. *Proceedings of the 2013 UAB Graduate Student Research Day (Second prize, oral presentation)*
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Decreased smooth muscle O-GlcNAcylation inhibits diabetic vascular calcification. *Proceedings of the 24th Annual Vascular Biology and Hypertension Symposium* (*First prize winner*)
CHEN, Yabing	Past	Yuan, Kaiyu (2010-present)	Heath J, Sun Y, **Yuan K,** and Chen Y. Diabetic vascular calcification is inhibited by smooth muscle-specific OGT deletion and decreased O-GlcNAcylation. *Circulation*, 2013S (*A Best Basic Science paper* for the American Heart Association Scientific Sessions 2013)
CRON, Randy Q.	Past	Arabshahi, Bita (2003-2006)	**Arabshahi B**, Dewitt EM, Cahill AM, Kaye RD, Baskin KM, Towbin RB, Cron RQ. Utility of corticosteroid injection for temporomandibular arthritis in children with juvenile idiopathic arthritis. *Arthritis Rheum*. 2005 Nov;52(11):3563-9. PMID: 16255045
CRON, Randy Q.	Past	Arabshahi, Bita (2003-2006)	**Arabshahi B,** Cron RQ. Temporomandibular joint arthritis in juvenile idiopathic arthritis: the forgotten joint. *Curr Opin Rheumatol*. 2006 Sep;18(5):490-5. PMID: 16896288
CRON, Randy Q.	Past	Arabshahi, Bita (2003-2006)	Cahill AM, Baskin KM, Kaye RD, **Arabshahi B,** Cron RQ, Dewitt EM, Bilaniuk L, Towbin RB. CT-guided percutaneous steroid injection for management of inflammatory arthropathy of the temporomandibular joint in children. *AJR Am J Roentgenol*. 2007 Jan;188(1):182-6. PMID: 17179362
CRON, Randy Q.	Past	Becker, Mara (2005-2006)	**Becker ML**, Rosé CD, Cron RQ, Sherry DD, Bilker WB, Lautenbach E. Effectiveness and toxicity of methotrexate in juvenile idiopathic arthritis: comparison of 2 initial dosing regimens. *J Rheumatol*. 2010 Apr;37(4):870-5. PMID: 20194449. PMCID: PMC2893572
CRON, Randy Q.	Past	Behrens, Ed (2004-2007)	**Behrens EM**, Kreiger PA, Cherian S, Cron RQ. Interleukin 1 receptor antagonist to treat cytophagic histiocytic panniculitis with secondary hemophagocytic lymphohistiocytosis. *J Rheumatol*. 2006 Oct;33(10):2081-4. PMID: 17014024
CRON, Randy Q.	Past	Behrens, Ed (2004-2007)	**Behrens EM**, Beukelman T, Paessler M, Cron RQ. Occult macrophage activation syndrome in patients with systemic juvenile idiopathic arthritis. *J Rheumatol*. 2007 May;34(5):1133-8. PMID: 17343315
CRON, Randy Q.	Past	Behrens, Ed (2004-2007)	**Behrens EM**, Beukelman T, Gallo L, Spangler J, Rosenkranz M, Arkachaisri T, Ayala R, Groh B, Finkel TH, Cron RQ. Evaluation of the presentation of systemic onset juvenile rheumatoid arthritis: data from the Pennsylvania Systemic Onset Juvenile Arthritis Registry (PASOJAR). *J Rheumatol*. 2008 Feb;35(2):343-8. PMID: 18085728
CRON, Randy Q.	Past	Beukelman, Tim (2004-2007)	**Beukelman T**, Arabshahi B, Cahill AM, Kaye RD, Cron RQ. Benefit of intraarticular corticosteroid injection under fluoroscopic guidance for subtalar arthritis in juvenile idiopathic arthritis. *J Rheumatol*. 2006 Nov;33(11):2330-6. PMID: 16981290

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CRON, Randy Q.	Past	Beukelman, Tim (2004-2007)	Behrens EM, **Beukelman T**, Paessler M, Cron RQ. Occult macrophage activation syndrome in patients with systemic juvenile idiopathic arthritis. J Rheumatol. 2007 May;34(5):1133-8. PMID: 17343315
CRON, Randy Q.	Past	Beukelman, Tim (2004-2007)	Behrens EM, **Beukelman T**, Gallo L, Spangler J, Rosenkranz M, Arkachaisri T, Ayala R, Groh B, Finkel TH, Cron RQ. Evaluation of the presentation of systemic onset juvenile rheumatoid arthritis: data from the Pennsylvania Systemic Onset Juvenile Arthritis Registry (PASOJAR). *J Rheumatol*. 2008 Feb;35(2):343-8. PMID: 18085728
CRON, Randy Q.	Past	Dewitt, Esi (2002-2005)	Arabshahi B, **Dewitt EM,** Cahill AM, Kaye RD, Baskin KM, Towbin RB, Cron RQ. Utility of corticosteroid injection for temporomandibular arthritis in children with juvenile idiopathic arthritis. *Arthritis Rheum*. 2005 Nov;52(11):3563-9. PMID: 16255045
CRON, Randy Q.	Past	Dewitt, Esi (2002-2005)	**DeWitt EM,** Sherry DD, Cron RQ. Pediatric rheumatology for the adult rheumatologist I: therapy and dosing for pediatric rheumatic disorders. *J Clin Rheumatol*. 2005 Feb;11(1):21-33. PMID: 16357693
CRON, Randy Q.	Past	Mannion, Melissa (2011-2014)	Nigrovic PA, **Mannion M**, Prince FH, Zeft A, Rabinovich CE, van Rossum MA, Cortis E, Pardeo M, Miettunen PM, Janow G, Birmingham J, Eggebeen A, Janssen E, Shulman AI, Son MB, Hong S, Jones K, Ilowite NT, Cron RQ, Higgins GC. Anakinra as first-line disease-modifying therapy in systemic juvenile idiopathic arthritis: report of forty-six patients from an international multicenter series. *Arthritis Rheum*. 2011 Feb;63(2):545-55. PMID: 21280009.
CRON, Randy Q.	Past	Mannion, Melissa (2011-2014)	Fain ET, **Mannion M**, Pope E, Young DW, Laxer RM, Cron RQ. Brain cavernomas associated with en coup de sabre linear scleroderma: Two case reports. *Pediatr Rheumatol Online J*. 2011 Jul 29;9:18. PMID: 21801349. PMCID: PMC3162908
CRON, Randy Q.	Past	Mehta, Jay (2006-2007)	**Mehta J**, Genin A, Brunner M, Scalzi LV, Mishra N, Beukelman T, Cron RQ. Prolonged expression of CD154 on CD4 T cells from pediatric lupus patients correlates with increased CD154 transcription, increased nuclear factor of activated T cell activity, and glomerulonephritis. *Arthritis Rheum*. 2010 Aug;62(8):2499-509. PMID: 20506525. PMCID: PMC2921031
CRON, Randy Q.	Past	Pessler, Frank (2003-2007)	**Pessler F**, Emery H, Dai L, Wu YM, Monash B, Cron RQ, Pradhan M. The spectrum of renal tubular acidosis in paediatric Sjögren syndrome. *Rheumatology* (Oxford). 2006 Jan;45(1):85-91.PMID:16159947
CRON, Randy Q.	Past	Pessler, Frank (2003-2007)	**Pessler F**, Dai L, Cron RQ, Schumacher HR. NFAT transcription factors--new players in the pathogenesis of inflammatory arthropathies? *Autoimmun Rev.* 2006 Feb;5(2):106-10. PMID: 16431337
CRON, Randy Q.	Past	Shakoory, Bita (2008-2010)	Minoia F, Davì S, Horne A, Demirkaya E, Bovis F, Li C, Lehmberg K, Weitzman S, Insalaco A, Wouters C, Shenoi S, Espada G, Ozen S, Anton J, Khubchandani R, Russo R, Pal P, Kasapcopur O, Miettunen P, Maritsi D, Merino R, **Shakoory B**, Alessio M, Chasnyk V, Sanner H, Gao YJ, Huasong Z, Kitoh T, Avcin T, Fischbach M, Frosch M, Grom A, Huber A, Jelusic M, Sawhney S, Uziel Y, Ruperto N, Martini A, Cron RQ, Ravelli A. Clinical features, treatment, and outcome of macrophage activation syndrome complicating systemic juvenile idiopathic arthritis: a multinational, multicenter study of 362 patients. *Arthritis Rheumatol*. 2014 Nov;66(11):3160-9. PMID: 25077692

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CRON, Randy Q.	Past	Shakoory, Bita (2008-2010)	Zhang M, Behrens EM, Atkinson TP, **Shakoory B**, Grom AA, Cron RQ. Genetic defects in cytolysis in macrophage activation syndrome. *Curr Rheumatol Rep*. 2014;16(9):439. PMID: 25086802
CRON, Randy Q.	Past	Fitch, Pam (2005-2007)	**Fitch PG**, Rettig P, Burnham JM, Finkel TH, Yan AC, Akin E, Cron RQ. Treatment of pediatric localized scleroderma with methotrexate. *J Rheumatol*. 2006 Mar;33(3):609-14. PMID: 16511930
CRON, Randy Q.	Past	Fitch, Pam (2005-2007)	**Weiss PF**, Arabshahi B, Johnson A, Bilaniuk LT, Zarnow D, Cahill AM, Feudtner C, Cron RQ. High prevalence of temporomandibular joint arthritis at disease onset in children with juvenile idiopathic arthritis, as detected by magnetic resonance imaging but not by ultrasound. *Arthritis Rheum*. 2008 Apr;58(4):1189-96. doi: 10.1002/art.23401. PMID: 18383394
CRON, Randy Q.	Past	Wright, Tracy (2005-2007)	**Wright T,** Cron RQ. Pediatric rheumatology for the adult rheumatologist II: uveitis in juvenile idiopathic arthritis. *J Clin Rheumatol*. 2007 Aug;13(4):205-10. PMID: 17762455
CUI, Xiangqin	Current	Guichard, Jason (2012-present)	Barnes J, Pat B, Chen YW, Powell PC, Bradley WE, Zheng J, Karki A, Cui X, **Guichard J**, Wei CC, Collawn J, Dell'Italia LJ. (2014) "Whole-genome profiling highlights the molecular complexity underlying eccentric cardiac hypertrophy." *Ther Adv Cardiovasc Dis*. 8(3):97-118 PMID: 24692245
CUI, Xiangqin	Current	Guichard, Jason (2012-present)	Gladden JD, Zelickson BR, **Guichard JL**, Ahmed MI, Yancey DM, Ballinger S, Shanmugam M, Babu GJ, Johnson MS, Darley-Usmar V, Dell'Italia LJ. Xanthine oxidase inhibition preserves left ventricular systolic but not diastolic function in cardiac volume overload*. Am J Physiol Heart Circ Physiol*. 2013;305:H1440-1450. PMCID: PMC4073978
CUI, Xiangqin	Current	Guichard, Jason (2012-present)	**Guichard JL**, Clark D, 3rd, Calhoun DA, Ahmed MI. Aldosterone receptor antagonists: Current perspectives and therapies. *Vasc Health Risk Manag*. 2013;9:321-331. PMCID: PMC3699348
CUI, Xiangqin	Current	Guichard, Jason (2012-present)	Yancey DM, **Guichard JL**, Ahmed MI, Zhou L, Murphy MP, Johnson MS, Benavides GA, Collawn J, Darley-Usmar V, Dell'Italia LJ. Cardiomyocyte mitochondrial oxidative stress and cytoskeletal breakdown in the heart with a primary volume overload*. Am J Physiol Heart Circ Physiol*. 2015. In Press. PMCID: PMC4360051
CUI, Xiangqin	Past	Kennedey, Richard (2008-2011)	**Kennedy RE**, and X. Cui**.** (2011). Experimental designs and ANOVA for microarray data. Book Chapter 8 in *Hand book of statistical bioinformatics* Edited by Henry Horng-Shing Lu, Bernhard Scholkopf, and Hongyu Zhao. Springer Heidelberg Dordrecht, London, pp. 151-169.
CUI, Xiangqin	Past	Kennedey, Richard (2008-2011)	**Kennedy RE**, Adragni KP, Tiwari HK, Voeks JH, Brott TG, Howard G. Risk-stratified imputation in survival analysis. *Clin Trials*. 2013;10(4):530-9. PMCID: PMC3807795
CUI, Xiangqin	Past	Kennedey, Richard (2008-2011)	**Kennedy RE**, Howard G, Go RC, et al. Association between family risk of stroke and myocardial infarction with prevalent risk factors and coexisting diseases. *Stroke.* 2012;43(4):974-9. PMCID: PMC3805250
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
CUI, Xiangqin	Past	Kennedey, Richard (2008-2011)	Wineinger NE, **Kennedy RE**, Erickson SW, Wojczynski MK, Bruder CE, Tiwari HK. Statistical issues in the analysis of DNA Copy Number Variations*. Int J Comput Biol Drug Des*. 2008;1(4):368-95. PMCID: PMC2747762
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CURTIS, Jeffrey R	Current	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I**, Singh JA, Curtis JR. (2012) Systematic Review of Tocilizumab for Rheumatoid Arthritis: A New Biologic Targeting the Interleukin-6 Receptor. *Clnl Ther* 34(4): 788-802. PMID 22444783.
CURTIS, Jeffrey R	Current	Navarro-Millán, Iris (2010 - 2013)	Curtis JR, McVie T, Mikuls TR, Reynolds RJ**, Navarro-Millán IY**, O'Dell JR, Moreland LW, Bridges SL Jr., Ranganath VK, Cofield SS. (2013) Clinical Response within 12 Weeks as a Predictor of Future Low Disease Activity in Early RA Patients: Results from the TEAR Trial. *Journal of Rheumatology* 40(5):572-8. PMCID: PMC3694569.
CURTIS, Jeffrey R	Current	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I,** Charles-Schoeman C, Yang S, Bathon JM, Bridges SL Jr., Chen L, Cofield SS, Dell'Italia LJ, Moreland LW, O'Dell JR, Paulus HE, Curtis JR. (2013) Changes in Lipoproteins Associated with Treatment with Methotrexate or Combination Therapy in Early Rheumatoid Arthritis: Results from the TEAR Trial. *Arthritis & Rheumatism* 65(6):1430-8. PMCID: PMC3672346.
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CURTIS, Jeffrey R	Current	Navarro-Millán, Iris (2010 - 2013)	**Navarro-Millán I**, Yang S, DuVall SL, Chen L, Baddley J, Cannon GW, Delzell ES, Zhang J, Safford MM, Patkar NM, Mikuls TR, Singh JA, Curtis JR. (2015) Association of hyperlipidaemia, inflammation and serological status and coronary heart disease among patients with rheumatoid arthritis: data from the National Veterans Health Administration. *Ann Rheum Dis* Jan 21. pii: annrheumdis-2013-204987. doi: 10.1136/annrheumdis-2013-204987. [Epub ahead of print]. PMID: 25609412
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Baddley JW, Winthrop KL, Chen L, Liu L, Grijalva CG, Delzell E, **Beukelman T**, Patkar NM, Xie F, Saag KG, Herrinton LJ, Solomon DH, Lewis JD, Curtis JR. Non-viral opportunistic infections in new users of tumor necrosis factor inhibitor therapy: Results of the safety assessment of biologic therapy (SABER) study. *Ann Rheum Dis* 2014; 73:1942-8. [published online 13 Jul 2013]. [cited 4 times] PMCID: PMC4273901
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Donnithorne KJ, Read RW, Lowe R, Weiser P, Cron RQ, **Beukelman T**. Retinal vasculitis in two pediatric patients with systemic lupus erythematosus: A case report. *Pediatr Rheumatol Online J* 2013; 11:25. [cited 3 times] PMCID: PMC3682897
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CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Haynes K, **Beukelman T**, Curtis JR, Herrinton L, Graham D, Solomon DH, Griffin MR, Chen L, Liu L, Saag KG, Lewis JD. Tumor necrosis factor alpha inhibitor therapy and cancer risk in chronic immune mediated diseases. *Arthritis Rheum* 2013; 65:48-58. [published online 10 Oct 2012]. [cited 14 times]. PMCID: PMC3778442
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CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	**Beukelman T**, Xie F, Chen L, Baddley JW, Delzell E, Grijalva CG, Patkar NM, Saag KG, Winthrop KL, Curtis JR. Rates of hospitalized bacterial infection associated with juvenile idiopathic arthritis and its treatment. *Arthritis Rheum* 2012; 64:2773-80. [published online 8 May 2012]. [cited 26 times]. PMCID: PMC3409300
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Curtis JR, Xie F, Chen L, Munter P, Grijalva CG, Spettell C, Fernandes J, McMahan RM, Baddley JW, Saag KG, **Beukelman T**, Delzell E. Use of a disease risk score to compare serious infections associated with anti-tumor necrosis factor therapy among high- versus lower-risk rheumatoid arthritis patients. *Arthritis Care Res* 2012; 64:1480-9. [published online 3 May 2012]. [cited 15 times] PMCID: PMC3687540

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CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	DeWitt EM, Kimura Y, **Beukelman T**, Nigrovic PA, Onel K, Prahalad S, Schneider R, Stoll ML, Angeles-Han S, Milojevic D, Schikler KN, Vehe RK, Weiss JE, Weiss P, Ilowite NT, Wallace CA. Consensus treatment plans for new-onset systemic juvenile idiopathic arthritis. *Arthritis Care Res* 2012; 64:1001-10. [published online 30 Jan 2012]. [cited 38 times]. PMCID: PMC3368104
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Stoll ML, Good J, Sharpe T, **Beukelman T**, Young D, Waite PD, Cron RQ. Intra-articular corticosteroid injections to the temporomandibular joints are safe and appear to be effective therapy in children with juvenile idiopathic arthritis. *J Oral Maxillofac Surg* 2012; 70:1082-7. [published online 21 Jan 2012]. [cited 16 times]. PMID: 22265164
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Bharat A, Xie F, Baddley JW, **Beukelman T**, Chen L, Calabrese L, Delzell E, Grijalva CG, Patkar NM, Saag KG, Winthrop KL, Curtis JR. Incidence and risk factors for progressive multifocal leukoencephalopathy among patients with selected rheumatic diseases. *Arthritis Care Res* 2012; 64:612-5. [published online 12 Dec 2011]. [cited 16 times]. PMCID: PMC3310319
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CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Herrinton LJ, Curtis JR, Chen L, Liu L, Delzell E, Lewis JD, Solomon DH, Griffin MR, Ouellet-Hellstom R, **Beukelman T,** Grijalva CG, Haynes K, Kuriya B, Lii J, Mitchel E Patkar NM, Rassen J, Winthrop KL, Nourjah P, Saag KG. Study design for a comprehensive assessment of biologic safety using multiple healthcare data systems. *Pharmacoepidemiol Drug Saf* 2011; 20:1199-209. [published online 15 Sep 2011]. [cited 13 times] PMCID: PMC3312584
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CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Lovell DJ, Passo MH, **Beukelman T**, Bowyer SL, Gottlieb BS, Henrickson M, Ilowite NT, Kimura Y, Morgan DeWitt E, Segerman J, Stein LD, Taylor J, Vehe RK, Giannini EH. Measuring process of arthritis care. A proposed set of quality measures for the process of care in juvenile idiopathic arthritis. *Arthritis Care Res* 2011; 63:10-16. [published online 14 Sep 2010] [cited 19 times] PMCID: PMC3016458
CURTIS, Jeffrey R	Past	Beukelman, Timothy (2009-2013)	Cron RQ, **Beukelman T**. Guilt by association—what is the true risk of malignancy in children treated with etanercept for JIA? [editorial comment]. *Pediatr Rheumatol Online J* 2010; 8:23. [cited 16 times] PMCID: PMC2931479

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CUTTER, Gary	Current	Lebensburger, J (2015-2020)	None
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CUTTER, Gary	Past	Marrie, R (2008-2011)	**Marrie R**, Horwitz R, Cutter G, Tyry T, Campagnolo D, Vollmer T. Comorbidity, socioeconomic status and multiple sclerosis. *Mult Scler*. 2008 Sep;14(8):1091-8 PMID: 18728060
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KIMBERLY, Robert P.	Past	Kelley, James * (2005-2006)	**Kelley JM**, Hughes LB, Faggard JD, Danila MI, Crawford MH, Edberg Y, Padilla MA, Tiwari HK, Westfall AO, Alarcon GS, Conn DL, Jonas BL, Callahan LF, Smith EA, Brasington RD, Jr., Allison DB, Jr., Kimberly RP, Moreland LW, Edberg JC, Bridges SL, Jr. (2009). Retraction: an African ancestry-specific allele of CTLA4 confers protection against rheumatoid arthritis in African Americans. *PLoS genetics*;5(12). PMC2792216.
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KIMBERLY, Robert P.	Past	Li, Xinrui (2009-2012)	Gibson AW, **Li X**, Wu J, Baskin JG, Raman C, Edberg JC, Kimberly RP. (2012). Serine phosphorylation of FcgammaRI cytoplasmic domain directs lipid raft localization and interaction with protein 4.1G. *Journal of leukocyte biology*;91(1):97-103: PMC3250306.
KIMBERLY, Robert P.	Past	Li, Xinrui (2009-2012)	Absher DM, **Li X**, Waite LL, Gibson A, Roberts K, Edberg J, Chatham WW, Kimberly RP. (2013). Genome-wide DNA methylation analysis of systemic lupus erythematosus reveals persistent hypomethylation of interferon genes and compositional changes to CD4+ T-cell populations. *PLoS genetics*;9(8):e1003678. PMC3738443.
KIMBERLY, Robert P.	Past	Li, Xinrui (2009-2012)	**Li X**, Wu J, Ptacek T, Redden DT, Brown EE, Alarcon GS, Ramsey-Goldman R, Petri MA, Reveille JD, Kaslow RA, Kimberly RP, Edberg JC. (2013). Allelic-dependent expression of an activating Fc receptor on B cells enhances humoral immune responses. *Science translational medicine*;5(216):216ra175. PMC3982386.
KIMBERLY, Robert P.	Past	Mukhtar, Shahid * (2011-2012)	Evidence for network evolution in an Arabidopsis interactome map. *Science* (New York, NY). 2011;333(6042):601-7. PMC3170756.
KIMBERLY, Robert P.	Past	Mukhtar, Shahid * (2011-2012)	**Mukhtar MS**, Carvunis AR, Dreze M, Epple P, Steinbrenner J, Moore J, Tasan M, Galli M, Hao T, Nishimura MT, Pevzner SJ, Donovan SE, Ghamsari L, Santhanam B, Romero V, Poulin MM, Gebreab F, Gutierrez BJ, Tam S, Monachello D, Boxem M, Harbort CJ, McDonald N, Gai L, Chen H, He Y, Vandenhaute J, Roth FP, Hill DE, Ecker JR, Vidal M, Beynon J, Braun P, Dangl JL.(2011) Independently evolved virulence effectors converge onto hubs in a plant immune system network. *Science* (New York, NY);333(6042):596-601.PMC3170753.
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KIMBERLY, Robert P.	Past	Mukhtar, Shahid * (2011-2012)	Pajerowska-Mukhtar KM, Emerine DK, **Mukhtar MS**. (2013). Tell me more: roles of NPRs in plant immunity. *Trends in plant science*;18(7):402-11. PMID:23683896 (no NIH funding).
KIMBERLY, Robert P.	Past	Mukhtar, Shahid * (2011-2012)	**Mukhtar MS**. (2013). Engineering NLR immune receptors for broad-spectrum disease resistance. *Trends in plant science*;18(9):469-72. PMID:23972530 (no NIH funding).
KIMBERLY, Robert P.	Past	Reddy, Tim * (2007-2011)	Brunner, AL, Johnson, DS, Kim, SW, Valouev, A**, Reddy, TE**, Neff, NF, Anton, E, Medina, C, Nguyen, L, Chiao, E*, et al.* (2009). Distinct DNA methylation patterns characterize differentiated human embryonic stem cells and developing human fetal liver. *Genome Res 19*, 1044-1056. PMC2694474.
KIMBERLY, Robert P.	Past	Reddy, Tim * (2007-2011)	**Reddy, TE**, Pauli, F, Sprouse, R., Neff, NF, Newberry, KM, Garabedian, MJ, and Myers, R. (2009). Genomic determination of the glucocorticoid response reveals unexpected mechanisms of gene regulation. *Genome Res 19*, 2163-2171. PMC2792167.
KIMBERLY, Robert P.	Past	Reddy, Tim * (2007-2011)	Gertz J, Varley KE, **Reddy TE**, Bowling KM, Pauli F, Parker SL, Kucera KS, Willard HF, Myers RM. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS genetics*;7(8):e1002228. PMC3154961.

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KIMBERLY, Robert P.	Past	Reddy, Tim * (2007-2011)	Kucera KS, **Reddy TE**, Pauli F, Gertz J, Logan JE, Myers RM, Willard HF.(2011). Allele-specific distribution of RNA polymerase II on female X chromosomes. *Human molecular genetics*.;20(20):3964-73. PMC3177651.
KORF, Bruce	Past	Boyd, Kevin (2007-2008)	**Boyd KP**, Gao L, Feng R, Beasley M, Messiaen L, Korf BR, Theos A. Phenotypic variability among café-au-lait macules in neurofibromatosis type 1. *J Am Acad Dermatol*. 2010;63(3):440-7. doi: S0190-9622(09)01251-1 [pii] 10.1016/j.jaad.2009.09.042. PubMed PMID: 20605257; PubMed Central PMCID: PMCPMC2922676
KORF, Bruce	Past	Boyd, Kevin (2007-2008)	**Boyd K**, Korf B, Theos A. Neurofibromatosis type 1. *J Am Acad Dermatol*. 2009;61(1):1- 14; quiz 5-6. doi: S0190-9622(09)00405-8 [pii]10.1016/j.jaad.2008.12.051. PubMed PMID: 19539839
KORF, Bruce	Past	Messiaen, Ludwine (2003-2005)	Piotrowski A, Xie J, Liu YF, Poplawski AB, Gomes AR, Madanecki P, Fu C, Crowley MR, Crossman DK, Armstrong L, Babovic-Vuksanovic D, Bergner A, Blakeley JO, Blumenthal AL, Daniels MS, Feit H, Gardner K, Hurst S, Kobelka C, Lee C, Nagy R, Rauen KA, Slopis JM, Suwannarat P, Westman JA, Zanko A, Korf BR, **Messiaen LM**. Germline loss-of-function mutations in LZTR1 predispose to an inherited disorder of multiple schwannomas. *Nat Genet*. 2014;46(2):182-7. doi: 10.1038/ng.2855. PubMed PMID: 24362817
KORF, Bruce	Past	Messiaen, Ludwine (2003-2005)	**Messiaen L**, Yao S, Brems H, Callens T, Sathienkijkanchai A, Denayer E, Spencer E, Arn P, Babovic-Vuksanovic D, Bay C, Bobele G, Cohen B, Escobar L, Eunpu D, Grebe T, Greenstein R, Hachen R, Irons M, Kronn D, Lemire E, Leppig K, Lim C, McDonald M, Narayanan V, Pearn A, Pedersen R, Powell B, Shapiro L, Skidmore D, Tegay D, Thiese H, Zackai E, Vijzelaar R, Taniguchi K, Ayada T, Okamoto F, Yoshimura A, Parret A, Korf B, Legius E. Clinical and Mutational Spectrum of Neurofibromatosis Type 1-like Syndrome. *JAMA*. 2009;302(19):2111-8. Epub 2009/11/19. doi: 302/19/2111 [pii]10.1001/jama.2009.1663 [doi]. PubMed PMID: 19920235.
KORF, Bruce	Past	Mikhail, Fady (2004-2006)	**Mikhail FM**, Lose EJ, Robin NH, Descartes MD, Rutledge KD, Rutledge SL, Korf BR, Carroll AJ. Clinically relevant single gene or intragenic deletions encompassing critical neurodevelopmental genes in patients with developmental delay, mental retardation, and/or autism spectrum disorders. *Am J Med Genet A*. 2011;155A(10):2386-96. doi: 10.1002/ajmg.a.34177. PubMed PMID: 22031302
LEFKOWITZ, Elliot J.	Current	Hatcher, Eneida (2014 - Present)	Song J, Doggett N, Wren M, Burr T, Fenimore PW, **Hatcher EL,** Bruno WJ, Li PE, Stubben C, Wolinsky M. Development of Forensic Assay Signatures for Ebolaviruses. *J Forensic Sci*. 2015 Mar;60(2):315-325. doi: 10.1111/1556-4029.12655. Epub 2015 Feb 10. PubMed PMID: 25677086.

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LEFKOWITZ, Elliot J.	Current	Hatcher, Eneida (2014 - Present)	Hendrickson RC, Wang C, **Hatcher EL**, Lefkowitz EJ. Orthopoxvirus genome evolution: the role of gene loss. *Viruses*. 2010 Sep;2(9):1933-67. doi: 10.3390/v2091933. Epub 2010 Sep 15. PubMed PMID: 21994715; PubMed Central PMCID: PMC3185746.
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LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	Li X, Wu J, **Ptacek T**, Redden DT, Brown EE, Alarcón GS, Ramsey-Goldman R, Petri MA, Reveille JD, Kaslow RA, Kimberly RP, Edberg JC. Allelic-dependent expression of an activating Fc receptor on B cells enhances humoral immune responses. *Sci Transl Med*. 2013 Dec 18;5(216):216ra175. doi: 10.1126/scitranslmed.3007097. PubMed PMID: 24353158; PubMed Central PMCID: PMC3982386.
LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	Li X, **Ptacek TS**, Brown EE, Edberg JC. Fcgamma receptors: structure, function and role as genetic risk factors in SLE. *Genes Immun*. 2009 Jul;10(5):380-9. doi: 10.1038/gene.2009.35. Epub 2009 May 7. Review. PubMed PMID: 19421223; PubMed Central PMCID: PMC2830794.
LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	Makowsky R, Wiener HW, **Ptacek TS**, Silva M, Shendre A, Edberg JC, Portman MA, Shrestha S. FcγR gene copy number in Kawasaki disease and intravenous immunoglobulin treatment response. *Pharmacogenet Genomics*. 2013 Sep;23(9):455-62. doi: 10.1097/FPC.0b013e328363686e. PubMed PMID: 23778324.
LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	**Ptacek T**, Li X, Kelley JM, Edberg JC. Copy number variants in genetic susceptibility and severity of systemic lupus erythematosus. *Cytogenet Genome Res*. 2008;123(1-4):142-7. doi: 10.1159/000184701. Epub 2009 Mar 11. Review. PubMed PMID: 19287148; PubMed Central PMCID: PMC2826785.
LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	**Ptacek T**, Song C, Walker CL, Sell SM. Physical mapping of distinct 7q22 deletions in uterine leiomyoma and analysis of a recently annotated 7q22 candidate gene. *Cancer Genet Cytogenet*. 2007 Apr 15;174(2):116-20. PubMed PMID: 17452252.
LEFKOWITZ, Elliot J.	Current	Ptacek, Travis (2013 - Present)	**Ptacek T**, Sell SM. A tiered approach to comparative genomics. *Brief Funct Genomic Proteomic*. 2005 Jul;4(2):178-85. Review. PubMed PMID: 16102272.

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LEFKOWITZ, Elliot J.	Past	Crutchley, Tamara (2007-2010)	**Crutchley TM**, Rodgers JB, Whiteside HP Jr, Vanier M, Terndrup TE. 2007. Agroterrorism: where are we in the ongoing war on terrorism? *J Food Prot*. Mar;70(3):791-804. Review. PubMed PMID: 17388078.
LI, Yi-Ping	Current	Gao, B. (2011-2012)	**Bo Gao**, Wei Chen, Liang Hao, Guochun Zhu, Shengmei Feng, Hongliang Ci, Xuedong Zhou, Phi Stashenko and Li Y-P. Inhibiting periapical lesions through AAV-RNAi silencing of Cathepsin K. *J Dent R* 2013; 92 (2): 180 - 186. PMCID: PMC3545691.
LI, Yi-Ping	Current	Gao, B. (2011-2012)	Tian F, Wu M, Deng L, Zhu G, Ma J, **Gao B**, Wang L, Chen W, Li YP*. Core binding factor beta (Cbfb) controls the balance of chondrocyte proliferation and differentiation by up-regulating Indian hedgehog (Ihh) expression and inhibiting parathyroid hormone-related protein Receptor (PPR) expression in postnatal cartilage and bone formation .*J Bone Miner Res*. 2014 Jul;29(7):1564-74. PMID: 24821091.
LI, Yi-Ping	Current	Jules, J. (2012-)	Chen W, Ma J, Zhu G, **Jules J**, Wu M, McConnell M, Zhou X, Tain F, Paulson C, Wang L, and **Li** YP*. Cb Deletion in Mice Recapitulates Cleidocranial Dysplasia and Reveals Multiple Functions of Cbfb; Required f Skeletal Development. *Proc Natl Acad Sci U S A. (PNAS). 2014;* 111(23): 8482-7. PMID: 24850862, PMCI PMC4060659
LI, Yi-Ping	Current	Jules, J. (2012-)	Wu M, Li C, Zhu G, Wang Y, **Jules J**, Lu Y, McConnell M, Wang YJ, Shao JZ, Li Y-P*, and Chen W*. Chondrocyte-specific knockout of Cbfb reveals the indispensable function of Cbfb in chondrocyte maturation, growth plate development and trabecular bone formation in mice*. Int J Biol Sci*. 2014 Jul 29;10(8): 861-72. PMCID: 25170300.
LI, Yi-Ping	Current	Jules, J. (2012-)	* Wu M, Li Y-P*, Zhu G, Lu Y, Wang Y**, Jules J**, McConnell M, Serra R, Shao JZ, Chen W. Deletion of Core-binding factor beta; (Cbfb) in mesenchymal progenitor cells provides new insights into Cbfb/Runxs complex function in cartilage and bone development. *Bone*. 2014 Aug; 65:49-59. PMID: 24798493.
LI, Yi-Ping	Current	Tian, F. (2010-2011)	**Tian F**, Wu M, Deng L, Zhu G, Ma J, Gao B, Wang L, Chen W, Li YP*. Core binding factor beta (Cbfb) controls the balance of chondrocyte proliferation and differentiation by up-regulating Indian hedgehog (Ihh) expression and inhibiting parathyroid hormone-related protein Receptor (PPR) expression in postnatal cartilage and bone formation .*J Bone Miner Res*. 2014 Jul;29(7):1564-74. PMID: 24821091.
LI, Yi-Ping	Current	Wu, M. (2014-)	**Wu M**, Deng L, Zhu G, Li Y-P. G Protein and Its Signaling Pathway in Bone Development and Disease. *Frontiers Biosci. Frontiers Biosci.* 2010;15:957-85.
LI, Yi-Ping	Current	Wu, M. (2014-)	Chen W, Zhu G, Hao L, **Wu M**, Ci HL, and Li Y-P. C/EBPa is the Key Regulator of Osteoclast Lineage Commitment. *Proc Natl Acad Sci U S A. PNAS. 2013;* 110(18):7294-9.PMID: 23580622. PMCID: PMC3645589.
LI, Yi-Ping	Current	Wu, M. (2014-)	Tian F, **Wu M**, Deng L, Zhu G, Ma J, Gao B, Wang L, Chen W, Li YP*. Core binding factor beta (Cbfb) controls the balance of chondrocyte proliferation and differentiation by up-regulating Indian hedgehog (Ihh) expression and inhibiting parathyroid hormone-related protein Receptor (PPR) expression in postnatal cartilage and bone formation .*J Bone Miner Res*. 2014 Jul;29(7):1564-74. PMID: 24821091.

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LI, Yi-Ping	Current	Wu, M. (2014-)	Chen W, Ma J, Zhu G, Jules J, **Wu M**, McConnell M, Zhou X, Tain F, Paulson C, Wang L, and Li YP*. Cbfb Deletion in Mice Recapitulates Cleidocranial Dysplasia and Reveals Multiple Functions of Cbfb; Required for Skeletal Development. *Proc Natl Acad Sci U S A. (PNAS). 2014;* 111(23): 8482-7. PMID: 24850862, PMCID: PMC4060659
LI, Yi-Ping	Current	Wu, M. (2014-)	**Wu M**, Li C, Zhu G, Wang Y, Jules J, Lu Y, McConnell M, Wang YJ, Shao JZ, Li Y-P*, and Chen W*****. Chondrocyte-specific knockout of Cbfb reveals the indispensable function of Cbfb in chondrocyte maturation, growth plate development and trabecular bone formation in mice*. Int J Biol Sci*. 2014 Jul 29;10(8): 861-72. PMCID: 25170300.
LI, Yi-Ping	Current	Wu, M. (2014-)	**Wu M,** Li Y-P*, Zhu G, Lu Y, Wang Y, Jules J, McConnell M, Serra R, Shao JZ, Chen W. Deletion of Core-binding factor beta; (Cbfb) in mesenchymal progenitor cells provides new insights into Cbfb/Runxs complex function in cartilage and bone development. *Bone*. 2014 Aug; 65:49-59. PMID: 24798493.
LI, Yi-Ping	Past	Ci, H. (2010-2012)	Bo Gao, Wei Chen, Liang Hao, Guochun Zhu, Shengmei Feng, **Hongliang Ci**, Xuedong Zhou, Phi Stashenko and Li Y-P**.** Inhibiting periapical lesions through AAV-RNAi silencing of Cathepsin K. *J Dent R* 2013; 92 (2): 180 - 186. PMCID: PMC3545691.
LI, Yi-Ping	Past	Ci, H. (2010-2012)	Ma, J, Chen W, Zhang L, Tucker B, Zhu G, Sasaki H, Hao L, Wang L, **Ci H**, Jiang H, Stashenko P, and Li P. RNAi mediated silencing of Atp6i prevents both periapical bone erosion and periapical inflammation in t mouse model of endodontic disease. *Infection and Immunity*. 2013; 81 (4): 1021–1030. PMCI PMC3639609.
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LI, Yi-Ping	Past	Feng, S. (2011-2012)	Yang DQ, **Feng S**, Chen W, Zhao H, Paulson C, Li Y-P. V-ATPase subunit ATP6AP1 (Ac45) regulates osteoclast differentiation, extracellular acidification, lysosomal trafficking, and protease exocytosis in osteoclast-mediated bone resorption. *J Bone Miner Res.* 2012 Aug;27(8):1695-707. PMCID: PMC3951719.
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LI, Yi-Ping	Past	Feng, S. (2011-2012)	Jiang HB, Chen W, Zhu G, Zhang L, Tucker B, Hao L, **Feng S,** Ci H, Ma J, Wang L, Stashenko P, and Li Y-P**.** RNAi-mediated silencing of Atp6i and Atp6i haploinsufficiency in Atp6i+/- mice prevents both bone erosion and inflammation in a mouse model of periodontal diseases. *PLOS ONE.* 2013; 8(4):e58599. PMCID: PMC3618217.

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LI, Yi-Ping	Past	Feng, S. (2011-2012)	**Feng S**, Guochun Zhu, Matthew McConnell, Lianfu Deng, Qiang Zhao, Mengrui Wu, Qi Zhou, Jinshen Wang, Jin Qi, Li Y-P,* and Wei Chen. Silencing of Atp6v1c1 Prevents Breast Cancer Growth and Bone Metastasis. *International Journal of Biological Sciences* 2013; 9(8): 853-862. PMCID: PMC3805834.
LI, Yi-Ping	Past	Jiang, H. (2009-2010)	Ma, J, Chen W, Zhang L, Tucker B, Zhu G, Sasaki H, Hao L, Wang L, Ci H, **Jiang H**, Stashenko P, and Li Y-P. RNAi mediated silencing of Atp6i prevents both periapical bone erosion and periapical inflammation in the mouse model of endodontic disease. *Infection and Immunity*. 2013; 81 (4): 1021–1030. PMCID: PMC3639609.
LI, Yi-Ping	Past	Ma, J. (2009-2010)	**Ma, J**, Chen W, Zhang L, Tucker B, Zhu G, Sasaki H, Hao L, Wang L, Ci H, Jiang H, Stashenko P, and Li Y-P. RNAi mediated silencing of Atp6i prevents both periapical bone erosion and periapical inflammation in the mouse model of endodontic disease. *Infection and Immunity*. 2013; 81 (4): 1021–1030. PMCID: PMC3639609.
LI, Yi-Ping	Past	Ma, J. (2009-2010)	Jiang HB, Chen W, Zhu G, Zhang L, Tucker B, Hao L, Feng S, Ci H, **Ma J**, Wang L, Stashenko P, and Li P**.** RNAi-mediated silencing of Atp6i and Atp6i haploinsufficiency in Atp6i+/- mice prevents both bo erosion and inflammation in a mouse model of periodontal diseases. *PLOS ONE.* 2013; 8(4):e5859 PMCID: PMC3618217.
LI, Yi-Ping	Past	Ma, J. (2009-2010)	Chen W, **Ma J,** Zhu G, Jules J, Wu M, McConnell M, Zhou X, Tain F, Paulson C, Wang L, and Li YP*. Cbfb Deletion in Mice Recapitulates Cleidocranial Dysplasia and Reveals Multiple Functions of Cbfb; Required for Skeletal Development. *Proc Natl Acad Sci U S A. (PNAS). 2014;* 111(23): 8482-7. PMID: 24850862, PMCID: PMC4060659.
LI, Yi-Ping	Past	Ma, J. (2009-2010)	Tian F, Wu M, Deng L, Zhu G, **Ma J**, Gao B, Wang L, Chen W, Li YP*. Core binding factor beta (Cbfb) controls the balance of chondrocyte proliferation and differentiation by up-regulating Indian hedgehog (Ihh) expression and inhibiting parathyroid hormone-related protein Receptor (PPR) expression in postnatal cartilage and bone formation .*J Bone Miner Res*. 2014 Jul;29(7):1564-74. PMID: 24821091.
LI, Yi-Ping	Past	Yang, S. (2002-2008)	**Yang S**, Li Y-P. RGS12 is essential for RANKL-evoked signaling for terminal differentiation of osteoclasts *Bone Miner Res* 2007;22:45-54. PMCID: PMC3559086.
LI, Yi-Ping	Past	Yang, S. (2002-2008)	Chen W, **Yang S**, Abe Y, Li M, Wang Y, Shao J, Li E, Li Y-P. Novel pycnodysostosis mouse model uncovers cathepsin K function as a potential regulator of osteoclast apoptosis and senescence. *Hum Mol Genet* 2007;16:410-23. PMCID: PMC3578583.
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LI, Yi-Ping	Past	Yang, S. (2002-2008)	Soltanoff CS, Chen W, **Yang S**, Li Y-P. The signaling networks that control the lineage commitment and differentiation of bone cells. *Crit Rev Eukaryot Gene Exp* 2009;19:1-46. PMCID: PMC 3392028.

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LORENZ, Robinna	Past	Dimmitt, Reed (2005-2008)	Elson CO, Cong Y, McCracken, VJ, **Dimmitt, RA**, Lorenz, RG, and Weaver, CT: Experimental models of inflammatory bowel disease reveal innate, adaptive, and regulatory mechanisms of host dialogue with the microbiota. *Imm.* Rev. 2005; 206:260-276. PMID: 16048554
LORENZ, Robinna	Past	Dimmitt, Reed (2005-2008)	Schmitz, JM, McCracken, VJ, **Dimmitt, RA** and Lorenz, RG, 2007, "Expressions of CXCL15 (lungkine) in murine gastrointestinal, urogenital, and endocrine organs". *J. Histochem. Cytochem*, 55:515-524. PMID: 17242461
LORENZ, Robinna	Past	Dimmitt, Reed (2005-2008)	Aprahamian CJ, Lorenz RG, Harmon CM and **Dimmitt RA**: Toll-like receptor 2 is protective of ischemia-reperfusion mediated small bowl injury in a murine model. *Ped. Crit*. Care Med. 2008 Jan;9(1):105-9. PMI 17906593
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LUND, Frances	Past	Harris, D. (2002-2005)	**Harris, D.P.,** Goodrich, S., Gerth, A.J., Peng, S.L., Lund, F.E. 2005. Regulation of IFNg□ production by effector Be1 cells: Essential roles for T-bet and the IFNg receptor. *J. Immunol*. 174:6781-6790. PMID: 15905519
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
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MUNTNER, Paul	Past	Bowling, C. Barrett (2010 – 2013)	**Bowling CB**, Booth JN 3rd, Gutiérrez OM, Kurella Tamura M, Huang L, Kilgore M, Judd S, Warnock DG, McClellan WM, Allman RM, Muntner P. *Clin J Am Soc Nephrol*. 2014 Oct 7;9(10):1737-45. Nondisease-Specific Problems and All-Cause Mortality among Older Adults with CKD: The REGARDS Study PMC4186504
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MURPHY-ULLRICH, Joanne	Past	Zhou, Yong (2002-2007)	**Zhou Y,** Poczatek M, Berecek KH, Murphy-Ullrich JE. 2006 "Thrombospondin 1 mediates angiotensin II induction of TGF-beta activation by cardiac and renal cells under both high and low glucose conditions. *Biochem Biophys Res Commun* 339: 633-641. PMID: 16310163
MURPHY-ULLRICH, Joanne	Past	Zhou, Yong (2002-2007)	**Zhou Y**, Koli K, Hagood JS, Miao M, Mavalli M, Rifkin DB, Murphy-Ullrich JE. 2009 "Latent TGF-β Bindng Protein (LTBP)-4 regulates TGF-β1 activation by fibrogenic lung fibroblasts in response to bleomycin. *Am J Pathol* 174:21-33. PMC2631315
MURPHY-ULLRICH, Joanne	Past	Zhou, Yong (2002-2007)	**Zhou Y,** Hagood JS, Lu B, Merryman WD, Murphy-Ullrich JE. 2010 **"**Thy-1-integrin αvβ5 interactions . inhibit lung fibroblast contraction-induced latent TGF-beta1 activation and myofibroblast differentiation." . *J Biol Chem* . (2010) 285(29):22382-93. PMC2903374
MYERS, Richard	Current	Lasseigne, Brittany (2013-present)	**Lasseigne, B. N**., Burwell, T. C., Patil, M. A., Absher, D. M., Brooks, J. D., and Myers, R. M. (2014). DNA methylation profiling reveals novel diagnostic biomarkers in renal cell carcinoma. *BMC Medicine*. BMC Med.12: 235. [Epub ahead of print]. PMID: 25472429. PMCID: PMC4265327.
MYERS, Richard	Current	Lasseigne, Brittany (2013-present)	Cirulli, E. T., **Lasseigne, B. N**., Petrovski, S., Sapp, P. C., Dion, P. A.,.....Myers, R. M., and Goldstein, D. B. (2015). Exome sequencing in amyotrophic lateral sclerosis identifies risk genes and pathways. Science 347: 1436-1441. PMID: 25700176. [PubMed - indexed for MEDLINE]. *Comment in Science* 347: 1422-1423 (2015). PMID: 25700176
MYERS, Richard	Current	Savic, Dan (2012-present)	Savic, D., Gertz, J., Jain P., Cooper, G. M. and Myers R. M. (2013). Mapping genome-wide transcription factor binding sites in frozen tissues. *Epigenetics & Chromatin*. 6: 30. PMCID: PMC3848595.
MYERS, Richard	Current	Savic, Dan (2012-present)	Gertz, J., **Savic, D.**, Varley, K. E., Partridge, E. C., Safi, A., Jain, P., Cooper, G. M., Reddy, T. E., Crawford, G. E. and Myers R. M. (2013). Distinct properties of cell type-specific and shared transcription factor binding sites. *Mol. Cell.* 52: 25-36. PMID: 24076218. PMCID: PMC3811135.
MYERS, Richard	Past	Bowling, Kevin (2009-2013)	Gertz, J., Varley, K., Reddy, T., **Bowling, K**., Pauli, F., Parker, S., Kucera, K., Willard, H. and Myers, R. M. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS Genetics*. PMID: 21852959. PMCID: PMC3154961.

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MYERS, Richard	Past	Bowling, Kevin (2009-2013)	Varley, K. E., Gertz, J., **Bowling, K. M.,** Parker, S. L., Reddy, T. E., Pauli, F., Cross, M. K., Williams, B., Stamatoyannopoulos, J. A., Crawford, G. E., Absher, D. M., Wold, B. J. and Myers, R. M. (2013). Dynamic DNA methylation across diverse human cell lines and tissues. *Genome Res*. PMID: 23325432. PMCID: PMC3589544.
MYERS, Richard	Past	Cross, Marie (2010-2013)	Gertz, J., Varley, K., Reddy, T., Bowling, K., Pauli, F., Parker, S., Kucera, K., Willard, H. and Myers, R. M. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS Genetics*. PMID: 21852959. PMCID: PMC3154961.
MYERS, Richard	Past	Cross, Marie (2010-2013)	Varley, K. E., Gertz, J., Bowling, K. M., Parker, S. L., Reddy, T. E., Pauli, F., **Cross, M. K**., Williams, B., Stamatoyannopoulos, J. A., Crawford, G. E., Absher, D. M., Wold, B. J. and Myers, R. M. (2013). Dynamic DNA methylation across diverse human cell lines and tissues. *Genome Res*. PMID: 23325432. PMCID: PMC3589544.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	**Gertz, J.**, Varley, K., Reddy, T., Bowling, K., Pauli, F., Parker, S., Kucera, K., Willard, H. and Myers, R. M. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS Genetics*. PMID: 21852959. PMCID: PMC3154961.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Simpson, N. E., **Gertz, J**., Imberg, K., Myers, R. M. and Garabedian, M. J. (2011). Enhanced genome-wide occupancy of estrogen receptor alpha by the co-chaperone p23 in breast cancer cells. *Molec. Endocrin*. PMID: 22074947. PMCID: PMC3248325.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Kucera, K. S., Reddy, T. E., Pauli, F., **Gertz, J.**, Logan, J. E., Myers, R. M., and Willard, H. F. (2011). Allele-specific distribution of RNA polymerase II on female X chromosomes. *Hum. Molec. Genet*. PMID: 21791549. PMCID: PMC3177651.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Ng, S-L., Friedman, B.A., Schmid, S., **Gertz, J.**, Myers, R. M., tenOever, B. R. and Maniatis, T. (2011). IKKε regulates the balance between the type I and type II interferon responses. *Proc. Natl. Acad. Sci. USA.* PMID: 22171011. PMCID: PMC3248534.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	**Gertz, J.,** Varley, K. E., Davis, N. S., Baas, B. J., Goryshin, I. Y., Vaidyanathan, R., Kuersten, S. and Myers, R. M. (2012). Transposon-based construction of strand-specific RNA-seq libraries. *Genome Res*. PMID: 22128135. PMCID: PMC3246200.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Reddy, T. E., **Gertz, J.,** Pauli, F., Kucera, K. S., Newberry, K. M., Marinov, G. K., Mortazavi, A., Williams, B. A., Wold, B., Willard, H. F. and Myers, R. M. (2012). Effects of sequence variation on differential allelic transcription factor occupancy and gene expression. *Genome Res*. PMID: 22300769. PMCID: PMC3337432.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Wang, H., Maurano, M. T., Qu, H., Varley, K. E., **Gertz, J.,** Pauli, F., Weaver, M., Lee, K., Canfield, T., Sandstrom, R., Thurman, R. E., Kaul, R., Myers, R. M. and Stamatoyannopoulos, J. A. (2012). Widespread plasticity in CTCF occupancy linked to DNA methylation. *Genome Res*. PMID: 22955980. PMCID: PMC3431485.

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MYERS, Richard	Past	Gertz, Jay (2009-2013)	**Gertz, J.,** Reddy, T. E., Varley, K. E., Garabedian, M. J., and Myers, R. M. (2012). Genistein and bisphenol A exposure cause estrogen receptor 1 to bind thousands of sites in a cell type-specific manner. *Genome Res*. PMID: 23019147. PMCID: PMC3483545.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Landt, S. J., Marinov, G. K., Kundaje, A., Kheradpour, P., Pauli, F., ….**Gertz, J.,** Myers, R. M., Park, P. J., Pazin, M. J., Perry, M. D., Raha, D., Reddy, T. E., Rozowsky, J., Shoresh, N., Sidow, A., Slattery, M., Stamatoyannopoulos, J. A., Tolstorukov, M. Y., White, K. P., Xi, S., Farnham, P. J., Lieb, J. D., Wold, B. J., and Snyder, M. (2012). ChIP-seq guidelines and practices of the ENCODE and modENCODE consortia. *Genome Res*. PMID: 22955991. PMCID: PMC3431496.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Tsumagari, K., Baribault, C., Varley, K. E., **Gertz, J.,** Terragni, J., Pradhan, S., Badoo, M., Crain, C. M., Song, L., Crawford, G. E., Myers, R. M., Lacey, M., and Ehrlich, M. (2013). Early de novo DNA methylation and prolonged active demethylation in the muscle lineage. *Epigenetics*. PMID: 23417056.
MYERS, Richard	Past	Gertz, Jay (2009-2013)	Reddy, T. E., **Gertz, J.**, Crawford, G. E., Garabedian, M. J. and Myers, R. M. (2012). The hypersensitive glucocorticoid response specifically regulates period 1 and expression of circadian genes. *Mol. Cell. Biol*. PMID: 22801371. PMCID: PMC3430195.
MYERS, Richard	Past	Grimwood, Jane (2000-2008)	Martin, J., Han, C., Gordon, L. A., Terry, A., Prabhakar, S., ….**Grimwood, J.,** Richardson, P., Rokhsar, D. S., Eichler, E. E., Gilna, P., Lucas, S. M., Myers, R. M., Rubin, E. M., and Pennacchio, L. A. (2005). The sequence and analysis of duplication-rich human chromosome 16. *Nature.* PMID: 15616553.
MYERS, Richard	Past	Grimwood, Jane (2000-2008)	Colosimo, P. F., Hosemann, K. E., Balabhadra, S., Villareal, G., Dickson, M., **Grimwood, J.**, Schmutz, J., Myers, R. M., Schluter, D. and Kingsley, D. M. (2005). Widespread parallel evolution of sticklebacks armor plates determined by ancestral genetic variation in Ectodysplasin. *Science*. PMID: 15790847.
MYERS, Richard	Past	Jain, Preti (2009-2013)	Gerstein, M. B., Kundaje, A., Hariharan, M., Landt, S. G., Yan, K., …. **Jain, P**., ….Myers, R. M., Weissman, S. M., and Snyder, M. (2012). Architecture of the human regulatory network derived from ENCODE data. *Nature*. PMID: 22955619.
MYERS, Richard	Past	Jain, Preti (2009-2013)	Ciofani, M., Madar, A., Galan, C., Sellars, M., Mace, K., Pauli, F., Agarwal, A., Huang, W., Parkurst, C. N., Muratet, M., Newberry, K. M., Meadows, S., Greenfield, A., Yang, Y., **Jain, P.,** Kirigin, F. K., Birchmeier, C., Wagner, E. F., Murphy, K. M., Myers, R. M., Bonneau, R. and Littman DR. (2012). A Validated Regulatory Network for Th17 Cell Specification. *Cell*. 151: 289-303. PMID: 23021777. PMCID: PMC3503487.
MYERS, Richard	Past	Johnson, Dave (2005-2008)	***Johnson, D. S.,** *Mortazavi, A., Myers, R. M. and Wold, B. (2007). Genome-wide mapping of in vivo protein DNA interactions. *Science*. (*co-first authors). PMID: 17540862.
MYERS, Richard	Past	Johnson, Dave (2005-2008)	**Johnson, D. S.,** Li, W., Gordon, D. B., Bhattacharjee, A., Curry, B., ….Myers, R. M., Lieb, J. D., and Liu, X. S. (2008). Systematic evaluation of variability in simulated ChIP-chip experiments. *Genome Res*. PMID: 18258921. PMCID: PMC2259103.

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MYERS, Richard	Past	Johnson, Dave (2005-2008)	Valouev, A., **Johnson, D. S.**, Sundquist, A., Medina, C., Anton, E., Batzoglou, S., Myers, R. M. and Sidow, A. (2008). Genome-wide analysis of transcription factor binding sites based on ChIP-seq data. *Nat. Methods*. PMID: 19160518. PMCID: PMC2917543.
MYERS, Richard	Past	Johnson, Dave (2005-2008)	Zhang, Y., Liu, T., Meyer, C. A., Eeckhoute, J., **Johnson, D. S.,** Bernstein, B. E., Nussbaum, C., Myers, R. M., Brown, M., Li, W. and Liu, X. S. (2008). Model-based analysis of ChIP-Seq (MACS). *Genome Biol*. PMID: 18798982. PMCID: PMC2592715.
MYERS, Richard	Past	Johnson, Dave (2005-2008)	Ji, H., Jiang, H., Ma, W., **Johnson, D. S**., Myers, R. M., and Wong, W. H. (2008). An integrated system CisGenome for analyzing ChIP-chip and ChIP-seq data. *Nat. Biotechnol*. PMID: 18978777. PMCID: PMC2596672.
MYERS, Richard	Past	Johnson, Dave (2005-2008)	Brunner, A. L., **Johnson, D. S**., Kim, S. W., Valouev, A., Reddy, T. E., Neff, N. F., Anton, E., Medina, C., Nguyen. L., Chiao, E., Oyolu, C. B., Schroth, G. P., Absher, D., Baker, J. C. and Myers, R. M. (2009). Distinct DNA methylation patterns characterize differentiated human embryonic stem cells and developing human fetal liver. *Genome Res*. PMID: 19273619. PMCID: PMC2694474.
MYERS, Richard	Past	Li, Jun (1999-2004)	**Li, J**., Nguyen, L., Gleason, C. Lotspeich, L., Spiker, D., Risch, N. and Myers, R. M. (2004). Lack of evidence for an association between WNT2 and RELN polymorphisms and autism. *Amer. J. Med*. *Genet.: Neuropsych. Genet*. PMID: 15048648.
MYERS, Richard	Past	Pauli, Flo (2009-2010)	Reddy, T. E., **Pauli, F**., Sprouse, R. O., Neff, N. F., Newberry, K. M., Garabedian, M. J. and Myers, R. M. (2009). Genomic determination of the glucocorticoid response reveals unexpected mechanisms of gene regulation. *Genome Res.* PMID: 19801529. PMCID: PMC2792167.
MYERS, Richard	Past	Reddy, Tim (2007-2011)	Brunner, A. L., Johnson, D. S., Kim, S. W., Valouev, A., **Reddy, T. E**., Neff, N. F., Anton, E., Medina, C., Nguyen. L., Chiao, E., Oyolu, C. B., Schroth, G. P., Absher, D., Baker, J. C. and Myers, R. M. (2009). Distinct DNA methylation patterns characterize differentiated human embryonic stem cells and developing human fetal liver. *Genome Res*. PMID: 19273619. PMCID: PMC2694474.
MYERS, Richard	Past	Reddy, Tim (2007-2011)	**Reddy, T. E**., Pauli, F., Sprouse, R. O., Neff, N. F., Newberry, K. M., Garabedian, M. J. and Myers, R. M. (2009). Genomic determination of the glucocorticoid response reveals unexpected mechanisms of gene regulation. *Genome Res.* PMID: 19801529. PMCID: PMC2792167.
MYERS, Richard	Past	Reddy, Tim (2007-2011)	Gertz, J., Varley, K., **Reddy, T.,** Bowling, K., Pauli, F., Parker, S., Kucera, K., Willard, H. and Myers, R. M. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS Genetics*. PMID: 21852959. PMCID: PMC3154961.
MYERS, Richard	Past	Reddy, Tim (2007-2011)	Kucera, K. S., **Reddy, T. E**., Pauli, F., Gertz, J., Logan, J. E., Myers, R. M., and Willard, H. F. (2011). Allele-specific distribution of RNA polymerase II on female X chromosomes. *Hum. Molec. Genet*. PMID: 21791549. PMCID: PMC3177651.
MYERS, Richard	Past	Sprouse, Rebekka (2008-2010)	Reddy, T. E., Pauli, F., **Sprouse, R. O.,** Neff, N. F., Newberry, K. M., Garabedian, M. J. and Myers, R. M. (2009). Genomic determination of the glucocorticoid response reveals unexpected mechanisms of gene regulation. *Genome Res*. PMID: 19801529. PMCID: PMC2792167.

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MYERS, Richard	Past	Varley, Katherine (2009-2013)	Gertz, J., **Varley, K**., Reddy, T., Bowling, K., Pauli, F., Parker, S., Kucera, K., Willard, H. and Myers, R. M. (2011). Analysis of DNA methylation in a three-generation family reveals widespread genetic influence on epigenetic regulation. *PLoS Genetics*. PMID: 21852959. PMCID: PMC3154961.
MYERS, Richard	Past	Varley, Katherine (2009-2013)	Gertz, J., **Varley, K. E**., Davis, N. S., Baas, B. J., Goryshin, I. Y., Vaidyanathan, R., Kuersten, S. and Myers, R. M. (2012). Transposon-based construction of strand-specific RNA-seq libraries. *Genome Res*. PMID: 22128135. PMCID: PMC3246200.
MYERS, Richard	Past	Varley, Katherine (2009-2013)	Wang, H., Maurano, M. T., Qu, H., **Varley, K. E**., Gertz, J., Pauli, F., Weaver, M., Lee, K., Canfield, T., Sandstrom, R., Thurman, R. E., Kaul, R., Myers, R. M. and Stamatoyannopoulos, J. A. (2012). Widespread plasticity in CTCF occupancy linked to DNA methylation. *Genome Res*. PMID: 22955980. PMCID: PMC3431485.
MYERS, Richard	Past	Varley, Katherine (2009-2013)	Gertz, J., Reddy, T. E., **Varley, K. E**., Garabedian, M. J., and Myers, R. M. (2012). Genistein and bisphenol A exposure cause estrogen receptor 1 to bind thousands of sites in a cell type-specific manner. *Genome Res*. PMID: 23019147. PMCID: PMC3483545.
MYERS, Richard	Past	Varley, Katherine (2009-2013)	**Varley, K. E.,** Gertz, J., Bowling, K. M., Parker, S. L., Reddy, T. E., Pauli, F., Cross, M. K., Williams, B., Stamatoyannopoulos, J. A., Crawford, G. E., Absher, D. M., Wold, B. J. and Myers, R. M. (2013). Dynamic DNA methylation across diverse human cell lines and tissues. *Genome Res*. PMID: 23325432. PMCID: PMC3589544.
MYERS, Richard	Past	Varley, Katherine (2009-2013)	Tsumagari, K., Baribault, C., **Varley, K. E**., Gertz, J., Terragni, J., Pradhan, S., Badoo, M., Crain, C. M., Song, L., Crawford, G. E., Myers, R. M., Lacey, M., and Ehrlich, M. (2013). Early de novo DNA methylation and prolonged active demethylation in the muscle lineage. *Epigenetics*. PMID: 23417056.
NOVAK, Jan	Past	Czernekova, L.,	Stuchlova Horynova, M., Vrablikova, A., Stewart, T.J., Takahashi, K., **Czernekova, L.**, Yamada, K., Suzuki, H., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. *N*-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant.* In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Eison, TM (2009-2010)	Kiryluk, K., Moldoveanu, Z., Sanders, J.T., **Eison, T.M**., Suzuki, H., Julian, B.A., Novak, J., Gharavi, A.G., Wyatt, R.J. Aberrant glycosylation of IgA1 is inherited in pediatric IgA nephropathy and Henoch-Schoenlein purpura nephritis. *Kidney Int*. 80, 79-87, 2011. PMID: 21326171
NOVAK, Jan	Past	Eison, TM (2009-2010)	Hastings, M.C., Afshan, S., Sanders, J.T., T. **Eison, T.M**., Lau, K.K., Moldoveanu, Z., Julian, B.A., Novak, J., Wyatt. R.J. Serum galactose-deficient IgA1 level is not associated with proteinuria in children with IgA nephropathy. *Int. J. Nephrol.* 2012, Article ID 315467, 2012. PMID: 22754697 PMCID: PMC3382943
NOVAK, Jan	Past	Eison, TM (2009-2010)	**Eison, T.M**., Hastings, M.C., Moldoveanu, Z., Sanders, J.T., Gaber, L., Walker, P., Lau, K.K., Julian, B.A., Novak, J., Wyatt, R.J. Association of IgG co-deposition with serum levels of galactose-deficient IgA1 in pediatric IgA nephropathy. *Clin. Nephrol.* 78, 465-469, 2012. PMID: 23006340

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NOVAK, Jan	Past	Hastings, M.C.	**Hastings, M.C.,** Afshan, S., Sanders, J.T., T. Eison, T.M., Lau, K.K., Moldoveanu, Z., Julian, B.A., Novak, J., Wyatt. R.J. Serum galactose-deficient IgA1 level is not associated with proteinuria in children with IgA nephropathy. *Int. J. Nephrol.* 2012, Article ID 315467, 2012. PMID: 22754697 PMCID: PMC3382943
NOVAK, Jan	Past	Hastings, M.C.	Eison, T.M., **Hastings, M.C**., Moldoveanu, Z., Sanders, J.T., Gaber, L., Walker, P., Lau, K.K., Julian, B.A., Novak, J., Wyatt, R.J. Association of IgG co-deposition with serum levels of galactose-deficient IgA1 in pediatric IgA nephropathy. *Clin. Nephrol.* 78, 465-469, 2012. PMID: 23006340
NOVAK, Jan	Past	Hastings, M.C.	**Hastings, M.C**., Moldoveanu, Z., Suzuki, H., Berthoux, F., Julian, B.A., Sanders, J.T., Renfrow, M. B., Novak, J., Wyatt, R.J. Biomarkers in IgA nephropathy: Relationship to pathogenetic hits. *Expert Opin. Med. Diagn.* 7, 615-627, 2013. PMID: 24175678
NOVAK, Jan	Past	He, M.	**He, M**., Novak, J., Julian, B.A., Herr, A.E. Microfluidic lectin blotting: Towards the assessment of aberrantly glycosylated serum IgA1 in IgA nephropathy. *J. Am. Chem. Soc.* 133, 19610-19613, 2011. PMID: 22070432 PMCID: PMC3267544
NOVAK, Jan	Past	Hou, P.	Gharavi, A.G., Kiryluk, K., Choi, M., Li, Y., **Hou, P**., Xie, J.Y., Sanna-Cherchi, S., Men, C.J., Julian, B.A., Wyatt, R.J., Novak, J., Wang, H., Lv, J., Zhu, L., Wang, Z.-H., Yasuno, K., Gunel, M., Mane, S., Umlauf, S., Tikhonova, I., Savoldi, S., Magistroni, R., Ghiggeri, G.M., Lugani, F., Ravani, P., Ponticelli, C., Allegri, L., Boscutti, G., Frasca, G., Izzi, C., Viola, F., Prati, E., Salvadori, M., Gesualdo, L., Amoroso, A., Scolari, F., Chen, N., Zhang, H., Lifton, R.P. Genome-wide association study identifies five susceptibility loci for IgA nephropathy, the most common form of glomerulonephritis. *Nat. Genet.* 43, 321-327, 2011. PMID: 21399633 PMCID: PMC3412515
NOVAK, Jan	Past	Hou, P.	Zhu, L., Zhai, Y.-L., Wang, F.-M., **Hou, P**., Lv, J., Xu, S.-F., Liu, L.-J., Yu, F., Zhao, M.-H., Novak, J., Gharavi, A.G., Zhang, H. Variants in complement factor H and complement factor H-related protein genes, CFHR3 and CFHR1, affect complement activation in IgA nephropathy. *J. Am. Soc. Nephrol*. 26, In Press. 2014. PMID: 25205734
NOVAK, Jan	Past	Hou, P.	Zhao, N., **Hou, P**., Lv, J., Moldoveanu, Z., Li, Y., Kiryluk, K., Gharavi, A.G., Novak, J., Zhang, H. Level of galactose-deficient IgA1 in sera of patients with IgA nephropathy is associated with disease progression. *Kidney Int.* 82, 790-796, 2012. PMID: 22673888 PMCID: PMC3443545
NOVAK, Jan	Past	Lavigne, K.A	**Lavigne, K.A**., Woodford, S.Y., Barker, C., Julian, B.A., Novak, J., Moldoveanu, Z., Gharavi, A.G., Wyatt, R.J. Familial IgA nephropathy in southeastern Kentucky. *Clin. Nephrol.* 73, 115-121, 2010. PMCID: PMC4116337
NOVAK, Jan	Past	Maillard, N.	Berthoux, F., Suzuki, H., Thibaudin, L., Yanagawa, H., **Maillard, N**., Mariat, C., Tomino, Y., Julian, B.A., Novak, J. Serum autoantibodies specific for galactose-deficient IgA1 associate with disease progression in IgA nephropathy. *J. Am. Soc. Nephrol*. 23, 1579-1587, 2012. PMID: 22904352 PMCID: PMC3431415

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NOVAK, Jan	Past	Maillard, Nicolas (2012-2013)	Wallace, E**., Maillard, N**., Ueda, H., Hall, S., Fatima, H., Novak, J., Julian, B.A. Immune profile of IgA-dominant diffuse proliferative glomerulonephritis. *Clin. Kidney J.* 7, In Press. 2014. PMCID: PMC4379348
NOVAK, Jan	Past	Maixnerova, D. (2012)	Kiryluk, K., Li Y., Sanna-Cherchi, S., Rohanizadegan, M., Suzuki, H., Eitner, F., Snyder, H.J., Choi, M., Hou, P., Scolari, F., Gesualdo, L., Savoldi, S., Amoroso, A., Cusi, D., Zamboli, P., Julian, B.A., Novak, J., Wyatt, R.J., Mucha, K., Perola, M., Kristiansson, K., Magnusson, P.K., Thorleifsson, G., Thorsteinsdottir, U., Stefansson, K., Boland, A., Metzger, M., Thibaudin, L., Wanner, C., Jager, K.J., Goto, S., **Maixnerova, D**., Karnib, H.H., Nagy, J., Panzer, U., Xie, J., Chen, N., Tesar, V., Narita, I., Berthoux, F., Floege, J., Stengel, B., Zhang, H., Lifton, R., Gharavi, A.G. Geographic differences in genetic susceptibility to IgA nephropathy: GWAS replication study and geospatial risk analysis. *PLoS Genet.* 8(6), e1002765, 2012. PMID: 22737082
NOVAK, Jan	Past	Maixnerova, D. (2012)	Kiryluk, K., Li, Y., Scolari, F., Sanna-Cherchi, S., Choi, M., Verbitsky, M., Fasel, D., Lata, S., Prakash, S., Shapiro, S., Fischman, C., Snyder, H.J., Appel, G., Izzi, C., Viola, B.F., Dallera, N., Del Vecchio, L., Barlassina, C., Salvi, E., Bertinetto, F.E., Amoroso, A., Savoldi, S., Rocchietti, M., Amore, A., Peruzzi, L., Coppo, R., Salvadori, M., Ravani, P., Magistroni, R., Ghiggeri, G.M., Caridi, G., Bodria, M., Lugani, F., Allegri, L., Delsante, M., Maiorana, M., Magnano, A., Frasca, G., Boer, E., Boscutti, G., Ponticelli, C., Mignani, R., Marcantoni, C., Di Landro, D., Santoro, D., Pani, A., Polci, R., Feriozzi, S., Chicca, S., Galliani, M., Gigante, M., Gesualdo, L., Zamboli, P., Battaglia, G.G., Garozzo, M., **Maixnerová, D**., Tesar, V., Eitner, F., Rauen, T., Floege, J., Kovacs, T., Nagy, J., Mucha, K., Pączek, L., Zaniew, M., Mizerska-Wasiak, M., Roszkowska-Blaim, M., Pawlaczyk, K., Gale, D., Barratt, J., Thibaudin, L., Berthoux, F., Canaud, G., Boland, A., Metzger, M., Panzer, U., Suzuki, H., Goto, S., Narita, I., Caliskan, Y., Xie, J., Hou, P., Chen, N., Zhang, H., Wyatt, R.J., Novak, J., Julian, B.A., Feehally, J., Stengel, B., Cusi, D., Lifton, R.P., Gharavi, A.G. Discovery of new risk loci for IgA nephropathy implicates genes involved in immunity against intestinal pathogens. *Nat. Genet.* 46, 1187-1196, 2014. PMID: 25305756 PMCID: PMC4213311
NOVAK, Jan	Past	Mirza, S.	**Mirza, S**., Wilson, L., Benjamin Jr., W.H., Novak, J., Barnes, S., Hollingshead, S.K., Briles, D.E. Serine protease PrtA from *Streptococcus pneumoniae* plays a role in the killing of *S. pneumoniae* by apolactoferrin. *Infect. Immun.* 79, 2440-2450, 2011. PMID: 21422179
NOVAK, Jan	Past	Nakata, J.	**Nakata, J.,** Suzuki, Y., Suzuki, H., Sato, D., Kano, T., Horikoshi, S., Novak, J., Tomino, Y. Experimental evidence of cell dissemination playing a role in pathogenesis of IgA nephropathy in multiple lymphoid organs. *Nephrol. Dial. Transplant.* 28, 320-326, 2013. PMID: 23136213
NOVAK, Jan	Past	Nakata, J.	**Nakata, J.**, Suzuki, Y., Suzuki, H., Sato, D., Kano, T., Yanagawa, H., Matsuzaki, K., Horikoshi, S., Novak, J., Tomino, Y. Changes in nephritogenic serum galactose-deficient IgA1 in IgA nephropathy following tonsillectomy and steroid therapy. *PLoS ONE*. 9(2), e89707, 2014. PMID: 24586974
NOVAK, Jan	Past	Okazaki, K.	**Okazaki, K.**, Suzuki, Y., Otsuji, M., Suzuki, H., Kihara, M., Kajiyama, T., Hashimoto, A., Nishimura, H., Brown, R., Hall, S., Novak, J., Izui, S., Hirose, S., Tomino, Y. Development of a model of early-onset IgA nephropathy. *J. Am. Soc. Nephrol*. 23, 1364-1374, 2012. PMID: 22797187

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
NOVAK, Jan	Past	Raska, M. (2006-present)	**Raska, M.,** Moldoveanu, Z., Suzuki, H., Brown, R., Kulhavy, R., Andrasi, J., Hall, S., Vu, H.L., Carlsson, F., Lindahl, G., Tomana, M., Julian, B.A., Wyatt, R.J., Mestecky, J., and Novak, J. Identification and characterization of CMP-NeuAc:GalNAc-IgA1 α2,6-sialyltransferase in IgA1-producing cells. *J. Mol. Biol.* 369, 69-78, 2007. PMCID: PMC1995659
NOVAK, Jan	Past	Raska, M. (2006-present)	**Raska, M.**, Moldoveanu, Z., Novak, J., Hel, Z., Novak, L., Bozja, J., Compans, R.D., Yang, C., Mestecky, J. Delivery of DNA HIV-1 vaccine to the liver induces high and long-lasting humoral immune responses. *Vaccine.* 26, 1541-1551, 2008. PMID: 18304708
NOVAK, Jan	Past	Raska, M. (2006-present)	**Raska, M.**, Novak, J. Involvement of envelope-glycoprotein glycans in HIV-1 biology and infection. Invited Review. *Arch. Immunol. Ther. Exp.* 58, 191–208, 2010. PMID: 20369301
NOVAK, Jan	Past	Raska, M. (2006-present)	**Raska, M**., Takahashi, K., Czernekova, L., Zachova, K., Hall, S., Moldoveanu, Z., Elliott, M.C., Wilson, L., Brown, R., Jancova, D., Barnes, S., Vrbkova, J., Tomana, M., Smith, P.D., Mestecky, J., Renfrow, M.B., Novak, J. Glycosylation patterns of HIV-1 gp120 are cell-producing type dependent and affect antibody recognition. *J. Biol. Chem.* 285, 20860-20869, 2010. PMID: 20439465
NOVAK, Jan	Past	Raska, M. (2006-present)	**Raska, M**., Czernekova, L., Moldoveanu, Z., Zachova, K., Elliott, M.C., Novak, Z., Hall, S., Vrbkova, J., Hoelscher, M., Maboko, L., Brown, R., Tomana, M., Smith, P.D., Mestecky, J., Novak, J. Differential glycosylation of envelope gp120 is associated with differential recognition of HIV-1 by virus-specific antibodies and cell infection. *AIDS Res. Ther.* 11, 23, 2014. PMID: 25120578
NOVAK, Jan	Past	Reily, C.R.	**Reily, C.R**., Ueda, H., Huang, Z.-Q., Mestecky, J., Julian, B.A., Willey, C.D., Novak, J. Cellular signaling and production of galactose-deficient IgA1 in IgA nephropathy, an autoimmune disease. *J. Immunol. Res.* 2014, article ID 197548, 1-10, 2014. PMID: 25152896
NOVAK, Jan	Past	Raskova Kafkova, L	Tamouza, H., Chemouny, J., **Raskova Kafkova, L**., Berthelot, L., Flamant, M., Demion, M., Mesnard, L., Walker, F., Julian, B.A., Tissandié, E., Tiwari, M.K., Camara, N.O.S., Vrtovsnik, F., Benhamou, M., Novak, J., Monteiro, R.C., Moura, I.C. IgA1 immune complex-mediated activation of MAPK/ERK kinase pathway in mesangial cells is associated with glomerular damage in IgA nephropathy. *Kidney Int.* 82, 1284-1296, 2012. PMID: 22951891
NOVAK, Jan	Past	Stewart, T.J.	Stuchlova Horynova, M., Vrablikova, A., **Stewart, T.J**., Takahashi, K., Czernekova, L., Yamada, K., Suzuki, H., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. *N*-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant.* In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Stuchlova Horynová, M.	**Horynová, M**., Takahashi, K., Hall, S., Renfrow, M.B., Novak, J., Raska, M. Production of N-acetylgalactosaminyl-transferase 2 (GalNAc-T2) fused with secretory signal Igκ in insect cells. *Protein Expr*. Purif. 81, 175-180, 2012. PMID: 22033505
NOVAK, Jan	Past	Stuchlova Horynová, M.	**Stuchlova Horynová**, M., Raska, M., Clausen, H., Novak, J. Aberrant O-glycosylation and anti-glycan antibodies in an autoimmune disease IgA nephropathy and breast adenocarcinoma. *Cell. Mol. Life Sci.* 70, 829–839, 2013. PMID: 22864623

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
NOVAK, Jan	Past	Stuchlova Horynová, M.	Takahashi, K., Raska, M., **Stuchlova Horynova, M.**, Hall, S. Poulsen, K., Kilian, M., Hiki, Y., Yuzawa, Y., Moldoveanu, Z., Julian, B.A., Renfrow, M.B., Novak, J. Enzymatic sialylation of IgA1 O-glycans: Implications for studies of IgA nephropathy. *PLoS ONE* 9(6), e99026, 2014. PMID: 24918438; PMCID: PMC4053367
NOVAK, Jan	Past	Stuchlova Horynová, M.	**Stuchlova Horynova, M**., Vrablikova, A., Stewart, T.J., Takahashi, K., Czernekova, L., Yamada, K., Suzuki, H., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. N-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant*. In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Takahashi, K., Wall, S.B., **Suzuki, H**., Smith, IV, A.D., Hall, S., Poulsen, K., Kilian, M., Julian, B.A., Mestecky, J., Novak, J., Renfrow, M.B. Clustered *O*-glycans of IgA1: Defining macro- and micro-heterogeneity by use of electron capture/transfer dissociation. *Mol. Cell. Proteomics.* 9, 2545-2557, 2010. PMID: 20823119 PMCID: PMC2984237
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	**Suzuki, H**., Moldoveanu, Z., Hall, S., Brown, R., Vu, H.L., Novak, L., Julian, B.A., Tomana, M., Wyatt, R.J., Edberg, J.E., Alarcón, G.S., Kimberly, R.P., Tomino, Y., Mestecky, J., Novak, J. IgA1-secreting cell lines from patients with IgA nephropathy produce aberrantly glycosylated IgA1. *J. Clin. Invest.* 118, 629-639, 2008. PMCID: PMC2157566
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	**Suzuki, H**., Suzuki, Y., Narita, I., Aizawa, M., Kihara, M., Yamanaka, T., Kanou, T., Tsukaguchi, H., Novak, J., Horikoshi, S., Tomino, Y. Toll-like receptor 9 affects severity of IgA nephropathy. *J. Am. Soc. Nephrol*. 9, 2384-2395, 2008. PMID: 18776126
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	**Suzuki, H**., Fan, R., Zhang, Z., Brown, R., Hall, S., Julian, B.A., Chatham, W.W., Suzuki, Y., Wyatt, R.J., Moldoveanu, Z., Lee, J.Y., Robinson, J., Tomana, M., Tomino, Y., Mestecky, J., Novak, J. Aberrantly glycosylated IgA1 in IgA nephropathy patients is recognized by IgG antibodies with restricted heterogeneity. *J. Clin. Invest.* 119, 1668-1677, 2009. PMCID: PMC2689118
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Gomes, M.M., **Suzuki, H**., Tomana, M., Moldoveanu, Z., Mestecky, M., Julian, B.A., Novak, J., Herr, A.B. Molecular basis for the recognition of galactose-deficient *O*-glycans in the hinge region of IgA1 by *N*-acetylgalactosamine-specific snail lectins. *Biochemistry.* 49, 5671-5682, 2010. PMID: 20507092
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Lindfors, K., **Suzuki, H**., Novak, J., Collin, P., Saavalainen, P., Koskinen, L.L.E., Mäki, M., Kaukinen, K. Galactosylation of serum IgA1 *O*-glycans in celiac disease. *J. Clin. Immunol.* 31, 74-79, 2011. PMID: 20938724
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Kiryluk, K., Moldoveanu, Z., Sanders, J.T., Eison, T.M., **Suzuki, H**., Julian, B.A., Novak, J., Gharavi, A.G., Wyatt, R.J. Aberrant glycosylation of IgA1 is inherited in pediatric IgA nephropathy and Henoch-Schoenlein purpura nephritis. *Kidney Int*. 80, 79-87, 2011. PMID: 21326171
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Camilla, R. **Suzuki, H**., Daprà, V., Loiacono, E., Peruzzi, L., Amore, A., Ghiggeri, G.M., Mazzucco, G., Scolari, F., Gharavi, A.G., Appel, G., Troyanov, S., Novak, J., Julian, B.A., Coppo, R. Oxidative stress and aberrantly glycosylated IgA1 as risk factors for progression of IgA nephropathy. *Clin. J. Am. Soc. Nephrol*. 6, 1903–1911, 2011. PMID: 21784819 PMCID: PMC3156425

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	**Suzuki, H**., Kiryluk, K., Novak, J., Moldoveanu, Z., Herr, A.B., Renfrow, M.B., Wyatt, R.J., Scolari, F., Mestecky, J., Gharavi, A.G., Julian, B.A. The pathophysiology of IgA nephropathy. *J. Am. Soc. Nephrol*. 22, 1795-1803, 2011. PMID: 21949093
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Kiryluk, K., Li Y., Sanna-Cherchi, S., Rohanizadegan, M., **Suzuki, H**., Eitner, F., Snyder, H.J., Choi, M., Hou, P., Scolari, F., Gesualdo, L., Savoldi, S., Amoroso, A., Cusi, D., Zamboli, P., Julian, B.A., Novak, J., Wyatt, R.J., Mucha, K., Perola, M., Kristiansson, K., Magnusson, P.K., Thorleifsson, G., Thorsteinsdottir, U., Stefansson, K., Boland, A., Metzger, M., Thibaudin, L., Wanner, C., Jager, K.J., Goto, S., Maixnerova, D., Karnib, H.H., Nagy, J., Panzer, U., Xie, J., Chen, N., Tesar, V., Narita, I., Berthoux, F., Floege, J., Stengel, B., Zhang, H., Lifton, R., Gharavi, A.G. Geographic differences in genetic susceptibility to IgA nephropathy: GWAS replication study and geospatial risk analysis. *PLoS Genet.* 8(6), e1002765, 2012. PMID: 22737082
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Okazaki, K., Suzuki, Y., Otsuji, M., **Suzuki, H**., Kihara, M., Kajiyama, T., Hashimoto, A., Nishimura, H., Brown, R., Hall, S., Novak, J., Izui, S., Hirose, S., Tomino, Y. Development of a model of early-onset IgA nephropathy. *J. Am. Soc. Nephrol*. 23, 1364-1374, 2012. PMID: 22797187
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Berthoux, F., **Suzuki, H**., Thibaudin, L., Yanagawa, H., Maillard, N., Mariat, C., Tomino, Y., Julian, B.A., Novak, J. Serum autoantibodies specific for galactose-deficient IgA1 associate with disease progression in IgA nephropathy. *J. Am. Soc. Nephrol*. 23, 1579-1587, 2012. PMID: 22904352 PMCID: PMC3431415
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Schoeb, T.R., Jarmi, T., Hicks, M.J., Henke, S., Zarjou, A., **Suzuki, H**., Kramer, P., Novak, J., Agarwal, A., Bullard, D.C. Endothelial nitric oxide synthase inhibits the development of autoimmune-mediated vasculitis in mice. *Arthritis Rheum*. 64, 4114-4124, 2012. PMID: 22933338
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Hastings, M.C., Moldoveanu, Z., **Suzuki, H**., Berthoux, F., Julian, B.A., Sanders, J.T., Renfrow, M. B., Novak, J., Wyatt, R.J. Biomarkers in IgA nephropathy: Relationship to pathogenetic hits. *Expert Opin. Med. Diagn.* 7, 615-627, 2013. PMID: 24175678
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	**Suzuki, H**., Raska, M., Yamada, K., Moldoveanu, Z., Julian, B.A., Wyatt, R.J., Tomino, Y., Gharavi, A.G., Novak, J. Cytokines alter IgA1 *O*-glycosylation by dysregulating C1GalT1 and ST6GalNAc-II enzymes. *J. Biol. Chem.* 289, 5330-5339, 2014. PMID: 24398680; PMCID: PMC3931088
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Nakata, J., Suzuki, Y., **Suzuki, H**., Sato, D., Kano, T., Yanagawa, H., Matsuzaki, K., Horikoshi, S., Novak, J., Tomino, Y. Changes in nephritogenic serum galactose-deficient IgA1 in IgA nephropathy following tonsillectomy and steroid therapy. *PLoS ONE*. 9(2), e89707, 2014. PMID: 24586974

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NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Kiryluk, K., Li, Y., Scolari, F., Sanna-Cherchi, S., Choi, M., Verbitsky, M., Fasel, D., Lata, S., Prakash, S., Shapiro, S., Fischman, C., Snyder, H.J., Appel, G., Izzi, C., Viola, B.F., Dallera, N., Del Vecchio, L., Barlassina, C., Salvi, E., Bertinetto, F.E., Amoroso, A., Savoldi, S., Rocchietti, M., Amore, A., Peruzzi, L., Coppo, R., Salvadori, M., Ravani, P., Magistroni, R., Ghiggeri, G.M., Caridi, G., Bodria, M., Lugani, F., Allegri, L., Delsante, M., Maiorana, M., Magnano, A., Frasca, G., Boer, E., Boscutti, G., Ponticelli, C., Mignani, R., Marcantoni, C., Di Landro, D., Santoro, D., Pani, A., Polci, R., Feriozzi, S., Chicca, S., Galliani, M., Gigante, M., Gesualdo, L., Zamboli, P., Battaglia, G.G., Garozzo, M., Maixnerová, D., Tesar, V., Eitner, F., Rauen, T., Floege, J., Kovacs, T., Nagy, J., Mucha, K., Pączek, L., Zaniew, M., Mizerska-Wasiak, M., Roszkowska-Blaim, M., Pawlaczyk, K., Gale, D., Barratt, J., Thibaudin, L., Berthoux, F., Canaud, G., Boland, A., Metzger, M., Panzer, U., **Suzuki, H**., Goto, S., Narita, I., Caliskan, Y., Xie, J., Hou, P., Chen, N., Zhang, H., Wyatt, R.J., Novak, J., Julian, B.A., Feehally, J., Stengel, B., Cusi, D., Lifton, R.P., Gharavi, A.G. Discovery of new risk loci for IgA nephropathy implicates genes involved in immunity against intestinal pathogens. *Nat. Genet.* 46, 1187-1196, 2014. PMID: 25305756 PMCID: PMC4213311
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Yamaji, K., Suzuki, Y., **Suzuki, H**., Satake, K., Horikoshi, S., Novak, J., Tomino, Y. The kinetics of glomerular deposition of nephritogenic IgA. *PLoS ONE*. 9(11):e113005, 2014. PMID: 25409466
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Stuchlova Horynova, M., Vrablikova, A., Stewart, T.J., Takahashi, K., Czernekova, L., Yamada, K., **Suzuki, H**., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. *N*-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant.* In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Suzuki, Hitoshi (2005-2009)	Nakata, J., Suzuki, Y**., Suzuki, H**., Sato, D., Kano, T., Horikoshi, S., Novak, J., Tomino, Y. Experimental evidence of cell dissemination playing a role in pathogenesis of IgA nephropathy in multiple lymphoid organs. *Nephrol. Dial. Transplant.* 28, 320-326, 2013. PMID: 23136213
NOVAK, Jan	Past	Takahashi, Kazuo (2008-2012)	**Takahashi, K**., Wall, S.B., Suzuki, H., Smith, IV, A.D., Hall, S., Poulsen, K., Kilian, M., Julian, B.A., Mestecky, J., Novak, J., Renfrow, M.B. Clustered *O*-glycans of IgA1: Defining macro- and micro-heterogeneity by use of electron capture/transfer dissociation. *Mol. Cell. Proteomics.* 9, 2545-2557, 2010. PMID: 20823119 PMCID: PMC2984237
NOVAK, Jan	Past	Takahashi, Kazuo (2008-2012)	Horynová, M., **Takahashi, K.**, Hall, S., Renfrow, M.B., Novak, J., Raska, M. Production of *N*-acetylgalactosaminyl-transferase 2 (GalNAc-T2) fused with secretory signal Igκ in insect cells. *Protein Expr. Purif.* 81, 175-180, 2012. PMID: 22033505
NOVAK, Jan	Past	Takahashi, Kazuo (2008-2012)	**Takahashi, K**., Smith IV, A.D., Poulsen, K., Kilian, M., Julian, B.A., Mestecky, J., Novak, J., Renfrow, M.B. Naturally occurring structural isomers in serum IgA1 *O*-glycosylation. *J. Prot. Res.* 11, 692-702, 2012. PMID: 22067045; PMCID: PMC3844682
NOVAK, Jan	Past	Takahashi, Kazuo (2008-2012)	**Takahashi, K**., Raska, M., Stuchlova Horynova, M., Hall, S. Poulsen, K., Kilian, M., Hiki, Y., Yuzawa, Y., Moldoveanu, Z., Julian, B.A., Renfrow, M.B., Novak, J. Enzymatic sialylation of IgA1 *O*-glycans: Implications for studies of IgA nephropathy. *PLoS* ONE 9(6), e99026, 2014. PMID: 24918438; PMCID: PMC4053367

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NOVAK, Jan	Past	Takahashi, Kazuo (2008-2012)	Stuchlova Horynova, M., Vrablikova, A., Stewart, T.J., **Takahashi, K**., Czernekova, L., Yamada, K., Suzuki, H., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. *N*-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant.* In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Ueda, H.	Reily, C.R., **Ueda, H**., Huang, Z.-Q., Mestecky, J., Julian, B.A., Willey, C.D., Novak, J. Cellular signaling and production of galactose-deficient IgA1 in IgA nephropathy, an autoimmune disease. *J. Immunol. Res.* 2014, article ID 197548, 1-10, 2014. PMID: 25152896
NOVAK, Jan	Past	Ueda, H.	Wallace, E., Maillard, N., **Ueda, H**., Hall, S., Fatima, H., Novak, J., Julian, B.A. Immune profile of IgA-dominant diffuse proliferative glomerulonephritis. *Clin. Kidney J.* 7, In Press. 2014. PMCID: PMC4379348
NOVAK, Jan	Past	Yamada, K. (2009-2012)	Stuchlova Horynova, M., Vrablikova, A., Stewart, T.J., Takahashi, K., Czernekova, L., **Yamada, K**., Suzuki, H., Julian, B.A., Renfrow, M.B., Novak, J., Raska, M. *N*-acetylgalactosaminide α2,6-sialyltransferase II is a candidate enzyme for sialylation of galactose-deficient IgA1, the key autoantigen in IgA nephropathy. *Nephrol. Dial. Transplant.* In Press. 2014. PMID: 25281698
NOVAK, Jan	Past	Yamaji, K.	**Yamaji, K**., Suzuki, Y., Suzuki, H., Satake, K., Horikoshi, S., Novak, J., Tomino, Y. The kinetics of glomerular deposition of nephritogenic IgA. *PLoS ONE*. 9(11):e113005, 2014. PMID: 25409466
NOVAK, Jan	Past	Yanagihara, T. (2005-2007)	**Yanagihara, T**., Brown, R., Hall, S., Moldoveanu, Z., Goepfert, A., Julian, B.A., Tomana, M., Mestecky, J., Novak, J. *In vitro*-formed immune complexes containing galactose-deficient IgA1 stimulate proliferation of mesangial cells. *Results Immunol.* 2, 166-172, 2012. PMCID: PMC3775378
NOVAK, Jan	Past	Zhao, N	**Zhao, N.,** Hou, P., Lv, J., Moldoveanu, Z., Li, Y., Kiryluk, K., Gharavi, A.G., Novak, J., Zhang, H. Level of galactose-deficient IgA1 in sera of patients with IgA nephropathy is associated with disease progression. *Kidney Int.* 82, 790-796, 2012. PMID: 22673888 PMCID: PMC3443545
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RANDALL, Troy	Past	Ballesteros-Tato, Andre (2008-2012)	**Ballesteros-Tato** and TD Randall. 2011. Memory – the incomplete unhappening of differentiation. *Immunity*. 35:496-498 PMID: 22035843
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RANDALL, Troy	Past	Carragher, Damian (2004-2008)	**Carragher, DM**, J Rangel-Moreno and TD Randall. 2008. Ectopic lymphoid tissues and local immunity. Semin. *Immunol*. 20:26-42. PMC2276727
RANDALL, Troy	Past	Carragher, Damian (2004-2008)	**Carragher, DM**, DA Kaminski, A Moquin, L Hartson and TD Randall. 2008. A novel role for non-neutralizing antibodies against nucleoprotein in facilitating resistance to influenza. *J. Immunol*. 181:4168-4176. PMC2590646

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RANDALL, Troy	Past	Carragher, Damian (2004-2008)	J Rangel-Moreno, Moyron-Quiroz, JE, **DM Carragher**, K Kusser, L Hartson, A Moquin, and TD Randall. 2009. Milky spots in the omentum develop independently of lymphoid tissue inducer cells and support T-dependent responses to peritoneal antigens. *Immunity* 30:731-743. PMC2754314
RANDALL, Troy	Past	Carragher, Damian (2004-2008)	Rangel-Moreno, J, **DM Carragher**, JY Hwang, M de la L Garcia-Hernandez, K Kusser, L Hartson, W Ouyang, J Kolls, SA. Khader and TD Randall. 2011. The development of inducible Bronchus Associated Lymphoid Tissue (iBALT) is dependent on IL-17. *Nat Immunol.* 12:639-647. PMCID: PMC3520063
RANDALL, Troy	Past	Garcia-Hernandez, Maria de la Luz (2009-2012)	Rangel-Moreno, J, DM Carragher, JY Hwang, **M de la L Garcia-Hernandez**, K Kusser, L Hartson, W Ouyang, J Kolls, SA. Khader and TD Randall. 2011. The development of inducible Bronchus Associated Lymphoid Tissue (iBALT) is dependent on IL-17. *Nat Immunol*. 12:639-647. PMCID: PMC3520063
RANDALL, Troy	Past	Kaminski, Denise (2006-2008)	Carragher, DM, **DA Kaminski**, A Moquin, L Hartson and TD Randall. 2008. A novel role for non-neutralizing antibodies against nucleoprotein in facilitating resistance to influenza. *J. Immunol*. 181:4168-4176. PMC2590646
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REDDEN, David T.	Past	Divers, Jasmin (2005-2007)	**Divers J**, Redden DT, Carroll RJ, Allison DB. How to estimate the measurement error variance associated with ancestry proportion estimates. *Stat Interface*. 2011 Jul 1;4(3):327-337. PubMed PMID: 24089627; PubMed Central PMCID: PMC3786624.
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REDDEN, David T.	Past	Divers, Jasmin (2005-2007)	Redden DT, **Divers J**, Vaughan LK, Tiwari HK, Beasley TM, Fernández JR, Kimberly RP, Feng R, Padilla MA, Liu N, Miller MB, Allison DB. Regional admixture mapping and structured association testing: conceptual unification and an extensible general linear model. *PLoS Genet*. 2006 Aug 25;2(8):e137. Epub 2006 Jul 18. PubMed PMID: 16934005; PubMed Central PMCID: PMC1557785.

