THE MAGAZINE OF THE UAB HEERSINK SCHOOL OF MEDICINE

WINTER 2023

UAB MEDICINE

MIND OVER MATTER

THE NEW FRONTIER OF NEUROENGINEERING AND BRAIN COMPUTER INTERFACES

On December 8, 2022, Marnix and Mary Heersink were presented with a framed, commemorative football jersey honoring the $95 million naming gift they made to the Heersink School of Medicine in 2021.

I'm pleased to welcome you to the first issue of UAB Medicine since I became interim senior vice president for Medicine and dean of the UAB Marnix E. Heersink School of Medicine. The new year always brings renewed excitement for the future and in this issue I think you'll find many reasons to look ahead with hope.

They include stories about new technologies and techniques that address a wide range of diseases and disorders, like our new Consortium for Neuroengineering and Brain-Computer Interfaces, which is helping make what was once science fiction a reality. We take a look at the future of vaccines in light of the successful development of the COVID-19 vaccines, and explore a new gene therapy approach that may deliver a breakthrough for patients suffering from sickle cell disease. You'll read about our Medical Scientist Training Program, which is fostering the next generation of physician-scientists, and meet two young alumni who are leading the charge to deliver much-needed primary care to rural Alabama.

The future of our school is looking especially bright as we celebrate the first year since receiving a $95 million naming gift from Marnix Heersink, M.D., and his wife Mary (pictured opposite) and their family. Being a named medical school is a tremendous endorsement of all we do across our mission areas in medical training, patient care, and biomedical research. Moreover, it recognizes the central role the Heersink School of Medicine and UAB Medicine play in the health and well-being of our state—a role that will only continue to grow as the programs and initiatives the gift has made possible take root and expand.

Indeed, since receiving the historic gift, its impact has multiplied. We have already seen numerous gains as it advances strategic growth, propels biomedical innovation, expands our global footprint, and encourages more philanthropy from medical school supporters. To date, we have been able to recruit new research faculty and retain several faculty through the creation of new endowments. The recruitment and retention of seasoned, top-tier scientists and clinicians, as well as young, early career investigators and physicians, is crucial to growing our programs and brings exciting new energy to our school.

The Heersink gift has also resulted in the establishment of two new institutes, the Marnix E. Heersink Institute for Biomedical Innovation and the Mary Heersink Institute for Global Health, both of which gained incredible momentum in their first year. We will explore their key accomplishments and programs in upcoming issues.

The milestones generated by the Heersink gift contribute to our pursuit of excellence in each mission area. These accomplishments spill over into the community, promoting economic opportunity and health equity in Alabama and beyond. Scaling up helps us serve more groups and break down barriers to care. With the momentum we have made in only a year, I am excited to see what else will be made possible by the Heersink gift as we move forward.

Sincerely,

Anupam Agarwal, M.D.
Interim Senior Vice President for Medicine and Dean
UAB Heersink School of Medicine
Professor of Medicine, Division of Nephrology
Hilda B. Anderson Endowed Chair in Nephrology
University of Alabama at Birmingham

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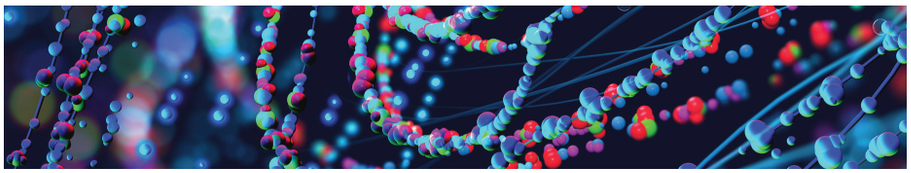

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FOUR FACULTY MEMBERS JOIN NATIONAL ACADEMIES

On October 17, 2022, UAB announced that three Heersink School of Medicine faculty members were invited to join the National Academy of Medicine (NAM), one of the highest honors that a physician or scientist in the United States can receive. Marie-Carmelle Elie, M.D., chair of the Department of Emergency Medicine; James Markert, M.D., chair of the Department of Neurosurgery; and Alan Tita, M.D., Ph.D., associate dean for Global and Women's Health, director of the Mary Heersink Institute for Global Health, and professor in the Department of Obstetrics and Gynecology, joined 12 current and former UAB faculty members who have been elected to the NAM.

The academy lauded Elie for being the first African American woman to chair an academic emergency department in the nation and for representing the first scholar at the crossroads of the emergency medicine, critical care, and palliative care disciplines to achieve such recognition in North America.

Markert was cited for being a world expert in oncolytic viruses, author on a first-ever paper of genetically engineered oncolytic viruses, primary author on the first-in-human trial of an oncolytic virus, senior author on first use of an IL12-expressing virus for human glioma, and currently conducting adult and pediatric brain tumor trials.

The academy praised Tita for his work as an innovative and impactful perinatal epidemiologist and clinical researcher who leads large, collaborative, multicenter national and international trials and observational studies that have shifted practice and policy and improved the quality of national and global obstetric care.

The honors followed the May 5, 2022, announcement that Casey Weaver, M.D., professor in the Department of Pathology, had become the third faculty member in university history to be elected to the prestigious National Academy of Sciences (NAS). The NAS has 2,512 U.S. and 517 international members, including about 190 Nobel laureates.

Ellen Eaton, M.D., associate professor in the Division of Infectious Diseases, was selected to serve as a National Academy of Medicine Emerging Leader in Health and Medicine (ELHM) Scholar for a three-year term that began June 1, 2022. Each year, the NAM selects 10 exceptional ELHM scholars. Eaton will contribute to NAM priority areas around the opioid crisis and COVID-19.

Marie-Carmelle Elie

James Markert

Alan Tita

Casey Weaver

Ellen Eaton

UNIVERSAL CORONAVIRUS THERAPY RESEARCH

UAB researchers discovered a neutralizing monoclonal antibody that potentially acts as a potent universal coronavirus therapy against SARS-CoV-2 and all its variants of concern, including Beta, Gamma, Delta, Epsilon, and Omicron. It also shows effectiveness against deadly coronaviruses SARS-CoV, which emerged in China in 2002, and MERS-CoV, which appeared in Saudi Arabia in 2012. It even shows effectiveness against several common cold coronaviruses.

This universal activity against all beta-coronaviruses results from a monoclonal antibody targeting the S2 stalk region of the viral spike (S) protein that is highly conserved among beta-coronaviruses and is essential for the virus to attach and enter cells, leading to infection.

In animal experiments, the monoclonal antibody protected against infections when given as an intraperitoneal injection or a nasal dose. The study was published in the journal PLOS Pathogens by co-senior authors James Kobie, Ph.D., associate professor in the Division of Infectious Diseases, and Mark Walter, Ph.D., professor in the Department of Microbiology, and Luis Martinez-Sobrido, Ph.D., of the Texas Biomedical Research Institute, San Antonio.

This and another monoclonal antibody the researchers discovered previously are being developed as a therapeutic cocktail for COVID-19 under license to Aridis Pharmaceuticals.

The researchers' goal is to find antibodies that block immune escape by mutated variants of SARS-CoV-2. It is hoped that identifying such antibodies can lead to the development of vaccines that protect from all coronaviruses.

RETIRED NFL PLAYERS GET HEALTH SCREENINGS

More than three dozen retired NFL players and their spouses received a variety of health tests and exams at the UAB Family and Community Medicine Clinic at UAB Hospital-Highlands on October 22, 2022. The event was the result of a partnership between UAB Sports and Exercise Medicine, the UAB Department of Family and Community Medicine, the Professional Athletes Foundation of the NFL Players' Association, and the Living Heart Foundation (LHF).

"The last place we want to go is to a doctor, and as big football players, we think we're invincible anyway," said former NFL player Antonio Langham, an Alabama native and former University of Alabama football player who serves as president of the Birmingham chapter of the NFL Players' Association. "Hearing, EKG, blood pressure, anything you may need. This is good … it's necessary. A lot of guys need this."

Arthur Roberts, M.D., retired cardiac surgeon and former NFL quarterback, founded LHF in 2001 to fight sudden cardiac death and to provide early intervention for heart conditions through free screenings in cities across the United States. UAB's attendees received cardiac exams, neurological exams, and orthopedic health exams, as well as screenings around exercise, nutrition, and mental health.

"These individuals are at high risk for brain, bone, and heart health issues related to their prior sporting engagement and historical lifestyle," said Irfan Asif, M.D., chair of the department, a family medicine and sports medicine physician, and the associate dean for Primary Care and Rural Health at UAB. "Through this screening, we've achieved the first step in providing these individuals with the tools and resources needed to care for themselves well after their playing careers are over."

NEW PATHOLOGY DIVISION OF WOMEN'S HEALTH

In July 2022, the UAB Department of Pathology established a new Division of Women's Health. "The establishment of this division serves to unify the subspecialties we have focused on in women's health in pathology as a field—obstetrics/gynecology, breast, perinatal—and bring them under one umbrella," says Interim Division Director Thomas Winokur, M.D.

The primary goals for the division are to aid in recruiting talented individuals to UAB to focus on women's health, to work with UAB Medicine to enhance diagnostic and molecular testing in areas impacting women's health, and to build a research portfolio in these areas.

"Both our primary and secondary faculty will have strong relationships with anyone on campus working on women's health issues," says George Netto, M.D., Robert and Ruth Anderson Endowed Chair. "This will enhance our connectivity to others in the institution working toward the goal of improving health care diagnostics and treatment for all women seeking care at UAB."

"This study adds, perhaps in a new population, to numerous prior studies which have shown that quick and simple tests of physical performance—including walking speed, grip strength, or as in this case, balance—used with older adults can be predictive of poor health outcomes."

Thomas Buford, Ph.D., director for the UAB Center for Exercise Medicine and a professor in the Division of Gerontology, Geriatrics and Palliative Care, quoted in "If You Can Pass This 10-Second Test, There's a Good Chance You'll Outlive Your Peers," Popular Mechanics, November 7, 2022.

PIONEERING PROCEDURE USING NEW DEVICE

In July 2022, physicians in the UAB Department of Radiology successfully performed the first human procedure using the EMBOLD™ Fibered Detachable Coil System. Theresa Caridi, M.D., director and associate professor of the Division of Vascular and Interventional Radiology, interventional radiologist at UAB Hospital, and vice chair of Interventional Affairs, led the team that performed the procedure.

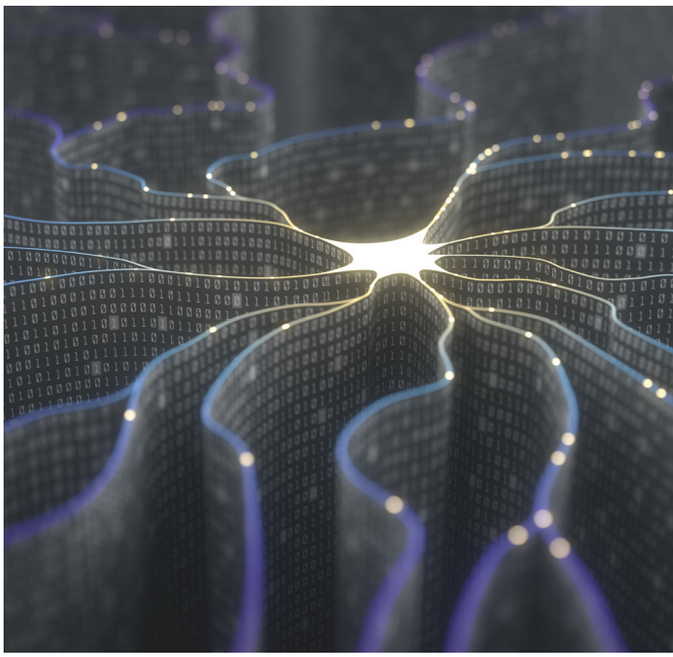
The EMBOLD Fibered Detachable Coil System is used in embolization procedures. Embolization is a minimally invasive procedure that takes away blood flow from an abnormal blood vessel or vessels. The reason for embolization is widespread and may include bleeding, tumor, shunting, and other arterial/venous abnormalities.

"This minimally invasive procedure using new technology can help improve procedure efficiency and enable better patient outcomes," Caridi says. "The device is designed to help reduce preparation and procedure times by limiting the amount of equipment and number of additional products required to complete the embolization."

The system has multi-catheter compatibility that may help interventional radiologists complete embolization procedures in a more efficient manner. The device also features a delivery system that prevents kinks from forming during the procedure, which may help reduce treatment complications. Caridi has shared input in the development process and served as a physician adviser on the project since its conception in 2018.

