GRADUATE BIOMEDICAL SCIENCES

CANCER BIOLOGY THEME

Supplement to the
GRADUATE and GBS STUDENT HANDBOOK
2015-2016

Note: This information is supplemental to the material presented in the *Office of Graduate Biomedical Sciences 2015-2016 Student Handbook*. Please refer the GBS Handbook for detailed information on resources, programs and policies common to all GBS Themes.

CANCER BIOLOGY THEME

Theme Co-Director:	Theresa Strong, Ph.D. WTI 510H 205 975-9878 tvstrong@uab.edu
Theme Co-Director:	Lalita Shevde-Samant, Ph.D. WTI 320D 205-975-6261 lsamant@uab.edu
Theme Administrator:	Patricia Matthews SHEL 120 205-934-7034 pm1@uab.edu
Website:	http://www.uab.edu/cancerbio

Important Dates August 2015 - June 2016

Classes:	GBS 707 / August 11-September 21
	GBS 708 / September 22 –November 2
	GBS 709 / November 3 – December 18
	GBS 710 / January 4-February 1
	GBS 720 / February 2-29
	GBS 774 / March 1-28
	GBS 753 / March 29-April 25
	GBS 770 / May 2-30
Rotations:	August 24-November 18 / Poster Session November 18, 1-3pm
	November 19-March 1 / Poster Session March 2, 1-3pm
	March 2-May 26 / Poster Session May 26, 1-3pm
Holidays:	September 7
UAB Closed	November 26 and 27
	December 19 (after class ends) – January 3
	January 18
	May 30
Theme Seminar	September 2
11am-12:15pm	October 7
(every 1st Wed.)	November 4
SHEL 105	December 2
	January 6
	February 3
	March 2
	April 6
	May 4
	June 1

CANCER BIOLOGY CURRICULUM

The Cancer Biology Theme curriculum is designed to give students a broad understanding of the diverse research areas that comprise cancer research. Advanced classes and other opportunities are geared to the student's specific cancer-related interests.

Year 1

First year students will follow a structured schedule designed to provide a broad base of knowledge for advanced studies. Concurrent with the first year of course work, each student will perform three laboratory research rotations (~8 weeks each) with mentors of his/her choosing in any of the GBS themes. At the end of each rotation, the students will present their research in the form of a poster.

First year students will also attend the Cancer Biology Journal Club on Fridays at 2PM in the Wallace Tumor Institute, Room 101, but will not be required to register or present. Starting in the second year, students will be required to register for a journal club each semester.

First Year Student Schedule - Fall Semester

		Title	Credit Hrs	Course Master	Days	Time	Dates
GBS	707	Basic Biochem/Metabolism	2	Ballinger, S Landar, A	. MTWRF..	08:00 - 10:00	Aug 11-Sept 21
GBS	708	Basic Genetics/Mole BIo	2	Giles, K Schneider, D	. MTWRF.	08:00 - 10:00	Sept 22-Nov 2
GBS	709	Basic Bio Organization	2	Sztul, E	. MTWRF.	08:00 - 10:00	Nov 3-Dec 19
GBS	795	Lab Rotation 1	1		. MTWRF .	00:00 - 00:00	Aug 24-Nov 18

First Year Student Schedule – Spring Semester

		Title	Credit Hrs	Course Master	Days	Time	Dates
GBS	710	Cell Signaling	2	Miller, M	. MTWRF.	10:00 - 12:00	Jan 4-Feb 1
GBS	720	Genomic Structure / Function	2	Crowley, M	. MTWRF..	08:00 - 10:00	Feb 2-Feb 29
GBS	774	Tumor Immunology	2	Yusuf, N Strong, T	. MTWRF.	08:00 - 10:00	Mar 1-Mar 28
GBS	753	Pharmacology and Molecular Medicine	2	Falany, C	. MTWRF.	08:00 - 10:00	Mar 29-Apr 25
GBS	796,	Lab Rotation 2	1		. MTWRF	00:00 - 0:00	Nov 19-Mar 1
BY	755	Biometry	3	Angus, R	..T..R	1400-1530	Jan-May