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REDDEN, David T.	Past	Vaughan, Laura K. (2006-2008)	Divers J, Redden DT, Rice KM, **Vaughan LK**, Padilla MA, Allison DB, Bluemke DA, Young HJ, Arnett DK. Comparing self-reported ethnicity to genetic background measures in the context of the Multi-Ethnic Study of Atherosclerosis (MESA). *BMC Genet.* 2011 Mar 4;12:28. doi: 10.1186/1471-2156-12-28. PubMed PMID: 21375750; PubMed Central PMCID: PMC3068121.
REDDEN, David T.	Past	Vaughan, Laura K. (2006-2008)	**Vaughan LK**, Divers J, Padilla M, Redden DT, Tiwari HK, Pomp D, Allison DB. The use of plasmodes as a supplement to simulations: A simple example evaluating individual admixture estimation methodologies. *Comput Stat Data Anal*. 2009 Mar 15;53(5):1755-1766. PubMed PMID: 20161321; PubMed Central PMCID: PMC2678733.
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REDDEN, David T.	Past	Vaughan, Laura K. (2006-2008)	Redden DT, Divers J, **Vaughan LK**, Tiwari HK, Beasley TM, Fernández JR, Kimberly RP, Feng R, Padilla MA, Liu N, Miller MB, Allison DB. Regional admixture mapping and structured association testing: conceptual unification and an extensible general linear model. *PLoS Genet*. 2006 Aug 25;2(8):e137. Epub 2006 Jul 18. PubMed PMID: 16934005; PubMed Central PMCID: PMC1557785.
REYNOLDS, Richard	Past	Baker, Brandi (2012)	Tang Q, Danila MI, Cui X, Parks L, **Baker BJ**, Reynolds RJ, Raman C, Wanseck KC, Redden DT, Johnson MR, et al. 2015. Expression of Interferon-γ Receptor Genes in Peripheral Blood Mononuclear Cells Is Associated With Rheumatoid Arthritis and Its Radiographic Severity in African Americans. *Arthritis and Rheumatology*. PMC4414815.
SAAG, Kenneth G.	Current	Beukelman, Timothy * (2006-present)	**Beukelman, T.**, Guevara, J.P., Albert, D.A., 2008. "Optimal treatment of knee monarthritis in juvenile idiopathic arthritis: a decision analysis," *Arthritis Rheum*., 59(11):1580-8. PMID: 18975367
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SAAG, Kenneth G.	Current	Beukelman, Timothy * (2006-present)	Cron, R.Q., **Beukelman, T.**, 2010. "Guilt by association - what is the true risk of malignancy in children treated with etanercept for JIA?" Pediatr*. Rheumatol. Online* J., 8:23. PMCID: PMC2931479
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
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SAAG, Kenneth G.	Current	Warriner, Amy ** (2006-present)	**Warriner, A.H.**, Patkar, N.M., Curtis, J.R., Delzell, E., Gary, L., Kilgore, M., Saag, K., 2011. "Which Fractures Are Most Attributable to Osteoporosis?" *J. Clin. Epidemiol.*, 64(1):46-53. PMID: 21130353
SAAG, Kenneth G.	Current	Warriner, Amy ** (2006-present)	Teng, G.G., **Warriner, A.**, Curtis, J.R., Saag, K.G., 2008. "Improving quality of care in osteoporosis: Opportunities and challenges," *Curr. Rheumatol. Rep.,* 10(2):123-130. PMID: 18460267
SAAG, Kenneth G.	Current	Warriner, Amy ** (2006-present)	**Warriner, A.H.**, Outman, R.C, Saag, K.G., Berry, S.D., Colón-Emeric, C., Flood, K.L., Lyles, K.W., Tanner, S.B., Watts, N.B., Curtis, J.R., 2009. "Management of osteoporosis among home health and long-term care patients with a prior fracture," *South. Med. J.,* 102(4):397-404. PMCID: PMC2720154
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SAAG, Kenneth G.	Current	Wright, Nicole # (2010-present)	Racovan, M., Walitt, B., Collins, C.E., Pettinger, M., Parks, C.G., Shikany, J.M., Wactawski-Wende, J., Manson, J.E., Moreland, L., **Wright, N.**, Jackson, R., Howard, B.V., 2011. "Calcium and vitamin D supplementation and incident rheumatoid arthritis: the Women's Health Initiative Calcium plus Vitamin D trial," *Rheumatol. Int.*, (Epub ahead of print). PMID: 22190273
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SAAG, Kenneth G.	Past	Danila, Maria * (2006-2008)	**Danila, M.I.**, Patkar, N.M., Curtis, J.R., Saag, K.G., Teng, G.G., 2008. "Biologics and heart failure in rheumatoid arthritis: are we any wiser?" *Curr. Opin. Rheumatol*., 20(3):327-33. PMID: 18388526.
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SAFFORD, Monika	Past	Vionea-Griffin, Andreea (2008-2010)	Hujoel P, Barasch A, Cunha-Cruz J, Curro FA, Sung AH, Vena D, **Voinea-Griffin AE**, Beadnell S, Craig RG, Derouen T, Dasanayake A, Gilbert A, Gilbert GH, Goldberg K, Hauley R, Hashimoto M, Holmes J, Latzke B, Leroux B, Lindblad A, Richman J, Safford M, Ship J, Thompson VP, Williams OD, Yin W. Osteonecrosis of the jaw and oral hygiene: a case-control study from Condor Dental Practice-Based Research Network. *J Dent Hyg* 2012;86(1):32-3. PMID: 22309930.
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SCARINCI-SEARLES, Isabel	Past	Cherrington, Andrea (2006-2012)	Agne AA, Daubert R, Munoz ML, Scarinci I, **Cherrington AL**. The cultural context of obesity: exploring perceptions of obesity and weight loss among Latina immigrants. *J Immigr Minor Health*. 2012 Dec;14(6):1063-70. PMCID: PMC3818086
SCARINCI-SEARLES, Isabel	Past	Cherrington, Andrea (2006-2012)	Martinez J, Powell J, Agne A, Scarinci I, **Cherrington A**. A focus group study of Mexican immigrant men's perceptions of weight and lifestyle. *Public Health Nurs*. 2012 Nov;29(6):490-8. PMCID: PMC4213931
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SCARINCI-SEARLES, Isabel	Past	Cherrington, Andrea (2006-2012)	Houston TK, **Cherrington A**, Coley HL, Robinson KM, Trobaugh JA, Williams JH, Foster PH, Ford DE, Gerber BS, Shewchuk RM, Allison JJ. The art and science of patient storytelling-harnessing narrative communication for behavioral interventions: the ACCE project. *J Health Commun*. 2011 Aug;16(7):686-97. PMID: 21541875

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SCARINCI-SEARLES, Isabel	Past	Halanych, Jewell (2005-2012)	Muntner P, **Halanych JH**, Reynolds K, Durant R, Vupputuri S, Sung VW, Meschia JF, Howard VJ, Safford MM, Krousel-Wood M. Low medication adherence and the incidence of stroke symptoms among individuals with hypertension: the REGARDS study. *J Clin Hypertens* (Greenwich). 2011;13(7):479-86. PMCID: PMC3140118

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SCARINCI-SEARLES, Isabel	Past	Halanych, Jewell (2005-2012)	**Halanych JH**, Safford MM, Keys WC, Person SD, Shikany JM, Kim YI, Centor RM, Allison JJ. Burden of comorbid medical conditions and quality of diabetes care. *Diabetes Care*. 2007;30(12):2999-3004. PMID: 17717287
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
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SCARINCI-SEARLES, Isabel	Past	Holt, Cheryl (2006-2008)	**Holt CL,** Oster RA, Clay KS, Urmie J, Fouad M. Religiosity and physical and emotional functioning among African American and White colorectal and lung cancer patients. *J Psychosoc Oncol*. 2011 Jul-Aug;29(4):372-93. PMCID: PMC3646396
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SCARINCI-SEARLES, Isabel	Past	Holt, Cheryl (2006-2008)	**Holt CL**, Caplan L, Schulz E, Blake V, Southward P, Buckner A, Lawrence H. Role of religion in cancer coping among African Americans: a qualitative examination. *J Psychosoc Oncol*. 2009;27(2):248-73. PMCID: PMC3646589

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SCARINCI-SEARLES, Isabel	Past	Lebensberger, Jeffrey (2010-2012)	**Lebensburger JD**, Sidonio RF, Debaun MR, Safford MM, Howard TH, Scarinci IC. Exploring barriers and facilitators to clinical trial enrollment in the context of sickle cell anemia and hydroxyurea. *Pediatr Blood Cancer*. 2013 Aug;60(8):1333-7. PMID: 23418000
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SCARINCI-SEARLES, Isabel	Past	White, Kari (2012-2014)	Potter E, Stevenson AJ, **White K**, Hopkins K, Grossman D. Hospital variation in postpartum tubal sterilization rates in California and Texas. *Obstet Gynecol*. 2013 Jan;121(1):152-8. PMCID: PMC4418541
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SCHROEDER, Harry W.	Past	Buckley, Kevin (2004- 2006)	Khass M, **Buckley K***, Kapoor P, Schelonka RL, Watkins LS*, Zhuang Y, Schroeder HW Jr. (2013) Recirculating, mature bone marrow B cells from C57BL/6 mice are more tolerant of charged CDR-H3s than BALB/c. *Eur J Immunol* 43(3):629-40. PMCID: PMC3653428.
SCHROEDER, Harry W.	Past	Giannobile, Joseph V (2008- 2010)	Endo LM*, **Giannobile JV***, Dobbs AK, Foote JB*, Szymanska E*, Warnock DG. Cook WJ, Conley ME, **Schroeder HW Jr.** (2011) Membranous glomerulopathy in an adult patient with X-linked agammaglobulinemia receiving intravenous gammaglobulin. *J Investig Allergol Clin Immunol* 21(5):405-409. PMCID: PMC3667600**.**
SCHROEDER, Harry W.	Past	Hwangpo, Tracy A (2011- 2014)	Szymanska-Mroczek E*, Ippolito GC, Rogosch T, Hoi KH, **Hwangpo TA***, Brand MG, Zhuang Y, Liu CR, Schneider DA, Zemlin M, Brown EE, Georgiou G, Schroeder HW Jr. (2014) Differences in the composition of the human antibody repertoire by B cell subsets in the blood. Front Immunol 19 March 2014 | doi: 10.3389/fimmu.2014.00096. PMCID: PMC3958703
SCHROEDER, Harry W.	Past	Johnston, David T (2004- 2006)	**Johnston DT***, Mehaffey G*, Thomas J, Young KR Jr, Wiener H, Li J, Li J, Go RCP, Schroeder HW Jr. (2006) Increased frequency of HLA *B44 in recurrent sinopulmonary infections (RESPI). *Clin Immunol* 119:346-350. PMID: 16542878
SCHROEDER, Harry W.	Past	Johnston, David T (2004- 2006)	**Johnston DT**, Schroeder HW Jr. (2007) B-cell numbers in the blood of patients with non-HLA*B8 or non-HLA*B44 common variable immunodeficiency. *Ann Allergy Asthma Immunol*. **98**(2):163-167. PMID: 17304884
SCHROEDER, Harry W.	Past	Mahmoud, Tamer	**Mahmoud T**, Schroeder HW Jr, Kearney JF. (2011) Limiting CDR-H3 diversity abrogates the antibody response to the bacterial polysaccharide a 1-3 dextran. *J Immunol* 187, 879-886. PMID 21677133. PMCID: PMC3210069**.**
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SCHROEDER, Harry W.	Past	Waldrep, Melissa	**Waldrep M***, Zhuang Y, Schroeder HW Jr. (2009) Analysis of TACI mutations in CVID & RESPI patients who have inherited HLA B*44 or HLA*B8. *BMC Med Genet* 10:100. PMID: 19775471. PMCID: PMC2760525.

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SCHWIEBERT, Lisa M.	Past	Creel, A. (2006-2008)	Hewitt, M., **Creel, A**., Estell, K., Davis, I., and L. M. Schwiebert. Acute exercise decreases airway inflammation but not responsiveness in an allergic asthma model. *Am. J. Respir. Cell Mol. Biol*. 40:83-89, 2009. PMC2606949
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SERRA, Rosa	Past	Nicola, Teodora (2005-2007)	Ambalavanan N, **Nicola T**, Hagood J, Bulger A, Serra R, Murphy-Ullrich J, Oparil S, Chen Y-F. Transforming growth factor-beta signaling mediates hypoxia-induced pulmonary arterial remodeling and inhibition of alveolar development in newborn mouse lung. *AJP: Lung Cellular and Molecular Physiology*. 295:L86-L95, 2008. PMC2494779
SERRA, Rosa	Past	Nicola, Teodora (2005-2007)	Johnson E, **Nicola T**, Roarty K, Yoder BK, Haycraft CJ, and Serra, R. A role for cilia in the regulation of mouse ovarian function. *Developmental Dynamics*, 237:2053-2060, 2008. PMID: 18629867
SERRA, Rosa	Past	Nicola, Teodora (2005-2007)	Maheshwari A, Kelly DR, **Nicola T**, Ambalavanan N, Jain SK, Murphy-Ullrich J, Athar M, Shimamura M, Bhandari V, Aprahamian C, Dimmitt RA, Serra R, Ohls RK. TGF-β2 Suppresses Macrophage Cytokine Production and Mucosal Inflammatory Responses in the Developing Intestine. *Gastroenterology*. 140:242-253 2010 PMC3008335
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
TIWARI, Hemant	Past	Erickson, Stephen (2006-2009)	Wilson NA, Keele BF, Reed JS, Piaskowski SM, MacNair CE, Bett AJ, Liang X, Wang F, Thoryk E, Heidecker GJ, Citron MP, Huang L, Lin J, Vitelli S, Ahn CD, Kaizu M, Maness NJ, Reynolds MR, Friedrich TC, Loffredo JT, Rakasz EG, **Erickson SW**, Allison DB, Piatak M Jr, Lifson JD, Shiver JW, Casimiro DR, Shaw GM, Hahn BH, Watkins DI. Vaccine-induced cellular responses control simian immunodeficiency virus replication after heterologous challenge. *J Virol*. 2009 Jul; 83(13):6508-21. Epub 2009 Apr 29. PMCID: PMC2698536
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TIWARI, Hemant	Past	Erickson, Stephen (2006-2009)	Bruder CE, Piotrowski A, Gijsbers AA, Andersson R, **Erickson SW**, Diaz de St˚ahl T, Menzel U, Sandgren J, von Tell D, Poplawski A, Crowley M, Crasto C, Partridge EC, Tiwari H, Allison DB, Komorowski J, van Ommen GJ, Boomsma DI, Pedersen NL, den Dunnen JT, Wirdefeldt K, Dumanski JP. Phenotypically concordant and discordant monozygotic twins display different DNA copy-number-variation profiles. *Am J Hum Genet*. 2008 Mar; 82(3):763-71. Epub 2008 Feb 14. PMCID: PMC2427204
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TIWARI, Hemant	Past	Erickson, Stephen (2006-2009)	Musani SK, **Erickson SW**, Allison DB. Obesity–still highly heritable after all these years. *Am J Clin Nutr*. 2008 Feb; 87(2):275-6. PMID: 18258613. freely available at http://ajcn.nutrition.org/content/87/2/275.long
TIWARI, Hemant	Past	Hidalgo, Bertha (2012-2014)	Wessel J, Chu AY, Willems SM, Wang S, Yaghootkar H, Brody JA, Dauriz M, Hivert MF, Raghavan S, Lipovich L, **Hidalgo B**, et al., Goodarzi MO; EPIC-InterAct Consortium. Low-frequency and rare exome chip variants associate with fasting glucose and type 2 diabetes susceptibility. *Nat Commun.* 2015 Jan 29;6:5897. doi: 10.1038/ncomms6897. PubMed PMID: 25631608; PubMed Central PMCID: PMC4311266.
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TIWARI, Hemant	Past	Irvin, Margurite Ryan (2009-2011)	Zhi D, **Irvin MR**, Gu CC, Stoddard AJ, Lorier R, Matter A, Rao DC, Srinivasasainagendra V, Tiwari HK, Turner A, Broeckel U, Arnett DK. Whole-exome sequencing and an iPSC-derived cardiomyocyte model provides a powerful platform for gene discovery in left ventricular hypertrophy. *Front Genet*. 2012 May 28;3:92. doi: 10.3389/fgene.2012.00092. eCollection 2012. PMCID: PMC3361011
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TIWARI, Hemant	Past	Kennedy, Richard (2008-2011)	Kennedy RE, Howard G, Go RC, Rothwell PM, **Tiwari HK**, Feng R, McClure LA, Prineas RJ, Banerjee A, Arnett DK. Family Risk of Stroke and Myocardial Infarction and Prevalent Risk Factors. *Stroke*. 2012 Apr;43(4):974-9. doi: 10.1161/STROKEAHA.111.645044. Epub 2012 Feb 9. PMCID: PMC3805250
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TIWARI, Hemant	Past	Musani, S. (2003-2005)	**Musani SK**, Erickson S, Allison DB. Obesity--still highly heritable after all these years. *Am J Clin Nutr*. 2008 Feb;87(2):275-6. (editorial) PMID: 18258613 freely available at http://ajcn.nutrition.org/content/87/2/275.long
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TIWARI, Hemant	Past	Musani, S. (2003-2005)	**Musani SK**, Zhang HG, Hsu HC, Yi N, Gorman BS, Allison DB, Mountz JD. Principal component analysis of quantitative trait loci for immune response to adenovirus in mice. *Hereditas*. 2006 Dec;143(2006):189-97. PMID: 17362354
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Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
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TIWARI, Hemant	Past	Vaughan, Laura Kelly (2005-2008)	**Vaughan LK**, Divers J, Padilla M, Redden DT, Tiwari HK, Pomp D, Allison DB. The use of plasmodes as a supplement to simulations: A simple example evaluating individual admixture estimation methodologies. *Comput Stat Data Anal*. 2009 Mar 15:53(5):1755-1766. PMCID: PMC2678733
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TIWARI, Hemant	Past	Vaughan, Laura Kelly (2005-2008)	Redden DT, Divers J, **Vaughan LK**, Tiwari HK, Beasley TM, Fernandez JR, Kimberly RP, Feng R, Padilla MA, Liu N, Miller MB, Allison DB. (2006) Regional admixture mapping and structured association testing: Conceptual unification and an extensible general linear model. *PLoS Genet* 2006 Aug 25;2(8);e137. PMCID: PMC1557785
TOLLEFSBOL, Trygve	Past	Tabitha Hardy (2010-2013)	Chen, H., **Hardy, TM**, Tollefsbol, T.O.. Epigenomics of Ovarian Cancer and Its Chemoprevention. Front Genet. 2011; 2: 67. PMCID: PMC3268620
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TOLLEFSBOL, Trygve	Past	Li, Yuanyuan (2006-2012)	Liu, L, **Li, Y**, and Tollefsbol, T.O. Gene-Environment Interactions and Epigenetic Basis of Human Diseases. Curr Issues Mol Biol. 2008; 10(1-2): 25–36. PMCID: PMC2434999
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WEAVER, Casey T.	Current	Winstead, Colleen 2009 - present	**Winstead CJ**, Weaver CT. Dwelling on T cell fate decisions. Cell. 2013 May 9;153(4):739-41. PMID: 23663773
WEAVER, Casey T.	Current	Winstead, Colleen 2009 - present	Balasubramani A, **Winstead CJ**, Turner H, Janowski KM, Harbour SN, Shibata Y, Crawford GE, Hatton RD, Weaver CT. Deletion of a conserved cis-element in the Ifng locus highlights the role of acute histone acetylation in modulating inducible gene transcription. PLoS Genet. 2014 Jan;10(1):e1003969. PMID: 24415943; PMCID: PMC3886902
WEAVER, Casey T.	Current	Harbour, Stacey (22009 - present	Zindl CL, Lai JF, Lee YK, Maynard CL, **Harbour SN**, Ouyang W, Chaplin DD, Weaver CT. IL-22-producing neutrophils contribute to antimicrobial defense and restitution of colonic epithelial integrity during colitis. Proc Natl Acad Sci U S A. 2013 Jul 30;110(31):12768-73. PMID: 23781104; PMCID: PMC3732935
WEAVER, Casey T.	Current	Harbour, Stacey (22009 - present	Balasubramani A, Winstead CJ, Turner H, Janowski KM, **Harbour SN**, Shibata Y, Crawford GE, Hatton RD, Weaver CT. Deletion of a conserved cis-element in the Ifng locus highlights the role of acute histone acetylation in modulating inducible gene transcription. PLoS Genet. 2014 Jan;10(1):e1003969. PMID: 24415943; PMCID: PMC3886902
WEAVER, Casey T.	Past	Zindl, Carlene 2010 - 2014	**Zindl CL,** Lai JF, Lee YK, Maynard CL, Harbour SN, Ouyang W, Chaplin DD, Weaver CT. IL-22-producing neutrophils contribute to antimicrobial defense and restitution of colonic epithelial integrity during colitis. Proc Natl Acad Sci U S A. 2013 Jul 30;110(31):12768-73. PMID: 23781104; PMCID: PMC3732935
WEAVER, Casey T.	Past	Zindl, Carlene 2010 - 2014	Basu R, Whitley SK, Bhaumik S, **Zindl CL**, Schoeb TR, Benveniste EN, Pear WS, Hatton RD, Weaver CT. IL-1 signaling modulates activation of STAT transcription factors to antagonize retinoic acid signaling and control the TH17 cell-iTreg cell balance. Nat Immunol. 2015 Mar;16(3):286-95. PMID: 25642823
WEAVER, Casey T.	Past	Zindl, Carlene 2010 - 2014	Jung YW, **Zindl CL**, Lai JF, Weaver CT, Chaplin DD. MMP induced by Gr-1+ cells are crucial for recruitment of Th cells into the airways. Eur J Immunol. 2009 Aug;39(8):2281-92. PMID: 19593770; PMCID: PMC2994262
WEAVER, Casey T.	Past	Zindl, Carlene 2010 - 2014	Maynard CL, Harrington LE, Janowski KM, Oliver JR, **Zindl CL**, Rudensky AY, Weaver CT. Regulatory T cells expressing interleukin 10 develop from Foxp3+ and Foxp3- precursor cells in the absence of interleukin 10. Nat Immunol. 2007 Sep;8(9):931-41. PMID: 17694059
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	**Maynard CL**, Weaver CT. Immunology: Context is key in the gut. Nature. 2011; 471(7337):169-70. PMID: 21390118.
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	Palmer MT, Lee YK, **Maynard CL**, Oliver JR, Bikle DD, Jetten AM, Weaver CT. Lineage-specific effects of 1,25-dihydroxyvitamin D(3) on the development of effector CD4 T cells. The Journal of Biological Chemistry. 2011; 286(2):997-1004. PMCID: PMC3020784.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	**Maynard CL,** Weaver CT. Intestinal effector T cells in health and disease. Immunity. 2009; 31(3):389-400. PMCID: PMC3109492.
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	**Maynard CL**, Hatton RD, Helms WS, Oliver JR, Stephensen CB, Weaver CT. Contrasting roles for all-trans retinoic acid in TGF-beta-mediated induction of Foxp3 and Il10 genes in developing regulatory T cells. The Journal of Experimental Medicine. 2009; 206(2):343-57. PMCID: PMC2646562.
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	**Maynard CL**, Weaver CT. Diversity in the contribution of interleukin-10 to T-cell-mediated immune regulation. Immunological Reviews. 2008; 226:219-33. PMCID: PMC2630587.
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	Lee YK, Turner H, **Maynard CL**, Oliver JR, Chen D, Elson CO, Weaver CT. Late developmental plasticity in the T helper 17 lineage. Immunity. 2009; 30(1):92-107. PMID: 19119024.
WEAVER, Casey T.	Past	Maynard, Craig 2012-2014	**Maynard CL,** Harrington LE, Janowski KM, Oliver JR, Zindl CL, Rudensky AY, Weaver CT. Regulatory T cells expressing interleukin 10 develop from Foxp3+ and Foxp3- precursor cells in the absence of interleukin 10. Nature Immunology. 2007; 8(9):931-41 PMID: 17694059.
YOUNGER, Jarred	Current	Lin, Joanne (2014-present)	Chu LF, **Lin JC**, Clemenson A, Encisco E, Sun J, Hoang D, Alva H, Erlendson M, Clark JD, Younger JW (under review). Acute opioid withdrawal is associated with increased neural activity in reward-processing centers in healthy men: a functional magnetic resonance imaging study.
YOUNGER, Jarred	Current	Lin, Joanne (2014-present)	**Lin JC**, Chu LF, Stringer EA, Baker KS, Sayyid Z, Campbell KA, Younger JY (under review). One month of oral morphine decreases right amygdalar gray matter volume in individuals with low back pain: Confirmation of previously reported magnetic resonance imaging results.
YOUNGER, Jarred	Current	Parkitny, Luke (2014-present)	**Parkitny L**, McAuley JH, Younger J, Moseley GL. (under review). Serum cytokine levels are associated with pain in people with an acute fracture. European *Journal of Pain*.
YOUNGER, Jarred	Current	Parkitny, Luke (2014-present)	**Parkitny L**, Middleton S, Baker S, Younger J. Evidence for abnormal cytokine expression in Gulf War illness: a preliminary analysis of daily immune monitoring data. (manuscript in preparation).
YOUNGER, Jarred	Current	Parkitny, Luke (2014-present)	Younger, J, **Parkitny, L**, & McLain, D. (2014). The use of low-dose naltrexone (LDN) as a novel anti-inflammatory treatment for chronic pain. *Clin Rheumatol*, 33(4). PMID: 24526250.
YOUNGER, Jarred	Past	Stringer, Elizabeth A. (2011-2013)	**Stringer EA**, Baker KS, Chu L, and Younger JW. (under review). Prescription Opioid Use Alters Functional Connectivity between the Amygdala and Other Memory-, Sensory-, and Decision-Processing Regions of the Human Brain.
YOUNGER, Jarred	Past	Stringer, Elizabeth A. (2011-2013)	**Stringer EA**, Baker KS, Chu L, and Younger JW. Prescription Opioid Analgesics Rapidly Change the Human Brain: a Triple-Blind, Placebo-Controlled Study (manuscript in preparation).

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
YOUNGER, Jarred	Past	Stringer, Elizabeth A. (2011-2013)	**Stringer EA**, Baker KS, Carroll IR, Montoya JG, Chu L, Maecker HT, and Younger JW. (2013). Daily Cytokine Fluctuations, Driven by Leptin, are Associated with Fatigue Severity in Chronic Fatigue Syndrome: Evidence of Inflammatory Pathology. *J Transl Med* (11:93). PMID:23570606.
YUSUF, Nabiha	Current	Burns, Erin (2013-present)	**Burns EM**, Yusuf N. 2014. Toll like receptors and skin cancer. *Front Immunol*. 5:135. PMCID PMC3978350.
YUSUF, Nabiha	Current	Burns, Erin (2013-present)	**Burns EM**, Elmets CA, Yusuf N. 2015. Vitamin D and skin cancer. *Photochem Photobiol* 91:201-9. PMCID PMC4295013.
YUSUF, Nabiha	Past	Ahmad, Israr (2011-2013)	**Ahmad I**, Simanyi E, Guroji P, Tamimi IA, delaRosa HJ, Nagar A, Nagar P, Katiyar SK, Elmets CA, Yusuf N. 2013. Toll-Like Receptor-4 deficiency enhances repair of ultraviolet radiation induced cutaneous DNA damage by nucleotide excision repair mechanism. *J Invest Dermatol.* 134:1710-1717.PMCID PMC4020975
YUSUF, Nabiha	Past	Ahmad, Israr (2011-2013)	**Ahmad I**, Muneer KM, Tamimi IA, Chang ME, Ata MO, Yusuf N. 2013. Thymoquinone suppresses metastasis of melanoma cells by inhibition of NLRP3 inflammasome. 2013. *Toxicol Appl Pharmacol*. 270:70-6. PMID: 23583630
YUSUF, Nabiha	Past	Ahmad, Israr (2011-2013)	Min W, Liu X, Qian Q, Lin B, Wu D, Wang M, **Ahmad I**, Yusuf N, Luo D. The effects of Baicalin against UVA-induced photoaging in skin fibroblasts. 2014. *Am J Chin Med*.42:709-27. PMID: 24871661
YUSUF, Nabiha	Past	Ahmad, Israr (2011-2013)	Yusuf N, Nasti TH, Ahmad I, Chowdhury S, Mohiuddin H, Xu H, Athar M, Timares L, Elmets CA. In vivo suppression of heat shock proteins (HSP)27 and HSP70 accelerates DMBA induced skin carcinogenesis by inducing antigenic unresponsiveness to the initiating chemical. 2015. *J Immunol*. Apr 3 pii. 1402804 (Epub ahead of print). PMID 25840912
YUSUF, Nabiha	Past	Min, Wei (2013-2014)	**Min W**, Liu X, Qian Q, Lin B, Wu D, Wang M, **Ahmad I**, Yusuf N, Luo D. The effects of Baicalin against UVA-induced photoaging in skin fibroblasts. 2014. *Am J Chin Med*.42:709-27. PMID: 24871661
ZAYZAFOON, Majd	Past	Akhter, Hasina (2009-2010)	A.Katre, C. Ballinger, **H. Akhter**, M. Fanucchi, Dae-Kee Kim, E. Postlethwait, and R-M. Liu. Increased transforming growth factor beta 1 expression mediates ozone-induced airway fibrosis in mice. *Inhal Toxicol*. 2011 Jul;23(8):486-94. Non-NIH. PMCID: PMC3690533
ZAYZAFOON, Majd	Past	Choo, Min-Kyung (2007-2009)	**Choo MK**, Yeo H, Zayzafoon M. NFATc1 mediates HDAC-dependent transcriptional repression of osteocalcin expression during osteoblast differentiation. *BONE*. 2009 45(3):579-89. PMCID: PMC2732115.
ZAYZAFOON, Majd	Past	Choo, Min-Kyung (2007-2009)	**Choo MK**, Yeo H, Zayzafoon M. NFATc1 mediates HDAC-dependent transcriptional repression of osteocalcin expression during osteoblast differentiation. *J Bone Miner Re*s 2008; 23(S1): S42(#1145).

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ZAYZAFOON, Majd	Past	Choo, Min-Kyung (2007-2009)	**Choo MK**, Yuan K, Hameed O, Chung L, Zayzafoon M. Stroma-secreted S100A4 promotes the motility of prostate cancer epithelial cells. *Proceedings of the American Association for Cancer Research* 2009. PMCID: PMC2732115
ZAYZAFOON, Majd	Past	Nagalingam, Arumugam (2007)	Saxena NK, Fu PP, **Nagalingam A**, Wang J, Handy J, Cohen C, Tighiouart M, Sharma D, Anania FA. Adiponectin modulates C-jun N-terminal kinase and mammalian target of rapamycin and inhibits hepatocellular carcinoma. *Gastroenterology*. 2010 Nov;139(5):1762-73, 1773.e1-5. Epub 2010 Jul 13. PMCID: PMC2967590
ZAYZAFOON, Majd	Past	Nagalingam, Arumugam (2007)	Sharma D, Wang J, Fu PP, Sharma S, **Nagalingam A**, Mells J, Handy J, Page AJ, Cohen C, Anania FA, Saxena NK. Adiponectin antagonizes the oncogenic actions of leptin in hepatocellular carcinogenesis. *Hepatology*. 2010 Nov;52(5):1713-22. PMCID: PMC2967627
ZAYZAFOON, Majd	Past	Okamura, Hirohiko (2009-2010)	Susilowati H, **Okamura H**, Hirota K, Shono M, Yoshida K, Murakami K, Tabata A, Nagamune H, Haneji T, Miyake Y. Intermedilysin induces EGR-1 expression through calcineurin/ NFAT pathway in human cholangiocellular carcinoma cells . *Biochemical and Biophysical Research Communications*, 404(1):57-61, 2011. Non-NIH PMID: 21094139
ZAYZAFOON, Majd	Past	Okamura, Kaya (2009-2010)	Susilowati H, Okamura H, **Hirota K**, Shono M, Yoshida K, Murakami K, Tabata A, Nagamune H, Haneji T, Miyake Y. Intermedilysin induces EGR-1 expression through calcineurin/ NFAT pathway in human cholangiocellular carcinoma cells . *Biochemical and Biophysical Research Communications*, 404(1):57-61, 2011. Non-NIH PMID: 21094139
ZAYZAFOON, Majd	Past	Yang, Yanping (2010-2011)	Friggeri A, **Yang Y,** Banerjee S, Park YJ, Liu G, Abraham E. HMGB1 inhibits macrophage activity in efferocytosis through binding to the alphavbeta3-integrin. *Am J Physiol Cell Physiol*. 2010 Dec;299(6):C1267-76. Epub 2010 Sep 8. PMCID: PMC3006331
ZAYZAFOON, Majd	Past	Yang, Yanping (2010-2011)	**Yang Y**, Friggeri A, Banerjee S, Bdeir K, Cines DB, Liu G, Abraham E. Urokinase-type plasminogen activator inhibits efferocytosis of neutrophils. *Am J Respir Crit Care Med*. 2010 Dec 15;182(12):1516-23. Epub 2010 Jul 23. PMCID: PMC3029937
ZAYZAFOON, Majd	Past	Yang, Yanping (2010-2011)	Liu G, Friggeri A, **Yang Y**, Milosevic J, Ding Q, Thannickal VJ, Kaminski N, Abraham E. miR-21 mediates fibrogenic activation of pulmonary fibroblasts and lung fibrosis. *J Exp Med*. 2010 Aug 2;207(8):1589-97. Epub 2010 Jul 19. PMCID: PMC2916139
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	**Yuan K**, Chung LW, Siegal GP, Zayzafoon M. Alpha-CaMKII Controls the Growth of Human Osteosarcoma by Regulating Cell Cycle Progression. *Lab Invest* 2007; 87:938-950, PMID: 17632540.
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	Wang D, Stockard CR, Harkins L, Lott PF, Salih C, **Yuan K**, Buchsbaum D, Hashim A, Zayzafoon M, Hardy R, Hameed O, Grizzle W, Siegal GP. Immunohistochemistry in the Evaluation of Neovascularization in Tumor Xenografts: Antibody Selection and Antigen Retrieval Method Optimization. *Biotechnic & Histochemistry* 2008; 83:179-189, PMCID: PMC2651088.

Mentor(s)	Past / Current	Name of Trainee (Years in Program)	Publication (Authors, Year, Title, Journal, PMCID)
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	Byon CH, Sun Y, Chen J, **Yuan K**, Mao X, Heath JM, Anderson PG, Tintut Y, Demer LL, Wang D, Chen Y. Runx2-Upregulated Receptor Activator of Nuclear Factor {kappa}B Ligand in Calcifying Smooth Muscle Cells Promotes Migration and Osteoclastic Differentiation of Macrophages. *Arterioscler Thromb Vasc Biol*. 2011 Mar 31. NIHMS291222 PMCID: PMC3098301
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	Jing G, Yuan K, Turk AN, Jhala NC, Arnoletti JP, Zhang K, McDonald JM, Chen Y. Tamoxifen enhances therapeutic effects of gemcitabine on cholangiocarcinoma tumorigenesis. *Lab Invest*. 2011 Apr 4. [Epub ahead of print] PMC Journal – PMC Pending. PMID: 21464824
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	**Yuan K**, Choo H, Siegal GP, Zayzafoon M. Calcium/Calmodulin dependent kinase controls cell cycle progression in osteosarcoma. *J Bone Miner Res* 2006;21(S1):S138(#SA78).
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	**Yuan K**, Zayzafoon M. Alpha-Calcium/Calmodulin Dependent Kinase II Controls Osteosarcoma Cell Migration. *J Bone Miner Re*s 2008; 23(S1): S299(#SU234).
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	Choo MK, **Yuan K**, Hameed O, Chung L, Zayzafoon M. Stroma-secreted S100A4 promotes the motility of prostate cancer epithelial cells. *Proceedings of the American Association for Cancer Research* 2009.
ZAYZAFOON, Majd	Past	Yuan, Kaiyu (2006-2009)	Paige-Robinson J, **Yuan K**, Hameed O, Petros J, Zayzafoon M. RAGE/S100A4: from prostate cancer biology to biomarker for the prediction of metastasis. *Oral and Poster Presentation at the 50th Annual Meeting of the British Association for Cancer Research* 2010

Table 6B Instructions: For New (Type 1) Applications

Read FOA, SF424 (R&R) Application Guide Section 8, and Introduction to NRSA Data Tables first.

List publications of representative previous postdoctoral trainees and all current postdoctoral trainees of the proposed mentors. Only include previous trainees over the last ten years and only trainees who would have been considered for appointment, if this program had been supported by an NIH training grant during their period of training. Sort trainees by mentor. Group past trainees separately from current trainees. Sort each group by their year of entry into postdoctoral training with their current faculty mentor or in association with the program. In parenthesis, include the year they began their training and, if appropriate, the year they completed training. Designate Kirschstein-NSRA training grant eligible trainees (TGE) by an asterisk (*). List all publications of trainees resulting from their period of training in the faculty member's laboratory or in association with the training program, regardless of when the publication actually appeared. List abstracts **only** if a more complete publication has not appeared and label these clearly as abstracts. List publications followed by abstracts in chronological order. Boldface the trainee's name in the author list.

When citing articles that fall under the Public Access Policy, were authored or co-authored by the trainee and arose from NIH support, provide the NIH Manuscript Submission reference number (e.g., NIHMS97531) or the PubMed Central (PMC) reference number (e.g., PMCID234567) for each article. If the PMCID is not yet available because the Journal submits articles directly to PMC on behalf of their

authors, indicate "PMC Journal - In Process." A list of these Journals is posted at: http://publicaccess.nih.gov/submit_process_journals.htm.

Summarize these data in the body of the proposal. For example, what is the average number of papers published by trainees, how many first author, what has been the impact of these publications on their field of science.

Rationale: This information provides an indicator of the ability of the mentor to foster trainee productivity and allows assessment of the research quality and authorship priority of previous postdoctoral trainees.

Table 7A. Admissions and Completion Records for the Participating Departments and Programs During the Past Five Years (Predoctoral Applicants)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Biochemistry & Structural Biology	2010	75(30) 8	17(11) 2	7(4) 1/0/x	5(3) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	1 (1) 1/0/x	1-career change
Biochemistry & Structural Biology	2011	56(26) 5	12(11) 2	5(4) 0/0/x	5(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biochemistry & Structural Biology	2012	65(42) 8	19(16) 4	4(4) 0/0x	3(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-career change
Biochemistry & Structural Biology	2013	54(39) 9	13(12) 3	9(8) 2/0/x	9(8) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biochemistry & Structural Biology	2014	64(43) 10	11(11) 3	3(3) 1/0/x	3(3) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biochemistry & Structural Biology	2015	63(47) 8	12(12) 2	7(7) 1/0/x	7(7) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell, Molecular & Developmental Biology	2010	110(48) 10	27(19) 0	13(10) 0/0/x	9(6) 0/0/x	1 (1) 0/0/x	1 (1) 0/0/x	2 (2) 0/0/x	1-career change 1-dismissed
Cell, Molecular & Developmental Biology	2011	152(79) 22	21(17) 6	9(7) 1/0/x	8(6) 1/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Cell, Molecular & Developmental Biology	2012	137(80) 21	16(15) 3	5(5) 0/0/x	5(5) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell, Molecular & Developmental Biology	2013	87(66) 13	15(13) 3	8(7) 2/0/x	6(5) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	2 (2) 0/0/x	2-academic difficulty

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Cell, Molecular & Developmental Biology	2014	66(52) 14	14(14) 3	9(9) 2/0/x	9(9) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell, Molecular & Developmental Biology	2015	77(55) 12	15(15) 5	9(9) 2/0/x	9(9) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cancer Biology	2010	101(62) 17	9(8) 2	7(6) 1/0/x	4(3) 1/0/x	0 (0) 0/0/x	3 (3) 0/0/x	0 (0) 0/0/x	
Cancer Biology	2011	108(56) 16	15(13) 6	7(7) 3/0/x	5(5) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	2 (2) 2/0/x	1-moved with mentor 1-career change
Cancer Biology	2012	112(55) 16	17(15) 4	6(6) 0/0/x	6(6) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cancer Biology	2013	68(39) 12	14(11) 4	7(4) 0/0/x	6(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-dismissed
Cancer Biology	2014	97(61) 18	16(12) 3	5(4) 1/0/x	5(4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cancer Biology	2015	87(38) 11	10(6) 1	7(3) 0/0/x	7(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics & Genomic Sciences	2010	69(38) 8	16(14) 1	5(4) 0/0/x	4(3) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics & Genomic Sciences	2011	64(39) 6	13(11) 2	5(5) 0/0/x	4(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-personal
Genetics & Genomic Sciences	2012	78(55) 16	15(15) 2	8(8) 2/0/x	7(7) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-personal
Genetics & Genomic Sciences	2013	69(51) 13	13(13) 4	5(5) 1/0/x	5(5) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Genetics & Genomic Sciences	2014	46(36) 6	10(10) 1	5(5) 0/0/x	4(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-career change
Genetics & Genomic Sciences	2015	63(48) 4	12(12) 2	7(7) 2/0/x	7(7) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Immunology	2010	56(30) 8	15(11) 1	6(5) 1/0/x	3(3) 1/0/x	2 (2) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1- academic
Immunology	2011	64(30) 10	14(7) 1	6(4) 0/0/x	4(3) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-personal
Immunology	2012	71(47) 11	12(11) 4	6(5) 0/0/x	5(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1- personal
Immunology	2013	51(33) 6	9(6) 1	3(3) 0/0/x	3(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Immunology	2014	72(50) 13	12(9) 3	7(5) 3/0/x	7(5) 3/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Immunology	2015	49(33) 11	8(7) 2	2(2) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2010	103(62) 14	18(14) 6	8(6) 2/0/x	4(3) 2/0/x	3 (2) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1- other career interest
Microbiology	2011	88(53) 17	13(9) 3	7(4) 2/0/x	6(3) 2/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Microbiology	2012	103(68) 15	14(12) 3	10(8) 2/0/x	10(8) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2013	68(48) 14	6(5) 2	6(5) 2/0/x	6(5) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Microbiology	2014	73(55) 15	12(11) 2	5(4) 0/0/x	5(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2015	82(65) 18	16(14) 4	7(5) 0/0/x	7(5) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neuroscience	2010	77(44) 7	13(12) 1	6(5) 0/1/x	3(2) 0/0/x	1 (1) 0/0/x	2 (2) 0/1/x	0 (0) 0/0/x	
Neuroscience	2011	87(56) 16	11(10) 1	8(7) 0/0/x	6(5) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	2 (2) 0/0/x	1-spouse relocation 1-personal
Neuroscience	2012	110(84) 17	12(12) 2	6(6) 0/1/x	4(4) 0/1/x	0 (0) 0/0/x	0 (0) 0/0/x	2 (2) 0/0/x	1-academic 1-career change
Neuroscience	2013	105(84) 14	10(8) 0	6(5) 0/0/x	5(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-transferred to UAB Rehab Sci program
Neuroscience	2014	95(71) 20	12(12) 3	4(4) 1/0/x	4(4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neuroscience	2015	117(93) 27	20(17) 9	15(12) 8/0/x	15(12) 8/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathobiology & Molecular Medicine	2010	122(94) 29	28(25) 3	19(15) 0/0/x	10(8) 0/0/x	6 (5) 0/0/x	0 (0) 0/0/x	3 (2) 0/0/x	1- transferred to Forensic Science program; 1-transferred with mentor 1 – medical school
Pathobiology & Molecular Medicine	2011	118(73) 27	18(16) 4	11(9) 2/0/x	6(4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	5 (5) 1/0/x	3- career change; 1- spousal relocation; 1- academic
Pathobiology & Molecular Medicine	2012	121(84) 24	20(19) 3	11(11) 2/0/x	8(8) 1/0/x	0 (0) 0/0/x	1 (1) 1/0/x	2 (2) 0/0/x	1-career change 1-withdrew

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Pathobiology & Molecular Medicine	2013	68(56) 21	15(13) 4	7(6) 3/0/x	6(5) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 1/0/x	1-transferred to UAB EHS program
Pathobiology & Molecular Medicine	2014	78(58) 12	12(11) 2	5(4) 1/0/x	5(4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathobiology & Molecular Medicine	2015	72(51) 16	11(7) 1	5(2) 0/0/x	5(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Departmental & MSTP Programs									
MSTP	2010	234(228) 24	23(23) 4	7(7) 1/0/0	7(7) 1/0/0	0 (0) 0/0/0	0 (0) 0/0/0	0 (0) 0/0/0	
MSTP	2011	278(278) 30	27(27) 3	7(7) 0/1/0	7(7) 0/1/0	0 (0) 0/0/0	0 (0) 0/0/0	0 (0) 0/0/0	
MSTP	2012	273(273) 30	16 (16) 4	8(8) 2/1/0	7(7)[1] 2(2)[2] 2/1/0	0 (0) 0/0/0	0 (0) 0/0/0	1 (1) 0/0/0	1-terminated
MSTP	2013	277(277) 30	23(23) 5	7(7) 1/0/1	7(7) 1/0/1	0 (0) 0/0/0	0 (0) 0/0/0	0 (0) 0/0/0	
MSTP	2014	268(268) 30	24(24) 5	7(7) 1/0/x	7(7) 1/0/x	0 (0) 0/0/0	0 (0) 0/0/0	0 (0) 0/0/0	
MSTP	2015	207(207) 39	25(25) 5	8(8) 2/0/x	8(8) 2/0/x	0 (0) 0/0/0	0 (0) 0/0/0	0 (0) 0/0/0	
Biology	2010	21(8) 0	7(7) 0	5 (5) 0/0/x	5 (5) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Biology	2011	21/(8) 0	7(7) 0	5 (5) 0/0/x	5 (5) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0x)	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Biology	2012	22 (6) 0	12(5) 0	9 (5) 0/0/x	9 (5) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Biology	2013	18(6) 1	7 (4) 1	3 (3) 1/0/x	3 (3) 1/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Biology	2014	17(6) 0	2(1) 0	2(1) 0/0/x	2(1) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Biology	2015	39(22) 5	9(9) 0	6(6) 0/0/x	6(6) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2010	30(7) 4	14(4) 0	6(4) 0/0/x	5(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-conflict with employment
Biostatistics	2011	26(8) 6	11(5) 2	6(5) 2/0/x	6(5) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2012	16(8) 0	9 (5) 0	6(4) 0/0/x	3(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	3 (2) 0/0/x	3-career change
Biostatistics	2013	24(10) 3	15(6) 2	5(4) 0/0/x	5(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2014	26(9) 0	12(6) 0	4(3) 0/0x	3(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1(0) 0/0/x	Moved out of state
Biostatistics	2015	20(10) 4	3(3) 0	3(3) 0	3(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1(0) 0/0/x	
BME	2010	86 (17) 6	23 (10) 3	11 (8) 1/0/x	11(8) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
BME	2011	68 (30) 7	15 (10) 0	8 (5) 0/0/x	7(5) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1-Transferred to a different program at UAB
BME	2012	31(20) 4	11(8) 0	7(4) 0/0/x	7(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
BME	2013	31(23) 3	8(6) 1	6(6) 1/0/x	6(6) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
BME	2014	34(21) 5	16 (12) 0	7(4) 0/0x	4(4) 0/0x	0 (0) 0/0/x	0 (0) 0/0/x	3 (0) 0/0/x	2-left with mentor; 1-transferred to a different program at UAB
BME	2015	23 (15) 3	6 (4) 0	6 (4) 0/0/x	6 (4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2010	32(13) 6	9(8) 5	9(8) 5/0/x	4(3) 1/0/x	1 (1) 0/0/x	0 (0) 0/0/x	4 (4) 4/0/x	2-grad school dismissal; 1-financial ; 1-unknown
Epidemiology	2011	40(21) 4	22(10) 3	7(5) 3/0/x	7(5) 3/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2012	29(18) 12	13(10) 2	7(6) 2/0/x	7(6) 2/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2013	37(19) 9	7(4) 0	7(4) 0/0/x	7(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2014	31(20) 9	4(2) 0	2(2) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2015	25(10) 3	4(2) 0	N/A	N/A	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Health Behavior	2010	17(13) 7	2(2) 0	1(1) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	1-career change
Health Behavior	2011	18(14) 8	11 (9) 4	6 (5) 4/0/x	6 (5) 4/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Health Behavior	2012	24 (22) 11	11(9) 2	6(6) 2/0/x	5(5) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (1) 1/0/x	1-career change
Health Behavior	2013	15(11) 6	4(2) 0	3(2) 0/0/x	3(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Health Behavior	2014	18(16) 7	10(8) 3	9(8) 3/0/x	9(8) 3/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Health Behavior	2015	12(10) 6	7(7) 5	N/A**	N/A**	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2010	20(na) na	3(3) 0	3(3) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1(1) 0/0/x	Career change after earning MA
Psychology	2011	13(11) 1	2(1) 0	2(1) 0/0/x	2(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2012	19(16) 3	6(6) 0	6(6) 0/0/x	6(6) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2013	17(15) 4	4(2) 1	4(2) 1/0/x	4(2) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2014	NA	4(4) 0	4(4) 0/0/x	4(4) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2015	NA	NA	NA	NA	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Total All Programs	2010	1153(694) 148	224(171) 28	113(91) 12/1/x	76(59) 7/0/x	16(13) 0/0/x	7(7) 0/1/x	14(12) 5/0/x	
	2011	1201(782) 175	212(163) 37	99(80) 17/1/x	84(67) 14/1/x	1(0) 0/0/x	2(2) 0/0/x	12(11) 3/0/x	
	2012	1211(794) 188	203(174) 33	105(92) 12/1/0	92(80) 10/1/x	0 (0) 0/0/x	1(1) 1/0/x	12(11) 1/0/x	

Department / Program	Entering Year	Applicants Applied (TGE) A	Applicants Accepted (TGE) A	Applicants Enrolled (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program Earned PhD or MD/PhD (TGE) A/B/C	Trainees Left Program Earned Other Degree (TGE) A/B/C	Trainees Left Program Without Degree (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
	2013	989(777) 158	163(128) 31	86(71) 14/0/1	81(66) 13/0/1	0 (0) 0/0/x	0 (0) 0/0/x	5(5) 1/0/x	
	2014	985(766) 159	159(147) 28	78(67) 13/0/x	73(66) 13/0/x	0 (0) 0/0/x	0 (0) 0/0/x	5(1) 0/0/x	
Sums all Years		5539(3813) 828	961(783) 157	481(401) 68/3/1	406(338) 57/2/1	17(13) 0/0/x	10(10) 1/1/x	48(40) 10/0/x	
Average all Years		1107.8(762.6) 165.6	192.2(156.6) 31.4	96.2(80.2) 13.6/.6/0	N/A	N/A	N/A	N/A	

* Among training grant eligible (TGE) individuals - A, individuals who are underrepresented minorities; B, individuals with disabilities; C, individuals from disadvantaged backgrounds; Group C definition does not typically apply to trainees beyond undergraduate level and is indicated by an “x”. However this information is available for MSTP applicants and is included here. Disability information is provided by the UAB Office of Disability Support Services and by the UAB Physician Resource Office.

** 2015 admissions not yet completed

[1] Acceptance of one advanced standing student out of the first year graduate student class

[2] Acceptance of two advance standing students from medical school class (both had completed MS2 year, one was in a one-year HHMI Fellowship and one was in the UAB MD-MS CCTS TL1 Program)

Table 7B. Admissions and Completion Records for the Participating Departments and Programs During the Past Five Years (Postdoctoral Applicants)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Biol & Mol Gen	2010	PhD	2(1)# 0	1(1)# na	1(1) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	1(1) 0/0/x	1-resigned
Biol & Mol Gen	2010	MD	0 (0)# 0	0 (0)## 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2011	PhD	13(0)# na	5(0)# na	5 (1) 0/0/x	3 (1) 0/0/x	2(0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2012	PhD	3(0)# 0	3(0)# 0	3(0) 0/0/x	3(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2013	PhD	5(1)# 0	5(1)# 0	5(1) 0/0/x	4(0) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-short term postdoc appointment after UAB PhD award, prior to fulltime postdoc at UTSW
Biol & Mol Gen	2013	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Biol & Mol Gen	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2014	PhD	2 (0)# 0	2 (0)# 0	2 (0) 0/0/x	2 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biol & Mol Gen	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2010	PhD	1(1)# 1	1(1)# 1	1(1) 1/0/0	0 (0) 0/0/x	1(1) 1/0/0	0 (0) 0/0/x	
Biology	2010	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2011	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2012	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Biology	2013	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2013	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2014	PhD	2(1)# 0	2(1#) 0	2(1) 0/0/x	2(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biology	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2010	PhD	80 (16)# na	7 (2)# 1	7 (2) 1/0/x	0 (0) 0/0/x	7 (2) 1/0/x	0 (0) 0/0/x	
Biostatistics	2010	MD	2 (0)# na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2010	MD/PhD	8 (2)# na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2011	PhD	56 (5)# na	7 (5)# na	1 (1) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Biostatistics	2011	MD	0 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2011	MD/PhD	0 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2012	PhD	17(10)#	6 (4)# 1	6 (4) 1/0/x	1 (1) 0/0/x	4 (2) 1/0/x	1 (1) 0/0/x	1- Senior Statistician at Carolinas Healthcare System

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Biostatistics	2012	MD	0 (0)# 0	0 (0#) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2013	PhD	1 (0)# 0	1 (0)# 0	1 (0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2013	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2014	PhD	1 (0)# 0	1 (0)# 0	1 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1- resigned
Biostatistics	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Biostatistics	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2010	PhD	33 (0)# na	10 (4) 1	9 (4) 1/0/x	0 (0) 0/0/x	7 (3) 1/0/x	2 (1) 0/0/x	1-lack of funding 1 -personal
Cell Developmntl & Integrative Biology	2010	MD	2 (0)# na	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2010	MD/PhD	2 (0)# na	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2011	PhD	18 (7)# 2	8 (7)# 2	4 (3) 1/0/x	1 (1) 1/0/x	3 (2) 0/0/x	0 (0) 0/0/x	

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Cell Developmntl & Integrative Biology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2012	PhD	23 (6)# na	8 (6)# 0	4 (2) 0/0/x	0 (0) 0/0/x	3 (2) 0/0/x	1 (0) 0/0/x	1- short term postdoc appointment after UAB PhD award, prior to fulltime postdoc at Yale
Cell Developmntl & Integrative Biology	2012	MD	6 (0)# na	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2012	MD/PhD	0 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2013	PhD	19 (3)# 0	4 (2)# 0	3 (1) 0/0/x	1 (0) 0/0/x	1 (1) 0/0/x	1 (0) 0/0/x	1-short term postdoc appointment after UAB PhD award, prior to fulltime postdoc at Harvard
Cell Developmntl & Integrative Biology	2013	MD	3 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2013	MD/PhD	7 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Cell Developmntl & Integrative Biology	2014	PhD	4(3)# 0	4(3) 0	4(3) 0/0/x	3(2) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-left for a position in another state
Cell Developmntl & Integrative Biology	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Cell Developmntl & Integrative Biology	2014	MD/PhD	0 (0# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2010	PhD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0 (0) 0/0/x	1(1) 1/0/x	0 (0) 0/0/x	
Dermatology	2010	MD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0 (0) 0/0/x	1(1) 1/0/x	0 (0) 0/0/x	
Dermatology	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2011	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	1 (1) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	
Dermatology	2011	MD	1(1)# 0	1(1)# 0	1(1) 0/0/x	0 (0) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	
Dermatology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2012	PhD	3(0)# 0	3(0)# 0	3(0) 0/0/x	1(0) 0/0/x	1(0) 0/0/x	1(0) 0/0/x	1-personal
Dermatology	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2012	MD/PhD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0 (0) 0/0/x	1(1) 1/0/x	0 (0) 0/0/x	
Dermatology	2013	PhD	2(1)# 0	2(1)# 0	2(1) 0/0/x	2(1) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	
Dermatology	2013	MD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0 (0) 0/0/x	1(1) 1/0/x	0 (0) 0/0/x	
Dermatology	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0(0) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Dermatology	2014	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2014	MD	0 (0)# 0	0 (0)# 0	0(0) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Dermatology	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0(0) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2010	PhD	1 (1)# 0	1 (1)# 0	1(1) 0/0/x	0(0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Epidemiology	2010	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2011	PhD	1 (0)# 0	1 (0)# 0	1(0) 0/0/x	0(0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2012	PhD	2(1)[#] 1	2(2)# 0	2(2) 1/0/x	1(1) 0/0/x	1 (1) 1/0/x	0 (0) 0/0/x	
Epidemiology	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2013	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2013	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Epidemiology	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2014	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Epidemiology	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2010	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2010	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2011	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2012	PhD	1(0)# 0	1(0)# 0	1(0) 0/0/x	0(0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Genetics	2013	PhD	1(0)# 0	1(0)# 0	1(0) 0/0/x	0(0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2013	MD	0(0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2014	PhD	5(1)# 0	5(1)# 0	5(1) 0/0/x	4(1) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1-Research Associate
Genetics	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Genetics	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2010	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2010	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2011	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2012	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med - Endocrinology	2012	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2013	PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2013	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2013	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2014	PhD	2 (1)# 0	2 (1)# 0	2 (1) 0/0/x	2 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Endocrinology	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med- Hematology/Oncology	2010	PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med- Hematology/Oncology	2010	MD	284 (na) na	4 (2) 0	4 (2) 0/0/x	0 (0) 0/0/x	4 (2) 0/0/x	0 (0) 0/0/x	
Med- Hematology/Oncology	2010	MD/PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med- Hematology/Oncology	2011	PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med-Hematology/Oncology	2011	MD	289 (na) na	3 (2) 0	3 (2) 1/0/x	0 (0) 0/0/x	3 (2) 1/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2011	MD/PhD	1 (0) 0	1 (0) 0	1 (0) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0x	
Med-Hematology/Oncology	2012	PhD	1 (1)# na	1 (1)# na	1 (1) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2012	MD	318 (na) 0	4 (0) 0	4 (0) 0/0/x	4 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2012	MD/PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2013	PhD	3 (0)# 0	3 (0)# 0	3 (2) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	3 (2) 1/0/x	1-lack of funding 1-resigned 1-end Trainee Award
Med-Hematology/Oncology	2013	MD	253 (na) 0	5 (2) 0	5 (2) 0/0/x	5 (2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2013	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2014	PhD	4 (2)# 0	1 (0)# 0	1 (0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Hematology/Oncology	2014	MD	288(171) 0	4(2) 0	4 (2) 0/0/x	4 (2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med-Hematology/Oncology	2014	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology: Fellows Program	2010	PhD	0 (0) 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2010	MD	101 (60) 13	2 (2) 0	2 (2) 1/0/x	0 (0) 0/0/x	2 (2) 1/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2010	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	MD	96 (56) na	1 (1) 0	1 (1) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	MD/PhD	1 (1)# 0	1 (1) 0	1 (1) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2012	PhD	0 (0)# 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2012	MD	93 (52) na	2 (2) 0	2 (2) 1/0/x	0 (0) 0/0/x	2 (2) 1/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Med – Immunology/Rheumatology	2012	DO	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2013	MD	65 (47) na	2 (2) 1	2 (2) 1/0/x	2 (2) 1/0/x	0 (0) 0/0/0	0 (0) 0/0/0	
Med – Immunology/Rheumatology	2013	PhD	0 (0) 0	0 (0) 0	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2013	MD/PhD	7 (7) na	0 (0) 0	0 (0) 0	0 (0) 0	0 (0) 0	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2014	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/0	0 (0) 0/0/0	
Med – Immunology/Rheumatology	2014	MD	69(43) (6)	1(0) 0	1(0) 0/0/x	1(0) 0/0/x	0 (0) 0/0/0	0 (0) 0/0/0	
Med – Immunology/Rheumatology	2014	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/0	0 (0) 0/0/0	
Med – Immunology/Rheumatology	2014	DO	3(3) 0	1(1) 0	1(1) 0/0/X	1 (1) 0/0/x	0 (0) 0/0/0	0 (0) 0/0/0	
Med – Immunology/Rheumatology (**Basic/Translational**)	2010	PhD	1 (1)# 0	1 (1)# 0	1 (1) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	

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Med – Immunology/Rheumatology	2010	MD	8 (0)# na	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2010	MD/PhD	3 (1)# na	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	PhD	29 (2)# 1	4 (2)# 1	4 (2) 1/0/x	1 (0) 0/0/x	3 (2) 1/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2012	PhD	5 (1)# 0	3 (1)# 0	3 (1) 0/0/x	2 (1) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1-Asst. Prof at UAB
Med – Immunology/Rheumatology	2012	MD	1 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2013	PhD	14 (0)# 0	1 (0)# 0	1 (0) 0/0/x	1 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2013	MD	1 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med – Immunology/Rheumatology	2013	MD/PhD	6 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2014	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2014	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Immunology/Rheumatology	2014	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2010	MD	61 (40) 3	17 (16) 3	4 (4) 1/0/x	0 (0) 0/0/x	4 (4) 1/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2010	MD/PhD	2 (0) 0	1 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2010	DO	3 (3) 0	1 (1) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2011	MD	88 (43) 7	19 (15) 1	4 (2) 2/0/x	3 (1) 1/0/x	1 (1) 1/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2011	MD/PHD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2011	DO	2 (2) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2012	MD	66 (24) 7	17 (6) 1	3 (1) 1/0/x	3 (1) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2012	MD/PHD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med-Infectious Disease	2012	DO	4 (4) 1	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2013	MD	47 (25) 5	20 (13) 2	3 (1) 1/0/x	3 (1) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2013	MD/PhD	2 (2) 0	1 (1) 0	1 (1) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2013	DO	3 (3) 0	1 (1) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2014	PhD	8 (0)# 0	3 (2)# 0	3 (2) 0/0/x	2 (1) 0/0/x	0 (0) 0/0/x	1 (1) 0/0/x	1-resigned
Med-Infectious Disease	2014	MD	53(26) 4	14 (10) 0	5 (4) 1/0/x	5 (4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Infectious Disease	2014	MD/PhD	2 (2) 1	1 (1) 0	1 (1) 0/0/x	1 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med - Nephrology	2010	PhD	2(0) 0	2(0) 0	2(0) 0/0/x	1(0) 0/0/x	1(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2010	MD	258 (na) na	7(3) 0	7 (3) 0/0/x	6(3) 0/0/x	0(0) 0/0/x	1(0) 0/0/x	1-Trainee left for medical reasons
Med - Nephrology	2010	MD/PhD	1 (0) 0	1 (0) 0	1 (0) 0/0/x	1(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2011	PhD	0(0) 0	0(0) 0	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2011	MD	250 (na) na	6 (1) 0	6 (1) 0/0/x	6(1) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2011	MD/PhD	0 (0) 0	0(0) 0	0 (0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	

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Med - Nephrology	2012	PhD	2(0) 0	2(0) 0	2(0) 0/0/x	2(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2012	MD	241 (na) na	6 (2) 0	6 (2) 0/0/x	6(2) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2012	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2013	PhD	3 (2)# 0	3 (2) 0	3 (2) 0/0/x	3(2) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2013	MD	154(56) 0	6(4) 0	6(4) 1/0/x	6(4) 1/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2013	MD/PhD	0(0) 0	0(0) 0	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2014	PhD	9(5)# 0	9(5)# 0	9(5) 0/0/x	9(5) 0/0/x	0(0) 0/0/x	0(0) 0/0/x	
Med - Nephrology	2014	MD	82(41) 0	5(3) 0	5(3) 0/0/0	5(3) 0/0/0	0(0) 0/0/0	0(0) 0/0/0	
Med - Nephrology	2014	MD/PhD	0(0) 0	0(0) 0	0(0) 0/0/0	0(0) 0/0/0	0(0) 0/0/0	0(0) 0/0/0	
Med – Preventive Medicine	2010	PhD	2(1)# 1	2(1)# 1	2(1) 1/0/x	0(0) 0/0/0	2(1) 1/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2010	MD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0(0) 0/0/0	1(1) 1/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2010	MD/PhD	1(1)# 0	1(1)# 1	1(1) 1/0/x	0(0) 0/0/0	1(1) 1/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2011	PhD	3(3)# 2	3(3)# 2	3(3) 2/0/x	0 (0) 0/0/x	2 (2) 1/0/x	1 (1) 1/0/x	1 - unknown
Med – Preventive Medicine	2011	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med – Preventive Medicine	2011	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2012	PhD	1(1)# na	1(1)# na	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2012	MD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2012	MD/PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2013	PhD	2(2)# 0	2(2)# 0	2(2) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2013	MD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2013	MD/PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2014	PhD	3(3)# na	3(3)# na	3 (3) 0/0/x	3 (3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2014	MD	0(0)# na	0(0)# na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med – Preventive Medicine	2014	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2010	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2010	MD	200 (116) 54	6 (6) 1	6 (6) 1/0/x	0 (0) 0/0/x	6 (6) 1/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2010	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med-Pulmonary/ Allergy/Critical Care	2011	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2011	MD	195 (92) 17	4 (4) 0	4 (4) 0/0/x	0 (0) 0/0/x	4 (4) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2011	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2012	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2012	MD	204 (91) 6	4 (3) 0	4 (3) 0/0/x	0 (0) 0/0/x	4 (3) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2012	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2013	PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2013	MD	203 (89) 5	6 (4) 1	6 (4) 1/0/x	6 (4) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2013	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2014	PhD	2(1)[#] 0	2 (1)[#] 0	2 (1) 0/0/x	2 (1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Med-Pulmonary/ Allergy/Critical Care	2014	MD	29(12) na	5(1) 0	5(1) 0/0/x	5(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2014	MD/PhD	0 (0) 0	0 (0) 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Med-Pulmonary/ Allergy/Critical Care	2014	DO	1(1) 0	1(1) 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2010	PhD	15 (0)# na	5 (2)# 0	5 (2) 0/0/x	1 (0) 0/0/x	4 (2) 0/0/x	0 (0) 0/0/x	
Microbiology	2010	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2010	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2011	PhD	16 (2)# na	8 (2)# na	8 (2) 0/0/x	1 (0) 0/0/x	5 (2) 0/0/x	2 (0) 0/0/x	1-Started residency at the Univ of Tennessee; 1-returning to home country
Microbiology	2011	MD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2011	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2012	PhD	73 (6)# na	11 (3)# 0	11 (3) 0/0/x	5 (2) 0/0/x	6 (1) 0/0/x	0 (0) 0/0/x	
Microbiology	2012	MD	4 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2012	MD/PhD	0 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2013	PhD	67 (7)# na	12 (5)# 0	12 (5) 0/0/x	12 (5) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Microbiology	2013	MD	3 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2013	MD/PhD	5 (0)# 0	0 (0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2014	PhD	7(2)# 0	7(2)# 0	7 (2) 0/0/x	7 (2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2014	MD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Microbiology	2014	MD/PhD	na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2010	PhD	4(3)# na	4(3)# na	4(3) 0/0/x	2(1) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	
Neurology	2010	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2010	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2011	PhD	85(7)# na	4(3)# na	4(2) 0/0/x	1 (1) 0/0/x	3(1) 0/0/x	0 (0) 0/0/x	
Neurology	2011	MD	0 (0)# na	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2011	MD/PhD	0 (0)# na	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2012	PhD	40(4)# 0	1(1)# 0	1(1) 0/0/x	0 (0) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	
Neurology	2012	MD	0(0)# 0	0(0)# 0	0(0) 0/0/x	0(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2012	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Neurology	2013	PhD	3(3)# 0	3(3)# 0	3(3) 0/0/x	3(3) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2013	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2013	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2014	PhD	2(2)# 0	2(2)# 0	2(2) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2014	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Neurology	2014	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2010	PhD	2(1)# 0	2(1)# 0	2(1) 0/0/x	2(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2010	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2010	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2011	PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2011	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2011	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Oral & Maxillofacial Surgery	2012	PhD	3(2)# 1	3(2) 1	3(2) 1/0/x	2(2) 1/0/x	1(0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2012	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2012	DDS	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2013	PhD	1(1)# 1	1(1)# 1	1(1) 1/0/x	1(1) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2013	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2013	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2014	PhD	1(0)# 0	1(0)# 0	1(0) 0/0/x	1(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2014	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Oral & Maxillofacial Surgery	2014	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2010	PhD	47 (3)# na	4 (1)# 0	4 (1) 0/0/x	0 (0) 0/0/x	3 (1) 0/0/x	1 (0) 0/0/x	1- short-term postdocs for recent UAB PhD recipients prior to fulltime postdocs elsewhere

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Pathology	2010	MD	3 (0)# na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2010	MD/PhD	6 (0)# na	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2011	PhD	49 (7)# 3	5 (3)# 2	5 (3) 2/0/x	0 (0) 0/0/x	5 (3) 2/0/x	0 (0) 0/0/x	
Pathology	2011	MD	4 (0)# 0	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2011	MD/PhD	1 (0)# 0	na	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2012	PhD	78 (4)# na	7 (1)# 0	7 (1) 0/0/x	4 (1) 0/0/x	2 (0) 0/0/x	1 (0) 0/0/x	1-visa expired
Pathology	2012	MD	17 (0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2012	MD/PhD	4 (0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2013	PhD	75 (5)# 2	5 (3)# 2	5 (3) 2/0/x	4 (3) 2/0/x	1 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2013	MD	5 (1)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2013	MD/PhD	17 (0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2013	DVM	3 (0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pathology	2014	PhD	10(3)# 0	10(3)# 0	10(3) 0/0/x	9(3) 0/0/x	0 (0) 0/0/x	1 (0) 0/0/x	1-resigned
Pathology	2014	MD	0(0) 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Pathology	2014	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2010	PhD	1(1)# 1	1(1)# 1	1(1) 1/0/x	0 (0) 0/0/x	1(1) 1/0/x	0 (0) 0/0/x	
Pediatrics	2010	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2010	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2011	PhD	1(0)# 0	1(0)# 0	1(0) 0/0/x	0 (0) 0/0/x	1(0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2011	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2011	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2012	PhD	1(1)# 1	1(1)# 1	1(1) 1/0/x	1(1) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2012	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2012	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2013	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2013	MD	1(0)# 0	1(0)# 0	1(0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	1(0) 0/0/x	1-personal
Pediatrics	2013	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2014	PhD	3(3)# 1	3(3)# 1	3(3) 1/0/x	3(3) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Pediatrics	2014	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatrics	2014	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2010	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2010	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2010	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2011	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2011	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2011	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2012	PhD	1(1)# 1	1(1) # 1	1 (1) 1/0/x	1 (1) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2012	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2012	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2013	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2013	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2013	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Pediatric Dentistry	2014	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2014	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Pediatric Dentistry	2014	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2010	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2010	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2010	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2011	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2011	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2011	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2012	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2012	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2012	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2013	PhD	2(2)# 0	2(2)# 0	2(2) 0/0/x	2(2) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2013	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

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Physical Medicine & Rehab	2013	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2013	DVM	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2014	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2014	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Physical Medicine & Rehab	2014	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2010	PhD	2(1)# 0	2(1)# 0	2(1) 0/0/x	0 (0) 0/0/x	2(1) 0/0/x	0 (0) 0/0/x	
Psychology	2010	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2010	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2011	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2011	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2011	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2012	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2012	MD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2012	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Psychology	2013	PhD	1(1)# 0	1(1)# 0	1(1) 0/0/x	0 (0) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	
Psychology	2013	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2013	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2014	PhD	5(2)# 1	5(2) 1	5(2) 1/0/x	5(2) 1/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2014	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Psychology	2014	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2010	PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2010	MD	1(1)# 0	1(1)# 0	1(1) 0/0/x	0 (0) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	
Surgery	2010	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2011	PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2011	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2011	MD/PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2012	PhD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2012	MD	0(0)# 0	0(0)# 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	

Department / Program	Entering Year	Previous Degree Type*	Applicants Applied** (TGE) A	Applicants Accepted (TGE) A	Applicants Entered Program*** (TGE) A/B/C	Trainees Still in Program (TGE) A/B/C	Trainees Completed Program (TGE) A/B/C	Trainees Left Program (TGE) A/B/C	Reason for Leaving Program (if training was not completed)
Surgery	2012	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2013	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2013	MD	1(1)# 0	1(1) 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2013	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2014	PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2014	MD	1(1)# 0	1(1) 0	1(1) 0/0/x	1(1) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Surgery	2014	MD/PhD	0(0)# 0	0(0) # 0	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	0 (0) 0/0/x	
Total All Programs	2010		1077(217)# 76	85(55)# 11	69(42) 12/0/x	12(5) 1/0/x	52(35) 11/0/x	5(2) 0/0/x	
	2011		1200(229)# 32	58(30)# 9	58(30) 9/0/x	17(6) 2/0/x	38(23) 6/0/x	3(1) 1/0/x	
	2012		1177(210)# 20	70(29)# 8	70(29) 8/0/x	38(15) 4/0/x	27(13) 4/0/x	5(1) 0/0/x	
	2013		987(261)# 14	72(41)# 8	72(41) 8/0/x	61(35) 7/0/x	5(3) 1/0/x	6(3) 0/0/x	
	2014		876(498)# 13	87(44)# 3	87(44) 3/0/x	82(42) 3/0/x	0 (0) 0/0/x	5(2) 0/0/x	
Sums			5317(1415) 155	372(199) 39	356(186) 40/0/x	210(103) 17/0/x	122(74) 22/0/x	24(9) 1/0/x	
Averages			1063.4(283) 31	74.4(39.8) 7.8	71.2(37.2) 8/0/x	42(20.6) 3.4/0/x	24.4(14.8) 4.4/0/x	4.8(1.8) 0/0/x	

** Degree types – "Other" group inserted only for those programs that received applications from individuals in this category.*

*** Numbers of applicants – the majority of applicants communicate directly with potential faculty mentors and these applications are not centrally recorded, however the Office of Postdoctoral Education has instituted a central repository into which faculty are requested to provide copies of all postdoctoral applications received. Application entries received to 5.2015 of the most recent complete calendar year, are included above. Participation is currently voluntary; not all faculty are fully represented. Applications to relevant subspeciality fellowship programs are maintained individually by the programs and are included for the relevant programs above. Na, not available.*

Numbers in parentheses are Training Grant Eligible postdoctoral individuals based on US citizenship or permanent residency. Among training grant eligible individuals, A, individuals who are underrepresented minorities; B, individuals with disabilities; C, definition does not typically apply to trainees beyond undergraduate level and is indicated by an "x" here. Disability data is provided by UAB Human Resources RAVE program.