UAB received more than $715 million in research grants and extramural awards for the 2022 fiscal year, up $67.8 million from the previous year, according to data from the Office of Sponsored Programs. This is a 10.5% increase for the year and a nearly 50% increase—an additional $237 million—during the past five years. UAB also ranks among the top 5% of U.S. universities based on all federal research and development expenditures and in the top 1% of all public, private, and international organizations funded by the National Institutes of Health.

ARTIFICIAL INTELLIGENCE AIDS CLINICAL TRIAL



Information gleaned via artificial intelligence has opened the door to a possible treatment for a rare genetic neurodevelopmental disorder. Findings published in Human Genetics and Genomic Advances suggest that low-dose ketamine is generally safe, well-tolerated, and effective to treat clinical symptoms in children diagnosed with activity-dependent neuroprotective protein syndrome, a disorder derived from a mutation in the ADNP gene.

Low-dose ketamine was identified as a possible therapeutic target for ADNP syndrome by the Hugh Kaul Precision Medicine Institute at UAB (PMI). That information was relayed to the ADNP Kids Research Foundation, the nation's leading advocate for ADNP syndrome research. That organization contacted investigators at the Seaver Autism Center for Research and Treatment at Mount Sinai Hospital, who conducted a clinical trial and published their findings online on August 27, 2022.

The impetus to investigate ketamine, an FDA-approved drug used in anesthesia, pain management and depression, came from an artificial intelligence tool called mediKanren. PMI Director Matt Might, Ph.D., developed mediKanren with funding from the National Center for Advancing Translational Sciences. mediKanren accesses the world's medical literature and uses artificial intelligence reasoning to make deductions—put simply, if one presents it with as much information as possible about a disease or condition, it will sort through the literature looking for potential results. Might believes this is the first time an artificial intelligence tool has directly led to a clinical trial.

450+

patients treated at the UAB Burn Center each year, mostly for kitchen-related injuries

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MIND OVER MATTER

THE NEW FRONTIER OF NEUROENGINEERING AND BRAIN COMPUTER INTERFACES

BY CARY ESTES

Throughout medicine, what was relegated to science fiction in the 20th century is fast becoming reality in the 21st century. Some of the most intriguing breakthroughs are occurring in the burgeoning field of neuroengineering, which enables the human brain and nervous system to interface with computers and machines.

In other words, we now have the capability of communicating directly with the brain using implantable devices and bioelectronics, and of recording the nervous system's signals. This is a conversation that ultimately could lead to therapies that help patients with cognitive or speech impairments, spinal cord or traumatic brain injuries, and neurodegenerative diseases such as Parkinson's and Alzheimer's.

UAB and the Heersink School of Medicine are fast emerging as leaders in this field. UAB launched a neuroengineering Ph.D. program in 2020, a first-of-its-kind program in the state of Alabama and one of the first freestanding neuroengineering doctoral programs in the country. In 2021, faculty from the UAB School of Engineering and the Departments of Neurobiology, Neurology, and Neurosurgery in the Heersink School of Medicine came together to establish the UAB Neuroengineering and Brain-Computer Interface Initiative (NBCII).

In October 2022, the NBCII transitioned into a new university-wide interdisciplinary research program called the Consortium for Neuroengineering and Brain-Computer Interfaces (CNBCI). Neurobiology Professor Lynn Dobrunz, Ph.D., who serves as director of the CNBCI, says the goals for the new center are to "foster collaborations, expand interdisciplinary research, facilitate large grant submissions, develop and commercialize neurotechnology, attract industry partners, provide state-of-the art training, and improve patient care." The CNBCI leadership team includes Assistant Professor of Neurosurgery Nicole Bentley, M.D., as co-director, as well as Associate Professor of Radiology Mark Bolding, Ph.D., (associate director), and Professor of Biomedical Engineering William "Jamie" Tyler, Ph.D., (associate director).

The CNBCI will host a national research symposium on neuroengineering and brain-computer interfaces, called NeuroGateways 2023, on March 30-31, 2023. The symposium will bring together leading experts from UAB and around the country to discuss the latest discoveries and clinical applications.

"This is a really exciting time in the field of neuroscience and engineering," says Dobrunz. "Deep-brain stimulation is already being used to help treat Parkinson's patients, and it has the potential to treat many other brain disorders as well. This research could be used to develop neuro-prosthetics that would help correct brain function or treat disorders like Alzheimer's and epilepsy. There is some amazing potential in the work we're doing."

"The UAB Neuroengineering Ph.D. program is training students in the skills needed for this type of research and device development," says Bolding. In a class taught by Bolding and Dobrunz last spring, a group of UAB neuroengineering students created a device that used signals recorded from a person's neck muscles to instruct a machine to pick up a gummy bear and put it in the person's mouth. Similar methods could be used to control devices using signals from the brain.

"The idea of being able to noninvasively manipulate things with your mind is the stuff of science fiction, but those are the kinds of things that are being worked on," Dobrunz says. "In the future, you could have brain-computer interfaces that enable the brain to control and operate other devices. This could be used to control a prosthetic limb by using thought, which would be an amazing benefit for people with paralysis and other types of disorders that make movement difficult."

In addition, researchers hope that by analyzing neuroengineering data, they can better understand what the brain is not doing correctly in patients with Alzheimer's or cognitive impairments and use those findings to try to electronically rectify the problem.

"The hope is that, similar to how deep brain stimulation has transformed how we can help Parkinson's patients with motor impairment, we can use neuroengineering to restore function in similar ways for many other diseases," says Bentley. "We have a huge volume of data here at UAB, and we have excellent collaborations across campus. Now we are pushing to become a regional and national leader in this field of neural data science."

“The idea of being able to noninvasively manipulate things with your mind is the stuff of science fiction, but those are the kinds of things that are being worked on. In the future, you could have brain-computer interfaces that enable the brain to control and operate other devices.”

LYNN DOBRUNZ, PH.D.
PROFESSOR, DEPARTMENT OF NEUROBIOLOGY
DIRECTOR, CONSORTIUM FOR NEUROENGINEERING
AND BRAIN-COMPUTER INTERFACES

Illuminating "The Black Box"

The brain has long been the black box of medicine. While researchers and physicians have an extensive understanding of how most of the body's organs work, many of the brain's functions have remained a frustrating mystery. But that is slowly changing.

"We understand better the language that the brain speaks, electrically and biochemically, and we're starting to be able to interpret that language," says Tyler. "On the therapeutic side, we're learning how to speak back to the brain in a way that's meaningful, and hopefully use that to mitigate some of the symptoms of these diseases.

"What we're trying to do is take all these observations, these basic understandings of the way the brain works, and then use microprocessors to basically convert energy into some stimulus that the brain understands. That way, we can start to treat these diseases without using drugs. If you look at bioelectronic medicine, the goal is to use devices that stimulate nerve and brain function in the same way that a drug would. That's the promise of the field."

The CNBCI operates with more than 150 members across UAB, including a BCI subset group with more than 80 members. For one of their first initiatives, the BCI special-interest group is working toward establishing a data-sharing platform to provide group members with better access to data relevant to BCI.

During routine surgeries for movement disorders or epilepsy, neurosurgeons like Bentley implant electrodes into specific regions of the brain to deliver electrical pulses or to investigate seizures. These electrodes can also be used to record brain activity during the procedure that neuroengineers can later analyze. For example, neurosurgeons can record baseline brain activity while patients are resting, and then again while patients perform various cognitive tasks.

"The rich data contained in brain signal recordings can provide insight into how the brain processes information, and how abnormal processes can lead to diseases we see clinically," Bentley says. "A major goal is to share this data across disciplines to answer fundamental questions about brain function in health and disease."

If those questions can be answered, Tyler says the potential benefits could be, well, mind-blowing. He notes that it already has been proven that pulse ultrasound can be used to control brain activity remotely. Researchers are now asking what else can the brain be directed to do, and how can that benefit patients?

"There is a lot of really good neuroscience at UAB, and a lot that could be unlocked to create new therapies and diagnostics," Tyler says. "Those things need to be taken on a commercial path, which is what we're doing."

Researchers know that there remains a lot of investigation and testing to do before they are able to unlock many of the brain's secrets. That is why the creation of the CNBCI is an important step for UAB's efforts in the field.

"Now we have a lot more capability to bring awareness to the fact that there is so much data at UAB, especially in the field of neuroengineering and neuromodulation," Bentley says. "This is what really sets UAB apart in these fields."

With the new Ph.D. program, initiative, and consortium in place, the time is ripe to take that data and come up with answers for questions that have long confounded the medical world. "These are discoveries that could lead to potential treatments for so many disorders," Dobrunz says. "That's one of the things that makes the field of neuroscience and neuroengineering so fascinating right now. It's really a very exciting time to be training students and post-docs in this area, and to be doing this type of work."

Boosting AI in Medicine

While neuroengineering seeks to unlock the mysteries and challenges of the human brain, a different type of "brain" is the focus of efforts to use artificial intelligence (AI) to improve biomedical research, medicine, and human health. UAB is establishing itself as a leader in the field of AI in medicine thanks in part to the Marnix E. Heersink Institute for Biomedical Innovation. The institute was established in 2022 as part of the transformational $95 million gift from longtime UAB supporter Marnix E. Heersink, M.D., which named the UAB Marnix E. Heersink School of Medicine and also established the Mary Heersink Institute for Global Health.

The Marnix E. Heersink Institute for Biomedical Innovation is aimed at futurizing health care by leveraging artificial intelligence, digital technologies, data, and virtual reality to address challenges around cost, access, disparities, and quality in health care. The institute is led by Rubin Pillay, M.D., Ph.D., assistant dean for Global Health Innovation in the Heersink School of Medicine and chief innovation officer for UAB Health System.

"We have four signature clusters for the institute: artificial intelligence in medicine, digital health care, big data and analytics, and the Metaverse or meta health," says Pillay. "All of our programming reflects those four signature areas, which, in my opinion, will shape the future of health care."

In its first year, the institute named Andrew Smith, M.D., Ph.D., professor and vice chair of innovation in the Department of Radiology, its clinical director of AI, and developed a graduate certificate in Artificial Intelligence in Medicine, along with graduate certificates in Digital Health and Health Care Innovation. (The institute is also in the beginning stages of developing a graduate certificate in Brain-Computer Interfacing through a partnership with the UAB Neuroengineering Ph.D. Program, and is partnering with the CNBCI to deliver academic programming in brain-computer interfacing.)

The institute hosted its first AI in Medicine Symposium on September 29, 2022. Keynote speakers included Anthony Chang, M.D., chief intelligence and innovation officer at Children's Health of Orange County

and the author of "Intelligence-Based Medicine," and Chris Aakre, M.D., vice chair for AI and Informatics of the Department of Medicine at the Mayo Clinic. The symposium also featured speakers from core global partners of the institute, including McMaster University in Canada, Alfaisal University in Saudi Arabia, and Maastricht University in the Netherlands.

AI in biomedical research got a boost in September 2022, when UAB announced that two UAB-led research teams out of approximately 100 contesting teams nationwide were selected for funding by the National Institutes of Health's new Bridge2AI program. The program is bringing together researchers from diverse backgrounds and disciplines to generate ethically sourced tools, data sets, and resources that will ultimately help accelerate the widespread use of artificial intelligence by the biomedical and behavioral research communities.

The UAB Informatics Institute was awarded over $2 million over the next four years as part of the Bridge2AI program, while the UAB Department of Ophthalmology and Visual Sciences team received a one-year, $2 million grant.

The UAB Informatics Institute team is led by module principal investigator Jake Chen, Ph.D., chief bioinformatics officer at the UAB Informatics Institute and a professor of Genetics, Computer Science, and Biomedical Engineering; co-principal investigator Ying Ding, Ph.D., of the University of Texas at Austin; operations manager Swathi Thaker, Ph.D., of UAB's Center for Clinical and Translational Science (CCTS); and Pamela Payne-Foster, M.D., of the University of Alabama and CCTS.

"The functional genomic data set that we generate will enable biomedical data scientists to develop a multi-scale cell architectural view of stem cells and cancer cells, benefiting basic biomedical research, AI-driven drug discovery, and companion diagnostic discoveries," Chen says.

The Department of Ophthalmology and Visual Sciences team is led by Cynthia Owsley, Ph.D., professor and director of the department's Clinical Research Unit, Gerald McGwin Jr., Ph.D., professor in the UAB School of Public Health, and Jeffrey Edberg, Ph.D., professor in the UAB Department of Medicine.

