In October 2013, I returned to UAB from the University of Minnesota to become senior vice president for medicine and dean of the School of Medicine. As I reflect on the past five years as dean, I am immensely proud of the changes that have taken place during that time. Some of these efforts were begun under my predecessors and entrusted to me to carry on; others were initiated under my watch in collaboration with an invaluable team of partners.

One thing that hasn't changed is our school’s drive to fulfill its multifaceted mission: to train the next generation of leaders in medicine; to conduct groundbreaking biomedical research to relieve suffering and improve human health; to provide world-class patient care to one of the country’s most diverse patient populations; and to be a catalyst for positive change and economic growth for our community and our state. Here are a few examples of our impressive progress:

- Our most recent entering class was 16 percent underrepresented in medicine—a number that has doubled since 2013.
- In overall National Institutes of Health research funding rankings, UAB has risen from 31 in 2013 to 21, according to preliminary results for 2018.
- Outpatient clinical encounters increased from 1,143,118 in 2013 to 1,492,348 this past year.
- Our impact on the local and state economies continues to grow—in fact, one in four Birmingham residents is either a UAB employee, student, or patient.

That’s why the theme of this year’s annual report is Driven. In the following pages, you'll meet a few of our extraordinary faculty who are helping lead the school through this era of transformation, one in which we are elevating our aspirations and expanding our reach. You’ll also learn about some of the innovative efforts, important milestones, and incredible acts of generosity that characterized 2018.

All these people and programs give me tremendous hope for the future as I look ahead to the next five years at the School of Medicine. I’m pleased to share this remarkable year with you.

Sincerely,

Selwyn M. Vickers, M.D., FACS
Senior Vice President for Medicine
Dean, UAB School of Medicine
James C. Lee Jr. Endowed Chair
University of Alabama at Birmingham
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62  **Leadership and Organization**
A Dec. 4 press conference, it was announced that O’Neal Industries Inc., a family-owned global business based in Birmingham, and its shareholders have given the largest single gift in the University of Alabama at Birmingham’s history—a $30 million donation to the Comprehensive Cancer Center—which will allow the center to change the lives of more patients and families through transformational cancer research, patient care, education, and prevention. The center will be known as the O’Neal Comprehensive Cancer Center at UAB.

“The O’Neal family has built a legacy in Birmingham, first in the city’s steel industry and now in its future as a biomedical and technology hub,” says Ray Watts, M.D., president of UAB. “UAB’s National Cancer Institute-designated Comprehensive Cancer Center is among the pre-eminent cancer centers in the world, and we are proud and grateful that our cancer center will bear the O’Neal name.”

Members of the O’Neal family have been business and political leaders in Alabama for generations. Edward O’Neal was Alabama’s 26th governor, and his son Emmet served as the state’s 34th governor. Kirkman O’Neal was a pioneer in Birmingham’s burgeoning steel industry, founding what was to become O’Neal Steel in 1921. The family now operates O’Neal Industries Inc., the nation’s largest family-owned group of metals service centers.

“We see this gift as an opportunity to give back in a meaningful way to a cause that is important to everyone,” says Craft O’Neal, chairman and CEO of O’Neal Industries. “We hope the gift will be used in ways that will yield the greatest results, accelerating progress in research, treatment, and prevention of cancer and, ultimately, eliminating cancer as a major public health problem.”

Craft O’Neal, chairman and CEO of O’Neal Industries Inc., speaks at a press conference announcing the $30 million gift from O’Neal Industries and its shareholders to the UAB Comprehensive Cancer Center.

The gift and naming will be formally considered for acceptance by the University of Alabama System Board of Trustees at its February meeting.

“This gift will enhance the profile and impact of the cancer center as a premier national destination for those working to end cancer, and those fighting a personal battle with the disease,” says Selwyn Vickers, M.D., senior vice president and dean of the UAB School of Medicine. “It will have lifesaving results that can serve as a catalyst for further philanthropic investment, and we are grateful to the O’Neal family and O’Neal Industries for their leadership in the fight to end cancer.”

The UAB Comprehensive Cancer Center was one of the original eight comprehensive cancer centers established by the National Cancer Act in 1971 and has been continuously funded for 46 years. UAB is the only National Cancer Institute-designated cancer center in its four-state region. – Bob Shepard
hanks to gifts both large and small, five years after publicly launching The Campaign for UAB: Give Something, Change Everything, UAB celebrated a remarkable accomplishment: The Campaign surpassed $1 billion in November, reaching its stated goal of achieving the milestone by the end of 2018.