**** Applicants Entered and Outcomes provided by the Office of Postdoctoral Education or by the appropriate subspeciality fellowship program.*

[#] *Complete data unavailable, minimum estimate based on available data, including number of applicants who entered the program.*

Table 8A. Qualifications of Recent Predoctoral Applicants

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biochemistry Structural and Stem Cell Biology	1*	Xavier University	BS, 15	3.35	148, 154 (36%, 56%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	2*	Univ of Georgia	BS, 14	3.43	153, 150 (59%, 40%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	3*	Kennesaw State University	MS, 15	4	165, 159 (95%, 74%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	4*	Samford University	BS, 14	3.98	163, 165 (92%, 90%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	5*	Utah State University	BS, 15	3.95	DAT	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	6*	Spring Hill College	BS, 15	3.98	165, 161 (95%, 80%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	7*	Univ of Mississippi	BS, 14	3.96	169, 161 (99%, 80%)	Y	Y	Y	N
2015	Biochemistry Structural and Stem Cell Biology	8*	Towson University	MS, 15	3.95	153, 155 (59%, 60%)	Y	Y	N	N
2015	Biochemistry Structural and Stem Cell Biology	9*	New Jersey Institute of Tech	BS, 14	3.8	149, 154 (41%, 56%)	Y	Y	N	N
2015	Biochemistry Structural and Stem Cell Biology	10*	Auburn University	BS, 15	3.78	162, 167 (89%, 94%)	Y	Y	N	N
2015	Biochemistry Structural and Stem Cell Biology	11*	Auburn University	BS, 15	3.99	166, 165 (96%, 90%)	Y	Y	N	N
2015	Biochemistry Structural and Stem Cell Biology	12*	Saint Leo University	BA, 15	3.68	163, 164 (92%, 88%)	Y	Y	N	N
2015	Biochemistry Structural and Stem Cell Biology	13*	Troy University-Troy	BS, 15	3.83	156, 153 (71%, 52%)	Y	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biochemistry Structural and Stem Cell Biology	14*	Brigham Young University	BS, 98	3.85	155, 166 (67%, 92%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	15*	Michigan State University	BS, 14	3.53	156, 149 (71%, 37%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	16*	Washington and Jefferson Coll	BA, 14	3.4	159, 158 (81%, 71%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	17*	Clemson University	BS, 15	3.29	164, 165 (93%, 90%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	18	Univ of Hawaii at Manoa	MS, 15	3.71	152, 156 (54%, 64%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	19	Claflin University	BS, 15	3.92	141, 153 (13%, 52%)	Y	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	20*	Saginaw Valley State Univ	BS, 15	3.34	154, 150 (63%, 40%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	21*	Juniata College	BS, 12	3.16	154, 159 (63%, 74%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	22*	Virginia Tech	BS, 14	3.99	155, 165 (67%, 90%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	23*	Kennesaw State University	MS, 15	4	570, 630 (78%, 40%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	24*	Lenoir-Rhyne College	BS, 15	3.89	156, 151 (71%, 44%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	25*	Univ of Central Florida	MS, 15	3.6	156, 150 (63%, 40%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	26*	Winona State University	BS, 14	3.21	155, 159 (67%, 74%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	27*	Bowling Green State University	BS, 15	3.7	161, 163 (87%, 86%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	28*	CUNY Hunter College	BA, 15	3.89	165, 159 (95%, 74%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biochemistry Structural and Stem Cell Biology	29*	Vanderbilt University	BA, 14	3.47	157, 152 (74%, 48%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	30*	Washington State University	BS, 14	3.32	158, 160 (78%, 78%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	31*	Texas Tech University	MS, 14	3.96	165, 154 (95%, 56%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	32*	Florida State University	BS, 15	3.42	153, 151 (59%, 44%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	33*	Murray State University	BS, 09	3.2	410, 600 (37%, 48%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	34*	Bangalore University India	MS, 11	NA	149, 152 (41%, 48%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	35*	Arizona St Univ at Tempe	BS, 14	4	150, 158 (45%, 71%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	36*	Florida State University	BS, 14	3.63	160, 156 (84%, 64%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	37*	Univ of Cincinnati	BS, 15	3.48	150, 153 (45%, 52%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	38*	Univ of North Carolina St-Rlgh	BS, 14	2.53	152, 158 (54%, 71%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	39*	Univ of Pittsburgh - Johnstown	BS, 14	3.2	146, 153 (29%, 52%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	40*	College of Wooster	BA, 13	2.8	153, 152 (59%, 48%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	41*	Towson University	BS, 14	2.75	154, 155 (63%, 60%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	42*	Illinois College	BS, 13	3.44	152, 152 (54%, 48%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biochemistry Structural and Stem Cell Biology	43*	Mount Saint Mary's College	BS, 14	2.8	159, 148 (81%, 32%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	44*	Alabama A and M University	BS, 15	3.09	143, 136 (18%, 2%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	45*	Univ of Massachusetts Amherst	BS, 15	3.04	154, 150 (63%, 40%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	46*	Central Michigan University	BS, 15	2.45	142, 152 (16%, 48%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	47*	Northland College	BS, 15	3.65	165, 154 (98%, 58%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	48*	Jinan University	MS, 06	3.41	141, 156 (13%, 64%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	49*	Berry College	BS, 15	3.34	153, 154 (59%, 56%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	50	Univ of Utah	MS, 14	3.8	510, 620 (65%, 52%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	51	Dr DY Patil University + WES	MS, 13	3.46	153, 162 (59%, 83%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	52	Univ Bristol-UK	MS, 12	3.21	151, 149 (50%, 37%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	53	HeBei Normal University	MS, 15	3.65	143, 160 (18%, 81%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	54	R. G. Kar Medical College	MD, 14	3.6	152, 159 (54%, 74%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	55	East Tennessee State Univ	MS, 14	3.84	146, 159 (29%, 74%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	56	Indian Institute of Science	BS, 15	NA	156, 151 (70%, 45%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biochemistry Structural and Stem Cell Biology	57	Univ of Minnesota-Twin Cities	MS, 14	3.2	149, 159 (41%, 74%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	58	PANJAB UNIVERSITY	MS, 06	3.7	490, 680 (57%, 66%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	59	Univ Dhaka-Bangladesh	MS, 14	3.55	149, 154 (41%, 56%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	60	Panjab University	MS, 12	3.6	152, 155 (54%, 60%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	61	New York Medical College	MS, 13	3.67	550, 680 (75%, 66%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	62	Nanjing Agriculture Univ China	BS, 15	NA	152, 164 (54%, 88%)	N	N	N	N
2015	Biochemistry Structural and Stem Cell Biology	63	Univ of Science and Technology of China	BS, 12	3.23	148, 168 (36%, 95%)	N	N	N	N
2015	Cancer Biology	1*	Univ of Michigan-Flint	BS, 15	3.7	153, 148 (59%, 32%)	Y	Y	Y	N
2015	Cancer Biology	2*	Univ of Georgia	BS, 15	3.3	160, 154 (84%, 56%)	Y	Y	Y	N
2015	Cancer Biology	3*	Georgia Southern University	MS, 14	3.5	156, 152 (71%, 48%)	Y	Y	Y	N
2015	Cancer Biology	4	Wesleyan College	BA, 15	3.52	154, 156 (63%, 64%)	Y	Y	Y	N
2015	Cancer Biology	5	Mississippi Univ For Women	BS, 14	3.92	151, 159 (50%, 74%)	Y	Y	Y	N
2015	Cancer Biology	6	National Cancer Institute	MS, 15	NA	570, 155 (78%, 60%)	Y	Y	Y	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Cancer Biology	7	Xuzhou Medical College	MBBS, 15	3.31	152, 168 (54%, 95%)	Y	Y	Y	N
2015	Cancer Biology	8*	Samford University	BS, 15	3.81	150, 156 (45%, 64%)	Y	Y	N	N
2015	Cancer Biology	9*	Univ of California-San Diego	BS, 13	3.54	156, 159 (71%, 74%)	Y	Y	N	N
2015	Cancer Biology	10*	West Chester Univ of PA	BS, 15	3.38	158, 156 (78%, 64%)	Y	Y	N	N
2015	Cancer Biology	11*	King College	BS, 12	3.7	155, 148 (67%, 32%)	Y	N	N	N
2015	Cancer Biology	12*	Hillsdale College	BS, 14	3.52	163, 153 (92%, 52%)	Y	N	N	N
2015	Cancer Biology	13*	Mississippi State University	MS, 15	4	155, 160 (67%, 78%)	Y	N	N	N
2015	Cancer Biology	14*	Oakwood College	BA, 14	3.49	149, 151 (41%, 44%)	Y	N	N	N
2015	Cancer Biology	15	Natl Yang Ming Med Coll-China	BS, 14	3.79	152, 166 (54%, 92%)	Y	N	N	N
2015	Cancer Biology	16	Shanghai Jiao Tong Univ-China	MB, 15	3.66	151, 158 (49%, 72%)	Y	N	N	N
2015	Cancer Biology	17	St. Xavier's College, Kolkata	BS, 14	3.64	149, 159 (40%, 75%)	Y	N	N	N
2015	Cancer Biology	18	Georgetown University	MS, 14	3.86	153, 169 (57%, 98%)	Y	N	N	N
2015	Cancer Biology	19	Sun Yat-sen University	MD, 15	3.94	157, 169 (74%, 97%)	Y	N	N	N
2015	Cancer Biology	20	William Jewell College	BA, 15	3.95	159, 167 (81%, 94%)	Y	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Cancer Biology	21*	Univ of Texas at Arlington	BS, 12	3.86	153, 157 (59%, 68%)	N	N	N	N
2015	Cancer Biology	22*	Brigham Young University	BS, 14	3.34	157, 160 (74%, 78%)	N	N	N	N
2015	Cancer Biology	23*	Univ of Alabama at Birmingham	BS, 10	2.7	149, 153 (40%, 53%)	N	N	N	N
2015	Cancer Biology	24*	Roosevelt University	BS, 14	3	146, 153 (29%, 52%)	N	N	N	N
2015	Cancer Biology	25*	Saint Olaf College	BA, 14	2.93	155, 154 (67%, 56%)	N	N	N	N
2015	Cancer Biology	26*	Grand Valley State University	MS, 12	3.45	147, 153 (33%, 52%)	N	N	N	N
2015	Cancer Biology	27*	Univ of Wisconsin-Madison	BS, 12	3.15	157, 153 (74%, 52%)	N	N	N	N
2015	Cancer Biology	28*	Univ of Florida	BS, 15	3.02	152, 151 (54%, 48%)	N	N	N	N
2015	Cancer Biology	29*	Univ of Arkansas-Fort Smith	BS, 14	4	150, 147 (45%, 28%)	N	N	N	N
2015	Cancer Biology	30*	Purdue University	MS, 05	3.59	147, 148 (32%, 35%)	N	N	N	N
2015	Cancer Biology	31*	Univ of California-Merced	BS, 13	2.69	156, 151 (71%, 44%)	N	N	N	N
2015	Cancer Biology	32*	East Texas Baptist University	BS, 15	3.97	155, 156 (67%, 64%)	N	N	N	N
2015	Cancer Biology	33*	Penn State-Univ Park	BS, 14	3.26	157, 150 (74%, 40%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Cancer Biology	34*	Bangalore University India	MS, 11	NA	149, 152 (41%, 48%)	N	N	N	N
2015	Cancer Biology	35*	Alabama A and M University	MS, 15	4	169, 163 (99%, 86%)	N	N	N	N
2015	Cancer Biology	36*	Illinois State University	BS, 13	2.5	150, 144 (45%, 18%)	N	N	N	N
2015	Cancer Biology	37*	Purdue University	BS, 15	3.48	149, 158 (41%, 71%)	N	N	N	N
2015	Cancer Biology	38*	Mount Holyoke College	BA, 13	3.2	150, 155 (45%, 60%)	N	N	N	N
2015	Cancer Biology	39*	Alabama A&M University	BS, 14	2.89	145, 143 (25%, 15%)	N	N	N	N
2015	Cancer Biology	40*	Framingham State College	BS, 13	3.44	160, 152 (84%, 48%)	N	N	N	N
2015	Cancer Biology	41*	Agnes Scott College	BS, 15	3.3	144, 150 (22%, 40%)	N	N	N	N
2015	Cancer Biology	42*	Penn State-Univ Park	BS, 14	3.6	155, 150 (67%, 40%)	N	N	N	N
2015	Cancer Biology	43*	Simpson University	BS, 13	3.87	153, 150 (59%, 40%)	N	N	N	N
2015	Cancer Biology	44*	Mississippi College	BS, 15	3.25	155, 157 (67%, 68%)	N	N	N	N
2015	Cancer Biology	45*	Columbia Univ Schl Gen Studies	BS, 14	3.25	163, 156 (93%, 64%)	N	N	N	N
2015	Cancer Biology	46*	East Tennessee State Univ	MS, 15	3.95	153, 148 (57%, 35%)	N	N	N	N
2015	Cancer Biology	47*	Tougaloo College	BS, 15	3.5	NA	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Cancer Biology	48*	Florida State University	BS, 12	3.24	154, 157 (63%, 68%)	N	N	N	N
2015	Cancer Biology	49	Ain Shams Univ-Egypt	MD, 15	3.5	146, 153 (28%, 53%)	N	N	N	N
2015	Cancer Biology	50	Modern Sciences and Arts University	BS, 12	3.6	149, 155 (41%, 60%)	N	N	N	N
2015	Cancer Biology	51	Univ Calcutta-India	MS, 14	4	154, 158 (62%, 72%)	N	N	N	N
2015	Cancer Biology	52	Univ Istanbul-Turkey	BA, 11	2.34	152, 165 (54%, 90%)	N	N	N	N
2015	Cancer Biology	53	Jordan Univ. of science and technology	MD, 14	3.77	158, 150 (71%, 45%)	N	N	N	N
2015	Cancer Biology	54	Univ of Alabama at Birmingham	MS, 14	3.9	158, 155 (77%, 64%)	N	N	N	N
2015	Cancer Biology	55	Univ of Utah	MS, 14	3.8	510, 620 (65%, 52%)	N	N	N	N
2015	Cancer Biology	56	Visva Bharatil University-India	MS, 14	NA	145, 157 (25%, 68%)	N	N	N	N
2015	Cancer Biology	57	Grambling State University	BS, 10	3.78	155, 144 (67%, 18%)	N	N	N	N
2015	Cancer Biology	58	Hanoi Med Univ-Vietnam	MD, 15	NA	144, 157 (22%, 68%)	N	N	N	N
2015	Cancer Biology	59	Alabama A&M University	MS, 13	4	270, 580 (2%, 44%)	N	N	N	N
2015	Cancer Biology	60	University of Asia Pacific	BS, 11	3.95	154, 158 (63%, 71%)	N	N	N	N

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2015	Cancer Biology	61	Mississippi Valley State University	BS, 14	3.97	144, 148 (2%, 32%)	N	N	N	N
2015	Cancer Biology	62	Barry University	MS, 12	3.36	138, 147 (6%, 29%)	N	N	N	N
2015	Cancer Biology	63	Univ Wurzburg-Germany	MS, 13	NA	157, 155 (74%, 60%)	N	N	N	N
2015	Cancer Biology	64	SLS, Manipal University	MS, 15	3.5	150, 156 (45%, 64%)	N	N	N	N
2015	Cancer Biology	65	University of Central Lancashire	MS, 11	3.2	163, 155 (92%, 60%)	N	N	N	N
2015	Cancer Biology	66	Wuhan Univ-China	BS, 14	3.3	158, 151 (78%, 44%)	N	N	N	N
2015	Cancer Biology	67	Sies College	MS, 14	3.2	163, 157 (92%, 68%)	N	N	N	N
2015	Cancer Biology	68	Columbia University Graduate School	MA, 14	3.73	153, 166 (59%, 92%)	N	N	N	N
2015	Cancer Biology	69	Univ Mumbai-India	MS, 14	NA	150, 156 (45%, 65%)	N	N	N	N
2015	Cancer Biology	70	Shanghai Jiao Tong Univ-China	BS, 15	3.7	155, 168 (67%, 95%)	N	N	N	N
2015	Cancer Biology	71	Henan Universityn College of Medicine	MD, 06	3.52	155, 166 (67%, 92%)	N	N	N	N
2015	Cancer Biology	72	Nanjing Agriculture Univ China	MS, 12	3.7	149, 162 (41%, 83%)	N	N	N	N

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2015	Cancer Biology	73	Addis Ababa Univ-Ethiopa	BS, 07	3.71	na, na (%, %)	N	N	N	N
2015	Cancer Biology	74	Nanjing Coll of Pharm-China	MS, 15	2.57	155, 166 (65%, 94%)	N	N	N	N
2015	Cancer Biology	75	Univ of Massachusetts Lowell	MS, 15	3.81	149, 148 (40%, 35%)	N	N	N	N
2015	Cancer Biology	76	Pondicherry University	MS, 13	4	150, 150 (45%, 40%)	N	N	N	N
2015	Cancer Biology	77	Nirma University	MPhar, 13	NA	147, 153 (32%, 53%)	N	N	N	N
2015	Cancer Biology	78	Southeast University	MS, 13	3.5	143, 167 (18%, 94%)	N	N	N	N
2015	Cancer Biology	79	Univ Calcutta-India	MS, 13	4.37	152, 152 (54%, 48%)	N	N	N	N
2015	Cancer Biology	80	ARIBAS, Sardar Patel University	MS, 15	NA	160, 164 (84%, 88%)	N	N	N	N
2015	Cancer Biology	81	Univ of Alabama at Birmingham	MBA, 15	3.85	149, 156 (40%, 65%)	N	N	N	N
2015	Cancer Biology	82	IBAB (Mysore University)	MS, 15	3	153, 155 (59%, 60%)	N	N	N	N
2015	Cancer Biology	83	Srm Enginerring Coll India	BS, 15	NA	147, 160 (33%, 78%)	N	N	N	N
2015	Cancer Biology	84	Univ Otago-New Zealand	MS, 14	NA	580, 570 (82%, 40%)	N	N	N	N
2015	Cancer Biology	85	SRM University	MS, 14	NA	154, 156 (63%, 64%)	N	N	N	N
2015	Cancer Biology	86	Univ of South Florida	MA, 13	3.18	410, 720 (33%, 64%)	N	N	N	N

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2015	Cancer Biology	87	Sun Yat-sen University	BS, 14	3.8	149, 167 (41%, 94%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	1*	Univ of Central Florida	BS, 14	3.3	152, 152 (54%, 48%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	2*	Northern Kentucky University	BS, 15	3.6	152, 158 (54%, 71%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	3*	Auburn University	BS, 08	2.87	157, 149 (74%, 37%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	4*	Towson University	BS, 14	3.71	161, 154 (87%, 56%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	5*	Indiana Univ of Pennsylvania	MS, 15	3.65	160, 153 (84%, 52%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	6*	San Diego State University	BS, 14	3.72	158, 158 (78%, 71%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	7*	Florida Atlantic University	MS, 15	4	156, 151 (71%, 44%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	8*	Shepherd University	BS, 14	3.73	159, 165 (81%, 90%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	9*	Southern Adventist University	BA, 15	3.88	162, 163 (89%, 86%)	Y	Y	Y	N
2015	Cell Molecular & Developmental Biology (CMDB)	10*	Univ of Washington	BS, 15	3.59	166, 160 (96%, 78%)	Y	Y	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	11*	Cal St Polytech Univ-Pomona	MS, 15	3.93	158, 161 (78%, 80%)	Y	Y	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	12*	Quinnipiac University	BS, 15	4	155, 157 (67%, 68%)	Y	Y	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	13*	Univ of Central Florida	MS, 15	3.68	161, 161 (87%, 80%)	Y	Y	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	14*	Washington and Jefferson Coll	BA, 14	3.4	159, 158 (81%, 71%)	Y	Y	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	15*	James Madison University	BS, 12	2.95	160, 158 (86%, 79%)	Y	Y	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	16*	Univ of Illinois-Urbana	BS, 15	3.65	162, 156 (89%, 64%)	Y	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	17*	University of Louisiana at Lafayette	BS, 14	3.4	151, 152 (54%, 44%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	18*	Univ of Alabama at Birmingham	BS, 15	3.01	152, 146 (54%, 25%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	19*	Fisk University	MA, 15	4	152, 152 (54%, 48%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	20*	Univ of North Carolina-P'broke	BS, 15	3.43	156, 154 (71%, 56%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	21*	Virginia Tech	BS, 12	3.61	162, 159 (89%, 74%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	22*	Mercer University-Macon	BS, 15	3.76	164, 154 (93%, 53%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	23*	Grand Valley State University	BS, 13	3.54	154, 159 (63%, 74%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	24*	Miami University	BS, 15	3	149, 156 (41%, 64%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	25*	Missouri State University	BS, 15	3.72	161, 164 (87%, 88%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	26*	Ball State University	BS, 15	3.88	160, 165 (84%, 90%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	27*	Oakwood College	BS, 14	3.63	153, 152 (59%, 49%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	28*	Univ of South Carolina-Aiken	BS, 15	2.65	157, 154 (74%, 56%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	29*	Western Michigan University	BS, 15	3.6	144, 151 (25%, 44%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	30*	Purdue University	MS, 05	3.59	147, 148 (32%, 35%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	31*	Appalachian State University	BS, 14	3.64	157, 150 (74%, 40%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	32*	Hope College	BS, 13	3.12	154, 154 (63%, 56%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	33*	Southeast Missouri State Univ	BS, 15	3.73	148, 151 (36%, 44%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	34*	Stony Brook University-Suny	MS, 12	3.54	145, 162 (25%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	35*	Bangalore University India	MS, 11	NA	149, 152 (41%, 48%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	36*	Univ of Cincinnati	BS, 15	3.48	150, 153 (45%, 52%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	37*	Ursinus College	BS, 15	3.26	158, 150 (78%, 40%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	38*	Alabama State University	BS, 13	3.5	149, 148 (41%, 32%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	39*	Anderson University	MBA, 15	4	156, 153 (71%, 52%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	40*	Univ of Vermont	BS, 13	3.14	139, 150 (8%, 40%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	41*	North Greenville University	BS, 14	3.78	159, 157 (81%, 68%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	42*	Stetson University	BS, 15	3.34	152, 148 (54%, 32%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	43*	Eastern Kentucky University	BS, 15	3.83	153, 151 (59%, 44%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	44*	Georgia Southern University	BS, 13	3.28	143, 148 (18%, 32%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	45*	Univ of Central Florida	MS, 14	3.6	149, 149 (41%, 37%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	46*	Williams College	BA, 13	2.64	166, 162 (96%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	47*	Scripps College	BA, 15	3.61	157, 158 (74%, 71%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	48*	The University of Tampa	BS, 15	3.57	153, 153 (59%, 52%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	49*	Cedarville University	BS, 13	2.9	162, 161 (89%, 80%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	50*	Jinan University	MS, 06	3.41	141, 156 (13%, 64%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	51*	Arizona State Univeristy	BS, 14	4	155, 154 (67%, 56%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	52*	Univ of Nevada-Las Vegas	BS, 08	2.9	155, 144 (67%, 18%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	53*	Birmingham-Southern College	BS, 14	3.29	151, 155 (50%, 60%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	54*	Jackson State University	BS, 15	3.53	147, 152 (33%, 48%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	55*	Philadelphia College of Osteopathic Medi	MS, 14	2.8	154, 148 (63%, 32%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	56	Ainshams Uuniversty,Faculty of Medicine	MS, 14	NA	141, 144 (10%, 21%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	57	College of Dentistry/ Baghdad University	MS, 12	NA	na, na (%, %)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	58	ARIBAS	MS, 15	NA	144, 158 (22%, 71%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	59	Univ Calcutta-India	MS, 12	3.3	148, 149 (36%, 37%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	60	Sun Yat-Sen University(Zhongshan Univ)	BS, 15	3.7	152, 163 (54%, 86%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	61	Alabama A&M University	MS, 13	4	270, 580 (2%, 44%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	62	Univ of Wisconsin-Madison	BS, 13	2.59	146, 155 (29%, 60%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	63	Dr DY Patil University + WES	MS, 13	3.46	153, 162 (59%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	64	Tsinghua Univ-China	BS, 15	3.81	155, 168 (67%, 95%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	65	Alexandria Univ Sch Med-Egypt	MBChB, 14	NA	149, 157 (41%, 68%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	66	Peking Union Med Coll-China	MS, 14	3.35	156, 162 (71%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	67	VTU	BE, 14	3.8	146, 141 (29%, 10%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	68	King's College, London	BS, 14	3.34	na, na (%, %)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	69	Univ of Alabama in Huntsville	MS, 15	3.92	600, 800 (86%, 94%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	70	University of Colombo, Sri Lanka	MS, 09	4	147, 151 (33%, 44%)	N	N	N	N

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2015	Cell Molecular & Developmental Biology (CMDB)	71	Srm Enginerring Coll India	BS, 15	NA	152, 162 (54%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	72	Univ of Florida	MS, 15	3	540, 620 (73%, 52%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	73	Northwest A&F University	BS, 14	3.28	148, 167 (36%, 94%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	74	Shandong Agricultural University	BS, 15	3.23	149, 165 (41%, 90%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	75	Lahore University of Management Sciences	BS, 14	3.18	154, 162 (63%, 83%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	76	China Medical University	MM, 15	2.1	140, 170 (10%, 98%)	N	N	N	N
2015	Cell Molecular & Developmental Biology (CMDB)	77	Chinese Academy of Sciences	MS, 15	3.1	137, 165 (5%, 90%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	1*	Univ of Alabama in Huntsville	BS, 14	3.57	157, 155 (74%, 61%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	2*	Indiana University Southeast	BS, 15	3.28	158, 148 (78%, 32%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	3*	Univ of Georgia	BS, 13	3.68	155, 148 (67%, 32%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	4*	Furman University	BS, 14	3.42	160, 151 (84%, 44%)	Y	Y	Y	N

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2015	Genetics Genomics and Bioinformatics	5*	Florida State University	BS, 14	3.6	163, 160 (91%, 78%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	6*	Univ of Alabama at Birmingham	MS, 15	3.7	155, 152 (65%, 52%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	7*	Louisiana St-AandM-Baton Rouge	BS, 13	3.7	160, 153 (84%, 52%)	Y	Y	Y	N
2015	Genetics Genomics and Bioinformatics	8*	Univ of Wisconsin-La Crosse	BA, 15	3.2	154, 155 (63%, 60%)	Y	Y	N	N
2015	Genetics Genomics and Bioinformatics	9*	Oakland University	BS, 14	3.52	154, 153 (63%, 52%)	Y	Y	N	N
2015	Genetics Genomics and Bioinformatics	10*	Chestnut Hill College	BS, 13	3.52	159, 151 (81%, 44%)	Y	Y	N	N
2015	Genetics Genomics and Bioinformatics	11*	Smith College	MS, 15	3.18	163, 153 (92%, 52%)	Y	Y	N	N
2015	Genetics Genomics and Bioinformatics	12*	Middle Tennessee State Univ	BS, 15	3.8	159, 154 (81%, 56%)	Y	Y	N	N
2015	Genetics Genomics and Bioinformatics	13*	Samford University	BS, 15	3.63	155, 158 (67%, 71%)	Y	N	N	N
2015	Genetics Genomics and Bioinformatics	14*	Middle Tennessee State Univ	BS, 14	3.78	157, 154 (74%, 56%)	Y	N	N	N
2015	Genetics Genomics and Bioinformatics	15*	Univ of Missouri-Columbia	BS, 15	3.44	151, 153 (50%, 52%)	Y	N	N	N
2015	Genetics Genomics and Bioinformatics	16*	Rutgers, The State University of NJ	BS, 14	3.62	155, 153 (67%, 52%)	Y	N	N	N
2015	Genetics Genomics and Bioinformatics	17*	University of North Georgia	MS, 15	3.72	158, 161 (78%, 80%)	Y	N	N	N

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2015	Genetics Genomics and Bioinformatics	18*	Univ of Texas at Arlington	BS, 12	3.86	153, 157 (59%, 68%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	19*	Brigham Young University	BS, 14	3.34	157, 160 (74%, 78%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	20*	Augsburg College	BS, 14	3.25	154, 153 (63%, 53%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	21*	Elon University	BS, 15	3.68	162, 162 (89%, 83%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	22*	Bowling Green State University	BS, 14	3.7	161, 163 (87%, 86%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	23*	Univ of New Hampshire	BS, 15	3	155, 153 (67%, 52%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	24*	Univ of Connecticut	BS, 11	3.49	147, 148 (33%, 32%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	25*	Univ of Wisconsin-Oshkosh	BS, 14	3.44	164, 162 (93%, 83%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	26*	Lipscomb University	MS, 15	NA	150, 155 (45%, 60%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	27*	Ohio Northern University	BS, 15	3.3	152, 155 (54%, 60%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	28*	Bangalore University India	MS, 11	NA	149, 152 (41%, 48%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	29*	Univ of Cincinnati	BS, 15	3.48	157, 149 (74%, 37%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	30*	Lamar University-Beaumont	MS, 15	4	163, 159 (92%, 74%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	31*	Roanoke College	BS, 15	3.5	149, 150 (59%, 40%)	N	N	N	N

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2015	Genetics Genomics and Bioinformatics	32*	Univ of Connecticut	BS, 14	3.2	162, 157 (89%, 68%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	33*	College St Benedict-St Johns	BA, 12	3.21	154, 161 (63%, 80%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	34*	California St Univ-Sacramento	BS, 15	3.41	164, 158 (93%, 71%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	35*	Western Connecticut State Univ	BA, 14	3	159, 148 (81%, 32%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	36*	Samford University	BA, 15	3.46	157, 152 (74%, 48%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	37*	Stetson University	BS, 15	3.34	152, 148 (54%, 32%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	38*	Mississippi State University	BS, 15	3.54	151, 153 (50%, 52%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	39*	PES Institute of Technology	BE, 15	NA	157, 167 (74%, 94%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	40*	Univ of Massachusetts Amherst	BS, 15	3.04	154, 150 (63%, 40%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	41*	Univ of Michigan	MPH, 15	3.45	146, 159 (29%, 74%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	42*	Texas A and M Univ-Main	BS, 15	2.5	162, 156 (89%, 64%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	43*	University or Alabama at Birmingham	MS, 14	3.84	153, 146 (57%, 27%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	44*	Ashford University	BA, 12	3.94	162, 155 (89%, 60%)	N	N	N	N

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2015	Genetics Genomics and Bioinformatics	45*	Purdue University	BS, 14	3.34	162, 163 (89%, 86%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	46*	Mississippi College	MS, 15	4	154, 146 (63%, 25%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	47*	University of Alabama	MA, 00	4	na, na (%, %)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	48*	Univ of Kansas	BS, 14	3.53	155, 156 (67%, 64%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	49	King Saud University	MS, 09	3.5	130, 138 (1%, 4%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	50	Kean University	MS, 15	3.68	149, 151 (41%, 44%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	51	Mersin University	MS, 12	3.84	153, 167 (59%, 94%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	52	Kasturi Medical College	MBBS, 14	3.5	143, 154 (18%, 56%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	53	Lebanese American University	MS, 12	NA	141, 150 (13%, 40%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	54	Biology	MS, 15	3.42	144, 160 (22%, 78%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	55	Miami University	MS, 15	3.21	149, 154 (41%, 56%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	56	Osmania University India	PGD, 15	3.9	144, 139 (85%, 82%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	57	Vellore Inst Tech-India	BS, 13	NA	155, 158 (67%, 71%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	58	Amity University Rajasthan	BS, 14	NA	140, 145 (10%, 21%)	N	N	N	N

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2015	Genetics Genomics and Bioinformatics	59	Viswabharathi Institute of Sciences	MS, 14	3.8	146, 158 (6%, 61%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	60	University of Alabama at Birmingham	MS, 14	4	144, 152 (21%, 52%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	61	Alexandria Univ Sch Med-Egypt	MBBCH, 12	3.6	150, 152 (45%, 48%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	62	St Univ of NY Upstate Med Univ	MS, 15	3	150, 162 (45%, 83%)	N	N	N	N
2015	Genetics Genomics and Bioinformatics	63	Jinan Univeristy	BA, 15	2.16	138, 160 (7%, 78%)	N	N	N	N
2015	Immunology	1*	Univ of Notre Dame	BS, 13	3.28	168, 156 (98%, 64%)	Y	Y	Y	N
2015	Immunology	2*	North Carolina St University	BS, 11	3.2	151, 155 (50%, 60%)	Y	Y	Y	N
2015	Immunology	3*	Morgan State University	BS, 12	3	145, 150 (25%, 40%)	Y	Y	N	N
2015	Immunology	4*	Auburn University	BS, 15	3.97	159, 158 (81%, 71%)	Y	Y	N	N
2015	Immunology	5*	Howard University	BS, 13	3.26	152, 150 (59%, 40%)	Y	Y	N	N
2015	Immunology	6*	Towson University	MS, 15	3.6	150, 151 (45%, 44%)	Y	Y	N	N
2015	Immunology	7*	Univ of California-San Diego	BS, 13	3.45	161, 155 (87%, 60%)	Y	Y	N	N
2015	Immunology	8	Nankai Univ-China	BS, 14	3.79	160, 169 (84%, 97%)	Y	Y	N	N

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2015	Immunology	9*	Univ of Alabama at Birmingham	MS, 13	3.31	134, 145 (3%, 32%)	N	N	N	N
2015	Immunology	10*	Univ of California-Merced	BS, 15	3	147, 154 (33%, 56%)	N	N	N	N
2015	Immunology	11*	Univ of New Mexico	BS, 14	3.42	154, 152 (63%, 48%)	N	N	N	N
2015	Immunology	12*	Univ of Iowa	BS, 14	3.46	157, 157 (74%, 68%)	N	N	N	N
2015	Immunology	13*	University of Cincinnati	BS, 15	3.12	153, 154 (59%, 56%)	N	N	N	N
2015	Immunology	14*	Lee University	BS, 95	3.8	159, 151 (81%, 44%)	N	N	N	N
2015	Immunology	15*	Alabama State University	BS, 15	3.7	NA	N	N	N	N
2015	Immunology	16*	University of Utah	BS, 13	2.49	153, 145 (59%, 21%)	N	N	N	N
2015	Immunology	17*	Colorado State University	MS, 15	4	162, 161 (89%, 80%)	N	N	N	N
2015	Immunology	18*	Long Island Univ-Brooklyn	MS, 15	3.52	153, 158 (59%, 71%)	N	N	N	N
2015	Immunology	19*	Davidson College	BS, 14	3.3	156, 156 (71%, 64%)	N	N	N	N
2015	Immunology	20*	Central Washington University	BS, 15	3.2	167, 158 (97%, 74%)	N	N	N	N
2015	Immunology	21*	Central Michigan University	BS, 15	3.9	147, 153 (33%, 52%)	N	N	N	N
2015	Immunology	22*	Saint Louis University	BS, 15	2.59	155, 156 (67%, 64%)	N	N	N	N

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2015	Immunology	23*	Univ of Arkansas	BS, 15	3.8	155, 157 (67%, 68%)	N	N	N	N
2015	Immunology	24*	Western University of Health Sciences	MS, 14	3.8	157, 150 (74%, 40%)	N	N	N	N
2015	Immunology	25*	Pacific Lutheran University	BS, 10	2.91	155, 158 (67%, 71%)	N	N	N	N
2015	Immunology	26*	Xavier University	BS, 15	3	146, 144 (25%, 18%)	N	N	N	N
2015	Immunology	27*	Goshen College	BA, 10	3.01	160, 155 (84%, 60%)	N	N	N	N
2015	Immunology	28*	Colorado State University	MS, 15	NA	155, 155 (66%, 61%)	N	N	N	N
2015	Immunology	29*	Shorter College	BS, 13	3.88	156, 148 (70%, 33%)	N	N	N	N
2015	Immunology	30*	Augusta State University	BS, 15	2.94	NA	N	N	N	N
2015	Immunology	31*	Cuny-City College of New York	BS, 14	3.78	NA	N	N	N	N
2015	Immunology	32*	Rutgers, The State University of NJ	BS, 14	3.62	155, 153 (67%, 52%)	N	N	N	N
2015	Immunology	33*	Covenant College	BA, 14	3.6	157, 149 (73%, 37%)	N	N	N	N
2015	Immunology	34*	Univ of Puerto Rico- RioPiedra	BS, 14	3.38	151, 146 (50%, 25%)	N	N	N	N
2015	Immunology	35	Alabama A&M University	MS, 13	4	270, 580 (2%, 44%)	N	N	N	N

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2015	Immunology	36	Inha Univ-Korea South	BS, 13	3.67	155, 157 (67%, 68%)	N	N	N	N
2015	Immunology	37	Long Island University C.W post	MA, 14	3.26	151, 149 (50%, 37%)	N	N	N	N
2015	Immunology	38	Abasaheb Garware College	MS, 10	NA	149, 151 (41%, 44%)	N	N	N	N
2015	Immunology	39	University of Isfahan	BS, 15	3.59	152, 169 (54%, 97%)	N	N	N	N
2015	Immunology	40	Nottingham Univ-UK	MS, 14	2.65	NA	N	N	N	N
2015	Immunology	41	Sung Kyun Kwan University	MS, 16	4.5	155, 168 (67%, 95%)	N	N	N	N
2015	Immunology	42	Huazhong Agricultural University	MS, 15	3.32	155, 170 (67%, 98%)	N	N	N	N
2015	Immunology	43	University of Liverpool-UK	MS, 10	NA	157, 158 (74%, 71%)	N	N	N	N
2015	Immunology	44	S.I.E.S College, Sion West	MS, 14	3.9	149, 163 (41%, 86%)	N	N	N	N
2015	Immunology	45	Sharda University	BS, 15	NA	148, 156 (36%, 64%)	N	N	N	N
2015	Immunology	46	Nankai Univ-China	BS, 13	NA	154, 166 (62%, 93%)	N	N	N	N
2015	Immunology	47	Univ of Central Florida	MS, 07	3.83	590, 158 (82%, 71%)	N	N	N	N
2015	Immunology	48	Bangalore University India	MS, 06	NA	150, 156 (45%, 64%)	N	N	N	N

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2015	Immunology	49	Univ Science/Tech China	BS, 14	3.46	146, 170 (29%, 98%)	N	N	N	N
2015	Microbiology	1*	Jacksonville University	BS, 15	3.61	161, 151 (87%, 44%)	Y	Y	Y	N
2015	Microbiology	2*	Univ of Maine at Orono	BS, 14	3.85	164, 160 (93%, 78%)	Y	Y	Y	N
2015	Microbiology	3*	Auburn University	BS, 14	3.88	165, 162 (95%, 83%)	Y	Y	Y	N
2015	Microbiology	4*	Centre College	BS, 12	3.1	166, 165 (96%, 90%)	Y	Y	Y	N
2015	Microbiology	5*	Gannon University	BS, 13	3.63	162, 161 (89%, 80%)	Y	Y	Y	N
2015	Microbiology	6	Univ Edinburgh-UK	MS, 15	NA	157, 164 (73%, 89%)	Y	Y	Y	N
2015	Microbiology	7	Univ of Alabama at Birmingham	MS, 15	NA	156, 146 (71%, 25%)	Y	Y	Y	N
2015	Microbiology	8*	California St Univ-San Marcos	BS, 15	3.31	153, 144 (59%, 18%)	Y	Y	N	N
2015	Microbiology	9*	Rochester Inst of Technology	BS, 15	3.81	165, 158 (95%, 71%)	Y	Y	N	N
2015	Microbiology	10*	Kenyon College	BA, 11	3.43	640, 620 (92%, 52%)	Y	Y	N	N
2015	Microbiology	11*	Howard University	BS, 13	3.63	161, 155 (87%, 60%)	Y	Y	N	N
2015	Microbiology	12*	Austin College	BA, 15	3.81	161, 155 (87%, 60%)	Y	Y	N	N
2015	Microbiology	13*	Univ of Michigan	MS, 14	3.99	161, 164 (87%, 88%)	Y	Y	N	N

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2015	Microbiology	14*	Michigan State University	BS, 15	3.74	154, 162 (63%, 83%)	Y	Y	N	N
2015	Microbiology	15*	Arizona St Univ at Tempe	BS, 15	3.81	159, 163 (81%, 86%)	Y	Y	N	N
2015	Microbiology	16*	Mercer University-Macon	BS, 15	3.76	164, 154 (93%, 56%)	Y	N	N	N
2015	Microbiology	17*	Merrimack College	BS, 15	3.92	154, 151 (63%, 44%)	Y	N	N	N
2015	Microbiology	18*	Bridgewater College	BS, 15	3.66	158, 147 (78%, 28%)	Y	N	N	N
2015	Microbiology	19*	Univ of Alabama at Birmingham	MS, 15	3.75	143, 144 (18%, 18%)	Y	N	N	N
2015	Microbiology	20*	Univ of Notre Dame	BS, 13	3.28	168, 156 (98%, 64%)	Y	N	N	N
2015	Microbiology	21*	Univ of California-San Diego	BS, 14	3.39	160, 163 (84%, 86%)	Y	N	N	N
2015	Microbiology	22	Wuhan Univ-China	BS, 15	3.68	154, 169 (63%, 97%)	Y	N	N	N
2015	Microbiology	23	National Institute of Virology	MS, 14	NA	153, 150 (59%, 40%)	Y	N	N	N
2015	Microbiology	24	Liaoning University	BS, 14	3.3	152, 170 (54%, 98%)	Y	N	N	N
2015	Microbiology	25*	Beni Suef University Faculty of Medicine	MD, 12	3.69	140, 153 (10%, 52%)	N	N	N	N
2015	Microbiology	26*	Middle Tennessee State Univ	MS, 14	3.37	161, 152 (87%, 48%)	N	N	N	N

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2015	Microbiology	27*	Univ of Southern Mississippi	MS, 15	3.9	147, 146 (33%, 25%)	N	N	N	N
2015	Microbiology	28*	Middle Tennessee State Univ	BS, 14	3.6	160, 159 (84%, 74%)	N	N	N	N
2015	Microbiology	29*	Univ of Scranton	BS, 15	3.38	159, 152 (81%, 48%)	N	N	N	N
2015	Microbiology	30*	Furman University	BS, 15	3.47	157, 150 (74%, 40%)	N	N	N	N
2015	Microbiology	31*	Ohio State University	BS, 15	2.7	160, 158 (84%, 71%)	N	N	N	N
2015	Microbiology	32*	Roanoke College	BS, 14	3.53	156, 157 (71%, 68%)	N	N	N	N
2015	Microbiology	33*	St. Petersburg College	BS, 15	2.7	152, 152 (54%, 48%)	N	N	N	N
2015	Microbiology	34*	Youngstown State University	MS, 15	4	510, 720 (75%, 66%)	N	N	N	N
2015	Microbiology	35*	Saint Anselm College	BA, 15	2.5	146, 148 (29%, 32%)	N	N	N	N
2015	Microbiology	36*	New Mexico State Univ	BS, 15	3.54	152, 147 (54%, 28%)	N	N	N	N
2015	Microbiology	37*	Excelsior College	BS, 15	3.57	161, 150 (87%, 40%)	N	N	N	N
2015	Microbiology	38*	Aquinas College-MI	BS, 14	3.63	157, 160 (74%, 78%)	N	N	N	N
2015	Microbiology	39*	Kean University	BS, 11	3	145, 143 (25%, 15%)	N	N	N	N
2015	Microbiology	40*	Univ of Texas at Dallas	BS, 11	3	154, 153 (63%, 52%)	N	N	N	N

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2015	Microbiology	41*	Indian River State College	BS, 14	3.67	161, 160 (87%, 78%)	N	N	N	N
2015	Microbiology	42*	Norfolk State University	BS, 14	3.6	141, 140 (13%, 8%)	N	N	N	N
2015	Microbiology	43*	Univ of Massachusetts Amherst	MS, 14	3.64	164, 157 (93%, 68%)	N	N	N	N
2015	Microbiology	44*	Univ of North Florida	BS, 15	3.24	156, 149 (71%, 37%)	N	N	N	N
2015	Microbiology	45*	Clemson University	BS, 14	3	158, 148 (78%, 32%)	N	N	N	N
2015	Microbiology	46*	Univ of Alabama in Huntsville	BS, 14	3.57	157, 155 (74%, 61%)	N	N	N	N
2015	Microbiology	47*	Young Harris College	BS, 14	3.75	153, 150 (59%, 40%)	N	N	N	N
2015	Microbiology	48*	University of North Alabama	BS, 15	3.9	148, 151 (36%, 44%)	N	N	N	N
2015	Microbiology	49*	King University	BS, 14	3.46	158, 154 (78%, 56%)	N	N	N	N
2015	Microbiology	50*	University of Iowa	MS, 01	3.2	149, 148 (41%, 32%)	N	N	N	N
2015	Microbiology	51*	Oregon State University	BS, 14	3.49	149, 161 (41%, 80%)	N	N	N	N
2015	Microbiology	52*	Jacksonville State University	BS, 15	3.8	153, 155 (59%, 60%)	N	N	N	N
2015	Microbiology	53*	University of West Georgia	BS, 15	3.77	152, 144 (54%, 18%)	N	N	N	N
2015	Microbiology	54*	Florida State University	BS, 15	3.15	153, 155 (59%, 60%)	N	N	N	N

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2015	Microbiology	55*	Univ of Georgia	BS, 12	2.6	154, 152 (63%, 48%)	N	N	N	N
2015	Microbiology	56*	Holy Family University	BA, 14	3.15	152, 153 (54%, 52%)	N	N	N	N
2015	Microbiology	57*	Univ of Puerto Rico- Humacao	BS, 14	3.91	156, 159 (71%, 74%)	N	N	N	N
2015	Microbiology	58*	San Francisco State University	MS, 20	3.6	150, 150 (45%, 40%)	N	N	N	N
2015	Microbiology	59*	Middle Tennessee State University	BS, 15	3.66	148, 149 (36%, 37%)	N	N	N	N
2015	Microbiology	60*	Texas State Univ-San Marcos	MS, 13	3.5	159, 151 (81%, 44%)	N	N	N	N
2015	Microbiology	61*	Siena College	BS, 15	3.11	157, 158 (74%, 71%)	N	N	N	N
2015	Microbiology	62*	George Mason University	BS, 12	3.2	154, 154 (63%, 48%)	N	N	N	N
2015	Microbiology	63*	Southeast Missouri State Univ	BS, 14	2.5	NA	N	N	N	N
2015	Microbiology	64*	Alabama A&M University	BS, 11	3	136, 133 (3%, 1%)	N	N	N	N
2015	Microbiology	65*	Stanford University	BA, 12	3.22	154, 156 (63%, 64%)	N	N	N	N
2015	Microbiology	66*	Bowling Green State University	BS, 15	3.45	158, 148 (78%, 32%)	N	N	N	N
2015	Microbiology	67*	Northern Illinois University	BS, 15	3.6	155, 151 (67%, 44%)	N	N	N	N

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2015	Microbiology	68*	Auburn University	BS, 15	3.13	161, 160 (87%, 78%)	N	N	N	N
2015	Microbiology	69*	Univ of South Florida	MPH, 11	3.85	156, 152 (71%, 48%)	N	N	N	N
2015	Microbiology	70	Univ Pune-India	MS, 11	NA	NA	N	N	N	N
2015	Microbiology	71	Nobel College, Pokhara University	BS, 13	3.82	149, 160 (40%, 78%)	N	N	N	N
2015	Microbiology	72	Islamic Azad University-Tonekabon Branch	MS, 12	3.63	151, 160 (50%, 78%)	N	N	N	N
2015	Microbiology	73	PSG IMSR	MBBS, 14	3.97	149, 152 (41%, 48%)	N	N	N	N
2015	Microbiology	74	National Institute of Virology, Pune	MS, 14	NA	151, 162 (50%, 83%)	N	N	N	N
2015	Microbiology	75	Xiamen Univ-China	BS, 14	2.9	148, 168 (36%, 95%)	N	N	N	N
2015	Microbiology	76	Troy University-Troy	MS, 15	3.6	150, 153 (45%, 52%)	N	N	N	N
2015	Microbiology	77	Tribhuvan Univ-Nepal	MS, 13	NA	158, 155 (78%, 60%)	N	N	N	N
2015	Microbiology	78	Indian Institute of Technology	Dual, 14	NA	155, 157 (67%, 68%)	N	N	N	N
2015	Microbiology	79	Amity Institute of Biotechnology	BS, 15	NA	144, 154 (22%, 56%)	N	N	N	N
2015	Microbiology	80	Huazhong Agricultural University	BS, 14	3.54	152, 170 (54%, 98%)	N	N	N	N

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2015	Microbiology	81	Qingdao Agricultural University	BS, 13	3.58	132, 161 (1%, 80%)	N	N	N	N
2015	Microbiology	82*	Winona State University	BS, 14	3.74	157, 151 (74%, 44%)	Y	Y	N	N
2015	Neuroscience	1*	California State University, Fullerton	BS, 15	3.57	146, 152 (29%, 48%)	Y	Y	Y	N
2015	Neuroscience	2*	University of Houston-Downtown	BS, 15	3.63	153, 153 (59%, 52%)	Y	Y	Y	N
2015	Neuroscience	3*	Rhodes College	BS, 15	3	155, 145 (67%, 21%)	Y	Y	Y	N
2015	Neuroscience	4*	Tennessee Technological Univ	BS, 14	3.62	161, 168 (87%, 96%)	Y	Y	Y	N
2015	Neuroscience	5*	Westminster College	BS, 15	3.5	151, 150 (50%, 40%)	Y	Y	Y	N
2015	Neuroscience	6*	Baylor University	BS, 14	3.04	157, 154 (74%, 56%)	Y	Y	Y	N
2015	Neuroscience	7*	McNeese State University	BS, 14	3.94	155, 155 (67%, 60%)	Y	Y	Y	N
2015	Neuroscience	8*	New Mexico State Univ	BS, 15	3.45	153, 153 (59%, 52%)	Y	Y	Y	N
2015	Neuroscience	9*	Mary Baldwin College	BS, 15	3.68	152, 150 (54%, 40%)	Y	Y	Y	N
2015	Neuroscience	10*	University of the Virgin Islands	BS, 14	3.46	142, 145 (16%, 21%)	Y	Y	Y	N
2015	Neuroscience	11*	Savannah State University	BS, 14	3.51	155, 150 (67%, 40%)	Y	Y	Y	N

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2015	Neuroscience	12*	Rhodes College	BS, 15	3.82	165, 159 (95%, 74%)	Y	Y	Y	N
2015	Neuroscience	13	National University of Singapore	BE, 12	3.34	159, 165 (81%, 90%)	Y	Y	Y	N
2015	Neuroscience	14	Univ Coll London-UK	MS, 13	NA	550, 800 (72%, 94%)	Y	Y	Y	N
2015	Neuroscience	15	Eberhard Karls University Tubingen	BS, 15	3	150, 150 (45%, 40%)	Y	Y	Y	N
2015	Neuroscience	16*	Rutgers St Univ-New Bruns	BA, 13	3.45	151, 159 (50%, 74%)	Y	Y	N	N
2015	Neuroscience	17*	Auburn University	BS, 13	3.72	149, 163 (41%, 86%)	Y	Y	N	N
2015	Neuroscience	18*	Cornell University	BA, 13	3.24	161, 164 (87%, 88%)	Y	Y	N	N
2015	Neuroscience	19*	Winthrop University	BS, 15	3.95	165, 154 (95%, 56%)	Y	Y	N	N
2015	Neuroscience	20*	Auburn University	BA, 15	3.6	153, 157 (59%, 68%)	Y	N	N	N
2015	Neuroscience	21*	Portland State University	BS, 15	3.83	155, 146 (67%, 25%)	Y	N	N	N
2015	Neuroscience	22*	Seton Hill University	BA, 15	3.96	157, 150 (75%, 40%)	Y	N	N	N
2015	Neuroscience	23*	Univ of Alabama at Birmingham	MS, 14	4	166, 161 (96%, 80%)	Y	N	N	N
2015	Neuroscience	24*	Univ of California-Santa Cruz	BS, 15	3	167, 159 (97%, 74%)	Y	N	N	N

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2015	Neuroscience	25*	Univ of North Carolina-P'broke	BS, 13	3.74	146, 150 (29%, 40%)	Y	N	N	N
2015	Neuroscience	26*	Vanderbilt University	BS, 15	3.45	144, 157 (21%, 71%)	Y	N	N	N
2015	Neuroscience	27*	Univ of Louisville	MS, 15	3.9	149, 161 (41%, 80%)	Y	N	N	N
2015	Neuroscience	28*	James Madison University	MA, 14	3.7	155, 157 (67%, 68%)	Y	N	N	N
2015	Neuroscience	29*	Alabama State University	BS, 15	3.77	165, 158 (95%, 71%)	Y	N	N	N
2015	Neuroscience	30*	Univ of Wisconsin-Milwaukee	BS, 15	3.72	159, 148 (81%, 32%)	Y	N	N	N
2015	Neuroscience	31*	Christopher Newport University	BS, 15	3.4	155, 150 (67%, 40%)	Y	N	N	N
2015	Neuroscience	32*	Dartmouth College	BA, 15	3.31	162, 152 (89%, 48%)	Y	N	N	N
2015	Neuroscience	33*	Georgia State University	BS, 15	4.25	157, 156 (74%, 64%)	Y	N	N	N
2015	Neuroscience	34	East West University	MS,	3.77	154, 158 (63%, 71%)	Y	N	N	N
2015	Neuroscience	35*	Alabama State University	BS, 14	3.7	142, 150 (15%, 41%)	N	N	N	N
2015	Neuroscience	36*	Fayetteville State University	BA, 13	2.91	156, 151 (71%, 44%)	N	N	N	N
2015	Neuroscience	37*	Univ of South Carolina	BS, 15	3.2	155, 158 (67%, 71%)	N	N	N	N
2015	Neuroscience	38*	Grinnell College	BA, 15	2.78	154, 145 (63%, 21%)	N	N	N	N

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2015	Neuroscience	39*	Univ of Northern Iowa	BA, 14	3.5	158, 157 (78%, 68%)	N	N	N	N
2015	Neuroscience	40*	Seton Hall University	MS, 14	3.4	147, 152 (33%, 48%)	N	N	N	N
2015	Neuroscience	41*	Univ of Kentucky	BS, 14	3.21	165, 165 (95%, 90%)	N	N	N	N
2015	Neuroscience	42*	Maryville College	BS, 15	3.85	158, 163 (78%, 86%)	N	N	N	N
2015	Neuroscience	43*	Univ of Florida	BS, 14	3.82	158, 162 (78%, 83%)	N	N	N	N
2015	Neuroscience	44*	Virginia Tech	BS, 14	3.61	162, 159 (89%, 74%)	N	N	N	N
2015	Neuroscience	45*	Delaware State University	MS, 14	3.6	149, 142 (41%, 12%)	N	N	N	N
2015	Neuroscience	46*	Connecticut College	BA, 14	3.26	150, 156 (46%, 64%)	N	N	N	N
2015	Neuroscience	47*	Univ of Central Florida	BS, 14	3.34	162, 160 (89%, 78%)	N	N	N	N
2015	Neuroscience	48*	Washington College	BS, 14	3.58	NA	N	N	N	N
2015	Neuroscience	49*	Middle Tennessee State Univ	MA, 11	3.65	158, 152 (78%, 48%)	N	N	N	N
2015	Neuroscience	50*	California St U-San Bernardino	MA, 15	3.86	157, 158 (74%, 71%)	N	N	N	N
2015	Neuroscience	51*	Ohio Northern University	BS, 15	3.49	165, 160 (95%, 78%)	N	N	N	N
2015	Neuroscience	52*	Penn State-Univ Park	BS, 15	3.56	167, 160 (97%, 78%)	N	N	N	N

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2015	Neuroscience	53*	Univ Toronto-Canada	HBS, 14	2.78	154, 158 (63%, 71%)	N	N	N	N
2015	Neuroscience	54*	Southern IL Univ-Edwardsville	BS, 15	3.7	165, 158 (95%, 71%)	N	N	N	N
2015	Neuroscience	55*	Georgia State University	BS, 11	2.67	490, 480 (60%, 23%)	N	N	N	N
2015	Neuroscience	56*	Chatham College	MS, 15	4	148, 149 (36%, 37%)	N	N	N	N
2015	Neuroscience	57*	Fayetteville State University	BS, 14	3.89	157, 147 (74%, 28%)	N	N	N	N
2015	Neuroscience	58*	Jacksonville State University	BS, 14	3.36	161, 152 (87%, 48%)	N	N	N	N
2015	Neuroscience	59*	Christopher Newport University	BS, 15	3.19	154, 154 (63%, 56%)	N	N	N	N
2015	Neuroscience	60*	Carthage College	BA, 15	3.96	164, 161 (93%, 80%)	N	N	N	N
2015	Neuroscience	61*	Colorado State University	BS, 15	3.8	149, 157 (41%, 68%)	N	N	N	N
2015	Neuroscience	62*	Univ of Wisconsin-Madison	BS, 15	3.27	158, 168 (78%, 95%)	N	N	N	N
2015	Neuroscience	63*	Sacred Heart University	BS, 13	3.44	163, 157 (92%, 68%)	N	N	N	N
2015	Neuroscience	64*	Univ of Alabama at Birmingham	MS, 11	3.96	147, 143 (33%, 52%)	N	N	N	N
2015	Neuroscience	65*	Wesleyan College	BA, 15	3.5	143, 138 (18%, 4%)	N	N	N	N

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2015	Neuroscience	66*	S Illinois University Edwardsville	BS, 15	3.38	155, 156 (67%, 64%)	N	N	N	N
2015	Neuroscience	67*	Emory University	BS, 13	3.57	164, 162 (93%, 83%)	N	N	N	N
2015	Neuroscience	68*	Morehouse College	BS, 13	3.11	148, 150 (36%, 40%)	N	N	N	N
2015	Neuroscience	69*	Mesa State College	BS, 02	3.42	na, na (%, %)	N	N	N	N
2015	Neuroscience	70*	Florida A and M University	BS, 15	3.17	139, 145 (8%, 21%)	N	N	N	N
2015	Neuroscience	71*	Austin College	BS, 15	3	153, 155 (59%, 60%)	N	N	N	N
2015	Neuroscience	72*	Howard University	BS, 14	2.99	149, 152 (41%, 48%)	N	N	N	N
2015	Neuroscience	73*	Mississippi State University	MS, 09	3.65	153, 151 (59%, 44%)	N	N	N	N
2015	Neuroscience	74*	Boston College	BS, 13	3.1	150, 152 (45%, 48%)	N	N	N	N
2015	Neuroscience	75*	Tulsa Community College	AS, 15	3.57	160, 155 (84%, 60%)	N	N	N	N
2015	Neuroscience	76*	Georgia College and State Univ	MS, 15	3.85	155, 150 (67%, 40%)	N	N	N	N
2015	Neuroscience	77*	Southern Wesleyan University	BS, 14	3.79	159, 151 (81%, 44%)	N	N	N	N
2015	Neuroscience	78*	Christopher Newport University	BS, 14	3.56	159, 157 (81%, 68%)	N	N	N	N

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2015	Neuroscience	79*	Univ of New Mexico	BS, 14	3.9	146, 137 (29%, 3%)	N	N	N	N
2015	Neuroscience	80*	Centre College	BS, 15	3.98	167, 158 (97%, 71%)	N	N	N	N
2015	Neuroscience	81*	California St Univ-Northridge	BA, 14	3.56	152, 153 (54%, 52%)	N	N	N	N
2015	Neuroscience	82*	Augusta State University	MS, 14	3.7	159, 157 (81%, 68%)	N	N	N	N
2015	Neuroscience	83*	Central Michigan University	BS, 13	3.41	155, 150 (67%, 40%)	N	N	N	N
2015	Neuroscience	84*	Univ of Mississippi	BA, 14	3.9	158, 156 (78%, 64%)	N	N	N	N
2015	Neuroscience	85*	Florida State University	BS, 10	3.62	167, 165 (97%, 90%)	N	N	N	N
2015	Neuroscience	86*	Salisbury University	BS, 12	2.4	159, 144 (70%, 18%)	N	N	N	N
2015	Neuroscience	87*	Florida State University	BS, 13	3.39	163, 158 (92%, 71%)	N	N	N	N
2015	Neuroscience	88*	Univ of South Alabama	BS, 15	3.2	158, 150 (78%, 40%)	N	N	N	N
2015	Neuroscience	89*	Mount Union College	BA, 15	2.59	136, 138 (3%, 1%)	N	N	N	N
2015	Neuroscience	90*	Univ of Alabama at Birmingham	BS, 15	3.5	166, 161 (96%, 80%)	N	N	N	N
2015	Neuroscience	91*	Penn State-Univ Park	BS, 13	3.13	156, 158 (71%, 71%)	N	N	N	N
2015	Neuroscience	92*	Univ of Illinois-Urbana	BS, 14	3.15	159, 152 (81%, 48%)	N	N	N	N
2015	Neuroscience	93*	Univ of Alabama at Birmingham	BS, 15	3.69	155, 150 (67%, 40%)	N	N	N	N

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2015	Neuroscience	94*	Bloomsburg Univ of Penn	BS, 13	3.47	147, 144 (33%, 22%)	N	N	N	N
2015	Neuroscience	95*	Boston University	BA, 08	2.56	157, 150 (74%, 40%)	N	N	N	N
2015	Neuroscience	96*	Rutgers St Univ-New Bruns	BA, 14	3.62	158, 159 (78%, 74%)	N	N	N	N
2015	Neuroscience	97	American Univ Beirut	MS, 15	3.68	155, 150 (67%, 40%)	N	N	N	N
2015	Neuroscience	98	Univ Nottingham-UK	MS, 10	NA	160, 155 (84%, 61%)	N	N	N	N
2015	Neuroscience	99	Universidade Federal do ABC	MS, 15	NA	NA	N	N	N	N
2015	Neuroscience	100	American Univ Beirut	MS, 13	3.7	146, 163 (29%, 86%)	N	N	N	N
2015	Neuroscience	101	Creighton University	MS, 15	3.6	152, 160 (54%, 78%)	N	N	N	N
2015	Neuroscience	102	Dr DY Patil University + WES	MS, 13	3.46	153, 162 (59%, 83%)	N	N	N	N
2015	Neuroscience	103	Univ Delhi-India	BS, 12	3.6	154, 157 (63%, 68%)	N	N	N	N
2015	Neuroscience	104	Southern Medical University	BS, 15	3.06	150, 163 (45%, 86%)	N	N	N	N
2015	Neuroscience	105	Univ Dhaka-Bangladesh	MBBS, 14	NA	148, 147 (36%, 28%)	N	N	N	N
2015	Neuroscience	106	School of Life Sciences	MS, 15	NA	147, 141 (33%, 10%)	N	N	N	N
2015	Neuroscience	107	Troy University-Troy	MS, 13	3.67	161, 170 (87%, 98%)	N	N	N	N

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2015	Neuroscience	108	Korea Univ South	MS, 15	3.89	720, 800 (98%, 92%)	N	N	N	N
2015	Neuroscience	109	Babes-Bolyai University	MS, 12	NA	159, 167 (81%, 94%)	N	N	N	N
2015	Neuroscience	110	Jaypee Univ Inform Tech-India	MS, 14	NA	155, 156 (67%, 64%)	N	N	N	N
2015	Neuroscience	111	University of Science	MS, 14	3.54	142, 161 (15%, 81%)	N	N	N	N
2015	Neuroscience	112	Inter American San German Campus	BS, 14	3.2	NA	N	N	N	N
2015	Neuroscience	113	Osmania Medical College	MBBS, 07	3.7	148, 152 (36%, 48%)	N	N	N	N
2015	Neuroscience	114	Univ Mumbai-India	MS, 15	3	159, 161 (81%, 80%)	N	N	N	N
2015	Neuroscience	115	New Castle Univ Tyne-UK	Mres, 14	3.67	154, 155 (63%, 60%)	N	N	N	N
2015	Neuroscience	116	Mount Sinai School of Medicine	MS, 15	3.15	151, 163 (50%, 86%)	N	N	N	N
2015	Neuroscience	117*	Florida State University	BS, 15	3.97	161, 151 (87%, 44%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	1*	Lipscomb University	BS, 14	3.76	159, 157 (81%, 68%)	Y	Y	Y	N
2015	Pathobiology & Molecular Medicine	2*	Eckerd College	BS, 15	3.47	156, 152 (71%, 48%)	Y	Y	Y	N
2015	Pathobiology & Molecular Medicine	3	Univ of Alabama at Birmingham	MS, 15	NA	146, 153 (28%, 53%)	Y	Y	Y	N

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2015	Pathobiology & Molecular Medicine	4	Henan University College of Medicine	MD, 06	3.52	155, 166 (67%, 92%)	Y	Y	Y	N
2015	Pathobiology & Molecular Medicine	5	Univ of Illinois at Chicago	MS, 15	3.79	146, 165 (29%, 90%)	Y	Y	Y	N
2015	Pathobiology & Molecular Medicine	6*	Univ of Alabama at Birmingham	BS, 13	3.55	148, 153 (36%, 52%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	7*	College of William and Mary	BS, 15	3.09	160, 160 (84%, 78%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	8*	Auburn University	BS, 15	3.92	158, 161 (78%, 80%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	9*	Univ of South Florida	BS, 13	3.79	161, 154 (87%, 56%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	10*	Univ of Southern Mississippi	BS, 15	3.96	157, 151 (74%, 44%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	11	Univ of Michigan	MS, 14	3.86	150, 156 (45%, 64%)	Y	Y	N	N
2015	Pathobiology & Molecular Medicine	12*	Baylor University	BS, 13	3.25	158, 158 (78%, 71%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	13*	Texas Tech University	BS, 15	4	159, 158 (81%, 71%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	14*	Tuskegee University	BS, 15	3.8	143, 147 (18%, 28%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	15*	Western University of Health Sciences	MS, 14	3.8	157, 150 (74%, 40%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	16*	Shorter College	BS, 15	3.9	159, 162 (81%, 83%)	Y	N	N	N

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2015	Pathobiology & Molecular Medicine	17*	Stetson University	BS, 14	3.42	151, 149 (50%, 37%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	18*	St Univ of NY Coll at Fredonia	BS, 15	3.5	156, 152 (71%, 48%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	19*	Univ of Tennessee-Chattanooga	BS, 13	3.82	158, 156 (78%, 64%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	20*	Tougaloo College	BS, 15	3.61	152, 146 (54%, 25%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	21*	Jinan University	MS, 06	3.41	141, 156 (13%, 64%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	22*	Georgia Institute of Technology	BS, 14	2.89	157, 154 (74%, 56%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	23	Cornell College	BA, 15	3.83	163, 152 (92%, 48%)	Y	N	N	N
2015	Pathobiology & Molecular Medicine	24*	Middle Tennessee State Univ	MS, 14	3.37	161, 152 (87%, 48%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	25*	College of Charleston Honors College	BS, 15	3.36	163, 154 (92%, 56%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	26*	Seton Hall University	MS, 14	3.4	147, 152 (33%, 48%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	27*	Univ of Georgia	BS, 14	3.43	153, 150 (59%, 40%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	28*	Point Loma Nazarene University	BS, 15	3.35	157, 147 (74%, 28%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	29*	George Washington Univ, The	MS, 14	3.25	157, 150 (73%, 42%)	N	N	N	N

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2015	Pathobiology & Molecular Medicine	30*	Berry College	BS, 14	3.27	162, 155 (89%, 60%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	31*	Wright State University	MS, 15	3.5	140, 146 (10%, 25%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	32*	Willamette University	BA, 14	3.37	157, 156 (74%, 64%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	33*	The National Ribat University	MBBS, 09	3.23	151, 150 (50%, 40%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	34*	Univ of Arizona	BS, 15	3.24	163, 153 (92%, 52%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	35*	Purdue University	MS, 05	3.59	147, 148 (32%, 35%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	36*	Juniata College	BS, 13	3.11	154, 152 (63%, 48%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	37*	Southern IL Univ-Edwardsville	BS, 14	3.96	154, 157 (63%, 68%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	38*	Berea College	BA, 15	2.97	160, 160 (84%, 78%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	39*	Bangalore University India	MS, 11	NA	148, 150 (36%, 43%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	40*	Univ of Central Florida	MS, 15	3.38	163, 162 (92%, 83%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	41*	Dalton State College	BS, 13	3.76	151, 158 (80%, 71%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	42*	Kean University	BA, 15	3.73	153, 150 (62%, 40%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	43*	Virginia Tech	BS, 15	2.97	153, 163 (59%, 86%)	N	N	N	N

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2015	Pathobiology & Molecular Medicine	44*	Alabama State University	BS, 14	3.5	149, 148 (41%, 32%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	45*	Univ of Alaska Anchorage	BS, 15	3.92	164, 160 (93%, 78%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	46*	Univ of Texas at Austin	BS, 15	3.4	155, 166 (67%, 92%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	47*	California St Univ-Stanislaus	BS, 14	3.6	152, 145 (54%, 21%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	48*	Winona State University	BS, 15	3.08	153, 148 (59%, 32%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	49*	Johns Hopkins University, The	MS, 14	3.9	166, 160 (96%, 78%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	50*	Univ of Alabama	BS, 15	3.06	161, 164 (87%, 88%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	51*	Florida Atlantic University	MS, 15	4	156, 151 (71%, 44%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	52*	Louisiana St Univ-Shreveport	BS, 14	3.94	161, 160 (87%, 78%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	53*	University of North Florida	BS, 15	3.39	157, 154 (74%, 56%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	54*	Washington College	BS, 15	3.08	149, 153 (41%, 52%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	55*	Michigan State University	BS, 14	3.3	147, 144 (33%, 18%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	56*	Unversity of South Carolina Aiken	BS, 15	3.78	162, 159 (89%, 81%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	57	Grant Med Coll-U Mumbai-India	MBBS, 07	NA	154, 158 (64%, 79%)	N	N	N	N

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2015	Pathobiology & Molecular Medicine	58	Jordan University of Science and Tech	BS, 11	NA	140, 148 (10%, 32%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	59	University of West Alabama	BS, 13	3.73	154, 155 (63%, 60%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	60	Tongji Univ-China	MS, 15	NA	150, 164 (44%, 90%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	61	Anhui Med Univ China	BM, 10	3.92	156, 165 (71%, 90%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	62	Igbinedion University	MS, 11	3.85	NA	N	N	N	N
2015	Pathobiology & Molecular Medicine	63	Texas AandM Univ-Main	MPH, 15	4	145, 151 (25%, 44%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	64	Tribhuvan Univ-Nepal	MS, 14	NA	150, 153 (45%, 52%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	65	Hanyang Univ-Korea South	MS, 14	4.5	153, 161 (59%, 80%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	66	South China Agricultural University	BS, 15	3.54	152, 166 (54%, 92%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	67	Obafemi Awolowo University	MBCHB, 13	3.54	151, 156 (50%, 64%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	68	Panjab University	MBBS, 07	3	154, 158 (63%, 71%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	69	Kilpauk Medical College India	MBBS, 15	NA	152, 161 (54%, 80%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	70	University of Medicine 1	MBBS, 07	3.7	500, 680 (62%, 65%)	N	N	N	N

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2015	Pathobiology & Molecular Medicine	71	Univ of Florida	MS, 15	3	540, 620 (71%, 37%)	N	N	N	N
2015	Pathobiology & Molecular Medicine	72	Carroll University	BS, 15	3.9	153, 164 (59%, 88%)	N	N	N	N
2015	MSTP	1*	Carthage College	B.A., 2015	3.89	27	Y	Y	Y	N
2015	MSTP	2*	Elon University	B.A., 2015	3.74	36	Y	Y	Y	N
2015	MSTP	3*	Columbia University in the City of New York	B.S., 2015	3.53	34	Y	Y	Y	N
2015	MSTP	4*	University of Arkansas Main Campus	B.A., 2015	4.00	33	Y	Y	Y	N
2015	MSTP	5*	University of California-Irvine	B.S., 2012	3.81	36	Y	Y	Y	N
2015	MSTP	6*	Emory University	Other - B, 2011	3.80	31	Y	Y	Y	N
2015	MSTP	7*	Montana State University-Bozeman	B.S., 2012	3.72	34	Y	Y	Y	N
2015	MSTP	8*	GEORGIA SOUTHERN UNIVERSITY	B.S., 2010	2.91	31	Y	Y	Y	N
2015	MSTP	9*	University of Central Florida	B.S., 2015	4.00	34	Y	Y	N	N
2015	MSTP	10*	Georgetown University	B.S., 2015	3.80	35	Y	Y	N	N
2015	MSTP	11*	University of Virginia-Main Campus	B.S., B.A., 2015	3.87	39	Y	Y	N	N

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2015	MSTP	12*	University of Alabama at Birmingham	B.S., 2015	3.99	36	Y	Y	N	N
2015	MSTP	13*	Columbia University in the City of New York	B.A., 2014	3.77	33	Y	Y	N	N
2015	MSTP	14*	University of Oklahoma	B.S., 2014	3.95	32	Y	Y	N	N
2015	MSTP	15*	University of Chicago	B.A., 2013	3.59	36	Y	Y	N	N
2015	MSTP	16*	Ohio University Main Campus	B.S., 2013	3.80	32	Y	Y	N	N
2015	MSTP	17*	University of Alabama at Birmingham	B.S., 2013	3.68	30	Y	Y	N	N
2015	MSTP	18*	University of Missouri-Columbia	B.S., 2013	3.53	28	Y	Y	N	N
2015	MSTP	19*	University of Pennsylvania	B.A., 2013	3.57	37	Y	Y	N	N
2015	MSTP	20*	University of Pennsylvania	B.A., 2013	3.64	35	Y	Y	N	N
2015	MSTP	21*	University of Florida	B.S., 2013	3.82	34	Y	Y	N	N
2015	MSTP	22*	Temple University	B.S., 2012	3.91	39	Y	Y	N	N
2015	MSTP	23*	University of Wisconsin-Madison	B.S., 2012	3.97	35	Y	Y	N	N

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2015	MSTP	24*	Massachusetts Institute of Technology	B.S., 2010	3.52	37	Y	Y	N	N
2015	MSTP	25*	Reed College	B.A., 2010	3.08	34	Y	Y	N	N
2015	MSTP	26*	University of San Francisco	B.S., 2015	3.87	32	Y	N	N	N
2015	MSTP	27*	Georgetown University	B.S., 2015	3.95	35	Y	N	N	N
2015	MSTP	28*	University of Florida	B.S., 2015	3.98	34	Y	N	N	N
2015	MSTP	29*	Rhodes College	B.S., 2015	3.95	31	Y	N	N	N
2015	MSTP	30*	North Carolina State University	B.S., 2015	4.00	35	Y	N	N	N
2015	MSTP	31*	Coe College	B.A., 2015	4.00	31	Y	N	N	N
2015	MSTP	32*	University of Arkansas Main Campus	B.S., 2015	4.00	37	Y	N	N	N
2015	MSTP	33*	University of Alabama at Birmingham	B.S., 2015	4.00	37	Y	N	N	N
2015	MSTP	34*	Auburn University	Other - B, 2015	4.00	34	Y	N	N	N
2015	MSTP	35*	The University of Alabama	B.S., 2015	4.00	39	Y	N	N	N
2015	MSTP	36*	University of Missouri-Kansas City	B.S., B.A., 2014	3.81	36	Y	N	N	N
2015	MSTP	37*	University of Pittsburgh	B.S., 2014	3.53	32	Y	N	N	N

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2015	MSTP	38*	University of Alabama at Birmingham	B.S., B.S., 2014	3.75	34	Y	N	N	N
2015	MSTP	39*	University of California-Irvine	B.S., 2013	3.80	34	Y	N	N	N
2015	MSTP	40*	San Jose State University	B.S., B.A., 2013	3.70	29	Y	N	N	N
2015	MSTP	41*	Morehouse College	B.S., 2013	3.79	27	Y	N	N	N
2015	MSTP	42*	University of Florida	B.S., 2013	3.92	34	Y	N	N	N
2015	MSTP	43*	Davidson College	B.S., 2013	3.42	34	Y	N	N	N
2015	MSTP	44*	State University of New York at Stony Brook	Other - B, 2013	3.64	36	Y	N	N	N
2015	MSTP	45*	California Institute of Technology	B.S., 2012	3.66	38	Y	N	N	N
2015	MSTP	46*	Duke University	B.S., 2011	3.64	32	Y	Y	N	N
2015	MSTP	47*	State University of New York College at Geneseo	B.S., 2010	3.51	36	Y	N	N	N
2015	MSTP	48*	University Of Florida	BA, BS, 2007/2009	2.900	37	N	N	N	N
2015	MSTP	49*	Stanford University	BS, MS, 2007/2008	3.600	33	N	N	N	N
2015	MSTP	50*	Auburn University	B.S., 2015	2.62	23	N	N	N	N

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2015	MSTP	51*	Stanford University	B.S., 2015	3.58	38	N	N	N	N
2015	MSTP	52*	University of Georgia	B.S., 2015	4.00	35	N	N	N	N
2015	MSTP	53*	University of Notre Dame	B.S., 2015	3.86	31	N	N	N	N
2015	MSTP	54*	University of Florida	B.S., 2015	3.94	34	N	N	N	N
2015	MSTP	55*	Cornell University	B.A., 2015	3.92	36	N	N	N	N
2015	MSTP	56*	Davidson College	B.S., 2015	3.84	36	N	N	N	N
2015	MSTP	57*	University of Southern Mississippi	B.S., 2015	3.82	29	N	N	N	N
2015	MSTP	58*	University of Pennsylvania	B.A., B.A., M.S., 2015	3.78	35	N	N	N	N
2015	MSTP	59*	Vanderbilt University	Other - B, 2015	3.89	38	N	N	N	N
2015	MSTP	60*	University of Virginia-Main Campus	B.S., 2015	3.86	39	N	N	N	N
2015	MSTP	61*	North Carolina Central University	B.S., 2015	3.93	25	N	N	N	N
2015	MSTP	62*	University of Arkansas at Little Rock	B.S., 2015	3.53	15	N	N	N	N
2015	MSTP	63*	The University of Alabama	B.S., 2015	3.83	28	N	N	N	N

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2015	MSTP	64*	Georgia Institute of Technology-Main Campus	B.S., 2015	3.65	27	N	N	N	N
2015	MSTP	65*	Agnes Scott College	B.S., 2015	3.29	13	N	N	N	N
2015	MSTP	66*	Washington and Lee University	B.S., 2015	3.68	32	N	N	N	N
2015	MSTP	67*	University of Illinois at Urbana-Champaign	B.S., 2015	3.93	34	N	N	N	N
2015	MSTP	68*	University of California-Berkeley	B.S., 2015	3.81	38	N	N	N	N
2015	MSTP	69*	Widener University-Main Campus	B.S., 2015	3.54	32	N	N	N	N
2015	MSTP	70*	Saint Louis University-Main Campus	B.S., 2015	3.88	33	N	N	N	N
2015	MSTP	71*	Wartburg College	B.A., 2015	3.88	29	N	N	N	N
2015	MSTP	72*	Marquette University	B.S., 2015	3.74	26	N	N	N	N
2015	MSTP	73*	Georgia Institute of Technology-Main Campus	B.S., 2015	3.79	24	N	N	N	N
2015	MSTP	74*	Cornell University	B.S., 2015	3.66	28	N	N	N	N

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2015	MSTP	75*	Georgia Institute of Technology-Main Campus	B.S., 2015	3.64	34	N	N	N	N
2015	MSTP	76*	Wichita State University	B.S., 2015	3.77	22	N	N	N	N
2015	MSTP	77*	Vanderbilt University	B.S., 2015	3.70	34	N	N	N	N
2015	MSTP	78*	Georgia Southern University	B.S., 2015	3.95	31	N	N	N	N
2015	MSTP	79*	Texas Tech University-Lubbock	B.S., 2015	3.91	29	N	N	N	N
2015	MSTP	80*	Texas A & M University-Main Campus	B.S., 2015	3.77	27	N	N	N	N
2015	MSTP	81*	Stevens Institute of Technology	B.S., 2015	3.94	34	N	N	N	N
2015	MSTP	82*	Samford University	B.S., 2015	3.81	27	N	N	N	N
2015	MSTP	83*	University of Illinois at Urbana-Champaign	B.S., 2015	3.82	33	N	N	N	N
2015	MSTP	84*	The University of Alabama	B.S., 2015	3.80	33	N	N	N	N
2015	MSTP	85*	Rice University	B.A., 2015	3.58	32	N	N	N	N
2015	MSTP	86*	Western Kentucky University	B.S., 2015	3.78	24	N	N	N	N

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2015	MSTP	87*	University of Arizona	B.S., 2015	3.81	31	N	N	N	N
2015	MSTP	88*	Michigan State University	B.S., 2015	4.00	31	N	N	N	N
2015	MSTP	89*	Erskine College	B.S., B.S., 2015	3.90	32	N	N	N	N
2015	MSTP	90*	University of Tennessee-Chattanooga	B.S., 2015	3.79	33	N	N	N	N
2015	MSTP	91*	Louisiana St University and Agricultural and Mechanical Col	B.S., B.A., 2015	3.61	29	N	N	N	N
2015	MSTP	92*	University of Georgia	B.S., 2015	3.84	31	N	N	N	N
2015	MSTP	93*	The University of Alabama	B.S., 2015	3.97	35	N	N	N	N
2015	MSTP	94*	University of Maryland-Baltimore County	B.S., 2015	3.89	38	N	N	N	N
2015	MSTP	95*	The University of Alabama	B.S., 2015	3.43	29	N	N	N	N
2015	MSTP	96*	University of Texas at Austin	B.S., 2015	3.43	33	N	N	N	N
2015	MSTP	97*	University of Wisconsin-Whitewater	B.S., 2015	4.00	27	N	N	N	N

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2015	MSTP	98*	University of South Alabama - ALLIED HEALTH	B.S., 2015	3.35	32	N	N	N	N
2015	MSTP	99*	Lafayette College	B.S., 2015	3.78	27	N	N	N	N
2015	MSTP	100*	The Ohio State University Main Campus	B.S., 2015	3.50	32	N	N	N	N
2015	MSTP	101*	University of Texas at Austin	B.S., 2015	3.85	36	N	N	N	N
2015	MSTP	102*	University of Illinois at Urbana-Champaign	B.S., 2015	3.99	31	N	N	N	N
2015	MSTP	103*	University of Michigan-Ann Arbor	B.S., 2015	3.75	33	N	N	N	N
2015	MSTP	104*	Oakland University	B.S., 2015	3.79	26	N	N	N	N
2015	MSTP	105*	Brigham Young University-Idaho	B.S., 2015	3.33	25	N	N	N	N
2015	MSTP	106*	Brigham Young University	B.S., 2015	3.95	30	N	N	N	N
2015	MSTP	107*	Brigham Young University	B.S., 2015	3.67	30	N	N	N	N
2015	MSTP	108*	University of California-Santa Cruz	B.S., 2015	3.37	31	N	N	N	N

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2015	MSTP	109*	North Carolina Central University	B.S., 2014	4.00	26	N	N	N	N
2015	MSTP	110*	Vanderbilt University	B.A., 2014	3.83	29	N	N	N	N
2015	MSTP	111*	Columbia University in the City of New York	B.A., 2014	3.68	32	N	N	N	N
2015	MSTP	112*	University of California-Los Angeles	B.S., 2014	3.78	30	N	N	N	N
2015	MSTP	113*	University of California-Los Angeles	B.S., 2014	4.00	37	N	N	N	N
2015	MSTP	114*	University of Washington	B.S., B.A., 2014	3.84	31	N	N	N	N
2015	MSTP	115*	Dartmouth College	B.A., 2014	3.49	34	N	N	N	N
2015	MSTP	116*	University of California-San Diego	B.S., 2014	3.48	35	N	N	N	N
2015	MSTP	117*	University of California-Berkeley	B.A., 2014	3.92	32	N	N	N	N
2015	MSTP	118*	Michigan State University	B.S., 2014	2.72	27	N	N	N	N
2015	MSTP	119*	University of Alabama at Birmingham	B.S., 2014	3.41	28	N	N	N	N
2015	MSTP	120*	Tulane University	B.S., 2014	3.42	26	N	N	N	N

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2015	MSTP	121*	Georgia State University	B.S., M.S., 2014	2.88	26	N	N	N	N
2015	MSTP	122*	University of Maryland-Baltimore County	B.S., 2014	3.30	30	N	N	N	N
2015	MSTP	123*	University of California-Berkeley	B.A., 2014	3.54	35	N	N	N	N
2015	MSTP	124*	Brandeis University	B.A., B.S., 2014	3.96	30	N	N	N	N
2015	MSTP	125*	Mount Mercy University	B.S., 2014	2.88	29	N	N	N	N
2015	MSTP	126*	Temple University	B.S., 2014	3.56	36	N	N	N	N
2015	MSTP	127*	Duke University	B.S., 2014	3.45	29	N	N	N	N
2015	MSTP	128*	University of Massachusetts-Amherst	B.S., 2014	3.83	32	N	N	N	N
2015	MSTP	129*	Tulane University	B.S., B.A., M.S., 2014	3.86	34	N	N	N	N
2015	MSTP	130*	University of California-Berkeley	B.S., B.A., 2014	3.62	34	N	N	N	N
2015	MSTP	131*	University of Colorado at Denver	B.S., 2014	3.91	31	N	N	N	N
2015	MSTP	132*	Texas A & M University-Main Campus	B.S., 2014	3.46	25	N	N	N	N

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2015	MSTP	133*	Mississippi University For Women	B.S., 2014	3.52	12	N	N	N	N
2015	MSTP	134*	Truman State University	B.S., 2014	3.85	36	N	N	N	N
2015	MSTP	135*	University of Illinois at Urbana-Champaign	B.S., 2014	3.74	30	N	N	N	N
2015	MSTP	136*	Pennsylvania State University-Penn State Erie-Behrend Coll	B.A., 2014	3.54	27	N	N	N	N
2015	MSTP	137*	California State University, Los Angeles	B.S., 2013	3.83	31	N	N	N	N
2015	MSTP	138*	University of Pittsburgh	B.S., 2013	3.68	28	N	N	N	N
2015	MSTP	139*	Northwestern University-Evanston	B.S., 2013	3.42	35	N	N	N	N
2015	MSTP	140*	University of California-Los Angeles	B.S., 2013	3.41	39	N	N	N	N
2015	MSTP	141*	University of California-Los Angeles	B.S., 2013	3.74	32	N	N	N	N
2015	MSTP	142*	Bowdoin College	B.A., 2013	3.60	30	N	N	N	N
2015	MSTP	143*	University of Oregon	B.S., 2013	3.91	32	N	N	N	N

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2015	MSTP	144*	University of Miami	B.S., 2013	3.99	31	N	N	N	N
2015	MSTP	145*	Harvard University	B.A., 2013	3.74	36	N	N	N	N
2015	MSTP	146*	Harvard University	B.A., 2013	3.46	31	N	N	N	N
2015	MSTP	147*	Cornell University	B.A., 2013	3.86	37	N	N	N	N
2015	MSTP	148*	New York University	B.A., 2013	3.63	28	N	N	N	N
2015	MSTP	149*	University of South Carolina Columbia	Other - B, 2013	3.92	30	N	N	N	N
2015	MSTP	150*	New York University	B.A., 2013	3.50	30	N	N	N	N
2015	MSTP	151*	Washington and Lee University	B.S., 2013	3.89	37	N	N	N	N
2015	MSTP	152*	University of Puerto Rico-Mayaguez	B.S., 2013	3.93	21	N	N	N	N
2015	MSTP	153*	University of North Georgia	B.S., 2013	2.78	37	N	N	N	N
2015	MSTP	154*	Duke University	A.A., Other - M, 2013	3.37	30	N	N	N	N
2015	MSTP	155*	The University of Scranton	B.S., 2013	3.43	26	N	N	N	N
2015	MSTP	156*	Davidson College	B.A., 2013	3.75	30	N	N	N	N

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2015	MSTP	157*	The University of Texas at Dallas	B.S., 2013	3.47	35	N	N	N	N
2015	MSTP	158*	Emory University	B.S., 2013	3.68	31	N	N	N	N
2015	MSTP	159*	Rutgers University New Brunswick Campus	B.A., 2013	3.91	29	N	N	N	N
2015	MSTP	160*	University of Maryland-College Park	B.S., 2013	3.96	30	N	N	N	N
2015	MSTP	161*	SUNY - Buffalo	B.S., 2013	3.87	34	N	N	N	N
2015	MSTP	162*	University of Maryland-College Park	B.S., 2012	3.88	31	N	N	N	N
2015	MSTP	163*	University of Maryland-Baltimore County	B.S., 2012	3.32	27	N	N	N	N
2015	MSTP	164*	Johns Hopkins University	B.S., 2012	2.63	34	N	N	N	N
2015	MSTP	165*	Loyola Marymount University	B.A., 2012	3.87	31	N	N	N	N
2015	MSTP	166*	University of California-Berkeley	B.S., 2012	2.89	16	N	N	N	N
2015	MSTP	167*	Princeton University	B.A., 2012	3.14	38	N	N	N	N
2015	MSTP	168*	Williams College	B.A., 2012	3.88	36	N	N	N	N
2015	MSTP	169*	Princeton University	B.S., 2012	3.47	41	N	N	N	N