"Our award is to lead three sites in the collection of data that will be used for machine learning approaches that will provide critical insights into the endemic condition Type 2 diabetes mellitus," Owsley says.

According to Chen, "We view Bridge2AI as a major program paradigm shift by NIH to enlist biomedical data scientists to generate and standardize challenge problem-organized biomedical data at scale, making them ready for broader data science AI researchers outside of biology and medicine to develop new tools and impact future treatments." – *Ryan McCain, Adam Pope, and Emma Shepard contributed to this article*

"The hope is that, similar to how deep brain stimulation has transformed how we can help Parkinson's patients with motor impairment, we can use neuroengineering to restore function in similar ways for many other diseases."

NICOLE BENTLEY, M.D.
ASSISTANT PROFESSOR,
DEPARTMENT OF NEUROSURGERY
CO-DIRECTOR, CONSORTIUM FOR NEUROENGINEERING
AND BRAIN-COMPUTER INTERFACES

THE **PAST, PRESENT,** AND **FUTURE** OF VACCINES

UAB researchers and clinicians are developing and testing new and improved vaccines for diseases from influenza to HIV to COVID

BY SARAH WILLIAMS

Frances Lund

More than 200 years ago, British physician Edward Jenner changed the history of medicine when he inoculated a 13-year-old boy with vaccinia virus (cowpox) and demonstrated immunity to smallpox in 1796. Suddenly, there was a powerful new weapon in the long-standing war between humankind and disease-causing viruses. In the centuries since, millions of lives have been saved by vaccines against pathogens like smallpox, polio, and measles. However, for all the advances in vaccine science and all the success stories, some viruses have remained hard to vanquish—influenza and human immunodeficiency virus (HIV) among them.

That is rapidly changing. Scientists have a greater understanding of how to arm the human immune system against viruses, as well as new technology for creating vaccines at a speed that would have been unimaginable just a decade ago. In the shadow of Operation Warp Speed, which successfully developed, tested, and rolled out safe and effective COVID-19 vaccines in less than a year, vaccines are yet again poised to enter a new era.

At UAB, researchers and clinicians have developed and studied vaccines for decades; their work contributed to numerous vaccines on the market today. Now, they are embracing the latest science to forge ahead with new vaccines, working to make existing vaccines even better, and helping ensure that people everywhere have knowledge of and access to vaccines.

"There are a lot of people on this campus with expertise in vaccines, from the very basic science to the most translational," says Frances Lund, Ph.D., former Charles H. McCauley Chair of Microbiology and founding director of UAB's Immunology Institute. "Vaccines are something we are all very passionate about. They have enabled humanity to have a healthy lifespan that we could not have without them."

THE COVID EFFECT

Lund has long studied B cells, the immune cells that produce antibodies against viruses, bacteria, and other foreign particles that enter the human body. She is particularly interested in how to develop vaccines that ensure long-lasting, effective B cells throughout the body, not just in the lymph nodes. Her research—mostly on influenza—has answered numerous questions about how B cells develop, mature, and fight pathogens. She has also shed light on the importance and effectiveness of B cells in the lining of the lungs, the first place that respiratory viruses usually infect.

When COVID-19 emerged, Lund and colleagues, including Troy Randall, Ph.D., who holds The Meyer Foundation William J. Koopman Endowed Professorship in Rheumatology and Immunology at UAB, quickly pivoted to studying the SARS-CoV-2 virus. They launched a collaboration with Altimmune Inc., first carrying out basic research to discover which antibodies against the virus were most effective, and then helping develop an intranasal spray vaccine candidate, which their research suggested could lead to strong antibodies in the lining of the nose and airways.

"When you get a flu or COVID vaccine in your arm, you develop what we call systemic immunity, and this means antibodies in your lymph nodes and spleen," says Lund. "What would be even better is B cells and specific kinds of secretory antibodies ready and waiting in your respiratory tract."

Work on the Altimmune COVID-19 vaccine was halted in 2021 but, in the same way that lessons from influenza helped make COVID-19 vaccines possible, the lessons learned and technology developed from the pandemic are now leading to new possibilities when it comes to influenza.

For influenza, Lund explains, the challenge in creating an effective vaccine is keeping up with the fast pace at which the virus mutates and evolves. In the past, flu shots have relied on inactivated copies of the influenza virus or isolated proteins. Both take about nine months to produce and distribute and include protection against four strains of the flu at once.

Most of the COVID-19 vaccines currently on the market use a different, new technology called mRNA. Rather than provide the body directly with a piece of a virus to teach the immune system to recognize it, a strand of mRNA instructs the body on how to make these proteins itself. One of the advantages of the technology is it is much quicker to produce mRNA than whole viruses or even proteins.

"If we shift to mRNA vaccines for flu, this means is we can wait until much closer to the flu season to see what's actually circulating and start designing vaccines," Lund says. "I think this will lead to much better protection against any given season's flu strains."

“When you get a flu or COVID vaccine in your arm, you develop what we call systemic immunity, and this means antibodies in your lymph nodes and spleen. What would be even better is B cells and specific kinds of secretory antibodies ready and waiting in your respiratory tract.”

—Frances Lund

Also, mRNA lets researchers combine many more viral proteins into one vaccine. This could also help provide better protection for any given flu season, when numerous strains of influenza might circulate at once.

“I think the next low-hanging fruit we’re going to see with the flu vaccine is combo-vaccines that can cover more strains,” Lund says.

Lund’s own research group is continuing their work on nasal vaccines and how to make sure B cells can produce anti-influenza antibodies that are long-lasting and found in the right place in the body. The results of their basic work, she says, will help inform future flu vaccines.

Paul Goepfert

PANDEMIC LESSONS

If the speed of creating mRNA vaccines is a boon for fighting influenza, it is also an incredible benefit in the race to develop a vaccine against human immunodeficiency virus (HIV), one of the fastest mutating viruses scientists have ever studied.

“COVID is definitely a lower bar for vaccination than HIV,” says Paul Goepfert, M.D, professor of medicine and director of the Alabama Vaccine Research Clinic, housed at the Heersink School of Medicine. “With COVID, there are a handful of strains out there at once; with HIV there are thousands of strains and every single one of them can cause AIDS.”

While mRNA vaccines were being studied before the advent of COVID-19, the pandemic sped along their development and helped push the technology to maturity. With the new ability to develop mRNA vaccines at a record pace, Goepfert and colleagues have already launched a phase 1 clinical trial of an mRNA-based HIV vaccine at UAB—one of 10 sites nationwide. The idea behind the trial is that, with mRNA, many different vaccines can be rapidly developed and tested for their ability to elicit powerful anti-HIV antibodies in people.

“mRNA technology won’t magically give us a vaccine against HIV, but it’s going to help hugely in HIV vaccine development,” says Goepfert. “We can develop many more vaccines in succession and if one doesn’t work, we can quickly go back to the drawing board.”

Goepfert and other researchers will test whether people who receive each experimental vaccine generate antibodies that are capable of recognizing many different strains of HIV at once—moving in the direction of a universal HIV vaccine. Scientists have already identified some of these “broadly neutralizing antibodies” but need to determine which vaccines can coax the immune system to generate them.

“Historically, vaccines were just versions of a virus, because we didn’t know any better,” says Goepfert. “Now, we’re getting better and better at tuning the immune response to be much more specific, effective, and safe.”

CANCELING CERVICAL CANCER

While the development of an HIV vaccine has, for the past few decades, been frustratingly slow, the human papillomavirus (HPV) vaccine is a modern-day success story. Scientists have known for decades that long-lasting HPV infections not only cause most cases of cervical

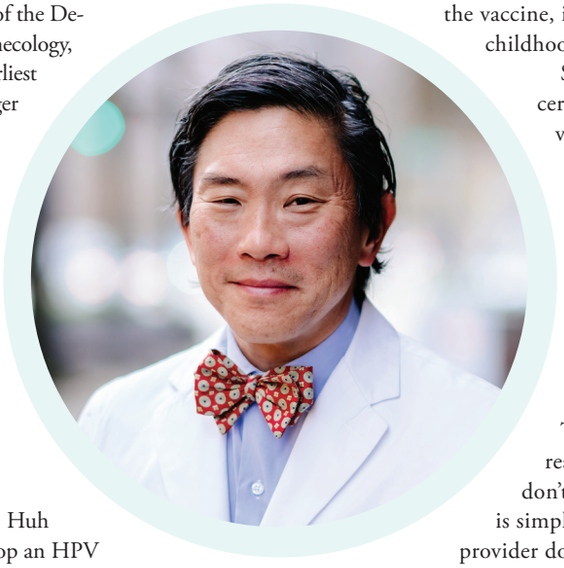
cancer, but also boost the risk of a person developing other cancers. The 2006 approval of Gardasil, the first HPV vaccine, was the first time a vaccine had been produced to help combat cancer.

"We are now starting to see a significant drop in the rate of pre-invasive disease and, perhaps, cancer rates," says Warner Huh, M.D., chair of the Department of Obstetrics and Gynecology, who helped lead some of the earliest tests of Gardasil. "We're no longer in a place where we can just dream about a world with no cervical cancer, we're actually seeing that this is highly realistic and probable."

In the 15 years since Gardasil's approval, Huh and other scientists have continued to study the safety and effectiveness of the vaccine. In 2016, the U.S. Food and Drug Administration approved a two-dose schedule instead of three. Now, Huh is spearheading efforts to develop an HPV vaccine that doesn't need refrigeration.

"Cervical cancer is a major issue in the developing world and if we can figure out a way to give one shot to individuals, that would be a massive step in the right direction," he says.

He and others at UAB are also modeling rates of HPV vaccination, cervical cancer screening, and cancer cases to determine when cancer screening—in the form of Pap smears and HPV tests—is no longer needed. "This is such an incredibly effective vaccine that we might be able to tell the next generation of women that they're fully protected against cervical cancer and may not even need screening, which would be amazing," he says.



Warner Huh

Wendy Landier

A COMMUNICATION STRATEGY

The HPV vaccine, though, is also an example of the continued challenges of rolling out a vaccine. Misinformation about the risks and benefits of vaccination has slowed rates of vaccine uptake, and the pandemic only exacerbated rates of vaccine hesitancy, most research suggests.

"The divisiveness of the COVID vaccine and its rollout had this halo effect on other vaccines that we give," says Huh.

Wendy Landier, Ph.D., CRNP, a professor of pediatric hematology-oncology, is well-armed to tackle some of these challenges. Since the release of the HPV vaccine, she and colleagues have been studying issues surrounding the vaccine, including its safety and ability to provoke an immune response, as well as the uptake of the vaccine, in one unique population: childhood cancer survivors.

Survivors of childhood cancers are at increased risk of developing HPV-related cancers in the future, but also have low rates of HPV vaccination. In 2021, Landier's team became the first to report that HPV vaccines are safe in these patients and provide similar levels of immunity as those seen in healthy young people. They also showed that the reason many cancer survivors don't get the vaccine is simply because a health care provider doesn't bring it up.

"In young cancer survivors, routine preventive care may fall through the cracks because everyone is very focused on cancer recovery," says Landier.

With that in mind, she is now working on communications strategies to ensure that pediatric oncologists start integrating HPV vaccine recommendations into their routine cancer follow-up visits. The intervention has been rolled out at six sites already and Landier and her collaborators are tracking how it helps boost vaccine uptake among childhood cancer survivors.

"Vaccines are something that people are talking about in a way they've never done before," she says. "That can be both helpful and challenging."

Other UAB researchers have similar sentiments—as they forge ahead with a new generation of safe and effective vaccines, they hope their passion and messaging reach the public.

"Hundreds of years ago, in the absence of vaccines, infections were the number one killer of children," says Lund. "They've improved human health so much and we're still working on improving things even more."