First Year Student Schedule – Summer Semester

		Title	Credit Hrs	Course Master	Days	Time	Dates
GBS	770	Pathogenesis/Biology of Cancer	2	Frost	MTWRF	08:00-10:00	May 2-May 30
GBS	797	Lab Rotation 3	1		MTWRF	00:00-00:00	Mar 2-May 26*

**This rotation starts during Spring Semester, but you do not register for it until Summer Semester.*

Rotations and choosing a thesis mentor. Laboratory rotations are meant to help students become acquainted with the laboratory and the mentor and gain practical experience in a variety of the techniques and types of scientific questions being addressed within different laboratories. At the end of the third rotation, the student will identify a thesis mentor. In choosing laboratories for rotations, that students should inquire directly about the funding status of the laboratory and whether the faculty

member will be accepting students permanently. When a student and mentor come to a mutually agreeable decision about joining the laboratory, the Chairman of the mentor's primary department must sign an agreement to support the student in the event the mentor is not able. In special circumstances, a fourth rotation may be required. Detailed regulations for rotation are in the GBS handbook and appropriate forms are on the GBS web site.

First Year Student Schedule -Summer Semester – Students will continue with Nondissertation research in the summer after their first year.

Transfers to Cancer Biology Theme. If a student would like to transfer into the Cancer Biology Theme after the first year, courses taken in other themes will count toward meeting the course requirements for Cancer Biology. Specific advanced courses may be required. These additional courses will be determined on a case-by-case basis in consultation with the mentor, theme director, and thesis committee.

Individualized Development Plan (IDP) – The IDP will be initiated during the student's first year and should be updated and modified as the student progresses through graduate school. Students will have an information session after class on Wednesday, August 19, and will participate in the workshop with Dr Jeffrey Engler on Thursday, August 27, immediately following class.
Beginning with their first committee meeting, students should present a slide/handout of 2-4 goals from their IDP at their committee meeting, and plans to meet those goals/progress towards those goals and/or changes to the goals should be reviewed briefly at subsequent committee meetings. Please see the GBS Handbook for general information about the Individualized Development Plan (IDP).

Year 2 and beyond.

Bioethics (GRD 717-Principles of Scientific Integrity) Bioethics is required and should be taken in the Fall of the student's second year. The class must be completed before taking the Qualifying Exam.

Pathobiology of Cancer (GBS770). This is a core cancer biology class offered every other year. Thus incoming fall 2014 and fall 2015 will take the class together in spring 2016.

Seminar (GBS 777). Beginning in the second year, students will take the Cancer Biology Seminar course each Fall and Spring semester until graduation. Because the cancer related seminars are offered through a variety of departments and centers, GBS 777 will allow students to attend cancer-related seminars of their choosing in at UAB or associated institutions (SRI, HudsonAlpha). Each student will keep an **electronic** seminar journal that includes each seminar date, title and a **brief** synopsis of the seminar. The journal will be emailed to the theme program office at the end of the semester. For the Fall 2015 semester, Seminar Journals **will be due no later than 10am on December 4, 2015**. Anyone turning in a journal after this deadline will receive NP for the course. At least 12 cancer-related seminars must be attended and documented in the Journal each semester for GBS 777. *Seminar guidelines*: Seminars should be cancer relevant, but do not need to specifically address cancer. Acceptable seminars include regular departmental seminars, Cancer Center seminars, and special seminars/multi-speaker symposium/retreats (but not more than 2 journal entries per event). Seminars given by graduate students or postdoctoral fellows do not count towards the 12 seminar total, except for final Defense of Dissertation seminars. Students attending tumor board presentations may include up to 4 such sessions in their 12 seminar total.