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2015	MSTP	170*	University of Washington	B.S., 2012	3.66	29	N	N	N	N
2015	MSTP	171*	Stanford University	B.A., 2012	3.21	32	N	N	N	N
2015	MSTP	172*	California State University-Los Angeles	B.S., 2012	3.85	34	N	N	N	N
2015	MSTP	173*	University of North Carolina at Chapel Hill	B.S., 2012	3.68	31	N	N	N	N
2015	MSTP	174*	Columbia University in the City of New York	B.A., 2012	3.25	29	N	N	N	N
2015	MSTP	175*	University of Nevada-Reno	B.S., 2012	2.22	19	N	N	N	N
2015	MSTP	176*	Johns Hopkins University	B.A., M.S., 2012	3.74	33	N	N	N	N
2015	MSTP	177*	Boston College	B.S., 2012	3.44	36	N	N	N	N
2015	MSTP	178*	Columbia University in the City of New York	Other - B, 2012	3.56	24	N	N	N	N
2015	MSTP	179*	University of Florida	B.S., 2012	3.30	31	N	N	N	N
2015	MSTP	180*	University of Oregon	B.S., 2012	3.51	30	N	N	N	N
2015	MSTP	181*	Vassar College	B.A., 2011	3.32	38	N	N	N	N
2015	MSTP	182*	University of California-Santa Barbara	B.S., 2011	2.58	27	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	MSTP	183*	University of Oregon	B.S., 2011	3.82	30	N	N	N	N
2015	MSTP	184*	University of California-Berkeley	B.A., 2011	3.30	30	N	N	N	N
2015	MSTP	185*	University of California-Berkeley	B.A., 2011	3.86	27	N	N	N	N
2015	MSTP	186*	University of Kentucky	B.S., 2011	2.59	31	N	N	N	N
2015	MSTP	187*	University of California-Berkeley	B.A., 2011	3.66	34	N	N	N	N
2015	MSTP	188*	Tulane University	B.S., 2011	2.61	32	N	N	N	N
2015	MSTP	189*	Rose-Hulman Institute Of Technology	BS, 2010	3.550	37	N	N	N	N
2015	MSTP	190*	Naropa University	B.A., 2010	3.16	32	N	N	N	N
2015	MSTP	191*	Furman University	BS, 2010	3.690	32	N	N	N	N
2015	MSTP	192*	Stevens Institute of Technology	B.S., 2010	3.43	26	N	N	N	N
2015	MSTP	193*	University of California-Irvine	B.S., 2009	2.93	30	N	N	N	N
2015	MSTP	194*	City University of New York Queens College	B.A., 2009	3.44	32	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	MSTP	195*	University of California-Berkeley	B.A., 2009	3.86	33	N	N	N	N
2015	MSTP	196*	University of Michigan-Ann Arbor	B.S., 2009	2.38	30	N	N	N	N
2015	MSTP	197*	University of California-Berkeley	B.A., 2008	3.62	32	N	N	N	N
2015	MSTP	198*	University of Chicago	B.A., 2008	3.39	33	N	N	N	N
2015	MSTP	199*	Oakwood University	B.S., 2008	3.28	19	N	N	N	N
2015	MSTP	200*	Wellesley College	BA, 2008	3.650	37	N	N	N	N
2015	MSTP	201*	University of Colorado at Boulder	B.S., 2007	2.61	23	N	N	N	N
2015	MSTP	202*	Gettysburg College	B.S., 2007	2.93	26	N	N	N	N
2015	MSTP	203*	Emory University	B.A., 2006	3.01	26	N	N	N	N
2015	MSTP	204*	Georgia Institute of Technology-Main Campus	B.S., 2004	3.38	24	N	N	N	N
2015	MSTP	205*	New York University	Other - B, 2004	3.53	29	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	MSTP	206*	University of Virginia-Main Campus - Graduate Engineering & Applied Science	B.S., 2004	3.14	27	N	N	N	N
2015	MSTP	207*	University of Florida	B.S., 1990	3.61	32	N	N	N	N
2015	Biology (PHD)	1*	Univ of Alabama at Birmingham	BS, 13	3.1	152, 151 (56%, 56%)	Y	Y	Y	N
2015	Biology (PHD)	2*	New Mexico State Univ	BS, 12	3.15	159, 155 (80%, 64%)	Y	Y	Y	N
2015	Biology (PHD)	3*	Univ of Alabama at Birmingham	BS, 14	3.23	152, 151 (53%, 48%)	Y	Y	Y	N
2015	Biology (PHD)	4*	Univ of Alabama at Birmingham	MA, 13	3.88	600, 700 (86%, 70%)	Y	Y	Y	N
2015	Biology (PHD)	5*	Hagerstown Community College	AS, 13	3.89	148, 153 (36%, 52%)	Y	Y	Y	N
2015	Biology (PHD)	6*	Univ of Alabama at Birmingham	BS, 09	3.26	159, 153 (84%, 65%)	Y	Y	Y	N
2015	Biology (PHD)	7*	Auburn University	BS, 14	3.96	168, 163 (98%, 86%)	Y	Y	N	N
2015	Biology (PHD)	8*	Univ of Texas at Tyler, The	BS, 13	3.6	157, 156 (73%, 68%)	Y	Y	N	N
2015	Biology (PHD)	9*	Univ of Tennessee-Martin	NA	3.6	163, 157 (92%, 68%)	Y	Y	N	N
2015	Biology (PHD)	10*	Macon State College	BS, 11	3.46	160, 155 (84%, 60%)	Y	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biology (PHD)	11*	Univ of Tennessee-Martin	BS, 06	3.4	155, 146 (67%, 25%)	Y	N	N	N
2015	Biology (PHD)	12*	Georgia State University	BS, 15	3.4	149, 150 (41%, 40%)	Y	N	N	N
2015	Biology (PHD)	13*	Radford University	BS, 15	3.66	NA	N	N	N	N
2015	Biology (PHD)	14*	Univ of Memphis	BS, 15	3.23	163, 161 (92%, 80%)	N	N	N	N
2015	Biology (PHD)	15*	Tuskegee University	BS, 15	3.3	136, 133 (3%, 1%)	N	N	N	N
2015	Biology (PHD)	16*	Wingate University	BS, 15	3.89	156, 154 (71%, 56%)	N	N	N	N
2015	Biology (PHD)	17*	Emory University	BS, 15	3.5	161, 150 (87%, 41%)	N	N	N	N
2015	Biology (PHD)	18*	Radford University	BS, 12	2.16	150, 145 (45%, 21%)	N	N	N	N
2015	Biology (PHD)	19*	Univ of Nebraska at Lincoln	BS, 12	3.54	160, 152 (83%, 52%)	N	N	N	N
2015	Biology (PHD)	20*	Athens State University	BS, 14	3.94	149, 150 (41%, 40%)	N	N	N	N
2015	Biology (PHD)	21*	Alabama State University	BS, 13	3.6	145, 142 (25%, 12%)	N	N	N	N
2015	Biology (PHD)	22*	Alabama A and M University	BS, 10	3	143, 133 (18%, 1%)	N	N	N	N
2015	Biology (PHD)	23	University of Dhaka	MS, 07	4	147, 153 (33%, 52%)	N	N	N	N
2015	Biology (PHD)	24	University of Agriculture	BS, 11	NA	148, 148 (%, %)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biology (PHD)	25	King Abdulaziz University	BS, 10	4.56	NA	N	N	N	N
2015	Biology (PHD)	26	Purbanchal University	BS, 11	3.54	157, 155 (77%, 69%)	N	N	N	N
2015	Biology (PHD)	27	China Agricultural Univers	BA, 14	3.23	149, 161 (41%, 80%)	N	N	N	N
2015	Biology (PHD)	28	Anhui Agriculture University	BS, 10	3.56	152, 162 (54%, 83%)	N	N	N	N
2015	Biology (PHD)	29	Sun Yat-sen University	BS, 15	3.7	152, 167 (54%, 94%)	N	N	N	N
2015	Biology (PHD)	30	Wuhan Univ-China	BS, 15	84	157, 170 (74%, 98%)	N	N	N	N
2015	Biology (PHD)	31	Devi Ahilya Vishwavidyalaya	BS, 12	7.8	145, 158 (25%, 71%)	N	N	N	N
2015	Biology (PHD)	32	East China Normal Univ	BS, 12	2.66	NA	N	N	N	N
2015	Biology (PHD)	33	Ocean Univ China	BS, 12	2.1	156, 170 (71%, 98%)	N	N	N	N
2015	Biology (PHD)	34	Plymouth University	BS, 14	NA	158, 144 (78%, 18%)	N	N	N	N
2015	Biology (PHD)	35	Faculty of Veterinary Medicine, Assuit	BA, 04	3	134, 147 (2%, 28%)	N	N	N	N
2015	Biology (PHD)	36	Nalanda degree college	BS, 10	3.6	290, 660 (6%, 61%)	N	N	N	N
2015	Biology (PHD)	37	Shanghai Ocean University	BS, 12	3.51	145, 164 (25%, 88%)	N	N	N	N
2015	Biology (PHD)	38	Hebei Univ-China	BS, 03	3.2	150, 162 (45%, 83%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biology (PHD)	39	Univ of South Florida	MA, 13	3.18	410, 720 (33%, 64%)	N	N	N	N
2015	BME	1*	Univ. of Mississippi	BS, '15	3.91	160, 164, 3.5 (84, 88, 38)	Y	Y	Y	N
2015	BME	2*	Univ. of Alabama Huntsville	BS, 15	4	160, 164, 3.5 (84, 88, 38)	Y	Y	Y	N
2015	BME	3*	Gustavus Adolphus College	BA, 15	3.41	163, 170, 4.0 (92, 98, 56)	Y	Y	Y	N
2015	BME	4	Soong Sil University	MS, 03 BS, 01	3.99	152, 165, 3.0 (54, 90, 15)	Y	Y	Y	N
2015	BME	5	Univ Dhaka-Bangladesh	MS, 14 BS, 13	3.45	150, 161, 2.5 (45, 81, 7)	Y	Y	Y	N
2015	BME	6*	Auburn University	BS, 15	3.62	151, 156, 5.0 (50, 64, 93)	Y	Y	Y	N
2015	BME	7*	Univ. of Alabama at Birmingham	BS, 15	4.0	160, 162, 4.0 (84, 83, 56)	Y	Y	N	N
2015	BME	8*	University of Alabama	BS, 15	4	162, 163, 4.0 (89, 86, 56)	Y	Y	N	N
2015	BME	9*	Southwestern University	BS, 15	3.6	167, 164, 4.0 (97, 88, 56)	N	N	N	N
2015	BME	10	Tianjin Univ-China Yunnan Univ-China	MS, 15 BS, 15	3.6	146, 167, 3.0 (29, 94, 15)	N	N	N	N
2015	BME	11	Univ of California-San Diego	BS 15	3.44	152, 161, 4.0 (54, 80, 56)	N	N	N	N
2015	Biostatistics	1*	Univ of Alabama at Birmingham	MPH, 12	3.92	630, 740 (91%, 80%)	Y	Y	Y	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biostatistics	2*	Univ of Alabama at Birmingham	MPH, 14	3.92	157, 159 (77%, 82%)	Y	Y	Y	N
2015	Biostatistics	3*	Univ of Alabama (Fa04-Sp05)	MS, 10	3.9	161, 166 (87%, 92%)	Y	Y	Y	N
2015	Biostatistics	4*	Univ of West Florida, The	MS, 15	3.68	165, 156 (95%, 64%)	N	N	N	N
2015	Biostatistics	5*	Iowa State University	MS, 04	3.38	141, 163 (13%, 86%)	N	N	N	N
2015	Biostatistics	6*	Univ of Southern Mississippi	MPH, 15	3.93	148, 147 (36%, 28%)	N	N	N	N
2015	Biostatistics	7*	Univ of Tennessee-Knoxville	MS, 12	3.7	157, 153 (74%, 52%)	N	N	N	N
2015	Biostatistics	8*	Univ of Alabama at Birmingham	MS, 14	3.23	149, 151 (40%, 48%)	N	N	N	N
2015	Biostatistics	9*	University of Alabama at Birmingham	MS, 15	3.14	153, 156 (57%, 68%)	N	N	N	N
2015	Biostatistics	10*	University of Alabama at Birmingham	MSPH, 14	3.26	450, 660	N	N	N	N
2015	Biostatistics	11	Indian Statistical Inst-India	MStat, 16	3.4	140, 167 (10%, 94%)	N	N	N	N
2015	Biostatistics	12	George Washington Univ, The	MS, 15	3.59	151, 162 (50%, 83%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Biostatistics	13	Korea Univ South	MS, 13	4.06	138, 164 (7%, 88%)	N	N	N	N
2015	Biostatistics	14	Univ of Nebraska at Lincoln	MS, 15	3.7	138, 165 (7%, 90%)	N	N	N	N
2015	Biostatistics	15	Univ of Southern Mississippi	MPH, 14	3.67	145, 154 (24%, 57%)	N	N	N	N
2015	Biostatistics	16	Univ of California-Davis	MS, 15	3.89	150, 168 (45%, 95%)	N	N	N	N
2015	Biostatistics	17	M S Univ If Baroda India	M.Sc, 15	7.79	155, 153 (67%, 52%)	N	N	N	N
2015	Biostatistics	18	East Tennessee State Univ	MS, 14	3.62	144, 153 (22%, 52%)	N	N	N	N
2015	Biostatistics	19	Georgia Southern University	MS, 13	3.66	155, 156 (65%, 68%)	N	N	N	N
2015	Biostatistics	20	Colegio de Posgraduados, Mexico	MS, 12	3.95	141, 157 (13%, 68%)	N	N	N	N
2015	Epidemiology	1*	Ohio State Univ, Columbus OH, Univ. of Kansas, Lawrence, KS	BS 13	3.430	154, 151 (63%, 44%)	Y	Y	NA**	N
2015	Epidemiology	2*	Georgia State Univ., Atlanta	BA 00	3.69	159, 154 (81%, 56%)	Y	Y	NA**	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Epidemiology	3	Washington Univ, St. Louis, MO West Chester Univ of Pennsylvania, West Chester	MPHil expected 8/2015	3.47;	148, 146 (36%, 65%)	Y	Y	NA**	N
2015	Epidemiology	4	MPH-EPI, Emory Univ, Atlanta, GA	MPH 15	3.30	159, 168 (81%, 95%)	Y	Y	NA**	N
2015	Epidemiology	5*	Morehouse College	MPH 08 MBBS 03	2.91	150, 140 (45%, 8%)	N	N	N	N
2015	Epidemiology	6*	Eastern Virginia Medical School	BA 13	2.87	470, 530 (50%, 21%)	N	N	N	N
2015	Epidemiology	7	West Virginai Univ	MPH 12 MBBS 09	3.05	146, 151 (29%, 44%)	N	N	N	N
2015	Epidemiology	8	Mphil Public Health-Univ. Hong Kong	MSPH 14 BS 12	3.54	161, 165 (87%, 90%)	N	N	N	N
2015	Epidemiology	9	Univ. of Oslo, Oslo Norway	MPH 14 BS 13	4.00	151, 155 (50%, 60%)	N	N	N	N
2015	Epidemiology	10*	Tuskegee Univ., Tuskegee, AL	PharmD 11	2.96	141, 142 (13%, 12%)	N	N	N	N
2015	Epidemiology	11*	Univ. of Mississippi, University, MS	BS 13	3.40	157, 163 (74%, 86%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Epidemiology	12	Weifang College, China	BS 13	2.69	151, 159 (49%, 75%)	N	N	N	N
2015	Epidemiology	13	Nantong Univ, Nantong China	BA 13	3.26	152, 164 (54%, 88%)	N	N	N	N
2015	Epidemiology	14*	Florida A&M Univ.,	MS 14 BS 11	3.890	159, 155 (81%, 60%)	N	N	N	N
2015	Epidemiology	15*	Univ of New Hampshire	BDS 13	2.92	152, 149 (54%, 37%)	N	N	N	N
2015	Epidemiology	16	Sichuan Univ. Sichuan, China	MPH 14 BHS 12	3.01	154, 163 (63%, 86%)	N	N	N	N
2015	Epidemiology	17	Western Kentucky Univ	MS 06 BS 04	3.28	151, 158 (50%, 71%)	N	N	N	N
2015	Epidemiology	18	Seoul Natl Univ-	BS 12	3.49;	160, 167 (84%, 94%)	N	N	N	N
2015	Epidemiology	19	Taipei Med. Univ.,	MBBS 09	3.45	150, 164 (45%, 88%)	N	N	N	N
2015	Epidemiology	20	Guangdong Pharmaceutical Univ,	MPH 10 BS 08	2.91	153, 167 (59%, 94%)	N	N	N	N
2015	Epidemiology	21	Univ Chittagong-Bangladesh,	BS 12	NA	154, 159 (63%, 74%)	N	N	N	N
2015	Epidemiology	22*	Texas A and M Univ-Main	BS 11	2.65	152, 151 (54%, 44%)	N	N	N	N
2015	Epidemiology	23	China Medical Univ,	MS 3 BS10	3.43	145, 169 (25%, 97%)	N	N	N	N
2015	Epidemiology	24*	Univ of Wisconsin-La	NA	2.67	150, 148 (45%, 32%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Epidemiology	25	Chinese Academy of Science and Healthcare	NA	3.59	142, 161 (13%, 78%)	N	N	N	N
2015	Health Behavior	1*	Univ of Texas, Houston Xavier of LA	MPH, 1 BS, 11	3.88	154, 146 (63%, 25%)	Y	Y	NA**	N
2015	Health Behavior	2*	Southern Mississippi; Mississippi State	MPH, 13 BA, 12	2.58	156, 148 (72%, 44%)	Y	Y	NA**	N
2015	Health Behavior	3	UAB Faculte De Medicine Pharm-Haiti	MPH, 15 MD, 00	3.59	151, 146 (49%, 27%)	Y	Y	NA**	N
2015	Health Behavior	4*	Wake Forest Calvin College	MS 12 BA 10	3.52	540, 680 (71%, 52%)	Y	Y	NA**	N
2015	Health Behavior	5*	Miss Univ for Women Miss State	MS 13 BS 09	3.81	149, 154 (42%, 67%)	Y	Y	NA**	N
2015	Health Behavior	6*	Wayne State Bowling Green	MPH BAHS	3.6	460, 630 (50%, 40%)	Y	Y	NA**	N
2015	Health Behavior	7*	Emory Florida	MPH BS	3.37	149, 146 (41%, 25%)	Y	Y	NA**	N
2015	Health Behavior	8*	U. of Alabama at Birmingham	MS, 15	3.62	158, 150 (77%, 43%)	N	N	N	N
2015	Health Behavior	9*	Adelphi Washington Univ.	MA 12 BA 11	2.8	146, 150 (28%, 41%)	N	N	N	N

Year	Department / Program	Applicant (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergrad GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Interviewed (Y/N)	Accepted (Y/N)	Enrolled (Y/N)	Support from this Grant (Y/N)
2015	Health Behavior	10	National Cheng Kung, Taiwan Chung Shan Medical University, Taiwan	MS 12 BS 10	3.44	143, 153 (18%, 52%)	N	N	N	N
2015	Health Behavior	11*	Georgia College of Charleston	MPH 15 BA 11	3.69	156, 144 (50%, 15%)	N	N	N	N
2015	Health Behavior	12*	Michigan Spelman	MPH 13 BS 10	3.61	320, 390 (10%, 6%)	N	N	N	N

Program Statistics

Total Number of Applicants	Number of TGE Applicants	Applicants Interviewed	Applicants Accepted	Applicants Enrolled	Applicants Supported By This Grant	Average GRE and/or MCAT Scores	Average GPA
924	696	244	161	82	0	Applied: V 60%, 60% Accepted: 71%, 64% Enrolled: 71%, 64% MCAT Applied: 32 MCAT Accepted: 34 MCAT Enrolled: 33	Applied: 3.5 Accepted: 3.62 Enrolled: 3.59

* Training grant eligible

** NA, Admissions for the 2015 entering classes of the Epidemiology and Health Behavior programs, School of Public Health, not yet completed.

Table 8B. Qualifications of Recent Postdoctoral Applicants

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Year	Department/ Program	Applicant (List by Number)**	Previous Institution	Degree(s) & Year(s)	Doctoral Thesis or Other Research Experience & Research Advisor (if relevant)	Residency Training Institution PGY	Offered Position (Y/N)**	Entered Program (Y/N)	Support from this Grant (Y/N)
2014	Biochemistry & Molecular Genetics	1	Institute of Hydrobiology, Chinese Academy of Sciences	PhD, 2014	Function of ELL in DNA damage, Hypoxia and innate immunity.	NA***	Y	Y	N
2014	Biochemistry & Molecular Genetics	2	Wuhan University, Wuhan, China	PhD, 2011	Role of HCV protein in regulation of HIV-1 transcription during co-infection	NA	Y	Y	N
2014	Biochemistry & Molecular Genetics	3	Shenyang Pharmaceutical University.	Pharm D, 2010	The Chinese Herb Isolate Yuanhuacine (YHL-14) Induces G_2/M Arrest in Human Cancer Cells by Up-regulating p21 Protein Expression through an p53 Protein-independent Cascade	NA	Y	Y	N
2014	Biochemistry & Molecular Genetics	4*	Meharry Medical College, Nashville	PhD, 2014	The interplay of Western Diet and Benzo(a)pyrene Exposure on Colon Carcinogenesis in PIRC Rat Model	NA	N	N	N
2014	Biochemistry & Molecular Genetics	5*	North Carolina State U.	PhD, 2013	Use of site directed mutagenesis to introduce mutations into a plasmid containing the caspase-3 gene	NA	N	N	N
2014	Biochemistry & Molecular Genetics	6	Sao Paulo State U. Brazil	PhD,2014	Functional characterization of the protein MxA	NA	N	N	N

Year	Department/ Program	Applicant (List by Number)**	Previous Institution	Degree(s) & Year(s)	Doctoral Thesis or Other Research Experience & Research Advisor (if relevant)	Residency Training Institution PGY	Offered Position (Y/N)**	Entered Program (Y/N)	Support from this Grant (Y/N)
2014	Biochemistry & Molecular Genetics	7	Texas Woman's U.	PhD, 2014	Use of energy centrality relationship (ECR) to identify and predict functionally-linked interacting proteins (FLIPs)	NA	N	N	N
2014	Biology	1*	University of South Alabama	PhD, 2014	Dissolved oxygen stress on the eastern oyster, Crassostrea virginica: Implications for physiology, management and restoration efforts	NA	Y	Y	N
2014	Biology	2	University of Basel	PhD, 2013	The Immunity Regulator *BAK1* Contributes to Resistance Against Diverse RNA Viruses	NA	Y	Y	N
2014	Biostatistics	1	University of Minnesota	PhD, 2014	The interaction between SCN populations and SCN-resistant genes in soybean.	NA	Y	Y	N
2014	Cell Developmntl & Integrative Biology	1*	UAB	PhD, 2014	Calreticulin regulates TGF-beta stimulated extracellular matrix production	NA	Y	Y	N
2014	Cell Developmntl & Integrative Biology	2*	State University of New York	PhD, 2014	Extracellular stiffness in organ formation and regeneration	NA	Y	Y	N
2014	Cell Developmntl & Integrative Biology	3*	UAB	PhD, 2014	Engineering fibroblast-remodeled electrospun matrices for full-thickness skin regeneration	NA	Y	Y	N
2014	Cell Developmntl & Integrative Biology	4	University of Padova, Italy	PhD, 2014	Ankrd2 modulates NF-kB mediated inflammatory responses in muscle	NA	N	N	N

Year	Department/ Program	Applicant (List by Number)**	Previous Institution	Degree(s) & Year(s)	Doctoral Thesis or Other Research Experience & Research Advisor (if relevant)	Residency Training Institution PGY	Offered Position (Y/N)**	Entered Program (Y/N)	Support from this Grant (Y/N)
2014	Cell Developmntl & Integrative Biology	5	Zhejiang University, China	PhD, 2014	Conditional knockout of ZNF9 in mesenchymal stem cells lead to altered bone development and application of one novel method of cDNA library preparation using next generation sequencing	NA	N	N	N
2014	Cell Developmntl & Integrative Biology	6	Hamdard University, India	PhD, 2010	Study on the inhibition of farnesylation of Ras p21 and dependent signaling in tumorigenesis	NA	N	N	N
2014	Cell Developmntl & Integrative Biology	7	Chonbuk National University Medical School	PhD, 2014	Bone morphogenetic protein-2(BMP-2) cross-talk with human metastatic spine tumor	NA	N	N	N
2014	Dermatology	1*	UCSF	MD 2013	NA	UCSF	Y	Y	N
2014	Genetics	1*	UAB	PhD, 2009	Exopolysacchrides of *Mycoplasma pulmonis*	NA	Y	Y	N
2014	Genetics	2	University of Alabama at Birmingham	PhD, 2014	Identification of a new schwannomatosis-predisposing gene and study of splicing defects caused by deep intronic NF1 mutations causing neurofibromatosis type 1	NA	Y	Y	N
2014	Genetics	3	University of Missouri	PhD, 2011	Deregulation of the notch signaling pathway N B-cell chronic lymphocytic leukemia	NA	Y	Y	N
2014	Genetics	4	La Trobe University, Melbourne	PhD, 2013	Impaired folding of the mitochondrial small TIM chaperones induces clearance by the i-AAA protease	NA	Y	Y	N

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2014	Genetics	5	CSJMU	PhD, 2011	Mechanisms of bimodal targeting of human CYP2D6 and 2C8 to mitochondria and its pathophysiological consequence in drug metabolism and toxicity	NA	Y	Y	N
2014	Genetics	6	Isfahan University of Medical Sciences, Iran	PhD 2011	Detection and evaluation of cholera toxin's mRNA from clinical isolates and live attenuated strain using site-directed mutagenesis	NA	N	N	N
2014	Genetics	7	Jiangnan University, China	PhD 2011	Study on the production, extraction, character, application and gene clone of the protease from Serratia sp. SYBC H	NA	N	N	N
2014	Med – Immun	1*	UAB	PhD 2014	Cd5-Dependent Ck2 Activation Is Critical For The Maintenance Of B-1a B Cells	NA	Y	Y	N
2014	Med – Immun	2	Government Medical College Patiala	MD, 2010	NA	Mount Sinai Medical Center Miami Beach, FL, M.D. Residency	Y	Y	N
2014	Med – Immun	3*	A.T. Still University-Kirksville College of Osteopathic Medicine	DO, 2012	NA	University of Oklahoma School of Community Medicine	Y	Y	N
2014	Med-Preventive Medicine	1*	Michigan State University	PhD, 2011	African American adolescents' parental, peer, and partner relationships and sexual risk	NA	Y	Y	N

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2014	Med-Preventive Medicine	2*	UAB	PhD, 2014	Health Education/Health Promotion	NA	Y	Y	N
2014	Med-Preventive Medicine	3*	University of Alabama at Birmingham	PhD, 2014	Physician-Parent Interactions in Pediatric End-of-Life Care: Implications for Integrative Communication, Decision-Making, and Ethics Training	NA	Y	Y	N
2014	Med-Preventive Medicine	4*	University of Connecticut	PhD, 2012	The Immediate and Long Lasting Effects of Aerobic Exercise among Ethnically Diverse Adults: A Meta-Analysis	NA	Y	Y	N
2014	Med-Preventive Medicine	5*	The University of Alabama	PhD, 2013	Validation of the Self-care Utility Geriatric African American Rating (SUGAAR) for Type 2 Diabetes	NA	N	N	N
2014	Med-Preventive Medicine	6*	The Ohio State University	PhD, 2013	Patient non-adherence within the context of treatment for latent tuberculosis infection (LTBI)	NA	N	N	N
2014	Med-Preventive Medicine	7	UAB	PhD, 2013	Risk Assessment and Staging of Cardiometabolic Diseases	NA	N	N	N
2014	Medicine/ Pulmonary & CCM	1*	Foreign University	MD, 2009	NA	Maimonides Medical Center, Brooklyn, NY	Y	Y	N
2014	Medicine/ Pulmonary & CCM	2*	University of Alabama at Birmingham	PhD, 2013	Phenotypic analysis of B cells In Hla*B44 positive patients that exhibit common variable immunodeficiency and recurrent sino-pulmonary infections	NA	Y	Y	N

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2014	Medicine/ Pulmonary & CCM	3	Foreign University	PhD, 2010	Selective debranching of guar galactomannan by structurally unrelated enzymes for improved functional properties.	NA	Y	Y	N
2014	Medicine/Pulmonary & CCM	4*	Midwestern Arizona	DO, 2010	NA	Keesler Medical Center	Y	Y	N
2014	Medicine/Pulmonary & CCM	5	Bangalore Medical College	MBBS, 2009	NA	Detroit Medical Ctr PGY 3	Y	Y	N
2014	Medicine/Pulmonary & CCM	6	Universidad Autonoma de Tamaulipas	MC, 2006	NA	Univ. of Texas PGY 4	Y	Y	N
2014	Medicine/Pulmonary & CCM	7	Stanley Medical College	MBBS, 2008	NA	Albert Einstein PGY 3	Y	Y	N
2014	Medicine/Pulmonary & CCM	8	Faculty of Medicine, Siriraj	MD, 2007	NA	Albert Einstein PGY 3	Y	Y	N
2014	Medicine/Pulmonary & CCM	9	Univ. of Damascus	MD, 2008	NA	Indiana Univ. PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	10*	Universidad San Francisco de Quito	MD, 2007	NA	Metrowest Medical Center PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	11*	Univ. of Kentucky	MD, 2010	NA	Univ. of Alabama at B'ham PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	12	Univ. of Aleppo	MD, 2008	NA	Henry Ford Hospital PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	13*	Albert Einstein, NY	MD, 2005	NA	Carolina Med Ctr. PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	14	All-India Institute of Medical Sciences	MBBS, 2007	NA	John H. Stroger Hospital of Cook County PGY 3	N	N	N

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2014	Medicine/Pulmonary & CCM	15*	American Univ. of the Caribbean	MD, 2009	NA	Univ of Tennessee PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	16*	Univ. of Virginia	MD, 2010	NA	Univ. of Alabama at B'ham PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	17	Seth G. S. Medical College	MBBS, 2008	NA	Georgetwon Univ. PGY 4	N	N	N
2014	Medicine/Pulmonary & CCM	18*	Univ. of Alabama	MD, 2010	NA	Univ. of North Carolina PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	19	Seth G.S. Medical College	MBBS, 2009	NA	UPMC PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	20*	Louisiana State Univ	MD, 2006	NA	Louisiana State Univ. PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	21*	Med. College of Georgia	MD, 2006	NA	Univ. of North Carolina PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	22*	Univ of Illinois	MD, 2010	NA	Univ. of Alabama at B'ham PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	23*	West Virginia Univ	MD, 2010	NA	West Virginia Univ PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	24	Government Medical College Surat	MBBS, 2006	NA	Univ. of Tennessee PGY 4	N	N	N
2014	Medicine/Pulmonary & CCM	25	Catholic Univ of Korea	MD, 2006	NA	Albert Einstein PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	26	Municipal Med College Gujar at Univ	MBBS, 2009	NA	Univ. of Illinois PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	27	Sindh Medical College	MBBS, 2006	NA	Univ. of Kansas PGY 3	N	N	N

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2014	Medicine/Pulmonary & CCM	28	Royal College of Surgeons	MBChB, 2007	NA	Univ. of Pennsylvania PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	29	Medizinische Universitat Wien	MD, 2009	NA	Vanderbilt PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	30*	Univ. of Tennessee	MD, 2009	NA	Univ. of Tennessee PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	31	Rangaraya Med College	MBBS, 2008	NA	Albert Einstein PGY 3	N	N	N
2014	Medicine/Pulmonary & CCM	32	Universidad Autonoma de Nuevo Leon	MD, 1996	NA	Texas Tech PGY 3	N	N	N
2014	Microbiology	1*	Vanderbilt University	PhD 2014	Identification of Synthetic Lethality between Mdm2 Overexpression and DNA Damage and a Novel Function of the Mdmx Oncogene in DNA Repair Independent of p53	NA	Y	Y	N
2014	Microbiology	2	Univ Science & Technology, China	PhD 2010	Blocking the Natural Killer Cell Inhibitory Receptor NKG2A Increases Activity of Human Natural Killer Cells and Clears Hepatitis B Virus Infection in Mice	NA	Y	Y	N
2014	Microbiology	3	Université Paris Sud	PhD 2013	Caractérisation biochimique des machineries de biosynthèse de t6A, un nucléoside modifié universel	NA	Y	Y	N

Year	Department/ Program	Applicant (List by Number)**	Previous Institution	Degree(s) & Year(s)	Doctoral Thesis or Other Research Experience & Research Advisor (if relevant)	Residency Training Institution PGY	Offered Position (Y/N)**	Entered Program (Y/N)	Support from this Grant (Y/N)
2014	Microbiology	4	University of Science and Technology of China	PhD 2013	Efficient attenuation of NK cell-mediated liver injury through genetically manipulating multiple immunogenes by using a liver-directed vector	NA	Y	Y	N
2014	Microbiology	5	Universite Lyon	PhD 2013	Human herpesvirus 6A infection in CD46 transgenic mice: viral persistence in the brain and increased production of proinflammatory chemokines via Toll-like receptor 9.	NA	Y	Y	N
2014	Microbiology	6*	University of South Florida	PhD 2014	Sigma Factor N: A Novel Regulator of Acid Resistance and Locus of Enterocyte Effacement in Escherichia coli O157:H7	NA	Y	Y	N
2014	Microbiology	7	Huazhong Agricultural University	PhD 2013	Uncovering new signaling proteins and potential drug targets through the interactome analysis of Mycobacterium tuberculosis	NA	Y	Y	N
2014	Microbiology	*8	George Washington U.	PhD 2014	The Proton Pump Inhibitor Lansoprazole Improves the Skeletal Phenotype in Dystrophin Deficient mdx Mice	NA	N	N	N
2014	Microbiology	9	Banaras Hindu University, India	PhD 2014	Virological response to nucleoside/tide analogues in Hepatitis B Virus (HBV) related chronic liver diseases	NA	N	N	N

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2014	Microbiology	10	Aix Marseille University, Marseille, France	PhD 2013	Whole genome sequence analysis of multidrug resistant bacteria in cystic fibrosis	NA	N	N	N
2014	Microbiology	11	University of Nigeria, Nsukka	PhD 2012	Molecular Epidemiology of Drug-Resistant Escherichia coli Isolates of Human and Animal Origin in Nigeria	NA	N	N	N
2014	Microbiology	12	Central Drug Research Institute & Jawaharlal Nehru University, India	PhD 2013	Evaluation of murine infection model of Mycobacterium fortuitum for drug screening and heterologous gene expression	NA	N	N	N
2014	Neurology	1*	University Louisville	PhD, 2014	Taking clinical judgement out of the equation: A call for the standardization of MCI diagnostic criteria and construction of a model to predict conversion to dementia	NA	Y	Y	N
2014	Neurology	2*	Marquette University	PhD, 2011	Mechanisms of Neuronal Death Induced by Environmental Toxicants in Murine Cortical Culture	NA	Y	Y	N
2014	Neurology	3	All India Institute of Medical Sciences (AIIMS), New Delhi, India	PhD, 2013	Evaluation of Clitoria ternatea and Evolvulus alsinoides extracts for cognitive impairment in rats	NA	N	N	N

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2014	Neurology	4	University of Delhi, India	PhD, 2010	Mechanistic study involving anti proliferative effect of COX-2 selective inhibitor on human cancer cell lines	NA	N	N	N
2014	Neurology	5	Jilin University, China	PhD, 2013	Single-chain catalytic antibodies scFv-2F3 imitate glutathione peroxidase (GPx)	NA	N	N	N
2014	Oral & Maxillofacial Surgery	1	UAB	PhD, 2014	Mechanisms of runt related transcription factor 2 (Runx2) and Sp7 tissue and cell-specific regulatory control during skeletogenesis	NA	Y	Y	N
2014	Pathology	1*	UAB	PhD, 2014	The expression and function of ICAM-2 in neuroblastoma	NA	Y	Y	N
2014	Pathology	2	Annamalai Univ	PhD, 2010	Effect of genistein on TNF-α-induced endothelial inflammation and vascular inflammation in C57BL/6 mice	NA	Y	Y	N
2014	Pathology	3	National Univ Singapore	PhD, 2013	Investigation of the redox sensitivity of Aif and Keap1 to oxidative stress and their regulation by thiol redox systems	NA	Y	Y	N
2014	Pathology	4	Foreign/UAB	M.D./PhD, 2010	The role Of Map Kinase cascade In Msp signaling response	NA	Y	Y	N
2014	Pathology	5	Medical Univ of Graz	PhD, 2013	The role of FGF21 in cardiac energy homeostasis	NA	Y	Y	N
2014	Pathology	6	Jiao Tong University, Shanghai	MD, 2007	NA	OBGYN	Y	Y	N

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2014	Pathology	7	Postgraduate Institute of Medical Education & Research, India	PhD, 2013	Regulation of autophagy by protein post-translational modification.	NA	Y	Y	N
2014	Pathology	8	UAB	PhD, 2013	The combined effect of formalin fixation and individual steps in tissue processing on immunorecognition	NA	Y	Y	N
2014	Pathology	9*	Indiana	PhD, 2014	Twist1 and Etv5 are part of a transcription factor network defining T helper cell identity	NA	Y	Y	N
2014	Pathology	10	Indian Institute of Science	PhD, 2011	Production of anti-cancer drug Taxol and its precursor Baccatin III by *Fusarium solani* and their apoptotic activity on human cancer cell lines	NA	Y	Y	N
2014	Pathology	10	University of Kentucky	PhD, 2013	Chemotherapy induced oxidative stress in breast cancer patients	NA	N	N	N
2014	Pathology	11	University of Madras, India	PhD, 2013	Anticancer effect of carvacrol against diethylnitrosamine induced hepatocarcinogenesis in rats - A biochemical and molecular approach	NA	N	N	N
2014	Pathology	12	Peking Union Medical College, China	PhD, 2013	The potential mechanism of differential expression of microRNAs is associated with neuropathic pain	NA	N	N	N

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2014	Pediatrics	1*	UAB	PhD 2014	Predictors of physical activity in child and adolescent survivors of cancer	NA	Y	Y	N
2014	Pediatrics	2*	UAB	PhD 2014	Coping with chronic illness: Temporal patterns of spiritual coping and adjustment among adolescents with chronic illness	NA	Y	Y	N
2014	Pediatrics	3*	Tennessee State U.	PhD 2014	Induced Reactive Oxygen Species Alter Insulin Signaling in Hypertensive Vascular Smooth Muscle Cells	NA	Y	Y	N
2014	Psychology	1*	Southern Miss.	PhD 2014	Does video game use exacerbate the relation between neuropsychological deficits and adhd symptoms in children and adolescents?	NA	Y	Y	N
2014	Psychology	2*	UAB	PhD 2014	Examining predictors of the longitudinal trajectories of diabetes distress and depressive symptoms in a sample of older adults with diabetes	NA	Y	Y	N
2014	Psychology	3*	UAB	PhD 2011	Cognitive Functioning in Adults Aging with HIV: A Cross-Sectional Analysis of Cognitive Subtypes and Influential Factors.	NA	Y	Y	N

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2014	Psychology	4	University of Aukland	PhD 2013	Investigating the microstructural and neurochemical environment within the basal ganglia of current methamphetamine abusers	NA	Y	Y	N
2014	Psychology	5	University of New South Wales	PhD 2013	The role of inflammation in recovery from fracture and in the development of complex regional pain syndrome (CRPS).	NA	Y	Y	N
2014	Surgery	1*	Ross U.	MD 2012	NA	Univ Ill College of Medicine	Y	Y	N

* Training grant eligible

The majority of applicants communicate directly with potential faculty mentors. The Office of Postdoctoral Education has instituted a central repository into which faculty are requested to provide copies of all postdoctoral applications received. Participation is currently voluntary; not all faculty and/or programs are fully represented. Data provided for **Applicants are a partial representation of larger applicant pools (Table 7b); it is often unknown if **Offers** were made to these applicants.

*** NA, Not available/applicable

Table 9A. Qualifications of the Current Predoctoral Trainees Clearly Associated with the Training Program (New Applications)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergraduate GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Current Research Mentor	Years in Program	Leave Column Blank
Biology	1*	UAB	BS, 09	3.08	490, 640	Tollefsbol, Trygve	09-present	
Biology	2*	UAB	BS, 09	3.11	540, 670	Tollefsbol, Trygve	09-present	
Biology	3	China Agricultural U.	BS, 09	NA**	590, 800	Tollefsbol, Trygve	11-present	
Biology	4	NA	NA	NA	440, 710	Tollefsbol, Trygve	11-present	
Biology	5	West Bengal U.	BS, 09	NA	620, 770	Tollefsbol, Trygve	12-present	
Biology	6*	UAB	MS, 14	3.5	142, 153	Tollefsbol, Trygve	14-present	
Biostatistics	7*	Yale University	BS, 08	3.91	670, 720	Cutter Gary	08-present	
Biostatistics	8*	Jacksonville State U.	BS,09	NA	420, 730	Redden David	09-present	
Biostatistics	9*	Vanderbilt U.	BS, 04	NA	640, 770	Tiwari Hemant	10-present	
Biostatistics	10	Yunnan Univ-China	BS, 10	NA	430, 800	Cutter Gary	10-present	
Biostatistics	11*	Iowa State U.	BS, 10	NA	450, 740	Tiwari Hemant	11-present	
Biostatistics	12*	Univ of Florida	MS, 04	3.84	530, 700	Cutter Gary	12-present	
Biostatistics	13*	Univ of Alabama at Birmingham	MS, 13	3.8	560, 780	Tiwari Hemant	13-present	
Biostatistics	14*	UAB	NA	3.72	730, 790	Cutter Gary	13-present	
Biostatistics	15	Huazhong Agricultural Univ	BS	NA	167, 166	Liu Nianjun	14-present	

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Biostatistics	16	South Dakota State University	MS 2014	3.67	167, 166	Liu Nianjun	14-present	
Epidemiology	17*	Oakwood College	BS, 07	3.36	420, 590	Muntner Paul	09-present	
Epidemiology	18*	Univ of Alabama at Birmingham	MS, 08	3.7	830, 410	Muntner Paul	12-present	
Epidemiology	19*	National University of La Plata (NULP)	2002	NA	162, 158	Muntner Paul	12-present	
Epidemiology	20	East China Normal U.	BS, 07	4	430, 800	Muntner Paul	12-present	
Health Behavior	21*	Univ of Alabama at Birmingham	MPH, 14	3.66	152, 147	Fontaine Kevin	14-present	
Health Behavior	22*	UAB	MPH, 01	3.83	480, 570	Fontaine Kevin	14-present	
Health Behavior	23*	NA	NA	NA	NA	Safford Monika	14-present	
BYCH_MG_PHD	24	Huazhong Univ Sci/Tech-China	BS, 07	NA	550, 740 (73%, 80%)	Townes Timothy	07-present	
BYC_STRC_PHD	25	University Of Alabama At Birmingham	BS, 11	3.96	32	Townes Timothy	11-present	
BYC_STRC_PHD	26*	Saint John's University	MS, 12	3.44	151, 151 (51%, 56%)	Serra Rosa	12-present	
BYC_STRC_PHD	27*	University of Puget Sound	BS, 12	3.38	167, 159 (97%, 77%)	Steele Chad	13-present	
BYC_STRC_PHD	28*	Mississippi College	BS, 13	3.72	160, 150 (83%, 43%)	Randall Troy	13-present	
CELL_MOL_PHD	29	Central Michigan University	MS, 10	3.44	510, 730	Benveniste Etty	10-present	

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CELL_MOL_PHD	30*	University of Notre Dame	BA, 11	3.81	38	Bridges Louis	11-present	
CELL_MOL_PHD	31*	Univ of Wisconsin-Stevens Pnt	BS, 11	3.86	440, 630	Napierala Dobrawa	11-present	
CELL_MOL_PHD	32*	Aurora University	BS, 12	3.93	151, 155 (51%, 69%)	Floyd Candace	12-present	
CELL_MOL_PHD	33*	UAB	DMD, 00	3.2	NA	McDougall Mary	13-present	
CELL_MOL_PHD	34	Univ British Columbia-Canada	PhD, 13	NA	670, 780 (93%, 88%)	Serra Rosa	13-present	
CNCER_BY_PHD	35*	Alabama State University	BS, 09	3.9	530, 680 (70%, 66%)	Feng Xu	10-present	
CNCER_BY_PHD	36*	University of Kenturky	MS,	3.3	690, 760	Li Yi-Ping	10-present	
CNCER_BY_PHD	37	Kyung-Hee Univ Korea South	BS, 09	3.45	650, 780	Ponnazhagan Selvarangan	10-present	
CNCER_BY_PHD	38	Padmashree Dr D.Y Patil University	MS, 14	3.94	159, 160 (81%, 78%)	Bellis Susan	14-present	
CNCER_BY_PHD	39*	Birmingham-Southern College	BS, 14	3.51	155, 152 (66%, 49%)	Bellis Susan	14-present	
CNCER_BY_PHD	40*	Georgia College and State Univ	MS, 14	3.84	154, 155 (62%, 61%)	Bellis Susan	14-present	
GENE_GEN_PHD	41*	Texas A and M Univ-Main	BS, 10	3.5	530, 670	Standaert David	11-present	
GENE_GEN_PHD	42*	Millersville Univ of Penn	BS, 11	3.58	149, 153	Standaert David	12-present	

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GENE_GEN_PHD	43*	Colby University	BA, 10	3.77	34	Myers Richard	12-present	
GENE_GEN_PHD	44*	Wesleyan College	BA, 13	3.52	159, 154 (80%, 60%)	Serra Rosa	13-present	
IMMUNE_PHD	45*	Univ of South Carolina-Aiken	BS, 09	4	570, 670 (79%, 65%)	Tse Hubert	09-present	
IMMUNE_PHD	46*	Georgia Institute of Technology	BS, 08	3.79	520, 660 (66%, 63%)	Weaver Casey	09-present	
IMMUNE_PHD	47*	Brigham Young University	BS, 09	NA	630, 770 (90%, 88%)	Szalai Alexander	09-present	
IMMUNE_PHD	48*	Louisiana St-AandM-Baton Rouge	BS, 09	NA	540, 720 (71%, 76%)	Davis Randall	09-present	
IMMUNE_PHD	49*	Juniata U.	BS, 09	3.88	31	George James	09-present	
IMMUNE_PHD	50*	Wake Forest University	BS, NA	3.59	34	Weaver Casey	09-present	
IMMUNE_PHD	51*	Auburn University	BS, 10	3.91	36	Lund Frances	10-present	
IMMUNE_PHD	52*	University Of Texas At Austin	BS, 10	3.13	35	Weaver Casey	10-present	
IMMUNE_PHD	53*	Duke University	BS , 10	3.58	35	Weaver Casey	10-present	
IMMUNE_PHD	54*	Jackson State University	MS, 09	3.88	440, 530 (46%, 33%)	Cron Randy	10-present	
IMMUNE_PHD	55*	Univ of California-San Diego	BS, 09	3.15	700, 700	Schroeder Harry	10-present	
IMMUNE_PHD	56*	Ursinus College	BS, 11	2.89	520, 790	Bullard Dan	11-present	
IMMUNE_PHD	57*	Univ of Central Florida	BS, 11	3.63	500, 720	Kearney John	11-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergraduate GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Current Research Mentor	Years in Program	Leave Column Blank
IMMUNE_PHD	58*	Michigan State University	BS, 11	3.14	460, 670	Tse Hubert	11-present	
IMMUNE_PHD	59*	Vanderbilt University	BA, 10	3.49	149, 156 (42%, 74%)	Benveniste Etty	12-present	
IMMUNE_PHD	60*	Univ of Missouri-Columbia	BS, 12	3.09	152, 156 (56%, 74%)	Goepfert Paul	12-present	
IMMUNE_PHD	61	Handong Univ Korea South Unofficial	BS, 11	4.04	166, 161 (97%, 86%)	Harrington Laurie	12-present	
IMMUNE_PHD	62*	Middle Tennessee State Univ	BS, 11	3.95	164, 155 (94%, 69%)	Mountz John	12-present	
IMMUNE_PHD	63*	Indiana University Bloomington	BA, 11	2.87	157, 148 (77%, 44%)	Steele Chad	12-present	
IMMUNE_PHD	64*	Georgia State University	MS, 14	4	162, 156 (89%, 68%)	Harrington Laurie	13-present	
IMMUNE_PHD	65*	Worcester Polytechnic Inst	BS, 12	3.3	154, 156 (61%, 68%)	Weinmann Amy	13-present	
IMMUNE_PHD	66*	Univ of Wisconsin-Superior	BS, 13	3.76	151, 154 (49%, 57%)	Lund Frances	14-present	
MICBY_PHD	67	Shandong Univ-China	BA, 10	3.73	620, 800	Elson Charles	10-present	
MICBY_PHD	68*	Georgia Institute of Tech	BS, 08	3.03	650, 800	Goepfert Paul	10-present	
MICBY_PHD	69*	Univ of Pennsylvania	NA, 09	3.1	530, 680 (70%, 66%)	Wu Hui	10-present	
MICBY_PHD	70	Henan University of Science & Technology	MA, 10	3.48	350, 780	Wu Hui	11-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergraduate GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Current Research Mentor	Years in Program	Leave Column Blank
MICBY_PHD	71*	Rochester Inst of Technology	BS, 11	3.5	160, 147 (86%, 40%)	Atkinson Prescott	12-present	
MICBY_PHD	72*	Univ of North Carolina	BS, 11	3.2	151, 153 (51%, 65%)	Kearney John	12-present	
MICBY_PHD	73	Peking Union Med Coll-China	MS, 12	3.83	155, 166 (69%, 94%)	Schroeder Harry	12-present	
MICBY_PHD	74*	Northwestern St - Univ of LA	BS, 12	3.81	147, 149 (36%, 49%)	Steele Chad	12-present	
MICBY_PHD	75*	Univ of Central Florida	BS, 11	3.99	156, 157 (72%, 77%)	Wu Hui	12-present	
MICBY_PHD	76*	Bethune-Cookman College	BS, 12	3.62	149, 152 (40%, 52%)	Weinmann Amy	13-present	
MICBY_PHD	77*	Mississippi College	MS, 14	4	157, 150 (73%, 41%)	Steele Chad	14-present	
NERROBY_PHD	78*	Emory University	BS, 08	3.73	33	Standaert David	08-present	
NEUR_SC_PHD	79*	Grand Valley Staet University	BS, 13	3.68	33	Standaert David	13-present	
PATHO_PHD	80*	Judson College-Marion	BS, 08	3.96	na	McDougall Mary	08-present	
PATHO_PHD	81*	Old Dominion University	BS, 08	3.12	660, 620 (94%, 53%)	Kearney John	08-present	
PATH_MOL_PHD	82*	Bloomsburg Univ of Penn	MS, 10	3.9	530, 760	Bamman Marcas	10-present	
PATH_MOL_PHD	83	Univ of Alabama in Birmingham	MS, 10	3.13	560, 800	Thannical Victor	10-present	
PATH_MOL_PHD	84*	Univ of Connecticut	MA, 11	4	520, 710	Bamman Marcas	11-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Undergraduate GPA	GRE Scores V, Q, A, S (Percentiles) and/or MCAT Scores	Current Research Mentor	Years in Program	Leave Column Blank
PATH_MOL_PHD	85*	Alcorn State University	BS, 11	3.56	500, 580 (84%, 41%)	Chatham John	11-present	
PATH_MOL_PHD	86*	Capital University	BS, 09	3.77	32	Thannickal Victor	12-present	
PATH_MOL_PHD	87*	Univ of Alabama	BS, 12	4	163, 155 (93%, 69%)	Yang Yang	12-present	
PATH_MOL_PHD	88*	Jacksonville State University	BS, 13	3.96	151, 159 (49%, 77%)	Bellis Susan	13-present	
PATH_MOL_PHD	89*	California St Univ-San Marcos	BS, 13	3.24	154, 157 (61%, 71%)	Floyd Candace	13-present	
PATH_MOL_PHD	90*	Millsaps College	BS, 14	3.5	157, 159 (73%, 75%)	Raman Chander	14-present	

Program Statistics

Total Number of Trainees	Number of TGE Trainees	Average GPA	Average GRE / MCAT Scores
90	71	3.60	Old GRE V, Q: 550, 710 New GRE V, Q: 156, 155 MCAT: 34

*Training grant eligible

**NA, Not available/applicable

Table 9B. Qualifications of the Current Postdoctoral Trainees Clearly Associated with the Training Program

(New Applications)

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Biochem & Molecular Genetics	1*	UAB	PhD, 09	Polycistronic lentiviral vector for hit and run reprogramming of mouse and human somatic cells to induced pluripotent stem cells	NA	T. Townes	09-present	
Biochem & Molecular Genetics	2	University of Iowa	PhD, 10	Characterization of telomeric defects and signal transduction pathways in Dyskeratosis Congenita cells	NA	T. Townes	10-present	
Biochem & Molecular Genetics	3*	UAB	PhD, 11	Sox2/parylated parp1 complexes regulate pluripotency	NA	T. Townes	11-present	
Biochem & Molecular Genetics	4	UAB	PhD, 12	Structural and molecular studies of nucleic acid chaperones	NA	T. Townes	12-present	
Biostatistics	5*	Emory U.	PhD, 13	Oxidative Stress and Health Outcomes	NA	G. Howard	13-present	
Cell, Devel,& Int Biology	6*	University of Alabama at Birmingham	PhD, 14	Function of primary cilia in the development of the mouse mammary gland and endochondral bone formation	NA	R. Serra	14-present	
Cell, Devel,& Int Biology	7*	SUNY-Albany	PhD, 14	Role of TGF-ß in tooth development.	NA	R.Serra	14-present	
Cell, Devel,& Int Biology	8*	UAB	PhD,	Role of glycosylation in tumor cell survival	NA	S. Bellis	15-present	
Dermatology	9*	Ohio State U.	PhD, 15	Chemoprevention of ultraviolet radiation induced skin cancer	NA	N. Yusuf	13-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Energetics	10*	Morehouse Sch of Medicine	PhD, 13	Nutritional Complications of Sickle Cell Disease	NA	D. Allison	13-present	
Epidemiology	11*	UAB	PhD, 11	Cardiovascular disease prevention, treatment and outcomes	NA	P. Muntner	12-present	
Institute of Oral Health	15*	UAB	PhD, 10	Mechanisms by which TRA-8 anti-DR5 antibody and chemotherapy enhance cytotoxicity in breast cancer”	NA	M. MacDougall	10-present	
Institute of Oral Health	16	Hamdard University, New Delhi, India	PhD, 10	Molecular mechanisms initiating the mineralization process.	NA	D. Napierala	10-present	
Institute of Oral Health	14*	Dartmouth College, Hanover	PhD, 11	Molecular interaction of adipose tissue and skeleton in aging	NA	A. Javed	12-present	
Institute of Oral Health	15*	Howard U.	DDS, 12	NA	UAB	M. MacDougall	12-present	
Institute of Oral Health	16*	UAB	PhD, 13	Selection and Evolution of Pneumococci in Response to Conjugate Vaccines	NA	M. MacDougall	13-present	
Institute of Oral Health	17	UAB	PhD, 14	Mechanisms of runt related transcription factor 2 (Runx2) and Sp7 tissue and cell-specific regulatory control during skeletogenesis	NA	A. Javed	14-present	
Med – Immunology & Rheum	18	National School of Biol Sciences, Natl Polytechnic Institute, Mexico	PhD, 10	Role of IL-22 in BALT development and function	NA	T. Randall	11-present	
Med – Immunology & Rheum	19*	Dartmouth U.	PhD, 12	Characterization of central and effector memory B cells	NA	T. Randall	12-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Med – Immunology & Rheum	20	UAB	PhD, 12	Role of the preBCR in répertoire developement	NA	H. Schroeder	12-present	
Med - Pulmonary/ Allergy/Critical Care	21*	University of Mumbai Mumbai, India	PhD, 99	Post-translational regulation of NOX4	NA	V. Thannickal	12-present	
Med – Immunology & Rheum	22	National School of Biological Sciences, National Polytechnic Institute, Mexico, D. F.	PhD, 10	Role of omentum in anti-tumor immunity	NA	T. Randall	13-present	
Med - Preventive Medicine	23*	Oklahoma U.	MD, 12	NA	UAB	K. Saag	13-present	
Med - Preventive Medicine	24*	Florida U.	PhD, 13	Patient-reported outcomes in hematopoietic stem cell transplant survivors	NA	K. Saag	13-present	
Med - Preventive Medicine	25*	Michigan U.	PhD, 11	African American adolescents' parental, peer, and partner relationships and sexual risk	NA	K. Saag	14-present	
Med - Preventive Medicine	26*	UAB	PhD, 14	A mixed methods study of health literacy and its role in HPV vaccine uptake among college students	NA	K. Saag	14-present	
Med - Preventive Medicine	27*	UAB.	PhD, 14	Physician-parent interactions in pediatric end-of-life care: implications for integrative communication, decision-making and ethics training	NA	M. Fouad	14-present	
Med - Pulmonary/ Allergy/Critical Care	28	University of Mysore Karnataka, India	PhD, 10	Mechanism for the dysregulation Nrf2 activation in aging	NA	V. Thannickal	14-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Med - Preventive Medicine	29*	Penn State	PhD, 14	An ecological approach to understanding adult obesity prevalence in the United States: a county-level analysis using geographically weighted regression	NA	K.Saag	15-present	
Med - Preventive Medicine	30*	Penn State	PhD, 14	An ecological approach to understanding adult obesity prevalence in the United States: a county-level analysis using geographically weighted regression	NA	M.Safford	15-present	
Med - Pulmonary/ Allergy/Critical Care	31*	Kempegowda Institute of Med Sci, Bangalore, India	MD, 06	AMPK in the resolution of age-related lung fibrosis	NA	V. Thannickal	14-present	
Microbiology	32	Loyola U.	PhD, 10	Role of AhR in B cell development and function	NA	J. Kearney	12-present	
Microbiology	33	University of Arizona	PhD, 10	Role of TRPM2 in regulating pulmonary inflammatory responses	NA	F. Lund	12-present	
Microbiology	34	University of Granada, Granada Spain	PhD, 10	Generation and characterization of human effector B cell subsets	NA	F. Lund	12-present	
Microbiology	35*	UAB	PhD, 12	Aberrant signaling in IgA1-producing cells in IgA nephropathy	NA	J. Novak	12-present	
Neurology	36*	UT Southwestern	PhD, 10	Inflammatory mechanisms in Parkinson Disease	NA	D. Standaert	10-present	
Neurology	37*	SUNY - Binghamton	PhD, 11	Molecular etiology of early onset torsion	NA	D. Standaert	11-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Nutrition Sciences	38*	U of SC	PhD, 12	Energy requirements and expenditure, economics, and health	NA	D. Allison	14-present	
Nutrition Sciences	39*	Conn U.	PhD, 12	The immediate and long lasting antihypertensive effects of aerobic exercise: a meta-analysis	NA	D.Allison	14-present	
Pathology	40	Jadavpur Univ , India	PhD, 07	Understanding the mechanism of peripheral tolerance in recent thymic emigrants	NA	C. Weaver	09-present	
Pathology	41	Foreign	PhD, 09	Investigating host regulation of *Helicobacter* induced pathology	NA	C. Weaver	09-present	
Pathology	42*	University of MN	PhD, 09	Studies of CD4 Tcell development, with an emphasis on the roles of IL-2 and IL-21 in T cell fate decisions	NA	C. Weaver	09-present	
Pathology	43	University of Leicester	PhD, 11	Diurnal variation in excitation -contraction coupling in rat ventricular myocytes	NA	J. Chatham	12-present	
Pathology	44*	UAB	PhD, 10	Transcriptional regulation of osteoclast lineage commitment and differentiation	NA	Y-P Li	13-present	
Pathology	45	Shangdong University/UAB	MD/PhD, 99	Novel regulator of Vascular Disease	NA	Y. Chen	14-present	
Pathology	46	Shanghai Jiao Tong University	MD, 07	NA	NA	X. Feng	14-present	
Pathology	47*	UAB	PhD, 14	ICAM-2 confers a non-metastatic phenotype in neuroblastoma cells by interaction with α-actinin.	NA	S. Ponnazhagan	14-present	

Department / Program	Trainee (List by Number)	Previous Institution(s)	Degree(s) & Year(s)	Doctoral Thesis or Other Previous Research Experience & Research Advisor (If Relevant)	Residency Training Institution	Current Research Mentor	Years in Program	Leave Column Blank
Pathology	48*	Indiana U.	PhD, 13	Twist1 and Etv5 are part of a transcription factor network defining T helper cell identity	NA	C. Weaver	14-present	
Pediatric Dentistry	49*	Auburn U.	PhD, 12	GlpR regulates the glycoxylate pathway and virulence factor production by *Pseudomonas aeruginosa*	NA	Hui Wu	12-present	
Physical Med&Rehab	50*	Emory U.	PhD, 09	Seizure susceptibility and epileptogenesis in depression-sensitive rats	NA	C. Floyd	13-present	
Physical Med&Rehab	51*	UAB	PhD, 12	Mitochondrial morphology and function in neuronal cells under stress	NA	C. Floyd	13-present	
Psychology	52	Foreign	PHARM, 13	Neuroimaging of Pain	NA	J. Younger	14-present	
Psychology	53	Foreign	PhD, 13	Moral elevation and the brain neuroimmodulatory pharmacotherapy in pain: therapy and outcomes	NA	J. Younger	14-present	
SPH Assoc Dean Office for Science	54*	Iowa St. U.	PhD, 12	The evolution of stress response and complex life history traits in natural populations of garter snakes	NA	D. Allison	13-present	

Program Statistics

Total Number of Trainees	Number of TGE Trainees
54	36

Table 10: Admissions and Completion Records for Underrepresented Minority (URM) Trainees, Trainees with Disabilities, and Trainees from Disadvantaged Backgrounds Clearly Associated With the Training Program

OMB Number 0925-0001 (Rev. 8/12 Approved Through 8/31/2015)

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	1*	2012 (Pre)	Biology	Cancer Prevention and Control Training Program; R25 CA047888	Y			Graduate Student, Biology, UAB
URM Trainee	2*	2014 (Pre)	Biology	NSF LSAMP	Y			Graduate Student, Biology, UAB
URM Trainee	3*	2014 (Pre)	Biostatistics	Grad Res Asst	Y			Graduate Student, Biostatistics, UAB
URM Trainees	4*	2011 (Pre)	Biostatistics	University funds	Y			Graduate Student, Biostatistics, UAB
URM Trainees	5*	2011 (Pre)	Biostatistics	T32 - NHBLI	Y			Graduate Student, Biostatistics, UAB
URM Trainees	6*	2008 (Pre)	Biostatistics	University funds			Y	Finish w/MS Degree Biostatistics, UAB
URM Trainees	7*	2007 (Pre)	Biostatistics	Combi RX Grant		Y		Research Biostatistician, Univ Hawaii-Manoa
URM Trainees	8*	2007 (Pre)	Biostatistics	T32HL079888			Y	Chg to Adm Hlth Svc Prog - SU09
URM Trainee	9*	2013 (Pre)	BME	1R01AR062507-03	Y			Graduate Student, BME, UAB
URM Trainees	10*	2013 (Pre)	BME	Bridge to Doctorate Fellowship	Y			Graduate Student, BME, UAB
URM Trainees	11*	2010 (Pre)	BME	Bridge to Doctorate Fellowship	Y			Graduate Student, BME, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	12*	2014 (Pre)	EPI_PHD	Grad Sch Fellowship	Y			Graduate Student, Epidemiology, UAB
URM Trainee	13*	2012 (Pre)	EPI_PHD	Grad Sch Fellowship	Y			Graduate Student, Epidemiology, UAB
URM Trainee	14*	2011 (Pre)	EPI_PHD	Grad Sch Fellowship			Y	Left with MS, Epidemiology, UAB; Resident, Psychiatry, UAB
URM Trainee	15*	2011 (Pre)	EPI_PHD	Nutrition Obesity Research Center; T32HL105349		Y		PhD, April 2015
URM Trainee	16*	2011 (Pre)	EPI_PHD	Grad Sch Fellowship	Y			Graduate Student, Epidemiology, UAB
URM Trainee	17*	2010 (Pre)	EPI_PHD	Cancer Prev & Control Training Program 5 R25 CA04788		Y		Unknown
URM Trainee	18*	2010 (Pre)	EPI_PHD	Grad Sch Fellowship			Y	Statistician II, Jaeb Center for Health Research
URM Trainee	19*	2010 (Pre)	EPI_PHD	Grad Sch Fellowship			Y	MSPH, UAB Minority Health and Health Disparities Research Center
URM Trainee	20*	2010 (Pre)	EPI_PHD	Cancer Prev & Control Training Program 5 R25 CA04788			Y	Unknown

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	21*	2014 (Pre)	BYC_STRC_PHD	GS Fellowship; Bridge to Doctorate	Y			Graduate Student, BYC_STRC_PHD, UAB
URM Trainee	22*	2013 (Pre)	BYC_STRC_PHD	GS Fellowship; EDEP Fellowship**	Y			Graduate Student, BYC_STRC_PHD, UAB
URM Trainee	23*	2013 (Pre)	BYC_STRC_PHD	GS Fellowship	Y			Graduate Student, BYC_STRC_PHD, UAB
URM Trainee	24*	2010 (Pre)	BYC_STRC_PHD	GS Fellowship; Departmental Funds			Y	Senior Research Scientist at Microbial Insights, Inc. Knoxville TN
URM Trainee	25*	2014 (Pre)	CNCER BY	Bridge to Doctorate	Y			Graduate Student, Cancer Biology, UAB
URM Trainee	26*	2011 (Pre)	CNCER BY	Bridge to Doctorate R01DK058259;	Y			Graduate Student, Cancer Biology, UAB
URM Trainee	27*	2011 (Pre)	CNCER BY	GS Fellowship			Y	Research Technician, Memorial Sloan-Kettering Cancer Center
URM Trainee	28*	2011 (Pre)	CNCER BY	GS Fellowship R01CA137000			Y	PhD Student at Wake Forest University(left w/ mentor)
URM Trainee	29*	2011 (Pre)	CNCER BY	GS Fellowship Mentor Start Up Funds	Y			Graduate Student, Cancer Biology, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	30*	2010 (Pre)	CNCER BY	HHMI Med to Grad Fellowship; CMFSDP** Fellowship	Y			Graduate Student, Cancer Biology, UAB
URM Trainee	31*	2010 (Pre) *(Transfer in w/advisor)*	Cell Biology	T32NS048039		Y		Postdoctoral Fellow, Chicago
URM Trainee	32*	2006 (Pre)	Cell Biology	GS Fellowship; CMFSDP Fellowship;		Y		Postdoc, Feinberg SOM, Northwestern U.
URM Trainee	33*	2005 (Pre)	Cell Biology	GS Fellowship; NSF research grant;		Y		Postdoc, Emory, Cell Biology
URM Trainee	34*	2009 (Pre)	CMB	GS Fellowship, R01HL096702		Y		MBA Student, UAB
URM Trainee	35*	2008 (Pre)	CMB	GS Fellowship; UAB Research Foundation; F31AI102594;		Y		Postdoc Trainee, U. of Colorado
URM Trainee	36*	2007 (Pre)	CMB	GS Fellowship, R01GM068854		Y		Postdoc Trainee, UNC
URM Trainee	37*	2007 (Pre)	CMB	GS Fellowship, R01HL008317			Y	ASPH fellow at US Department of Transportation (DOT) Arlington VA
URM Trainee	38*	2007 (Pre)	CMB	NIH Training Grant T32AI070415 (83%) State Account (17%)		Y		Postdoc, National Biosafety and Biocontainment Training Program (NBBTP), NIH
URM Trainee	39*	2007 (Pre)	CMB	GS Fellowship, R01AI028457		Y		Postdoc Trainee, New York U.

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	40*	2007 (Pre)	CMB	GS Fellowship T32GM8111; NIH Federal Contract HHSN266200400036 C-52		Y		Postdoc, Microbiology, UAB
URM Trainee	41*	2006 (Pre)	CMB	GS Fellowship; University Funds			Y	MPH-UAB; Nursing student, Duke Univ Sch Nursing
URM Trainee	42*	2006 (Pre)	CMB	T32GM008111 (83%) State Account (17%)			Y	MS, MPH degrees; ORISE Fellow, CDC
URM Trainee	43*	2006 (Pre)	CMB	GS Fellowship; Emory University 5-21210-G1; F31AI085970		Y		Postdoc Trainee, Duke Human Vaccine Institute
URM Trainee	44*	2002 (Pre)	CMB	GS Fellowship; T32NS048039; T32NS07441		Y		Research Assoc, UAB
URM Trainee	45*	2005 (Pre)	CMB	GAANN 2006			Y	Pharmacist, Phoebe Putney Memorial Hospital, Albany GA
URM Trainee	46*	2005 (Pre)	CMB	University Funds 2005; 62.5% K12AI05760 38% Non Federal Source			Y	Research tech, Southern Research Institute
URM Trainee	47*	2005 (Pre)	CMB	GS Fellowship; R01GM085105		Y		Clinical embryologist, Kirklin Clinic

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	48*	2005 (Pre)	CMB	GAANN** 2006; CMFSDP (50%) University Funds (10%) ; T32GM08111		Y		Postdoc, Baylor College Med, Breast Center, Fuqua Laboratory
URM Trainee	49*	2005 (Pre)	CMB	R01 CA10085			Y	Microbiology Lab Coordinator and Instructor, Our Lady of the Lake College, Baton Rouge LA
URM Trainee	50*	2004 (Pre)	CMB	GAANN 2005 & 2006; 90.3% T32 AI07051 9.7% Non Federal Source; F31AI077305		Y		Biology Lab Instructor, Barnard College
URM Trainee	51*	2014 (Pre)	CMDB	GS Fellowship; Bridge to Doctorate	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	52*	2014 (Pre)	CMDB	GS Fellowship;	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	53*	2013 (Pre)	CMDB	GS Fellowship: Bridge to Doctorate	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	54*	2013 (Pre)	CMDB	GS Fellowship; Bridge to Doctorate	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	55*	2013 (Pre)	CMDB	T90DE022736	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	56*	2011 (Pre)	CMDB	GS Fellowship; T32GM008111	Y			Graduate Student, Dept of CMDB, UAB
URM Trainee	58*	2013 (Pre)	GGS	GS Fellowship	Y			Graduate Student, GGS, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	59*	2012 (Pre)	GGS	GS Fellowship; Cystic Fibrosis Ctr	Y			Graduate Student, GGS, UAB
URM Trainee	60*	2012 (Pre)	GGS	GS Fellowship; International Rett Syndrome Foundation	Y			Graduate Student, GGS, UAB
URM Trainee	61*	2009 (Pre)	IBS	GS Fellowship R21AI088498			Y	Assistant Curriculum Coordinator/Advisor, Virginia State Univ
URM Trainee	62*	2008 (Pre)	IBS	GS Fellowship			Y	Medical School Student
URM Trainee	63*	2008 (Pre)	IBS	GS Fellowship; T32 HL007918			Y	MSBMS degree, UAB; Surgical PA program, UAB
URM Trainee	64*	2008 (Pre)	IBS	GS Fellowship; CMFSDP Fellowship		Y		Postdoc Trainee, Emory University
URM Trainee	65*	2008 (Pre)	IBS	GS Fellowship; F31AI094961	Y			Graduate Student Dept of Pathology, UAB
URM Trainee	66*	2008 (Pre)	IBS	HHMI Med to Grad Fellowship; Bridge to Doctorate	Y			Graduate Student Dept of Pathology, UAB
URM Trainee	67*	2007 (Pre)	IBS	Comprehensive Cancer Center Gala Funds		Y		Postdoc, Morehouse School of Medicine, Atlanta GA
URM Trainee	68*	2007 (Pre)	IBS	Alabama Minority Fellowship 84%; Comprehensive Cancer Center Gala Funds 16%		Y		Postdoc, Moffitt Cancer Center, Tampa FL

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	69*	2007 (Pre)	IBS	GS Fellowship;			Y	MS, UAB Secondary Education; Huffman High School, Birmingham; National Math and Science Initiative's All-American Teacher of the Year, 2011
URM Trainee	70*	2007 (Pre)	IBS	GS Fellowship; NIH R01 Grant		Y		Postdoc, UAB, Dept of Pharmacology
URM Trainee	71*	2007 (Pre)	IBS	GS Fellowship; Mentor R01; R24		Y		Postdoc, UAB, Dept of Pathology
URM Trainee	72*	2006 (Pre)	IBS	State Impact funds 3110764			Y	MSBMS, UAB; Atlata Guru, Brooks Running
URM Trainee	73*	2006 (Pre)	IBS	HHMI Med to Grad Fellowship Program Funds			Y	Deceased
URM Trainee	74*	2006 (Pre)	IBS	GS Fellowship; CMFSDP			Y	Unknown
URM Trainee	75*	2006 (Pre)	IBS	GS Fellowship; Departmental Funds; F31DK084798		Y		Assistant Professor, University of West Florida
URM Trainee	76*	2005 (Pre)	IBS	Dept Funds; Mentor R01; Minority Supplement to Mentor R01		Y		Postdoc Trainee, Dept of Pathology, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	77*	2005 (Pre)	IBS	GS Fellowship; Research Supplement to Promote Diversity in Health-Related Research linked to parent grant AA15172		Y		Asst Professor, Biology, Southern Polytechnic State Univ, GA
URM Trainee	78*	2005 (Pre)	IBS	Dept Funds; Mentor R01; Minority Supplement to Mentor R01		Y		Senior Director of Research and Assessment at CE Outcomes, LLC
URM Trainee	79*	2005 (Pre)	IBS	GS Fellowship			Y	Postdoc, Emory University Vaccine Center
URM Trainee	80*	2014 (Pre)	IMMUNE	GS Fellowship; EDEP Fellowship**	Y			Graduate Student, Immunology, UAB
URM Trainee	81*	2014 (Pre)	IMMUNE	GS Fellowship;	Y			Graduate Student, Immunology, UAB
URM Trainee	82*	2014 (Pre)	IMMUNE	GS Fellowship; Bridge to Doctorate	Y			Graduate Student, Immunology, UAB
URM Trainee	83*	2010 (Pre)	IMMUNE	GS Fellowship; ARRA; T32AI007493	Y			Graduate Student, Immunology, UAB
URM Trainee	84*	2014 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			MS1 Medical Student, UAB SOM

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	85*	2013 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			MS2 Medical Student, UAB SOM
URM Trainee	86*	2012 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			Graduate Student, Immunology, UAB
URM Trainee	87*	2012 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			Graduate Student, Cancer Biology, UAB
URM Trainee	88*	2010 (Pre)	MSTP	MSTP T32 5T32GM008361; MD PhD Institutional Funds; UAB Graduate School Funds; F31HL120614	Y			Graduate Student, Biochemistry & Structural Biology, UAB
URM Trainees	89*	2009 (Pre)	MSTP	MSTP T32 5T32GM008361; MD PhD Institutional Funds; UAB Graduate School Funds	Y			Graduate Student, Neuroscience, UAB
URM Trainees	90*	2008 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds		Y		MS4 Medical Student, UAB SOM

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	91*	2007 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds; Mentor Research Funds		Y		MS3 Student/MSTP, UAB SOM
URM Trainees	92*	2007 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds; Mentor Research Funds		Y		MS4 Student/MSTP, UAB SOM
URM Trainees	93*	2007 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds			Y	Academic Dismissal, 10/2008, transferred to Mercer Univ SOM, graduated 2012, currently a resident at Baylor College of Medicine, Houston, TX
URM Trainees	94*	2006 (Pre)	MSTP	MSTP T32 5T32GM008361; MD PhD Institutional Funds; UAB Graduate School Funds, T32AI0007041; Mentor Research Funds; 1F31AI093103		Y (2014)		Residency in Internal Medicine (Research Track), Barnes-Jewish Hospital, St. Louis, MO

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	95*	2004 (Pre)	MSTP	NIH 5T32AI07493, MD PhD Institutional Funds, UAB Graduate School Funds; T32 AI007493; Mentor Research Funds		Y (2013)		Residency in Pediatrics, Baylor College of Medicine, Houston, TX
URM Trainees	96*	2002 (Pre) (transfer from Tulane MD/PhD to UAB MSTP in 2006 after Hurricane Katrina)	MSTP	NIH 3F31CA110206; MD PhD institutional Funds; Mentor Research Funds		Y (2012)		Postdoctoral Fellow, NIH Clinical Center, Department of Perioperative Medicine (2012- 2014); Residency in Family Medicine, Cahaba Medical Care, Centreville, AL
URM Trainees	97*	2013 (Pre)	MICBY	GS Fellowship; CMFSDP Fellowship	Y			Graduate Student, Microbiology, UAB
URM Trainees	98*	2013 (Pre)	MICBY	GS Fellowship; EDEP Fellowship	Y			Graduate Student, Microbiology, UAB
URM Trainee	99*	2012 (Pre)	MICBY	GS Fellowship; CMFSDP Fellowship	Y			Graduate Student, Microbiology, UAB
URM Trainee	100*	2012 (Pre)	MICBY	GS Fellowship; EDEP Fellowship	Y			Graduate Student, Microbiology, UAB
URM Trainee	101*	2011 (Pre)	MICBY	GS Fellowship; T32AI007493	Y			Graduate Student, Microbiology, UAB
URM Trainee	102*	2011 (Pre)	MICBY	GS Fellowship F31AI106288	Y			Graduate Student, Microbiology, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainee	103*	2010 (Pre)	MICBY	GS Fellowship; CMFSDP Fellowship; R01DE017954 F31DE024041	Y			Graduate Student, Microbiology, UAB
URM Trainee	104*	2010 (Pre)	MICBY	GS Fellowship Departmental funds; R01A1028457; F31AI104172	Y			Graduate Student, Microbiology, UAB
URM Trainee	105*	2014 (Pre)	NSC	GS Fellowship	Y			Graduate Student, Neuroscience, UAB
URM Trainees	106*	2009 (Pre)	NSC	CMFSDP Fellowship; T32HL105349; Ellison Medical Foundation UNCF-Merck Dissertation Award		Y		Postdoc, Harvard
URM Trainees	107*	2008 (Pre)	NSC	CMFSDP Fellowship; R01NS047533		Y		Postdoc, UC Davis
URM Trainees	108*	2007 (Pre)	NSC	GS Fellowship; CMFSDP Fellowship; T32NS061788; Departmental Funds		Y		Teach for America, Rochelle Middle School, Kinston, NC
URM Trainees	109*	2007 (Pre)	NSC	Departmental Funds		Y		Postdoc Trainee, Emory University
URM Trainees	110*	2014 (Pre)	PBMM	GS Fellowship; Bridge to Doctorate	Y			Graduate Student, PBMM, UAB
URM Trainees	111*	2014 (Pre)	PBMM	Georgia Regents University	Y			Graduate Student, PBMM, UAB
URM Trainees	112*	2014 (Pre)	PBMM	5P01HL095499-05	Y			Graduate Student, PBMM, UAB
URM Trainees	113*	2013 (Pre)	PBMM	GS Fellowship			Y	Graduate Student, Env Health Sci, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	114*	2013 (Pre)	PBMM	GS Fellowship; EDEP Fellowship	Y			Graduate Student, PBMM, UAB
URM Trainees	115*	2013 (Pre)	PBMM	GS Fellowship; EDEP Fellowship	Y			Graduate Student, PBMM, UAB
URM Trainees	116*	2012 (Pre)	PBMM	GS Fellowship; AG Gaston Fellowship; Bridge to Doctorate	Y			Graduate Student, PBMM, UAB
URM Trainees	117*	2012 (Pre)	PBMM	GS Fellowship; HMG; Departmental Funds; Bridge to Doctorate	Y			Graduate Student, PBMM, UAB
URM Trainees	118*	2011 (Pre)	PBMM	GS Fellowship			Y	Teacher, High school chemistry
URM Trainees	119*	2011 (Pre)	PBMM	GS Fellowship; R01HL101192	Y			Graduate Student, PBMM, UAB
URM Trainees	120*	2007 (Pre)	Pathology	F31HL102910		Y		Postdoc Trainee, UAB
URM Trainees	121*	2007 (Pre)	Pathology	HHMI Med to Grad Fellowship Program W81XWH-11-1-0151		Y		Postdoc Trainee, U. Michigan
URM Trainees	122*	2006 (Pre)	Pathology	Departmental Funds			Y	Unknown
URM Trainees	123*	2003 (Pre)	Pathology	Departmental funds		Y		Faculty, Stillman College, Tuscaloosa AL
URM Trainees	124*	2002 (Pre)	Pathology	F31HL102910		Y		Postdoc, RTI International, Durham NC
URM Trainees	125*	2011 (Post)	Biology	K12GM088010		Y		Instructor, Biology, LSU

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	126*	2010 (Post)	Biology	K12GM088010 NIH R01 Grant		Y		Asst Prof, Biology, Stillman College
URM Trainees	127*	2012 (Post)	Biostatistics	2T32HL072757		Y		Asst Prof, Biostatistics, UAB
URM Trainees	128*	2011 (Post)	Biostatistics	T32HL072757 T32DK062710		Y		Risk Assessment Statistician, Food and Drug Administration
URM Trainees	129	2010 (Post)	Biostatistics	5T32HL072757		Y		Postdoc, U. of Florida
URM Trainees	129*	2009 (Post)	Biostatistics	T32HL072757		Y		Assistant Professor of Statistics, Department of Mathematics and Statistics, University of Maryland, Baltimore County
URM Trainees	130*	2008 (Post)	Biostatistics	T32NS054584		Y		Asst Professor, Biostatistics, UAB
URM Trainees	131*	2007 (Post)	Biostatistics	T32HL072757		Y		Kings College. London, St Thomas Hospital
URM Trainees	132*	2006 (Post)	Biostatistics	T32AI07493		Y		Assistant Professor at Wake Forest University Health Sciences
URM Trainees	133*	2006 (Post)	Biostatistics	R01DK067487		Y		Operations Research Analyst, Alexandria VA
URM Trainees	134*	2005 (Post)	Biostatistics	R01AR052658-03S1		Y		Assistant Professor Department Mathematics and Statistics Old Dominion University

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	135*	2005 (Post)	Cell Biology**	T32HL009718			Y	Asst Prof, Cal State Univ
URM Trainees	136*	2011 (Post)	Cell Developmntl & Integrative Biology	K12GM088010; R01AA013395 F32AR061246	Y			Postdoc, Cell Developmntl & Integrative Biology, UAB
URM Trainees	137*	2011 (Post)	Cell Developmntl & Integrative Biology	McMahon impact account	Y			Postdoc, CDIB, UAB
URM Trainees	138*	2012 (Post)	Epidemiology	Thomas start up account	Y			Postdoc, Epidemiology, UAB
URM Trainees	139*	2010 (Post)	Epidemiology	Amgen 200622492		Y		Asst Prof, Epidemiology UAB
URM Trainees	140*	2013 (Post)	Med – Immunology	GME	Y			Fellow, Immunology/Rheum UAB
URM Trainees	141*	2011 (Post)	MED – Imm/Rheum	5T32AR007450-30		Y		Assistant Professor of Biology, Paine College, GA
URM Trainees	142*	2011 (Post)	MED – Imm/Rheum	GME		Y		Rheumatologist, Trinity Med Ctr, Palm Beach Gardens FL
URM Trainees	143*	2009 (Post)	MED – Imm/Rheum	T32AR007450		Y		Assistant Professor, Med-Immunology/Rheumatology, UAB
URM Trainees	144*	2005 (Post)	MED – Imm/Rheum	T32 AR007450-29		Y		Rheumatologist – Private Practice Anniston, AL
URM Trainees	145*	2014 (Post)	Med - Preventive	T32HS013852	Y			Postdoc, Med - Preventive

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	146*	2014 (Post)	Med - Preventive	T32HS013852	Y			Postdoc, Med - Preventive
URM Trainees	147*	2014 (Post)	Med - Preventive	R01CA160313	Y			Postdoc, Med - Preventive
URM Trainees	148*	2010 (Post)	Med - Preventive	T32HS019463		Y		Director of Pharmacy, Delta Health Center
URM Trainees	149*	2009 (Post)	Med - Preventive	P60DK079626		Y		Director, Univ Health Services, Univ North AL
URM Trainees	150*	2009 (Post)	Med - Preventive	T32HS013852		Y		Assistant Professor, UAB
URM Trainees	151*	2005 (Post)	Med - Preventive	R25CA47888; U01CA093329		Y		Institute Gerontology, SOPH, Univ Georgia
URM Trainees	152*	2012 (Post)	Med –Pulmonary Disease/Critical Care	Graduate Medical Education	Y			Postdoc, Med-Pulmonary Disease/Critical Care
URM Trainees	153*	2007 (Post)	Med –Pulmonary Disease/Critical Care	Graduate Medical Education		Y		Pulmonologist, Internal Medicine McAllen, TX
URM Trainees	154*	2009 (Post)	Microbiology	T32AI007051		Y		Scientific Publications Manager, Grifols, Raleigh-Durham NC
URM Trainees	155*	2008 (Post)	Microbiology	P30DK072482		Y		Asst Prof, AL State Univ, Montgomery AL
URM Trainees	156*	2008 (Post)	Microbiology	R01 HL088642		Y		Postdoc, University of California, Los Angeles
URM Trainees	157*	2007 (Post)	Microbiology	R01 AI072647		Y		Lawson State Community College

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	158*	2007 (Post)	Microbiology	R01 AI044626-		Y		Assistant Professor Department of Chemistry and Chemical Biology Indiana University-Purdue University.
URM Trainees	159*	2007 (Post)	Microbiology	UAB Research Foundation; T32AI007051		Y		Health Science Policy Analyst, NIH, Washington DC
URM Trainees	160*	2006 (Post)	Microbiology	5T32AI007493-14		Y		Investigator, FDA, Atlanta
URM Trainees	161*	2004 (Post)	Microbiology	R01 GM068854; AHA 0255121B; T32 AI07140			Y	Assoc Director, Hematology, Biogen IDEC Research
URM Trainees	162*	2003 (Post)	Microbiology	R01 AI28457			Y	Director of Diversity Affairs, Office of Biomedical Graduate Education, UNC
URM Trainees	163*	2012 (Post)	Institute of Oral Health	5T90DE022736-03	Y			Postdoc, Oral Health, UAB
URM Trainees	164*	2014 (Post)	Pathology	5P50CA101955-10; 5U54CA118948-08; 5UM1CA183728-02	Y			Postdoc, Pathology, UAB
URM Trainees	165*	2013 (Post)	Pathology	2R01AR044741-11A1				Postdoc, Pathology, UAB
URM Trainees	166*	2013 (Post)	Pathology	T32HL007457	Y			Postdoc, Pathology, UAB
URM Trainees	167*	2011 (Post)	Pathology	T32DK007545		Y		Instructor, Pathology, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	168*	2011 (Post)	Pathology	R01HL101192		Y		Postdoc, Atherotech Diagnostics
URM Trainees	169*	2009 (Post)	Pathology	T32AI007051	Y			Postdoc, Pathology, UAB
URM Trainees	170*	20007 (Post)	Pathology	Crohns and Colitis Foundation of America		Y		Instructor, Pathology, UAB
URM Trainees	171*	2008 (Post)	Pathology	AHA 0455296B		Y		Research Associate, Pathology, UAB
URM Trainees	172*	2006 (Post)	Pathology	T32AI007051		Y		Medtronic, 1800 Pyramid Place, Memphis, TN
URM Trainees	173*	2004 (Post)	Pathology	NASA NNJ04HB27G; R01CA109119;			Y#	Postdoc, RTI International, Durham NC
URM Trainees	174*	2004 (Post)	Pathology	R01DK062071; T32GM063490		Y		Asst Professor, Environmental Health Sciences, LSU
URM Trainees	175*	2012 (Post)	Pediatrics	AMBAL-IMPACT FUNDS	Y			Postdoc, Pediatrics, UAB
URM Trainees	176*	2014 (Post)	Pediatrics	K12GM088010	Y			Postdoc, Pediatrics, UAB
URM Trainees	177*	2012 (Post)	Pediatric Dentistry	5T90DE022736-03	Y			Postdoc, Pediatric Dentistry, UAB
URM Trainees	178*	2011 (Post)	Physiology & Biophysics**	T32DK007545; R01DK037206		Y		Sr Medical Writer at CONNEXION Healthcare
URM Trainees	179*	2007 (Post)	Physiology & Biophysics**	PI funds T32AI007051		Y		Asst Professor, Tenure Track, Univ South AL

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
URM Trainees	180*	2007 (Post)	Physiology & Biophysics**	RO DK54367; T32HL007553			Y[#]	Asst Prof, Biochemistry, The University of Texas Health Center at Tyler,
URM Trainees	181*	2004 (Post)	Physiology & Biophysics**	T32 DK007545		Y		Medical Science Liaison, Genzyme
Trainees with Disabilities^	1*	2014 (Pre)	BYC_STRC_PHD	Graduate School Fellowship	Y			Graduate Student, BYC_STRC_PHD
Trainees with Disabilities	2*	2006 (Pre)	CMB	HHMI Med to Grad Fellowship Program Departmental funds			Y	MSBMS degree, UAB
Trainees with Disabilities	3*	2010 (Pre)	CMDB	HHMI Med to Grad Fellowship Program	Y			Graduate Student, Dept of CMDB, UAB
Trainees with Disabilities	4*	2013 (Pre)	Cancer Biology	Graduate School Fellowship	Y			Graduate Student, Cancer Biology Theme
Trainees with Disabilities	5*	2007 (Pre)	IBS	GS Fellowship; Departmental funds			Y	Research technician, Southern Research Institute
Trainees with Disabilities	6*	2006 (Pre)	IBS	NIH Pass Through Subcontract to mentor		Y		Postdoc, Albert Einstein, NYC
Trainees with Disabilities	7*	2012 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			MS2 Medical Student, UAB SOM (currently on LOA for health reasons)
Trainees with Disabilities	8*	2011 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			MS2 Student, UASOM (did one year as a graduate student in between the MS1 and MS2 year)

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
Trainees with Disabilities	9* (also in URM and dis-advantaged groups)	2008 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds		Y		MS4, MSTP, UAB
Trainees with Disabilities	10* (also in dis-advantaged background group)	2008 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds		Y		MS4, MSTP, UAB
Trainees with Disabilities	11*	2008 (Pre)	MSTP	MD PhD Institutional Funds			Y	Deceased
Trainees with Disabilities	12* (also in URM and dis-advantaged background groups)	2007 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds			Y	Academic Dismissal, 10/2008, transferred to Mercer Univ SOM, graduated 2012, currently a resident at Baylor College of Medicine
Trainees with Disabilities	13* (also in URM Group)	2006 (Pre)	MSTP	NIH 3F31CA110206; MD PhD institutional Funds: Mentor Research Funds		Y		Postdoctoral Fellow, NIH Clinical Center, Department of Perioperative Medicine (2012- 2014); Residency in Family Medicine, Cahaba Medical Care, Centreville, AL

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
Trainees with Disabilities	14*	2006 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds			Y	Resident, Surgery, Univ. of Illinois Hospital, Chicago, IL
Trainees with Disabilities	15*	2006 (Pre)	MSTP	MSTP T32 5T32GM008361, MD PhD Institutional Funds, UAB Graduate School Funds			Y	Resigned from the program, currently reapplying to medical schools
Trainees with Disabilities	16*	2005 (Pre)	MSTP	MSTP T32 5T32GM008361, MD PhD Institutional Funds, UAB Graduate School Funds, NIH T32 AI007051; 1F30DK085898		Y		Residency in Internal Medicine, University of Texas, Southwestern
Trainees with Disabilities	17*	2004 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds; Mentor Research Funds		Y		Residency in Emergency Medicine, University of Nebraska, Omaha, NE
Trainees with Disabilities	18*	2004 (Pre)	MSTP	MSTP T32 5T32GM008361, MD PhD Institutional Funds, UAB Graduate School Funds, Mentor Research Funds			Y	Left program (8/2009) to become MD only student, UASOM, Psychiatry Resident, Univ. of Michigan Hospital, Ann Arbor, MI

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
Trainees with Disabilities	19*	2003 (Pre)	MSTP	MSTP T32 5T32GM008361, MD PhD Institutional Funds, UAB Graduate School Funds, Mentor Research Funds		Y (2013)		Residency in Internal Medicine (ABIM Research Pathway), University of Alabama at Birmingham
Trainees with Disabilities	20*	2012 (Pre)	NSC	R01NS065920	Y			Graduate Student, Neuroscience Theme
Trainees with Disabilities	21*	2010 (Pre)	NSC	GS Fellowship; T32NS061788-06	Y			Graduate Student, Neuroscience Theme
Trainees From Disadvantages Backgrounds^	1* (also in URM group)	2014 (Pre)	MSTP	MSTP T32 5T32GM008361 and MD PhD Institutional Funds	Y			MS1 Student, MSTP, UAB
Trainees from Disadvantaged Backgrounds	2*	2013 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds	Y			MS2 Student, MSTP, UAB
Trainees from Disadvantaged Backgrounds	3* (also in URM group)	2009 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds	Y			Graduate Student, Neuroscience Theme
Trainees from Disadvantaged Backgrounds	4* (also in disability group)	2008 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds		Y		MS4, MSTP, UAB

Diversity Recruitment Group***	Trainee (List by Number)	Entering Year (Pre/Post)	Department / Program	Source of Support and if Support by NRSA Grant***	In Training	Completed Training	Left Without Completing Training	Current Status Career or Employment
Trainees from Disadvantaged Backgrounds	5* (also in URM and disability groups)	2008 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds; UAB Graduate School Funds		Y		MS4, MSTP, UAB
Trainees from Disadvantaged Backgrounds	6* (also in URM and disability groups)	2007 (Pre)	MSTP	MSTP T32 T32GM008361 and MD PhD Institutional Funds			Y	Academic Dismissal, 10/2008, transferred to Mercer Univ SOM, graduated 2012, currently a resident at Baylor College of Medicine

*Training grant eligible

**GS Fellowship, Graduate School Fellowship for 1st year students; CMFSDP, UAB Comprehensive Minority Faculty and Student Development Program; EDEP, Equity& Diversity Enhancement Program; HMG, HHMI Med to Grad Fellowship; GAAN, Graduate Assistance in Areas of National Need (Dept Ed)

*** Disability information provided by the UAB Disability Support Services, UAB HR RAVE or by the UAB Physician Resource Office (MSTP students - Self identified on original AMCAS application). Disabilities include drug addiction, depression, agoraphobia, bipolar disorder, and attention deficit disorder.