A HISTORY OF VACCINES

1796
First vaccine for smallpox was developed by Dr. Edward Jenner, considered the founder of vaccinology in the West

1881
French biologist Louis Pasteur developed a successful vaccine against anthrax

1885
Louis Pasteur developed a successful vaccine against rabies

1914
Vaccine for whooping cough is developed

1926
Diphtheria vaccine is developed

1954
Division of Biologics Standards was formed in the U.S. to oversee vaccine safety and regulation

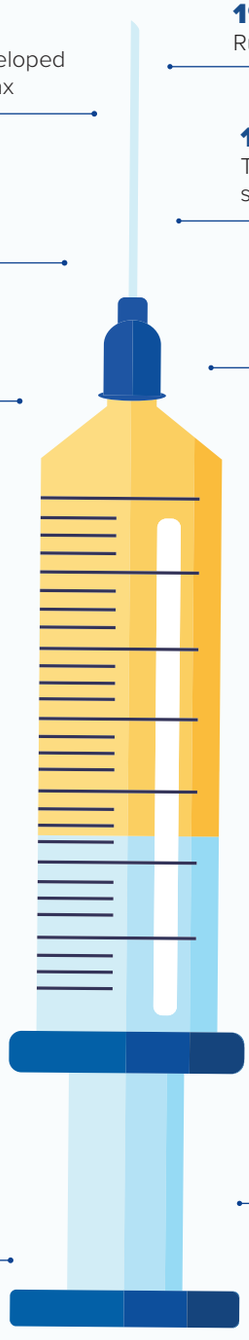
1948
Pertussis, diphtheria, and tetanus vaccines are combined and given as the DTP vaccine

1955
Dr. Jonas Salk develops the injectable (inactivated) polio vaccine

1960
Dr. Albert Sabin develops the oral (live attenuated) polio vaccine

1963
Measles vaccine is developed

1967
Mumps vaccine is developed



1938
Tetanus vaccine is developed

1969
Rubella vaccine is developed

1980
The World Health Organization declares smallpox eradicated

1981
Hepatitis B vaccine is developed

1996
Chickenpox vaccine is developed

1999
Rotavirus vaccine is developed

2000
Hepatitis A vaccine is developed

Polio vaccine is no longer recommended in the U.S. because of the vaccine's success

2001
Pneumococcal vaccine is developed

2006
The first HPV vaccine is approved for use in Australia and the U.S.

2021
COVID-19 vaccine is developed

Alana Jones

Twice

THE CHALLENGE, TWICE THE REWARD

MEDICAL SCIENTIST TRAINING PROGRAM CELEBRATES 30 YEARS OF FOSTERING PHYSICIAN-SCIENTISTS

By Rosalind Fournier

Alana Jones, a Medical Scientist Training Program (MSTP) M.D.-Ph.D. student at the UAB Heersink School of Medicine, was a Latin and biology double-major as an undergraduate at Howard University—unwavering, almost, in her plans to become a physician.

Then one summer she came to UAB for an NIH-funded program called PARAdiGM, which accepts outstanding college students from underrepresented minority backgrounds and introduces them to the concept of a career as a physician-scientist, a unique path for those who want to pursue both research and clinical medicine.

Jones spent the summer doing lab research in neonatology while also shadowing a physician in the neonatology ward. "I got to see how the wet lab and the clinic really merge, and I loved being able to go back and forth," she says. After returning to the program the following summer, she decided she wanted to pursue both worlds as an M.D.-Ph.D., a medical scientist with both a medical degree and a Ph.D. She is currently working on her Ph.D. dissertation project developing genetic and epigenetic risk scores for kidney disease in African Americans—something that combines her interests in health equity, epidemiology, and genetics—under the guidance of Marguerite "Ryan" Irvin, Ph.D., in the UAB School of Public Health.

WHAT IT TAKES

The MSTP is a rigorous process for those who undertake it, beginning with two years taking a selection of medical school and graduate courses concurrently, followed by completion of their Ph.D. before finishing clinical training in medical school. Completing the MSTP normally takes about eight years.

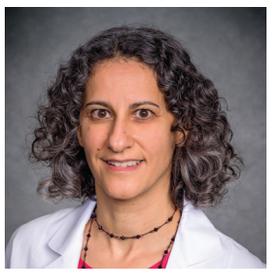
The Heersink School of Medicine's M.D.-Ph.D. program dates back to 1987, and the National Institutes of Health (NIH) designated the program as an MSTP in 1991. The designation confers prestige by recognizing the strength of an institution's M.D.-Ph.D. program after an exhaustive review process.

No less importantly, it provides funding to pay for MSTP students' tuition, fees, and stipends, along with support for curriculum development programming. UAB's MSTP, which recently celebrated its 30th anniversary, has produced leaders in science and medicine who have landed at some of the most prestigious institutions around the country. Roughly two-thirds of MSTP graduates move on to top 25 residency programs. Many others have remained at or returned to UAB and now serve as faculty, and others hold leadership positions in the school.

MSTP Director Talene Yacoubian, M.D., Ph.D., professor of Neurology, explains the value of a strong M.D.-Ph.D. program for fostering medical scientists who have the skills to play a singular role in medicine. "M.D.-Ph.D.s bridge the gap between laboratory research and clinical practice," she says. "Physician-scientists understand the clinical realm and know where we still lack knowledge in disease and what therapies we still need, so their research is dedicated to solving those questions and problems that ultimately improve care for patients. Being able to bridge both fields is where an M.D.-Ph.D. fills a unique spot in academics and research in general."

Alison Gammie, Ph.D., director of Training, Workforce Development, and Diversity at the National Institute of General Medical Sciences (NIGMS)—the institute that oversees the nation's NIH-funded MSTPs—cites the value of strengthening the relationship between research and clinical practice as the reason the NIH supports MSTPs at UAB and other chosen institutions.

"With the dual qualification of rigorous scientific research and clinical practice, graduates are equipped with the skills to develop research programs that accelerate the translation of research advances to the understanding, detection, treatment, and prevention of human disease," Gammie says.



Talene Yacoubian

Jeremy Day

William Geisler

ATTRACTING TOP TALENT

William Geisler, M.D., MPH, professor of Medicine, is the assistant dean for Physician Scientist Development in the Heersink School of Medicine and former co-director of the MSTP. "What the NIH MSTP designation means is we're in the top echelon of M.D.-Ph.D. programs," he says. "And because we're in that top group, we can attract top talent. There are much more rigorous standards you're held to as an MSTP—we have to be innovative, we have to change with the times and strive to be at the forefront."

As an indication of the program's success, Geisler points to the fact that, in the most recent renewal of their NIH-funded training grant, the UAB MSTP was awarded additional funds to support acceptance of two more students per year into the program. There are currently 75 students in various stages of the program at the Heersink School of Medicine.

Randy Seay, M.A., MPA, MPH, associate director of the Physician Scientist Development Office, says another selling point for potential applicants is the fact that UAB has so many strong, nationally recognized programs in multiple fields of medical research. "The overarching research opportunities, from epidemiology to nephrology, are what draw students here," Seay says. "They like that they have different opportunities aside from the traditional mold of biomedical science. They can take alternate pathways like health behavior, rehabilitation sciences, vision sciences, epidemiology, and biomedical engineering. Those alternate pathways to get a Ph.D. create a much broader applicant pool for the UAB MSTP. That is a great strength from an institutional standpoint."

Faculty members and mentors emphasize that, with the level of commitment required to complete an MSTP, the school places a high priority on providing support across the board for students. This begins with a strong mentorship program. Jeremy Day, Ph.D., an associate professor in the Department of Neurobiology, says he values the opportunity to mentor MSTP students along with the other Ph.D. students in his lab as a way of giving back what was given to him as a Ph.D. candidate. "I received training as a graduate student and post-doctoral fellow in how to do science—how to set up a research experiment, collect data, analyze that data, translate the findings, and communicate them in the format of a publication," Day says. "I really care about passing that on to the next generation of trainees coming through the lab." He says he also appreciates what the MSTP students in turn bring to the lab. "They want to think about how the work they're doing affects patients—how it's going to translate. I think that's good for everyone."

Peer support also plays an important role, says Seay. "One of the advantages of our program is we have a built-in support system. When we recruit students, we make sure they meet with students who fit in some way their own life situation. There are students who are establishing relationships, who are having children, trying to find work-life balance, focusing on trying to complete the degree and maintaining some type of personal environment. Peer connections can help them get through the rigors of the day-to-day but also year one to year eight."

Yacoubian points to the ways the program has grown over the years as well as goals on the horizon. The program boasts a high level of diversity both in gender ratios and enrollment of those traditionally underrepresented in medicine. The program has expanded on its training for grant writing, which culminates in every student submitting a fellowship grant—many of them with favorable results. "We have a high rate of students who are successful in getting funding, which is great for them because it will help them in the long run in their career goals," Yacoubian says. "But it also helps our program by bringing in money to our program, so it's a win-win for everyone." Also on the horizon is an alumni networking program to pair current students with alumni across the country who can share advice and serve as mentors.

Corey Duke, a recent MSTP graduate who began his residency in child neurology this summer at Boston Children's Hospital—where he has already connected with a fellow UAB MSTP alum, Christopher Yuskaitis, M.D., Ph.D., to serve as a mentor for this next stage of his career—says he's helped to spread the word by speaking to undergraduate students about what it means to be an MSTP. "I tell them, if you're curious, if you're passionate, and you get a lot of joy out of helping the patient in front of you—but you know you won't be fully satisfied without having the lab research skills as well— then it's the right path for you." He adds that he advocates for UAB's program above all others for the level of mentorship it provides, the volume and broad variety of patients students are exposed to, and research he says is on par with that of any major institution.

"If you're not afraid of challenge, UAB is a wonderful place to be," Duke says. "It's a privilege to get to see the patient diversity and to help UAB with its mission to serve people. The opportunities here are incredible, and the MSTP can make you into the person who's helping push the boundaries of medicine with what you discover in science."

If you're not afraid of challenge, UAB is a wonderful place to be. It's a privilege to get to see the patient diversity and to help UAB with its mission to serve people.""

—Corey Duke

Corey Duke

CUTTING-EDGE GENE THERAPY COULD DELIVER BREAKTHROUGH FOR SICKLE CELL DISEASE

By Adam Pope

Research from UAB published in the New England Journal of Medicine in February 2022 suggests a gene therapy called LentiGlobin could provide a drastic improvement in quality of life for people with sickle cell disease (SCD). Julie Kanter, M.D., director of the UAB Adult Sickle Cell Clinic, says patients treated with this therapy are beginning to show signs of producing stable amounts of normal red blood cells containing hemoglobin.

Sickle cell disease is a group of inherited red blood cell disorders. It is inherited when a child receives two genes—one from each parent—that code for abnormal hemoglobin. Red blood cells contain hemoglobin, a protein that carries oxygen. Healthy red blood cells are round and they move through small blood vessels carrying oxygen to all parts of the body. In a person who has SCD, the hemoglobin is abnormal, which causes the red blood cells to become hard and sticky and look C-shaped, like a sickle farm tool. The sickle cells die early, which causes a constant shortage of red blood cells. Also, when they travel through small blood vessels, they get stuck and clog the blood flow. This can cause pain and other serious complications such as infection, anemia, acute chest syndrome, and stroke.

SCD occurs in about one out of every 365 Black or African American births, according to the Centers for Disease Control and Prevention, and about one in 13 Black or African American babies is born with sickle cell trait.

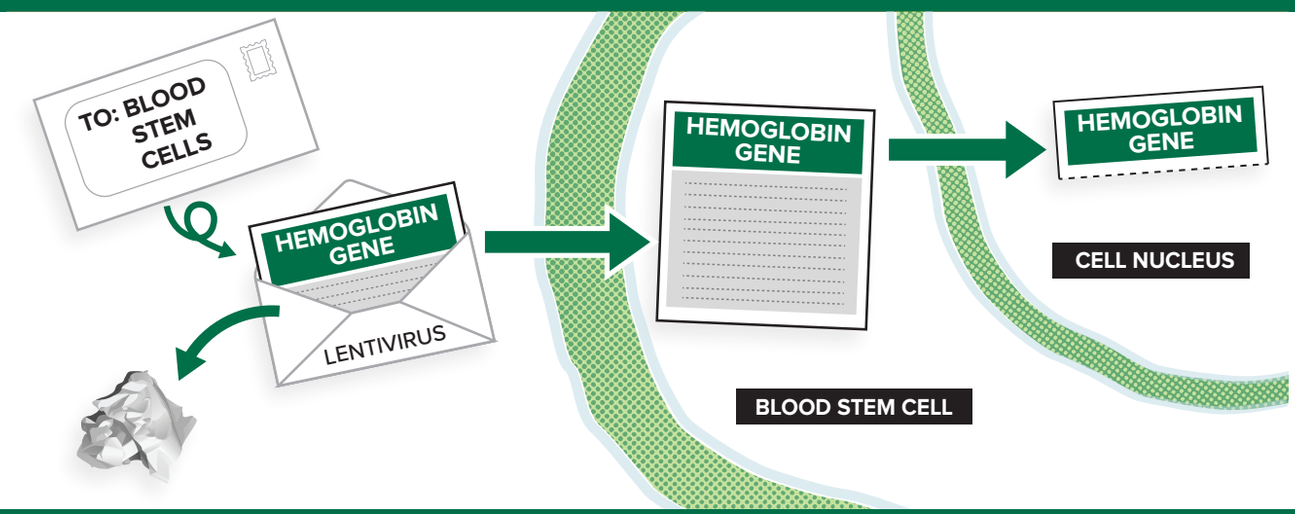
HOW IT WORKS

Kanter says there are several types of gene therapy (gene addition/transfer, gene editing, gene correction, and gene silencing), but this particular therapy is categorized as gene addition or transfer.