Suggested format for Seminar entries:
Title:
Name and Affiliation of speaker:

Date / time / venue of talk:
Hypothesis/objective:
Data/approach:
Summary of findings/take home message
Note: descriptions should be concise; bullet points are acceptable

Journal Club. Cancer Biology students must participate in a cancer-relevant journal club related to the student's research interests during the Fall and Spring semesters. Journal club provides students with valuable experience in critical assessment of the scientific literature, enhances presentation skills and keeps students up-to-date on emerging cancer research. Most Cancer Biology students will take the Cancer Biology Journal Club (GBS 776); however other journal clubs may be included upon approval of the mentor and Cancer Biology theme director. Students are required to present at least once a year in the journal club but are encouraged to present more often if possible. Alternative journal clubs relevant to the Cancer Biology theme include but are not limited to: Advanced Pharmacology Seminar (PHR 790), Journal Club in Cell Signaling (GBS 774), and Cell Death Mechanisms Journal Club (GBS 786).

Advanced Courses. Students must successfully complete at least three advanced courses (700 level; graded classes only) with a grade of B or better prior to graduation. Advanced courses are chosen after consultation with the mentor and, if applicable, the student's thesis committee. Advanced courses offered by any theme or department will count toward this requirement. Cancer Biology offers one advanced course each semester. In addition, spring introductory from other themes can be completed for advanced credit. In most cases, additional assignments will be required to bring the course up to an advanced level.

Advanced Course Offerings by Cancer Biology

		Title	Credit Hrs	Course Master	Days	Dates
GBS	769	Carcinogenesis	3	Samant, L. Samant, R.	. M. W. F.	Fall even yrs
GBS	778	Cancer Metastasis	3	Hurst, D	. M. W. F.	Spring odd yrs
GBS	779	Translational Research in Cancer	3	Yang, E.	. M. W. F.	Fall odd yrs
GBS	775	Cancer Treatment	3	Yoon, K Wiley, C.	. M . W . F.	Spring even yrs

Nondissertation Research. Cancer Biology students generally take a total of 9 credits per Fall and Spring semesters and 9 hours in the summer. Nondissertation research is laboratory research performed prior to admission to candidacy (before the qualifying exam). Nondissertation research credits are graded on a Passed/ Not Passed scale. After enrolling for Advanced Classes, Journal Club and Seminar, students will register for nondissertation research up to the required number of credit hours each semester.

Assembling a thesis committee. At the beginning of their second year and before the qualifying exam, students must assemble a thesis committee. Instructions and requirements for the thesis committee are detailed in the GBS handbook. In general, the committee consists of 5 faculty, each of whom contributes some expertise to guide the student's project. The committee must be approved by the Graduate School. It is required that the thesis committee meet at least one time prior to the qualifying exam. After the qualifying exam and during years 2-4, the student should meet with the committee at least once a year. After year 4, the student must meet with the committee every 6 months. After each committee meeting, a written progress report must be completed and submitted to the Theme Administrator for review by the Cancer Biology Curriculum Committee each year.

Special Topics in Cancer Biology GBS 746– Qualifying Exam Preparation. This course is offered to students in the Fall of the third year. This course is designed to assist the student in preparing a proposal for their qualifying exam by providing general instruction on writing an R01 style proposal and familiarizing the student with the review process. The class is a guided self-study class, and the scope of work for the proposal will be determined by the student in consultation with their mentor and committee. The course is required for third year graduate students and is expected to result in a completion of a high quality proposal by November, in preparation for the QE later that fall or in the spring. MSTP students who have taken STP2043 are exempt from this course.

Qualifying Exam. The details of the requirements for the qualifying exam are discussed in the GBS handbook. Briefly, the exam will include a written research proposal as well as an oral defense of this proposal. The proposal will be written on the topic of the student's thesis research and will be formatted like a 12 page NIH R01 grant. During the oral phase of the exam, the student will be required to defend the proposal as well as address general scientific questions to gauge the students general knowledge, comprehension, and critical thinking skills. The qualifying exam should be completed sometime between the summer of the second year and end of the third year. Most students will take their qualifying exam in the Spring of their third year. Students are required to have one of the Cancer Biology co-directors in attendance at their qualifying exam.

Dissertation Research. Students will register for dissertation research after the successful completion of the qualifying exam.

Clinical Opportunities for Advanced Cancer Biology Students After successful completion of the qualifying exam, candidates will also have the opportunity to advance their understanding of clinical issues in cancer prevention, diagnosis and therapy through involvement in clinical forums and interaction with cancer clinicians including Grand Rounds with the Division of Hematology/Oncology and Tumor Boards in Pathology. Students should discuss these opportunities with Drs. Shevde-Samant or Strong.