^Among Disabled Trainees, two are also both URM and Disadvantaged; one is also URM; and one is also Disadvantaged.

^ Among Disadvantaged Trainees, two are also both URM and Disabled; two are also URM; and one is also Disabled.

These individuals are included in each appropriate cohort above.

14. LETTERS OF SUPPORT

Research Training Program (RTP) Executive Committee

1. S. Louis Bridges, Jr., MD, PhD *(PI and Director of this T32 Research Training Program)*
   Anna Lois Waters Professor, and Director, UAB Division of Clinical Immunology and Rheumatology
   Director, UAB Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
2. Kenneth G. Saag, MD, MSc (*Associate Director of this Research Training Program*)
   Jane Knight Lowe Professor of Medicine, UAB Division of Clinical Immunology and Rheumatology
   Vice Chair for Faculty Development, UAB Department of Medicine
   Director, Center for Outcomes and Effectiveness Research and Education (COERE)
   Director, Center for Education and Research on Therapeutics of Musculoskeletal Disorders (CERTs)
   Associate Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
3. Yi-Ping Li, PhD (*Associate Director of this Research Training Program*)
   Jay McDonald Professor of Pathology; Former Vice Director of the UAB Center for Metabolic Bone Disease
4. Marcas Bamman, PhD
   Professor of Cell, Developmental, and Integrative Biology
   Director, UAB Center for Exercise Medicine
5. Harry W. Schroeder, Jr., MD, PhD
   Professor of Medicine and *John Irby* Research Scholar, UAB Division of Clinical Immunology and Rheumatology
   Director, UAB Program in Immunology
   Associate Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
6. David D. Chaplin, MD, PhD
   Professor of Microbiology
   Director of the CCTS Training Academy, UAB Center for Clinical and Translational Science

Research Training Program (RTP) Internal Advisory Committee

7. Donna Arnett, PhD, MSPH – Professor and Chair, Department of Epidemiology, UAB School of Public Health
8. Randy Q. Cron, MD, PhD – Professor and Director, Division of Rheumatology, UAB Department of Pediatrics
9. Mona Fouad, MD – Professor and Director, Division of Preventive Medicine; Director, UAB Minority Health & Health Disparities Research Center; Senior Associate Dean for Diversity and Inclusion, School of Medicine
10. Shawn R. Gilbert, MD – Associate Professor, Division of Orthopaedic Surgery
    Chair, Orthopaedic Research Committee
11. Laura B. Hughes, MD, MSPH - Associate Professor, UAB Division of Clinical Immunology and Rheumatology
    Director, Rheumatology Fellowship Training Program
12. Robert P. Kimberly, MD – *Howard Holley* Professor of Medicine, UAB Division of Clinical Immunology and Rheumatology
    Senior Associate Dean, Clinical and Translational Research
    Director, Center for Clinical and Translational Science
13. Robin G. Lorenz, MD, PhD – Professor of Pathology
    Director, Medical Scientist Training (MD/PhD) Program
14. Frances E. Lund, PhD - *Charles H. McCauley* Professor and Chair, UAB Department of Microbiology
15. Amie Brown McLain, MD – Professor and Chair, Department of Physical Medicine & Rehabilitation
16. Lisa M. Schwiebert, PhD - Professor of Cell, Developmental, and Integrative Biology
    Associate Dean for Postdoctoral Education, UAB School of Medicine
17. Majd Zayzafoon, MD, PhD – Associate Professor of Pathology
    Former Director of the UAB Center for Metabolic Bone Disease
    Associate Director, UAB Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Graduate Biomedical Sciences (GBS) Themes

18. Peter D. Burrows, PhD – Director, Immunology Graduate Theme
19. Daniel C. Bullard, PhD - Director, Genetics, Genomics, and Bioinformatics Graduate Theme
20. Michelle V. Fanucchi, PhD - Director, Pathobiology and Molecular Medicine Graduate Theme
21. Bradley K. Yoder, PhD – Director, Cell, Molecular, and Developmental Biology Graduate Theme

Department Chairs/Division Directors

22. Mitchell Cohen, MD - Chair, Department of Pediatrics
23. Bruce R. Korf, MD, PhD - Chair, Department of Genetics
24. C. Seth Landefeld, MD – Chair, Department of Medicine
25. David T. Redden, PhD – Chair, Department of Biostatistics
26. Steven M. Theiss, MD – Director, Division of Orthopaedic Surgery

Other T32 Training Programs (see also letters from Drs. Saag, Schroeder, and Bamman)

27. Victor Thannickal, MD – Director, Training Program in Lung Biology and Translational Medicine
28. Hemant Tiwari, PhD - Director, UAB Statistical Genetics Post-Doctoral Training Program; and UAB Biostatistics Pre-Doctoral Training Program

UAB Leadership

29. Michael S. Reddy, DMD, DMSc – Dean, School of Dentistry
30. David Allison, PhD – Associate Dean for Science, School of Public Health
31. Jeffrey Engler, PhD – Interim Dean, Graduate School
32. Selwyn Vickers, MD – Senior Vice President for Medicine and Dean, School of Medicine
33. Richard B. Marchase, PhD - Vice President for Research and Economic Development
34. Linda Lucas, PhD - Provost
35. Ray Watts, MD - President

UAB SCHOOL OF MEDICINE

Department of Medicine

May 11, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou:

It is a great pleasure to write a letter in very strong support for your T32 application entitled, "Training Program in Rheumatic and Musculoskeletal Diseases Research" and to express my willingness to serve as an Associate Director and member of the Research Training Program (RTP) Executive Committee. Many of my roles at UAB make this Associate Directorship a logical and natural fit. In my roles as Director of the UAB Center for Outcomes and Effectiveness Research and Education (COERE); Director of the UAB Deep South Arthritis and Musculoskeletal Center for Education and Research on Therapeutics (CERTs), Vice Chair for Faculty Development, UAB Department of Medicine, and Associate Director of CAMBAC, I will work with you and other members of the Executive Committee to make this the strongest possible training program.

The COERE, a University-Wide Interdisciplinary Research Center, plays a central role in facilitating both outcomes and effectiveness research and training of postdoctoral fellows and faculty in all disciplines on our campus. Established in July 2000, the AHRQ-funded UAB CERTs combines the substantial UAB clinical and health services research expertise with private sector collaborations to evaluate the effectiveness and safety of new musculoskeletal therapeutics and to guide changes in the practice community. Through the COERE and the CERTs, and with the T32 Training Program in Rheumatic and Musculoskeletal Diseases Research, we will have an ideal environment for training clinical investigators in arthritis and musculoskeletal diseases.

As you know, I am currently PI and Director of the T32 Health Services, Outcomes, and Effectiveness Research Training Program and the K12 in Patient Centered Outcomes Research (both funded by AHRQ). These training grants are not focused on rheumatic or musculoskeletal diseases, so I will work with you to make sure that our programs complement each other.

In summary, I look forward to working with you in training young investigators across the spectrum of investigation to bring discovery to practical and effective application to rheumatic and musculoskeletal diseases.

Sincerely Yours,

Kenneth G. Saag, MD, MSc.
Jane Knight Lowe Professor of Medicine
Vice Chair, Faculty Development, Department of Medicine
Director, Center for Education and Research on Therapeutics (CERTs) of Musculoskeletal Disorders, Center for Outcomes Effectiveness Research and Education (COERE), and Center of Research Translation (CORT) in Gout and Hyperuricemia

Division of Clinical Immunology and Rheumatology
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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Department of Pathology

May 7, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am extremely supportive of your T32 application, "Training Program in Rheumatic and Musculoskeletal Diseases Research." As you know, I previously served as senior Vice Director of the UAB Center for Metabolic Bone Diseases, and am currently the Jay McDonald Professor of Pathology. I have a long track record of mentoring trainees. My research program is focused on bone biology and bone disease, and is well funded through NIH grants.

The collaborative atmosphere, the wealth of funded investigators in rheumatic and musculoskeletal diseases, and the pool of potential trainees makes UAB an ideal institution for the research training program you have outlined in your application to the NIAMS.

As we have discussed, I would be pleased to serve as an Associate Director and as a member of the Research Training Program (RTP) Executive Committee. I look forward to working with you in training young investigators to gain new insights into of bone and musculoskeletal diseases.

Best,

Yi-Ping Li, Ph.D.
Jay McDonald Endowed Professor of Bone Biology
Department of Pathology
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UAB CENTER FOR EXERCISE MEDICINE

Marcas M Bamman, PhD
Director

07 May 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I write to convey my enthusiastic support of your T32 application, ***Training Program in Rheumatic and Musculoskeletal Diseases Research***. As you know, I serve as Director of the UAB Center for Exercise Medicine, a University-Wide Interdisciplinary Research Center that is focused on improving health and well-being through interdisciplinary research on exercise and rehabilitation. In addition, I am Program Director of T32HD071866, ***Interdisciplinary Training in Pathobiology and Rehabilitation Medicine***, funded by NICHD and the National Center for Medical Rehabilitation Research. This training program spans numerous diseases and scientific foci, and is not focused on rheumatic or musculoskeletal diseases, so I will work with you to make sure that our training programs are both complementary and synergistic.

I have enjoyed working with you on our recently funded NIH R01HD084124, ***Overcoming TWEAK Signaling to Restore Muscle and Mobility after Joint Replacement***. The collaborative atmosphere at UAB, as exemplified by this project, is ideal for the conduct of the research training program you have outlined in your application. I would be very pleased to serve as a member of the Research Training Program (RTP) Executive Committee. I look forward to working with you in training young investigators who will help us in our goals of better treatment and outcomes for patients with rheumatic and musculoskeletal diseases.

Sincerely,

Marcas M Bamman, PhD
Professor, Department of Cell, Developmental, and Integrative Biology
Director, UAB Center for Exercise Medicine

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Core Facilities: Clinical Exercise Facility 205.934.6221•Muscle Research Laboratory 205.996.7936
exercise@uab.edu•www.uab.edu/exercise

SCHOOL OF
MEDICINE

Harry W Schroeder Jr MD PhD
Division of Clinical Immunology and Rheumatology
Departments of Medicine, Microbiology and Genetics

May 19, 2015

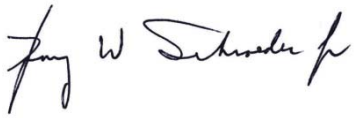
S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou:

I'm writing to provide my strongest possible support for your T32 application, “Training Program in Rheumatic and Musculoskeletal Diseases Research." As you know, I have several roles which directly impact on how we can work together to make your training program as effective as possible. Immunology has long been one of the strengths of UAB, as has multidisciplinary research and training. As Director of the UAB Program in Immunology and PI of the training program “Immunology Diseases and Basic Immunology” (funded by a T32 grant from NIAID), I will be happy to serve on the Research Training Program Executive Committee to ensure that our programs work together and utilize the shared knowledge we have accumulated in developing our program. I envision that the Training Program in Rheumatic and Musculoskeletal Diseases Research will be highly synergistic with, and complementary to, our existing training program in immunology and immunologic diseases.

I have enjoyed working with you in my role as an Associate Director of the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center, which will serve as an outstanding foundation for the proposed training. I look forward to helping you to train the next generation of investigators who will focus on immunologic aspects of rheumatic and musculoskeletal diseases. Through the group of investigators you have assembled, there is a great opportunity to provide a wonderful training environment.

Sincerely yours,



Harry W. Schroeder, Jr., M.D., Ph.D.
Professor of Medicine, Microbiology, and Genetics

cc:

Clinical Immunology and Rheumatology
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The University of
Alabama at Birmingham
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UAB CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE

Knowledge that will change your world

May 18, 2015

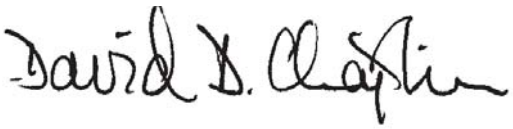
S. Louis Bridges, Jr., MD, PhD
Director, Training Program in Rheumatic and Musculoskeletal Diseases Research"
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am writing to provide my strongest possible support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Diseases Research." I am confident that this program will be a highly successful training vehicle within the very broad immunology community at UAB. In my role as Director of the Training Academy of the UAB Center for Clinical and Translational Science (CCTS), I will work with you to assure that trainees have access to all of the career development resources of our balanced and experienced training community. I will take special efforts to assure that the post-doctoral trainees in this program are engaged effectively in the CCTS TIERS (Training Interdisciplinary Emerging Research Scholars) program (http://www.uab.edu/ccts/tiers). I will also work with your Mentors-in-Training to guide them towards programs appropriate for their developmental stage in acquisition of mentoring competency (http://www.uab.edu/ccts/training-academy/mentoring). In my role as Chair of the Steering and Oversight Committee of the UAB Graduate Biomedical Sciences (GBS) Program, I will also assure that pre-doctoral trainees in this program have access to the strongest possible training in biostatistics, bioinformatics, translational research, and bioethics.

I look forward to working with both your pre-doctoral and your post-doctoral candidates, and I will be happy to serve on your Research Training Program Executive Committee. In addition, I will work with you to ensure that your mentors in training are aware of the many resources available for them to become the next generation of outstanding mentors. Congratulations on assembling such an outstanding team of training faculty, and best of luck with your application.

Sincerely,



David D. Chaplin, MD, PhD
Professor of Microbiology and Medicine
Director, CCTS Training Academy
Chair, GBS Steering and Oversight Committee
Associate Dean for Faculty Development

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UAB SCHOOL OF PUBLIC HEALTH

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

The purpose of this letter is to convey my enthusiastic support for your NIH application for the T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. As Chair of the Department of Epidemiology, I am pleased to coordinate with you and to support your goals. I am most happy to serve on the Research Training Program Internal Advisory Committee. Our longstanding collaborations on genetics of rheumatoid arthritis, biomarkers of treatment response, and collaborative co-mentoring of trainees make my participation in this program's Advisory Committee a natural fit.

I look forward to collaborating with you in promoting the best environment for encouraging interdisciplinary research at UAB and to teach trainees the fundamental ethical values required.

I wish you the best on your application.

Sincerely,

Donna K. Arnett

Donna K. Arnett, PhD, MSPH
Professor and Chair
UAB Department of Epidemiology
School of Public Health

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UAB MEDICINE
PEDIATRIC RHEUMATOLOGY

Children's of Alabama

May 12, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

This letter is to convey my willingness to serve on the Research Training Program Internal Advisory Committee, as well as my support for your T32 application, Training Program in Rheumatic and Musculoskeletal Disease Research. As you know, I am strongly committed to training the next generation of rheumatology clinicians, educators, and researchers through my roles as Director of the Division of Rheumatology, and Director of the Pediatric Rheumatology Fellowship Program, at UAB in the Department of Pediatrics. Now that we have established a fellowship in pediatric rheumatology, these trainees will add substantially to your applicant pool. Our fellowship program is set up as one year of clinical training and 2 years of protected research. Our ongoing research and training collaborations between pediatric and adult rheumatology at UAB are a true strength for this application.

We are making our best efforts to recruit fellows who have the interest, commitment, and potential skills to become independently funded investigators in rheumatic and musculoskeletal diseases research. Along these lines, we recently hired as a physician-scientist the first fellow to graduate from our program. We hope to generate many more physician-researchers in the years to come.

Sincerely yours,

Randy Q. Cron, MD, PhD
Professor of Pediatrics & Medicine
Arthritis Foundation, Alabama Chapter Endowed Chair
Director, Division of Pediatric Rheumatology
Director, Pediatric Rheumatology Fellowship Program
Children's Hospital of Alabama/University of Alabama at Birmingham
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Email: rcron@peds.uab.edu

UAB SCHOOL OF MEDICINE

Division of Preventive Medicine

May 14, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am writing to convey my strong support, and willingness to serve on the Research Training Program Internal Advisory Committee for your T32, "Training Program in Rheumatic and Musculoskeletal Diseases Research." As a faculty, we recognize that interdisciplinary integration is central to our academic mission in discovery and scholarship. I offer my enthusiastic support for your training grant, and look forward to working with you in preparing our students for outstanding careers in rheumatic and musculoskeletal diseases.

In addition, in my role as Senior Associate Dean for Diversity and Inclusion in the UAB School of Medicine, I will do all I can to help you to ensure that unrepresented minorities are successfully recruited to your training slots.

I wish you the best of luck on your application.

Warm regards,

Mona Fouad

Mona Fouad, MD
Senior Associate Dean for Diversity and Inclusion, UAB School of Medicine
Professor and Director, Division of Preventive Medicine
Director, UAB Minority Health & Health Disparities Research Center

UAB Division of Preventive Medicine
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UAB MEDICINE
SCHOOL OF MEDICINE

In affiliation with Children's of Alabama

May 13, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

This letter is to convey my support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Disease Research." In addition, I am willing to serve on the Research Training Program Internal Advisory Committee. As you know, I am strongly committed to training the next generation of orthopaedics researchers through my role as Chair of the UAB Orthopaedic Research Committee. I have enjoyed having you as member of this committee as we recruit and train orthopaedics residents and fellows who have the interest, commitment, and skills to become independently funded investigators in orthopaedics and musculoskeletal diseases research.

The faculty members in the UAB Division of Orthopaedic Surgery provide a great depth and breadth of clinical skills and accomplishments that draw outstanding candidates to our training program, and I will continue to work closely with you to attract those with research potential.

I wish you the best of luck with the application. Please let me know if you need additional information or if I can assist you in any way.

Sincerely,

Shawn R. Gilbert, MD
Associate Professor of Surgery
Chair, UAB Orthopaedics Research Committee

SRG/abp

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SCHOOL OF MEDICINE
Department of Medicine
Division of Clinical Immunology and Rheumatology

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

This letter is to convey my support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Disease Research." In addition, I am willing to serve on the Research Training Program Internal Advisory Committee. As you know, I am strongly committed to training the next generation of rheumatology clinicians, educators, and researchers through my role as Director of the UAB Rheumatology Fellowship Training Program. We are making our best efforts to recruit fellows who have the interest, commitment, and potential skills to become independently funded investigators in rheumatic and musculoskeletal diseases research.

As a former trainee on a T32 training program, I know the advantages that this program can bring to bear on a career in biomedical research and I will continue to try to identify candidates early in their fellowship. The faculty members in the UAB Division of Clinical Immunology and Rheumatology provide a great depth and breadth of research skills and accomplishments that draw topnotch clinical candidates to our fellowship, and I will continue to work closely with you to attract those with research potential. In addition, I will do my best to help you find highly qualified unrepresented minorities.

Please let me know if you need additional information or if I can assist you in any way. I wish you the best of luck with the application.

Sincerely,

Laura B. Hughes, MD, MSPH
Associate Professor of Medicine
Director, Rheumatology Fellowship Training Program

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UAB CENTER FOR CLINICAL AND TRANSLATIONAL SCIENCE

Knowledge that will change your world

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I want to express my enthusiastic support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Disease Research" and my willingness to serve on the Research Training Program Internal Advisory Committee. As PI/Director of the UAB Center for Clinical and Translational Science, a former PI/Director of a T32 training program and an investigator with a long track record of NIH funding, I understand the critical importance of having a robust pipeline of trainees who will become the research innovators and leaders. It would be my privilege to bring my experience and interest in the development of research trainees to your proposed T32 program.

Through my leadership roles in the UAB Center for Clinical and Translational Science and the UAB School of Medicine, we will provide your trainees and mentors with a variety of training resources through the CCTS Training Academy. In addition to didactic sessions and experiential modules for mentors and mentees alike, we are co-sponsoring mini-sabbaticals both within the Partner Network in the Southeast and throughout the CTSA network. With our Informatics program, we can provide both training and support in data science and informatics, and our i2b2/SHRINE network in the southeast provides an unparalleled opportunity for cohort identification and clinical study.

I look forward to working with you and the outstanding group of mentors that you have brought together for this training program.

Sincerely,

Robert P. Kimberly, MD
Howard L. Holley Professor of Medicine
Director, UAB Center for Clinical and Translational Science
Senior Associate Dean for Clinical and Translational Research,
UAB School of Medicine

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Web: www.uab.edu/ccts

UAB SCHOOL OF MEDICINE

MEDICAL SCIENTIST TRAINING PROGRAM
Robin Lorenz, MD, PhD, Program Director
Louis Justement, PhD, Associate Director
William Geisler, MD, MPH, Associate Director
Randy Seay, MA, MPH, MPA, Program Manager
Jacquelyn Bennett, Program Coordinator

May 15, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I would be honored to serve on the Research Training Program (RTP) Internal Advisory Committee for your "Training Program in Rheumatic and Musculoskeletal Diseases Research". In my capacity as Director of the Medical Scientist Training Program at UAB, I am integrally involved in the training of MD/PhD students, many of whom are training to become clinical/translational investigators. In addition, I can help advise your program on current NIH policies on T32 Training Programs due to my appointment as a permanent reviewer and current Chair of the the NIGMS Training, Workforce Development and Diversity (TWD) Review Committee.

The Rheumatic and Musculoskeletal Diseases Research program highlights UAB's ability to foster excellent Interdisciplinary research training programs on both the pre- and post-doctoral levels. This program will involve a range of faculty mentors and weaving them into an integrated thematic fabric. Thank you for all of the effort that you are investing in the development of our rheumatic and musculoskeletal diseases research training programs at UAB. I look forward to serving on the Research Training Program Internal Advisory Committee.

Sincerely,

Robin Lorenz, M.D., Ph.D.
Director, Medical Scientist Training Program
Assistant Dean for Physician Scientist Education
Professor of Pathology
205-934-0676; rlorenz@uab.edu

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Department of Microbiology

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I'm writing to express my full support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Diseases Research". I am also happy to serve on the Research Training Program Internal Advisory Committee. Your training program provides exceptional training opportunities to a very strong group of pre-doctoral and post-doctoral trainees with interests in rheumatic and musculoskeletal diseases, many of which have immunologic aspects. By providing outstanding training for pre- and post-doctoral scholars, the program will be an important resource for recruiting new faculty. As you know, both fundamental and translational immunology programs are going to play a central role in the School of Medicine's strategic plan. As the Director of the UAB School of Medicine new research initiative in Inflammation, Infection and Immunity, I can assure you that training and educational opportunities such as your training program are very important to the growth of our immunology and inflammation research community. In the coming years we anticipate making significant investments in these areas and I am confident that the recipients of your T32 training slots will be exposed to cutting edge clinical and basic research and will have the opportunity to train with some of the best scientists working in the areas of rheumatic and musculoskeletal disease. It is an exciting time to be at UAB and I think that training programs such as the one that you are proposing will capitalize on the research, education and clinical opportunities that are so abundant at UAB.

I welcome the opportunity to lend my support and wish you all the best in this and all future endeavors.

Sincerely,

Frances E. Lund, Ph.D.
Charles H. McCauley Professor
Chair, Department of Microbiology

UAB SCHOOL OF MEDICINE
Department of Physical Medicine and Rehabilitation

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

This letter is to convey my enthusiastic support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Disease Research" and my willingness to serve on the Research Training Program Internal Advisory Committee. As we have discussed, my colleagues and I are strongly committed to training the next generation of musculoskeletal researchers. The faculty members in our department provide a great depth and breadth of clinical skills and accomplishments that draw outstanding candidates to our training program. I will continue to work closely with you to attract those with research potential.

I have enjoyed working with you on the CAMBAC Steering Committee and on the Musculoskeletal Screening Clinic, which has been a highly successful collaboration. I look forward to extending our collaboration through the recruitment of trainees and developing them into independently funded investigators in musculoskeletal diseases research. I wish you the best of luck with the application. Please let me know if you need additional information or if I can assist you in any way.

Sincerely,

Amie Brown McLain, MD
Chair, Department of Physical Medicine & Rehabilitation

Spain Rehabilitation Center
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Alabama at Birmingham
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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of Postdoctoral Education

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am happy to serve on the Research Training Program Internal Advisory Committee of the T32, "Training Program in Rheumatic and Musculoskeletal Disease Research". The links that we have between your postdoctoral training program and the University's Office of Postdoctoral Education are important ties to enhance the postdoctoral experience for the trainees.

As you know, the University of Alabama at Birmingham is committed to the development and success of outstanding postdoctoral scientists. Here at UAB, approximately 250 postdoctoral scholars are training currently in a variety of disciplines, including dentistry, engineering, health professions, medicine, natural sciences and mathematics, public health, optometry, and social and behavioral sciences. Career development opportunities to enhance and define the training experience are available to all postdoctoral scholars. Past and continuing events include our 'Transition to Independence Seminar Series', 'Career Day', 'Grant Writing for Postdocs', and 'Lab Management Skills'. Each of these events presents information regarding career opportunities and job skills for the biomedical field.

Because of its commitment to the success of postdoctoral fellows, UAB ranks consistently as one of the top locations among US universities for training postdoctoral scholars. Within the UAB context, this training program provides an outstanding interdisciplinary research experience for its trainees. The high quality of the faculty participating in this program assures trainees that they will receive top-notch training, which will enable significant contributions to the field of musculoskeletal and rheumatic diseases. If we can further assist in the preparation of your proposal, please do not hesitate to contact me directly.

Best regards,

Lisa M. Schwiebert, Ph.D.
Associate Dean for Postdoctoral Education
Professor of Cell, Developmental, and Integrative Biology

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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Department of Pathology

May 12, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As current Associate Director of the UAB Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center and former Director of the UAB Center for Metabolic Bone Disease, I would like to express my support for the T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. Additionally, I would be glad to serve on the Research Training Program (RTP) Internal Advisory Committee.

I believe that the proposed T32 will serve as an important resource for supporting the research training of students and postdoctoral fellows in mechanisms of rheumatic and musculoskeletal diseases. The proposed mentors in this T32 application are outstanding and well regarded in their fields. I believe their expertise and their commitment to the training of young academicians will ensure the long-term success of the program.

I look forward to our continuing our close collaboration.

Sincerely,

Majd Zayzafoon, MD, PhD, MBA
Associate Professor, Department of Pathology
Associate Director, UAB Comprehensive Arthritis, Musculoskeletal,
Bone and Autoimmunity Center
Director, UAB International Health Program
Director, International Advanced Clinical Training Program

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THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

On behalf of the Graduate Biomedical Sciences (GBS) Immunology Theme, I am writing to express my enthusiastic support for your T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. My colleagues and I in the GBS Immunology Theme are very appreciative of the tremendous efforts you and your training faculty have put forth on behalf of our students. We look forward to working effectively together in preparing our students for outstanding careers in biomedical science focused on rheumatic and musculoskeletal diseases, many of which have substantial immunologic aspects.

I wish you all the best with your application.

Sincerely,

Peter D. Burrows

Digitally signed by Peter D. Burrows
DN: cn=Peter D. Burrows, o=University of Alabama at Birmingham, ou=Department of Microbiology, email=peterb@uab.edu, c=US
Date: 2015.05.12 13:43:15 -05'00'

Peter D. Burrows, PhD
Professor of Microbiology
Director, Immunology Graduate Theme

Graduate Biomedical Sciences - Immunology Theme
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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Department of Genetics

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As the Director of the Graduate Biomedical Sciences Genetics, Genomics and Bioinformatics (GGB) Theme, I am writing to express my enthusiastic support for your T32 application entitled, "Training program in Rheumatic and Musculoskeletal Diseases Research."

My colleagues and I in the GGB Theme are very appreciative of the efforts you and your training faculty have put forth on behalf of our graduate students in the past. As you know, there are substantial genetic components to many rheumatic and musculoskeletal diseases. We look forward to working effectively together in preparing our students for outstanding careers in biomedical science focused on these diseases. I wish you the best of luck with your grant application.

Sincerely,

Daniel C. Bullard, PhD
Professor of Genetics
Director, Genetics, Genomics and Bioinformatics Graduate Theme

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GRADUATE SCHOOL

Graduate Biomedical Sciences

May 12, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
SHEL 178C, 2182
Birmingham, AL 35294

Dear Lou,

The purpose of this letter is to convey my support for your T32 application, *Training Program in Rheumatic and Musculoskeletal Diseases Research*. The Pathobiology and Molecular Medicine (PBMM) Graduate Theme of the Graduate Biomedical Sciences program is committed to continue its tradition of recruiting the very strongest graduate students from across the United States.

On behalf of the PBMM Theme, we look forward to working with you in preparing our students for outstanding careers in biomedical science. I wish you the best of luck with your application.

Sincerely,

Michelle V. Fanucchi, PhD
Associate Professor of Public Health
Director, Pathobiology and Molecular Medicine
Graduate Biomedical Sciences

THE UNIVERSITY OF
ALABAMA AT BIRMINGHAM
Department of Cell, Development, and Integrative Biology

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
***Anna Lois Waters* Professor of Medicine**
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am writing on behalf of the faculty in the Graduate Biomedical Sciences (GBS) Cell, Molecular, and Developmental Biology Theme to express my enthusiastic support for your T32 entitled, “Training Program in Rheumatic and Musculoskeletal Diseases Research”. My colleagues and I look forward to working effectively together in preparing our students for outstanding careers in biomedical science focused on rheumatic and musculoskeletal diseases.

I wish you all the best with your application.

Sincerely,

Bradley K. Yoder, PhD
HSF Endowed Chair
Director Hepatorenal Fibrocystic Disease Center
Director Cell, Molecular, and Developmental Biology Graduate Theme
Director T32 Training Program in Cell and Molecular Biology

UAB MEDICINE
PEDIATRICS

Children's of Alabama

May 11, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As Chair of the Department of Pediatrics, I am pleased to offer my support for your NIH application for the T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. As you know, over the last several years, we have invested a great deal of effort in building our program in Pediatric Rheumatology. This is the only academic division of Pediatric Rheumatology in the State. In addition to our local clinics, we also serve the pediatric population on Mobile through a collaborative agreement with the University of South Alabama. This provides us an opportunity to study and improve population health in Alabama and the region through research and knowledge translation. Under Dr. Randy Cron's leadership, we have six faculty members, and our ability to recruit successfully has been greatly facilitated by the training opportunities in your program. I believe that with continued faculty recruitment and the increasing grant support in our department, we will further strengthen our training and other collaborative programs. Our pediatric rheumatology fellowship program will provide you with strong candidates, and your training faculty will help us to develop them into independent researchers. Our investment throughout the Department is focused on training the academic and research leaders of tomorrow and providing them with an infrastructure and environment to excel.

On behalf of the faculty in the Department of Pediatrics, I strongly endorse your application and look forward to continued excellence in UAB's training program in rheumatic and musculoskeletal diseases research. Please feel free to contact me if I can be of further assistance.

Sincerely,

Mitchell B. Cohen, MD
Katharine Reynolds Ireland Chair in Pediatrics
Professor and Chair, UAB Department of Pediatrics
Physician-in-Chief, Children's of Alabama

UAB Department of Pediatrics, Office of the Chairman, Lowder Suite 600
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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As Chair of the Department of Genetics, I am delighted to lend my support for your T32, Training Program in Rheumatic and Musculoskeletal Diseases Research. Given the strength of our current trainee pool and the School of Medicine's ongoing efforts to expand immunology and genomics research, your program is particularly positioned to continue to play a pivotal role in the School. I will assure that your program's trainees are invited to all Genetics research seminars and to the annual Genetics research retreat. As an active biomedical investigator, I also look forward to offering meaningful research training opportunities in my laboratories to both pre-doctoral and postdoctoral candidates. I wish you success on your application.

Sincerely,

Bruce R. Korf, MD, PhD
Wayne H. and Sara Crews Finley Chair in Medical Genetics
Professor and Chair, Department of Genetics
Director, Heflin Center for Genomic Sciences

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Office of the Chairman
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UAB SCHOOL OF MEDICINE

Department of Medicine

May 20, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As Chair of the Department of Medicine, I am delighted to lend my support for your T32 application, "Training Program in Rheumatic and Musculoskeletal Diseases Research." The substantial, sustained excellence of the research and training activities of the Division of Clinical Immunology and Rheumatology and the CAMBAC will serve as an ideal foundation for the training the next generation of researchers in rheumatic and musculoskeletal diseases. The UAB Department of Medicine has the largest research portfolio of any Department at UAB. The Vice Chairs of the Department and I will be happy to work with you to help ensure the success of trainees focused on careers in rheumatic and musculoskeletal diseases research.

As you know, UAB provides substantive institutional support for training efforts such as the T32 research training program you are proposing. As stated in the letter of support from the UAB School of Medicine (Selwyn M. Vickers, MD, Dean), should your application be funded, there will be a monetary fund of $30,000 provided to you as Director of the T32 Research Training Program (RTP) for use in training, education, and collaboration to enhance the training environment at UAB. In addition, there is substantial support of effort from the Department of Medicine in the way of endowments, state funds, etc., to support the educational activities such as those on the proposed T32 research training program. Your 10% committed effort on this RTP is covered by Divisional, Departmental, and CAMBAC funds. In addition, the efforts of Dr. Kenneth Saag (Associate Director of the RTP); Dr. Harry Schroeder (RTP Executive Committee); and Drs. Laura Hughes and Robert Kimberly (RTP Internal Advisory Committee) are covered in part for educational activities such as these. In total, a conservative estimate of 25% FTE effort of a senior investigator (~$61,400 in salary and fringe benefits) is provided on an annual basis to support this research training plan.

I look forward to your continued success in developing the next generation of researchers in rheumatic and musculoskeletal diseases, and I wish you all the best in your application.

Sincerely,

C. Seth Landefeld, MD
Professor and Chair, Department of Medicine
Spencer Chair in Medical Science Leadership

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UAB SCHOOL OF PUBLIC HEALTH
Department of Biostatistics

May 20, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
University of Alabama at Birmingham
1825 University Blvd, SHEL 178C
Birmingham, AL 35294-2182

Dear Lou,

As Chair of the Department of Biostatistics, I write to give my strongest support for the T32 Training Program in "Rheumatic and Musculoskeletal Diseases Research". As you know, there are many ongoing collaborative research and training opportunities that involve our two units. Your Training Program will serve as an important resource for supporting the research training of students and postdocs in mechanisms of arthritis, rheumatic and musculoskeletal diseases.

I have enjoyed working with you on the UAB Multidisciplinary Clinical Research Center and other program and individual grants for the past 10 years. I look forward to continuing our collaborations, working with you to train young investigators and developing collaborative training opportunities for both pre-doctoral and postdoctoral candidates.

I wish you success on your application.

Sincerely,

David T. Redden

David T. Redden, PhD
Chair, Department of Biostatistics

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UAB SCHOOL OF MEDICINE

Department of Surgery

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As Director of the Division of Orthopaedic Surgery, I write to provide the strongest possible support for your T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. My colleagues and I are strongly committed to training the next generation of orthopaedics researchers. As you know through your membership on the Orthopaedic Research Committee (ORC), the faculty members in our Division provide great clinical skills that draw outstanding candidates to our training program. I will continue to work with you and others on the ORC to identify and recruit those with research potential. Your proposed training program will serve as an important resource for development of students and postdoctoral fellows in musculoskeletal diseases.

In addition to our collaborations on the ORC, I have enjoyed working with you on the Musculoskeletal Screening Clinic, which has been a highly successful collaboration among your unit, ours, and PM&R. I look forward to extending our collaboration through the recruitment of trainees and developing them into independently funded investigators in musculoskeletal diseases research. Please let me know if you need additional information or if I can assist you in any way. I wish you success on your application.

Sincerely,

Steven M. Theiss, M.D.
John D. Sherrill Chair of Orthopaedic Surgery
Professor of Surgery
Director, Division of Orthopaedic Surgery

Division of Orthopaedic Surgery
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UAB MEDICINE

PULMONARY, ALLERGY & CRITICAL CARE

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

I am delighted to participate and support your T32 grant application entitled, "Training Program in Rheumatic and Musculoskeletal Diseases Research." I currently serve as the Director of the T32 "Training Grant in Lung Biology and Translational Medicine." I look forward to identifying ways that we can expand our collaborative efforts. One of the most fruitful areas of research may be the intersection of rheumatic diseases and interstitial lung disease, which is a substantial clinical problem with limited therapeutic success.

Your proposed T32 will serve as an important resource for supporting the research training of students and postdoctoral fellows, and I will continue to foster collaborations of our trainees in the area of rheumatic and musculoskeletal diseases. I wish you the best of luck with your application.

Sincerely,

Victor J. Thannickal, M.D.
Professor of Medicine and Pathology
Director, Division of Pulmonary, Allergy, and Critical Care Medicine
Ben Vaughan Branscomb Chair of Medicine in Respiratory Disease

VJT:baw

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SCHOOL OF
PUBLIC HEALTH

Department of Biostatistics
Section on Statistical Genetics

Hemant K. Tiwari, Ph.D.
Head of the Section on Statistical Genetics
William "Student" Sealy Gosset Professor
Director, Biostatistics Pre-Doctoral NHLBI Training Program
Director, Post-Doctoral Training Program on Statistical Genetics
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May 9, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

As the Director of the Statistical Genetics Post-Doctoral, and the Biostatistics Pre-Doctoral Training Programs at UAB, I express my support for your T32 application. As PI of these training programs, I look forward to identifying ways that we can expand these collaborative efforts, as there are many research and training opportunities that involve our two units. I have enjoyed our several productive collaborations over the years and look forward to working with you on this training program.

Your proposed T32 will serve as an important resource for supporting the research training of students and postdocs in mechanisms of arthritis and rheumatic diseases, and I will continue to foster collaborations of our students and trainees in the area of rheumatic and musculoskeletal diseases.

I wish you the best of luck with your application.

Sincerely,

Hemant Kumar Tiwari

Hemant K. Tiwari, PhD

UAB SCHOOL OF DENTISTRY

Office of the Dean

May 18, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
The University of Alabama at Birmingham
Shelby Biomedical Research Building
1825 University Boulevard, SHEL 178C
Birmingham, AL 35294-2182

Dear Lou,

As Dean of the UAB School of Dentistry, I wish to express my enthusiastic support for your T32 application, Training Program in Rheumatic and Musculoskeletal Diseases Research. As you know, several of our faculty members have research programs in bone biology, which are directly relevant to the focus of your T32 training grant. I am confident this training effort will allow us to grow collaborative efforts across schools at UAB and provide outstanding training for pre- and post-doctoral candidates interested in research careers centered on rheumatic and musculoskeletal disease.

On behalf of the UAB School of Dentistry, and the leadership of UAB, thank you for your continuing training efforts in the area of rheumatic and musculoskeletal diseases. I wish you success with your application and other future endeavors.

Sincerely,

Michael S. Reddy, DMD, DMSc
Dean

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SCHOOL OF
PUBLIC HEALTH

David B. Allison, Ph.D.
Distinguished Professor
Quetelet Endowed Professor of Public Health
Associate Dean for Science
Director, Office of Energetics
Director, Nutrition Obesity Research Center
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S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center
lbridges@uab.edu

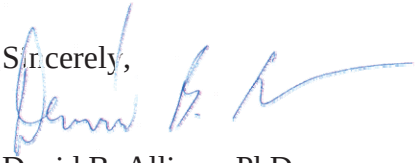
May 11, 2015

Dear Lou,

As Associate Dean for Science in UAB's School of Public Health, I want to convey my enthusiastic support for your NIH application for the T32 "Training Program in Rheumatic and Musculoskeletal Diseases Research." As you know, there have been substantial collaborations among faculty in the School of Public Health and researchers focused on rheumatic and musculoskeletal diseases. I am very supportive of your application, which will foster additional collaborations, and will help to train the next generation of researchers in these diseases.

The School of Public Health and I will do all that we can to help build bridges among our academic units and centers and provide the best possible training for young investigators in rheumatic and musculoskeletal disease. I wish you the best on your application.

Sincerely,



David B. Allison, PhD

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Graduate School

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou:

As Interim Dean of the UAB Graduate School, I wish to express my support for your T32 application, Training Program in Rheumatic and Musculoskeletal Diseases Research. Your training program has been an outstanding example of interdisciplinary training. The broad participation of training faculty from across the university is truly impressive. The active involvement of multiple different mentors from different divisions and departments underscores both your commitment to, and success in, fostering interdisciplinary training relevant to rheumatic and musculoskeletal diseases.

I am very pleased to see a substantial role for predoctoral training in your program. As you know, our program in Graduate Biomedical Sciences (GBS) is structured into thematically oriented interdisciplinary tracks. The main benefit of this structure, which was initiated several years ago, is attracting more outstanding applicants into an already strong applicant pool. We anticipate that the GBS theme based training programs will continue to attract extremely well qualified graduate students. The applicant pool available to your training faculty and for your training grant is of the highest caliber.

On behalf of the Graduate School, and the leadership of UAB, I want to thank you for your efforts in training the next generation of investigators. We deeply appreciate your contributions and wish you success with your application.

Sincerely,

Jeffrey Engler

Jeffrey Engler, PhD
Interim Dean, Graduate School

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UAB SCHOOL OF MEDICINE

Office of the Senior Vice President and Dean

May 11, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

The purpose of this letter is to convey my enthusiastic support from the leadership of the UAB School of Medicine for your NIH application for the T32 Training Program in Rheumatic and Musculoskeletal Diseases Research. As Senior Vice President for Medicine and Dean of the School of Medicine, I am pleased to support the goals of your training program. Over the years, UAB has been highly successful in facilitating interdisciplinary research training programs.

I look forward to collaborating with you in promoting the best environment for encouraging interdisciplinary research at UAB and to teach trainees the fundamental ethical values required. The Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center (CAMBAC) and the Division of Clinical Immunology and Rheumatology, which will form the heart of this application, are units with highly visible, sustained successes and outstanding reputations for excellence in training and research.

The School of Medicine will support the management and administration of this award through the Office of Post-Doctoral Education, as well as a monetary fund of $30,000 provided to training program directors for use in training, education, and collaboration to enhance the training environment at UAB upon successful funding of this award.

Your accomplished mentors will set a high standard and create an optimal environment for the conduct of this T32 program. The School of Medicine has a continuing commitment to UAB's programs in rheumatic and musculoskeletal diseases. I fully support your application, which is central to our academic mission and will continue the tradition of excellence in rheumatic and musculoskeletal disease research at UAB.

I wish you the best with your grant application.

Sincerely,

Selwyn M. Vickers, M.D.
James C. Lee, Jr. Endowed Chair
Professor of Surgery
Senior Vice President for Medicine
Dean, UAB School of Medicine

The University of Alabama at Birmingham
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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Vice President for Research and Economic Development

May 11, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Dr. Bridges:

As UAB's Vice President for Research and Economic Development, and a representative of UAB leadership, I am very enthusiastic about the program of training which you have proposed in your T32 application, "Training Program in Rheumatic and Musculoskeletal Diseases Research." The proposed program highlights UAB's ability to organize and conduct outstanding interdisciplinary research training programs on both the pre- and post-doctoral levels. The cooperative synergies which pervade our institution set a high standard and create an optimal environment for the conduct of your T32 program.

This training program, while it will be supported by faculty from many units on campus, has as its main foundation the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC) and the Division of Clinical Immunology and Rheumatology, both of which have had longstanding and highly visible success. This T32 application is precisely the type of collaborative program we seek to nurture and which is central to our academic missions of discovery and scholarship.

Thank you for all that you are doing for the development of our rheumatic and musculoskeletal diseases research training programs at UAB. I wish you all the best in your application.

Sincerely,

Richard B. Marchase, PhD
Vice President for Research and Economic Development

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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM
Office of the Provost

May 8, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

Thank you for the opportunity to express, on behalf of the UAB Office of Provost, and the leadership of UAB, support for your T32 Training Program application. The faculty members associated with your "Training Program in Rheumatic and Musculoskeletal Diseases Research" are highly productive scientists with significant experiences in pre-doctoral and post-doctoral research training. Indeed, both the strength and diversity of the T32 faculty demonstrate the opportunities for interdisciplinary research related to arthritis and rheumatic disease oriented research for your trainees.

Through the Graduate School and our Office of Postdoctoral Education, UAB has an enduring commitment to graduate training for the next generation of basic and translational investigators. UAB has been greatly enriched and is truly fortunate to host the caliber of faculty in your application for a T32 grant. We will continue its long-standing commitment to fostering an atmosphere conducive to multidisciplinary research training.

Best wishes for your continued success. When I may be of assistance, please feel free to call on me.

Sincerely,

Linda C. Lucas, PhD
Provost

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THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

Knowledge that will change your world

Ray L. Watts, MD
President

May 12, 2015

S. Louis Bridges, Jr., MD, PhD
Anna Lois Waters Professor of Medicine
Director, Division of Clinical Immunology and Rheumatology
Director, Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center

Dear Lou,

In my leadership role as President of UAB, this is a welcome opportunity to express my enthusiastic support for your application to the NIH for a T32 grant entitled, "Training Program in Rheumatic and Musculoskeletal Diseases Research." As you know, UAB has been highly successful in facilitating interdisciplinary research training programs. The team spirit and synergy which pervades our institution set a high standard and create an optimal environment for the conduct of this T32 program. Your state-of-the-art training program, with its broad initiatives in rheumatic and musculoskeletal diseases, will complement and enhance our current strengths in these areas of research. This is exactly the kind of program which we seek to foster and which we recognize as central to our academic mission.

The UAB Division of Clinical Immunology and Rheumatology is one of the most successful units on campus. In addition, within our University-wide Interdisciplinary Research Centers program, the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center (CAMBAC), which you direct, stands among the very strongest. I fully support your application, which will continue the tradition of excellence in rheumatic and musculoskeletal disease research at UAB.

You and your program faculty have done an outstanding job. Keep up the good work!

Sincerely,

Ray

Ray L. Watts, MD

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APPENDICES

A. GBS Graduate Themes, MSTP and HHMI Med-Grad Fellowship

A1. GBS Immunology Graduate Theme
http://www.uab.edu/gbs/immunology/
A2. GBS Genetics and Genomics Sciences Graduate Theme
http://www.uab.edu/gbs/genomic/
A3. GBS Pathobiology and Molecular Medicine Graduate Theme
http://www.uab.edu/gbs/pathobiology/
A4. GBS Cell, Molecular, and Developmental Biology Graduate Theme
http://www.uab.edu/gbs/cmdb/
A5. UAB MSTP - Medical Scientist Training Program (MD/PhD Program)
http://www.uab.edu/medicine/mstp/
A6. UAB Howard Hughes Medical Institute (HHMI) Med-Grad Fellowship (HHMG)
http://www.uab.edu/gbs/medgrad/

B. **UAB Office of Postdoctoral Education (OPE)** (http://www.uab.edu/postdocs/)

B1. What Can the OPE Do For You?
B2. Tools to Help
B3. NIH MERIT Program
B4. UAB Postdoc Outcomes
B5. UAB Postdoctoral Association
B6. UAB Postdoctoral Handbook

C. Didactic Coursework and Training Opportunities

C1. T32 Curriculum: MIC 741 – Topics in Professional Development
C2. Institutional Curriculum: GRD 717: Principles of Scientific Integrity
C3. Institutional Curriculum: Masters of Science in Public Health
C4. Graduate Level Certificate Program in Translational and Molecular Sciences
C5. Training Programs Organized by the UAB Center for Clinical and Translational Studies (CCTS) Training Academy (http://www.uab.edu/ccts/training)

D. UAB Program in Immunology (http://www.uab.edu/medicine/immunology/**)**

D1. Mission and Goals
D2. Seminar Series speakers 2012-2015

E. UAB and State of Alabama Efforts to Enhance Diversity in Education and Training Programs

E1. List of major funding that support diversity in biomedical research or funding that can be used to support training of minority students.
E2. Current biomedical collaborations with Historically Black Colleges and Universities (HBCUs)/Minority Institutions (MI)
E3. Other Available Programs and Resources
E4. State institutional commitment to increase diversity

F. Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC)-Associated Programs and Events

F1. Background and History of the UAB CAMBAC
F2. Multidisciplinary Clinical Research Center
F3. Center of Research Translation in Gout and Hyperuricemia
F4. Rheumatic Diseases Cores Center
F5. CAMBAC (formerly CAMAC) Research Day 2014
F6. CAMBAC Osteoimmunology Symposium – August 2015
F7. Rheumatology Grand Rounds and Clinical Conference schedule 2012-2015
F8. Rheumatology Journal Club schedule 2012-2015

G. UAB Mentoring Resources

G1. UAB Mentoring White Paper
G2. Individual Development Plan (IDP) Resources
G3. Annual Evaluation Forms and Exit Interview for Predoctoral and Postdoctoral Trainees
G4. UAB Mentoring Academy

APPENDIX A

GBS Graduate Themes, MSTP, HHMI Med-Grad Fellowship

A1. GBS Immunology Graduate Theme
http://www.uab.edu/gbs/immunology/

A2. GBS Genetics and Genomics Sciences Graduate Theme
http://www.uab.edu/gbs/genomic/

A3. GBS Pathobiology and Molecular Medicine Graduate Theme
http://www.uab.edu/gbs/pathobiology/

A4. GBS Cell, Molecular, and Developmental Biology Graduate Theme
http://www.uab.edu/gbs/cmdb/

A5. UAB MSTP - Medical Scientist Training Program (MD/PhD Program)
http://www.uab.edu/medicine/mstp/

A6. UAB Howard Hughes Medical Institute (HHMI) Med-Grad Fellowship (HHMG)
http://www.uab.edu/gbs/medgrad/

The Graduate Biomedical Sciences (GBS) (http://www.uab.edu/medicine/mstp/academics/gbs) community at UAB encompasses approximately 475 graduate students and 350 faculty. They participate in multiple interdisciplinary thematic programs that integrate more than 25 departments and 20 research Centers in the School of Medicine, partner Schools throughout the university and the Southern Research Institute, an affiliated drug discovery and development institute. The UAB GBS offers eight interdisciplinary training pathways. Predoctoral trainees supported by this T32 joined UAB via four of these pathways: (i) Immunology; (ii) Genetics and Genomic Sciences; (iii) Pathobiology & Molecular Medicine and (iv) Cell, Molecular & Developmental Biology.

GBS Basic Biosciences Core Courses (August-December) – First year students in all GBS themes participate in an accelerated 20-week, three-block core course that provides a common foundation in essential principles of biochemistry, metabolism, molecular biology, genetics, and biological organization, upon which theme-specific courses are based.

GBS 707 – Biochemistry/Metabolism

GBS 708 – Genetics/Molecular Biology

GBS 709 – Biological Organization

GBS Theme Modules (January-May) – The remainder of the first-year curriculum is presented in multiple modules of approximately one month each. These modules focus on training and research areas tailored to specific interests of individual themes or theme groups. Theme students select five of the 34 one-month modules to complete the first and second semester curriculum. Each theme offers a recommended modular training pathway or a pathway can be tailored to student interests.

GBS Biostatistics and GBS Bioethics Core Courses (spring and fall sessions) – This GBS Biostatistics course is designed specifically for GBS theme students. It may be completed in the spring of the first or second year, upon advice of the theme director and faculty mentor. The GBS Bioethics course covers training in the responsible conduct of research, as required by the National Institutes of Health and by the UAB Graduate School for all students in the biomedical sciences; it is offered in the fall semester.

A1. GBS Immunology (IMM) Graduate Theme

The Immunology Graduate Theme is an interdisciplinary program emphasizing the study of multiple aspects of the immune system, from basic molecular mechanisms to whole animal studies and human translational research. The remarkable breadth of our program can be seen in the primary departments of the almost fifty theme faculty members. Faculty from the Departments of Microbiology, Cell, Developmental and Integrative Biology, Biochemistry and Molecular Genetics, Genetics, Biology, Pathology, Medicine, Pediatrics, Environmental Health Sciences, Epidemiology, Surgery, Ophthalmology, Dermatology, and Dentistry are involved in internationally recognized research and in the training of PhD-level graduate students and postdoctoral fellows. Currently, forty-five students are in training in the laboratories of our immunology faculty. Primary areas of research include: Allergy, Autoimmunity, Cancer Immunology, Clinical/Translational, Developmental Immunology, Host Defense, Immunodeficiency, Immunogenetics, Inflammation, Mucosal and Ocular Immunology, Neuroimmunology, Structural Immunology, and Transplantation Immunology. Students graduating from the Immunology Graduate Theme will be well-versed in modern immunology and have the option to pursue diverse career pathways.

First year - Courses, Laboratory Rotations, Selection of Mentor

First year students in all GBS themes participate in an accelerated 20-week, three-block core course that provides a common foundation in essential principles of biochemistry, metabolism, molecular biology, genetics, and biological organization, upon which theme-specific courses are based. Students in the Immunology

Theme will continue their first semester coursework with a seven week survey course, Introductory Immunology, which will cover the basics of this broad discipline.

It is expected that students will select their thesis research mentor and confirm their theme affiliation typically by May of their first year of training. Students, who enter a theme early, during the summer semester, may select their mentor and begin their thesis research by late February.

More specialized (advanced) courses will be offered in the second semester. A passing grade of B or better is required in all courses. Students who make less than a B must retake and pass the relevant course in the subsequent year. Students who fail more than two courses during the first year are subject to dismissal from the program.

Immunology Theme (IMM) Courses (2014-2015)

FALL SEMESTER

GBS 795: Lab Rotation 1

GBS 707: Basic Biochemistry and Metabolism

GBS 708: Basic Genetics and Molecular Biology

GBS 709: Basic Biological Organization

GBS 740A: Intro to Immunology Part 1

SPRING SEMESTER -

GBS 796: Lab Rotation 2, Poster Session-

GBS 740B: Intro to Immunology Part 2

GBS 745: Neuroimmunology

GBS 741: Lymphocyte Biology

GBS 744: Mucosal Immunology

BY 755: Biometry (Biostatistics requirement) -

SUMMER SEMESTER

GBS 797: Lab Rotation 3, Poster Session

FALL SEMESTER of second year

GRD 717: Principles of Scientific Integrity (Ethics requirement)

Introductory Immunology is a team-taught survey course that covers basic concepts of innate and adaptive immunity. These integrated series of lectures provide a firm foundation in immunology, especially for those with minimal immunology background, and serve as an important refresher for the developing immunologist. Students actively participate in the course through weekly presentations of selected immunology topics based on the current literature.

Lymphocyte Biology. The objective of this class is to provide first year immunology students with the opportunity to gain a more in-depth understanding of selected aspects of lymphocyte biology. Possible topics include T cell subsets, B cell biology, lymphocyte activation, and transplantation immunology. The course is literature intense and students are required to read and present numerous scientific papers.

Dendritic Cell Biology. Understanding the biology and function of the immune system's professional antigen presenting cells, the dendritic cells, is a fast moving challenge. We will cover the seminal papers in the field

that have laid the groundwork for our current understanding of this group of complex cells. The major component of the class will emphasize student presentations of assigned reviews and journal articles. Presentations will include an overview (provided by the review article) and 2-3 papers per class.

Innate Immunity. The study of innate immunity has made a resurgence in recent years and its critical role, not only in host defense against invading pathogens, but in the development of adaptive immune responses is now appreciated. This course will provide an in-depth look at selected aspects of the innate immune response including the cellular and molecular components critical to its development. The course will involve student presentations on selected topics.

Mucosal Immunology. The mucosal immune system is essentially the primary site of interaction between invading pathogens and the immune system. Mucosal immunity has always been a strength of the immunology community at UAB and is rarely covered at most other institutions. This class will provide in-depth analysis of the structural features that distinguish the mucosal immune system from the peripheral immune system. Features of innate and adaptive immunity as they relate to mucosal immune responses will also be covered. The course will involve student presentations on selected topics.

LABORATORY ROTATIONS

During the first year, students participate in three laboratory rotations of their choosing. Lab rotations allow the student to identify specific research areas and mentors with whom they will ultimately perform their dissertation research project.

Second year and beyond - Qualifying examination, Immunology Courses, Journal clubs, Dissertation Research, Awarding of degree.

Qualifying Exam and Admission to Candidacy. All students, before the end of the third year, must develop their thesis project into the equivalent of a small NIH grant proposal to be presented in written and then oral form to their thesis committee. This is a combined qualifying examination and admission to candidacy for the Ph.D. degree. Students must demonstrate a strong background in general scientific knowledge, the relevant literature for their thesis area and the ability to defend the testable hypothesis at the heart of their proposal.

Immunology courses. Three advanced courses in areas relevant to the student's area of interest are required and may be completed anytime from the second year on. Students are encouraged to take these courses as early as possible in order to achieve the most benefit in their training. A listing of advanced courses can be found here.

Journal Clubs. From the second year until completion of the program, students participate in a Journal Club related to their specific area of interest. The purpose of the journal club is to enhance the ability to critically read the literature and to stay abreast of current findings in the field. A listing of Journal Clubs can be found in the Appendix.

Dissertation research. After completion of the Qualifying Examination, and no later than the third year, the student forms a dissertation committee comprised of five faculty members (including the mentor) whose expertise will be beneficial in helping direct the research and course of study. At the first meeting of this committee, the student presents a proposed plan of study and any preliminary data. Satisfactory performance at this initial meeting constitutes Admission to Candidacy.

Awarding of the PhD degree. The PhD is awarded upon completion of the academic requirements and defense of the dissertation. The dissertation consists of a written document that is expected to include published papers or manuscripts in preparation, along with a scholarly introduction and discussion of the work that has been completed. A successful private defense of the dissertation in front of the dissertation committee is then followed by a seminar presentation and public defense of the dissertation as the final step in completion of the PhD degree.

A2. GBS Genetics and Genomics Sciences Graduate Theme

ACADEMIC PROGRAM

First year - Courses, Laboratory Rotations, Selection of Mentor

In the first year, time is devoted to coursework and exploration of research opportunities. In the first semester a course is taken to refresh the basic knowledge in the fundamentals of biochemistry, molecular and cell biology. The second semester is focused entirely on modern concepts of genetics. Students take the GBS core curriculum described in detail in the section above.

Three rotations are performed to gain practical experience and to become familiar with the research activities of several laboratories. By the summer between the first and the second year, a mentor and a laboratory in which the thesis research project will be carried out is selected.

In the first and subsequent years, students attend the weekly Genetics seminar series, in which faculty from outside Universities, National Laboratories, or UAB discuss their research. Each semester, students also participate in the GGS journal club. Here they present for discussion published articles covering the latest research in genetics and genomic sciences. Participants review and critique these articles, thus developing their communication skills.

Second Year

After the first year, a student chooses a thesis adviser and undertakes an original research project under the faculty member's direct guidance. Throughout the period of research, additional guidance is provided by a faculty graduate advisory committee consisting of 5-6 members, chosen jointly by the student, the adviser and the Director of Graduate Studies. The committee is assembled for each student, taking into account the student's background and interests.

During the second year, the students also take specialized courses that will aid in their thesis research. There are a number of classes that focus on topics in specialized areas of genetics and genomic sciences, e.g. Medical Genetics, Epigenetics, Statistical Genetics. Students can also select courses from the other UAB Graduate Biomedical Science Themes. These classes are selected with the help of the student's thesis advisor and committee At the end of this year, students attend a course designed to teach them how to write a successful grant proposal. This prepares them for their qualifying examination which consists of a written proposal and its oral defense. Upon successful completion of the qualifying exam and the necessary advanced coursework, students are accepted to candidacy for the Ph.D. degree.

Third Year and Beyond

After completing the qualifying examination, the major focus is on the thesis research. In addition to pursuing research objectives in the laboratory, students complete advanced course electives, attend local scientific retreats, national and international meetings in specialized areas of interest, and participate in seminars.

The Ph.D. degree is awarded upon successful defense of the dissertation, including an oral presentation of students' original scientific investigations and a written dissertation which demonstrates their ability to carry out creative and significant research.

Genetics, Genomics & Bioinformatics (GGB) Theme Courses (2014-2015)

FALL SEMESTER

GBS 795: Lab Rotation 1, Poster Session

GBS 707: Basic Biochemistry and Metabolism

GBS 708: Basic Genetics and Molecular Biology

GBS 709: Basic Biological Organization

GBS 724: Principles of Genetics

SPRING SEMESTER

GBS 796: Lab Rotation 2, Poster Session

GBS 720: Genomic Structure and Function

GBS 722: GGS Bioinformatics

GBS 723: Model System for Genetic Analysis

GBS 746: Epigenetics

BY 755: Biometry (Biostatistics requirement)

SUMMER SEMESTER

GBS 797: Lab Rotation 3, Poster Session

FALL SEMESTER of second year

GRD 717: Principles of Scientific Integrity (Ethics requirement)

A3. GBS Pathobiology and Molecular Medicine Graduate Theme

The Pathobiology and Molecular Medicine (PBMM) Graduate theme is designed to give students the very best multidisciplinary training within the emerging and exciting field of molecular medicine. The PBMM theme is composed of over 130 active research faculty that are utilizing state-of-the-art resources and ideas to drive the field of molecular medicine forward.. The main objective of the program is to expose students to a diverse faculty with research interests that range from molecules - to whole organisms - to disease processes - to new therapies. Our premise is that students, when trained in basic principles of molecular and cellular biology, in addition to organ-based physiology, pharmacology, toxicology, pathology, and environmental health sciences will be prepared to study biological processes at any level of organization. Within PBMM, students have the opportunity be trained on the leading edge of biomedicine and translational research and to share in the excitement first-hand by working alongside research pioneers. Graduates of the PBMM training program will be fully prepared to address the most complex and challenging issues in disease biology and therapy and be well positioned to pursue work in academic, industrial or government research or related positions. Training for the PhD degree is generally completed within four to six years, depending on the student's background and training goals.

ACADEMIC PROGRAM

First year - Courses, Laboratory Rotations, Selection of Mentor

Integrated, science-based teaching is the foundation of every PBMM course. Students will learn from a team of faculty that will contribute their expertise in the basic biology and physiology of each topic coupled with an emphasis on understanding relevant diseases, clinical correlates, and therapeutic approaches. The lectures also emphasize the scientific techniques and experimental approaches that are essential to the concepts being discussed. Additionally, first-year PBMM students take four module courses designed to equip students with the ability to apply knowledge of essential biologic mechanisms to specific disease processes, thus laying the foundation necessary for advanced coursework and research training. Individual modules can be taken as electives by students in other themes.

During the first year (August-November), students complete the respective series of rigorous courses in the GBS Core Curriculum described above. November-December of the first year is dedicated to the course “Introduction to Experimental Medicine”. This course is followed by four modules of one month. These explore

fundamental principles and mechanisms modulating normal and abnormal function of the major human organ systems. Students learn to appreciate how organ systems are truly integrative, highly-refined, and exquisitely responsive to mechanical, endocrine, autocrine/paracrine, and neural stimuli, and why alterations in these inputs can induce disease and dysfunction. With each organ system discussed, this principle is reinforced by detailed discussions of the pathobiology underlying several disease states (during which homeostasis is lost). Together, these four modules equip students with the ability to apply knowledge of essential biologic mechanisms to specific disease processes, thus laying the foundation necessary for advanced coursework and research training. The modules include the following foci: (i) Nerves, Muscle and Bone; (ii) Heart, Lung and Kidney; (iii) GI, Endocrine and Immune Systems; and (iv) Pharmacology and Molecular Medicine.

There is ample time allotted to attend research seminars, learn to make scientific presentations and to perform 3-4 laboratory rotations. . Based on specific interests, students will choose from a wide range of research laboratories available to students. This "hands on" research experience will provide students with the background to decide on a laboratory and mentor to guide students through dissertation research. These rotations are designed to give the student a practical introduction to bench research and to help the student choose a faculty mentor.

Second Year and Beyond

After the first year there is additional coursework directed in the student's area of interest, but the main focus is on intensive research training within the laboratory. Here, guided by the mentor and graduate advisory committee, students develop critical technical and analytical skills that will form the basis of their dissertation research. Students must pass a qualifying examination that assesses their general knowledge, ability to read the literature, and ability to formulate and defend testable hypotheses. The examination involves a written proposal and oral defense of the proposal.

Pathobiology and Molecular Medicine (PBMM) Theme Courses (2014-2015)-

FALL SEMESTER

GBS 795: Lab Rotation 1, Poster Session

GBS 707: Basic Biochemistry and Metabolism

GBS 708: Basic Genetics and Molecular Biology

GBS 709: Basic Biological Organization

GBS 704: Intro to Experimental Medicine-

SPRING SEMESTER

GBS 796: Lab Rotation 2, Poster Session

GBS 750: Nerves, Muscles, Bones

GBS 751: Heart, Lung, Kidney

GBS 752: GI, Endo, Immune Systems

GBS 753: Pharmacology and Molecular Medicine

BY 755: Biometry (Biostatistics requirement)

SUMMER SEMESTER

GBS 797: Lab Rotation 3, Poster Session

FALL SEMESTER of second year

GRD 717: Principles of Scientific Integrity (Ethics requirement)

A4. GBS Cell, Molecular, and Developmental Biology (CMDB) Graduate Theme

The Cell, Molecular, and Developmental Biology (CMDB) is a cross-disciplinary theme, under the umbrella graduate program in Biomedical Sciences, that consists of a diverse group of scientists and physicians who have a collective interest in cell, molecular, and developmental biology and how defects in these processes result in human diseases and birth defects. CMDB students receive comprehensive training and instruction in cell, molecular, and developmental biology using modern tools and approaches as well as a wide range of model organisms and cell culture systems. The overall goal of the theme is to develop well-rounded scholars with expertise applicable to multiple fields pertinent to a productive research and teaching career in academic science centers, research institutions, and industry.

The CMDB theme comprises more than 60 primary and secondary faculty members with appointments in many of the academic departments and Centers at UAB including Cell Biology, Genetics, Biochemistry, Neurobiology, Medicine, Oral and Maxillofacial Surgery, Nutrition Sciences, Cardiovascular Disease, Clinical Immunology, Rheumatology, Pathology, Environmental Health Sciences, Physiology and Biophysics, Psychiatry & Behavioral Neurobiology, Vision Sciences and Optometry. The scientific interests of the faculty are very diverse and interdisciplinary in nature. As such, the CMDB theme provides students an individually tailored, comprehensive training program in cell, molecular, and developmental biology using modern tools and approaches in a wide range of model organisms. The research conducted by CMDB faculty addresses fundamental cellular and molecular questions that provide the basis for understanding and treating human disease.

ACADEMIC PROGRAM

First year - Courses, Laboratory Rotations, Selection of Mentor

In the first semester, students will complete the GBS core curriculum described in detail in section above. After completion of the core GBS curriculum, CMDB students will complete a course titled "Introduction to Experimental Medicine," which will introduce students to fundamental questions in biomedical sciences and the research approaches and model systems used to address them. Students will obtain research experience through three laboratory rotations that will be completed by the end of the first year. Laboratory rotations are for 10 weeks, and allow students to become acquainted with the laboratory and the mentor and to gain practical experience in a variety of the techniques and types of scientific questions being addressed within the different theme areas. At the end of each rotation the students will present their research in the form of a poster presentation that is open to the GBS community. After completion of the rotations, students choose a mentor and laboratory for their dissertation research.

In the second semester, CMDB students must attend Methods and Scientific Logic, a journal club designed to demonstrate how to critically evaluate data and experimental design in the scientific literature and research. In addition, beginning in the second semester CMDB students will complete a series of one-month modules in areas related to cell, molecular, and developmental biology that are in the general research and scientific interest of the individual student. The CMDB curriculum is tailored to the student's research and scientific interests. As such, the student will be able to select from modules in the CMDB theme as well as from other GBS themes approved by the student's mentor and the CMDB theme directors. The student must complete eight modules, five of which should be listed as a CMDB course. Additional course work may be required to fill gaps in the student's knowledge based on the recommendation of the mentor and the student's thesis committee.

In the summer of the first year, all CMDB students must complete course in biostatistics and bioethics as well as conduct non-dissertation research in their selected laboratories.

At the beginning of the second year, students will assemble a thesis committee in consultation with their mentors. This committee will be formed by anywhere between four and six members, three of whom should be faculty associated with the CMDB theme.

Second Year

In the second year, students continue non-dissertation laboratory research and take module course work to fulfill the requirements described above. By the beginning of the third year, CMDB students must complete their qualifying examination consisting of a written dissertation research proposal in the format of an NIH-style grant and an oral defense. The examination will evaluate whether the student has gained a sufficiently broad knowledge necessary for successful academic research. To help in this process, the second-year curriculum will include a course in scientific writing and grantsmanship with a mock NIH grant review session. After successful completion of the exam, the proposal will be submitted to a funding agency (if applicable) for possible support.

After the second semester, all students must participate in a CMDB approved Departmental Seminar Series and a weekly journal club until completion of the doctoral degree.

Third Year and Beyond

The curriculum of each Ph.D. candidate usually requires five years of training and is individually tailored to the interests and needs of the student by the advisor and a graduate committee chosen by the student. The Ph.D. is awarded upon successful defense of the student's dissertation, which includes an oral presentation of original, creative scientific investigations, and a written dissertation which is expected to include published manuscripts or manuscripts in preparation. Because pursuit of the Ph.D. is a full-time activity, all graduate students are supported by monetary stipends and do not have any required teaching duties. The level of activity required does not permit outside jobs or excessive extracurricular activities. Continuous registration and satisfactory academic standing during all terms is required.

Cell, Molecular, and Development Biology (CMDB) Theme Courses (2014-2015)

The following courses are offered through GBS or the CMDB theme but they are not required by CMDB. CMDB has an open curriculum driven by the scientific and research interests of the student. Courses offered by any theme will count toward meeting CMDB course requirements.

FALL SEMESTER (Aug 11Dec 19, 2014) -

GBS 795: Lab Rotation 1, Poster Session

GBS 707: Basic Biochemistry and Metabolism

GBS 708: Basic Genetics and Molecular Biology

GBS 709: Basic Biological Organization

GBS 710: Cell Signaling

SPRING SEMESTER

GBS 796: Lab Rotation 2, Poster Session

Students may take any of the modules offered in January term

GBS 712: Cellular/Molecular Aspects of Developmental Biology

GBS 714: Developmental Neuroscience

GBS 784: Stem Cell Biology

BY 755: Biometry (Biostatistics requirement)

SUMMER SEMESTER

GBS 797: Lab Rotation 3, Poster Session

FALL SEMESTER of second year

GRD 717: Principles of Scientific Integrity (Ethics requirement)

Course Descriptions- Cell, Molecular and Developmental Biology

Cell Signaling. This course covers major extracellular and intracellular signal transduction cascades that regulate animal development and physiology. The class meets every day for two hours and consists of two exams.

Cell and Molecular Aspects of Developmental Biology. The goal of this course is to provide an introduction to the fundamentals of vertebrate developmental biology. The course will consist of faculty lectures and research paper discussion groups covering a broad range of developmental issues from fertilization to organogenesis.

Developmental Neuroscience. The course will utilize scientific literature and faculty lectures to cover a broad range of topics related to the mechanisms of building a brain. The topics covered range from neural induction in early development, to axonal guidance and synapse formation, to neuro-glial interactions in the adult nervous system. Grades will be based on two exams and student participation in class discussions.

Stem Cell Biology. This course will explore the derivation, manipulation, and differentiation of embryonic, fetal, and adult stem cells in both mice and humans. Topics to be discussed include stem cell self-renewal, teratoma formation, hematopoietic stem cells, neural stem cells, trans-differentiation, nuclear transfer, and reproductive and therapeutic cloning. The course will be a mixture of instructor lectures and interactive journal club style presentations from the current stem cell literature by the students. Students will be evaluated based upon their journal article presentations, participation in class discussions, quizzes, and attendance.

Development and Evolution. This course will cover the developmental mechanisms that drive evolutionary change and how body plans evolve through natural selection. The course consists of lectures and scientific literature discussions that will demonstrate developmental biology principles.

Skeletal Development and Disease. The primary goal of this course is to introduce graduate students to the basic and translational knowledge about development, maintenance and homeostasis of the mineralized tissues. Lectures in this course will focus on approaches and techniques that are utilized for understanding cellular and molecular mechanisms essential for the normal development, remodeling, and patho-physiology of skeleton.

Mechanisms of Birth Defects. This class will provide an overview of the mechanisms of common birth defects. A review of the development of each organ system is followed by a discussion of molecular mechanisms leading to alterations in normal development. Genetic and environmental mechanisms are discussed. A recent paper on each topic is presented as part of the class. Depending on the number of students enrolled, each student will be required to present one or two papers.

Grantsmanship and Scientific Writing. The objective of the course is to teach students how to effectively write grant proposals. This course will provide hands on training in the preparation of a grant application and demonstrate effective strategies for assembling a successful proposal. With guidance from the faculty, the students will write a NIH-style proposal on their dissertation research topic. After the proposal is complete, each grant will be reviewed in a mock-NIH study section. Based on the comments from the study section, the student will revise the application and submit the proposal to his/her thesis committee as part of the qualifying examination for admittance into candidacy.

Laboratory Rotations. Concurrent with the first year of course work, each student will perform laboratory research with mentors of his/her choosing in any of the GBS themes. Laboratory rotations are meant help students become acquainted with the laboratory and the mentor and to gain practical experience in a variety of the techniques and types of scientific questions being addressed within the different theme areas. Laboratory rotations last approximately ten weeks and each student will complete three rotations by the end of their first year. At the end of each rotation the students will present their research in the form of a poster. The performance in the laboratory and the poster presentation will be graded by the mentor of the laboratory and by two GBS faculty members respectively. A passing grade is required for all laboratory rotations. 1-6 hours.

Non-dissertation Research. Laboratory research performed prior to admission to candidacy. 1-12 hours.

Dissertation Research. Prerequisite: Admission to candidacy. 1-12 hours.

CMDB Approved Seminar Series. All CMDB students must attend one of the weekly departmental based seminar series within the scientific interest of the student. The seminar series feature prominent speakers from both inside and outside of UAB and attendance is mandatory. Students should consult with their PI and the GBS Seminar. Additional seminar series may be included upon approval of CMDB and the mentor.

CMDB Journal Clubs. In the beginning of the second year until completion of the thesis defense, all CMDB students must participate in a journal club related to the student's research interests and to the CMDB theme. The purpose of the journal club is to give students valuable experience in critical assessment of the scientific literature and to keep up-to-date on the research activities emerging from CMDB related research. Students should consult with their PI and the GBS Journal Club

A5. Medical Scientist Training Program

The focus of the Medical Scientist Training Program (MSTP) at UAB is to train outstanding students in the intellectual discipline of being a scientific investigator and a thoroughly trained physician. Although the ultimate career pathway for individual trainees may range from the conduct of basic biomedical research to clinical trials of novel therapeutic agents or procedures, the net effect of this cadre of investigators will be to increase the translation of basic biomedical understanding into clinical practice. The MSTP aims to (1) offer superb classroom training in both basic science education and the fundamentals of clinical education; (2) train students in the tools necessary to become successful biomedical scientists, including grant and manuscript writing, as well as time and laboratory management; and (3) graduate physician-scientists who go on to become leaders in academic medical centers throughout the country.

ACADEMIC PROGRAM

Three Phase Curriculum

The MSTP curriculum at UAB is a truly integrated educational program. It is composed of three phases: the preclinical phase (2 years), the research phase (usually 3.5 to 4.5 years), and the clinical phase (14-18 months). The most distinctive feature of the UAB MSTP curriculum is that students in the first year take the medical school basic science courses while participating in a translational biomedical research forum.

First and Second Years, Courses, Research Rotations, Selection of Mentor

Pre-clinical Phase: Under the new integrated medical school curriculum, first year MSTP students take the Patient, Doctor and Society course in late summer of their entering year. Throughout the Fall semester, our students attending advance courses in biochemistry, genetics, cellular biology, and a variety of other disciplines taught by research faculty, while at the same time participating in our translational biomedical research forum (GBS 793). This innovative course is adapted from Currier, Schneider, and Heubi, "Taking journal clubs off autopilot: a case study of teaching literature evaluation skills to preclinical MD/PhD students" and serves to enhance the students' knowledge set while also exposing them to possible researcher mentors or collaborators. Subsequently, in the late Fall MSTP students take Fundamentals II in the medical school curriculum. Fundamentals II covers general topics related to pathology, pharmacology and medical microbiology/immunology. Starting in the spring semester of their first year, MSTP students take organ-based modules as part of the medical school curriculum.

During the first year of the Medical curriculum, MSTP students are enrolled in the Graduate School Graduate Biomedical Sciences core courses, which are formally listed as Medical School courses for MSTP students. The first semester of the graduate curriculum includes GBS707 (Biochemistry/Metabolism), GBS708 (Genetics/Molecular Biology), and GBS709 (Biological Organization) and satisfies the requirements for the Medical School curriculum in these disciplines. The Medical School curriculum is organized around organ systems rather than the traditional sciences disciplines. The objective of this curriculum is for students to learn basic sciences in a more clinically relevant context, teaching them to think comprehensively about organ function and diseases rather than simply memorize mountains of facts. All organ-based modules are co-directed by both basic scientists and clinicians. This curriculum consists of both lectures and problem-solving small-group discussions. This curriculum begins with a "Pre-clerkship" phase that includes a "Patient, Doctor and Society" ethics in medicine course followed by two courses that cover the "Fundamentals of Biomedical Science". The graduate coursework taken by the MSTP students does substitute for the majority of the Fundamentals I course. This means that only the lectures and exams on Histology, Anatomy, and Pharmacology are required for the MS1 MSTP students and no other portion of the course is taken. The MSTP students begin full immersion in the UASOM curriculum, starting with Fundamentals II (Pathobiology) and then the integrated organ or system based modules (including cardiovascular, pulmonary, renal, gastrointestinal, musculoskeletal/skin, neurosciences, hematology/oncology, and endocrine/reproductive). These organ-based modules continue until the end of the MS2 year.

During the first two years there are three research rotations allowing an in depth experience in different laboratories prior to selecting a lab for the Ph.D. dissertation research. Students first conduct a rotation in the summer prior to their first year of medical school and then also do a 2nd and 3rd rotation during summer breaks from medical school.

MSTP students also enroll in graduate school coursework during the second semester of their MS2 year (during the endocrine/reproductive organ module and the subsequent organ integration module). This graduate school coursework is divided into 4 one-month long modules with several distinct offerings during each module. The student's elect which of these offerings to take with the advice of their MSTP mentor and credit is given as Medical School Electives. As the MSTP students are taking a required graduate school course during the time the other medical students are studying for USMLE Step I, the MSTP students are given one additional month after finishing their graduate school coursework before they are required to have taken the board exam. However, all students must pass USMLE Step I before they are promoted to the Research Phase of the program. After taking this exam, the MS2 MSTP students have the option of completing their required Family Medicine exposure (a 4-week clerkship or elective), starting their third and final summer research rotation, or choosing and starting in their PhD thesis laboratory. If they choose to complete the Family Medicine Clerkship prior to beginning the Research Phase of the program, then they start their third rotation and/or their PhD thesis work one month later than their classmates.

Research Project and Dissertation

Research Phase: Once a Thesis Mentor has been selected, the student officially takes a Leave of Absence from the UASOM and transfers to the UAB Graduate School and remains in the Research Phase until the PhD

dissertation is complete. The expectation of the MSTP is that students will complete their research and dissertation defense within 3-4 years. Although the formal requirements for the PhD are set by the individual Graduate Departments/Themes, the MSTP program carefully monitors the progress of each student during these years. All of the departments require a formal project proposal in the form of a grant proposal for admission to candidacy. In many cases, the first year graduate courses and Medical School courses will satisfy the requirements for formal courses in the graduate school, but each Department may also require advanced courses, in addition to a required Journal Club course each term and training in research ethics and biostatistics. Requirements for advanced courses are variable and tailored to each student and are exactly the same as required of regular PhD students in that department. Completion of the student's research project and successful defense of a dissertation is an absolute requirement prior to progression to the clinical rotation phase of the program.

Clinical Rotation

Clinical Phase: In the final Clinical Phase, students are required to complete clinical rotations in Medicine, Surgery, Pediatrics, Neurology/Psychiatry, Family Medicine, and Obstetrics/Gynecology as well as two Senior Medicine Acting Internships and two electives. MSTP students are given considerable flexibility in the organization of their MS3/4 years and can take Acting Internships and/or electives prior to finishing the required clinical rotations if that is useful in their career decision making process or to get exposure to a subspecialty prior to residency applications.