Julie Kanter with a patient at the UAB Adult Sickle Cell Clinic.

"I like to think of it [the viral vector] as an envelope. We take out the bad part of a virus (the letter) and leave the empty envelope. We put a new gene (the new letter) with the right instructions into the envelope and send it into the stem cells. The viral parts of the letter are removed so patients don't get the virus itself—they only get the letter coding for the new hemoglobin, called HbAT87Q (a modified type of normal HbA)."

—Julie Kanter



LentiGlobin gene therapy is a gene addition/transfer type made using a viral vector to deliver a new gene that will make a healthy hemoglobin--a beta hemoglobin--into the stem cell.

"In this therapy, we do not change or edit the genes that cause sickle cell disease," Kanter says. "Instead, we use a viral vector to deliver a new gene that will make a healthy hemoglobin—a beta hemoglobin—into the stem cell. This is like coding new instructions into the cell. The old instructions for the abnormal hemoglobin S (HbS) are still there, but now the cell can make normal HbA (hemoglobin A) and HbS. The vector can deliver more than one copy of the instructions to each cell—usually between one and four copies—so the cell can make more HbA than HbS."

WHAT IS A VECTOR?

A vector is part of a virus. Kanter compares vectors to envelopes and letters.

"I like to think of it [the viral vector] as an envelope," she says. "We take out the bad part of a virus (the letter) and leave the empty envelope. We put a new gene (the new letter) with the right instructions into the envelope and send it into the stem cells. The viral parts of the letter are removed so patients don't get the virus itself—they only get the letter coding for the new hemoglobin, called HbAT87Q (a modified type of normal HbA)."

WHAT IS T87Q?

T87Q is a special type of hemoglobin A that is slightly different from regular hemoglobin A and has two advantages:

- The intentional change inserted (called T87Q) makes the hemoglobin even less likely to cause sickling when it is near hemoglobin S.
- The HbAT87Q can also be measured more accurately inside the cell (since it is slightly different from regular HbA), which allows doctors to know how much of the new hemoglobin a patient is making compared to how much they get from a transfusion.

NEXT STEPS

Kanter says that, although this therapy is providing a significant amount of hope, researchers continue to test to make sure the therapy remains safe.

"In an earlier part of this study (now called "group A") we were not able to get enough of the new gene into each stem cell and we did not have enough total stem cells," Kanter says. "Not enough envelopes were delivered."

This caused the stem cells to be extra stressed and the patients to still make red blood cells with HbS and they had symptoms of sickle cell disease. They had only slight improvements in their hemoglobin levels or symptoms (compared to the current group C patients who are doing very well).

"Unfortunately, the stressed-out stem cells may have also housed a bad clone which can cause cancer when isolated in empty bone

marrow," she says. "Two patients in group A developed leukemia because these abnormal cells were too stressed."

It is important to note that the leukemia was not caused by the viral vector or the new gene (i.e. not from the LentiGlobin) but from the stress of the procedure and the insufficient cell correction.

"We need to see that we have fixed this problem in group C—and that no one else develops leukemia," Kanter says. "We also need to make sure this procedure both reduces pain/stops all pain crisis and prevents organ damage from sickle cell. This will take time. We will have to watch people for the next two to 15 years and measure their organ function compared to those who did not get this therapy."

HOPE FOR THE FUTURE

Much of Kanter's career has been dedicated to helping those with SCD. She says a therapy like this is a game changer.

"People with sickle cell disease have endured unnecessary hardship for more than 100 years," she says. "They have fewer medications and therapies than many other diseases and have received much less attention and funding. We need new and better options for people with sickle cell disease."

She also says this is just a beginning. "We need to make these treatments available, and we need all people with sickle cell disease to have a sickle cell specialist (doctor) to make that happen. We need the therapy to be affordable so that people everywhere living with this disease have the option for gene therapy. Right now, most people with sickle cell disease live in sub-Saharan Africa and in India. They don't have even the basic treatments they need like v accines, penicillin, or hydroxyurea that can make a huge difference in people's lives with SCD. Eventually we need people in these areas to have equal opportunity to better outcomes."

A Recipe for Success

In August 2022, Kanter was awarded a five-year, $7.7 million grant by the National Institute of Health to help eliminate barriers to care for those with sickle cell disease. She received the grant for her project, "Recruitment and Engagement in Care to Impact Practice Enhancement (RECIPE) for Sickle Cell Disease." Kanter co-leads the endeavor with several other investigators around the United States. They will use the grant to focus on finding and recruiting people with sickle cell disease (SCD) who are currently unaffiliated from care and understanding their barriers to their care.

Up to 50 percent of affected adults may not see SCD specialists, which limits the delivery of disease-specific screenings and treatment with disease modifying therapies. Issues worsen for individuals living in rural regions or with socioeconomic challenges.

"People not getting the care they need is a major issue for all people with health disparities but especially those with a stigmatizing disease," Kanter says. "Our goal with this project is to reduce the science-to-practice gap in SCD by identifying individuals who are not receiving guideline-based SCD care."

Kanter's project will emphasize the readiness of health systems to serve traditionally underserved populations and sustainability of this work in these areas. The researchers will advance efforts to identify and link unaffiliated patients to SCD specialists by applying implementation science research to adapt existing methods used in human immunodeficiency virus (HIV) care.

"Similar to SCD, individuals with HIV have faced significant healthcare stigma causing reciprocal misgivings about healthcare," Kanter says. "In this project, we will adapt models for patient identification and engagement in HIV to SCD using a multi-staged, patient-oriented process."

The Lifespan Comprehensive Sickle Cell Center is part of the Marnix E. Heersink School of Medicine's Department of Medicine Division of Hematology and Oncology. **– Tehreem Khan**

PROMOTING PRIMARY CARE

Primary Care Track graduates first cohort of medical students

By Tehreem Khan

For decades, reports have warned of the looming shortage of primary care physicians in the United States. The problem is especially acute in rural areas, like much of Alabama—according to the U.S. Department of Health and Human Services, 62 of the Alabama's 67 counties do not have enough primary care physicians to meet the needs of its population.

The Heersink School of Medicine's Primary Care Track (PCT) aims to increase the number of medical students who pursue careers in primary care. Moreover, it is hoped that some of these graduates will practice in under-resourced, rural communities. Last May, the first cohort of Primary Care Track students graduated, 65% of which entered potential primary care residencies.

A four-year M.D. program for students interested in primary care careers, the PCT is based at the Heersink School of Medicine's Tuscaloosa Regional Campus at the University of Alabama's College of Community Health Sciences (CCHS). The track provides students with a strong foundation in clinical medicine through longitudinal experiences with patients, lasting relationships with physician mentors, and special leadership-building programming.

"CCHS and other regional campuses support the school by extending the clinical training capacity and providing a training environment that emphasizes primary and community-based care," says Grier Stewart, M.D., assistant dean for Undergraduate Medical Education and associate professor of Family, Internal, and Rural Medicine at the CCHS. "The Primary Care Track continues to train physicians to return to rural Alabama."

"This track differs from traditional training in the sense that students get exposure to more outpatient care and follow their procedures in continuity," Renita Daniels, M.D., part of the first cohort of PCT graduates, says. "For example, I got to examine a pregnant woman in Family Medicine and six weeks later, her baby in Pediatrics. Similarly, another classmate examined a patient in Family Medicine and followed them through their process in Surgery." Daniels began the UAB Medicine-Pediatrics Residency Program last summer.

PCT students complete the requisite basic sciences curriculum during their first two years of medical school on the main campus in Birmingham. They then spend their third year in a Longitudinal Integrated Clerkship (LIC) on the Tuscaloosa campus. In the LIC clinical education model, students work alongside faculty for a majority of the year to follow and care for patients longitudinally, learning simultaneously across the core disciplines of medicine and in a variety of settings, including outpatient clinics, hospitals, nursing homes, and patients' home.

"As part of the LIC program, you get to do something different every day," Austin Brooks, M.D., who graduated in May 2022 from the Rural Medical Scholars Program, which is also based at the Tuscaloosa Regional Campus and offers the same coursework as the Primary Care Track. "As a person interested in general medicine and primary care, rotating through different specialties every day was truly the highlight of the program." Brooks joined the University of Alabama Family Medicine Residency Program last summer.

"As a person interested in general medicine and primary care, rotating through different specialties every day was truly the highlight of the program."

—Austin Brooks

During the fourth year, PCT students complete three required four-week rotations: In-patient Acting Internship, Acute Care Acting Internship, and Community Medicine Acting Internship. PCT students also complete 18 weeks of electives, in addition to a two-week residency preparation course. Brooks completed all of his rotations at the Tuscaloosa campus. “The continuity of physician-patient relationship was the big thing for me,” he says. “For example, being a part of delivering a baby and following them through postpartum checkups was very special.”

Another key attraction of the PCT is the mentoring offered. “Generally, students are drawn into the fields of mentors that serve as role models for them,” says Stewart. “One of the purposes of the PCT is to keep students exposed to physicians and mentors who work in primary care and community-based medicine. The hybrid LIC accomplishes this goal. By working one-on-one with their preceptors in the ambulatory environment, students have the opportunity to see what it’s really like in primary care.”

Brooks says he considers primary care the “cornerstone” of any health care system. “Primary care is like the quarterback in football—a person who should coordinate people’s care. The key is to be proactive and preventive, instead of reactive.”

According to Daniels, primary care is about the ability to see every point of care in a patient’s journey. “Everything branches through primary care; patients must see their primary care physicians when any symptoms appear. We are ones to treat them firsthand and send them to specialists if needed. Therefore, primary care is the starting point—the focal point of medicine.”

Currently, the CCHS is working on expanding its presence into the medical students’ preclinical years. “Our preclinical curriculum is being piloted and will expand to all PCT students with the class of 2026,” Stewart says. “We will teach and connect to students through online learning modules and discussion groups and bring them to Tuscaloosa for periodic clinics with a primary care mentor. We are also building a summer ‘camp’ for these students before the second year that will get them involved in the Tuscaloosa and West Alabama community and build on the education they are already receiving.”

ONE FINAL TEST

Medical student's training and quick-thinking help save a life

By Rosalind Fournier

In February 2022, Mario Andres Espinosa Hernandez was nearing graduation from the UAB Heersink School of Medicine and was looking forward to Match Day in March, when he would learn where he has matched into residency. However, there was one more challenge for him to overcome—one that arrived unexpectedly and with higher stakes than any he had previously encountered.

It was an ordinary Tuesday when Espinosa Hernandez headed to the gym to work out. There, something happened that changed two lives in dramatic ways. "I was doing my workout, and out of the corner of my eye I saw my friend crouched over a girl who was lying on the floor, and he was motioning for me to come over," Espinosa Hernandez says. "It looked like she was having a seizure."

Leaning into his medical school training, Espinosa Hernandez says he thought about the ABCs (airway, breathing, circulation), felt for a pulse (which he says was "very thready"), and began performing the jaw thrust maneuver to open her airway. A nurse who also happened to be at the gym hurried over to help. A few minutes later, Espinosa Hernandez saw that the woman's face, lips, and fingers were turning blue, and he checked her pulse again and found none. He asked the nurse to begin CPR and asked another person to get one of the gym's automated external defibrillators (AEDs). When they removed the woman's shirt to place the AED pads, he noticed a long scar running down her chest. "I saw that and thought, 'Oh no, this might be cardiac. It could be very serious.'" Indeed, once applied the AED diagnosed that the young woman's heart was in a fatal arrhythmia.

It was a moment that could have triggered what Espinosa Hernandez says medical students call "imposter syndrome"—the feeling that, regardless of all the training, you're not truly prepared to handle a life-or-death situation. Instead, he says the opposite sensation kicked in. "I didn't have time to be scared or nervous. My brain was like, 'You've done the simulations. You've had the training. You know what needs to be done, and she may die without it.'"