Thesis defense. Details of the policies and forms required for the thesis defense are listed in the GBS and Graduate School Handbooks. The Graduate School requires at least two semesters between the qualifying exam and the thesis defense. In addition, the student must be registered for at least three to five credit hours in the semester of the thesis defense, depending on the need for continued health insurance. In general, Cancer Biology students should have at least two first author publications related to their thesis work. Exceptions can be approved by the thesis committee. Deadlines and rules for the final preparation of your dissertation and graduation requirements are available from the Graduate School and may be obtained from the Graduate School website under the UAB website (http://main.uab.edu/). On average, students should plan for 1-2 months to devote to writing their dissertation. When students are ready to schedule their final defense, they should confer with the Theme Administrator and schedule the defense at a time that does not conflict with other student defense presentations, and allows attendance of at least one of the CANB Co-Directors.

Students should schedule a private defense with their committee prior to the public defense, with the public defense scheduled 10-14 days after the private defense. Students passing the private defense will go on to give their public Defense of Dissertation.

Special requirements for students after their fifth year. Once a student enters into a laboratory (after completing the core curriculum) he or she will receive up to 5 years of support by the mentor. The stipend is not an entitlement and will be evaluated on a yearly basis for research progress and thesis committee evaluation. After 5 years, the student will have to petition their Graduate committee for an

extension of the graduate stipend. Both the Graduate committee and Drs. Shevde-Samant and Strong will have to approve this extension. The extension will be for 1 year and must be re-approved each subsequent year. Obviously, this does not insure that the student will complete his/her thesis during this timeframe, but may mean that the student will have to complete the thesis work without benefit of a stipend. Exceptions to this rule include maternity leave or an extended illness. Those students that transfer to another laboratory during their thesis work would be evaluated based on the recommendations of their new thesis committee and with the approval of Drs. Strong and Shevde-Samant. Policies regarding leave of absence and displaced students are detailed in the GBS Handbook.

Participation in Cancer Biology functions. Students are required to attend Cancer Biology functions, including:

- Monthly Cancer Biology Student Seminar Series – A student led seminar series will provide a forum for advanced students to present their current research progress to their peers. Two students will present in each session (15-20 min presentation, 15 min discussion). These seminars will occur on the first Wednesday of the month, at 11:00-12:15 (lunch included).
- Defense of Dissertation for Cancer Biology students (these can count towards the 12 seminar total for GBS 777 Cancer Biology Seminar class);
- Cancer Biology theme meetings
- The annual Comprehensive Cancer Center Retreat (all students, 2nd year and beyond, should present their research in the poster session);

In addition, we ask that students plan to participate in recruitment activities for Cancer Biology GBS applicants.

Students should check emails regularly for announcements from the Theme Manager or Co-Directors, and are expected to respond within 24 hours of a request for information.

Certificate Programs. The GBS offers certificate programs with specialized instruction for specific career paths. Students can enroll in these programs with the permission of their mentor and committee members. More information can be found at:
http://www.uab.edu/gbs/home/component/content/article/126-programs/118-certificate-programs

First Year Course Descriptions.

Core curriculum GBS 707, 708, 709- Overview of basic biochemistry, genetics, and cell biology.

Cell Signaling GBS710 (Michael Miller) - This course covers major extracellular and intracellular signal transduction cascades that regulate animal development and physiology. Topics include the mitogen activated protein kinase cascade, transforming growth factor beta, insulin, and cytokines.

Genomics GBS 720 (Michael Crowley)- This course covers gene mapping and linkage in humans and animal models of disease. Disease gene mapping and single gene disorders will be covered. Development and use of genomic technology including microarrays and next generation sequencing will be covered in the context of future personalized medicine applications.

Tumor Immunology GBS 774 (Nabiha Yusef and Theresa Strong)- This course will review basic concepts in immunology, including the innate and adaptive immune response and immunological methods. The lectures will then examine topics in tumor immunology including the interaction of the immune system and tumors, and cancer immunotherapy.