MSTP students are evaluated in this phase of their training exactly as other medical students. At the end of the third year, students are required to take a series of standardized patient exercises and examinations (OSCE) comprised of ten stations. This exam must be passed to graduate from the UASOM. This exam tests the students' clinical exam, communication, and interpersonal skills. Students performing more than two standard deviations below the mean (only one MSTP student to date) are required to review their performance with a faculty member to determine remediation needs. Students requiring remediation complete a one-month elective in which they are closely supervised in clinical skills. Students must also demonstrate achievement of core knowledge and skills by passing the USMLE Step 2 CK examination. Although students are required to take the Step 2 CS exam, they are not required to pass it to graduate from the UASOM.

MSTP Specific Requirements

CAMS: This course consists of a series of seminars on the broad topic of Translational Research. The seminars are designed to review different specific areas of Translational Research in a "case study" approach. Invited speakers will choose a "case" of a particular scientific concept or candidate drug that is being developed or has been translated into an approved therapy with clinical impact. The speaker will attempt to highlight the milestones along the developmental pathway, including their own contributions, but focus on the overall development of the field over a significant period of time. An appreciation for the key elements that determine success in translating basic biomedical understanding into medical practice, include a combination of science, financial, and often political issues, that are often only clearly apparent in hind sight. By understanding the specifics of a number of different actual cases of successful completion of translational projects, students will become more aware of the issues in translational research beyond the specific scientific facts.

Retreat: A summer Research Retreat is held in mid-July of each year during which time selected students in the research phase of the program will present oral presentations of their research. The retreat also includes several discussion sessions that address program specific development topics, such as how to choose a clerkship, how to choose a thesis advisor, how to prepare for USMLE Part I, etc. In addition, several alumni of the program are invited to attend each year to give career advice. Attendance at the annual summer retreat is a requirement of the program.

Special Topics: As part of the new UASOM curriculum, all MS2 students are required to take a 2-week long special topics course. The UAB MSTP designed a unique course for our MSTP students to take, titled "Survival Skills for Physician Scientists". This course is designed to give MD/PhD students a basic background in topics necessary to succeed as a physician-scientist in today's academic medical environment. Topics covered include: the NIH funding system (including R01's, training grants, program project grants, etc.), how to write a fellowship, record keeping, authorship and publication, conflict of interest, animal and human

subjects, and tips for selecting a mentor and establishing a positive relationship. The course syllabus can be found in Appendix V. Further support for professional development is offered through UAB's Professional Development Program, which offers several semester-long credit courses as well as day-long workshops in a variety of areas, including Academic and Grant Writing and Presentation Skills.

Clinical experiences: MSTP students during their dissertation years are required to complete a total of 20 half-day clinics in the specialty of their choice. This experience will serve to both maintain clinical skills of the MD/PhD students while they are in their research years, as well as expose them to multiple clinical specialties to help them narrow down their future career choices.

Teaching: Students in the UAB MSTP do not have a required teaching component; however, they are encouraged by the program to avail themselves of the many teaching opportunities available through UAB and beyond. The opportunities include serving as trainers of standardized patients and examiners for Introduction to Clinical Medicine (ICM), small-group instructors and preceptors (Clinical Skills Teaching Associates) for ICM, and teachers of MCAT and GRE preparatory courses.

MSTP Mentor: An MSTP mentor is assigned to each MSTP student upon entry into the program who advises and monitors the student's progress throughout his or her 7-8 years in the program. The MSTP mentor meets with each student at least twice yearly and serves as an ex officio member of the student's dissertation committee. The MSTP mentor also submits yearly written evaluations of each student at the beginning of each new academic year (August/September) to the MSTP Director.

A6. UAB Howard Hughes Medical Institute (HHMI) MED-GRAD Fellowship (HHMG)

The UAB Howard Hughes Medical Institute Med-Grad Fellowship (HHMG) is a revolutionary Ph.D. program which combines translational research and drug discovery and provides graduate students in training with career development opportunities. UAB is one of only twenty-three schools in the nation to receive funding from the Howard Hughes Medical Institute (HHMI) $16-million dollar initiative for the Med into Grad Fellowship Program. The UAB Hughes Med-Grad Fellowship represents a unique graduate experience in disease-oriented research that partners UAB faculty with the drug discovery community at Southern Research Institute (SRI), a proven Birmingham-based pharmaceutical development company.

The UAB Howard Hughes Medical Institute Med-Grad Fellowships consisted of three elements: (1) a specialized curriculum; (2) mentored, disease-oriented thesis research; and (3) an enrichment program.

Specialized HHMG Curriculum. The specialized HHMG curriculum include five courses focused upon the clinical pathological diagnosis and management of disease; clinical research topics; research approaches to drug discovery; disease phenotyping; and statistical methods. Students also complete the program requirements for their respective graduate programs of study.

Mentored Thesis Research. HHMG Scholars complete mentored disease-oriented thesis research.

Hughes Med-Grad Enrichment (HMGF) Program is a catalyst for interactions between fellows and faculty, providing valuable training in career development. Activities are intended to fill in curriculum gaps in the areas of leadership and management skills; scientific manuscripts, grants, and presentations; and interactions with industry. Enrichment activities will also provide opportunities for networking among fellows and with program leaders.

The Scientific Writing Seminar Series includes 15 hours of instruction in the development of grants, scientific manuscripts, and presentations. Eight hours are devoted to planning, writing, and submitting competitive NIH grant applications; five hours focus on organizing, writing, and critiquing scientific manuscripts; and two hours are spent on developing skills to prepare and deliver effective presentations. The culminating HMGF experience will include the development of an individual NRSA (or equivalent) fellowship application.

Career Guidance Program. Hughes Med-Grad Scholars will also attend a semi-annual program facilitated by senior faculty. This series of lectures and interactive sessions will utilize the HHMI/Burroughs-Wellcome "Making the Right Moves" as a manual for instruction and will address challenges related to career

development and scientific research management. Through mentoring relationships, faculty will provide tailored career development guidance that will assist fellows in achieving their post-doctoral career goals.

The Industry Roundtable: This popular program has existed at UAB for the past ten years. Sponsored by the UAB Graduate School, the Roundtable includes a monthly seminar series selecting speakers from the Birmingham area and from across the country. Speakers have included venture capitalists, patent lawyers, medical liaisons, CEOs of pharmaceutical companies, and lobbyists. Seminars cover topics such as professional skills (resumes, interviews, etc.), trends in employment, and securing funding.

Annual Student Research Day: Each year, Hughes Med-Grad Scholars from all HHMI sponsored Med-Into-Grad Programs will convene for a scientific symposium that will include student research presentations, guest speakers, and networking opportunities.

HHMG Courses

In addition to the coursework required by the GBS program overall and specific the theme to which a student has committed, the following courses have been developed or adapted for the UAB Hughes Med-Grad Fellowship. These courses are intended to reduce the intellectual distance between bench and bedside through instruction of medically-relevant, patient-oriented information by top physician-scientists. The didactic experience will provide a conduit for matching fellows with world-class mentors for thesis projects in contemporary disease-based research. All UAB Hughes Med-Grad Scholars will matriculate through one of the existing interdisciplinary Ph.D. programs to fulfill their degree requirements.

Modeling Human Disease A case-based, clinical pathological, conference-style course that will present relevant physical exam and laboratory data key to the diagnosis and clinical management of specific diseases. Fellows will team with mentors to present and discuss patients. A seminar will follow, led by a prominent researcher in the field, to highlight the molecular basis of the disease as well as the mechanism for diagnosis and treatment**.**

Phenotyping Human Disease This course will cover disease processes, such as cancer metastasis, that will form the basis of modules for instruction in modern methodology (e.g., histological basis of the epithelial-mesenchymal transition, use of gene chips to identify global changes in gene expression, transgenic strategies targeting epithelial cells, introduction of imaging modalities to track metastatic cells, and visualizing lung/bone metastasis in human tissue).

Drug Discovery Research and Development Process Fellows will gain an understanding of the modern drug discovery process, including the steps from identification of lead targets to completion of clinical trials required for FDA approval. This course challenges fellows to think about how the molecule or pathway identified in their research could be targeted and validated.

Logistic and Regulatory Issues in Clinical and Translational Science HMG fellows will become familiar with the principles and methods of clinical research and learn how to critically evaluate medical research literature and understand how clinical questions are framed, how studies are designed, and how knowledge is transferred to the bedside.

APPENDIX B

UAB Office of Postdoctoral Education (OPE)

B1. What Can the OPE Do For You?

B2. Tools to Help

B3. NIH MERIT Program

B4. UAB Postdoc Outcomes

B5. UAB Postdoctoral Association

B6. UAB Postdoctoral Handbook

B1. What Can the OPE Do For You?

What Can the OPE Do For You?

The Office of Postdoctoral Education provides:

1. A **website** location for faculty to advertise their available positions for potential Postdoctoral candidates to review. Send a description of the available position for posting to lluck@uab.edu.
2. An **information packet** for faculty to give to Postdoc candidates during recruiting and interviewing. The packet includes information about Birmingham and UAB Postdoctoral issues such as insurance, vacation, maternity leave, policies and procedures, and available awards.
3. Informational **advertisements** about UAB on a regular basis in journals such as *Science, New Scientist* andvarious on-line publications.
4. Opportunities for Postdocs to compete twice yearly for the **Career Enhancement Awards (CEA)** which provide up to $1,500.00 for collaborative research with other universities, attending workshops or courses to learn new skills or internships up to 1 month. Our **Travel Awards** provide $500.00 for Postdocs to enhance their development by traveling to national or international scientific meetings for the purpose of giving an oral presentation. Another OPE competitive award, **Internship Award**, provides the funding to experience another learning environment in industrial, academics, or administrative settings for up to six weeks. The **Postdoctoral Scholar Award** of $1,000.00 is given to any Postdoc who writes a grant and receives funding.
5. A Grant Writing Course designed for Postdoc participants to produce a grant at the end of the six week program. We also provide a Lab Management Course designed for Postdocs participants to learn budget management, safe lab practices, and career management. The Translational Medicine Course will introduce every aspect of preparing and conducting a clinical and translational science research program. Finally, a Job Skill Course designed to describe an array of career options outside academic research, help you build a resume, and develop and implement a career management plan.
6. Funding for Postdocs to take 6 hours each year that would enhance career development. Professional Development classes in areas such as English as a 2nd language, presentation skills, or research ethics are some that are frequently taken.
7. **Workshops or seminars** on topics of interest to Postdocs are conducted on an on-going basis.
8. Open **communication** with the UAB Postdoctoral Association concerning issues of importance to Postdocs.
9. Available to help mentors or Postdocs with **questions or problems** that may arise.

Grant Submission Info

The UAB Office of Postdoctoral Education (OPE) was established in 1999 and was one of the first Postdoctoral offices in the country. Since its inception, the OPE has been instrumental in establishing and maintaining competitive terms, benefits and training programs for all postdoctoral fellows. At UAB, nearly 300 postdoctoral fellows are training currently in a variety of disciplines, including biomedical sciences, dentistry, engineering, health professions, clinical medicine, natural sciences and mathematics, public health, optometry, and social and behavioral sciences. The demographics of this postdoctoral community are 45% US citizen or permanent resident, including 45% female, and 17% underrepresented minority.

Consulting Services for Grants:
Often, as part of their training experiences, post-doctoral fellows are asked to write grant applications as principal investigators. In such cases, reviews of the applications by experts in grant writing, English-language composition, or the scientific subject matter can all be useful learning aids. Such reviews can be especially valuable when they are from outside experts (beyond the local mentoring environment) who can offer fresh perspectives and critiques with objectivity. Funds to pay for such consulting services can be made available from a training grant the mentoree is assigned to, departmental funds, or other available resources.

Orientation:
All new postdocs at UAB are required to attend a Postdoc Orientation during their first year; orientations are offered twice a year. Orientation sessions include information from UAB administrators in the offices of the OPE, Institutional Review Board, Conflict of Interest Review Board, Institutional Animal Care and Use Committee, Occupational Health and Safety Office, Grants and Contracts Administration, Research Foundation, among others. In addition, these sessions include a 2-hour workshop in the responsible conduct of research conducted by the UAB Department of Philosophy.

Instruction in the responsible conduct of research:
In addition to the ethics training included during the required orientation session, the following opportunities and resources are available for additional research ethics instruction.

- **Written Materials:** All postdoctoral scholars receive copies of the following ethics resources: 1) *"On Being a Scientist"* published by the National Academy of Sciences; and 2) the UAB misconduct policy.
- **Seminars and Symposia:** Established in 1998 by the University of Alabama Trustees, the *UAB Center for Ethics and Values in Science* offers seminars and symposia that discuss issues related to scientific integrity and research ethics training. The *Center*, directed by Dr. Jeffrey Engler seeks to be a focal point both on campus and nationally for discussion of value issues in science. Recent symposia hosted by the *Center* have examined the topics of scientific misconduct, fraud, and ethics involving information communication in science as well as the bioethics of health disparities. Postdoctoral scholars and their mentors will be encouraged to attend and/or participate in the training opportunities offered through the *Center*.
- ***Optional Research Ethics Training:*** Postdoctoral scholars may also choose to take systematic instruction about the responsible conduct of science via a series of formal courses including:

- ***IRB training****:* Postdoctoral scholars who will perform research on human subjects will complete an approved training course on human subjects protection and will update their training annually. There are

a number of avenues for fulfilling this training requirement, including on-line opportunities and seminars. For example, scholars may fulfill this requirement via completion of the web based training program *Collaborative IRB Training Initiative (CITI).* The *CITI Program* includes courses in the 'Protection of Human Research Subjects for Biomedical as well as for Social/Behavioral Research'. Each training module focuses on different aspects of bio-ethics and human subjects research.

- ***IACUC training:*** Postdoctoral scholars who will be involved in research that utilizes animals will complete IACUC training via on-line coursework combined with individualized instruction from IACUC veterinarians. Specifically, IACUC training will review the humane use of animals in research together with related ethical issues. In addition, scholars will receive species-specific direction in the appropriate techniques of drug administration, specimen collection, and surgery.
- ***Principles of Scientific Integrity (GRD 717: Jeffrey Engler, PhD)*** A survey of ethical issues and principles in the practice of science. Topics include the nature, extent and causes of fraud in science; UAB policies on fraud; ideals of good science; responsibilities of authorship and peer review; bias and sloppy practices; responsible use of the press; potential problems raised by the commercialization of research; scientists as public policy advisors; and ethical issues involved in animal experimentation and in clinical trials.

Professional skills development:
Throughout the research training component, postdoctoral scholars will be encouraged to receive training in new skills that differ from and/or complement those that they learned as graduate students. Each postdoctoral scholar will also be encouraged to interact with the mentor's research team, including other postdoctoral scholars, graduate students, and collaborators, through laboratory meetings, journal clubs, and departmental seminar series. In addition, each scholar will be provided with opportunities to develop professional skills, including presentation and publication skills; these opportunities are described below.

- **Personal Research Skills Development Plan:** At the start of the research training component, each postdoctoral scholar will formulate a 'Personal Research Skills Development Plan' together with his/her research mentor. The purpose of this plan is to initiate a discussion between the scholar and mentor regarding the goals for the research project and the development of research-related professional skills.
- **Scientific seminars and journal clubs:** There are a number of seminar series and journal clubs that will be available to postdoctoral scholars. Weekly seminar series, which host scientists from other universities as well as showcase the work of UAB faculty, are sponsored by departments and research centers across the UAB campus. On-going journal clubs in both clinical and basic science research offer trainees the opportunity to discuss and debate current literature in a small group format.
- **Presentation of research at local and national meetings:** Postdoctoral scholars will be encouraged to present their research work at several research venues both at UAB and nationally.

Postdoctoral curriculum in professional skills:
The OPE offers a variety of workshops, seminars, and opportunities that promote the development of professional skills. Past and on-going topics / opportunities include 'Transition to Independence Seminar Series' and 'Job Fair'; each of these events present information regarding career opportunities and job skills for the biomedical field. The OPE also offers the "How do you manage" workshop to all postdoctoral trainees. This workshop provides self-assessment tools for the improvement of management and leadership skills. In addition to these events, the OPE provides the following training opportunities:

- ***Grant Writing Course for Postdoctoral Scholars*** - This course, which is offered by the OPE, introduces every aspect of grant writing, including selecting funding mechanisms, writing individual grant sections and understanding administrative policies, to postdoctoral scholars. In addition, this course provides

each postdoctoral scholar with the opportunity to write a grant and have it reviewed through a 'mock-study section' with faculty who evaluate trainee applications for the NIH. Several postdoctoral scholars who have participated in this course have utilized it to prepare NRSA-F32 and K99/R00 applications for submission to the NIH; to date, three of these postdoctoral scholars have received funding.

- ***Laboratory Management Course for Postdoctoral Scholars*** - This course introduces every aspect of laboratory management, including hiring staff, managing start-up budgets, and practicing safe laboratory practices, to postdoctoral scholars in any discipline. Throughout the course, participants are expected to: i) attend each class; ii) participate in class discussions; and iii) present a laboratory management plan.
- ***Translational Science for Postdoctoral Scholars*** – This course introduces postdoctoral scholars to major aspects of preparing a translational science research program, including program design, data analysis, and regulatory requirements. The *Clinical and Translational Science: Principles of Human Research* text, by David Robertson and Gordon Williams, will be utilized. Throughout the course, participants are expected to: i) attend each class; ii) participate in class discussions; and iii) develop a proposal for a translational science project in a team-based approach.
- ***Jobs Skills Course*** - This course introduces every aspect of preparing for and completing a job search, including career options, preparing CVs and resumes, and interviewing skills. Participants will have the opportunity to work one-on-one with a career services specialist.
- ***Mentored Experiences in Research, Instruction, and Teaching (MERIT) Program*** - The primary goal of this program is to provide postdoctoral scholars with outstanding research and teaching experiences while improving the recruitment of underrepresented minorities into the field of biomedical research. It includes 3 years of concurrent research training and teaching instruction and is facilitated in partnership with Stillman College in Tuscaloosa, AL.
- ***Business Certificate Program in Life Sciences Entrepreneurship*** - The mission of this program is to provide knowledge in the areas of business and entrepreneurship to UAB trainees, to further cross-institutional collaborations among UAB schools, and to promote interactions between UAB and the Birmingham business community. The program includes three required courses in business planning, understanding the biotech industry, and innovation.
- ***Tuition Payment for Professional Classes*** - The OPE provides tuition monies to all postdoctoral scholars for up to 6 credit hours of course work per year. Eligible course work includes Professional Development courses, such as grant and professional writing, English as a 2nd language, and presentation skills, that are designed to enhance career development.
- ***Postdoctoral Research Day*** - Each Spring, all postdoctoral scholars are invited to participate in 'Postdoctoral Research Day' through the oral presentation of their studies' results. Presentations are judged by UAB faculty members; cash awards are given for 1st-, 2nd-, and 3rd-place finishes.
- ***Career Enhancement Awards*** - These competitive awards are available to all postdoctoral scholars and provide up to $1,500 for collaborative research with other universities, attendance at workshops or courses to learn new skills, or performance of science-related internships.
- ***Job Fairs***- The UAB OPE, in partnership with its counterpart at Emory University in Atlanta, GA, hosts a job fair showcasing biomedical career opportunities for postdoctoral scholars at both institutions.

R*ecruitment process:*

Postdoctoral scholars are recruited to apply through a multi-pronged approach that includes advertisements in scientific journals, web postings, and attendance at recruitment fairs. Specifically, advertisements are listed in scientific journals, including *The Scientist, Science*, and *Nature*. Web postings are targeted toward academic career-related websites, including*Science Careers* and *FASEB Minority Access to Research Careers*. To enhance recruitment of minorities, OPE representatives will attend postdoctoral recruitment fairs, such as the *Annual Biomedical Research Conference for Minority Students* and the *National Conference of the Society for Advancement of Chicanos and Native Americans in Science*, to increase awareness of UAB's postdoctoral training programs.

B3. NIH MERIT PROGRAM

UAB OFFICE OF POSTDOCTORAL EDUCATION

Knowledge that will change your world

Program Overview

The primary goal of the **M**entored **E**xperiences in **R**esearch, **I**nstruction, and **T**eaching Program (MERIT) is to provide Postdoctoral Scholars with outstanding research and teaching experiences while improving the recruitment of underrepresented groups into the field of biomedical research. The immediate objective of the **MERIT Program** is to enhance the research backgrounds and teaching experiences of developing scientists in order to prepare them to conduct high quality research in an academic environment. Long-term objectives for this program are three-fold: 1) to enhance research-oriented teaching at partner institutions that have a historical mission and a demonstrated commitment to providing training, encouragement and assistance to students from groups underrepresented in biomedical and behavioral research; 2) to further promote interactions between research-intensive universities and partner institutions that will lead to collaborations in research and teaching; and 3) to develop highly trained biomedical and behavioral scientists from diverse populations. To achieve these objectives, qualified Postdoctoral Scholars are recruited into a four year program that provides research experiences at the University of Alabama at Birmingham (UAB) and teaching experiences at Oakwood University and Stillman College. Through these experiences, the Postdoctoral Scholars gain knowledge and skills in both biomedical research and higher education instructional design. Together, UAB and its partner schools collaborate in the overall design, improvement, and sustainability of the **MERIT Program**.

Applicants to the **MERIT Program** must be Ph.D. candidates or recent Ph.D. recipients (within the past year) and a US citizen or non-citizen national; individuals with comparable degrees, including the MD and DVM, are also eligible. Women and persons from diverse backgrounds, including underrepresented racial and ethnic groups, individuals with disabilities, and individuals from disadvantaged backgrounds, are encouraged to apply.

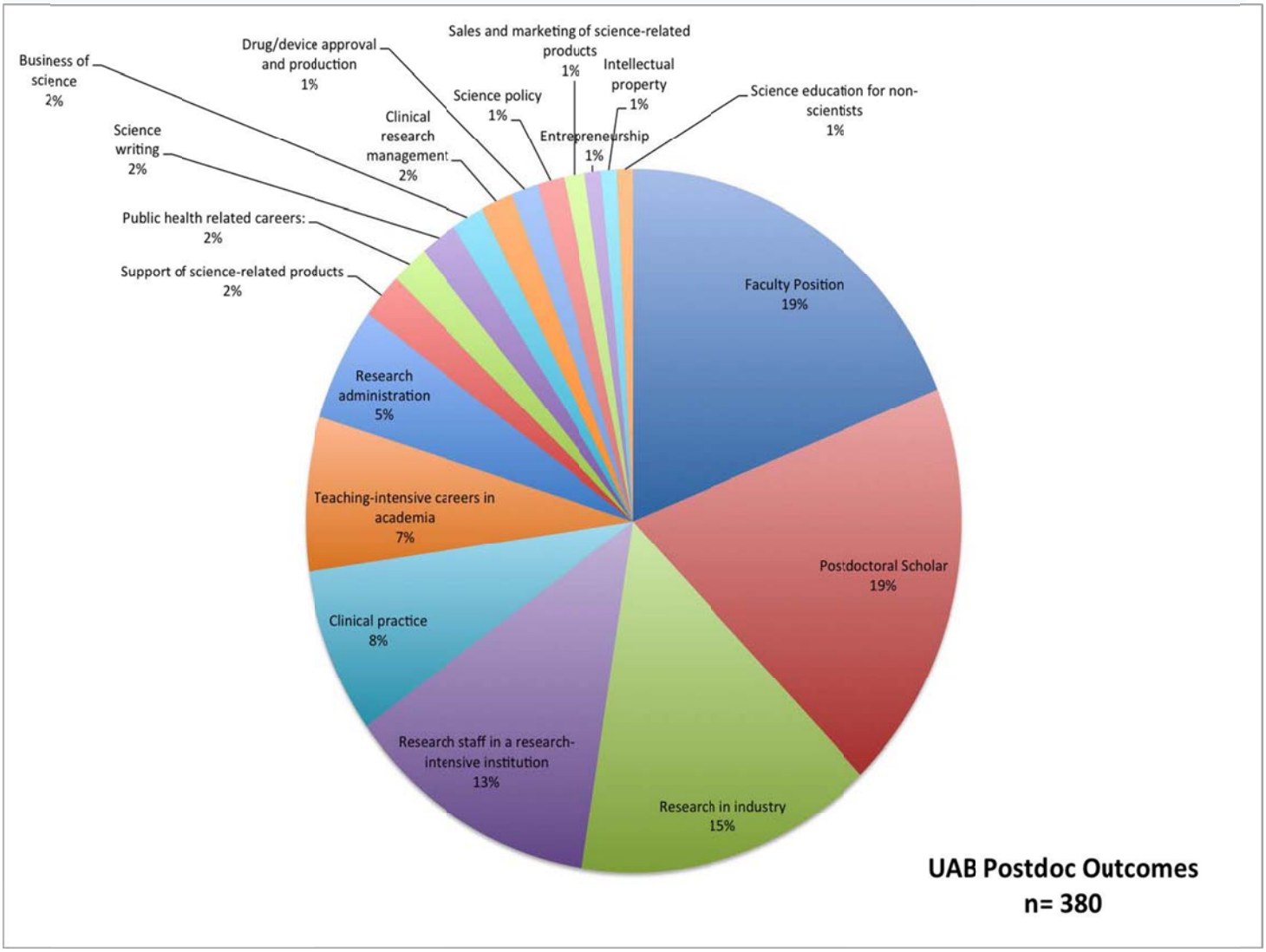
The underlying philosophy that drives the **MERIT Program** is that successful academicians combine a love of learning and teaching with a passion for research. The **mission** of the **MERIT Program**, therefore, is to provide experiences in both teaching and research that will permit Postdoctoral Scholars to become tomorrow's leading academicians, while at the same time prompting undergraduate students from underrepresented groups to pursue advanced degrees in STEM disciplines.

B4. UAB Postdoc Outcomes

UAB Postdoc Outcomes

Since 2000, UAB has been collecting data on the outcomes of our Postdoctoral Alum. Below is a chart which sums up the data we have collected. This data spans from 2000-2014 depicting the job the alumni took directly after finishing their Postdoc at UAB. The outcomes are segmented to show the distribution of our alumni based upon the Science Careers myIDP categories and career options.

**Data is received through LinkedIn accounts and does not represent all UAB Postdoc outcomes. Only those with LinkedIn accounts*.



B5. UAB Postdoctoral Association

UAB Postdoctoral Association

The UAB Postdoctoral Association (PDA) is a volunteer organization that provides a voice for the interest of postdoctoral scholars at UAB. It works to encourage meaningful and constructive dialogue with the Office of Postdoctoral Education, the Council on Postdoctoral Education, and the university to advocate for improvements in policies affecting postdocs. It also organizes and carries out social and educational events for all postdocs at UAB.

If you are a postdoc at UAB, you are a member of the UAB-PDA! We welcome your suggestions and input. Please contact a member of the PDA Executive Board.

Check out our Facebook page **here**. **Email** us with any questions.

Thank you!

UAB Postdoctoral Association

PDA Executive Board

Stefanie Robel, Ph.D.
President
Department of Neurobiology
srobel@uab.edu

My major research interest is in the role of astrocytes in the development and progression of CNS diseases. Throughout my training, I have focused on changes that astrocytes undergo in response to different CNS pathologies, namely penetrating head injury, repeated mild traumatic brain injury, epilepsy, glioma and Alzheimer's Disease. My long-term career goal is to establish an independent laboratory in an academic setting, where I will continue to study astrocytes in CNS disease. In my graduate career in Munich, Germany, I received extensive training in the use of transgenic mice in combination with immunohistochemistry and biochemistry. These methods serve as powerful tools for the study of the molecular basis of cell biological changes after injury. However, I also feel that it is extremely important to understand the sequelae of events after injury in order to identify therapeutic targets. In addition, the use of clinically relevant models of disease is of the essence. During my postdoctoral training at UAB, I have

been expanding this expertise by integrating additional surgical, electrophysiological and imaging techniques that allow intravital imaging in animals over time in clinically relevant mouse models of CNS disease into my repertoire.

Alisha Epps, Ph.D.
Vice President
Neurobiology & Physical Medicine and Rehabilitation
alishae@uab.edu

My long-term career goals involve a combination of research and teaching to further investigate the mechanisms underlying hippocampal dysfunction in disorders such as traumatic brain injury, epilepsy, and depression using a multi-faceted approach. I have been fascinated by this region of the brain since my days as an undergraduate student at the University of South Carolina, where I first began to study the role of the GABAergic system in epilepsy. Later, through my work with Drs. David Weinshenker and Jay Weiss at Emory University, I assessed the role of the hippocampus in depression and epilepsy co-morbidity using novel animal models and cutting-edge genetic techniques. Since completion of my graduate dissertation, I have pursued postdoctoral training with Drs. Linda Overstreet-Wadiche and Candace Floyd at UAB. My current research investigates alterations in cellular physiology and hippocampal neurogenesis following mild traumatic brain injury, utilizing hippocampal slice whole-cell electrophysiology and immunological techniques. In addition to my research interests, I am also enthusiastically engaged in undergraduate education, and teach multiple courses through UAB's Science & Technology Honors Program.

Samantha Giordano, Ph.D.
Secretary
Vascular Biology and Hypertension
sgiordano@uab.edu

I am a first year post doc working in the Hypertension program. I completed my PhD in Molecular and Cellular Pathology at UAB studying mitochondria and autophagy in Parkinson's disease models. I have really enjoyed shifting to Vascular Biology and Hypertension as a new model during my post doc and am learning novel concepts and techniques. Currently, I am working on projects in a variety of animal models using targeted based cell therapy as a treatment for vascular disease and injury. My eventual goal is to establish my own independent laboratory researching targeted cell based therapies and their effects on the cellular metabolism in vivo, incorporating both my pre and post-doctoral research experiences. With my training from UAB both in research and in personal and professional development I feel confident I will achieve this goal.I also work with GASP, a group dedicated to increasing air quality in Birmingham, and am learning the ins and outs of the Science Policy field. As a member of the PDA executive board I hope to help other post-docs reach their career goals, whether it is to become a faculty member, work in industry; teach etc. by helping to facilitate various training opportunities

University of Alabama at Birmingham

Office of Postdoctoral Education

2014 - 2015 Handbook

Office of Postdoctoral Education
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Welcome to the UAB Office of Postdoctoral Education!

The University of Alabama at Birmingham is committed to the development and success of outstanding Postdoctoral scientists. Here at UAB, our 250+ Postdoctoral Scholars are training currently in a variety of disciplines, including dentistry, engineering, health professions, medicine, natural sciences and mathematics, public health, optometry, and social and behavioral sciences. Career development opportunities to enhance and define the training experience are available to all Postdoctoral Scholars. Because of its commitment to the success of Postdoctoral Scholars, *UAB ranks consistently as one of the top ten locations among US universities for training Postdoctoral Scholars.*

The UAB Office of Postdoctoral Education (OPE) was established in 1999 and was one of the first Postdoctoral offices in the country. Since its inception, the OPE has been instrumental in establishing and maintaining competitive terms, benefits and training programs for all Postdoctoral Scholars. It works closely with the University's academic administration, the UAB Council on Postdoctoral Education and the UAB Postdoctoral Association to address the needs and concerns of Postdoctoral Scholars in a timely and professional manner.

The goal of the OPE is to provide Postdoctoral Scholars with the opportunities and skills they need to be successful in their chosen careers. The possibilities for academic and research-related careers are ever changing; as such, we strive to prepare Postdoctoral Scholars for these possibilities. In doing so, the OPE is dedicated to making UAB the first choice among Postdoctoral Scholars as a place to work, live and succeed!

If you are considering a Postdoctoral position here at UAB or are already in residence, we welcome your suggestions and look forward to working with you!

Best regards,

Lisa M. Schwiebert, Ph.D.
Associate Dean
Office of Postdoctoral Education

THE POSTDOCTORAL EXPERIENCE

Approximately 250 Postdoctoral Scholars are on the University of Alabama at Birmingham campus. They have received their terminal degree and are pursuing further training under the direction of a faculty member (mentor). The University of Alabama at Birmingham views the Postdoctoral experience as one in which an environment is cultivated that will encourage research excellence, leadership qualities, and independent thinking.

The Office of Postdoctoral Education (OPE) was established in April 1999 to address the rising concerns of this unique and valued sector of the University's population, and falls under the stewardship of The Graduate School. Policies regarding Postdoctoral training are the responsibility of the Associate Dean of the Office of Postdoctoral Education along with the Council of Postdoctoral Education (COPE), a committee of Postdoctoral Scholars and senior and junior Faculty. Final authority for all Postdoctoral decisions rests with the Graduate School Dean. The OPE at UAB is responsible for facilitating the goals of Postdoctoral Scholars and their mentors who arrange for training and offer terms of appointment in accordance with established policies.

The OPE will strive to identify primary responsibilities and clear expectations of both the Postdoctoral Scholar and the Faculty mentor, to aid in transition to a Postdoctoral environment, and to ensure a worthwhile Postdoctoral experience that reflects the balanced interests of both Postdoctoral Scholar and faculty mentor. However, the ultimate responsibility for the success of a Postdoctoral appointment rests with the research mentor. Periodic verbal and written evaluation of progress is strongly encouraged. Similarly, a major role of the OPE is to provide opportunities for identification and acquisition of skills needed for successful career development.

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APPOINTMENT INFORMATION

Definition

Because the term "fellow" is used to describe a large variety of positions, the designation of "Postdoctoral Scholar" is used at UAB to identify those individuals who have received their terminal degree (such as Ph.D., M.D., D.D.S., D.V.M., O.D.), and who have opted to pursue further mentored-training. This period of training is a standard component in the preparation of performing research in the sciences. A Postdoctoral position is a time-limited appointment, the primary purpose of which is to provide research and/or Scholarly training for an academic or research career. Postdoctoral Scholars may be funded by training grants, research grants, or institutional resources.

A Postdoctoral Scholar at UAB is expected to:

- participate in a full-time regimen of advanced training and research
- train under the supervision and direction of a faculty research mentor who will provide the opportunity for collaborative and independent research, as well as promote publication of findings as determined by mutual agreement between the Postdoctoral Scholar and the mentor
- training as a Postdoc includes all relevant academic activities related to the preparation for a career in research or academia. These are typically; manuscript preparation of research findings, reading broadly the literature, manuscript reviewing, presentations at meetings, attendance and presentation at seminars, organization and attendance at training related activities (including Grantsmanship workshops) and limited training in teaching related activities. All these activities should have the objective of enhancing the performance of the Postdoc in the pursuit of the research related projects from which they draw their support. In many cases the training component of a Postdoctoral fellowship may involve the joint preparation and development of proposals for extramural funding
- have a temporary appointment, usually for a period of one year with the possibility of annual re-appointment for up to an additional three years, for a total not to exceed four years unless by exception of the Associate Dean of the Office of Postdoctoral Education
- have been awarded a Fellowship or Traineeship or equivalent support for studies at the Postdoctoral level

It is strongly recommended that a person who falls into one of the following categories NOT be appointed as a Postdoctoral Scholar through the Office of Postdoctoral Education:

- registered students or candidates for a degree at UAB even if they already hold a doctoral degree
- registered Residents and Clinic Fellows (may be appointed via Graduate Medical Education)
- individuals appointed for less than one year

Types of Appointments

Upon appointment, a Postdoctoral Scholar is assigned to one of two distinct categories for payroll and taxation purposes:

Status Code 20: A Postdoctoral **Trainee** is an individual who is receiving a true fellowship, as defined by the IRS, and receives an amount to aid in the pursuit of research training. This amount cannot represent payment for the performance of any past, present, or future teaching, research, or other services. Postdoctoral Trainees are provided health insurance with the opportunity to purchase dental options.

In accordance with IRS regulations, UAB does not withhold federal income taxes on status code 20 postdoc Trainees, and the State of Alabama currently excludes fellowships from taxation in their entirety. Therefore, to the extent that a Scholarship/fellowship is federally taxable to the individual, that individual will probably have to file federal quarterly estimated income tax returns and pay quarterly taxes in order to comply with individual income tax regulations. (For specific advice on an individual tax situation, a tax professional or the IRS should be contacted. Non-resident aliens should direct their tax questions to the International Scholar and Student Services (ISSS) at (205) 934-3328. Postdoctoral Trainees receive benefits as shown under the Benefits section.

In accordance with regulations, federal and state income taxes are not withheld from stipend amount IF YOU ARE A CITIZEN OF THE UNITED STATES. You may be required to file federal quarterly estimated income tax returns and pay quarterly taxes to comply with individual income tax regulations.

It is important to consult an income tax professional or the IRS for advice on this matter.

The IRS booklet, Publication 970, Tax Benefits for Education, can be viewed on-line at: http://www.irs.gov. In the Search For field type: Publication 970 and in the Search Within field choose: IRS site. The booklet can be printed out or you may call (800) 829-3676 for a copy to be sent by mail. Additional publications at this site that may help you include:

Publication 421, Scholarships and Fellowship Grants
Publication 355, Estimated Tax
Publication 306, Penalty for Underpayment of Estimated Tax
Publication 505, Tax Withholding and Estimated Tax

State of Alabama income tax website - www.ador.state.al.us/incometax

Financial Affairs webpage on the UAB web site has a Scholarship & Fellowship section which is very helpful. See "Taxability to Individuals" at
http://financialaffairs.uab.edu/content.asp?id=297413

Status Code 21: A Postdoctoral **Employee** is an individual who, while pursuing further training, provides services to UAB for compensation. These postdocs receive a salary, usually as part of an NIH-funded grant. Salaries and wages are fully taxable to the individual providing the services. Postdoctoral employees receive benefits as shown under the Benefits section.

The Appointment Process

All the following steps must be completed in order for the appointment process to be finalized.

Letter of Offer
All Postdoctoral appointments and re-appointments are coordinated through the Office of Postdoctoral Education. Detailed letters of offer on OPE letterhead, signed by the Associate Dean, are sent to the Mentor to be signed and forwarded to the potential postdoc. In many cases, the letter of offer needs to be sent several weeks or months prior to the actual starting date (for example, to begin the visa process) and will specify the following:

- department or division to which the postdoc is assigned
- effective date of appointment
- duration of appointment and possibility of re-appointment
- Mentor to whom assigned
- annual award/stipend amount
- a brief description of research activities in which the postdoc will be involved and the qualifications needed by the postdoc to complete these activities

Mentors may agree but are not required to provide relocation support to Postdoctoral Scholars as a part of a recruitment package. If Mentors decide to support Postdoctoral Scholars by providing additional resources, the following must be stated explicitly in the position offer letter.

> Postdoctoral 20 (Trainee)
> *"As a part of your start up package, you will receive an additional award of $___. This additional award is subject to federal tax reporting and will be included through your next direct deposit."*
>
> Postdoctoral 21 (employee)
> *"As a part of your start up package, you will receive an incentive of $___. This incentive is subject to tax withholdings and will be included through your next direct deposit."*

The allocation for this allowance cannot exceed $10,000. Once the Postdoctoral Scholar is hired, an ACT document will need to be created with the document reason of Nonrecurring Element. The element is "Trainee 1T" for Postdoctoral Trainees (Status 20) and "Start-Up 1T" for Postdoctoral Employee (Status 21).

An accepted offer is signified by the Postdoctoral Scholar's signature with a copy of the signed letter kept in the Office of Postdoctoral Education. The department will keep the original letters.

International Candidates: If the prospective Scholar will need assistance in entering the USA, the Department will contact UAB International Scholar and Student Services (ISSS) when the letter of offer is ready to be mailed. ISSS will process visa information and forward to the postdoc.

Status Letter
A second, equally important letter will be generated when the department establishes the funding source(s). The status letter provides details concerning the type of appointment (status code) and how that status code affects their benefits and taxes. See types of appointments above.

Signed copies of both the letter of offer and the status letter should be forwarded to the department administrator or to the Mentor who should provide copies to the Office of Postdoctoral Education.

Background check – Education, employment and criminal
The letter of offer states that the appointment is contingent upon receipt of a background check report that is acceptable to the university. The review includes a criminal history background check, degree (education) verification and employment history verification.

The candidate will receive information electronically, if a US citizen or Permanent Resident, or a physical copy to sign, if international, requesting consent to allow the university to conduct this investigation. In the event that the background investigation has not been completed by the time the appointment date starts, the appointment will be conditioned upon receipt of a background check report that is acceptable to the university. Before a final decision is made to rescind an appointment because of a background check result, the candidate will receive a copy of the background check report and will have an opportunity to provide explanatory information.

Copy of Curriculum Vitae
An up-to-date copy of the curriculum vitae is required at the time of appointment for our files.

Postdoctoral Scholar Personal Data Form
The Postdoctoral Scholar Personal Data Form should be completed within the first month after arrival of the new postdoc. This form provides the necessary information required for the purpose of complying with federal reporting requirements and establishing averages that can be used to compare UAB standards with those on the national level. This information is confidential and will be kept in individual personnel files located in the OPE. **The OPE will use the current e-mail address provided on the Postdoctoral Scholar Personal Data Form to communicate with postdocs regarding upcoming awards, seminars, positions, funding opportunities, etc. A new Postdoctoral Scholar Personal Data Form will need to be completed at the time of re-appointment each year to update our postdoc database.**

Departmental Personnel Officer
The postdoc should also contact their Departmental Personnel Officer as soon as possible after their arrival. The Departmental Personnel Officer will also need additional documents completed in order to process the postdoc's appointment into the UAB system.

Length of Appointment

A Postdoctoral position is a short-term, training position which should lead to a research career in academics, private industry, or government. Appointments are established for an initial period of one year, with the possibility of being re-appointed annually for an additional three years, not to exceed a total of four years. A four year time period for Postdoctoral training has become the recommended length for most universities. A time-limited appointment protects the postdoc from an indefinite length of stay in a training position and is an adequate period for transition into full time positions with appropriate salaries and benefits.

In some cases, a Faculty member may wish to extend an individual's Postdoctoral appointment beyond the fourth year. If so, a written request to the Associate Dean of the Office of Postdoctoral Education should be made before the end of the postdoc's fourth year. Requests for a fifth year must include a mutually agreed upon and detailed career development plan for the postdoc signed by both the Mentor and the postdoc. In all cases, appointment as a Postdoctoral Scholar at UAB is limited to a period not to exceed five (5) years.

Re-Appointments

Postdoctoral Scholars are appointed for one year periods and must be re-appointed every year on their anniversary date if they continue in training. The department personnel representative or Mentor will notify the OPE that a re-appointment letter must be generated through the OPE during the month prior to the yearly end date. The re-appointment letter will be signed by the Associate Dean of the Office of Postdoctoral Education, the Mentor, and the Postdoctoral Scholar. If the Mentor does not intend to re-appoint the postdoc for another year, the Mentor must notify the postdoc in writing three months prior to the re-appointment date. Following the first year of appointment and in subsequent years, if it is apparent that funding will no longer be available, a minimum of three months notice must be given to the postdoc by the Mentor

Change in Status

Whenever a Postdoctoral Scholar’s funding is changed requiring a change in status (21 to 20 or 20 to 21), a new letter of offer must be generated by the Office of Postdoctoral Education showing the new status and duties.

Appointment Protection

The initial letter of offer specifies that the term of appointment at the University of Alabama at Birmingham as a Postdoctoral Scholar is for one year, subject to all rules and regulations. If satisfactory progress is achieved, the appointment can be renewed up to three more years (Four (4) years total). Postdoctoral Scholars must be notified by their Mentors in writing at least three months in advance that their appointment will not be renewed for the next year. Under special circumstances, Postdoctoral Scholars may be eligible for a fifth year of training, with the approval of the Associate Dean for Postdoctoral Education.

Compensation

All Mentors at the University of Alabama at Birmingham are strongly encouraged to follow the National Institutes of Health, National Research Service Award (NRSA) stipend level guidelines. The current ranges for years of experience can be found at the NIH Guide for Grants and Contracts or at the UAB postdoc Web site, www.uab.edu/postdocs/.

If it is impossible to fund according to the NRSA guidelines, **the minimum starting salary at UAB is $35,190.00 plus benefits.**

Orientation

All UAB Postdoctoral Scholars are required to attend a general UAB orientation program conducted weekly by Human Resource Management (HRM). This orientation is an important component of the introduction to UAB. Personnel policies and benefits are discussed and benefit enrollment forms are completed during orientation.

Once a Postdoctoral Scholar has been appointed, he/she should be scheduled to attend the next regular orientation session which are held twice a month, usually on Mondays. The appropriate department personnel can contact HRM (205) 934-6272 to accomplish this.

In conjunction with the regular orientation, a personalized session will be conducted for Postdoctoral Scholars by HRM staff. During this time, postdocs will be given the opportunity to ask questions and to receive individualized explanations of their benefits and responsibilities, and to complete enrollment forms.

All new postdocs at UAB are also required to attend a Postdoc Orientation during their first year. This Orientation is scheduled twice a year. Communication about the dates and times will be posted on the Office of Postdoctoral Education Web site, by e-mail and by flyers posted around campus. This Orientation introduces new postdocs to representatives from a number of important areas but usually aren't familiar with until later in their training. Representatives may include Institutional Review Board, Conflict of Interest Review Board, Institutional Animal Care and Use Committee, Occupational Health and Safety Office, Grants and Contracts Administration, Research Foundation, UAB Postdoctoral Association, among others. The program is approximately 5-6 hours and lunch is provided.

International Recruitment & Student Services (IRSS)

ISSS advises international postdocs in matters of immigration, federal and state taxation, and orientation to the Birmingham community. IRSS also serves as a collaborative resource center that facilitates, promotes and strengthens international understanding on campus and throughout the Birmingham community. Smolian International House (I-House), located at 1600 10th Avenue South, Birmingham, AL 35294 is a central place for services and activities for international students and Scholars. You can contact them at (205) 934-3328.

Postdoc Obligations*

- **Overall**: Acquire the experiences they need to advance their careers and contribute to the program of their Mentor through research accomplishments and interaction with others. Meeting both objectives is most likely when the Mentor and postdoc communicate well and share similar expectations.

- **Conduct**: Participate in the research project(s) outlined in discussions with the Faculty Mentor and to regularly inform the Mentor of the research activity; to exercise ethical standards of the profession and of the University; to exhibit good laboratory practice and comply with guidelines for the use of human subjects and animals in research; to exhibit collegial conduct to his/her Mentor, coworkers, and members of the University community; and to comply with University, School, departmental and funding agency policies and procedures.

- **Career Development**: Postdocs (with the support of their Mentors) must take ownership of their professional development. They need to learn not only the use of new research tools, but also ways to access special resources (such as national and international labs, centers, and multi-user facilities) and to keep up with the exploding streams of scientific communication.

  The chances for a satisfying career can be increased through regular attendance at seminars, "getting known" through publications and meeting attendance, course work related to the area of research, integrating research into teaching experiences, developing possible collaborations, and developing skills in grant writing, reviewing, and oral and written communication. This "continuing education" can increase versatility and the change for a rewarding career.

  Intrinsic to "taking ownership" of a career is the element of taking control, of making and seizing opportunities. Timidity is not productive. Rather than waiting for invitations or instructions, successful postdocs ask for what they need, find their own new resources, meet new people, and solicit invitations to speak about their work. Developing a proactive mindset hastens the journey from student to professional. Not all advisers will welcome such initiatives. Their negative reactions can often be ameliorated by improved communication. In very difficult situations, the postdoc may need to consider an alternative situation.

- **Communication**: Communication is an essential responsibility of both postdoc and Mentor. Postdocs must clearly articulate the skills or training they need; Mentors must clearly explain the needs of the laboratory or institution. These needs are most likely to be met if the postdoc steps forward with questions and if the Mentor takes the time to listen. The postdoc must also communicate with the institution when help is required.

- **Contributing to the institution**: The more postdocs are able to support the program of their Mentor, the greater their value as team members. This can lead to a richer research experience, the respect of other group members, and support in developing a career in the future. In addition to getting the work done, good practices include keeping up with the latest advances, communicating them to others (including the Mentor), and interacting regularly with others in both the group and the institution. Expectations about the

postdoc's contributions to the immediate community should be discussed carefully with the Mentor and other lab members.

- **Planning for departure**: Departure should not be delayed without good reason; the postdoc should neither be pressured to work indefinitely for the Mentor, nor become overly comfortable in what should be a finite apprenticeship. If success in the research has proved elusive, the postdoc may be tempted to extend the stay, even indefinitely.

***From Enhancing the Postdoctoral Experience for Scientists and Engineering, A Guide for Postdoctoral Scholars, Advisers, Institutions, Funding Organizations, and Disciplinary Societies, National Academy Press, Washington, DC. For complex text see: http://www.nap.edu/books/0309069963/html**

Mentor Obligations*

Postdoctoral research opportunities at the University of Alabama at Birmingham are intended to foster the training of basic and clinical research scientists. Included within this goal is the concept that Postdoctoral Scholars, with the guidance of their Mentors, will develop a scientific project that utilizes the creativity and independence of the Scholar. In this spirit, the Mentor will provide adequate facilities, funds and the appropriate guidance to achieve the agreed upon goals of the project. In addition, Mentors should provide guidance in critical review of scientific information, grant writing, manuscript writing and preparation and in the art of performing research. Mentors should also advise and, as possible, aid Scholars in decisions regarding future employment potential and career paths. Mentor review of Postdoctoral Scholar performance and career development should be conducted at least once per year. Unsatisfactory job performance or failure to comply with University standards of conduct should be discussed with the Postdoc and documented in writing.

***Adapted from Emory University Office of Postdoctoral Education website at http://www.med.emory.edu/POSTDOC**

Postdoctoral Scholar Tracking System

The Office of Postdoctoral Education maintains a Postdoctoral database that contains information on Postdoctoral Scholars within the UAB system. This information is obtained from the Postdoctoral Scholar Personal Data Form that is required from each postdoc upon their initial appointment and each year at their re-appointment. This information is kept in the postdoc's individual folder. The principal purpose for compiling the information is to comply with federal reporting requirements, but also to give the University an accurate base from which to establish standard minimum salaries, and to track appointments that involve more than one department.

UAB Postdoctoral Association

The UAB Postdoctoral Association (UAB-PDA) submitted a constitution and bylaws to the Postdoctoral community in April 2004. Ratification was given at the first UAB-PDA meeting on May 4, 2004. Executive Board and officers are listed on the Postdoctoral webpage.

POLICIES AND PROCEDURES

UAB establishes policies and procedures in order to provide an environment that is conducive to working, learning, and providing services to the public. Such policies include guidelines for employees, for the administration, for protecting employees' rights, and for providing an atmosphere in which one's best potential can be realized.

Included in the packet of information for a new postdoc is a copy of The Policy 22. Policy Concerning the Maintenance of High Ethical Standards in Research and Other Scholarly Activities. It can also be found at http://www.uab.edu/policies/content/Pages/UAB-RA-POL-0000263 . This is one of the guiding principles and core value for which Postdoctoral Scholars and all UAB researchers will adhere. Please take the time to read this policy and understand your obligation as a member of the UAB community of researchers.

In signing the letters of offer, the Postdoctoral Scholar agrees to abide by this policy and all UAB policies and standards of conduct. Other policies which affect a Postdoctoral Scholar can be found in published materials such as Faculty Handbook and Policies, You and UAB: Handbook for Administrative Professional and Support Personnel or the complete Policies and Procedures library at http://www.uab.edu/policies/Pages/default .

Postdoctoral Dispute Resolution Procedure

The Dispute Resolution Procedure for Postdoctoral Scholars of the University of Alabama at Birmingham is an internal mechanism designed to assure prompt and impartial consideration of complaints that may arise in the workplace. The Dispute Resolution Procedure is available to all Postdoctoral Scholars. UAB Postdoctoral Scholars may use this Procedure without penalty or fear of reprisal.

The Dispute Resolution Procedure is a two-step process. A formal grievance may be invoked only after the prospective grievant has first reported the basis for his/her dispute to the Associate Dean for Postdoctoral Education. The Associate Dean shall have a reasonable opportunity to resolve the dispute informally before a grievance can be initiated. If the Associate Dean's effort to resolve the dispute is unsuccessful, he/she will notify the Postdoctoral Scholar of his/her right to initiate a formal grievance.

In order to initiate a grievance, a Postdoctoral Scholar must provide a written statement to the Associate Dean in which he/she states specifically the facts believed to support the charge and the desired outcome no later than thirty days following notification from the Associate Dean that a formal grievance may be initiated. After having determined that the facts stated by the Postdoctoral Scholar may be grieved, the Associate Dean shall notify the responding party that a grievance has been filed, shall provide a copy of the charge, and shall allow the responding party five (5) work days in which to provide to the Associate Dean his/her response to the allegation(s) made by the grievant.

Guidelines for assessment and monitoring the performance of Postdoctoral Scholars in all aspects of their position are defined in You and UAB Handbook for Administrative, Professional, and Support Personnel. Guidelines in respect of scientific conduct are defined in Faculty Handbook and Policies. Both documents can be found at http://www.uab.edu/policies/Documents/Faculty_Handbook_2014-Feb-19.pdf

Following receipt of the statement from the responding party, the Associate Dean will select a committee of three Faculty members and two Postdoctoral fellows to hear the grievance and shall provide to the Committee the written statements of the parties. The Faculty members chosen to serve on the Committee shall not have had prior knowledge of the issue(s) grieved. After having chosen one of their numbers to be chairperson, the Committee shall determine the date of the grievance hearing and shall notify the parties of the date and time of the hearing, which shall not be sooner than five (5) work days from the date notification is sent to the parties by the Committee.

Each party shall be required to provide to the Committee a list of potential supporting witnesses, if any, and a brief statement describing what information each witness has regarding the facts at issue. A witness should be a person with first-hand knowledge of facts pertinent to the resolution of the issue(s) grieved.

The formal grievance hearing shall not be bound by formal rules of evidence or judicial rules of procedure. The Committee may hear any testimony or receive any supporting evidence that it deems to be pertinent to the issue(s) grieved. Both the grievant and the responding party may be present throughout the hearing. The grievant may also be accompanied by an advisor of his/her choosing, however, the advisor may not participate in the hearing, other than to advise the grievant.

The grievant shall be afforded a reasonable opportunity to be heard, to question witnesses indirectly through the Committee, to rebut adverse evidence, and to make a brief closing statement. Members of the Committee may ask any questions at any time during the hearing and may elect to disallow or to curtail testimony that the Committee determines to be unnecessarily redundant or not probative of the issue(s) being heard. Throughout the hearing, all persons present shall conduct themselves in an orderly manner.

The Committee shall be responsible for the conduct of the hearing at all times. Hearings before the Committee are confidential proceeding and only those persons determined by the Committee to have a need to be present shall be included. Except for the grievant, the responding party and the advisor of the grievant, if any, all other witnesses shall be excluded from the hearing room, except when testifying. No more than one witness shall be called to testify at a time.

All questioning of witnesses shall be by the Committee unless the Committee shall decide otherwise. Although the specific procedure for the conduct of the hearing may vary somewhat, the process shall generally include the following: (1) call to order by the Chair; (2) introduction of those present; (3) statement of the issue(s) grieved; (4) presentation of the evidence and testimony in support of the issue(s) grieved; (5) questioning of grievant' s witnesses; (6) presentation of evidence and testimony in opposition to the charge; (7) questioning of responding party's witnesses; (8) closing statements.

As soon as practical following the conclusion of the hearing, the Committee shall meet in private session to consider all of the evidence presented, and shall decide on one of two outcomes. The outcome shall be determined by a "preponderance of the evidence" standard, that is, that the facts more likely than not either prove or disprove the issue(s) before the Committee. The decision of the Committee shall be that the issue(s) is either (1) proven by a preponderance of the evidence or (2) not proven by a preponderance of the evidence. Following their deliberations, the Committee shall provide a brief narrative statement explaining its finding(s) and a summary of the supporting facts. The Committee's written decision shall be transmitted to the Associate Dean for appropriate action. The Associate Dean shall notify the grievant and the responding party of the committee's decision and any action to be taken as a result of the Committee's findings.

Upon notification to the grievant of an adverse outcome, the Associate Dean shall also advise the grievant of his/her right to appeal the Committee's decision in writing to the Dean of the Graduate School. An appeal to the Graduate School Dean shall be limited to the presentation of new, previously unavailable evidence, and/or the identification of procedural error in the hearing process.

After a review of any new evidence presented on appeal and a review of the process afforded the grievant, the Graduate School Dean shall notify the grievant, the responding party and the Associate Dean of his/her decision, which shall be final.

Policy for Postdoctoral Part-Time Positions

A Postdoctoral position is a full-time position of one to four years, training scientists/researchers for career advancement. Only in rare cases should a Postdoctoral position be part-time and usually for short periods of time. A postdoc may request his/her position be changed to part-time or enter a position as part-time because of a variety of reasons including the birth of a child, care for an ill or injured family member or his/her own physical impairments. A position cannot be part-time due to lack of funds to meet the NIH minimum salary/stipend standards.

Documentation from both the Mentor and the Postdoctoral Scholar requesting a part-time position should include the reason for the request, number of hours, projected length of time, and salary. This information must be received before the letter of offer or reappointment letter will be issued.

BENEFITS AND SERVICES

Benefits

Benefits to Postdoctoral Scholars vary according to the type of appointment. Due to IRS restrictions placed on non-taxed fellowships, retirement benefits are not allowed for **Postdoc Trainees (Status Code 20)**. VIVA Health Insurance coverage is provided at no cost to the postdoc with the option of purchasing the dental portion of the insurance plan. Because of their unique status as "Trainees" who do not receive a salary but rather a stipend, these postdocs are eligible for student housing.

Postdoc Employees (Status Code 21), because of their employee-employer relationship with the University, receive a salary. They also are provided VIVA Health Insurance coverage paid through the University with the option of purchasing the dental portion of the insurance plan. Status Code 21 postdocs are not eligible for student housing.

Benefits Eligibility Table

Employment Category	Status Code	UAB paid Accidental Death and Dismemberment Insurance	Employee paid Accidental Death and Dismemberment Insurance
Postdoctoral Scholar Trainee	20	Yes	Yes*
Postdoctoral Scholar Employee	21	Yes	Yes*

Employment Category	Status Code	TIAA-CREF Retirement	Viva Health Insurance	Dental Insurance	UAB paid Group Term Life Insurance
Postdoctoral Scholar Trainee	20	No	Yes	Yes*	Yes
Postdoctoral Scholar Employee	21	Yes Matched up to 5% of salary	Yes	Yes*	Yes

*individual pays premium

University Paid Benefits

- **Viva Health Insurance -** VIVA Health is the health care plan provided **for Postdoctoral Trainees (status code 20) and Postdoctoral employees (status code 21).** The premium for either single or family coverage is paid by the University. Coverage under UAB's group health care plan must be elected on either the first day of appointment or the first day of the month following the date of appointment. The postdoc has **31 days from their starting date to complete hospital insurance forms** either by participating in orientation or by scheduling an appointment with the Benefits Department. Some form of health insurance coverage is mandatory and proof of insurance is required if the University's health insurance is not elected. VIVA Health also covers medical evacuation and repatriation of remains for International Postdoctoral Scholars.

- **Group Term Life Insurance -** Group Term Life Insurance coverage **varies with salary** as indicated at no cost to the individual.

- **Accidental Death and Dismemberment Insurance - $**22,500.00 for accidental death. No cost to the individual.

- **Long Term Disability Insurance** (Salary Continuation) – After a 90-Day waiting period, 66 2/3% monthly salary (not to exceed $10,000 per month) for the first 90 days of benefits. After 90 days of continued benefits, plan pays 60% monthly salary (not to exceed $10,000 per month). No cost to the individual.

- **Retirement Plan – TIAA/CREF -** Teachers Insurance & Annuity Association/College Retirement Equities Fund (TIAA/CREF). Eligible to participate in the TIAA/CREF 403(b) program on a tax sheltered basis. The program offers the individual a choice as to the distribution of the total deposit to be placed in TIAA (fixed annuity) or CREF (variable annuity). UAB will match the amount that the postdoc contributes, up to 5% of his/her salary. **Available to Postdoctoral employees (status code 21) only.**

Voluntary Employee Paid Benefits

- **Postdoctoral Met Life Dental Basic Option -** Preventive and diagnostic are covered at 90% UCR. Basic services are covered at 90% UCR subject to a $25.00 deductible. The postdoc will pay a monthly premium for single coverage or family coverage.

- **Postdoctoral Met Life Dental Comprehensive Option -** In addition to the basic dental benefits, the comprehensive plan covers major services at 60% UCR subject to the deductible. Orthodontics is covered at 50% UCR up to a $1,000 lifetime maximum per patient. The postdoc pays the full monthly premium for single coverage or for family coverage.

- **Group Universal Life Insurance Coverage -** Maximum Coverage - Five (5) times salary, not to exceed $1.4 million. Guaranteed Issue - Three (3) times salary, not to exceed $100,000 during first 31 days of employment without evidence of insurability. Individual pays full premium.

- **Accidental Death and Dismemberment Insurance** - Maximum coverage - up to $500,000. Individual pays full premium.

Other Benefits

- **Social Security** - Taxes and benefits established by the U.S. Government
- **Unemployment Compensation Insurance** (paid by the University)
- **On-the-Job Injury/Illness Program** (paid by the University)

Legacy Community Federal Credit Union

Credit Card - The Office of Postdoctoral Education is very happy to announce that the Legacy Community Federal Credit Union will offer the opportunity to obtain a **credit card** to newly-arrived foreign nationals. A postdoc should go to either of the locations near UAB – 1400 South 20th Street or 516 South 20th Street –open an account for as little as $25.00 and fill out the application. They will require social security number, the letter of offer showing salary and start date, and another identification such a passport, driver's license, or US government or military ID.

Loan - Another service that the Legacy Community Federal Credit Union can provide for postdocs is help with unplanned cash flow shortages. A new UAB postdoc can exhaust their available funds quickly when paying deposits on rent, utilities, etc and may require a **small loan** to tide him or her over until they are in the UAB system and receive a paycheck. The Legacy Community Federal Credit Union again can help with this problem. Open an account with them for as little as $25.00, provide an ID as mentioned previously, social security number, letter of offer, complete the application and they will begin the process.

The Legacy Community Federal Credit Union will not eliminate anyone from their services because of lack of credit history, but will need to know, as all financial institutions do, that an individual's ability to repay a loan or pay a credit card bill is not hindered from excessive debt. They will need documentation showing salary and have agreed to accept the letter of offer as proof. The application for a loan or credit card will ask about any debt amount owed. After comparison of these two figures, they will determine qualification and notify the applicant about the requested service. For a Foreign National Postdoc acquiring the necessary credit history for a credit card can sometimes take years so we believe that this is a wonderful opportunity for newly arrived postdocs and are very happy to present this offer to you from the Legacy Community Federal Credit Union.

LEAVE POLICIES

Vacation Leave - Six months after the effective appointment date, all Postdoctoral Scholars are eligible for ten (10) paid working days per year. Vacation days do not accrue and cannot be carried over from year to year. All requests for vacation leave should be made in writing and must be approved by the direct supervisor. Postdoctoral Scholars and their supervisors are responsible for maintaining appropriate records.

Sick Leave - Ten (10) paid working days per year. Sick leave should not be used as vacation. Sick days do not accrue and cannot be carried over from year to year.

Maternity/Paternity Leave - Twenty-two (22) paid successive working days immediately following or just prior to birth or adoption of a child. If both spouses are employed as Postdoctoral fellows, each one is eligible for a consecutive term of maternity/paternity leave. Additional, non-paid leave, following the provisions of the Family Medical Leave Act, must be requested and approved by the supervisor.

COUNSELING

Career Counseling - Jami Armbrester, MS, is available by appointment in the OPE office in Shelby 171A and the 936 Building to meet with postdocs and GBS students. Jami is available for one-hour, confidential, one-on-one career counseling. With individualized career counseling, she can help you:

- Clarify and define your career goals
- Research and explore career options
- Identify your strengths and weakness
- Implement a plan for skills development
- Develop an effective self-marketing campaign, including job search materials (i.e., CV, resume, cover letter)
- Prepare for upcoming interviews (academic and industry)

To schedule an appointment with Jami, please contact the UAB Office of Career and Professional Development Services, 205-934-4324 or email careerservices@uab.edu.

Health and Wellness Counseling

The Resource Center – An Employee Assistance/Counseling Service is provided by UAB as a benefit to all employees. All Postdoctoral Scholars are eligible for this confidential service (205) 934-2281.

Campus Counseling - (205) 934-3779, is a non-UAB affiliation, but is open to anyone. It is a non-profit organization that offers front line counseling by appointment. Hours are 8:00 AM to 3:00 PM every Tuesday, Wednesday, and Thursday.

Motorist Assistance Road Services (M.A.R.S.) - Motorist Assistance Road Services "M.A.R.S" is a service provided by Parking Services free of charge. The service is set up to help any employee or student having car trouble on campus. Services include retrieving keys, jump starting cars, inflating tires, and assisting if you are out of gas. M.A.R.S. employees are not mechanics, but they will do their very best to assist you and get you on your way. If they are unable to provide assistance then they will help you find someone who can. Telephone number: (205) 975-MARS (975-6277)

GETTING STARTED INFORMATION

A new Postdoctoral Scholar at UAB has many resources to help in the transition to a new community and new research environment. These resources include the Mentor, fellow lab

members, departmental administrators, IRSS for foreign nationals, and the Office of Postdoctoral Education. Please make use of all or as many as needed to help smooth the way.

Alabama Driver's License Frequently asked questions at:
http://dps.alabama.gov/Home/wfContent.aspx?ID=80&PLH1=plhDriverLicense-StarIDFAQ
Department of Public Safety, (205) 252-7445
Open Monday - Friday, 8:00 a.m. -5:00 p.m., 908 Bankhead Highway W

Social Security Office - International postdocs should take the following documents with them to the Social Security office: Passport, I-94 card, Immigration Document (for example, IAP-66 or I-20) - Open Monday-Friday, 9:00-4:00, 1-800-772-1213, 2001 12th Avenue North

Voter Registration - Packets may be obtained from: any public library, City Hall, Jefferson County Court Houses, Jefferson County Board of Registrars, (205) 325-5550, 716 21st Street North

Off Campus Housing - A variety of types of housing are available for rent. Contact leasing companies or see classified sections of local newspapers for rates, availability and leasing agreements. Birmingham News: http://www.bhamnews.com

Student Housing - Student Housing is available to Postdoctoral Trainees (status code 20), as they are engaging in training and are provided stipends from a fellowship (a strictly interpreted training grant). Contact Student Housing at: https://www.uab.edu/students/housing.

Student Housing is not available for Postdoctoral Employees (status code 21). At the current time, no facilities are available for married postdocs.

Child Care - The following are some of the child care facilities where UAB postdocs have placed their children. There are many more in the nearby vicinity. Check local yellow pages for others.

- UAB Child Development Center, (205) 934-7353 or (205) 934-7353, Fax: (205) 975-7374. It is located at 1113 15th Street South. Randy East is the Director. Email: reast@uab.edu .The website is: http://www.uab.edu/humanresources/home/childdevelopmentcenter.

- South Highland Presbyterian, (205) 939-1210, 2035 Highland Avenue South near UAB

- McElwain Baptist Church, 4445 Montevallo Road, (205) 956-8790, near the Eastwood Mall/Mountain Brook area

- Jewish Community Center, 3960 Montclair Road, (205) 879-0411, in Mountain Brook

- Dawson Memorial Baptist Church, 1114 Montclair Road, (205) 871-8771, in Homewood

CAREER DEVELOPMENT OPPORTUNITIES

OPE Courses

Each year, the UAB Office of Postdoctoral Education sponsors courses in Lab Management (Fall), Grant Writing (Winter), Translational Science (Spring), and Job Skills (Summer). There are no tuition fees for these courses and they are open to all UAB Postdoctoral Scholars. The Grant Writing and Job Skills courses are also open to senior graduate students at UAB. Please see the OPE website or contact OPE office for more detail about these courses.

- ***Lab Management*** will introduce every aspect of laboratory management. Throughout the course, participants are expected to write and present a laboratory management plan to the class. This course is open to Postdoctoral Scholars in any discipline. In general, the class meets two hours every week from September to November. Course enrollment is limited to 25 participants.

- ***Grant Writing Course*** will introduce every aspect of grant writing to Postdoctoral fellows and will be instructed by successful grant writers. Throughout the course, participants are expected to write a grant application. All grants will be criqued by participating Faculty in a mock study section formal. This course is open to Postdoctoral Scholars in any discipline in which extramural individual fellowship funding is available. In general, the class meets for 2 hours every week over 10 weeks TBA. Course enrollment is limited to 20 participants.

- ***Translational Medicine Course for M.D. and Ph.D. Scholars*** will introduce every aspect of preparing and conducting a clinical and translational science research program, including program design, data analysis, and regulatory requirements. It will be instructed by both physician-scientists and Ph.D. Scientists. Throughout the course, participants will be encouraged to design a pilot clinical and translational project using team-based approach. All projects will be critiqued by participating Faculty. This course is open to M.D. and Ph.D. Postdoctoral Scholars in all disciplines. The class will meet every week for 2 hours a week TBA. Course enrollment is limited to 25 participants.

- ***Job Skills Course*** will introduce every aspect of preparing for and completing a job search, including career options, preparing CVs and resumes, and interviewing skills. This course is open to Trainees, including Postdoctoral Scholars and senior graduate students, in any discipline. Throughout the course, participants are expected to: 1. Attend each class; 2. Participate in class discussions; and 3. Develop a job search strategy. This class meets for 2 hours each week during the summer TBA. Enrollment is NOT Limited. Class topics will include: Academic and Non-academic Career Options, Preparing CVs and Resumes, and Interviewing and Negotiating Skills.

Professional Development Classes

The Office of Postdoctoral Education encourages Postdoctoral Scholars to take advantage of the many classes and seminars offered through the Professional Development Office. The OPE will pay tuition and fee costs for up to six hours of credit Postdoc per year. A complete listing of these courses can be found on the OPE web page at www.uab.edu/postdocs/ under Career Resources, or by going directly to the Professional Development web page at

www.uab.edu/profdev. Regular credit classes as well as additional non-credit classes are available to Postdocs as long as the course will enhance career and professional development for the Postdoc.

All courses to be sponsored by the OPE must be approved prior to registration. Once a course has been decided upon, the Postdoctoral Scholar must contact Linda R. Luck by email at lluck@uab.edu or call (205) 975-7020 for approval. Upon approval to take the course, the Office of Postdoctoral Education will notify the Postdoc of the correct method to register for that particular class

In most cases, OPE will handle your registration. Please send your request with Course Title, Number, and CRN to Linda R. Luck prior to the open registration period to allow time for processing and avoid late fees. ‘

Any request to take addition hours in a calendar year must be approved by OPE prior to registration. Your request, with the rationale for this course as a benefit to your professional development, should be submitted to Dr. Lisa Schwiebert with a copy to Linda R. Luck.

MERIT Program

The ***Mentor****ed* ***E****xperiences in* ***R****esearch,* ***I****nstruction, and* ***T****eaching (****MERIT****) Program* is a funded Institutional Research and Academic Career Development Award (K12) from the Division of Minority Opportunities in Research (MORE) at NIH / NIGMS. It is facilitated through the partnership between the University of Alabama at Birmingham (UAB), Oakwood University, and Stillman College.

The primary goal of the MERIT Program is to provide Postdoctoral Scholars with outstanding research and teaching experiences while improving the recruitment of students from underrepresented minorities into the field of biomedical research. It includes 3 years of concurrent research training and teaching instruction. The research component incorporates laboratory-based instruction and professional skills development. The teaching component includes instruction in teaching pedagogy, course development, Mentorship training, and classroom teaching experiences.

Assistance with job placement upon successful completion of the MERIT program is provided.

Business Certificate Program in Life Sciences Entrepreneurship

The program includes three required courses in business planning (MBA 673), understanding the biotech industry (MBA 681), and innovation (MBA 690). Each of these courses is 3 credit hours. There are no pre-requisites and these courses may be taken in any order.

Current UAB graduate students may register directly. If you are not a current graduate student, you will need to apply to the UAB Graduate School as a non-degree seeking student. Non-degree seeking students will need to contact Christy Manning at (205) 934-8815 or cmanning@uab.edu for more information.

MBA 681 – “From Idea to Successful Company: Life Sciences and Technology Entrepreneurship”
MBA 673 – “Technology Venture Business Planning”
MBA 690 – “Managing Innovation”

OPE AWARDS

The OPE funds several award mechanisms that assist with the funding of Postdoctoral Scholars' participation in educational activities outside of UAB, travel to scientific meetings, participation in internships, and grant incentives. Please see the OPE website for more details regarding these awards. These funding mechanisms include:

The OPE Scholars' (Grant Incentive) Award The Office of Postdoctoral Education (OPE) believes that in order to insure their future success, Postdoctoral Scholars must begin an independent track record of extramural funding early in their Postdoctoral careers. Accordingly, the OPE has established the Office of Postdoctoral Education Postdoctoral Scholars Award, which provides a financial incentive designed to encourage Scholars to apply for individual fellowships. The OPE anticipates that this award will increase the number of individual fellowships within various programs at UAB.

Award Description:

1. To qualify for this award, the Scholar must provide to the OPE a copy of the submitted grant application along with the official award notification from the granting agency.
2. If a Postdoctoral Scholar's application is funded, the Postdoctoral Scholar will receive a financial reward of **$1,000.00** and will be designated as a recipient of The Office of Postdoctoral Education Postdoctoral Scholars Award.
3. Awarded monies may be utilized to enhance the Postdoctoral Scholar's training respective to the funded grant. Allowable expenses include internships up to a month period, attending educational workshops, visiting laboratories to perform collaborative studies, travel to national and international professional conferences to present current findings, and, in general, expand their professional horizons. Research supplies, equipment or salary support will not be allowable expenses. All award winners must submit a short written report detailing their experiences before expenses will be reimbursed. Expenses are reimbursed upon submission of appropriate receipts according to UAB expenditure guidelines.

Eligibility: This plan is available to Postdoctoral Scholars in any graduate discipline in which extramural individual fellowship funding is available. Such funding must provide more than half the Scholar's current salary. Applications for and receipt of travel and other small grants will not be eligible for this incentive plan. *Only one Office of Postdoctoral Education Postdoctoral Scholars Award will be granted per person.* An individual must apply for the award within six months of receiving the official award notification. Reimbursement must be requested immediately following the event.

The OPE Career Enhancement Award Four Career Enhancement Awards up to $1,500 will be given twice a year to Postdoctoral Scholars to enhance their professional Development. Allowable expenses may include: attending extramural courses (e.g. NIH, Cold Spring Harbor, Woods Hole, etc) to learn new skills and visiting laboratories to conduct collaborative studies. These funds cannot be used for the purpose of travel to scientific meetings. Previous CEA recipients are welcome to apply but should state in the application the date(s) of previous awards

as well as the report of the activity. Applicants must be Postdoctoral Scholars in good standing at UAB. Interested parties should submit:

- ✓ Updated curriculum vitae
- ✓ a short description (no longer than 2 pages) of the educational activity as well as the potential benefits
- ✓ a letter from the Mentor endorsing the activity
- ✓ a letter of invitation from the collaborative research partner
- ✓ a letter of invitation from the sponsoring event (if possible)
- ✓ a budget of anticipated expenses

Deadlines for submitting applications for the twice yearly competition will be communicated by email, flyers or on the OPE website. The applications should be sent by email to the OPE and will be reviewed by members of the Council of Postdoctoral Education (COPE) and ranked according to the following criteria: (1) potential impact of the education activity to the career development of the applicant and (2) research productivity of the applicant during his/her Postdoctoral training as judged by publications and presentations in national and international meetings. Successful applicants will be notified and must complete their activity within the time period allowed. All requests for reimbursement must be submitted within 30 days of the activity.

See expenditure guidelines at the UAB Financial Affairs website for all reimbursable items for employee or Trainee travel and the appropriate procedures. Airline tickets may be provided in advance by the UAB Travel office.

Receipt of this award does not guarantee acceptance into the desired education activity; similarly, acceptance into a desired educational activity does not guarantee receipt of the Postdoctoral Career Enhancement Award.

The OPE Internship Award In order to enhance career opportunities available to Postdoctoral Scholars at UAB, the Office of Postdoctoral Education is providing monies to assist with the funding of internships in industrial, administrative, or academic settings within UAB or the Birmingham area. Providing such opportunities will add to the development and training experience of Postdoctoral Scholars as they define their independent career paths.

Award Description:

The OPE will fund up to two awards per year in the amount of $5000 each to aid Scholars in their performance of internships within or outside of UAB. Specifically, these monies will be used to purchase a percentage of a Postdoctoral Scholar's effort from his/her Mentor for the purposes of completing an internship. Postdoctoral Scholars in their second or subsequent years of Postdoctoral training are eligible. Interested Scholars must submit:

- ✓ An updated CV
- ✓ a short description (no longer than 2 pages) of the internship as well as the potential benefits to his/her career
- ✓ a letter from the Mentor endorsing the activity

- ✓ a letter of invitation from the collaborative research Faculty or professional organization
- ✓ a description of the internship training plan and evaluation process

  Following submission, applications will be reviewed and ranked by a group of Council of Postdoctoral Education (COPE) members according to:

  - Potential impact of the education activity to the career development of the applicant
  - Research productivity of the applicant during his/her Postdoctoral training as judged by publication and presentations in national and international meetings.
  - Application for this award will be accepted and reviewed on a rolling receipt basis. Internships must be completed within one year of notice of award.
  - Internships for a 6 week period may be performed in an industrial, administration, or academic setting. The length of the internship may be extended pending Mentor's approval and availability of supplementary funds from the internship host. These monies are not to be used for the purpose of travel to scientific meetings. Acceptance into a desired internship does not guarantee receipt of The Office of Postdoctoral Education Internship Award.
  - All awardees will be required to present a summary of their internship experiences during the OPE career workshop series. In addition, awardees will be required to provide contact information upon the completion of their Postdoctoral training in order to track their career paths. All participating Mentors and internship hosts will be required to submit evaluations of the Postdoctoral interns and provide feedback regarding the benefit of the Postdoctoral internship experience to their respective laboratories/offices.

The OPE Travel Award – Four awards of $500 each will be given twice a year to Postdoctoral Scholars to enhance their professional development. Allowable expenses include travel to national or international scientific meetings for the purpose of giving an **oral presentation**. These monies are not to be used for the purpose of attending extramural courses (e.g. NIH, Cold Spring Harbor, Woods Hole, etc) or visiting laboratories to perform collaborative studies.

Applicants must be Postdoctoral Scholars in good standing at UAB. Interested parties should submit:

- ✓ An updated CV
- ✓ A short description (no longer than two pages) of the scientific meeting or conference as well as the potential benefits to his/her career plans
- ✓ A letter from the Mentor endorsing this travel
- ✓ A letter of invitation from the meeting or conference organizers to give an **oral presentation** on research-related work
- ✓ A budget of anticipated expenses

Application deadlines will be communicated by email, flyers, and OPE website. Applications must be submitted electronically. All applications will be reviewed by OPE and ranked according to the following criteria: 1) potential impact of attendance at the scientific meeting or

conference to the career development of the applicant; and 2) research productivity of the applicant during his/her Postdoctoral training as judged by publication and presentations in national and international meetings.

See expenditure guidelines at the UAB Financial Affairs website for all reimbursable items for employee or Trainee travel and the appropriate procedures. All requests for reimbursement must be submitted within 30 days of the activity. Airline tickets may be provided in advance by the UAB Travel office.

Receipt of this award does not guarantee an oral presentation at the desired meeting; similarly, an oral presentation at a desired meeting does not guarantee receipt of the Postdoctoral Travel Award.

DIRECTORY

Lisa M. Schwiebert, Ph.D., Associate Dean, Office of Postdoctoral Education, (205) 934-3970, lschwieb@uab.edu

Linda R. Luck, Program Manager I, Office of Postdoctoral Education, (205) 975-7020, lluck@uab.edu

Alana L. Keith, Administrative Associate, Office of Postdoctoral Education (205) 975-7021, alanakei@uab.edu

Jami Armbrester, M.S., Career and Professional Development Services, (205) 934-4324 or email jamia@uab.edu.

International Recruitment & Student Services, Smolian International House, (205) 934-3328 Phone, email isss@uab.edu

Benefits, 701 20th Street South, 264 Administration Building, Birmingham, AL 35294-0102, (205) 934-3458 Phone, (205) 975-7402 fax, Email Benefits@uab.edu

IMPORTANT WEBSITES

Office of Postdoctoral Education – http://www.uab.edu/postdocs/

MERIT Program - http://www.uab.edu/meritprogram/

UAB Ph.D. Careers – www.uab.edu/phdcareers

National Postdoctoral Association – www.nationalpostdoc.org

APPENDIX C

Didactic Coursework

C1. T32 Curriculum: MIC741: Topics in Professional Development

C2. Institutional Curriculum: GRD 717: Principles of Scientific Integrity

C3. Institutional Curriculum: Masters of Science in Public Health (MSPH)

C4. Graduate Level Certificate Program in Translational and Molecular Sciences (TMS)

C5. Training Programs Organized by the UAB Center for Clinical and Translational Studies (CCTS) Training Academy (http://www.uab.edu/ccts/training)

C1. T32 Curriculum: MIC741: Topics in Professional Development

MIC 741 – Syllabus

Winter/Spring 2015

Time: Thursdays, after the Program in Immunology Seminar, from 5:30 – 7:30 p.m.

Place: Shelby building, conference room 415

Moderators: Harry Schroeder, MD, PhD, Laurie Harrington, PhD and Ada Elgavish, PhD

Topic: ***Immune-Mediated Diseases***: The objectives of this course are: (1) To provide graduate and postdoctoral immunology trainees with an opportunity to learn medical aspects of immunological diseases and discuss these with UAB experts in the respective medical area; (2) To train the students in searching the literature for medical aspects of immunological diseases; and (3) To encourage discussion and help the students discern differences between information obtained in polished articles in the literature and the medical picture emerging at the patient's bedside.

Session #	Date	Immune Disease Discussed	Trainee Assigned	Moderator
1	1/8/2015	Introduction		Harry W. Schroeder, Jr, MD, PhD
	1/15/2015	No meeting – Assignment: Prepare your presentation		
2	1/22/2015	Primary Antibody Deficiencies	James Stewart New	Harry W. Schroeder, Jr, MD, PhD
3	1/29/2015	Severe Combined Immune Deficiency	Michael Levinson	T. Prescott Atkinson, MD, PhD
4	2/5/2015	HIV	Shannon Kahan, PhD	Michael Saag, MD
5	2/12/2015	Asthma	Duy Pham, PhD	Teresa Magruder, MD
6	2/19/2015	Organ Transplantation	Ian McWilliams	Roslyn Mannon, MD
7	2/26/2015	Systemic Lupus Erythematosus	Sara Gibson	W. Winn Chatham, MD
8	3/5/2015	Multiple Sclerosis	Kirsten Scarlett Evonuk	Chander Raman, PhD
9	3/12/2015	Vasculitis	Kirsten Scarlett Evonuk	S. Louis Bridges, Jr, MD, PhD
10	3/19/2015	Diabetes	Lindsey Padgett	Tom Brooks Vaughan, MD
11	3/26/2015	Inflammatory Bowel Disease	Daniel Silberger	Charles O. Elson, MD
12	4/2/2015	Allergic Disorders	Alexia Carrillo	John Anderson, MD
13	4/9/2015	Chronic Lymphocytic Leukemia	Lindsey Padgett	Randall Davis. MD
14	4/16/2015	Complement Disorders	James Stewart New	Alexander Szalai, PhD
15	4/23/2015	Rheumatoid Arthritis	Alexia Carrillo, PhD	Jeffrey Curtis, MD

C2. Institutional Curriculum: GRD 717: Principles of Scientific Integrity

Course Syllabus
Principles of Scientific Integrity
3 credit hours
Cudworth Hall, room 140
2 – 4:30 pm Fridays
Fall, 2014
Course Director: Jeffrey A. Engler, Ph.D.
Associate Dean for Academic Affairs, UAB Graduate School
Office: HUC 504F
Telephone: 934-4734
Email: engler@uab.edu
Grading: Pass/No Pass. To pass, you must earn 75% or greater of the possible points on the quizzes given in weeks 2 through 10.

First class meeting: August 29, 2014
Requirements: Students are expected to read the textbook, watch slide presentations and videos (when available) on the class web site, and attend all course meetings.
Required Text: Introduction to the Responsible Conduct of Research, by Nicholas H. teneck.The textbook is available as a free download at http://ori.hhs.gov/documents/rcrintro.pdf or can be found on the GRD 717 course website on Blackboard. To log-one to the course website, go to the UAB Instructional Academic Institute: http://www.uab.edu/it/instech/blackboard/a_login.html.
Enter your Blazer ID and password.
You should see a list of courses in which you are enrolled. Choose GRD 717
Honor code: All members of the class will be held to the standards stated in the UAB Academic Honor code: http://www.uab.edu/graduate/component/content/article/23-catalog/200-academic-ethics-and-conduct
During class, all cell phones, tablets, laptops and other electronic devices should be turned off. The organization of the course will be different than what you may have experienced in the past. We're trying a new pedagogic approach, called "Team Based Learning." You can learn more about TBL at http://www.teambasedlearning.org/. The course is modeled after a course developed by Dr. Wayne McCormack at the University of Florida School of Medicine and is being used at Florida, at the Hershey College of Medicine, and the Albert Einstein School of Medicine. TBL organizes the instruction of the course so that the materials that normally would be presented in a lecture format are made available approximately one week before the class meeting. Class time is spent in teams of 6 to 7 students each who will meet each week to discuss the course materials. **It is each student's responsibility to come to class having read or watched all the instructional materials**. A typical class session will start with an individual quiz over the course materials for the week. Each question has 4 possible answers and is worth 4 points. The answer sheet has one box for each of the answers. If you are sure of the answer, you can write "4" in the box corresponding to your answer. If you are correct, then you'll get 4 points for that question; if you're not correct, you will get no points. If you're unsure of the answer, you can split your 4 points among the answers you believe are correct; you'll receive the points that you wrote in the box that correspond to the correct answer. Once each individual has turned in their completed quiz, the group will discuss the answers to the same quiz questions and record their group's answer on the scratch off card. If the group gets the answer correct, a star will appear in the box; if the answer is incorrect, the group should reconsider their reasoning and scratch off another box, continuing until the star appears. The more boxes you scratch off, the lower the point score for the question.

Class meetings:
1. Introduction to RCR and Ethical Decision Making
Friday, August 29, 2014:
Instructor: Jeffrey Engler, PhD
Reading Assignment: none

2. Research Misconduct
Friday, September 5, 2014
Instructor: Jeffrey Engler, Ph.D.

Reading Assignment: Chapter 2, Steneck; PowerPoint by Dr. Engler on website

Major questions to be discussed: What constitutes "research misconduct"? What are the standards by which we judge misconduct? How do we protect both the "whistleblower" and the persons accused of misconduct?

3. Protection of Human Subjects
Friday, September 12, 2014
Instructor: Jonathan Miller, Director, UAB Institutional Review Board
Reading Assignment: Chapter 3, Steneck; PowerPoint by Mr. Miller on website

Major questions to be discussed: What constitutes human subjects research? What should patients/participants know about the research to give their informed consent? What principles should be applied to approving research using human subjects?