Espinosa Hernandez says he shocked her three times with the AED before the emergency medical system (EMS) team arrived. EMS shocked her again, finally bringing the woman back to a regular heart rate before rushing her to the ambulance.

Only then did the enormity of what had just happened hit Espinosa Hernandez. "When I knew she was at least temporarily stabilized, all of the emotions flooded in," he says. "I was shaking, and it seemed like the entire gym walked up to me, asking me questions and calling me a hero. It was insane."

Knowing his quick reactions had helped save a young woman's life would have boosted the confidence of any medical student, but it held particular significance for Espinosa Hernandez. Growing up, he helped care for his mother, who suffers from multiple sclerosis. The two watched a lot of medical shows together, and he says he was hooked. "My mom would call me her little doctor," Espinosa Hernandez, whose family is from Puerto Rico, says. "I knew medicine was what I needed to do. I wanted to help people."

Not surprisingly, Espinosa Hernandez's first call after helping save the young woman's life was to his mother. "We were both on the verge of tears, because she's my motivation for everything," he says. "She told me she always knew I had it in me and said she was really proud of me. It made me feel, 'I need to do this.'" He says he felt in those moments like he genuinely belongs in medicine.

That hasn't always been the case. Espinosa Hernandez admits he occasionally struggled with doubt and insecurity while in medical school. "I sometimes had feelings of, 'I'm different than a lot of the other medical students, I'm from Puerto Rico, I come from a low-income household.' I thought maybe I didn't really belong," he says. "But I will always love UAB, because UAB was the medical school that gave me a chance. And then this happened, and it definitely gave me a boost of confidence."

For several weeks, Espinosa Hernandez did not know the fate of the woman he had helped keep alive, until one day a staff member at the gym told him that her father was trying to track him down. "I called him, and it was very emotional," he says. "He filled me in on a lot of details. She has a congenital heart disease called Tetralogy of Fallot, and she had had open-heart surgery when she was 15 or 16 months old. She was actually scheduled to have another heart procedure done before the incident at the gym happened."

Espinosa Hernandez learned that the woman spent several days in the ICU before being transferred to the hospital where her heart surgeon practices. Her father told him she had had the scheduled heart procedure and was home recovering well.

Today, Espinosa Hernandez has started residency training at the University of Florida in Gainesville. His specialty is an appropriate one: emergency medicine. "Maybe this is cheesy, but when I was a kid taking care of my mom, I really wanted to be a hero. One of the reasons I wanted to go into emergency medicine is I wanted to know what to do in case of an emergency, and this scenario has showed me that I achieved my dream."

Mario Andres Espinosa Hernandez

BECOME SOMETHING YOU'VE NEVER SEEN

Two alumni reflect on their paths to practicing rural medicine

By Lynne Hall

The quote "You can't be what you can't see" by civil rights activist Marian Wright Edelman is one UAB Heersink School of Medicine 2014 alumna Brittney Anderson, M.D., often cites as her motivation to help mentor and recruit more Black students into the medical profession. The lack of role models and exposure to how one pursues a career in health care is an important factor in Black underrepresentation in medicine.

At age 6, Anderson made it her goal to serve others by becoming a physician. She says her ability to believe she could become something she'd never seen—a Black female physician—was due largely to her love of reading. Books transported Anderson, who grew up on a small family farm in Autauga County, to faraway places and opened her mind to other ways of life.

"Reading exposed me to what was outside of our dirt-road farm," Anderson says. "It showed me there were people who lived differently and interesting things going on outside our farm in Alabama. Reading was the vehicle that helped me realize the possibilities that were out there."

A sense of boldness and being open to opportunities runs in Anderson's family. The farm she grew up on was land her great-grandfather bought after decades of his family working and sharecropping the land. At the time, he was among the few Black landowners in the area.

"It was a great place to grow up. The main crop was sugar cane, and we had a syrup mill. After working several years at Prattville's cotton gin, he farmed crops to sell. But he gave away more than he sold. He always did his part to ensure those in our community could feed their families."

> **"Reading exposed me to what was outside of our dirt-road farm. It showed me there were people who lived differently and interesting things going on outside our farm in Alabama."**
>
> —Brittney Anderson

As much as she loved the farm, when it came time to begin her journey toward her life's goal, she eagerly ventured out—first to Duke University in North Carolina, where she threw herself into her undergraduate studies and enjoyed the freedom of living away from home for the first time. Then, after her junior year, she completed a study abroad trip to Ghana, West Africa, which proved transformative.

Stricken with malaria, Anderson had an up-close-and-personal experience of the country's health care system. She was struck by how poor access to physicians and resources resulted in long travel distances and negative effects on health.

Inspiration struck: She knew where she was needed. "I was so excited," she says. "When I got back, I told my parents, 'They need me there. That's where I'm going to practice when I finish my training.'"

Her father had a different viewpoint. Look around, he told her, there are problems here at home. People need you here, he said. A check around her home county proved her father right, and it wasn't just in Autauga that people struggled to access health care. Since 2005, seven rural Alabama hospitals have closed and 30 more are at risk. A shortage of rural physicians means patients must travel long distances for care.

Her interest piqued, she got accepted into the Rural Medical Scholars Program, a partnership between the Heersink School of Medicine and the school's Tuscaloosa Regional Campus, housed at the University of Alabama's College of Community Health Sciences. There she learned about the health care disparities in rural areas across the state that result in higher rates of disease, increased mortality, and lower life expectancies.

More importantly, she learned she could make a difference without leaving her home and family behind. In July 2022, Anderson opened Anderson Family Care in Demopolis, and says she has already experienced the best of what rural practice has to offer.

"It's been overwhelming, but in a great way," she says. "The support we've had from the town and its leaders has been great. We've been seeing a full schedule of patients and we've had so many people stop in just to say 'hey' and 'we wish you well.' Some have even brought us lunch. Our motto for the clinic is 'We treat your family like family,' and that's what it feels like—we're just family."

Another way Anderson is working to alleviate the access problem by helping recruit more underrepresented minorities into health care professions. She has worked with the Heersink School of Medicine/Medical Alumni Association Underrepresented in Medicine (URiM) Initiative, which seeks to increase and enrich Alabama's physician workforce by recruiting more diverse students. She speaks with high school students, and at her church she started the Bright Futures

BRITTNEY ANDERSON

ARNELYA CADE CHATMAN

> **Cahaba has opened my eyes to what could be in all rural areas. You shouldn't have to have less than just because you're rural."** —Arnelya Cade Chatman

Health Interest Group, a monthly Zoom meeting that features Black health professionals talking with students about their specialty, from therapists to technicians to physicians. To top it all off, Anderson also writes a regular blog called Melanin Mentor, M.D., in which she speaks to Black pre-med students as a big sister or mentor would to help them through their training.

"Everything I do as a physician, from encouraging the next generation of health care workers to treating patients in clinic, gets to the heart of who I am and to the legacy of my parents and grandparents," Anderson says. "I just want to help people; and to do so in the most genuine and compassionate way I can."

A JOURNEY WORTH TAKING

By age four, Heersink School of Medicine 2015 alumna Arnelya Cade Chatman, M.D., was proclaiming her goal to become a pediatrician. High aspirations for a young Black girl growing up in the small town of Thomaston, Alabama (population 326), perhaps, but her exposure to the medical field had come early, when at age 2 she began a five-year ordeal of gastrointestinal symptoms that had her in and out of the hospital with no diagnosis. Finally, a doctor diagnosed the cause as anxiety.

"It was brought on by the death of my grandfather," Chatman says. "He was my main caretaker and the loss was shattering. It was frustrating even back then being sick for so long and not getting a diagnosis."

The summer following seventh grade solidified her determination to become a physician. Her grandmother experienced a stroke that summer, and her care fell to Chatman. She quickly learned how to cook, ensured her grandmother took her medications, and did all she could to nurse her back to health. It was her first health care success.

"Oh, she's still with us," Chatman laughs easily. "She's still going strong at 97."

Growing up in a small town, Chatman became aware of disparities in rural health care early on. The nearest physician was 26 miles away in Demopolis, which was a problem for those without transportation or money for gas. Lack of health insurance, hospital closures, elevated drug costs, an older and sicker population, and high poverty levels were, and still are, challenges for rural health in Alabama.

Chatman learned more about these disparities her junior and senior years of high school when she participated in the University of Alabama Rural Health Scholars (RHS) program and the Minority Rural Health Pipeline Program (MRHPP), where she lived on campus and took college courses, attended tutorials and seminars, and shadowed health care professionals, and took field trips to rural medical facilities.

"I was fortunate to be able to do those programs," Chatman says. "I earned college credit, we learned about various health care professions, we met doctors, nurses, and pharmacists, and took tours of rural hospitals. Plus, I took chemistry and was able to use a lab for the first time. My high school was so small it didn't have a working lab."

Continuing in the Rural Scholars Programs after obtaining her chemical engineering degree at the University of Alabama, she was then accepted into the Rural Medical Scholars Program, where for the first time, the high school valedictorian and undergraduate magna cum laude student found herself struggling.

In addition to the sudden wave of new school work, the daytime sleepiness that had plagued her for years became overwhelming. She sought help and, again, spent years searching for a diagnosis.

"I just couldn't stay awake to study. A 30-minute power nap would turn into two hours and I was really struggling."

She somehow powered her way through her studies, earning her medical degree from Heersink School of Medicine. It wasn't until her intern year of residency that she was diagnosed with narcolepsy and began taking medication. That (second) struggle for a diagnosis informs her patient care philosophy, she says.

"I don't want my patients to go through that," she says. "It's important that they know I take them seriously and that I'm there for them."

On Match Day, Chatman matched with Cahaba Medical Care in a new community-based family medicine residency program, a partnership with the Heersink School of Medicine's Department of Family and Community Medicine. It was a natural fit. Cahaba Medical Care has locations in several Alabama counties, and is dedicated to helping both underserved urban and rural patients get the care they need.

Now practicing at the center's office in Woodstock, Alabama, Chatman is happy for the resources they provide, including dieticians, social workers, counselors, prescription and financial assistance, and programs that help ensure patients with limited resources can get to specialist appointments.

"Cahaba has opened my eyes to what could be in all rural areas. You shouldn't have to have less than just because you're rural," she says.

In addition to the care she provides at Cahaba, Chatman, like Anderson, is active in the SOM/MAA URiM initiative. She was featured in a promotional video for the initiative and continues to work with the Outreach Committee's SPARK program to "spark" interest in the health professions in junior-high and high school minority students and provide mentorship. Her story, no doubt, is an inspiration and she is certainly a good role model for students who can see themselves in the woman who was once a little Black girl from tiny Thomaston, Alabama.

"It's been quite the journey. If I had to do it all again, I would," she says. "I really can't see myself doing anything else. I'm fulfilled in what I do and I feel I'm making a difference. I really care about my patients and they care about me. It really is wonderful."

Learn more about the URiM Initiative, and watch a video featuring Arnelya Cade Chatman at maa.uab.edu/urim.

AN INVALUABLE GIFT

Scholarships open doors to medical school and allow passion —not paycheck—to guide decisions

By Rachel Burchfield

On September 20, 2022, 185 scholarship donors and medical student scholarship recipients gathered together at the Hilton Birmingham at UAB for the UAB Heersink School of Medicine Scholarship Dinner. It was the school's first in-person Scholarship Dinner since the COVID-19 pandemic, and donors and students were excited to be able to meet each other, most for the first time.

The Heersink School of Medicine is fortunate to have an outstanding group of medical scholarship donors. Their generosity encourages young aspiring physicians during a critical moment in their lives and ensures the best and brightest are welcomed into the medical field regardless of their background. For the 2022-2023 academic year, the school distributed more than $4.5 million in scholarship dollars—an almost 8% increase over the previous academic year. Nearly a quarter of the medical student body received a scholarship this academic year.

Read on to learn more about two scholarships—one long-standing and one newly established—that support our students through their medical school journey.

AN ENDURING COMMITMENT

It's no secret that medical school comes with a hefty price tag. Fortunately, recipients of the Paul W. Burleson, M.D. Medical Scholarship—one of the most financially generous scholarships the Heersink School of Medicine offers—are able to focus more on their studies and less on how to afford the experience.

Not surprisingly, having tuition, fees, and other educational expenses paid for positively impacts their medical school experience, and the ripple effect goes far beyond just their four years at the Heersink School of Medicine, recipients say. Because they won't have to someday face paying off hundreds of thousands of dollars in student loans, the Burleson scholarship gives them freedom to choose the medical specialty they are most passionate about—and not necessarily the one that is the most lucrative. Enthusiasm for primary care takes the driver's seat, not the worry of having to eradicate exorbitant debt.