Pathobiology of Cancer GBS 770 (Andra Frost)- In this course, students will gain an understanding of the pathology and epidemiology of cancer in general and an appreciation of the gross, histologic and molecular pathology of cancers of multiple organs, including the brain, lungs, skin, breast, prostate, colon, bone marrow and lymph nodes. The students will learn the basis of the pathologic classification of cancers of particular organs, including the gross, microscopic and molecular features that aid in classification. The clinical implications (i.e., prognostication and treatment) of the classification systems will be discussed. *Note: this module will be provided every even year, and both first and second year students will be take the course in the year it is offered.*

Pharmacology and Toxicology GBS 753 (Charles Falany)- This course is designed to provide an introduction to several of the basics principles and areas of Pharmacology and Toxicology. The course is primarily interactive lectures and discussion focused on introducing graduate students to several aspects pharmacology. The course is divided into sections on Pharmacokinetic/pharmacokinetic principles and Drug Metabolism, Chemotherapy, Drug Discovery and Development, Autonomic Pharmacology and Toxicology.

Biostatistics BY755 (Robert Angus)- The objectives of the course include: 1) To introduce the student to appropriate statistical techniques for data analyses in common biological research situations. 2) To provide the student with the computer skills sufficient to store, manipulate, graph and analyze research data using two popular software packages. 3) To provide the student with an understanding of statistics sufficient to understand experimental designs and analytical methods described in the biological literature.

Bioethics GRD 717 (Jeff Engler)- This course surveys ethical issues and principles in the practice of science. Among the topics discussed are the nature, extent, and causes of fraud in the sciences; 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.

Cancer Biology Faculty* *Spreadsheet as of August 2015*

*Note: these are faculty who are officially designated as Cancer Biology faculty. There are additional faculty doing cancer related research at UAB and associated institutions (SRI, HudsonAlpha), and those faculty members may apply to join the Cancer Biology faculty at any time.

Faculty Last Name	Faculty First Name
Aller	Stephen
Ballinger	Scott
Basu	Malay
Beierle	Elizabeth
Bellis	Susan
Benveniste	Tika
Bhatia	Ravi
Bjornsti	Mary-Ann
Blume	Scott
Cassady	Kevin
Chang	Pi-Ling
Davis	Randall
Deshane	Jessy S
Ding	Qiang
Eto	Isao
Everts	Maaike
Falany	Charles
Feng	Xu
Fiveash	John
Frank	Stuart
Frost	Andra
Gillespie	Yancey G.
Gorbatyuk	Marina
Griguer	Corrine
Hardy	Robert
Hartman	John
Hel	Zdenek
Hjelmeland	Anita
Hu	Kejin
Hurst	Douglas
Javed	Amjad
Jiang	Mengxi
Jiao	Kai
Kedishvili	Natalia
Kesterson	Bob
Kim	Helen
King	Gwendalyn
King	Peter
Klampfer	Lidija
Klug	Chris

Faculty Last Name	Faculty First Name
Krishna	Rama N.
Lahti	Adrienne
Landar	Aimee
Li	Yi-Ping
Li	Yonghe
Lorenz	Robinna Gail
Manne	Upender
Miller	Michael
Mitra	Kasturi
Murphy-Ullrich	Joanne
Myers	Richard
Nabors	Louis
Nozell	Susan
Parant	John
Placzek	William
Ponnazhagan	Selvarangan
Preuss	Meredith
Randall	Troy
Renfrow	Matthew
Samant	Rajeev
Sanderson	Ralph
Serra	Rosa
Sha	Bingdong
Shevde-Samant	Lalita
Shrestha	Sadeep
Siegal	Gene*
Singh	Keshav
Song	Yuhua
Strong	Theresa
Sudarshan	Sunil
Tang	Jianming
Tollefsbol	Trygve
van Waardenburg	Robert
Wang	Hengbin
Wang	Lizhong
Xu	Bo
Yang	Eddy
Yang	Qinglin
Yang	Yang
Yoon	Karina
Yusuf	Nabiha
Zayzafoon	Majd
Zhao	Xinyang
Zhou	Lufang
Zinn	Kurt