4. Welfare of Laboratory Animals
Friday, September 19, 2014
Instructor: J. Michael Wyss, Ph.D., Professor of Cell, Developmental, and Integrative Biology; former Chair, Institutional Animal Care and Use Committee Reading Assignments: Chapter 4, Steneck; PowerPoint by Dr. Wyss on website

Major questions to be discussed: Why do animals used in research deserve protection? Are there animals that should not be used in research? How should animals be cared for during their use in research?

5. Conflicts of Interest
Friday, September 26, 2014
Instructor: J. Michael Wyss, Ph.D., Professor of Cell, Developmental, and Integrative Biology; Chair, Conflict of Interest Review Board
Reading Assignments: Chapter 5, Steneck; PowerPoint by Dr. Wyss on website

Major questions to be discussed: Should investigators be allowed to benefit from the commercialization of their research, over and above their institutional salary? What rights or expectations should graduate students have if their research contributes to a financial benefit to their PI or their institution?

6. Data Management
Friday, October 3, 2014
Instructor: James Collawn, Ph.D., Professor of Cell, Developmental, and Integrative Biology
Reading Assignments: Chapter 6, Steneck; PowerPoint by Dr. Collawn on website

Major questions to be discussed: To whom does your research data belong? How long can an investigator hold data from the public domain in order to protect their intellectual property rights?

7. Collaborative Research
Friday, October 10, 2014
Instructor: Thomas Ryan, Ph.D., Associate Professor of Biochemistry and Mol. Gen.
Reading Assignments: Chapter 8, Steneck; PowerPoint by Dr. Noe on website

Major questions to be discussed: Should collaborative research be encouraged? What issues might need to be decided at the beginning of a collaborative research project?

8. Mentor and Trainee Responsibilities
Friday, October 17, 2014
Instructor: Lisa Schweibert, Ph.D., Professor of Cell, Developmental, and Integrative Biology
Reading Assignments: Chapter 7, Steneck; PowerPoint by Dr. Schweibert on website

Major questions to be discussed: How do graduate students and their mentors define their roles and expectations? What are the qualities of a good mentor and a good trainee?

9. Authorship
Friday, October 24, 2014
Instructors: Jeffrey Engler PhD, Jennifer Greer,
PhD Reading Assignments: Chapter 9, Steneck

Major questions to be discussed: What are the accepted practices for authorship? In work that involves more than one researcher, what principles should be used to determine who is an author and the order of authors?

10. Peer Review
Friday, October 31, 2014
Instructor: Michelle Fanucchi, Ph.D., Professor of Public Health
Reading Assignments: Chapter 10, Steneck; PowerPoint by Dr. Fanucchi on website

Major questions to be discussed: What are the obligations of reviewers of grants and publications? How can peer reviewers deal with conflicts of interest?

Instructor: Jeffrey Engler
- All entering biomedical sciences students are educated during orientation about requirements to complete human subjects and animal use and care training programs; completion of requisite training is arranged and documented by their specific graduate programs. All requisite training and annual updates must be completed in order for final Graduate School acceptance of the PhD thesis.

The Center for Ethics and Values in the Sciences (EVIS) teaches "*Principles of Scientific Integrity*" (above), organizes a yearly national conference on various aspects of research integrity, and provides ongoing research ethics training and development of research integrity educational materials at UAB. A recent conference "Philosophy of Medicine," drew national and international speakers and was co-sponsored by the Cystic Fibrosis Research Center at UAB.
- New travelling integrity workshop "*Avoiding Plagiarism*" is organized around video-based facilitator-led discussions and organized by the Professional Development unit of the Graduate School. These workshops have been hosted by departments, lab groups and journal club groups. The Ethics of Paraphrase: How to Avoid Plagiarism- Center for Ethics video presentations *"In the Lab: Mentors and Students Behind the Scenes"* and *"Teaching Research Integrity in Analysis and Reporting: A Web-site with Case-Based Vignettes",* are focused on best practices for presenting image data in research publications and are utilized both locally and nationally. Online Tools for Education in Issues of Scholarly Integrity UAB is one of eight institutions awarded funding by the Council of Graduate Schools and NSF to develop RCR educational materials for an expanded audience of faculty and graduate students in the Schools of Engineering and of Natural Sciences and Mathematics. Focus groups have been used to develop scripted case studies into short video vignettes in QVQ format for reflective learning. UAB's national and international leadership in the area of ethics training was reflected by UAB Graduate Dean's invited participation in the 2008 Global Strategic Leaders Summit on Scholarly Integrity and Research Ethics, held in Florence Italy.

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C3. Institutional Curriculum: Masters of Science in Public Health (MSPH)

The Master of Science in Public Health (MSPH) is an academic research degree designed for those students seeking specialization in one area of public health. The MSPH is offered in:

- *Clinical and Translational Science (BST, EPI, HB)*
- *Outcome Research*
- *Environmental Health and Toxicology and Industrial Hygiene,*
- *Applied Epidemiology and Pharmacoepidemiology,*

These programs combine didactic research instruction and applied research experience in the chosen discipline in order to prepare students for further study toward the PhD or for research or specialized technical positions in government, industry, academia or private institutions. All MSPH students complete a research project/thesis. All MSPH students take core courses in biostatistics and epidemiology and complete a minimum of 15 hours of methodologic and specialty area courses. Students are strongly encouraged to enroll in other core public health courses. Individual MSPH programs require additional courses specific to the area of study. Please refer to the individual program's curriculum information for further details

MSPH Minimum Requirements

BST 611	Biostatistics I *	3
BST 612	Biostatistics II *	3
EPI 610	Principles of Epidemiologic Research	4
EPI 610L	Principles of Epidemiologic Research-	0

*** Some departments require BST 611 and BST 612 as the MSPH Biostatistics Core requirement.**

Additional requirements:

A minimum of nine credit hours of research methodologic instruction

A minimum of six credit hours in the area of specialization

A minimum of nine credit hours of research project/thesis work

Minimum Total Credit Hours Required - vary by department and degree program.

C4. Graduate Level Certificate Program in Translational and Molecular Sciences (TMS)

Purpose and Educational Objectives: The last decade has seen significant emphasis on translational research being a central feature of biomedical-related research training. This certificate program formalizes graduate training and education in translational sciences at UAB. Students completing the certificate will be trained in one or more key facets that comprise the process and goals of translational research; namely, understanding mechanisms of disease, how these insights are then used to develop, test and apply therapies for the treatment of disease, and how translational research is a bridge between basic and applied research.

Admission Requirements: Any degree (MS, PhD or MD/PhD) earning graduate student who has completed the first year of graduate school, is in good academic standing (UAB GPA ≥ 3), and has begun full-time research in a laboratory can enroll in the certificate program. The following materials are also required:

i) A letter from the student's theme or program director ***and*** dissertation research mentor stating their approval for the student to enroll into the certificate program.

ii) A statement from the student as to how participating in the certificate program would enhance his / her research and career goals.

The certificate program director will review these materials and decide on acceptance. Non-degree earning students will not be allowed to enroll in the certificate program.

Academic Program

Requirements for Completion of Certificate:

i) Students are required to complete 12 credit hours (accumulated from at least one core course plus any combination of electives listed under "Academic Program") to complete the certificate. Courses can be taken at any time up until the student graduates. Only those courses that are completed and passed, up until the student graduates, will be considered for the certificate program. A failing grade (C or below) in any of the courses will not be applied to the required 12 credit hours.

ii) Semi-annually, students are required to submit to the certificate program administrator an update of credits received for TMS core and elective courses, and students will also be asked to complete an evaluation of the program upon completion of certificate requirements.

Please note that the information below is meant to serve as a guide. It is important that you check the UAB Class Schedule in BlazerNet to see exactly what is offered and when.

Core Courses

EPI 607: Fundamentals of Clinical Research (3 credits)-This course will provide an overview of principles and practices related to the study of determinants and outcomes of medical interventions. Methods for conducting epidemiologic research in the "clinic", assessing the validity of diagnostic and screening tests, measuring therapeutic efficacy and safety, and describing the natural history of disease will be reviewed. **(fall)**

HMG 702: Phenotyping Human Disease (2 credits)-Introduction to the study of human disease and translational research. The course will consist of several 2-week modules, each covering a different disease. Each module will consist of two types of lectures. During the first week of each module, a physician scientist will discuss human patients and case studies of disease. In the second week of each module, a basic science researcher will discuss the animal models used to study the same disease. **(fall)**

HMG 705: Drug Discovery & Development (2 credits)-This course will enable the student to follow the pipeline of drug discovery from target selection to FDA approval. Additional lectures will cover cancer drugs and targets. **(spring)**

Electives

BME 690: Biodesign (3 credits)-The purpose of this course is to introduce students to the process of innovating medical technologies to prepare them for a career in the medical technology industry. Students will learn the aspects of biomedical product development including needs finding, invention, developing intellectual property, business development, marketing, regulatory processes and reimbursement strategies. Following the guidelines in the text student groups will interact with physicians to need find, need screen, generate concepts and select one concept to develop a business plan. **(spring)**

BST 612: Intermediate Statistical Analysis II (3 credits)-This course with utilize current statistical techniques to assess and analyze public health related data. In addition, students will learn to read and critique the use of such techniques in published research. Students will also determine what analytical approaches are appropriate under different research scenarios. The course is lecture based with optional help sessions and computer lab software demonstrations. Students will be expected to interact with one another and the instructor during lectures. **(spring)**

BST 621: Statistical Methods I (3 credits)-Lectures will include descriptions and derivations of statistical methods as well as demonstrations of these methods using SAS software. Additional reading from the text, outside reading and homework problems will be assigned to complement the class lectures. **(fall)**

BST 622: Statistical Methods II (3 credits)-Students are taught to intermediate-level basic analysis methods focusing on regression modeling including the links between regression and analysis of variance (parameterization), multiple regression, indicator variables, use of contrasts, multiple comparison procedures and regression diagnostics. The course will generalize these modeling concepts to different types of outcome data including categorical outcomes (i.e., logistic and loglinear modeling) and survival outcomes (i.e., proportional hazards analysis). Students are taught to conduct the relevant analysis using current software such as SAS, SPSS, and JMP. **(spring)**

EPI 680: Topics in Clinical Research (2 credits)-Provide health sciences professionals interested in clinical trials, clinical epidemiology, and other forms of population research with both essential principles and specific technical knowledge in a variety of areas relevant to the conduct of biological and behavioral investigation of human subjects. This course begins in the Spring term and extends into the Summer term. Registration for this course is during the Summer semester. Please contact the Program Coordinator for the course syllabus and course schedule. **(summer)**

GBS 745: NeuroImmunology (2 credits)-The purpose of this course is threefold: 1) to provide students with a basic overview of immunology and neuroscience in conjunction with a specific focus on how neuroinflammatory processes affect the brain, 2) to teach students basic neuroanatomy of the brain, and 3) to have students undestand the clinical implications of neuroinflammatory diseases by attending rounds with clinicians. **(spring)**

GBS 775: Cancer Treatment (3 credits)-Students will study current theories regarding chemotherapy, radiation therapy, drug discovery & development, clinical trials, chemoprevention, and imaging. Students will also e exposed to state-of-art for each of these treatment/diagnostic modalities. **(fall)**

GBS 779: Translational Cancer Research (3 credits)-The goal of this class is to give students a general understanding of what patient-based research methods are available and how they may incorporate these studies into their basic science pursuits. **(every other fall)**

GBSC 715: Molecular Basis of Disease (3 credits)-
This is an advanced, graduate course that explores the molecular and cellular mechanisms that underlie the causes, symptoms, and complications of various diseases, including diabetes, autoimmune diseases, atherosclerosis, and cancer. An integrative approach to the clinical, pathologic, biochemical, and molecular perspectives of diseases is introduced. This will help the students to understand how metabolic pathways, cell cycle regulation, signal transduction, transcription factors, and protein glycosylation impacts on our ability to understand and treat human disease. Requirement: This course is designed for graduate students admitted to campus-wide PhD programs in the biomedical and basic sciences, post-doctoral fellows, medical students, residents, staff, and members of the faculty interested in the latest advances and approaches in understanding and treating human disease. Prerequisite: Successful completion of doctoral level biochemistry/molecular biology course. Individuals may contact the Course Director before enrolling in the course. **(spring)**

HMG 704: Modeling Human Disease (2 credits)-Introduction to the study of disease-based research. The format will consist of clinical-pathobiological conference-style experience where students will present patient cases and researchers will discuss molecular basis of each disease. **(summer)**

HMG 707: Vocabulary in Clinical Research (1 credit)-Students will be exposed to basic topics in clinical research and learn the details involved in designing clinical trials. Students will also sit in as ad-hoc members of the Scientific Advisory Committee of the UAB General Clinical Research Center and learn the review process for human/clinical research trials. **(fall)**

MBA 673: Technology Based Venture Planning (3 credits)-Translating scientific and technology discovery into viable business models requires careful analysis and planning. The business plan is the DNA or genetic map of a technology venture. This course is designed to prepare students for the challenges of preparing business plans for technology-based innovations. Because many business plans focus on internal strategy rather than a comprehensive assessment of the competitive landscape, particular attention will be paid to market due diligence and competitive analysis. The course is practically focused and experiential: students prepare full business plans for real technology-based innovations. **(spring)**

MBA 681: Idea to IPO (3 credits)-This course is specifically designed to give graduate students in business, medicine, and engineering a deeper understanding of the issues involved in determining how to take the right idea from the laboratory to the marketplace. **(fall)**

NTR 722: Recent Advances in Nutrition and Cancer (1 to 3 credits)-Critical evaluation of the effects of genetics and environmental factors, especially nutrients, on the development and prevention of obesity, atherosclerosis, and cancer.**(every other summer)**

NTR 725: Nutrition Through Life Cycle (3 credits)-Examination of the role of nutrition and dietary factors on the growth, development, and maintenance of health throughout the human life cycle. Nutritional guidelines/recommendations, special nutritional needs, physiology, and nutritional health concerns for each stage of the human lifecycle beginning with preconception and continuing throughout adulthood and aging. **(every other fall)**

NTR 750: Body Composition and Energy Metabolism (3 credits)-Methods of measurement and relationship to human health and disease **(every other summer)**

NTR 779: Obesity in the XXI Century (3 credits)-Overview of the facts and research findings underlying the understanding of obesity, its co-morbidities, and its consequences in the population. **(every other spring)**

PAT 700: Biology of Disease (3 credits)-The Biology of Disease course is a comprehensive course in general pathology designed specifically for graduate students in the biomedical sciences. In this course we will begin with a review of normal anatomy (autopsy organs) and histology (microscopic slides and virtual microscopy). Then we will do an overview of general pathology principles emphasizing pathogenetic mechanisms and clinically important diseases where current research areas will be highlighted. The biomedical scientist will learn the mechanisms involved in disease processes and will develop an understanding of diseases and clinical medicine which will help them to converse knowledgeably with medical colleagues and to target their research towards clinically relevant issues. **(fall)**

PAT 777: Autopsy Experience (1 credit)-The purpose of offering an optional autopsy experience for PhD graduate students in MCP is to provide education of the thought processes and investigation involved in determining the pathological basis and causes of disease. It is anticipated that this experience will broaden the appreciation of the application of pathology as study of the science of disease. **(spring)**

C5. Training Programs Organized by the UAB Center for Clinical and Translational Studies (CCTS) Training Academy (http://www.uab.edu/ccts/training)

CCTS offers specialized programs and training

The Center for Clinical and Translational Science is committed to lifelong learning. We develop clinical and translational researchers and research teams through our programs and training opportunities, integrating successful programs with new initiatives.
Unless otherwise indicated, all events are in the Pittman Center for Advanced Medical Studies (PCAMS) located at 1924 7th Avenue South, Birmingham, AL 35294.

Recurring Events:

Biostatistics - Epidemiology & Research Design (BERD)
Monday from 10 am to 2 pm, Lister Hill Library - Edge of Chaos, 4th Floor
Wednesday from 11:30 am to 1 pm

Professional Skills Development Series - Second Thursday of each month at 11 am

Research Seminar Series - Critical research implementation and management topics presented on the first and third Thursday at noon and on the second and fourth Thursday at 12:30 pm

UAB Research Orientation Program - Fourth Thursday of each month from 8am - noon

Secondary Data Analysis and Health Services Research Methods Seminar - First Thursday of each month at noon at UAB Medical Towers.

The UAB Center for Clinical and Translational Science (CCTS) is part of the Clinical and Translational Science Award program funded by the National Center for Advancing Translational Sciences at the National Institutes of Health (NIH) (grant number UL1 TR000165). The content of this website is solely the responsibility of UAB and does not necessarily represent the official views of the NIH.

NIH Funding Acknowledgment — All publications resulting from the use of CCTS resources are required to credit the CCTS grant by including the NIH funding acknowledgment and must comply with NIH Public Access Policy.

Training Grant Programs

Predoctoral Training Program (TL1)

Through the CCTS Pre-doctoral Training Program (TL1 trainees), eligible individuals will acquire competencies necessary to conduct clinical and translational research. The TL1 award provides a stipend and partial support for tuition and specified educational expenses for one year. During this year, the trainee will complete the CCTS' Clinical and Translational Science Training Program.

CCTS TL1 trainees dedicate full-time effort to pursue a translational science-related doctoral degree. In addition to completing the core curriculum and other requirements, trainees will ultimately complete a dissertation that will culminate in the submission of manuscripts for publication and a grant application.

Past Trainees

Mentored Career Development Program (KL2)

The CCTS Mentored Career Development Program (KL2 scholars) is for junior faculty in a clinical or related discipline. The overall goal of this training program is to impart knowledge, experience and perspective to a network of junior scientists who will emerge as independent investigators.

Scholars, selected through a competitive application process, receive KL2 Clinical and Translational Science career development support for up to five years with protected time for both formal training and hands-on research. Scholars enroll in an educational program, usually the MSPH in Clinical and Translational Science, which include the CTS core curriculum. In parallel, they enter a research apprenticeship with a primary mentor who has an excellent training record and commits to extended close interaction with the scholar. Training will culminate in lead author manuscripts and an extramurally-funded research grant submission (e.g., R01).

Short-Term Research Training Program

The **Summer Enrichment Series** provides an introduction to general principles of research and an introduction to CER/PCOR. The series will begin Monday, June 15, 2015 and is open to all trainees. Topics are listed; check back for the schedule. Contact the CCTS for more information.

- Introduction to CER/PCOR
- Responsible Conduct of Research
- Study Design 101 and Stats 101
- Information Finding and Evaluation of CER/PCOR Literature
- Overview of Dissemination and Implementation Research
- Community/Stakeholder Engagement in PCOR
- Trainee Presentations

8 Week Summer Program in Comparative Effectiveness
and Patient-Centered Outcomes Research
June 8 - July 31, 2015

(Download a PDF of 2015 application guidelines)

2014 Trainees - *Back row:* Matthew Carle (UAB), Michael Gunter (U South Alabama), Ben Carroll (U Mississippi Medical Center) *Front row:* Christine Hayden (U Mississippi School of Pharmacy), Jesse Morrison (U Mississippi Medical Center), Sonja Falvey (U Mississippi School of Pharmacy). Not pictured: Zeb Akers (UAB)This 8-week program provides mentored research training experiences in patient centered outcomes research (PCOR) and comparative effectiveness research (CER) for medical students or other clinically-oriented doctoral students that have completed their first year of training.

Why CER and PCOR? With an increasing, ongoing national focus, there is a growing need for training in these areas especially in the earliest stages of clinical training.

Who may apply? Many applicants have finished their first year of medical school. Students in other clinical doctorate programs and those that have been admitted to a pre-professional, clinical program are eligible to apply if they are able to meet the requirements of the program.

What else? Trainees will devote full-time effort (40 hours week) for the duration of the 8-week program (June and July). A stipend is provided; on-campus housing is available. The **Summer Enrichment Program** provides a series of seminars, available to all via videoconference, for introduction to general principles of research and an introduction to CER/PCOR. A presentation is expected of each trainees at the conclusion of the summer.

Purpose
In a time of accelerated scientific discovery, researchers are needed to translate research to the clinical setting. A national shortage of such investigators is well documented and specialized training is needed early in the career development process. Furthermore, with a continued national focus on comparative effectiveness research (CER) and patient centered outcomes research (PCOR), there is a growing need for training in these areas.
Clinically focused students in the earliest stages of training may have an interest but limited experience in research in PCOR, CER and related topics. The summer program at UAB provides an opportunity for a hands-on research experience leading to the generation of research products, all within a supportive, mentored research environment.

Career Development

New K Writing Group

Five sessions provide an overview and strategies for writing a mentored K award. Group size is limited, and you must be eligible to apply for a K award to engage. Commitment to all five sessions is encouraged. Sessions will be presented via videoconference for our partners. Dates include April 17, May 1, May 15, May 22, June 12. Time: 2:00 p.m. Location: Pittman Center for Advanced Medical Studies (PCAMS) / 1924 7th Avenue South.

Partner sites, please join from your computer, tablet or smartphone:
https://global.gotomeeting.com/join/368881781 Access Code: 368-881-781

NIH Application Advice and Examples

Learn which mentored K awards are tailored to physician-scientists and why it's important to pick the right institute for your application. Review success rates by mechanism at all NIH Institutes and Centers.

Looking for NIH research grant examples? The NIAID has example grants (R and K) and summary statements (aka pink sheets). See 12 Tips for writing a strong research application. Local K applications are available for viewing here.

The Medical Scientist Training Program (MSTP; Dr. Robin Lorenz, PI) maintains sample Fellowship awards. Contact the MSTP for more information.

Dr. David Redden, Chair, UAB Department of Biostatistics, methodology seminars on "The Fundamentals of Data Management"

Dr. Tung-Tien Sun's Scientific Method website (Sun Laboratory, New York University School of Medicine)

Dr. Mark Rolstch, former NIH Scientific Review Officer and Program Director, and current Executive Director of the Office of Academic Research and Sponsored Project at St Mary's University, San Antonio, Texas - Fellowship and K award talks Dr. Rolstch visited the UAB campus in May; the archived talks are from similar events at Stanford University.

Recurring Training & Events

Mentor Training Opportunities

The Clinical and Translational Science (CTS) Training Program - The application deadline was Monday, November 17, 2014. Please contact us if you are interested in applying for 2016.

The CTS Training Program is a six-month certificate program that includes approximately 50 hours of didactic instruction and interactive experience. Our program provides additional training in clinical and translational research over a six-month period (January to June) with class on Wednesday mornings, 8-10 am. Videoconference access is available for those away from UAB.

Coursework

School of Public Health
Genetics
Office of Postdoctoral Education
Lab management
Grantwriting
Translational Medicine
Job Skills
Biostatistics and Epidemiology
Informatics

APPENDIX D

UAB Program in Immunology (PI)

D1. Mission and Goals

D2. Seminar Series speakers 2012-2015

D1. Mission and Goals

UAB Program in Immunology (Harry W. Schroeder, Jr., MD, PhD)

The multi-disciplinary Program in Immunology consists of over 100 UAB Faculty who identify themselves as basic or clinical immunologists and are members of multiple units at UAB. A desire for excellence on the part of the UAB faculty, coupled with the relative youth of the institution, has promoted a collective attitude of interdepartmental cooperation and collegiality.

With over $45M in FY 2008 from the National Institute of Allergy and Infectious Diseases (NIAID) and the National Institute of Arthritis, Musculoskeletal, and Skin Diseases (NIAMS), the two NIH funding agencies most focused on host defense, immunology, and inflammation research, this represented about 25% of the entire NIH research portfolio at UAB.

UAB is the home of several internationally prominent research programs, e.g., Developmental Immunology, Mucosal Immunology, Clinical Immunology and Rheumatology Division, Arthritis and Musculoskeletal Center, Host Defense, Virology and Vaccine Biology. Newer programs in Cancer Immunology, Allergy, Immunogenetics, Inflammation and Tissue Injury, Transplantation Immunology, Neuroimmunology, and Basic Immunology of the T cell and innate systems are poised to become highly competitive.

Mission and Goals

The Program in Immunology was created to enhance the wide distribution of immunology-related research at UAB. This trans-departmental program seeks to enhance communication among faculty in order to identify and stimulate additional synergies across campus. The main goals of the program are to:

- Facilitate research through coordination and collaboration
- Establish a committed Program Administration that broadly represents participating Departments and Centers to implement cross-cutting activities
- Enhance state-of-the-art technologies, including model systems, imaging, and cell therapeutics
- Advance the translational research capacity, including pre- and post-doctoral training improvements
- Establish a graduate training program in Immunology.

D2. Seminar Series speakers 2012-2015

Program in Immunology Seminar Series. The Program in Immunology Seminar Series hosts guest speakers representing a variety of academic and industrial institutions. The speakers present seminars based on their work in the field of Immunology, broadly writ. The goals of the speaker series extend not only to learn of the ongoing research inside and outside of UAB, but also to provide the opportunity for faculty and students to interact with colleagues to promote scientific dialogue. The series is collaboratively supported by Departmental and Center contributions. The list of speakers in the past 3 years can be found in **Appendix D2.**

Program in Immunology Seminar Series 2012-1013

Seminars are in the Bevill Biomedical Research Building, room 170, on the dates shown below, from 4:00 - 5:00 p.m.

Date	Speaker	Institution	Title
9/6/2012	Harry W. Schroeder, Jr, MD, PhD	UAB	Immune Deficiency, Autoimmunity and Control of the Antibody Repertoire
9/13/2012	Jason Cyster, PhD	University of California San Francisco	Oxysterols and sphingolipids in B cell immunity
9/20/2012	Janusz H. Kabarowski, Ph.D.	UAB	HDL as a therapeutic in Lupus
10/11/2012	Troy Randall, PhD	UAB	Programming memory CD8+ T cells
10/18/2012	Matthew Krummel, PhD	University of California San Francisco	The Immune Bee-Hive: Motor-protein Regulated Motility, Motile Synapses and the Generation of Collective Behaviors in the Immune Response
10/25/2012	Frances Lund, PhD	UAB	Regulation of central and effector memory B cell differentiation by T-bet expressing B cell effectors
11/1/2012	J. Edwin Blalock, PhD	UAB	A Mechanism for Self-Propagating Neutrophilic Inflammation in Chronic Lung Diseases

11/8/2012	Allan Zajac, PhD	UAB	Tuning CD8 T cell Responses
11/15/2012	Charles O. Elson, MD	UAB	Microbiota and Immune Homeostasis
11/22/2012	**Thanksgiving Holiday - No seminar**		
12/6/2012	Anette H. H. van Boxel-Dezaire, M.Sc., Ph.D.	Cleveland Clinic Foundation Lerner Research Institute	Unraveling the Complexity of the IFN-β-Induced Signaling Pathways in order to explain Cell Type-Specificity and Individual Responsiveness to IFN-β Therapy in Multiple Sclerosis
12/27/2012	**Christmas Holiday - No Seminar**		
01/3/2013	Hiromi Kubagawa, MD	UAB	What we have learned so far about the IgM Fc receptor (FcμR)
02/07/2013	Chander Raman, PhD	UAB	CD5: An “old” molecule with “new” functions
02/14/2013	Jonas Almeida, PhD	UAB	Integrative Bioinformatics for BigData Biomedical Research
02/21/2013	L. Flores-Romo, MD, PhD	CINVESTAV, Mexico City, Mexico	Of Mice and men: Immunology Research in Mexico
2/28/2012	Laura Timares, PhD	UAB	Vaccine-induced protection against chemical carcinogenesis
3/7/2013	Mark Kaplan, PhD	Indiana University	Th9 cells: Differentiation and disease
03/14/2013	Daniel Cua, PhD	Merck Research Laboratories, Palo Alto, California	IL-23 regulation of innate and adaptive immunity
3/21/2013	Roland Tisch, PhD	University of North Carolina at Chapel Hill	Reestablishing beta cell-specific tolerance in type 1 diabetes
04/04/2013	Arup Chakraborty, PhD	MIT	How to hit HIV where it hurts

04/11/2013	John C. Luckey, MD, PhD	Harvard Medical School	Cytokine control of memory CD8+ T cell homeostatic self-renewal
04/18/2013	S. Louis Bridges, Jr., MD, PhD	UAB	Pathogenesis of Rheumatoid Arthritis and Biomarkers of Response to Immunomodulators
04/25/2013	Hubert Tse, PhD	UAB	Oxidative Stress and Type 1 Diabetes Immune Responses
05/09/2013	Michael B. Brenner, MD	Brigham and Women's Hospital, Harvard University	iNKT cells: Innate lipid sensing T cells regulate immune responses
05/16/2013	Elliott Lefkowitz, PhD	UAB	Poxviruses and the evolution of an anti-immune system
05/30/2012	Zdenek Hel, PhD	UAB	Role of neutrophils in HIV-1 pathogenesis and the effect of hormonal contraception on mucosal transmission of HIV-1
6/6/2013	Russell Vance, PhD	University of California, Berkley	Cytosolic surveillance as a strategy for innate detection of bacterial pathogens
06/13/2013	Shimon Sakaguchi, MD, PhD	Immunology Frontier Research Center, Osaka University, Japan	
06/27/2013	Susan Bellis, PhD	UAB	

Program in Immunology Seminar Series 2013-1014

Seminars are in the Bevill Biomedical Research Building, room 170, on the dates shown below, from 4:00 - 5:00 p.m.

Date	Speaker	Institution	Title
9/12/2013	Hui-Chen Hsu, PhD	UAB	B-cell Traveling from the Marginal Zone to the Germinal Center, A Mechanism of Type I interferons-induced Autoimmunity
9/19/2012	Yi-Ping Li, PhD	UAB	Understanding of the role of Osteo-immune gene in inflammatory diseases and cancer
9/26/2013	Tomasz Zal, PhD	The University of Texas MD Anderson Cancer Center	Visualizing Anticancer Immune Surveillance and Immunotherapy
10/10/2013	Yang Yang, PhD	UAB	How do osteolytic cancer cells modify the bone microenvironment in distant bone?
10/17/2013	Boris Calderon, MD	Washington University School of Medicine	Central antigen presentation events in autoimmune diabetes
10/24/2013	Maaike Everts, PhD	UAB	The Alabama Drug Discovery Alliance: Translational Science through Collaboration
11/7/2013	Vanessa Ezenwa, PhD	University of Georgia	Exploring the ecological consequences of immunity: Can helminth-mediated immune suppression predict patterns of infection at the population and species levels
11/21/2013	***Outstanding Trainee Lecture:*** Gordon Meares, PhD	UAB	AMPK and ER stress in Neuroinflammation
11/28/2013	**Thanksgiving Holiday - No seminar**		

12/5/2013	Randy Cron, MD, PhD	UAB	Blurring of the Distinction between Hemophagocytic Lymphohistiocytosis and Macrophage Activation Syndrome
12/12/2013	Lewis Lanier, PhD	University of California at San Francisco	Natural Killer cells in viral immunity
12/19/2013	Pater Mannon, MD	UAB	Endotypes of Disease in Ulcerative Colitis
12/26/2013	**Christmas Holiday - No Seminar**		
1/2/2014	**New Year Holiday - No Seminar**		
1/16/2014	Prescott Atkinson, MD	UAB	Emerging Macrolide Resistance in Mycoplasma pneumoniae – Subtle Pathogen Implicated in Chronic Inflammatory and Autoimmune Disorders
1/23/2014	Andre Ballesteros-Tato, PhD	UAB	In vivo regulation of T follicular helper (Tfh) cell responses by Interleukin-2
1/30/2014	Thorsten Mempel, MD, PhD	Harvard University	T cell migration and function during the anti-tumor response
2/6/2013	Roslyn Mannon, MD	UAB	The Barriers to Successful Kidney Transplantation: Translational Studies to Improve Outcomes
2/13/2014	Gloria Soldevila, PhD	Universidad Nacional Autonoma de Mexico	New roles of the TGFβ superfamily in the regulation of the immune system
2/27/2014	Alexander Khoruts, MD	University of Minnesota	Can a fecal transplant alter the immune response?
2/28/2014	Polly Matzinger, PhD	NIH	Tissue-based control of immunity
3/20/2014	V. Michael Holers, MD	University of Colorado Denver	Complement in the Pathogenesis of Inflammatory Arthritis: How Animal Models Inform the New Era of Human

			Therapeutics
3/27/2014	Moon Nahm, MD	UAB	Immunologic lessons from pneumococci
4/3/2014	***Robert Stroud Advanced Trainee Seminar:*** Lindsey Padgett Nathan Bowers	UAB	LP - NADPH oxidase-deficient macrophages display an elevated M2 macrophage phenotype to prevent autoimmune diabetes NB - Neutrophil extracellular traps contribute to chronic inflammation in HIV-1-infection
4/10/2014	Suresh Boppana, MD	UAB	HCMV reinfections – failure of immunity?
4/17/2014	***John Volanakis Lecture in Immunology:*** Shane Crotty, PhD	La Jolla Institute of Allergy and Immunology	Genetics of Tfh cell differentiation
5/8/2014	Anjana Rao, PhD	La Jolla Institute for Allergy and Immunology	Transcriptional programmes in T cells
5/15/2014	Roberta Pelanda, PhD	University of Colorado Denver School of Medicine	Development and function of an unusual B cell subset with the potential to drive autoimmunity
5/29/2014	Eric G. Pamer, MD	Memorial Sloan-Kettering Cancer Center	Microbiota-mediated defense against antibiotic-resistant bacterial infections
6/5/2013	Victor J. Thannickal, MD	UAB	Fibrosis: A Disease of Innate Immunity
6/26/2014	Hilde Cheroutre, PhD	La Jolla Institute for Allergy & Immunology	Immune Regulation without Compromising Protective Immunity at the Mucosal Borders

Program in Immunology Seminar Series 2014-1015

Seminars are in the Bevill Biomedical Research Building, room 170, on the dates shown below, from 4:00 - 5:00 p.m.

Date	Speaker	Institution	Title
Special Seminar 7/31/2014	Maria Julia Westerink, MD	University of Toledo	The immune response to pneumococcal polysaccharide vaccination: a B cell's perspective
9/18/2014	Lawrence S. Lamb, PhD	UAB	Combination Chemotherapy and Immunotherapy for High-Grade CNS Tumors using Drug- Resistant Gene-Modified T Cells
9/25/2014	Rakesh Patel, PhD	UAB	Role of endothelial N-glycan zip- codes in immune cell trafficking
10/2/2014	Tracy McGaha, PhD	Georgia Regents University, Augusta, GA	Metabolic Signals and Prevention of Immunogenic Cell Death
10/30/2014	Cox Terhorst, PhD	Harvard Medical School	SLAM Family Cell Surface Receptors: Bridging Innate and Adaptive Immune Responses
11/6/2014	Amy Weinmann, PhD	UAB	The molecular balance between lineage-specifying transcription factors impacts the metabolic and cell cycle profiles of T cells
11/13/2014	Phillip D. Smith, MD	UAB	Role of mucosal macrophages in enteric CMV and HIV-1 infections
Special Seminar 11/14/2014	Ulus Atasoy, MD	University of Missouri School of Medicine	Posttranscriptional gene regulation:sometimes small fish are more important than big ones

11/20/2014	Gregory F. Sonnenberg, PhD	University of Pennsylvania	Immune regulation of intestinal health and disease
11/27/2014	**Thanksgiving Holiday - No seminar**		
12/4/2014	Brian T. Fife, PhD	University of Minnesota, Minneapolis	Identifying antigen specific cells in type 1 diabetes and pathways for T cell tolerance
12/11/2014	Heidi H. Kong, MD	National Cancer Institute	The skin microbiome in health and skin diseases
12/18/2014	Stuart Frank, MD	UAB	Growth Hormone Signaling: Better Living through Partnership
12/25/2014	**Christmas Holiday - No Seminar**		
1/1/2015	**New Year Holiday - No Seminar**		
1/8/2015	Alexander Szalai, PhD	UAB	C-reactive protein and T cell fate in CNS disease: an update
1/15/2015	Laurie Harrington, PhD	UAB	Intestinal Immunity during Homeostasis and Disease
1/22/2015	Anath Shalev, MD	UAB	Diabetes, Cytokines and Thioredoxin-Interacting Protein
1/29/2015	Thorsten Mempel, MD, PhD	Harvard Medical School	T cell migration and function during the anti-tumor response
Special Seminar Wednesday 2/11/2015	Darrell Pilling, PhD	Texas A & M University, College Station, TX	Regulation of inflammation and fibrosis by endogenous proteins: Role of Slit2 and pentraxins

2/19/2015	Michael Sieweke, PhD	CNRS, France	Control of macrophage self renewal and identity
2/26/2015	Nabiha Yusuf, PhD	UAB	Toll like receptor-4: Potential player in immunological responses in skin cancer
3/5/ 2015	Robin Hatton, PhD	UAB	The expanding universe of IL-2 regulation
3/12/2015	Hui Hu, PhD	UAB	A Fox(y) link between T cell quiescence and Tfh cell differentiation
3/19/2014	***John Volanakis Immunology Lecture*** Marc Jenkins, PhD	University of Minnesota	What can one T cell do?
3/26/2015	Frank Carbone, PhD	The University of Melbourne, Australia	Generation and Function of Tissue-Resident Memory T cells
4/9/2015	Matthew Stoll, MD, PhD	UAB	Microbiota in Spondyloarthritis
4/16/2015	Lionel B. Ivashkiv, MD	Weill Cornell Medical College, NY	Epigenetic Regulation of Macrophage Polarization and Activation
4/23/2015	***Robert Stroud Advanced Immunology Trainee Seminar*** Preeyam Patel (Mentor: John Kearney,DDS, PhD) Daniel Silberger (Mentor: Casey Weaver, MD)	UAB	B Cells Generated As a Result of Early Microbial Exposure Dampen the Development of Allergic Disease During Adult Life Role of IL-21 in Adaptive Immunity to Citrobacter rodentium

5/7/2015	David Artis, PhD	Jill Roberts Institute for Research in Inflammatory Bowel Disease Weill Cornell Medical College, NY	Immune Regulation at Barrier Surfaces

APPENDIX E

Efforts to Enhance Diversity in Education and Training Programs

E1. List of major funding that support diversity in biomedical research or funding that can be used to support training of minority students.

E2. Current biomedical collaborations with Historically Black Colleges and Universities (HBCUs)/Minority Institutions (MI)

E3. Other Available Programs and Resources

E4. State institutional commitment to increase diversity

E1. List of major funding that support diversity in biomedical research or funding that can be used to support training of minority students.

UAB Efforts to Enhance Diversity in Education and Training Programs

List of major funding that support diversity in biomedical research or funding that can be used to support training of minority students.

- Comprehensive Minority Health & Health Disparities Research Center P60, Phases I, II, III – NIH/NIMHD (Mona Fouad)
- Center of Excellence in Comparative Effectiveness Research for Eliminating Disparities (CERED) – NIH/NIMHD (Ken Saag)
- Mid-South Center of Excellence in Eliminating Disparities (CEED) U58 – CDC
- Enhancing Minority Participation in Clinical Trials (EMPaCT) U24, Phases I and II – NIH/NIMHD (Selwyn Vickers)
- Morehouse School of Medicine/Tuskegee University /UAB Comprehensive Cancer Center Partnership U54 – NIH/NCI (Upender Manne)
- CPN Deep South Network for Cancer Control U54 – NIH/NCI (Edward Partridge)
- Deep South Resource Center for Minority Aging Research (RCMAR) P30 – NIH/NIA (Kathryn Burgio)
- Diabetes Research and Training Center P60 – NIH/NIDDK (Timothy Garvey)
- Mid-South Transdisciplinary Collaborative Center for Health Disparities Research U54 – NIH/NIMHD (Mona Fouad)
- Gulf States Collaborative Center for Health Policy Research U54 – NIH/NIMHD (Michelle Martin, David Butler)
- National Transdisciplinary Collaborative Center for African American Men's Health U54 – NIH/NIMHD (Selwyn Vickers, James Shikany)
- Training Program in Cardiovascular Pathophysiology T32 – NIH/NHLBI (Victor Darley-Usmar)

E2. Current biomedical collaborations with Historically Black Colleges and Universities (HBCUs)/Minority Institutions (MI)

1. UAB P60 Center of Excellence – Minority Health & Health Disparities Research Center
(PIs: Mona Fouad, Isabel Scarinci) The NIMHD-funded UAB P60 COE – "Comprehensive Minority and Health Disparities Research Center (MHDRC)," currently in its third phase of funding, generates new knowledge on minority health and health disparities in the areas of cancer prevention and control, cardiovascular disease, and their risk factors, including obesity. This goal is being accomplished through a Research Core with two full research projects targeting Hispanic and African American populations. The generated knowledge will be translated and disseminated through a Community Engagement Core, which enhances minority participation in research by building community capacity and engaging the community in the development and implementation of research studies. A Research Training Core builds a pipeline of African American scientists through partnerships with Historically Black Colleges and Universities (HBCUs) in Alabama. The P60 utilizes the infrastructure of the institutionally supported UAB Minority Health & Health Disparities Research Center (MHRC).

The MHRC is a University-Wide Interdisciplinary Research Center focused on eliminating the health disparities of racial/ethnic minorities and underserved populations locally, regionally, and nationally through state-of-the art research, training and career development, community outreach, and dissemination of information. The MHRC offers training opportunities for undergraduate students, graduate students, and junior faculty and post-docs.

- **Undergraduate Summer Enrichment Program (SEP).** The SEP is a 3-year program for minority students, in partnership with 5 HBCUs (Alabama A&M, Alabama State, Miles College, Oakwood University, Stillman College) and Tuskegee University. Its goal is to increase minority enrollment in graduate schools for health-related research. The aims of SEP are to a) develop a career roadmap plan for each Scholar accepted into the program; b) Improve Scholars' knowledge of health disparities issues and research, as evidenced by improvement from pre- to post-test scores; and c) Increase Scholars' GRE or MCAT scores from pre- to post-test. The program also organizes HBCU Academic Advisory Council meetings twice a year.
    - Year 1 (4 weeks): Health Disparities and Cultural Competency; Careers in Health-care Practice and Research; Career Roadmaps; Scientific Communication and Writing; Introduction to Lab Basics, Techniques, Safety, and Ethics
    - Year 2 (6 weeks): Scientific Communication and Writing; Health Policy Discussions and Debate; GRE or MCAT Preparation; Update Career Roadmaps; Health Disparities Research Project
    - Year 3 (8 weeks): Health Policy Discussions, Policy Memo Writing; Update Career Roadmap; GRE or MCAT Preparation; Health Disparities Research Project

  Interaction between RTC, Advisors, and Scholars is maintained during the school year. To date, 217 minority students have been trained by the program.

- **Summer Cancer Research Training Program**
  The Summer Cancer Research Training Program, sponsored by the Morehouse School of Medicine (MSM)/ Tuskegee (TU)/ UAB Cancer Partnership U54, admits graduate students in an 8-week summer program. Participants attend seminars and workshops and work on a research project guided by a mentor. Participants can become stronger candidates for advanced degrees in cancer research and progress as independent investigators. To date, 128 students have been trained in the program.

- **Health Disparities Research Training Program (HDRTP)**
  The HDRTP is a 2-year certificate program that trains junior faculty and post-docs to develop independent researchers in health disparities. The program is co-sponsored by several grants (MSM/TU/UAB CCC Partnership – NCI); Deep South Network for Cancer Control – NCI; ACCE – NHLBI; RCMAR – NIA; and MHDRC/CERED – NIMHD) and a number of institutions (UAB, University of Alabama, Tuskegee University, Morehouse School of Medicine, Jackson State University, and other academic institutions across the Southeast). To date,

142 scholars have been trained by the program and pilot funding of $100,000 has been awarded to 10 scholars, generating a return of $2M in extramural awards (1:20 ratio)

In addition, since 2005 the MHRC Research Program has awarded pilot research funding of $1.5M to 44 faculty. This investment has brought a return of $30M in extramural awards (1:20 ratio) to 20 of the pilot funding recipients.

2. MSM/TU/UAB CC Partnership (U54)
The NCI-sponsored Morehouse School of Medicine/Tuskegee University/UAB Comprehensive Cancer Center Partnership covers *two states – Alabama and Georgia* – to increase the capability of minority-serving institutions to conduct cancer health disparity research. It funds pilot investigations in basic and community-based research, promotes career development and training and cancer education, and is supported by bioethical and biostatical cores. The community outreach program of this partnership focuses on healthier lifestyle to reduce the risk of cancer in African Americans living in urban and rural communities, disseminates culturally appropriate cancer prevention and control information, partners with neighborhoods, churches, and local community organizations to conduct cancer prevention interventions and develop community capacity, and partners with public schools to conduct science education outreach activities and recruit the next generation of minority cancer scientists and researchers.

3. Deep South RCMAR – P30
The NIA-funded Deep South Resource Center for Minority Aging Research (RCMAR) covers *two states – Alabama and Georgia* – in a partnership between four institutions (Morehouse School of Medicine, Tuskegee University, University of Alabama, and University of Alabama at Birmingham) provides an infrastructure for enhancing the cultural diversity of the professional workforce conducting research on the health of older persons, disseminates strategies for recruiting and retaining African American older adults in research, supports enduring research careers in minority aging, advances the knowledge leading to a decrease in health disparities, and disseminates to scientific and non-scientific communities results addressing the resolution of health disparities through the improvement of minority health, particularly for older African Americans.

4. The MERIT Program
The primary goal of the **M**entored **E**xperiences in **R**esearch, **I**nstruction, and **T**eaching Program continues to be providing postdoctoral scholars with outstanding research and teaching experiences while improving the recruitment of underrepresented groups into the field of biomedical and behavioral research. The immediate objective of the MERIT Program remains enhancing the research backgrounds and teaching experiences of developing scientists to conduct high quality research in an academic environment. Long-term objectives for this program are still three-fold: i) to enhance research-oriented teaching at institutions that serve underrepresented groups; ii) to further promote interactions between these institutions and a research-intensive university leading to collaborations in research and teaching; and iii) to increase the number of well-qualified students from underrepresented groups entering competitive careers in biomedical and behavioral research. To achieve these objectives, qualified postdoctoral scholars are recruited into a program that provides research experiences at the University of Alabama at Birmingham (UAB) and teaching experiences at two institutions that serve underrepresented groups: Oakwood University and Stillman College. Through these experiences, the postdoctoral scholars gain knowledge and skills in both biomedical and/or behavioral research and higher education instructional design and pedagogy. Together, UAB, Oakwood University, and Stillman College collaborate in the overall design, implementation and continued improvement of the MERIT Program.

The primary goal and objectives of the MERIT Program were founded originally upon two central concerns that have been reiterated in the most recent IRACDA Program Announcement (PAR-12-245). These concerns are stated as follows: i) "…the need for a diverse workforce permeates all aspects of the nation's health-related research effort..."; and ii) "A separate but contemporary problem is that many new scientists find that the traditional postdoctoral research experience does not give them the best preparation for entering an academic environment in which teaching and other problem-solving skills are essential." These central concerns continue to drive the mission of the MERIT Program, which remains *providing experiences in both*

teaching and research that permit a diverse community of postdoctoral scholars to become tomorrow's leading academicians.

Background of Participating Institutions. As noted above, the MERIT Program is facilitated by a consortium of institutions within the state of Alabama: UAB, Oakwood University, and Stillman College. UAB serves as the applicant institution. Oakwood University and Stillman College were selected for partnership in this endeavor because both recruit motivated student bodies, which provide ideal teaching experiences for postdoctoral fellows, and their proximity to UAB. Through the teaching instruction development plan described below (section III.E), the MERIT Program has had a substantive impact on the science curricula and student development at each of these institutions. Importantly, both Oakwood University and Stillman College are located in close proximity to UAB; as such, postdoctoral fellows are able to complete their research and teaching training simultaneously.

5. The Transdisciplinary Geographic Management Program (GMaP)
GMaP is designed to develop a systematic and comprehensive strategy for building a state-of-the-art network for the support and efficient management of cancer health disparities research, training, and outreach across *five states – Alabama, Florida, Georgia, Louisiana, Mississippi – and Puerto Rico*. We are the lead site for this NCI-funded project, and our institutional partners include Tulane University, Xavier University, University of Mississippi, Tuskegee University, Morehouse School of Medicine, Emory University Winship Cancer Center, University of South Florida - H. L. Moffitt Cancer Center and Research Institute, and Ponce School of Medicine. The overall goal of the GMaP-3 is to eliminate racial/ethnic cancer health disparities by: (1) identifying factors associated to such disparities; (2) developing culturally relevant approaches to address these factors; and (3) disseminating evidence-based interventions across the cancer control continuum and across the continuum of the socio-ecological model. Our primary target audience is African Americans and Latinos living in this region. Through this effort and these partnerships, we plan to further increase our capacity to conduct community-based participatory projects.

6. Deep South Network for Translational Research
The network, funded by the UAB Center for Clinical and Translational Science (CCTS), which covers *three states – Alabama, Mississippi, and Louisiana* – in partnership between UAB, Jackson State University, Louisiana State University, Tulane University, Pennington Biomedical Research Institute, and University of Southern Mississippi. The initiative mentors early-stage investigators by providing pilot awards (four awards of $50,000 each) through the existing UAB CCTS Nascent Projects Panel, provides pilot project support in the form of vouchers (four awards of $25,000 vouchers each) to use the UAB CCTS Core facilities, and sponsors a meeting at UAB for early-stage investigators and their mentors focused on overarching clinical and translational research themes.

E3. Other Available Programs and Resources

1. Summer in Biomedical Science (SIBS) Undergraduate Research Program. The program provides opportunity for young people to be instructed in the techniques of modern biology while becoming integrated members of a vibrant clinical and scientific community. Students who will be sophomore or junior level college undergraduates are accepted into an 8-week paid summer program to work with faculty members on mentored research projects. SIBS participants will receive a stipend and campus housing.

2. Summer Program in Neuroscience (SPIN). The SPIN Program originated from a Research Experience for Undergraduates (REU) site with support from the National Science Foundation. It is now jointly sponsored by the Department of Neurobiology, the Civitan International Research Center, and the Comprehensive Neuroscience Center at UAB. The primary goal of SPIN is to provide motivated undergraduates who have demonstrated excellent scientific aptitude with the opportunity to experience independent research in neurobiology. SPIN is designed to increase student competitiveness for entry into graduate education leading to careers in biomedical research. Special emphasis is given to students with limited research opportunities at their home institutions. Students entering their junior or senior year by the start of the program are particularly encouraged to apply. Under the supervision of a faculty member, students have the opportunity to learn the basic skills necessary to contribute to a research program. They participate in both the intellectual and practical aspects of daily laboratory work. Students are trained in research methods, data analysis, attend lab meetings, and create written and oral presentations of their results at a research forum. They attend weekly seminars from program faculty to obtain a wider perspective of neurobiology research, and participate in professional development sessions designed to prepare them for the graduate school admissions and interview process.

3. Minority Health International Research Training (MHIRT) Program. The Department of Epidemiology at the UAB School of Public Health is offering research training opportunities to minority undergraduate, graduate, and health professions students who have an interest in research experience in the areas of nutrition, tropical infectious diseases, reproductive health and/or sexually transmitted diseases, HIV/AIDS or chronic disease. Funded by NIMHD, the program is offered to undergraduates (from any US accredited college or university) and/or Grad/Health professions students (UAB). Participants spend 12 weeks at a foreign training site under the guidance of an assigned foreign mentor and a UAB supervising mentor.

4. UAB PREP Scholars
This post baccalaureate program is funded by NIGMS and is an educational intervention designed to provide assistance to students from under-represented groups who have completed a BS degree but are not considered adequately prepared to attend Graduate School. The objectives of the project include providing academic training and laboratory experiences for students to enhance their skills in the bio-medical sciences. The program provides stipends and tuition and student health insurance for participants who are expected to work 40 hours per week on a biomedical research project in addition to taking 11 credit hours of academic instruction over the course of this one-year training program. URL: http://www.uab.edu/prep/.

5. CIRTL@UAB
UAB is one of 22 major research universities that participate in the NSF-funded Center for the Integration of Research, Teaching, and Learning. Its goal is to improve undergraduate education in the STEM disciplines by better preparing graduate students, postdoctoral fellows, and junior faculty to employ the most effective pedagogic methods in their teaching of undergraduate STEM students. URL: http://www.uab.edu/cirtl/

E4. State institutional commitment to increase diversity

UAB is a research university and academic health center that discovers, teaches and applies knowledge for the intellectual, cultural, social and economic benefit of Birmingham, the state and beyond. It is the mission of the Office for Equity and Diversity to increase, retain and enhance faculty, student and staff diversity at all levels of the University and to ensure equity.

At UAB, diversity is the full range of human difference and potential that manifests itself in individual members of the campus community. Included in this range are many differences – race, gender, ethnicity, age, culture, national origin, religious belief, physical abilities, sexual orientation, socioeconomic class, lifestyle preference, political conviction and any other distinction. Equity is meant to include equal access to employment and educational opportunities and to deal fairly and equally with all members of the UAB community.

The goals of the UAB Office of Equity and Diversity are to:

- Fully implement and regularly assess UAB policies related to affirmative action and equal opportunity.
- Explore creative ways to promote diversity and a university climate that is inviting and sustaining for all and to help all members of the community to understand and learn from each other.
- Actively foster and maintain effective external relations and collaborations in the city, state and nation that enhance support for programs of diversity and equity.
- Develop and implement activities to enhance external support for equity and diversity programs with particular emphasis on minority medical programs, undergraduate scholarships and graduate fellowships.
- Work with the Office of the Provost and deans to monitor academic achievement for comparisons of target groups of students within the university with a goal of assisting units with the elimination of disparities.
- Develop and implement policies and procedures to ensure that African Americans, underrepresented minorities and females are represented on search committees and in candidate pools.
- Work with Human Resource Management and other units on ways to educate faculty, students and staff on the importance of diversity and on issues of equitable treatment of individuals and groups regardless of race, gender, sexual orientation or other classifications.
- Research, monitor and assess the progress of all equity and diversity initiatives and programs at UAB and provide an annual report to the provost and president.
- Develop and implement strategies to ensure that all individuals holding positions of authority and responsibility understand and are sensitive to issues of diversity and see diversity as a strength of UAB.
- Actively promote faculty, student and staff diversity at all levels of the university and promote diversity as a criterion for excellence.

APPENDIX F

Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC)-Associated Programs and Events

F1. Background and History of the UAB CAMBAC

F2. Multidisciplinary Clinical Research Center

F3. Center of Research Translation in Gout and Hyperuricemia

F4. Rheumatic Diseases Cores Center

F5. CAMBAC (formerly CAMAC) Research Day 2014

F6. CAMBAC Osteoimmunology Symposium – August 2015

F7. Rheumatology Grand Rounds and Clinical Conference schedule 2012-2015

F8. Rheumatology Journal Club schedule 2012-2015

F1. Background and History of the UAB CAMBAC

Introduction – The UAB Multipurpose Arthritis Center was formed in 1977 as one of the first arthritis research centers in the nation supported by a grant from the National Institutes of Health (J. Claude Bennett, MD, Principal Investigator). The Center has been federally funded since its establishment. As the scope broadened to include musculoskeletal diseases, the Center was renamed the Arthritis and Musculoskeletal Center (AMC). In 1997, a university-wide interdisciplinary research center (UWIRC) network of thematic research centers was established at UAB and the AMC successfully competed for intramural funds, and it has continued to successfully compete every three year cycle since then. In 2008, the name was changed to the Comprehensive Arthritis, Musculoskeletal, and Autoimmunity Center (CAMAC) to reflect its breadth of research, clinical, educational, and other activities. Over the years, CAMAC has developed many collaborative programs involving multiple schools at UAB and throughout the US. A sustained, broad base of funding for interdisciplinary, multi-investigator awards from federal (NIAMS, NIAID, AHRQ, VA) and other sources (Rheumatology Research Foundation, Arthritis Foundation, etc.) has greatly enhanced the vibrancy of the research environment and contributed to the spirit of innovation at UAB. In 2014, there was a merger of CAMAC with the Center for Metabolic Bone Disease (CMBD) to create the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC). At present, UAB is the only institution in the nation that is supported by arthritis-focused NIH P30 (Rheumatic Diseases Cores Center), P50 (Center of Research Translation), and P60 (Multidisciplinary Clinical Research Center) grants.

The mission of the CAMBAC is: 1. To generate new understanding and apply knowledge to the diagnosis and treatment of patients; 2. To promote and integrate fundamental research with clinical care, developing and applying new diagnostics and therapeutics; 3. To educate the public; and 4. To train new and established investigators and health care professionals to help them focus on research in these areas.

F2. Multidisciplinary Clinical Research Center

UAB Multidisciplinary Clinical Research Center (MCRC)

S. Louis Bridges, Jr., MD, PhD, PI and Director
Kenneth G. Saag, MD, MSc, Co-Director
NIH P60 AR064172 (2013-2018)

Overview

The University of Alabama at Birmingham (UAB) Multidisciplinary Clinical Research Center (MCRC) is a multidisciplinary program designed to foster and promote research related to the causes, diagnoses, treatments and improved care of patients with arthritis and musculoskeletal diseases. The Administrative Core of the MCRC is specifically designed to coordinate MCRC activities while facilitating interactions and collaborations, promoting scientific development, performing continuous evaluation of ongoing MCRC programs, and setting the strategic agenda for the MCRC. The Administrative Core enables optimal coordination of the various MCRC components through its committees and regularly scheduled meetings and seminars serving to enhance communication and scientific development among the various investigators. To assist the Center Director in his effort to ensure the highest quality in the operation of the UAB-MCRC, four committees have been established: the UAB-MCRC Executive Committee, the Internal Advisory Committee, the External Advisory Committee, and the Data Safety and Monitoring Committee. These advisory groups will counsel and assist the Center Director in maximizing the strengths of the MCRC's projects, as well as in identifying and correcting any weaknesses. The Executive Committee members will be liaisons (Neurobehavioral Medicine; Epidemiology, Outcomes, and Prevention; Experimental Therapeutics and Biomarkers; Genetics and Functional Genomics; Immunology, Autoimmunity, and Inflammation; and Bone, Cartilage, and Connective Tissue). The personnel of the Administrative Core are highly motivated and experienced and will assist the Director and Associate Director by ensuring efficient communications, scheduling and other appropriate logistical support and fiscal responsibility in the operation of the MCRC.

MCRC Methodology Core – Xiangqin Cui, PhD - PI

The established mission of the Methodology Core for the UAB Multidisciplinary Clinical Research Center (MCRC) is to develop and provide state of the art methodology and methodological education in the collaborative support of clinical and translational research in arthritis and musculoskeletal disease (MSD) at the local, regional, national, and international level. Toward this goal, the Methodology Core will continue to provide the statistical, epidemiological, outcomes research, statistical genetics, economics/cost effectiveness, and bioinformatics leadership and expertise required to develop and perform cutting-edge clinical research in arthritis and MSD as it pursues four broad goals are to: I. Support the design, data collection, management, and analytic efforts of the MCRC projects. II. Nurture original research in methodology applicable to clinical research in arthritis and MSD. III. Develop new investigators in the area of arthritis and MSD research. IV. Provide methodology seminars, workshops, and mini-courses to introduce the newest methodological approaches to the MCRC research base.

MCRC Project 1. Facilitating Treat-to-Target Strategies Using Novel Health Technology with Decision Support. Jeffrey R. Curtis, MD, MS, MPH, PI

In this project, we will extend and rigorously evaluate past investments made by the NIH, ACR, and AHRQ in novel health information technology developed by the project team to: enable the systematic collection and integration of Patient Reported Outcome (PRO) and healthcare provider data in routine clinical practice; make use of this data to facilitate patient-provider interaction around

optimal use of rheumatoid arthritis (RA) therapies; integrate this data with information in Electronic Health Record (EHR) systems; and demonstrate benefit for both process and outcomes among patients with RA. Our specific aims are: Aim 1: To refine and integrate a novel approach to the electronic collection and use of PRO data from RA patients to facilitate better patient-provider communication, and achievement of Treat to Target (T2T) goals. We will further pilot-test novel and recently-completed technologies developed by our research team: 1) the RhEumatoid Arthritis Disease activitY (READY) electronic measurement tool that will collect data from patients using multiple existing, validated PRO instruments at physician offices and patients' homes via the Internet and smartphones (e.g. iPhone); 2) a risk communication tool focused on optimal use of biologic agents for RA patients considering changes in therapy; and 3) linked EHR-based data available through the ACR's new national registry, the Rheumatology Informatics System for Effectiveness (RISE). With critical input from many key stakeholders, including patients, we will refine this integrated tool in a variety of clinical practices using commonly available computing devices (e.g. iPad) to create a highly generalizable resource that can be deployed across both community and academic practice settings nationally. Aim 2: To conduct a cluster-randomized study to examine the effect of the integrated electronic tool to optimize RA patient care. We will test the hypothesis that RA patients receiving care in the physician practices randomized to receive the intervention tool will attain better RA outcomes as quantified by the proportion of patients in each physicians' practice that have achieved a T2T goal of low disease activity or remission one year after randomization.

MCRC Project 2. Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis. Charles O. Elson, MD, PI; Matthew L. Stoll, MD, PhD, MSCS – Investigator
The link between intestinal inflammation and spondyloarthritis (SpA) has long been recognized. Likewise, the role for intestinal microbiota in inflammatory bowel disease (IBD) is well appreciated, and a similar role in SpA is emerging. It is unknown, however, whether the contents of the flora are abnormal in SpA patients (dysbiosis), or whether the immunologic response to an otherwise normal flora mediates intestinal inflammation. Data in both IBD and SpA suggest a role for dysregulated adaptive immunity in the pathogenesis of both diseases, and there is also evidence supporting dysbiosis in the pathogenesis of IBD. Therefore, we predict that SpA patients will have an abnormal adaptive (B and T cell) immune response to a limited set of bacterial antigens and will additionally demonstrate abnormal fecal flora contents. Both of these hypotheses will be tested in this proposal. In Aim 1, we will identify humoral immunologic targets to enteric antigens using a novel antigen microarray followed by targeted screening of select bacteria. In Aim 2, we will evaluate for abnormal floral content through 16S ribosomal DNA sequencing followed by metagenome sequencing of the enteric microflora of children and adults with SpA. In Aim 3, we will perform T cell functional studies and analysis of T cell receptor (TCR) oligoclonality before and after exposure to potential target antigens. All of these aims are inter-connected, as bacterial antigens identified in Aim 2 will be studied in Aims 1 and 3, and B cell targets identified in Aim 1 will also be studied in Aim 3. These studies will help to establish a role for an altered adaptive lymphocyte response to intestinal bacteria in SpA patients (compared to control subjects), as well as explore a potential role for an altered gut microbiota in the pathogenesis of SpA. The outcome of these studies will be the identification of a limited set of bacterial antigens associated with and potentially causative of the disease, as well as identifying a role for the adaptive immune response in SpA. Thus, this research will provide novel insights into the pathogenesis of SpA as well as suggest potential new biomarkers useful for diagnosis and monitoring of the disease, and even targets of therapy as we learn to manipulate the microbiota and/or the adaptive immune response to the microbiota.

F3. Center of Research Translation in Gout and Hyperuricemia

NIAMS P50 Center of Research Translation (CORT) on Gout and Hyperuricemia
Kenneth Saag, MD, MSc – PI and Director
S. Louis Bridges, Jr., MD, PhD – Co-Director
P50 AR060772 – 2012 - 2017

Gout affects ~1 to 2% of the U.S. population. With an aging population, the societal burden of gout will likely grow. The role of genetic factors on gout and hyperuricemia among different races/ethnicities and the mechanisms by which treatment of hyperuricemia may impact vascular disease remain poorly understood. While the causes of hyperuricemia are known, and efficacious treatments for gout are available, there are large gaps in the quality of care of gout patients. These care gaps, the societal impact of gout, and rising concerns about deleterious effects of hyperuricemia make these conditions ideal targets for translational research. Our multi-disciplinary UAB CORT includes research projects and an administrative core focused on the theme of "Gout and Hyperuricemia: from Bench to Bedside to Backyard. Gout, hyperuricemia, and vascular disease are more common among African Americans than Caucasians, yet little is known about genetic and environmental factors associated with increased risk of gout in this minority population. Our projects are thus further united by a sub-theme of racial/ethnic disparities in gout and hyperuricemia. We will characterize biomarkers of inflammation (CRP), vascular disease (endothelial function), and blood pressure changes associated with the ULT allopurinol; examine factors associated with suboptimal gout care and factors influencing effective and safer dosing of allopurinol and colchicine in African-Americans and Caucasians; and compare the effectiveness of a novel pharmacy-based "virtual" Gout Clinic that includes protocol-driven care to usual care in the treatment of chronic gout. The overall goal of our CORT is to improve the health of patients with gout and hyperuricemia by applying scientifically rigorous, state-of-the-art methodology to clinically important questions in translational investigation and to educate clinical investigators through an enrichment program. Drawing on the unique strengths of many UAB Centers, Departments, and Programs, and in collaboration with an experienced team of 20 investigators representing 5 disciplines, our innovative projects hold the promise of significant improvements in our understanding of the pathogenesis of gout, hyperuricemia, and related co-morbid conditions, and may ultimately lead to better ways to predict, treat, or prevent gout and hyperuricemia.

CORT Project 1. The Effects of Urate Lowering Therapy on Inflammation, Endothelial function, and Blood Pressure. Ken Saag, Angelo Gaffo, David Calhoun

Hypertension and adverse cardiovascular outcomes affect individuals with gout and hyperuricemia at disproportionately high rates. Rat models and epidemiological studies have provided significant preliminary evidence for an association between serum urate and hypertension. To further support this hypothesis, urate lowering therapy with allopurinol has been associate with decreased blood pressure in adolescents with hyperuricemia, in one small study. No further studies have confirmed this hypothesis and no translational studies have defined the mechanisms of action through which urate lowering may be contributing to hypertension control in humans. Our major objective is to determine if and through which physiologic mechanisms urate lowering therapy is useful for the treatment of hypertension. Since hypertension is an key comorbid condition in individuals with gout and hyperuricemia, elucidating novel mechanisms for the management of hypertension will be specially beneficial gout patients. We also will focus on the UAB CORT subtheme by studying racial/ethnic differences with a focus in African Americans who disproportionately suffer from this disorder and have differential responses to hypertension therapies. The Specific Aims of our study aims are to: 1: Determine if in young adults with pre- or stage I hypertension urate-lowering therapy with 300 mg of allopurinol once daily for one month will: a) Induce change in highly sensitive C-reactive protein, b) Induce change in endothelial function, and c) Lower blood pressure 2: Determine if urate-lowering therapy as in Aim 1 induces changes in highly

sensitive C-reactive protein, endothelial function and blood pressure that are proportional with the urate lowering achieved. A secondary hypothesis is that African Americans will have differential responses in the study outcomes compared with other races/ethnicities. This translational study (n= 112 subjects) with physiologic measurements will be a double-blinded, randomized, placebo-controlled, cross-over trial. The target population will be young adults (ages 18-35) with pre-hypertension (SBP 120-139/DBP 80-89) or stage I hypertension (SBP 140-159/DBP 90-99) and with serum urates of >/= 5.0 mg/dL in men and >/= 4.0 mg/dL in women. This novel multi-disciplinary translational study will generate knowledge on the mechanism by which ULT lowers blood pressure and will provide evidence that can be translated into clinical practice for patients with hyperuricemia and gout.

CORT Project 2. Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments. Jas Singh, Lou Bridges

Our long-term goal is to improve health outcomes in patients with gout, the most common inflammatory arthritis in adult men. Inability to achieve a target serum urate of <6 mg/dl is common in gout patients undergoing treatment with urate-lowering therapy, which is associated with more acute gout flares, higher societal costs, and diminished quality of life. High-quality national studies of gout have been limited by the lack of availability of serum urate results in large national databases and use of only ICD-9 codes to identify gout cohorts, and when used alone ICD-9 codes may be inaccurate. Innovations in Veterans Affairs (VA) informatics including Natural language processing (NLP) algorithms, ability to obtain serum urate in national VA databases and to merge inpatient, outpatient and pharmacy databases allow conduct of high quality studies in gout. Data regarding patient, physician and healthcare factors influencing the ability to achieve target serum urate <6 mg/dl are lacking. Major adverse events (AEs) such as allopurinol hypersensitivity syndrome (AHS) and colchicine-associated neuromyopathy and hematologic AEs are associated with significant morbidity and mortality and have not been studied with well-designed, adequately-powered studies The main objective of this proposal is to study the effectiveness an safety of gout medications using national VA databases. Our project is innovative in using NLP algorithm to develop a large valid national cohort of gout patients, extracting serum urate levels and validating and studying AEs in a large gout cohort. Specific Aim 1: To identify key patient, provider, and health system factors associated with achieving and maintaining serum urate below 6 mg/dl ("target") in gout patients taking allopurinol. Specific Aim 2: To characterize the epidemiology and risk factors for major adverse events (AEs) associated with the use of allopurinol and colchicine for treatment of gout. We will use natural language processing (NLP) algorithm that incorporates the rich information from national VA EHR (text field data from clinic notes) and nationally available laboratory results (serum urate, synovial fluid result) in addition to ICD-9 codes to more accurately identify gout patients. With a similar approach, we will identify a validated cohort of gout patients with major AEs. We will examine association of key (patient, physician, healthcare) factors with ability to achieve target serum urate and with risk of major AEs.

CORT Project 3. A Novel Centralized Virtual Gout Clinic for Chronic Gout Management. Jeff Curtis, Ted Mikuls

While there is strong evidence that ULTs are efficacious when used appropriately, their use in gout is too often characterized by poor quality of care and suboptimal patient outcomes. For that reason, a majority of gout patients receiving ULT fail to reach serum urate concentrations < 6.0 mg/dl, a threshold associated with improved outcomes. Although approved at daily doses as high as 800 mg per day, the modal daily dose of allopurinol (accounting for more than 95% of all ULT prescriptions) is 300 mg. Taken together, these data suggest that the current paradigm for gout treatment fails most patients and that novel approaches to health care delivery in chronic gout are needed. We propose a Type 2 translational research project aimed at adopting best practices for the management of gout in a community setting. This project fulfills the definition of Type 2 translational research, which is described by the Institute of Medicine (IOM) as 'research moving discovery from the bedside to community practice'. The IOM has defined deficiencies in medical care as the "quality chasm", and

we have highlighted that a quality chasm in gout exists. The overarching goal of our project is to identify best practices in gout and hyperuricemia management, translate these evidence-based practices into a highly generalizable strategy for optimal delivery of gout care, and implement and evaluate such a strategy in a large, population-based healthcare setting. With the use of novel and readily-accessible technology, we will examine the use of a novel, large-scale, and relatively low-cost pharmacy-based intervention, with the goal of optimizing ULT in chronic gout treatment. The Specific Aims of our proposal are to: SA1. Using a rigorous randomized controlled study design, compare the effectiveness of a novel pharmacy-based Centralized "virtual" Gout Clinic (CGC) that incorporates protocol-driven care with usual care in the treatment of chronic gout. SA2. Compare adherence to allopurinol administered through the CGC with administration, in usual care. We hypothesize that a novel CGC incorporating protocol-driven care with the administration of allopurinol in chronic gout will be significantly more effective and will be associated with greater treatment adherence than usual care.

F4. Rheumatic Diseases Cores Center

NIAMS P30 Rheumatic Disease Core Center (RDCC)
John Mountz, MD, PhD, Director, and S. Louis Bridges, Jr., MD, PhD, Associate Director
P30 AR048311 – 2012 – 2017

The overall goal of the UAB-RDCC is to stimulate collaborative and innovative interdisciplinary research in order to enhance our fundamental understanding of disease mechanisms and their application to human rheumatic diseases. Through this understanding, the UAB-RDCC's goal is to improve the diagnosis and treatment of patients with arthritis and musculoskeletal diseases. The strategy of the UAB-RDCC is to draw on the strengths of the UAB research community, including the Hudson Alpha Institute of Biotechnology and Southern Research, to provide essential scientific tools and technologies, to enlist new investigators, to foster the sharing of knowledge and to nurture collaborations among translational and basic science investigators in the fight against rheumatic diseases through the creation and support of a vibrant scientific culture of discovery and innovation. Accordingly, our specific aims are 1) to facilitate rheumatic disease research through Research Core facilities, which provide scientifically rigorous, state-of-the-art techniques necessary for improved understanding of disease pathogenesis and the development of new treatments; 2) to support outstanding Pilot & Feasibility research projects drawing on the unique strengths of the RDCC research base and using innovative tools and approaches in biomedical science; and 3) to provide career development and career enrichment activities to enhance both the mentorship of talented investigators as independent researchers and the continuing education of all of our investigators. To achieve its specific aims, the UAB-RDCC has worked continuously with its Research Core facilities to develop technical capacities, to assess user needs and to provide a variety of formats for outreach and enrichment, including our IDEAs program (individualized design and experimental analyses sessions). The RDCC leadership team has worked with the School of Medicine, the Provost, the Vice President for Research and the Faculty Practice (HSF-GEF) to support the continued development of available tools and technologies for rheumatic diseases research, and through these efforts the UAB-RDCC provides the opportunity for our investigators to commit their programs to the mission of NIAMS.

Comprehensive Flow Cytometry Core
John Mountz, MD, PhD, Director
Olaf Kutsch, PhD, Co-Director, Troy Randall, PhD, Co-Director

The Comprehensive Flow Cytometry Core (CFCC) is directed by Dr. John D. Mountz with assistance of Co-Directors, Drs.Troy Randall and Olaf Kutsch. The goal of the CFCC is to enhance the productivity of the research base of the UAB Rheumatic Disease Core Center (RDCC) through state-of-the-art flow cytometry and cell separation technologies. To accomplish this, the Core provides the equipment, service and expertise necessary for the application of flow cytometry and related technologies to cell analyses and cell purification at a reasonable cost. These services play a key role in studies of disease pathogenesis and identification of potential therapeutic targets, as well as in analysis of determinants of disease susceptibility and drug responsiveness, and pre-clinical testing of potential therapeutic reagents. Our Specific Aims are: 1 Service. To improve service by continued improvements of our equipment, through enhanced sophistication of our user base, optimal efficiency of sample analysis, rigorous quality control of all operations and maintenance of operator proficiency for technologically challenging applications. 2. Outreach & Education. To provide informal tutorials, formal courses, symposia, and web-based information with the goals of increasing our user base through enhanced awareness of flow cytometry and introducing established users to newer technologies and applications. 3. Development. To develop new applications in response to users' needs and to take full advantage of equipment capabilities, through discussions with users, participation in international flow cytometry meetings, and inclusion of knowledgeable core users on our Advisory Committee. To keep pace with research needs of the RDCC investigators, we have

expanded the capacity of the CFCC and introduced new equipment and technologies. Continued development of innovative applications is enhanced by the depth of expertise at UAB and external collaborations. Education is accomplished through bi-weekly Individualized Design of Experiments & Analyses Sessions (IDEAs) in which the Director/Co-Directors interact with investigators to develop protocols and applications, including integration of flow cytometry aspects in the experimental design with other Cores, including AIIC and AGTC.

Analytical Genomics and Transgenics Core
Robert Kesterson, PhD, Director
Jeffrey Edberg, PhD, Co-Director, Devin Absher, PhD, Co-Director

The overall goal of the Analytical Genomics and Transgenics Core (AGTC) is to enhance the productivity of the UAB Rheumatic Disease Core Center (RDCC) researchers, and provide state-of-the-art services to facilitate the development and use of appropriate genetic animal models. During the two previous funding cycles, this Core served to support expertise in embryonic stem (ES) cell services as part of the UAB Transgenic Mouse Facility. In response to user needs, the Core has expanded services to more specifically assist with the creation of mouse models relevant to rheumatic disease beyond just ES services to 1) generate novel genetically engineered models of broad utility to multiple RDCC investigators, and 2) establish educational and outreach programs to forge active collaborations between the Core and RDCC investigators, especially in areas related to genomics. Formal educational resources for learning modern and emerging genetic and genomic technologies via workshops, seminars, lectures, and symposia hosted at UAB and our partner institution, Hudson Alpha Institute for Biotechnology (HAIB) are an extension of the core's evolution. The overarching objective and downstream output of the Core remains the same; to produce mouse models of human disease and of human genetic variants contributing to disease in order to provide a mammalian system to study the pathophysiology of rheumatic disease, as well as to test the efficacy of potential treatment interventions. To this end, the Analytical Genomics & Transgenic Core has the following specific aims: AIM 1. SERVICE: To provide expert services to generate and analyze genetic/genomic data, and to develop translational animal models relating to the mission of the RDCC. AIM 2. OUTREACH AND EDUCATION: To provide enrichment programs for RDCC investigators. AIM 3. DEVELOPMENT: To assess RDCC investigator needs and develop new platforms and technologies to address those needs.

Analytical Imaging and Immunoreagent Core
Kent Keyser, PhD, Director
Mary Ann Accavitti-Loper, PhD, Co-Director, Casey Weaver, MD, Co-Director

Rheumatic diseases are a complex group of human disorders that cause significant morbidity and mortality. With the identification of gene loci involved in human rheumatic diseases, the next objectives will be to identify the function, localization, and interactions of these gene products and to determine their role in the initiation and progression of rheumatic diseases. To advance research into molecular and cellular basis of the rheumatic diseases, the Analytical Imaging and Immunoreagent Core will support RDCC investigators research programs with state-of-the-art imaging capabilities and through the generation of essential immunoreagents. First, the Immunoreagent Component will assist P30 investigators in the development and characterization of novel monoclonal antibodies that are relevant to the study of rheumatic diseases. Second, the Imaging Component will provide center members with access to high-end imaging capabilities that include multi and single photon confocal, high resolution fluorescence using Stimulated Depletion (STED) and conventional transmission, cryo, and environmental scanning electron microscopy. In addition, the AIIC will provide expertise in the areas of experimental design, data collection, and data analysis. The resources provided through the AIIC far exceed the capabilities available to individual laboratories and departments and together will facilitate the detailed analyses of the pathogenic mechanisms leading to rheumatic diseases.

F5. CAMBAC Research Day 2014

Call for Abstracts and Registration
CAMAC Research Day 2014

Friday, September 19, 2014, 8:00 AM – 5:00 PM
UAB Alumni House

Tentative Schedule

8:00 AM	Continental Breakfast
	Welcome and Overview of CAMAC – S. Louis Bridges, Jr., MD, PhD, Director
8:15 AM	Keynote Speaker
	Eswar Krishnan, MD, Assistant Professor of Medicine, Stanford University: Big Data in Clinical Medicine
8:45 AM	UAB NIAMS Center of Research Translation on Gout and Hyperuricemia
	Kenneth G. Saag, MD, MSc, CORT PI and Director - Introduction
	Angelo Gaffo, MD, MSPH - Effects of Urate Lowering Therapy on Inflammation, Endothelial Function and Blood Pressure
	Jeff Curtis, MD, MS, MPH - A Novel Centralized 'Virtual' Gout Clinic for Chronic Gout Management
	Jasvinder Singh, MD, MPH - Determinants of Achieving Target Serum Urate in Gout and Safety of Gout Treatments
10:00 AM	Coffee Break
10:15 AM	UAB NIAMS Multidisciplinary Clinical Research Center
	S. Louis Bridges, Jr., MD, PhD, MCRC PI and Director - Introduction
	Jeffrey Curtis, MD, MS, MPH - Facilitating Treat to Target Using Novel Health Technology with Decision Support
	Matt Stoll, MD, PhD, CRC - Adaptive Immune Responses to Gut Microbiota in Juvenile & Adult Spondyloarthritis
	Xiangqin Cui, PhD - MCRC Methodology Core
11:30 PM	Lunch and Poster Session with Exhibits for RDCC Cores and Methodology Core
1:00 PM	UAB NIAMS Rheumatic Diseases Cores Center
	Introduction – John D. Mountz, MD, PhD, RDCC PI and Director Comprehensive Flow Cytometry Core; Analytic
Imaging	and Immunoreagent Core; Analytical Genomics and Transgenics Core
2:15 PM	Abstract Presentations – (Top abstracts - 2 each of junior faculty, postdoc, grad student)
4:30 PM	Closing Remarks and Abstract Awards for best presentations and runner up and best poster presentation.

Abstract submission deadline is Friday, September 12, 2014. All submitted abstracts from junior faculty and trainees are eligible for cash awards.
All abstracts will be accepted as either oral presentation or poster presentation.
To register or submit abstract, go to: http://www.uab.edu/medicine/camac

For more information, contact: Stephanie Ledbetter; sledbetter@uab.edu ; 205 934-7423

The Mission of the CAMAC is to generate new understanding and apply knowledge to the diagnosis and treatment of patients with arthritis, musculoskeletal and autoimmune diseases; to promote and integrate fundamental research with clinical care, developing and applying new diagnostics and therapeutics; to educate the public about arthritis, musculoskeletal, and autoimmune diseases. CAMAC thematic work groups are: Experimental Therapeutics & Biomarkers; Neurobehavioral Medicine; Epidemiology, Outcomes & Prevention; Immunology, Autoimmunity, &Inflammation; Genetics and Functional Genomics; and Bone, Cartilage &Connective Tissue.

UAB COMPREHENSIVE ARTHRITIS, MUSCULOSKELETAL, AND AUTOIMMUNITY CENTER

2014 CAMAC Research Day Awardees

Oral Presentations

Graduate Students

First Place: Jennie Hamilton
Mentor: John D. Mountz, MD, PhD

Second Place: George Coricor
Mentor: Rosa Serra, PhD

Postdoctoral Fellows

First Place: Tracy Hwangpo, MD, PhD
Mentor: Harry W. Schroeder, Jr., MD, PhD

Second Place: Liang Hao, PhD
Mentor: Yi-Ping Li, PhD

Junior Faculty

First Place: Iris Navarro-Millán, MD
Second Place: Huifeng Yun, PhD

Poster Presentations – Awards of Excellence

Elizabeth Mitchell
Mentor: Rosa Serra, PhD

Lindsey Padgett
Mentor: Hubert M. Tse, PhD

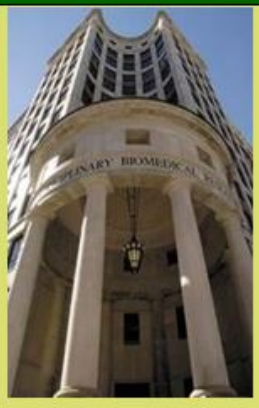
Richard Reynolds, PhD

F6. CAMBAC Osteoimmunology Symposium – August 2015

COMPREHENSIVE ARTHRITIS, MUSCULOSKELETAL, BONE AND AUTOIMMUNITY CENTER

Knowledge that will change your world

PLEASE SAVE THE DATE



UAB Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center (CAMBAC)

Director
S. Louis Bridges, Jr., MD, PhD

Associate Directors
Majd Zayzafoon, MD, PhD, MBA
Kenneth Saag, MD, MSc
Harry Schroeder, Jr., MD, PhD

UAB Symposium on Osteoimmunology

Thursday, August 20, 2015
8AM – 3:30 PM
Shelby 105

Confirmed External Speakers include:

Nancy E. Lane, MD, Endowed Professor of Medicine, University of California Davis

Anne-Marie Malfait, MD, PhD, Associate Professor of Medicine & Biochemistry, Rush University Medical Center

Roberto Pacifici, MD, Garland Herndon Professor of Medicine, Director, Division of Endocrinology, Metabolism and Lipids Emory University School of Medicine

Antonios Aliprantis, MD, PhD, Assistant Professor of Medicine Harvard Medical School, Associate Immunologist and Director of the Brigham and Women's Osteoarthritis Center

This event is sponsored by the UAB CAMBAC, the UAB Division of Clinical Immunology and Rheumatology, and a Pfizer Medical and Academic Partnership educational grant.