Such is the case for scholarship recipient Eddie Higginbotham, a first-year medical student. "There's the assumption going into medical school that massive debt comes along with it," he says. "I don't think anybody plans to come out of medical school without debt. When I got the call back in April that I'd be receiving the scholarship, I was in shock. It was a huge burden and relief lifted off of my shoulders. It definitely freed me up to consider all paths of medicine. For a lot of medical students, income post-medical school is a really big thing. If you come out with $400,000 in loans—even if you come out making $200,000 as a primary care physician—that's still a huge burden in loans you have to pay off, even though technically you're making a good income."

Higginbotham says he wants to become a primary care physician and can do so now without reservation. Had he not received the Burleson scholarship, a higher-paying specialty might have won out. "It freed up that path," Higginbotham says. "The door is wide open [to become a primary care physician] and not have to go an alternate route."

The scholarships are awarded to medical students with both high academic standing and financial need, with a preference given to those students who, like Higginbotham, are residents of Alabama and are interested in practicing primary care in the state upon completion of their training. Higginbotham, a native of Corner, Alabama, plans to do just that.

"I hope to be able to give back to the community that gave so much to me—I cannot express enough gratitude," he says.

HONORING A LEGACY OF CARE

The Burleson scholarships are named for Paul W. Burleson, M.D., who served the Heersink School of Medicine as an

This page and facing: Linda Draughn with Burleson scholarship recipients at the 2022 Scholarship Dinner.

internist for 35 years before retiring in 1986. From his own experience, Burleson was keenly aware of the heavy financial burden medical school debt creates for students. Because of this, he and wife Martha established the Paul W. and Martha R. Burleson Scholarship Endowment and the Paul W. Burleson Foundation, which provides not just medical student scholarships but also internal medicine faculty support. The foundation—established by Burleson's estate after his death in 2005—is supporting 10 students this academic year alone. Ten students are typically awarded the scholarship annually, and students that qualify may be awarded the scholarship each successive year of medical school.

"Through the Burleson Foundation, we try to honor Dr. Burleson's wishes to help pay for medical school for deserving students who have both outstanding scholastic achievement and financial need," says Linda Draughn, Martha Burleson's daughter and the director and trustee of the Burleson Foundation. "We have been so fortunate to have been able to support so many incredible students over the years."

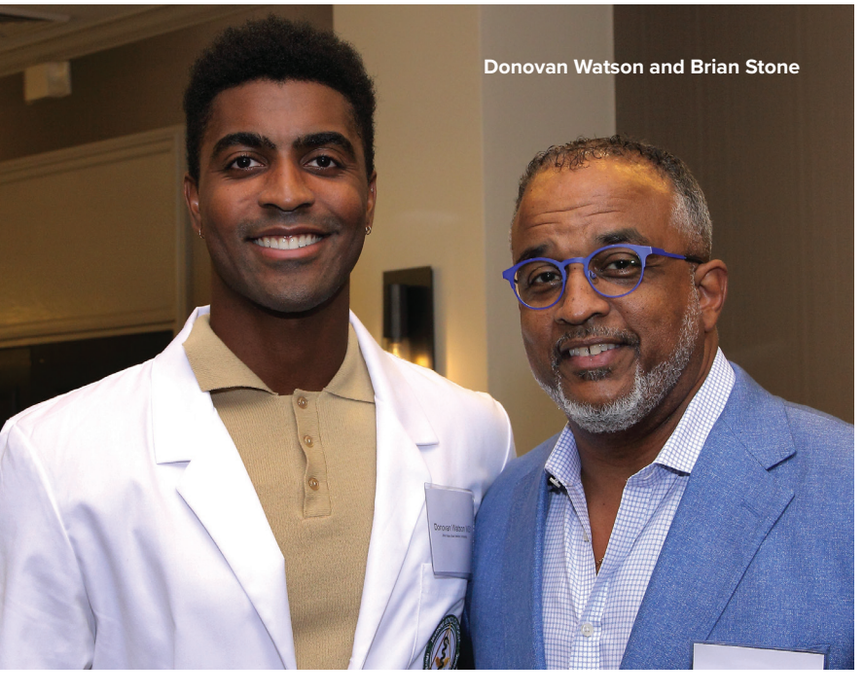
One such student is first-year medical student Juan Gordillo, the child of immigrants and both a first-generation college student and first-generation medical student. "Ever since I was a child, medical school was a big dream," he said. "My parents tried to instill in me that I could achieve anything I want—you know how your parents do. [This scholarship] really helped make that dream a possibility. It allows me to focus on school without thinking about juggling a job on the side. I can't imagine how difficult that would be, to stay afloat. It guarantees a peace of mind that is invaluable to me."

Other Burleson scholarship recipients echo that sentiment. Third-year medical student Michael Pettit said he was nervous coming into medical school because his family wasn't able to help him financially; the Burleson scholarship reassured him that medical school was the right path. Being awarded the Burleson scholarship cemented second-year medical student Amiria Blakely's desire to become a primary care physician, as well as her desire to stay in Alabama to show others from the state that anything is possible.

"Having this scholarship makes it so much easier for me, and takes away the thought of 'How am I going to do what I love

> **“Our goal is to increase the pool of academically qualified kids with an interest in STEM majors, which will allow UAB to recruit more Alabama natives into the School of Medicine who will more likely stay and practice medicine in Alabama.”**
>
> —Brian Stone

and also provide for myself?’” Blakely says. “I can focus on how to be a good student and future physician to make a bigger impact in the lives of my future patients. Initially, I thought maybe I’d go somewhere [outside of Alabama] for residency. But knowing that there is such a large community here who wants to see students succeed and make a difference in Alabama’s health care system has changed my perspective to stay here and be a part of this environment. Having the direct support from the Burleson scholarship and knowing that they want to see me succeed has made a huge difference in my mindset and what I want to do moving forward.”



Donovan Watson and Brian Stone

“WE’VE GOT TO DO SOMETHING”

Brian Stone, M.D.—a urologist who lives in Birmingham and practices in Jasper—still remembers what his mentors told him.

“As my mentors steered me along the way—some of whom were African-American—they didn’t ask much of me other than, if I had the opportunity, to reach back and help a young Black student,” Stone says. “I do the same with all of my students, but I’m very conscious of underrepresentation in our population. I do everything I can to teach and also tell the people I’m mentoring to do the same—be a mentor to somebody. You never know who you may influence.”

One student Stone mentors is Donovan Watson, a first-year medical student at the Heersink School of Medicine. Watson is the first recipient of the Beta Kappa Boulé Medical Scholarship. The scholarship, which is funded by a $25,000 endowment, was established this year to support a URiM (underrepresented in medicine) student at the Heersink School of Medicine. Beta Kappa Boulé—which is the Birmingham chapter of Sigma Pi Phi Fraternity—is an organization that is committed to mentoring young African-American men to become successful. The national organization was founded in 1904 and is the oldest graduate African-American fraternity in the country.

“[Beta Kappa Boulé] has always represented some of the most successful Black men in the Birmingham community—doctors, lawyers, and businesspeople,” Stone says. “We have always been very socially conscious, particularly now with the precipitous decline of African-Americans in STEM [science, technology, engineering and math] careers. Creating this scholarship was part of this initiative, and we’ve also created a STEM program for the Boys and Girls Club of Birmingham, an after-school program to introduce middle school to 12th grade kids to STEM activities. Our goal is to increase the pool of academically qualified kids with an interest in STEM majors, which will allow UAB to recruit more Alabama natives into the School of Medicine who will more likely stay and practice medicine in Alabama.”

The Beta Kappa Boulé Medical Scholarship—funded by 13 members of the chapter, the majority of them physicians themselves, and a grant from the Beta Kappa Boulé national office—seeks to increase the number of Black students admitted to medical school, which Stone says is at its lowest point since 1978.

“That was kind of a call to action,” he said. “We’ve got to do something.” The chapter’s goal became clear: to address the declining number of Black medical students. This scholarship is one way to help in that effort, Stone says. “Physicians of color tend to take care of the majority of Black patients, and they’re much more likely to work in the communities where those patients are,” he says. “It’s very important to us for that reason. Diversity in the physician workforce is critical in maintaining compassionate care for all.”

The Heersink School of Medicine, which is committed to diversity, provided a one-to-one match for Beta Kappa Boulé’s scholarship effort.

When Watson received his acceptance letter to the Heersink School of Medicine, it was accompanied by an email notifying him he’d received the scholarship, alleviating a significant financial burden for Watson and his family. The scholarship will cover 75 percent of Watson’s medical school tuition for four years.

Supporters of the Beta Kappa Boulé Medical Scholarship with recipient Donovan Watson (back row, second from right) and scholarship recipient Alyssa Cole (second from left) at the 2022 Scholarship Dinner.

"I was beyond happy," Watson says. "It really helps my family out so much. I don't have to take on student loans, and it helps me tremendously. Also, I don't have to worry about working as much, which helps take a weight off of my shoulders."

AMPLIFYING DIVERSE VOICES

Watson—who has known he wanted to be a physician since he was a young child—received his undergraduate degree from UAB, and the Heersink School of Medicine was always his top choice, he says.

"[Medicine] was one of those fascinations I've had since I was a little kid," he says. "I've had a couple of procedures myself and watching doctors doing different things from a young age—I thought that was the coolest thing ever. As I got older and was doing different school assignments, science courses related to medicine was what I naturally gravitated towards. I did research on my own and volunteer work, and it really pushed me to this path."

In addition to the financial support, Watson says he has met many minority physicians through his connection to Beta Kappa Boulé, including Stone, who Watson shadowed in his practice, Jasper Urology Associates.

Watson says he is interested in surgery, but still undecided as to what type of medicine he wants to practice long-term. Meeting the doctors in Birmingham's Beta Kappa Boulé chapter will allow him to be mentored by doctors who can help him find the right fit for him in medicine.

"It's opened doors to meet a lot of new people I might not have been able to meet had I not gotten the scholarship," Watson says. "This has definitely helped and will help me going forward even more. [I want to] see what knowledge about their fields they can share. I'm very interested to hear what advice they have for me going forward in life."

When underrepresented populations don't have a seat at the table, it hurts the practice of medicine in the United States, Stone says. The Beta Kappa Boulé Medical Scholarship hopes to do its part to amplify the African-American voice in the profession, specifically in Alabama.

"Having diversity of thought in graduate medical education increases the likelihood of a compassionate physician," Stone says. "We need diverse representation in all STEM professions."

To learn more about supporting medical scholarships and the Dean's Office scholarship match, contact Erica Hollins at (205) 996-6839 or elhollins@uabmc.edu.

NEW RESEARCH BUILDING

A new Biomedical Research and Psychology Building supported by a $76 million federal appropriation has received stage 1 approval by the University of Alabama System Board of Trustees. Pending additional approvals by UA System Board of Trustees, the six-story, 165,000-square-foot building will house the College of Arts and Sciences' Department of Psychology and research-intensive departments from the Heersink School of Medicine. Wet and dry research laboratories and research support spaces in the new building will provide flexibility for investigators from various fields and disciplines to utilize the space.

LCME ACCREDITATION SUCCESS

In November 2022, the UAB Heersink School of Medicine was notified it had achieved the highest level of accreditation available to a medical school in the United States—valid for eight years—by the Liaison Committee on Medical Education (LCME). The achievement came after a rigorous, two-year self-study process.

Accreditation demonstrates that the Heersink School of Medicine has met and is maintaining high standards set by the LCME, the nationally recognized authority for accrediting medical education programs leading to the M.D. degree in the United States and Canada.

"Maintaining our full LCME accreditation is a testament the work teams across the school put into the process," says Craig Hoesley, M.D., senior associate dean for Medical Education. "We took a long look at our institution and began making changes in areas where we felt we could grow to address our challenges, which is the whole point of the accreditation process. Full accreditation is also a signal to students and faculty that the Heersink School of Medicine provides medical education rivaling schools across the country."

The LCME Executive Committee, directed by faculty co-leads Cathy Fuller, Ph.D., professor in the Department of Cell, Developmental and Integrative Biology, and Gustavo Heudebert, M.D., professor in the Department of Medicine, oversaw each step of the process, which included a Self-Study Task Force and Independent Student Analysis. The process concluded with a virtual site visit from an LCME review team April 11-13, 2022.