F7. Rheumatology Grand Rounds and Clinical Conference schedule 2012-2015

Rheumatology Grand Rounds & Clinical Conferences

2012-2015

All conferences convene at **8:00 a.m.** in the **West Pavillion, Room D** (unless otherwise specified)

Date	Speaker Institution	Title
07/5/2012	**Dr. Maria Danila** UAB	Rheumatoid Arthritis
7/12/2012	**Dr. Peter A. Nigrovic** Brigham and Women's Hospital	Mast cells and inflammatory arthritis
07/19/2012	**Dr. Kenneth Saag** UAB	Osteoporosis
07/26/2012	**Clinical Conference**	
08/2/2012	**Prof. Dr. Wolfgang-Ludwig Gross** Klinikum Bad Bramstedt GmbH	Vasculitis: Outcome and Management
08/9/2012	**Clinical Conference**	
8/16/2012	**Clinical Conference**	
8/23/2012	**Dr. Angelo Gaffo** UAB	Large vessel vasculitis
08/30/2012	**Dr. Jeffrey Curtis** UAB	Biologic Agents in RA Treatment
9/6/2012	**Dr. Laura Su** Stanford School of Medicine	The human CD4+ T cells exhibit extensive cross-reactivity and regulatory co-specificity
9/13/2012	**Dr. Sherine Gabriel** Mayo Clinic	Cardiovascular Risk Assessment in Rheumatoid Arthritis Patients
9/20/2012	**Clinical Conference**	
9/27/2012	**Clinical Conference**	
10/4/2012	**Clinical Conference**	

10/11/2012	**Clinical Conference**	
10/18/2012	**Dr. Karen H. Costenbader** Brigham and Women's Hospital	Environmental exposures and risks of RA and SLE: What we think we know now
10/25/2012	**Clinical Conference**	
11/01/2012	**Clinical Conference**	
11/8/2012	**Dr. Iain McInnes** University of Glasgow, Glasgow, Scotland, UK	Exploring Rheumatoid Pathogenesis – of Worms and Wine!
11/15/2012	**Clinical Conference**	
11/22/2012	**Thanksgiving Holiday: No Conference**	
11/29/2012	**Clinical Conference**	
12/06/2012	**Clinical Conference**	
12/13/2012	**Clinical Conference**	
12/20/2012	**Clinical Conference**	
12/27/2012	**Christmas Holiday Weekend: No Conference**	
01/03/2013	**New Year's Holiday Weekend: No ConferenceClinical Conference**	
01/10/2013	**Dr. Hani El-Gabalawy** University of Manitoba, Canada	Rheumatoid Arthritis in the North American Native (NAN) Population: studies in the preclinical stages of individuals at risk
01/17/2013	**Clinical Conference**	
01/24/2013	**Dr. Amie B. Jackson** UAB	Physical Rehabilitation of Patients with Osteoporosis and Other Rheumatic Diseases
01/31/2013	**Clinical Conference**	
02/07/2013	**Dr. Steven Theiss** UAB	The Evaluation and Treatment of Adult Spine Deformities

02/14/2013	**Clinical Conference**	
02/21/2013	**Dr. Troy Randall** UAB	The role of local lymphoid tissues in pulmonary immunity and autoimmunity
02/28/2013	**Clinical Conference**	
03/7/2013	**Clinical Conference**	
03/14/2013	**Clinical Conference**	
03/21/2013	**Spring Break: No Conference**	
3/28/2013	**Dr. Antonios Aliprantis** Brigham and Women's Hospital	Inflammatory Scleroderma: from mouse models to therapeutics
04/04/2013	**Clinical Conference**	
4/11/2013	**Dr. Chander Raman** UAB	Regulation of Pathogenesis in Autoimmune Neuroinflammation
04/18/2013	**Clinical Conference**	
04/25/2013	**Dr. Robert Lafyatis** Boston University School of Medicine	Biomarkers as tools for understanding pathogenesis and defining response to therapeutics in clinical trials
05/02/2013	**Clinical Conference**	
5/9/2013	**Dr. Michael B. Brenner** Brigham and Women's Hospital	Role of synovial fibroblasts in rheumatoid arthritis
5/16/2013	**Dr. Clifford J. Rosen** St. Joseph Hospital, Bangor, Maine	Gauging the Skeleton: Time and Temperature
05/23/2013	**Clinical Conference**	
5/30/2013	**Dr. Leslie Harrold** University of Massachusetts Medical School	Mind the Gap: New Approaches to the Treatment of Gout
	Clinical Conference	

06/06/2013		
06/13/2013	**Clinical Conference**	
06/20/2013	**Clinical Conference**	
06/27/2013	**Clinical Conference**	
7/11/2013	**Dr. Winn Chatham** UAB	SLE
7/18/2013	**Dr. Angelo Gaffo** UAB	Large Vessel Vasculitis
7/25/2013	**Dr. Jasvinder Singh** UAB	Gout
8/1/2013	**Dr. S. Louis Bridges, Jr** **UAB**	Rheumatoid Arthritis
8/8/2013	**Dr. Angelo Gaffo** UAB	ANCA
8/15/2013	**Dr. Richard Loeser** Wake Forrest	Redox Signaling and the Regulation of Chondrocyte Matrix Metalloprotease Production
08/22/2013	**Clinical Conference**	
8/29/2013	**Dr. Jeffrey Curtis** UAB	RA Therapeutics
09/05/2013	**Clinical Conference**	
09/12/2013	**Clinical Conference**	
9/19/2013	**Dr. Tracy R. Luckhardt** UAB	Pulmonary Disease in Sjogren's Syndrome
09/26/2013	**Clinical Conference**	
10/3/2013	**Clinical Conference**	
10/10/2013	**Clinical Conference**	
10/17/2013	**Clinical Conference**	

10/24/2013	**Dr. Lisa Stamp** Dunedin School of Medicine University of Otago in Christchurch, New Zealand	Challenges in urate lowering therapy - optimizing allopurinol
10/31/2013	**Clinical Conference**	
11/7/2013	**Dr. Monique E. Hinchcliff** Northwestern University Feinberg School of Medicine	Gene expression in Ssc skin and esophagus provide insights into pathogenesis
11/14/2013	**Dr. Vivian Bykerk** Hospital for Special Surgery, NY	Collaborative Observational Research: Goals, Advantages and Challenges (The Canadian Experience)
11/21/2013	**Clinical Conference**	
11/28/2013	**Thanksgiving Holiday - No RGR**	
12/5/2013	**Dr. Maria Trojanowska** Boston University School of Medicine	The molecular mechanism of vasculopathy and fibrosis in systemic sclerosis
12/12/2013	**Dr. Melissa Chambers** UAB	Evaluation of Outcomes Following Kyphoplasty for the Treatment of Vertebral Fractures
12/19/2013	**Dr. Jeremy Sokolove** Stanford University	Protein citrullination: A link between innate and adaptive immunity
12/26/2013	**Christmas Holiday - No RGR**	
01/02/2014	**New Year Holiday - No RGR**	
1/9/2014	**Dr. Carol A. Wallace** Seattle Children's Hospital	Development of Evidence-based Standard Treatments for Childhood Rheumatic Diseases
1/16/2014	**Dr. Balazs Rada** University of Georgia	Neutrophil activation by MSU and CPPD microcrystals: potential relevance in gout and pseudogout pathogenesis
01/23/2014	**Clinical Conference**	
01/30/2014	**Clinical Conference**	
2/6/2014	**Clinical Conference**	
2/13/2014		

	Clinical Conference	
2/20/2014	**Dr. Matthew Stoll** UAB Children's Hospital	The spondyloarthropathies
2/27/2014	**Clinical Conference**	
03/06/2014	**Dr. Dan Kastner** NIH	Fevers, Genes, and Vasculitis: Whole-Exome Sequencing Reveals a New Autoinflammatory Disease
3/13/2014	**Clinical Conference**	
03/20/2014	**Dr. Michael Holers** University of Colorado at Denver	Natural History of Rheumatoid Arthritis: What We Learn from Studies of At-Risk Individuals
3/27/2014	**Spring Break - No RGR**	
04/03/2014	**Dr. E. Michael Lewiecky** Clinical Research & Osteoporosis Center, Albuquerque, New Mexico	Fracture Prevention in Patients with CKD
04/10/2014	**Clinical Conference**	
4/17/2014	**Clinical Conference**	
04/24/2014	**Dr. Rosalind Ramsey-Goldman** Northwestern University Feinberg School of Medicine, Chicago, IL	*1st Graciela Alarcon MD, MPH Lecture* To D or not to D
5/1/2014	**Clinical Conference**	
05/08/2014	**Dr. Jose Scher** New York University	In search of the Second Hit: Microbiome Perturbation, Mucosal Immunity and Systemic Inflammation in RA
5/15/2014	**Clinical Conference**	
5/29/2014	**Clinical Conference**	
6/19/2014	**Clinical Conference**	

7/3/2014	**Dr. Laura Hughes** UAB	Osteoarthritis (OA)
7/10/2014	**Dr. Martin Trojanowski** UAB	Rheumatology Labs

7/17/2014	**Dr. Winn Chatham** UAB	Systemic Lupus Erythematosus (SLE)
7/24/2014	**Dr. Maria Danila** UAB	Rheumatoid Arthritis (RA)
7/31/2014	**Dr. Jose Crispin** The Harvard Clinical and Translational Center	Thinking Pathways in Lupus
8/7/2014	**Dr. Martin Trojanowski** UAB	Scleroderma
8/14/2014	**Dr. Kenneth Saag** UAB	Osteoporosis
08/21/2014	**Dr. Matthew Stoll** UAB	Juvenile Idiopathic Arthritis (JIA)
8/28/2014	**Dr. Eroboghene Ubogu** UAB	Necrotizing Myopathies
09/04/2014	**Dr. Jeffrey Curtis** UAB	RA Therapeutics
9/11/2014	**Clinical Conference**	
9/18/2014	**Dr. Eswar Krishnan** Stanford School of Medicine	Gout Research: New Wine in Old Bottle?
9/25/2014	**Dr. Eric Matteson** Mayo Clinic College of Medicine	Giant Cell Arteritis: Approaches and Answers to FAQs
10/2/2014	**Dr. Jasvinder A. Singh** UAB	Gout
10/9/2014	**Clinical Conference**	
10/16/2014	**Clinical Conference**	
10/23/2014	**Clinical Conference**	
10/30/2014	**Dr. Peter Mannon** UAB	Addressing the IL-12/23 pathways in GI Disease
11/6/2014	**Clinical Conference**	
11/13/2014	**Dr. Nicola Dalbeth** University of Auckland, New Zealand	Joint damage in gout: mechanisms and treatment strategies
11/20/2014	**Clinical Conference**	

12/4/2014	**Dr. S. Sam Lim** Emory University School of Medicine	The Georgia Lupus Cohort: Past, Present and Future
12/11/2014	**Clinical Conference**	
1/8/2015	**Dr. Joel A. Block** Rush University Medical Center	OA: Can we alter the disease course?
1/15/2015	**Clinical Conference**	
1/22/2015	**Clinical Conference**	
1/29/2015	**Dr. Niharika Sharma** Chicago University	Idiopathic Inflammatory Myositis - Recent Advances in Management
2/5/2015	**Clinical Conference**	
2/12/2015	**Clinical Conference**	
2/19/2015	**Dr. John O'Shea** NIAMS	Genomic Switches and Lymphocyte Identity
2/26/2015	**Clinical Conference**	
3/5/2015	**Dr. Shruti Agnihotri** UAB	Neurologic Manifestations of Sarcoidosis
3/12/2015	**Clinical Conference**	
3/19/2015	**Dr. Richard Pope** Northwestern University	The Many Faces of FLIP in the Pathogenesis of Inflammation and Arthritis
3/26/2015	**Clinical Conference**	
4/2/2015	**Clinical Conference**	
4/9/2015	**Clinical Conference**	
4/16/2015	**Dr. Lionel B. Ivashkiv** Weill Cornell Medical College	Regulation of Cytokine Responses in Health and Disease
4/23/2015	**Clinical Conference**	
4/30/2015	**Clinical Conference**	
5/7/2015	**Clinical Conference**	
5/14/2015	**Clinical Conference**	
RGR **5/21/2015** 8 a.m. West Pavilion Conference	**Dr. Bevra Hahn** *Professor Emerita* UCLA	A history of treatment of SLE, from 1960's to 2015

Room D		
Special Seminar **5/21/2015** 12:00 Noon FOT 803	**Dr. Bevra Hahn** *Professor Emerita* UCLA	***2nd Annual Graciela S. Alarcón, MD, MPH Lecture*** The Status of New Therapies for SLE – Beyond Belimumab and Mycophenolate

F8. Rheumatology Journal Club schedule 2012-2015

Rheumatology Journal Club 2012-2013

Journal Club will be held **12:00 -1:00 p.m.** in the **Shelby Building, Room 105 or 515**

Date	Speakers	Papers for Discussion
9/7/2012	Jeffrey Edberg, PhD & Chander Raman, PhD	JE - Karsten et al, 2012 CR - Sherlock et al, 2012
9/14/2012	Maria Danila, MD and Laura Hughes, MD	MD - Hand et al, 2012 LH - Wu et al, 2012
9/21/2012	**No Journal Club**	
9/28/2012	Rob Lowe, MD, PhD and Alexander Szalai, PhD	AS - Rosetti et al, 2012 RL - Wang et al, 2012 RL - Corse et al, 2012
10/5/2012	Randy Cron, MD, PhD and Angelo Gaffo, M.D.	AG - Podubbnyy et al, 2012 RC - Yeremenko et al, 2012
10/12/2012	Richard Reynolds, PhD and Harry Schroeder, MD PHD	RR - Forster et al, 2012 HWS - Berkowska et al, 2012
10/19/2012	**No Journal Club**	
10/26/2012	Winn Chatham, MD and Andrew Gibson, PhD	AG - Chuang et al, 2011 WC - Domizio et al, 2012
11/2/2012	Sarah Morgan, MD and Peter Weiser, MD (Rheum-CMBD joint meeting)	SM - Avenell et al, 2012 PW - Nakazawa et al, 2012
11/9/2011	**No Journal Club - ACR Conference**	
11/16/2012	Matthew Stoll, MD, PhD. and Tong Zhou, MD	MS - Norsdtrom et al, 2012 TZ - Chan et al, 2012
11/23/2012	**No Journal Club - Thanksgiving Holiday**	

11/30/2012	John Mountz, MD, PhD and Hui-Chen Hsu, PhD	HCH - Ravishankar et al, 2012 JDM - Getts et al, 2012
12/7/2012	Yanming Xing, M	YX - Mavragani et al, 2012
12/14/2012	**No Journal Club**	
12/21/2012	**No Journal Club - Christmas Weekend**	
12/28/2012	**No Journal Club- New Year Weekend**	
1/4/2013	Xinrui Li, PhD. and Hubert Tse, PhD	XL - Jeelall et al, 2012 HT - Strollo et al, 2012
1/11/2013	Paul Mendoza MD and Jasvinder Singh, MD	PM - Dougados et al, 2013 JS - van Vollenhoven et al, 2012
1/18/2012	**No Journal Club**	
1/25/2013	Melissa Mannion, MD and Barri Fessler, MD	MM - De Benedetti et al, 2012 BF - Mackie et al, 2012
2/1/2013	Iris Navarro-Milan, MD and Chander Raman, PhD	INM - Krickaert et al, 2012 CR - Diana et al, 2013
2/6/2013	Rane McLaughlin, MD and Alex Szalai, PhD	AS - Schorn et al, 2012 RM - Higgins et al, 2013
2/15/2013	**No Journal Club**	
2/22/2013	Archana Jain, MD and S. Louis Bridges, Jr, MD, PhD	AJ - Weinblatt et al, 2013 LB - Eyre et al, 2013
3/1/2013	Jeffrey Curtis, MD and Philip Berry, MD (*CMBD Speaker*)	JC - Wasko et al, 2013 PB - Waring et al, 2012
3/8/2013	Timothy Beukelman, MD and Larry Bradley, PhD	TB - Oddis et al, 2013 LB - Finan et al, 2013

3/15/2013	No Journal Club	
3/22/2013	Xiaoli Li, PhD and Martin Trojanowski, MD	MT - Schneeberger et al, 2012 XL - Sieger et al, 2013
3/29/2013	Peter Weiser, MD and Angelo Gaffo, MD	AG - Steiger et a;, 2013 PW - McCarthy et al, 2013
4/5/2013	Henry Townsend, MD and David Splading, MD	DS - Giannoukakis et al, 2011 KS - Krishman et al, 2013
4/12/2013	Laura Hughes, MD and Troy Randall, PhD	TR - Sathaliyawala et al, 2013 LH - Nakagomi et al, 2013
4/19/2013	***Note Special Presentation:*** **Peter K. Gregersen, MD** Director, Robert S. Boas Center for Genomics and Human Genetics The Feinstein Institute for Medical Research Manhasset, New York	**Title:** Phospho-flow studies in rheumatoid arthritis
4/26/2013	Amro Elbalkhi, MD and Tong Zhou, MD	AE - Wager et al, 2013 TZ - Nie et al, 2013
5/3/2013	No Journal Club - AAI meeting	
5/10/2013	Robb Lowe, MD, PhD and Jeffrey Edberg, PhD	RL - Ohkura et al, 2012 RL - Delgoffe et al, 2012 RL - Ohkura et al, 2013 JE - Wu et al, 2013 JE - Kleinewietfeld et al, 2013

5/17/2013	No Journal Club	
5/24/2013	Matthew Stoll, MD, PhD and Jason Ashley, PhD	MS - Koeth et al, 2013 MS - Koeth et al, Supplemental Info JA - Binder et al, 2013
5/31/2013	Andrew Gibson, PhD and Randy Cron, MD, PhD	RC - Dvergsten et al, 2013 AG - Espeli et al, 2012
6/7/2013	Winn Chatham, MD and Maria Danila, MD	WC - Haroche et al, 2012 (a) WC - Haroche et al, 2012 (b) MD - Kerkman et al, 2013
6/14/2013	Chuanyi Ji, PhD and Richard Reynolds, PhD	RR - Barra et al, 2013 CJ - Darrah et al, 2013
6/21/2013	No Journal Club	
6/28/2013	No Journal Club	

Rheumatology Journal Club & Special Topics 2013-14

Meetings will be held **12:00 -1:00 p.m.** in the **Shelby Building, Room 105**

Date	Speakers	Papers for Discussion or Title of Special Topic
9/6/2013	Chander Raman, PhD and Alexander Szalai, PhD	CR - De Weerd et al, 2013 AS - Wang et al, 2013
9/13/2013	Peter Weiser, MD and Jeffrey Edberg, PhD	JE - Rudnicka et al, 2013 PW - Melet et al, 2013
9/20/2013	***Special Topics*** *- S. Lou Bridges, Jr., MD, Ph.D.*	Getting Your First Job

9/27/2013	Angelo Gaffo, MD, and Randall Cron, MD, PhD	RC - Chellapandian et al, 2013 AG - Miloslavsky et al, 2013 AG - Specks et al, 2013
10/4/2013	Xinrui Li, PhD and S. Louis Bridges, Jr, MD, PhD	LB - Qiao et al, 2013 XL - Abdollahi-Roodsaz et al, 2013
10/11/2013	John Mountz, MD, PhD and Hui-Chen Hsu, PhD	HH - Pau et al, 2013 JM - Nakaya et al, 2013 JM - Ramirez-Ortiz et al, 2013
10/18/2013	***Special topics:*** *Barri Fessler, MD*	Demystifying the ACR meeting for first time attendees
10/25/2013	**No Journal Club - ACR Conference**	
11/1/2013	Robert Lowe, MD, PhD and Sarah L. Morgan, MD (Rheum-CMBD joint meeting)	SLM - Heijboer et al, 2012 RL - Hedrich et al, 2012
11/8/2013	Matthew Stoll, MD, PhD	MS - Baeten et al, 2013
11/15/2013	***No meeting***	
11/22/2013	Richard Reynolds, PhD	RR - Frisell et al, 2013
11/29/2013	**No Journal Club - Thanksgiving Holiday**	
12/6/2013	Maria Danila, MDS and Laura Hughes, MD	MD - Negi et al, 2013 LH - Lindhardsen et al, 2013
12/13/2013	Laurence Bradley, PhD and Winn Chatham, MD	LB - Skou et al, 2013 WC - Pereira-Lopes et al, 2013
12/20/2013	**No Journal Club - Christmas Weekend**	
12/27/2013	**No Journal Club- New Year Weekend**	
1/3/2014	**No Journal Club**	
1/10/2014	Jenny Lin, MD and Jasvinder Singh, MD	JL - Anthony et al, 2013 JAS - Katz et al, 2013
1/17/2014	***Special Topics*** - William Koopman, MD	Faculty Development and Mentoring

1/24/2014	Melissa Mannion, MD and Barri Fessler, MD	BF - Chu et al, 2013 BF - Schiopu et al, 2013 MM - Weiss et al, 2014
1/31/2014	Cancelled - Snow storm	
2/7/2014	Ray McLaughlin, MD and Andre Ballesteros-Tato, PhD	RM - O'Dell et al, 2013 ABT - Hamel et al, 2014
2/14/2014	***Special Topics - TBA***	
2/21/2014	Archana Jain, MD and Jeffrey Curtis, MD	AJ - Gartner et al, 2013 JC - Burmester et al, 2014 JC - Daugados et al, 2014
2/28/2014	Xena Whittier, MD and Troy Randall, PhD	XW - Werner et al, 2013 TR - Yang et al, 2014
3/7/2014	**Joint Rheumatology/CMBD Meeting** Iris Navarro-Millan, MD and Hubert Tse, PhD	INM - Kristensen et al, 2014 HT - Eneljung et al, 2013
3/14/2014	Jeffrey Edberg, PhD and Angelo Gaffo, MD	JE - Gregersen et al, 2014 JE - Fairfax et al, 2014 JE - Lee et al, 2014 AG - Devauchelle-Pensec et al, 2014
3/21/2014	**Special Topics**	
3/28/2014	Hui-Chen Hsu, PhD and John Mountz, MD, PhD	HCH - Byrne et al, 2013 JM - Ravishankar et al, 2013
4/4/2014	**Joint Rheumatology/CMBD Meeting** *Michael Lewiecki, MD, Director New Mexico Clinical Research and Osteoporosis Center* **Special Seminar**	New and Emerging Treatments for Osteoporosis
4/11/2014	Peter Weiser, MD and Jun Li, MD, PhD	PW - Kavanaugh et al, 2014 JL - Weber et al, 2013
4/18/2014	**Special Topics**	

4/25/2014	Matthew Stoll, MD, PhD and Winn Chatham, MD	MS - Scher et al, 2013 WC - Rossi et al, 2013
5/2/2014	**No Journal Club - AAI Meeting**	
5/9/2014	Alexander Szalai, PhD and Mohamad Hassan, PhD	AS - Findlay et al, 2013 MH - Kawane et al, 2014
5/16/2014	**Special Topics**	
5/23/2014	Marcin Trojanowski, MD and S. Louis Bridges, Jr, MD, PhD	LB - Towfique Raj et al, 2014 MT - van Bon et al, 2014
5/30/2014	Richard Reynolds, PhD and Kenneth Saag, MD	KS - McClung et al, 2014 RR - Kratzer et al, 2014
6/13/2014	Xinrui Li, PhD and Randall Q. Cron, MD, PhD	RC - Hejblum et al, 2014 RC - Riviere et al, 2014 RC - Fardet et al, 2014 XL - Schauer et al, 2014
6/20/2014	Have a great Summer! See you back in September	

Rheumatology Journal Club & Special Topics 2014-15

Meetings will be held **12:00 -1:00 p.m.** in the **Shelby Building, Room 105**

Date	Speakers	Papers for Discussion or Title of Special Topic
8/15/2014	***Special Topics:*** S. Louis Bridges, MD, PhD	Demystifying the Grant Review Process
9/5/2014	Chander Raman, PhD and S. Louis Bridges, MD, PhD	CR - Hou et al, 2014 CR - Rubtsova et al, 2013 SLB - Wright et al, 2014
9/12/2014	Matthew Stoll, MD, PhD and Jasvinder Singh, MD	MS - Osborne et al, 2014 MS - Chhabra et al, 2014 JAS - Lee et al, 2014
9/19/2014	***Special Topics***	
9/26/2014	Cancelled	
10/3/2014	Michael Fuller, PhD and Peter Weiser, MD	MF - Kuehn et al, 2014 MF - Rieux-Laucat et al, 2014 PW - Liu et al, 2014
10/10/2014	Troy Randall, PhD and Andrew Gibson, PhD	TR - Le Coz et al, 2013 AG - Funabiki et al, 2014
10/17/2014	***Special topics:*** Erin D. Snyder, MD	How to Give a Lecture in an Academic Setting
10/31/2014	Kenneth Saag, MD and Jeffrey Curtis, MD	KS - Mease et al, 2014 JC - Genovese et al, 2014
11/7/2014	Robert Lowe, MD and Sarah L. Morgan, MD (Rheum-CMBD joint meeting)	RL - Cribbs et al, 2014 SLM - Schwartz et al, 2014
11/14/2014	Ulus Atasoy, MD University of Missouri School of Medicine	Posttranscriptional gene regulation: sometimes small fish are more important than big ones

11/21/2014	***No Special Topics Meeting***	
11/28/2014	***No Journal Club - Thanksgiving Holiday***	
12/5/2014	Hui-Chen Hsu, PhD and John Mountz, MD, PhD	Rowland et al, 2014 Sisirak et al, 2014
12/12/2014	Jenny Lin, MD and Alexander Szalai, PhD	JL - Frauenfelder et al, 2014 AS - Guo et al, 2014
12/19/2014	***No Journal Club-No Special Topics - Holiday***	
12/26/2014	***No Journal Club - Holiday***	
1/2/2015	***No Journal Club- Holiday***	
1/9/2015	Maria Danila, MD and Yang Yang, PhD	MD - Emery et al, 2015 YY - Krevvata et al, 2014
1/16/2015	***Special Topics:*** Melissa O. McBrayer, Program Director, CCTS, UAB	CCTS Opportunities
1/23/2015	Melissa Mannion, MD and Angelo Gaffo, MD	AG - Guillevin et al, 2014 MM - Eng et al, 2014
1/30/2015	Xinrui Li, PhD and Marcin Trojanowski, MD	XL - Clatworthy et al, 2014 MT - van Laar et al, 2014
2/6/2015	Andre Ballesteros, PhD	AB - Choi et al, 2014
2/13/2015	***Special Topics***	
2/20/2015	Iris Navarro-Millan, MD and Xena Whittier, MD	INM - Myasoedova et al, 2015 XW - Liu et al, 2015
2/27/2015	Laura Hughes, MD and Richard Reynolds, PhD	LH - Marks et al, 2015 RR - Fahr et al, 2015
3/5/2015	Elizabeth Kitchin, MS, RD and Chander Raman, PhD	EK - Byberg et al, 2015 CR - Berod et all, 2014
3/13/2015	Andrew Gibson, Ph.D. & W. Winn Chatham, MD	AG - Belot et al, 2013 WC - Jenkins et al, 2015

3/20/2015	No seminar	
3/27/2015	Matthew Stoll, MD, PhD & Jasvinder Singh, MD	MS - Arvonen et al, 2015 MS - ACR Abstract, 2014 JAS - Haschka et al, 2015
4/3/2015	Peter Weiser, MD & Troy Randall, PhD	PW - Pontarini et al, 2015
4/10/2015	Randall Cron, MD, PhD & Michael Fuller, PhD	RC - Spessott et al, 2015 MF - Pauken et al, 2015
4/17/2015	***Special Topics:*** Karen Caton, Personnel Generalist, Rheumatology Cancelled - Will be re-scheduled	Faculty Tenure and Promotion Process
4/24/2015	Matthew Mullen, MD & Alexander Szalai, PhD	MM - Gottenberg et al, 2014 AS - Kim et al, 2015
5/1/2015	Robert Lowe, MD, PhD & Mohammad Hassan, DVM, PhD	MH - Krzeszinski et al, 2015 RL - Robinson et al, 2002
5/8/2015	*AAI Meeting - No Journal Club*	
5/15/2015	Susan L. Bellis, PhD Professor, Cell, Developmental and Integrative Biology	Novel Strategies for Enhancing the Regenerative Potential of Bone Graft Materials This seminar will be in Shelby 1015
5/22/2015	Jeffrey Curtis, MD & S. Louis Bridges, Jr, MD, PhD	
5/29/2015	John Mountz, MD, PhD & Hui-Chen Hsu, PhD	
6/5/2015	Randall Beyl, MD, & Tracy Hwangpo, MD, PhD	
6/12/2015	Jun Li, MD, PhD & Xiaoli Li, PhD	
6/19/2015	*No Journal Club - Summer Break*	
6/26/2015	*No Journal Club - Summer Break*	

APPENDIX G

UAB Mentoring Resources

G1. UAB Mentoring White Paper

G2. Individual Development Plan Resources

G3. Annual Evaluation Forms and Exit Forms for Predoctoral and Postdoctoral Trainees

G4. UAB Mentoring Academy

UAB Mentoring White Paper

Mary-Ann Bjornsti , Ph.D.
Pamela Burks, Ed.D.
Jeffrey A. Engler, Ph.D.
William Koopman, M.D.
Jean Ann Linney, Ph.D.
Patrick McNees, Ph.D.
Claire Peel, Ph.D.
Peter Smith, Ph.D.
Timothy Wick, Ph.D.
Audrey S. Wrenn, M.A.Ed.
Karen Meneses PhD, RN, Chair

A special thanks to Ned Hook MD

A special recognition of the contributions of Dale J. Benos PhD.

Executive Summary

The Mentoring Panel was established in 2009 by the Center for Clinical and Translational Science (CCTS) and the Council for Translational Research (CTR) to examine the state of mentoring activities within UAB and to make recommendations regarding future mentoring activities at UAB.

The Mentoring Panel completed the following:

- Compiled a listing of existing mentoring programs and activities within UAB Schools, Colleges, Departments, and Centers;
- Developed and refined a definition of mentoring suitable for UAB;
- Developed a survey of mentoring activities at UAB to assess current activities and needs of faculty, staff and students. A preliminary version of the mentoring survey was presented to the Council of Deans in May 2010.
- Developed the UAB Mentoring White Paper. Provided periodic updates of the Mentoring Panel activities to the Council for Translational Research (CTR).

In April 2011, Dr. Meneses sent a copy of the Mentoring White Paper and Mentoring Programs to the CTR for review and critique. In May 2011, Dr. Guay-Woodford presented the final version of the Mentoring Panel White Paper and the UAB Mentoring Programs to the Council of Deans. In June and August 2011, Drs. Guay-Woodford and Meneses met with Vice-Provost Suzanne Austin to discuss the Mentoring White Paper and recommendations.

Recommendations of the Mentoring Panel

Based on information cited in the White Paper and the knowledge and expertise of panel members, we submit the following recommendations to the Provost and the Council of Deans:

1. That all UAB colleges and schools have mentoring programs that serve faculty at all ranks and in tenure earning, non-tenure earning and tenured positions.
2. That UAB adopt a decentralized, "*federated*"model wherein mentoring activities and resources are linked but not necessarily managed centrally. In this model, each college/school, department, and/or center can determine its mentoring plan and activities.
3. That mentoring activities have a "central home" within the university that may include a repository of mentoring information and resources, mentoring education, and training activities. A university-wide strategic plan for mentoring would be developed by the Council of Deans.
4. Additional recommendations include:
    - Increased visibility of mentoring best practices from within the university.
    - An increase in the number and recognition of awards for mentoring.
    - Supplemental support (at the university, department, and/or college/school level for mentees to work with mentors.
    - Incorporation of specific language in the UAB Faculty Handbook and college/school handbooks stating that effective mentoring is valued at UAB and that mentoring quality is an important consideration in senior-level promotion and tenure decisions.
    - Consideration that funding allocation formulas at the institutional level incorporate faculty mentoring activity metrics as an additional criterion.

Introduction

Mentoring is commonly acknowledged as helpful in personal and career development [1-4]. It is widely practiced across the University of Alabama at Birmingham (UAB) campus in different ways with different emphases. Mentoring appears to mean different things to different people. Therefore, catalyzed by the Center for Clinical and Translational Science (CCTS), we have convened a mentoring panel work group to consider ways to enhance and improve professional mentoring at UAB.

Mentoring is *defined as* a committed, long-term association between one or more experienced individuals (mentors) and another, less experienced, individual (mentee) in which the mentor(s) provides guidance, support and feedback to aid the protégé in professional development. Successful mentoring relationships focus on conceptualization, delineation and attainment of both professional (short and long term) and personal goals including efforts to overcome barriers to success [5]. Mentors aid in developing and refining goals, developing strategies to attain goals, and developing alternative approaches when necessary. Mentors serve as role models, teachers, counselors, problem solvers and guides.

Mentoring is critically important early in one's career and at times when a person's responsibilities or duties change or increase [6-8]. Mentoring includes personal feedback, extended interactions, frank bi-directional dialogue, and provision of social and emotional support. Effective mentoring is fluid over time in response to the evolving goals, needs and abilities of the mentee. The nature of the mentor/mentee relationship evolves over time and may include recruiting new mentors in response to new goals, accomplishments and challenges. A strong and effective mentoring relationship is beneficial not only to the mentee, but also to the mentee's academic unit, the mentor, and to the university as a whole.

The Benefits of Mentoring

What do Mentees Gain?

Mentees benefit from mentoring relationships by gaining critical skills necessary for personal and career growth. Mentees gain a supportive, nonjudgmental environment where one can be open without fear of repercussions; acquisition of and improved knowledge, skills and attitudes; practical resources and tools, shortcuts and strategies normally learned by years of trial and error, and advice regarding professional responsibilities and professional priorities [9].

Mentees have opportunities to observe and interact with successful experts, network and develop new collaborations, and receive career planning and career development advice. They increase their network as they interact with mentors and other mentees as a result of being introduced at meetings, and/or promotion as a speaker. They receive advocacy from colleagues, more predictable professional development, personalized feedback and encouragement, and an overall accelerated pace of career advancement. Mentees are also encouraged to develop a balance between personal and professional needs. As a result of these benefits, mentees can experience a reduced level of anxiety related to advancement and promotion.

What do Mentors Gain?

Mentors play an important role in mentees' research training and experiences. Yet, mentoring is also beneficial to the mentor. Through mentoring, mentors expand their peer group and future collaborations, gain new technical knowledge and skills, and expand their professional presence and notoriety as mentees advance professionally. Mentors indirectly pay back their own mentors for help received, increase their professional network, pass on years of experience, and demonstrate their ability to recognize and develop talent. Mentors gain satisfaction from contributing to the professional growth and development of capable individuals, fresh enthusiasm for their own careers [10] and recognition from senior leadership in the organization.

What do Organizations Gain?

Organizations also benefit from mentoring by providing a sense of a valued contribution to the broad academic community [7, 11, 12]. Organizations gain from positive and beneficial collaboration among colleagues, a professional opportunity that can be promoted during faculty/staff recruitment, increased productivity from mentors and mentees, and a "pipeline" of successful trainees and faculty. Within a mentoring environment, organizations have an increased commitment of participants to the organization, develop future leaders, and reduce turnover among mid and upper level faculty, leading to an increased return on investment.

Mentoring Metrics

There are many ways to consider appropriate metrics for mentoring efforts. At perhaps the most general level, metrics should minimally assist in answering questions regarding: (a) whether operationally described mentoring expectations, processes and practices exist; (b) the extent to which these processes and practices actually occur, and; (c) when followed, the extent to which the mentoring experience results in expected benefits for the mentee, mentor and UAB as an organization. Continuous examination and consideration of such feedback should allow for ongoing refinement of mentoring processes and incremental improvement in outcomes.

Common to Mentor and Mentee

Relevant measures common to the mentor and mentee include:

(1) Evidence of a formal process for designating mentoring relationships, a mentoring contract or other mechanism reflecting mutual expectations.
(2) Frequency and latency of regularly scheduled meetings between mentor and mentee.
(3) Frequency of *ad hoc* or incidental meetings.
(4) Indications of bi-directional communication.
(5) Satisfaction

The Mentee

In addition to the aforementioned measures, metrics for mentees might address:

(1) Scholarly production
(2) Success in teaching and service
(3) Intramural funding
(4) Extramural funding
(5) Indicators of career advancement
(6) Extent of campus-wide interdisciplinary integration (such as project/publication interdisciplinary author mix or expanding nodes and connectors from social network analysis)
(7) Increased job/life satisfaction

The Mentor

In addition to those measures common to both mentors and mentees, metrics for mentors might include:

(1) Evidence of increasing the mentees exposure and/or promotion with colleagues, other UAB departments and schools and external groups.
(2) Evidence of increasing involvement of mentors in projects or working with teams that are beyond their normal scope.
(3) Mentoring awards
(4) Travel awards
(5) Awards to the mentee (e.g., Young investigator award)

The Organization (UAB)

While additional institutional measures will likely emerge over time, currently several indicators deserve consideration:

(1) Changes in the institutional mentorship "climate" as measured by institution-wide survey assessments.
(2) Greater employee job satisfaction
(3) Employment and retention patterns
(4) Improved administration satisfaction
(5) Increased scholarly production and extramural funding for mentor-mentee dyads as compared to faculty who are not mentors or mentees.
(6) Indications of national or international recognition for mentoring

Recognition of Mentoring

Importance

Evidence implicating effective mentoring as a determinant of faculty/student satisfaction, career development, and subsequent career success argues that mentoring is an important cultural factor in facilitating attainment of the institution's goals; namely, excellence in teaching, research, and service [11]. It is therefore logical for the institution and its constituent components to promote excellence in mentoring as a desirable goal. Critical in this regard is the need for increasing recognition of quality mentoring at all levels (e.g., students, trainees, faculty, staff). Fortunately, the University (and its components) have available numerous means for raising the visibility of mentoring achievements/activities and thereby fostering a culture that embraces the importance of mentoring as a major ingredient in the achievement of overall excellence.

Mechanisms

As implied above, strategies for raising the visibility and emphasizing the desirability of quality mentoring will require a concerted effort involving the institution as a whole, as well as its components (e.g. schools, programs), to affirmatively recognize individual(and collective) meritorious mentoring endeavors. Potential mechanisms might include (but not be limited to) the following:

A. Incorporation of mentoring excellence as a parameter to be positively considered in promotion and tenure decisions.
B. Inclusion of mentoring activity/effectiveness as a factor in allocation of resources. Such a policy would be consistent with existing incorporation of research and teaching functions as parameters influencing allocation decisions.
C. Creation of awards/recognitions for meritorious mentoring achievements (individual or programmatic). These might be patterned along existing recognitions for teaching and service excellence. It should be noted in this regard that some such awards are in place (e.g., Charles Barkley Award for Mentoring Excellence, Graduate Dean's Awards for Excellence in Mentoring), but there is clearly need for more such awards at all levels of the institution.
D. Use of various institutional media vehicles for recognition and communication of mentoring accomplishments or best practices (be they individual or programmatic).

The Mentor-Mentee Relationship

It is essential that the mentee and the mentor clarify and agree upon the goals and expectations at the outset of the relationship to ensure a successful mentoring partnership. This can be achieved through the use of a mentoring contract or compact between mentor and mentee. Using an Individual Development Plan, mentees should delineate their short (1 year) and long term (3-5 years) career goals, the challenges to achieving these goals, and how the accomplishment of each goal will be assessed. By taking the initiative and

formulating a clearly defined set of goals, the mentee helps to facilitate a relationship in which the mentor is able to provide insight and guidance that is focused on the mentee's goals. Because successful mentoring relationships are bi-directional, the mentor and mentee should be willing to engage in reciprocal and on-going feedback. Trust must also exist between mentor and mentee for the mentoring relationship to flourish [13].

It is recommended that the mentor and mentee meet at least 2-3 times per year. An updated CV and Individual Development Plan should be reviewed at least twice each year. Formal mentor-mentee meetings should be structured to provide sufficient time to focus on immediate issues as well as current and long term goals. A portfolio should be maintained in which the goals discussed and the action items arising each meeting are recorded.

Both the mentor and the mentee should recognize that the nature of the mentor/mentee relationship will evolve over time. As the mentee transitions from a formal mentoring relationship to an informal mentoring or peer relationship with his/her mentor, it is important that the mentor and mentee discuss and plan the process by which the relationship will move forward.

Examples of Mentoring Tools at UAB

1. *UAB ADVANCE Faculty Mentoring Guidelines:* The mentoring program in the UAB ADVANCE schools (School of Engineering and College of Arts and Sciences) functions to provide support to young faculty members for enhancing their professional advancement and for retaining these faculty members at UAB. The handbook presents guidelines for mentors and mentees, tips on mentor-mentee interactions, potential mentoring pitfalls, responsibilities of departmental chair and enhancing the success of the mentoring program.
2. *Postdoctoral Scholar and Graduate Student Professional Development Plans:* Professional development plans are used annually to define both the short term (up-coming year) and career goals, and to review progress toward these goals during the past year. Professional developments plans are discussed with and approved by the by the faculty mentor. The UAB Office of Postdoctoral Education's Professional Development Plan can be found at: http://postdocs-uab.infomedia.com/personal_development_plan.pdf

3. *AAMC Compacts for Graduate Students, Postdoctoral Associates, and Residents:* The American Association of Medical Colleges (AAMC) Group on Graduate Research, Education, and Training has produced the following documents:
    1. Compact between Biomedical Graduate Students and their Research Advisors http://www.aamc.org/research/gradcompact/start.htm
    2. Compact between Postdoctoral Appointees and Their Mentors http://www.aamc.org/research/postdoccompact/start.htm
    3. Compact between Resident Physicians and Their Teachers http://www.aamc.org/meded/residentcompact/start.htm

Each compact is intended to serve as a model document that can be adapted by individual institutions for use by mentors and mentees to foster open communication and clarify expectations.

4. *UAB Center of Clinical and Translational Science (CCTS) Mentoring Contract:* The mentoring contract is an agreement between the mentee and his/her mentor(s). Both the mentee and mentor complete the form individually and then jointly review and discuss each person's responses in order to reach an agreement. Upon reaching an agreement, the mentee writes the agreed upon answers prior to the contract being signed by both parties. In contrast to personal development plans that focus on the mentee, the mentoring contract focuses on both the mentee and mentor and defines their expectations, thereby strengthening and enhancing the mentoring relationship. This contract has been

adopted for the use by the CCTS KL2 Program, the CCTS TL1 Program, and the School of Medicine's Scholarly Activity for medical students. The mentoring contract can be found at: http://www.ccts.uab.edu/pages/uploadfiles/MentorContractV2.doc

Concluding Notes

The Mentoring Panel believes that having a high quality and comprehensive mentoring program available for all faculty is an important initiative for faculty retention and success of the university. In the current economic environment, there is concern that highly skilled faculty are leaving UAB for other universities that offer more supportive work environments.

As of October 2011, the Mentoring Panel completed its review of mentoring activities at UAB and provided the deliverables requested by the CCTS and the CTR. The Mentoring Panel wishes to thank Audrey Wrenn for her expert support and communication throughout the process. The Mentoring Panel also wishes to thanks the CCTS and CTR for convening the Panel and further recommends that a **Mentoring Panel II** be considered and convened for the next level of new and exciting adventures based on a federated mentoring model.

The retiring members of the Panel as of Oct 2011: Mary-Ann Bjornsti, Ph.D., William Koopman, M.D., Jean Ann Linney, Ph.D., Patrick McNees, Ph.D., Karen Meneses Ph.D., Peter Smith, Ph.D.

The members of the Panel who wish to be considered for Mentoring Panel II: Pamela Burks, Ed.D. , Jeffrey A. Engler, Ph.D. , Claire Peel, Ph.D. , Timothy Wick, Ph.D.

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G2. Individual Development Plan (IDP) Resources

Individual Development Plans (IDPs)

Information for Faculty about Individual Development Plans (IDPs)

Background

In July, 2013, NIH issued a notice (NOT-OD-13-093) to encourage institutions to develop IDPs for their graduate students and postdoctoral fellows. Their rationale was "It is important to assist graduate students and postdoctoral researchers to achieve their career goals and become contributing members of the biomedical research workforce." In August, 2014, NIH issued a revised notice (NOT-OD-14-113), describing a process for monitoring compliance with this directive by PIs on research and other grants.

NIH Requirements

NIH progress reports using the Research Performance Progress Report (RPPR) must include a report on the use of IDPs in Section B. Accomplishments, Question B.4. Actual IDPs should not be included. Instead, grantees will report on whether they use IDPs for all the graduate students and postdoctoral researchers included in Section D. list of Participants. The use of IDPs as well as the manner in which IDPs are used is expected to be determined by the awardee institution, but the RPPR will include a brief description of how and whether IDPs are used to help manage the career development of students and postdocs associated with that award. A similar response is required for all T, F, K, R25, R13, D43 and other awards or award components designed to provide training and professional development opportunities for graduate students and postdoctoral researchers.

Reminder, the RPPR is currently required for all type 5 progress reports submitted using a Streamlined Non-Competing Award Process (SNAP), and will be required for all non-SNAP progress reports submitted on/after October 17, 2014 (see NOT-OD-13-035 and NOT-OD-14-092). - See more at: http://grants.nih.gov/grants/guide/notice-files/NOT-OD-14-113.html#sthash.1Liduk0u.dpuf

UAB IDP Process

The Graduate School, working with the GBS theme directors, the MSTP, and the Office of Postdoctoral Education, has organized training sessions for graduate students, postdocs and other trainees to begin an IDP, using the MyIDP website (https://myidp.sciencecareers.org). Over the past two months, we have held several IDP training sessions for graduate students and postdocs. Theme and program directors are responsible for assuring and documenting IDP instruction and participation. Evidence of IDP use includes documented attendance at IDP training sessions or provision of a screenshot of a myIDP *Summary Personal Information* page. As of October 1, 2014, most new and current GBS students and about 30% of current postdoctoral fellows have attended one of these training sessions and/or have started an IDP; IDP training will be incorporated into all future trainee orientations, beginning in Oct. 2014. Individual programs may have requirements for additional IDP training activities and/or IDP inclusion in student committee meetings. Dr. Jeffrey Engler, Interim Dean of the Graduate School, is keeping a list of those students who have attended a training session, in case NIH decides to audit our compliance.

Trainees' reaction to these IDP sessions has generally been favorable. In the sessions, we have encouraged the trainees to revisit their IDP plans every 3 to 6 months. We have also encouraged them to share their IDP with their mentors, their committee members, the theme directors, and anyone else who could help them develop the skills and knowledge needed to achieve their career goals.

Values Assessment

Rate **how important it is to you** that your future career path matches each of the following values, where:
1 = Unimportant
5 = Essential

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Help Society:**contribute to betterment of world
○1 ○2 ○3 ○4 ○5	**Help Others:**be involved with directly helping individuals or small groups
○1 ○2 ○3 ○4 ○5	**People Contact:**have day-to-day contact with clients or colleagues
○1 ○2 ○3 ○4 ○5	**Teamwork:**work in collaboration with others as part of a team
○1 ○2 ○3 ○4 ○5	**Friendships:**Develop close personal relationships with people at work

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Congenial Atmosphere:**work with friendly colleagues
○1 ○2 ○3 ○4 ○5	**Competition:**engage in activities that test my abilities/achievements against others' abilities/achievements
○1 ○2 ○3 ○4 ○5	**Make Decisions:**have authority to decide courses of action, policies, etc.
○1 ○2 ○3 ○4 ○5	**Fast Pace:**work in a busy atmosphere with frequent deadlines
○1 ○2 ○3 ○4 ○5	**Supervision:**be directly responsible for work done by others

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Influence People:**be in a position to change attitudes or opinions of other people
○1 ○2 ○3 ○4 ○5	**Work Alone:**work on projects by myself, with little contact with others
○1 ○2 ○3 ○4 ○5	**Independence:**work with little direction from others
○1 ○2 ○3 ○4 ○5	**Intellectual Challenge:**perform work that is intellectually stimulating
○1 ○2 ○3 ○4 ○5	**Work on Frontiers of Knowledge:**engage in the pursuit of knowledge or generating new ideas

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Expert Status:**be acknowledged as an expert in a given field
○1 ○2 ○3 ○4 ○5	**Creativity:**originate and develop new ideas
○1 ○2 ○3 ○4 ○5	**Aesthetics:**appreciate the beauty of things and ideas that I work with
○1 ○2 ○3 ○4 ○5	**Predictability:**have job duties that are similar day-to-day
○1 ○2 ○3 ○4 ○5	**Variety:**have job duties that change frequently

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Job Security:**be assured of keeping my job and salary
○1 ○2 ○3 ○4 ○5	**Benefits Available:**have health, retirement, tuition reimbursements, etc.
○1 ○2 ○3 ○4 ○5	**Recognition:**be recognized or appreciated for the quality of my work
○1 ○2 ○3 ○4 ○5	**Risk Taking:**have work duties that involve trying new things, despite the chance that negative outcomes could result
○1 ○2 ○3 ○4 ○5	**Earning Potential:**have a salary which allows me to purchase essentials as well as some luxuries of life

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Location:**live in a place which is conducive to my lifestyle
○1 ○2 ○3 ○4 ○5	**Physically Challenging:**have a job that requires high physical demands
○1 ○2 ○3 ○4 ○5	**Not Physically Challenging:**have a job that does not require high physical demands
○1 ○2 ○3 ○4 ○5	**Flexible Schedule:**have some choice over the hours or days that I work
○1 ○2 ○3 ○4 ○5	**Status and Prestige:**work in a position or organization which carries respect with my friends, family or colleagues

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Professional Development:**have a job with opportunities for growth or promotions
○1 ○2 ○3 ○4 ○5	**Job Tranquility:**work in a low pressure environment
○1 ○2 ○3 ○4 ○5	**Work/Life Balance:**balance time spent at work and time spent doing other activities
○1 ○2 ○3 ○4 ○5	**Family Friendly:**have a job with policies supportive of families, including day care, flexible work schedules, etc.
○1 ○2 ○3 ○4 ○5	**Exercise Competence:**take advantage of my strongest talents and skills on a regular basis

1 = Unimportant | 5 = Essential

○1 ○2 ○3 ○4 ○5	**Learn New Things:**be challenged to learn new skills or knowledge on a regular basis
○1 ○2 ○3 ○4 ○5	**High Demand:**develop a desirable knowledge base or skill set to facilitate finding my next job

Save | Save & Move to Next Step

...

UAB's Support of IDPs

"UAB provides all trainees with information about the benefits of individual development plans for their desired career outcomes. Training sessions for new and continuing trainees are provided throughout the year, including an introduction to the myIDP website. UAB provides many options by which trainees can receive advice about career planning, including a full-time staff person dedicated to both pre- and post-doctoral trainee advising in the UAB Career Services Office (Jami Armbrester) and bimonthly drop-in IDP consultations sponsored by the UAB CCTS."

After this text, each PI should describe his/her own mentoring and training activities. For example, have you participated in the Faculty Mentoring Academies or other activities provided by UAB or other institutions (University of Minnesota, University of Wisconsin-Madison)? What conversations have you had with your trainees on your grants and to what activities have you directed them to build their skill sets for their chosen career paths?

Faculty Resources

- UAB: Every April there is a Faculty Mentoring Academy at which mentoring and career planning are featured topics
- UAB CCTS sponsors biannual mentoring workshops.
- University of Minnesota: http://www.ctsi.umn.edu/education-and-training/mentoring/mentor-training
- University of Wisconsin-Madison: https://mentoringresources.ictr.wisc.edu
- Stanford Bioscience: http://biosciences.stanford.edu/current/idp/faqsforfaculty.html

Student, Postdoc and Trainee Resources

- UAB Office of Postdoctoral Education - http://www.uab.edu/postdocs/.
- UAB Postdoctoral Scholar Personal Development Plan - http://www.uab.edu/postdocs/images/Downloads/personal_development_plan.pdf
- Participate in Graduate School- and OPE-sponsored professional skills and career workshop events
- Attend bi-monthly "walk-in" clinics sponsored by the CCTS
- Meet as desired with the Associate Director *Graduate and Postdoctoral Services* Career & Professional Development Office – Jami Armbrester JamiA@uab.edu , SHEL 171
- UAB Graduate School Professional Development Program – courses in writing, presentation, grant and fellowship preparation – http://www.uab.edu/graduate/professional-development-courses.
- CIRTL@UAB: develop teaching skills; 3 levels of certificates to document skills – www.uab.edu/cirtl.
- Graduate Careers Awareness and Trends (GCAT) - http://www.uab.edu/gcat.
- Office of Postdoctoral & Visiting Scholar Affairs UC San Diego - http://postdoc.ucsd.edu/idp/index.html.
- Science Careers Content Collection: myIDP - http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2013_05_14/caredit.a1300100
- Defining the Dual Role of Graduate Students and Postdocs Supported by Research Grants - http://nexus.od.nih.gov/all/2014/10/10/defining-the-dual-role-of-graduate-students-and-postdocs-supported-by-research-grants/.

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UAB GRADUATE SCHOOL

INDIVIDUAL DEVELOPMENT PLAN (IDP) WORKSHOPS

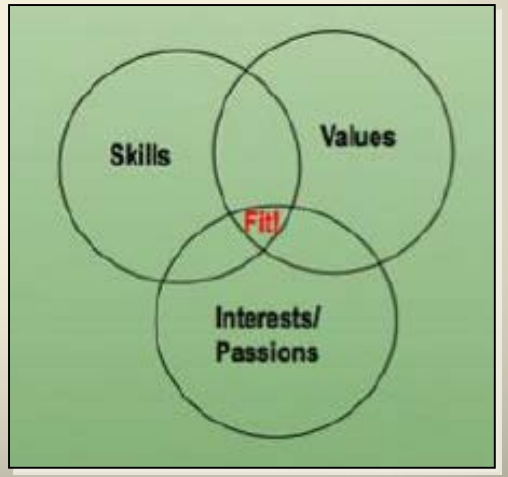
THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

UAB GRADUATE SCHOOL
Individual Development Plan (IDP) Workshop

Individual Development Plan (IDP)

- A career planning process designed to help individuals identify career goals and develop a plan for meeting those goals
  - assessment of one's skills, values, and interests
  - exploration of career opportunities and best fit
  - development of realistic goals to prepare for that career

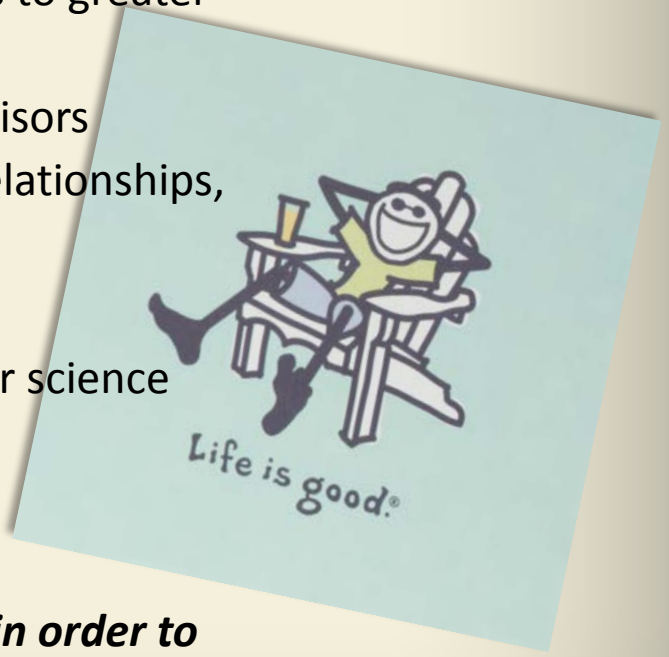
- An instrument to facilitate discussion between trainee and mentor
  - Research project
  - Expectations
  - Plan to obtain, improve skills
  - Short and long-term career goals



UAB Graduate School
Individual Development Plan (IDP) Workshop

Studies demonstrate:

- Goal setting enhances performance and career outcomes.
- More likely to achieve goals with a specific plan.
- Planning and pursuit of career-specific goals leads to greater career success – salary, promotions, satisfaction
- Trainees with development plans shared with advisors
  - more publications, more productive advisor relationships, greater training satisfaction

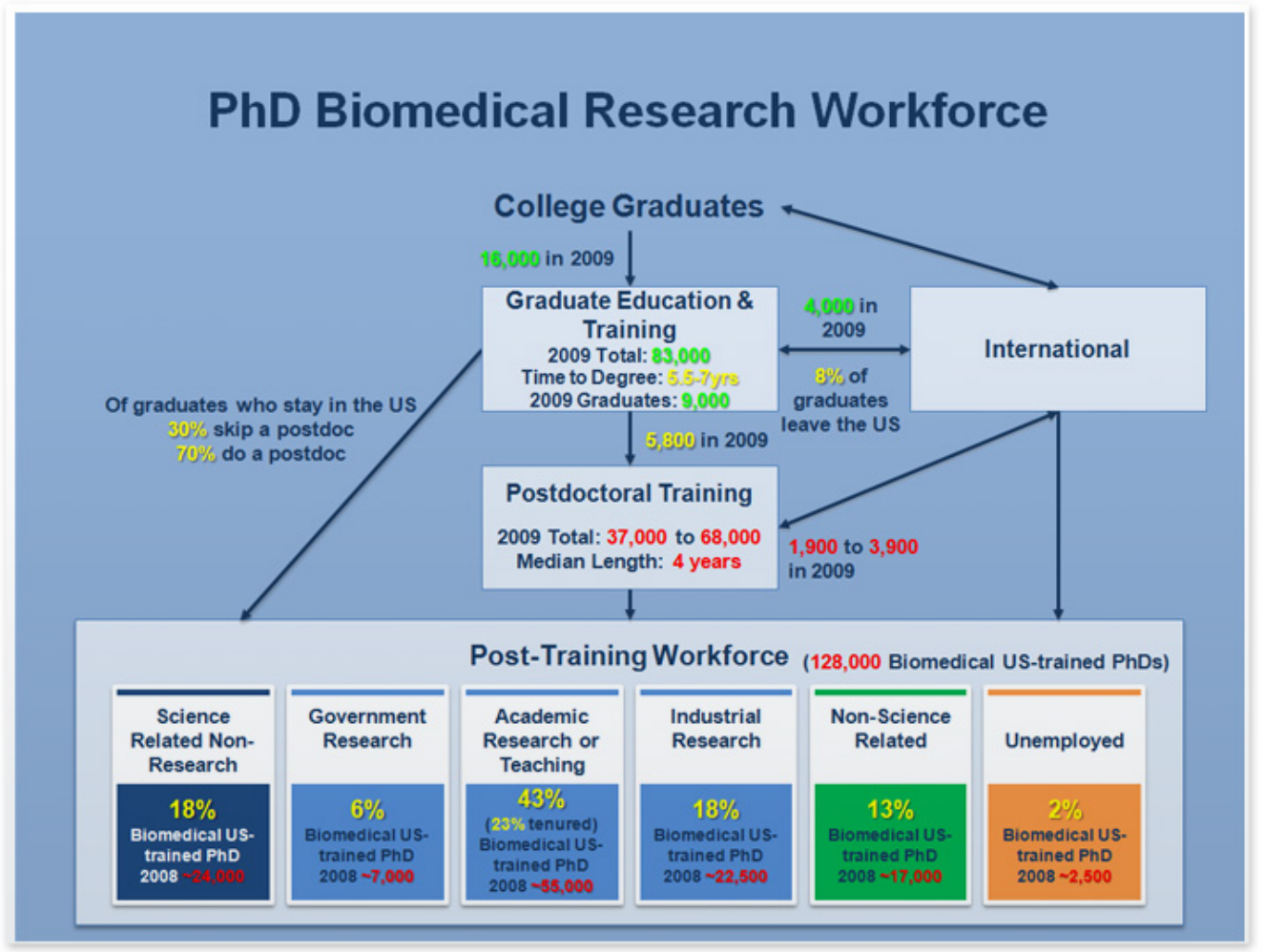


NIH says:

- Academic research positions are decreasing; other science career areas are expanding.
- Trainees should be exposed to breadth of career opportunities.
- ***Provide IDP training process as of October 2014 in order to continue NIH funding!*** *(NIH NOT-OD-13-093)*

UAB Graduate School

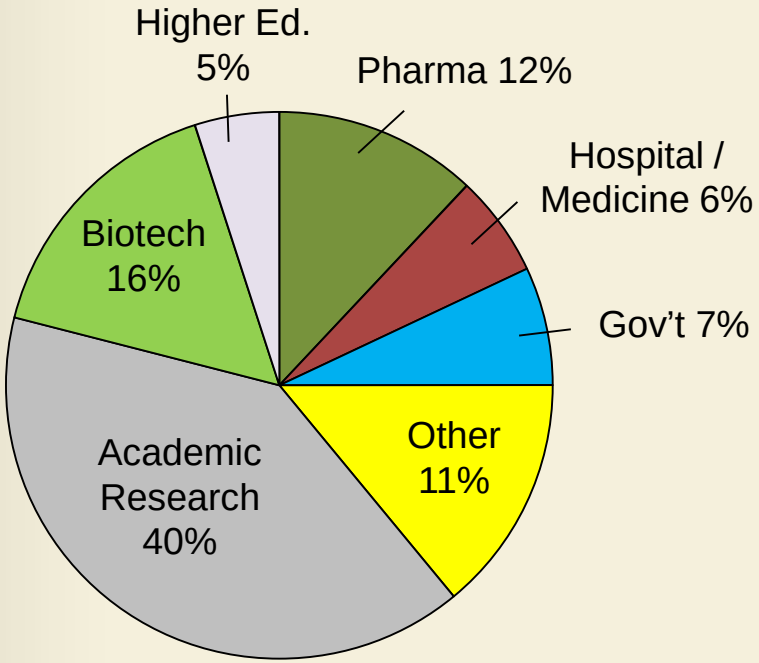
Individual Development Plan (IDP) Workshop



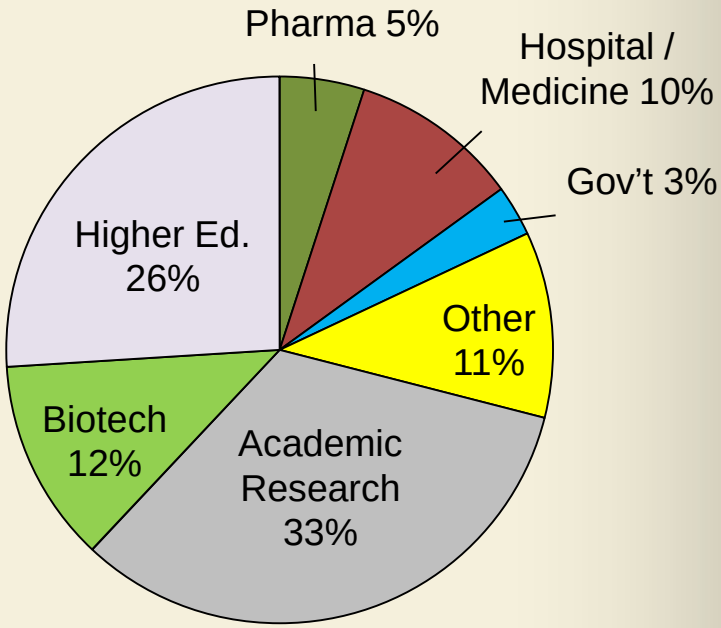
NIH Biomedical Research Workforce Report, 2012

UAB Graduate School
Individual Development Plan (IDP) Workshop

UAB Graduate Student Alumni



UAB Postdoctoral Alumni



UAB Graduate School

Individual Development Plan (IDP) Workshop

my IDP INDIVIDUAL DEVELOPMENT PLAN Science Careers

LOG ON | CONTACT US | ABOUT myIDP | ABOUT *Science* Careers

AAAS

You have put a lot of time and effort into pursuing your PhD degree. Now it's time to focus on how to leverage your expertise into a satisfying and productive career. An individual development plan (IDP) helps you explore career possibilities and set goals to follow the career path that fits you best.

myIDP provides:

- Exercises to help you examine your skills, interests, and values
- A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests
- A tool for setting strategic goals for the coming year, with optional reminders to keep you on track
- Articles and resources to guide you through the process

There is no charge to use this site and we encourage you to return as often as you wish. To learn more about the value of IDPs for scientists, read the first article in our myIDP series.

Click below to get started.

First Time Here? Returning User

Authored by:
Cynthia N. Fuhrmann, Ph.D. (UCSF)
Bill Lindstaedt, M.S. (UCSF)
Jennifer A. Hobin, Ph.D. (FASEB)
Philip S. Clifford, Ph.D. (MCW)

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advancing the life sciences 1912-2012 FASEB Federation of American Societies for Experimental Biology

myIDP http://myidp.sciencecareers.org/

THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

For Graduate Students in Social Sciences and Humanities

Some questions that may be addressed at the beginning of a mentoring relationship:

- What type of assistance does the mentee want from the mentor?
- What expectations do the mentor(s) have for the mentee?
- What expectations does the mentee have for the mentor(s)?
- How often will you meet?
- When, where, and how long will you meet?
- Who will be responsible for scheduling the meetings?
- Who will create meeting agendas and topics to discuss?
- What will be the ground rules for discussion? (e.g. confidentiality, candor, openness)
- Are there concerns and reservations for either the mentor or the mentee?

Resources for IDPs

Self Assessments

- http://postdocs.usc.edu/files/2012/10/FINAL-Humanities-Cover-Self-Assessment-Form-20123-10-19-121.pdf
- http://postdocs.usc.edu/files/2012/10/FINAL-Social-Sciences-Cover-Self-Assessment-Form-20123-10-16-121.pdf

IDP forms

- http://postdocs.usc.edu/files/2012/10/FINAL-Humanities-IDP-Form-20123-10-19-12.pdf
- http://postdocs.usc.edu/files/2012/10/FINAL-Social-Sciences-IDP-Form-20123-10-16-12.pdf

UAB Graduate School
Individual Development Plan (IDP) Workshop

Next Steps in the IDP process

- Submit *myIDP Personal Information Form* or otherwise verify initiation of IDP to Theme for UAB compliance records – **October 1 2014 deadline**
- Continue to complete myIDP and periodically update (at least annually)
- Provide and discuss myIDP summary(s) with mentor, theme and/or committee as recommended
- Participate in Graduate School- and OPE-sponsored professional skills and career workshop events
- Attend Bi-monthly "walk-in" clinics sponsored by the CCTS
- Meet as desired with the Associate Director

  Graduate and Postdoctoral Services

  Career & Professional Development Office –

  Jami Armbrester JamiA@uab.edu , SHEL 171

UAB Graduate School

Career Development Activities

- UAB Graduate School Professional Development Program – courses in writing, presentation, grant and fellowship preparation – http://www.uab.edu/graduate/professional-development-courses.
- CIRTL@UAB: develop teaching skills; 3 levels of certificates to document skills – www.uab.edu/cirtl.
- Graduate Careers Awareness and Trends (GCAT) - http://www.uab.edu/gcat/.

CIRTL@UAB
Center for the Integration of Research, Teaching, and Learning
University of Alabama at Birmingham

UAB Graduate School
Individual Development Plan (IDP) Workshop

Next Steps in the IDP process

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- Meet as desired with the Associate Director

  Graduate and Postdoctoral Services

  Career & Professional Development Office –

  Jami Armbrester JamiA@uab.edu , SHEL 171

G3. Annual Evaluation Forms for Predoctoral and Postdoctoral Trainees

Predoctoral Research and Career Progress: Annual Review

Name: _____Review Date: _____

Department: _____

Advisor: _____

(Advisor's Signature)

Part 1. Progress Review: Research and Professional Training in the Past Year

1. Brief overview of your research project and major accomplishments in the past year (one half page should be sufficient):

2. Courses Taken

3. Graduate Committee Meeting Summary. Please state if admitted to PhD candidacy

4. Publications:

5. Honors/Awards (include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.):

6. National or other professional meetings attended (indicate meeting title, oral or poster presentation):

7. Workshops attended:

8. New areas of research or technical expertise acquired in past year:

9. Teaching activity:
    a. Oversight of undergraduate or summer student (name, academic level, project title):
    b. Course lectures (department, course name) or lab sections(section title, supervised/unsupervised):

10. Committee or other service activity (indicate if you held an office):

11. Other professional activities not identified above:

12. Other activities (community, etc) with professional relevance:

Part 2. Plans for the Up-coming year:

Research and other training plans:

1. Research project goals (brief paragraph):

2. Anticipated publications (indicate projected titles):

3. Anticipated meeting or workshop attendance:

4. Fellowship or other funding applications planned (indicate name of award):

5. Other professional training (course work, teaching activity):

Career Goals:

1. Current career goal(s):
   a)

   b)

2. When do you anticipate beginning a search for a postdoctoral fellowship opportunity?

Additional information required by NIH

1. Please mark all the answers that are correct for you:

   Hispanic or Latino:

   Not Hispanic or Latino:

   American Indian/Alaska Native:

   Asian:

   Native Hawaiian or Other Pacific Islander:

   Black or African American:

   White:

   Disability:

   Disadvantaged Background:

2. If you were involved in the development of any of the types of products below, describe next to the respective product how it will be available to be shared with the research community.

   Audio or video products:

   Data and research material (e.g., cell lines, DNA probes, animal models):

   Databases:

   Instruments or equipment:

   New scientific protocols:

   Software or NetWare:

Postdoctoral Annual Evaluation Forms

Postdoctoral Research and Career Progress: Annual Review

Name: _____Review Date: _____

Department: _____

Advisor: _____

(Advisor's Signature)

Part 1. Progress Review: Research and Professional Training in the Past Year

1. Brief overview of your research project and major accomplishments in the past year (one half page should be sufficient):

2. Course Taken

3. Publications:

4. Patents:

5. Honors/Awards (include fellowships with entire funding periods, grants written/applied for/received, professional society presentation awards or travel awards, etc.):

6. National or other professional meetings attended (indicate meeting title, oral or poster presentation):

7. Workshops attended:

8. Seminar Presentations (title, department):

9. New areas of research or technical expertise acquired in past year:

10. Teaching activity:

10.1. Oversight of graduate, undergraduate or summer student (name, academic level, project title):

10.2. Course lectures (department, course name) or lab sections(section title, supervised/unsupervised):

11. Clinical activity:

12. Committee or other service activity (indicate if you held an office):

13. Other professional activities not identified above:

14. Other activities (community, etc) with professional relevance:

Part 2. Plans for the Up-coming year:

Research and other training plans:

1. Research project goals (brief paragraph):

2. Anticipated publications (indicate projected titles):

3. Anticipated meeting or workshop attendance:

4. Fellowship or other funding applications planned (indicate name of award):

5. Other professional training (course work, teaching activity):

Career Goals:

1. Current career goal(s):
   a)

   b)

2. What further research activity or other training is needed before it is appropriate to start a job search?

3. When do you anticipate beginning a job search?

4. Please indicate if there are other issues that affect your job search (an international trainee with an assured position in home country):

Additional information required by NIH

1. Please mark all the answers that are correct for you:

   Hispanic or Latino:

   Not Hispanic or Latino:

   American Indian/Alaska Native:

   Asian:

   Native Hawaiian or Other Pacific Islander:

   Black or African American:

   White:

   Disability:

   Disadvantaged Background:

2. If you were involved in the development of any of the types of products below, describe next to the respective product how it will be available to be shared with the research community.

   Audio or video products:

   Data and research material (e.g., cell lines, DNA probes, animal models):

   Databases:

   Instruments or equipment:

   New scientific protocols:

   Software or NetWare:

Trainee Exit Interview

Trainee Name:

Mentor:

Dates of T32 support:

Graduate or Postdoctoral Trainee:

Degree earned:

Summary of the project carried out with the Immunology T32 support:

Publications in press or submitted, while supported by the T32 (Please make sure to cite the T32 support in each paper published). Please provide full reference:

Evaluation of the extra value provided to your training by the T32 support (strengths and weaknesses; give personal examples):

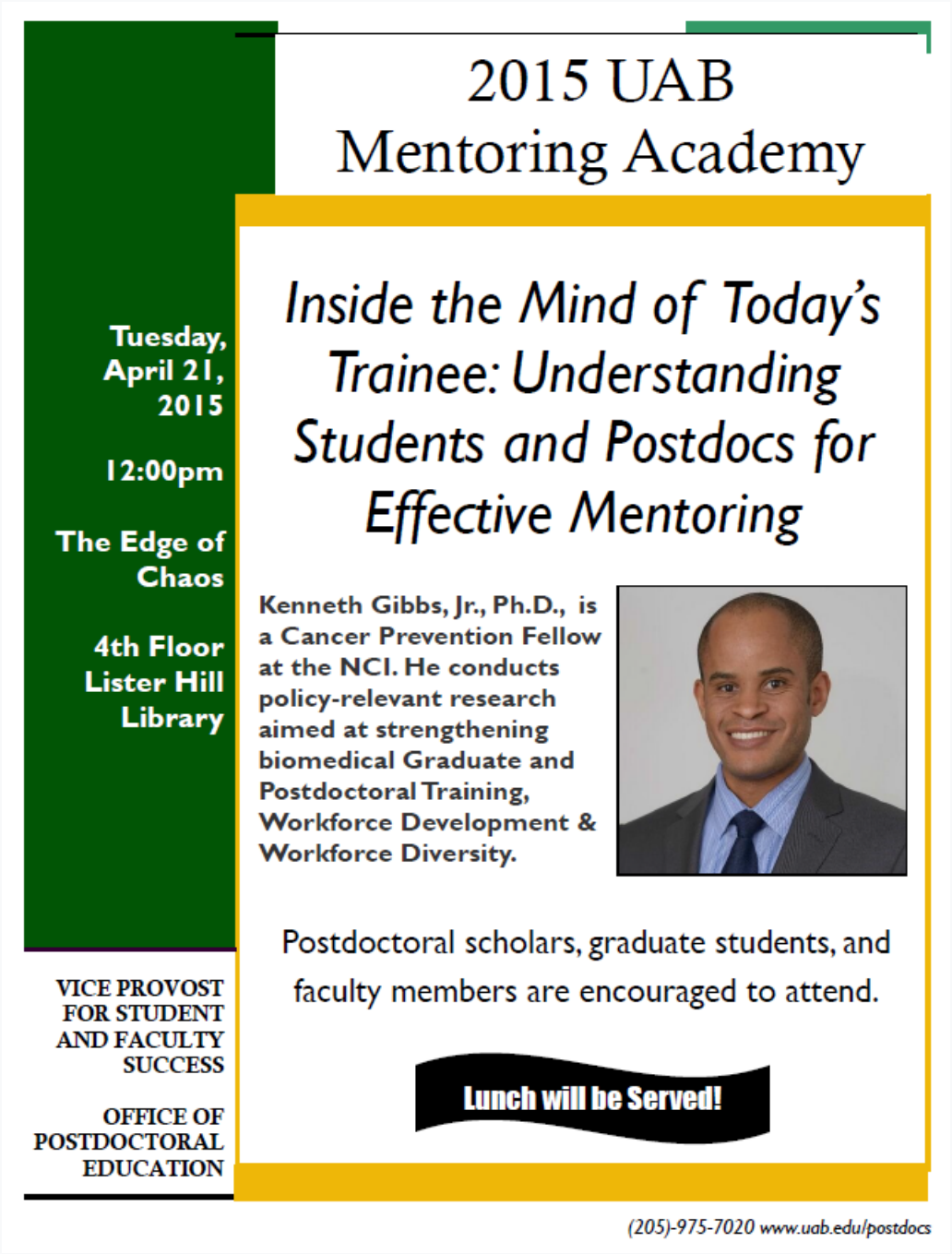
- Program in Immunology seminar series
- MIC 741 – Professional Development class
- Opportunities to present your studies
- Opportunities to learn how to apply for research funding
- Opportunities to meet UAB and outside UAB researchers active in your research area

Post Award Information:

- Current Position: Please provide current address, telephone number and email.
    - Academic Position (If you already have a position, please state the relative percentage of time expected to be dedicated to research/teaching/administration/other, provide the name of the institution and contact information)
    - Non-academic position: (If you already have a position, please state the relative percentage of time expected to be dedicated to research/teaching/administration/other, provide the name of the institution and contact information)
    - Other:

Additional comments:

2015 UAB Mentoring Academy




UAB Mentoring Week – 2015
Cultivation
An Interactive Theater performance on Faculty Mentorship
Topics:
Accessibility/Boundaries
Communicating Critical Feedback
Guiding Student Research
Favoritism/Unconscious Bias
Wednesday, April 22nd
12pm – 2pm BBRB 170
Sponsored by the UAB
Office of Postdoctoral Education
Theater Delta

For more information or to register, please email **Lisa Schwiebert, Ph.D.**

Annual UAB Mentoring Academy

Thursday, April 17th, 2014

Double Tree Hotel Centennial Room One

Morning Session: 'Mentoring Baseline' **(9am – 12pm)**

- Welcome - Dr. Suzanne Austin, Vice Provost for Student & Faculty Success and Dr. Lisa Schwiebert, Assoc. Dean for Postdoctoral Education

- Getting to Know Your Table-Mates – Dr. Kellie Carter
  Tools and approaches

- What is Good Mentoring? - Dr. Julia Austin
  Elements of good mentoring

- Setting Goals and Expectations for Mentees - Dr. Philip Clifford
  Case Study: *"Trust and Respect"*

- Communicate, Communicate, Communicate - Dr. Lisa Schwiebert
  Case Study: *"Projects"*

~~~ *Lunch Break* (12pm – 1pm) ~~~

Afternoon Session: 'Mentoring Challenges' **(1pm – 4pm)**

1. Identifying and Resolving Challenges – Dr. Jeff Engler
   Case Studies: *"Diversity I, Diversity II"*

2. Facilitator Panel Discussion and Wrap Up – Dr. David Rogers

Facilitators:

- Dr. Julia Austin, Director, Professional Development Program, UAB
- Dr. Kellie Carter, Instructor, The Graduate School, UAB
- Dr. David Chaplin, Associate Dean, School of Medicine, UAB
- Dr. Philip Clifford, Associate Dean, University of Illinois at Chicago
- Dr. Jeff Engler, Associate Dean, The Graduate School, UAB
- Dr. Louis Justement, Assoc. Director, MSTP, UAB
- Dr. David Rogers, Sr. Associate Dean, School of Medicine, UAB
- Dr. Lisa Schwiebert, Associate Dean, Office of Postdoctoral Ed., UAB

SUMMARY STATEMENT

PROGRAM CONTACT:
Su-Yau Mao
301-594-5032
maos2@mail.nih.gov

(Privileged Communication) ***Release Date:*** **12/08/2015**

Application Number: **1 T32 AR069516-01**

Principal Investigator

BRIDGES, S LOUIS MD, PHD

Applicant Organization: UNIVERSITY OF ALABAMA AT BIRMINGHAM

Review Group: **ZAR1 YL (M1)**
National Institute of Arthritis and Musculoskeletal and Skin Diseases Special Emphasis Panel
Training Grants Review

Meeting Date: **11/04/2015** ***RFA/PA:*** **PA14-015**
Council: **JAN 2016** ***PCC:*** **1 C**
Requested Start: **04/01/2016**

Project Title: **Training Program in Rheumatic and Musculoskeletal Diseases Research**

SRG Action: **Impact Score: 10**
Next Steps: **Visit http://grants.nih.gov/grants/next_steps.htm**
Human Subjects: **10-No human subjects involved**
Animal Subjects: **10-No live vertebrate animals involved for competing appl.**

Project Year	Direct Costs Requested	Estimated Total Cost
1		
2		
3		
4		
5		
TOTAL		

ADMINISTRATIVE BUDGET NOTE: The budget shown is the requested budget and has not been adjusted to reflect any recommendations made by reviewers. If an award is planned, the costs will be calculated by Institute grants management staff based on the recommendations outlined below in the COMMITTEE BUDGET RECOMMENDATIONS section.

1T32AR069516-01 Bridges, S

Year	1	2	3	4	5
Pre/Postdoctoral (Requested)	2/2	2/2	3/3	3/3	3/3
Pre/Postdoctoral (Recommended)	2/2	2/2	3/3	3/3	3/3

RESUME AND SUMMARY OF DISCUSSION: This is a new T32 training grant application from the University of Alabama at Birmingham. The program is designed to train both predoctoral students and postdoctoral fellows in the research of rheumatic and musculoskeletal diseases. The program director is Dr. S. Louis Bridges, Jr, who is a known leader in rheumatology field, well-funded and with a strong mentoring and training record. The training faculty includes many strong, well-funded investigators with broad expertise as well as junior mentors in training. The training program is well-designed with a good balance of basic and clinical research. The training environment is exceptional with many established research programs, numerous core facilities and excellent support from the institution. The trainee pool is sufficiently large and with good qualifications. The past training record of the participating faculty is outstanding. In summary, the proposed training program has numerous strengths with very minor, easily addressable weaknesses. The committee is extremely enthusiastic about the application and concludes it will be a high value program.

DESCRIPTION (provided by applicant): The UAB Training Program in Rheumatic and Musculoskeletal Disease Research (Director: S. L. Bridges, Jr.) builds on established strengths in adult and pediatric rheumatology, immunology, musculoskeletal medicine, and clinical/translational investigation. To provide a vibrant and effective interdisciplinary training environment, this program brings together the Divisions of Clinical Immunology and Rheumatology and Pediatric Rheumatology, the Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center (CAMBAC), and the Center for Outcomes and Effectiveness Research and Education (COERE). These units enable an integrated, interwoven fabric of collaborative science, which ranges from fundamental molecular discovery to applied clinical and translational research. This training program also builds on trans-departmental initiatives in autoimmunity and inflammation, genetics, and state of the art translational clinical and outcomes research. It incorporates an established faculty committed to training in the rheumatic diseases. There is also the explicit effort to incorporate young faculty to further strengthen the outstanding mentoring environment and to promote development of all phases of this program. An effective interdisciplinary training program requires faculty with collaborative and synergistic scientific interests and projects, as well as systematic coordination of training opportunities. The collaborative environment at UAB, embodied by the centers, programs, and departments in this application, provides a strong research foundation. The committed training environment of the thematically organized Graduate Biomedical Sciences program and an outstanding Office of Postdoctoral Education, provide an ideal setting for the implementation of training in interdisciplinary rheumatic and musculoskeletal disease research. Required coursework will be incorporated into the individual development plan (IDP) of each trainee, which will be augmented by a broad interdisciplinary enrichment program. Leadership will be provided by an Executive Committee and the overall performance of the Program will be evaluated by the Research Training Program Internal Advisory Committee and by an External Advisory Committee. To provide rigorous and timely feedback to both trainees and mentors, formal assessment of the Research Training Program will be performed. A series of benchmarks for progress will be formulated for each trainee and mentor and reviewed on a semi-annual basis. The members of the UAB training faculty are fully committed to continuing to provide mentorship, support, and guidance to young investigators to help them develop the tools and skills necessary to advance the diagnosis, treatment, and prevention of rheumatic and musculoskeletal diseases.

PUBLIC HEALTH RELEVANCE: This Training Program in Rheumatic and Musculoskeletal Disease Research at UAB enables vibrant, interdisciplinary, fundamental and translational research training. There is a large, diverse faculty with interests centered on Bone, Cartilage, Muscle and Connective Tissue; Epidemiology, Outcomes and Prevention; Experimental Therapeutics and Biomarkers; Genetics and Functional Genomics; Immunology, Autoimmunity and Inflammation; and Neurobehavioral Medicine. The training faculty, resources, and environment provide an exceptionally strong mentoring environment to train the next generation of rheumatic and musculoskeletal disease researchers.

CRITIQUE 1:

Training Program and Environment:
Training Program Director/Principal Investigator (PD/PI):
Preceptors/Mentors:
Trainees:
Training Record:

Overall Impact: This is a new application for a pre-and post-doctoral training grant in rheumatic and musculoskeletal diseases. The application requests 2 pre-doctoral and 2 post-doctoral slots initially in year 1, increasing to 3+3 thereafter. A prior training grant in rheumatic diseases was in place at UAB from 1981-2012, and the scientific scope of the training program has been expanded for the current application. There are numerous strengths in this application, including many experienced and well-funded mentors, a good balance between laboratory-based and clinical research, several center and program grants, numerous core facilities, appropriate didactic coursework, detailed mentoring plans, successful recruitment of a diverse pool of trainees, and a very capable PI. Weaknesses are very few and do not significantly reduce enthusiasm for this proposal.

1. Training Program and Environment:

Strengths

- Excellent balance of clinical and basic research
- Well-funded research programs, including both individual and program/center grants (including P30, P50 and P60 awards from the NIAMS)
- Numerous biomedical core facilities and a CTSA with core facilities for clinical research
- Strong institutional commitment to both pre-doctoral and post-doctoral training

Weaknesses

- None noted

2. Training Program Director/Principal Investigator (PD/PI):

Strengths

- The PI is Dr. Bridges, who is Chief of the Division of Rheumatology and Clinical Immunology. He is an institutional and national leader in rheumatology, with experience and productivity in basic, translational and clinical research, mainly in RA. He has a strong training and mentoring record, and is an ideal leader for this training program.

Weaknesses

- None noted

3. Preceptors/Mentors:

Strengths

- Many strong investigators are listed as mentors, spanning the areas of rheumatology (adult and pediatric), immunology, musculoskeletal biology and other fields.
- Mentors in this program have national/international standing in their fields and are well-funded.
- Junior faculty are included as mentors-in-training.
- Collaborating faculty are included as “content experts”.

Weaknesses

- There are too many mentors in this training program.

4. Trainees:

Strengths

- Sufficient numbers of trainees and applicants are documented in the various component units of this training program, with generally good qualifications/background.

Weaknesses

- It is hard to gauge the research interest and potential of the MDs applying to the rheumatology and pediatric rheumatology fellowship programs.

5. Training Record:

Strengths

- Many past trainees of the various mentors have gone on to productive academic positions.
- Even without a training grant for the past few years, the UAB rheumatology faculty have been able to train at least a few MDs for research careers, using mechanisms such as F32 awards; at least one of these trainees now has a K23.

Weaknesses

- None noted

Recruitment and Retention Plan to Enhance Diversity:

Acceptable

- There is a solid institutional commitment and a good track record

Training in the Responsible Conduct of Research:

Acceptable

Comments on Format (Required):

- Details are provided and are appropriate

Comments on Subject Matter (Required):

- Comprehensive

Comments on Faculty Participation (Required):

- Appropriate

Comments on Duration (Required):

- Suitable

Comments on Frequency (Required):

- Suitable

Budget and Period of Support:

Recommend as Requested

CRITIQUE 2:

Training Program and Environment:
Training Program Director/Principal Investigator (PD/PI):
Preceptors/Mentors:
Trainees:
Training Record:

Overall Impact: This is an exceptionally well designed training program which picks back up from a previously long standing T32 (1981 – 2012). The takes good advantage of an outstanding training environment with a Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity Center, a strong division of Clinical Immunology and Rehumatology, and outstanding Division of Pediatric Rheumatology, the Center for Outcomes and Effectiveness Research and Education, an MCRC, a CERT, and a CORT. The program is well designed with integrating didactics, IDPs, formalized mentoring teams, and outstanding individual research opportunities. The PD and associate PDs are outstanding as are the program faculty. There is a large and strong trainee pool. The evaluation plan is well laid out with specific metrics and a clear process.

1. Training Program and Environment:

Strengths

- Clearly laid out administrative structure
- Formal Mentoring teams with Core Mentor, Content Mentor, and Mentors in Training
- Programs take good advantage of resources including CAMBAC, COERE, UCEM, MCRC.
- A well designed formal evaluation plan
- Extremely good funding environment with arthritis focused P30, P50, and P60 grants.
- A formal office of Post-doctoral Education
- Formal efforts to train Junior Faculty in Research Mentoring
- Well designed and comprehensive training program
- Good institutional support

Weaknesses

- None noted

2. Training Program Director/Principal Investigator (PD/PI):

Strengths

- Drs. Bridges and Saag are extremely accomplished, well-funded with outstanding mentoring experience.

Weaknesses

- None noted

3. Preceptors/Mentors

Strengths

- Well-structured with Core(33), Content (51), and Mentors in Training(11)
- Broad thematic groups are well represented.
- Well-Funded

Weaknesses

- None noted

4. Trainees:

Strengths

- Large and strong Candidate Pool

Weaknesses

- None Noted

5. Training Record:

Strengths

- Very good record for trainees of participating Mentors.

Weaknesses

- None Noted

Recruitment and Retention Plan to Enhance Diversity:

Acceptable

Training in the Responsible Conduct of Research:

Acceptable

Comments on Format (Required):

- Acceptable

Comments on Subject Matter (Required):

- Acceptable

Comments on Faculty Participation (Required):

- Acceptable

Comments on Duration (Required):

- Acceptable

Comments on Frequency (Required):

- Acceptable

Budget and Period of Support:

Recommend as Requested

CRITIQUE 3:

Training Program and Environment:
Training Program Director/Principal Investigator (PD/PI):
Preceptors/Mentors:
Trainees:
Training Record:

Overall Impact: Very strong proposal. The PI is outstanding and he has assembled a very strong group of mentors. Additionally, it should be noted that the PI is the Director of CAMBAC, which is a highly integrated center for Comprehensive Arthritis, Musculoskeletal, Bone, and Autoimmunity diseases. From a structural perspective, the PI has established both an internal and external advisory board. Nice incorporation of the UAB CTSA. As a minor comment, it appears as though all of the required elements are in place, and the T32 Evaluation Matrix was an excellent addition that made it simple to understand the different levels of evaluation. Strong faculty and the inclusion of members such as Marcas Bamman provides a real nice touch and strengths the skeletal muscle component significantly.

THE FOLLOWING SECTIONS WERE PREPARED BY THE SCIENTIFIC REVIEW OFFICER TO SUMMARIZE THE OUTCOME OF DISCUSSIONS OF THE REVIEW COMMITTEE, OR REVIEWERS' WRITTEN CRITIQUES, ON THE FOLLOWING ISSUES:

RECRUITMENT AND RETENTION PLAN TO ENHANCE DIVERSITY: ACCEPTABLE

TRAINING IN THE RESPONSIBLE CONDUCT OF RESEARCH: ACCEPTABLE

COMMITTEE BUDGET RECOMMENDATIONS: The budget was recommended as requested. (2 predoctoral students and 2 postdoctoral fellows per year for the first two years and 3 predoctoral students and 3 postdoctoral fellows per year for the next three years)

or calculated into the overall impact score. Some applications also receive a percentile ranking. For details on the review process, see http://grants.nih.gov/grants/peer_review_process.htm#scoring.