The full LCME findings are available at go.uab.edu/lcme.

GRANT FUNDS VIRTUAL REALITY SIMULATION LAB

Thanks to grant funds from the Comprehensive Urban Underserved and Rural Experience (CU2RE) Program in the UAB Department of Family and Community Medicine, the Huntsville Regional Medical Campus (HRMC) purchased four virtual reality simulators and built out a new simulation lab on the HRMC's first floor.

The simulators include both an abdomen and upper body that can be filled with fluid for students to ultrasound, prep, and drain; a torso that simulates heart and lung sounds; wrists and arms for practice placing arterial lines and IVs; and a pelvis, simulating births. The campus also purchased several point of care ultrasound (POCUS) systems to support the training.

HRMC Regional Dean Roger Smalligan, M.D., MPH Smalligan says the most important of the simulators are the central line trainers, which help students and residents learn how to properly prep and drape a patient and then use the handheld ultrasound to find the critical blood vessels in the neck and safely place a central line, minimizing the risk of damage to the carotid artery or causing a pneumothorax.

WELCOMING LEADERS

ANUPAM AGARWAL, M.D., became interim vice president of Medicine and interim dean of the Heersink School of Medicine in September 2022. Agarwal serves as the school's executive vice dean. He formerly directed the Division of Nephrology and serves as the program director of the O'Brien Center for Acute Kidney Injury Research.

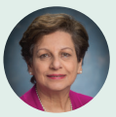
SCOTT BALLINGER, PH.D., was named the new associate dean for Faculty Affairs in the Heersink School of Medicine. Ballinger is a professor in the Division of Molecular and Cellular Pathology and associate director of the Center for Free Radical Biology.

KENNETH BOOCKVAR, M.D., was named director of the Division of Gerontology, Geriatrics and Palliative Care and director of the Integrative Center for Aging Research.

WILL BROOKS, PH.D., a professor in the Department of Cell, Developmental and Integrative Biology, was named assistant dean for Preclinical Education in the Heersink School of Medicine.

ANDREA CHERRINGTON, M.D., was named interim director of the Division of Preventive Medicine. She is a professor of Medicine, associate professor of Public Health, and the Triton Endowed Professor in Health Equity Research.

GENA DUNIVAN, M.D., joined the Department of Obstetrics and Gynecology as director of the Division of Urogynecology and Pelvic Reconstructive Surgery and vice chair of Mentorship and Faculty Development.



MONA FOUAD, M.D., was appointed associate vice president of UAB's Office for Diversity, Equity, and Inclusion. Fouad also serves as senior associate dean for Diversity and Inclusion in the Heersink School of Medicine.

NICOLE LOHR, M.D., PH.D., was named director of the Division of Cardiovascular Disease, director of the Comprehensive Cardiovascular Center, and co-director of the UAB Medicine Cardiovascular Institute.

SHIVANI MALHOTRA, M.D., was named chair of the Department of Family Medicine at the Heersink School of Medicine's Huntsville Regional Medical Campus.

SOROUSH RAIS-BAHRAMI, M.D., MBA, was named interim chair of the Department of Urology. He is a urology professor and a scientist in the O'Neal Comprehensive Cancer Center at UAB's Experimental Therapeutics Program.

TERESA WILBORN, PHARM.D., PH.D., was appointed interim chair of the Department of Pharmacology and Toxicology. Wilborn serves as professor and vice-chair in the department.

DINE WITH THE DOCS RETURNS

After a two-year pandemic hiatus, the Medical Alumni Association (MAA) resumed its Dine with the Docs dinner events November 3-5, 2022. Approximately 20 alumni signed up to host small groups of medical students in their homes, and nearly 100 students across three of the school's campuses—in Birmingham, Tuscaloosa, and Huntsville—participated.

MAA Assistant Director Beth Eddings worked with alumni to organize the dinners. "We allow the hosts to have all the creativity they'd like," she says. For example, four hosts from the event work together at Urology Centers of Alabama, and two live in the same neighborhood, so their dinner was progressive. "The students ate dinner at one house and walked to another for dessert."

Britney Corey, M.D., associate professor in the Department of Surgery, hosted a group at her lake house and took them out for a sunset boat ride. "The night was a success because we were all able to relax together and enjoy each other's company," she says.

AI IN MEDICINE SYMPOSIUM

The Marnix E. Heersink Institute for Biomedical Innovation held its inaugural AI (Artificial Intelligence) in Medicine Symposium on September 29, 2022. Rubin Pillay, M.D., Ph.D., the institute's executive director, and Andrew Smith, M.D., Ph.D., the institute's Clinical Director of AI, welcomed guests who attended on Zoom and in person. Anupam Agarwal, M.D., interim dean of the Heersink School of Medicine, and Marnix Heersink, M.D., whose $95 million gift named the Heersink School of Medicine, opened the symposium.

Keynote presentations included "Current and Future of AI in Clinical Medicine: Lessons Learned this Decade and Future Paradigm for Clinical Impact" by Anthony Chang, M.D., founder of AIMed, and "Building an AI Program at Mayo Clinic," by Chris Aakre, M.D., vice chair for AI and Informatics at the Mayo Clinic.

Additional presentations included "Integrating AI and Knowledge Maps for Drug Discovery," by Jake Chen, Ph.D., chief bioinformatics officer at the UAB Informatics Institute and a professor of Genetics, Computer Science, and Biomedical Engineering; "Addressing infrastructure needs to develop, evaluate, and clinically implement AI software solutions," by Carlos Cardenas, Ph.D., assistant professor in the UAB Department of Radiation Oncology; "Algorithmic Approaches to Antibiotic Discovery," by Jon Stokes, Ph.D., assistant professor of Biochemistry and Biomedical Sciences at McMaster University in Hamilton, Ontario, Canada; "Augmented Intelligence in Radiology," by Andrew Smith, M.D., Ph.D., professor in the UAB Department of Radiology; "Screening and Case Detection with AI for Integration into Clinical Practice," by Sandeep Bodduluri, M.S., Ph.D., instructor in the UAB Division of Pulmonary, Allergy and Critical Care Medicine; and "Your First Hire and Your First AI Project," by Ryan Melvin, Ph.D., assistant professor in the UAB Department of Anesthesiology.

SIMULATION PROMOTES YOUTH MENTAL HEALTH

As of fall 2022, fellows in the UAB Department of Psychiatry and Behavioral Neurobiology and students from the Department of Social Work in the College of Arts and Sciences now undergo a child and adolescent mental health simulated training in an emergency room setting as part of the both programs' curriculum.

"Through the simulation, social work graduate students and child and adolescent psychiatry fellows receive hands-on experience in providing acute mental health care to child and adolescent patients," says Blessing Falola, M.D., assistant professor and director of the Child and Adolescent Psychiatry Fellowship Program. "Trainees learn to demonstrate interprofessional communication and determine the appropriate care in an emergent situation."

During the simulation, Falola and Laurel Hitchcock, Ph.D., associate professor in the Department of Social Work, provide instruction, direct the debriefing process, and review trainees' learning goals and feedback on the interprofessional collaborative patient care experience.

"The knowledge, skills, and perspective learned from this experience will strengthen the interprofessional collaborative teamwork often encountered in the emergency room and ultimately lead to quality patient care and satisfaction," Falola says.

AWARDS & ACCOLADES

MARY-ANN BJORNSTI, PH.D., professor and former chair of the Department of Pharmacology and Toxicology, became president-elect of the largest coalition of biological and biomedical research associations in the United States, the Federation of American Societies for Experimental Biology (FASEB). Her term began July 1, 2022.

CHERI CANON, M.D., professor and chair of the Department of Radiology, was named the 2022 Ashbel Smith Distinguished Alumni Award recipient by the University of Texas Medical Branch at Galveston John Sealy School of Medicine Alumni Association Board of Trustees.

WARNER HUH, M.D., chair of the UAB Department of Obstetrics and Gynecology, received the American Cancer Society's 2021 St. George National Award, which is given to outstanding community volunteers in recognition of distinguished service to the American Cancer Society.

KIERSTIN KENNEDY, M.D., interim chief medical officer at UAB Medicine, joined the board of directors of the Society of Hospital Medicine for a three-year term in April 2022.

BRUCE KORF, M.D., PH.D., professor in the Department of Genetics, associate dean for Genomic Medicine, and chief genomics officer, and **ANATH SHALEV, M.D.,** professor in the Division of Endocrinology, Diabetes, and Metabolism and director of the UAB Comprehensive Diabetes Center, were inducted into the Association of American Physicians, which recognizes outstanding physician-scientists who make the highest contributions to the advancement of medicine.

SUZANNE LAPI, PH.D., professor and vice chair of research in the Department of Radiology and director of the UAB Cyclotron Facility, was selected for the Academy for Radiology and Biomedical Imaging Research Council of Distinguished Investigators Class of 2022.

JAYME LOCKE, M.D., MPH, director of the Division of Transplantation and Arnold G. Diethelm Endowed Chair in Transplantation Surgery, was one of 95 new members elected to the American Society for Clinical Investigation for 2022.

JEANNE MARRAZZO, M.D., professor and director of the Division of Infectious Diseases, received the 2022 American Sexually Transmitted Diseases Association Distinguished Career Award.

VU NGUYEN, M.D., chair of the Department of Physical Medicine and Rehabilitation, was named as the North American representative to the executive committee of the International Society of Physical and Rehabilitation Medicine and a member of the Accreditation Council for Graduate Medical Education Physical Medicine and Rehabilitation Review Committee.

ISABEL SCARINCI, PH.D., vice chair of Global and Rural Health for the Department of Obstetrics and Gynecology and senior adviser for Globalization and Cancer with the O'Neal Comprehensive Cancer Center, was honored by TogetHER for Health with the first-ever Trailblazer Award for her dedication to saving women's lives in Alabama and across the world.

DAVID STANDAERT, M.D., PH.D., chair of the Department of Neurology, was presented with the Parkinson Association of Alabama Lifetime Achievement Award for his committed efforts in Parkinson's disease research throughout his career.

JIANYI "JAY" ZHANG, M.D., PH.D., professor and chair of the Department of Biomedical Engineering, was named chair of the Council on Basic Cardiovascular Sciences at the American Heart Association for a two-year term, effective July 1, 2022.

Four faculty members were invited to join the National Academies of Medicine and Sciences in 2022. Read more on page 3.

AMPLIFYING VOICES

Meet pathologist and podcaster with a purpose Michael Williams

By Tehreem Khan

In 2021, Michael Williams, M.D., a fellow in the UAB Department of Pathology, was motivated by the events surrounding the death of George Floyd to create a platform for more diverse voices in pathology. After being a guest on several podcasts, Williams decided to start his own.

Williams moved to Birmingham for his Neuropathology fellowship after completing residency at the State University of New York's Upstate Medical University in Syracuse. He says he spent months planning before launching Diversify in Path, a podcast that aims to highlight diversity in the field of pathology.

"It explores how investing in diversity can lead to a high return of investment in pathology and lab medicine by learning from the knowledge and experiences of diverse voices within the field," Williams says.

Williams wants his podcast to provide an environment for the BIPOC (Black, Indigenous, and people of color) community in pathology to share their stories and experiences. "The ultimate goal is to grow a meaningful platform for each and every voice to be heard," Williams says. He believes diversifying pathology will lead to growth in the field.

His active social media presence has afforded him many opportunities, such as presenting at the 2020 United States and Canadian Academy of Pathology (USCAP) Annual Meeting in Los Angeles, and he has recruited numerous Twitter connections to be guests on his podcast.

His guests include Joye Carter, M.D., the first African American to be appointed a chief medical examiner in the U.S., and Bettie Yeboah, M.D., a PGY2 in the University of Virginia's Department of Pathology, who discusses growing up with immigrant parents and the importance of recognizing disease manifestations across varying skin tones.

Williams has been recognized for his podcast in The Pathologist's 2022 Power List. He was also featured in the American Society for Clinical Pathology's Critical Values magazine "PRIDE in the Laboratory" for his essay, "Is there even a guidebook?," which highlights the experiences of members of the LGBTQIA+ laboratory community.

Listen to the Diversify in Path podcast on Spotify, Apple Podcasts, and other major podcast platforms, or at diversifyinpathpodcast.com.

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At the UAB Heersink School of Medicine, we're dedicated to improving the health of people not only in Alabama but across the globe. With your support, we're training the next generation of leaders in medicine, conducting groundbreaking research, and providing world-class patient care. Thanks to alumni and friends like you, the future can be healthier for all.

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