Overwhelming response from donors resulted in substantial funds for each of the Campaign’s priorities—programmatic support, facilities, faculty, research and innovation, athletics, and student support—adding up to a Campaign total of $1,002,957,673.

“We are a national leader among comprehensive public urban research universities with academic medical centers because of the people who work and learn here every day, and because of our donors who have demonstrated their belief in the efforts of our students, faculty, and staff by giving so generously throughout this Campaign,” says Ray Watts, M.D., president of UAB. “The profound impact of their support and generosity is seen in every pillar of UAB’s mission and in every corner of our campus, as well as across our community and state, and indeed around the world. We can’t thank our friends—old and new—enough for their philanthropy.”

Support from more than 103,000 donors, including alumni, community partners, faculty, staff, and students, helped set records throughout the course of the Campaign, including:

- 789 $100,000+ donors
- 148 $1 million+ donors
- 211 new endowed chairs, professorships, and scholars
- 221 new endowed scholarships
- 248 planned gifts

The School of Medicine enjoyed unprecedented support throughout the Campaign for UAB as well:

- $675,550,463 Campaign total
- 27,545 Campaign donors
- $48,578,067 in planned gifts
- 29 new endowed chairs
- 49 new endowed professorships
- 9 new endowed scholars
- 37 new endowed scholarships

“As part of this Campaign, UAB asked supporters what was important to them, what they wanted to change in the world, and the university was able to connect those individuals to the people and initiatives at UAB who could make that change happen,” says Campaign Co-Chair Mike Warren, president and CEO of Children’s of Alabama. “All these gifts collectively translate into an incredibly bright future for UAB and Birmingham—one that will be felt around the world.”

“The School of Medicine is honored that thousands of alumni and friends are committed to helping us further our missions in medical training, research, and patient care,” says Selwyn Vickers, M.D., FACS, senior vice president for medicine and dean of the School of Medicine. “These gifts are an expression of their faith in us and our work. We are profoundly grateful for their support.” – Bob Shepard
Driven to Discover
or as long as psychiatrists have been diagnosing depression and other mood disorders in patients and prescribing medications for them, they have traditionally had to determine the right medications for their patients through trial and error.

“It often takes two to three tries before finding the correct medication for each patient,” says Richard Shelton, M.D., the Charles Byron Ireland Chair of Psychiatric Research, professor in the Department of Psychiatry and Behavioral Neurobiology, and director of the Mood Disorders Program in the School of Medicine. He says research has shown about 90 percent of depression patients will improve and 80 percent will recover within 18 months of starting on antidepressants and finding what works through trial and error. But, with a disease like depression, 18 months to settle on the right medication is too long to wait for many patients. Some get discouraged and quit treatment; some become disabled; others, tragically, commit suicide. Genetic testing allows doctors to speed up that timeframe, which can be a lifesaver.

Today, physicians and researchers are gaining a greater understanding of the role a person’s genes play in determining which medications will work as prescribed and which will not—a field known as pharmacogenomics. Shelton says research has found that most people are taking one or more medications that are unlikely to produce the desired outcome because of genetic factors.

“At UAB, we routinely do genetic testing of patients who have tried at least two antidepressants and had no luck or tried at least two and had issues with side effects,” Shelton says. This type of testing is central to precision medicine, an approach that takes into account individual characteristics like genes,

BUILDING BLOCKS
OF THE FUTURE

Major data-gathering initiatives are paving the way for a precision medicine revolution

BY RYAN BROUSSARD
lifestyle, and environment to mold health care to each person’s needs. It is an approach with transformative implications for diagnosis and treatment. Before the full potential of precision medicine can be unlocked, however, a mountain of data must be collected and analyzed. UAB is at the forefront of several groundbreaking efforts to gather the necessary data for a precision medicine revolution.

**GET THE DATA**

In 2017, recruitment began in Birmingham for the Alabama Genomic Health Initiative (AGHI). A collaborative effort with Huntsville-based HudsonAlpha Institute for Biotechnology, the AGHI is one of the nation’s first statewide efforts to harness the power of genomic analysis to help identify those at high risk for a genetic disease and to provide a basis for continuing research into genetic contributors to health and disease. Participants are adults who consent to have their DNA analyzed for potentially medically actionable conditions. The results are collected in a biobank unique to the state of Alabama, which will enable future medical research. A smaller cohort of participants with undiagnosed conditions thought to be due to a genetic cause who receive more extensive evaluation known as whole genome sequencing. Results are communicated to participants in whom a medically significant genetic variant is found, and these individuals are then linked to the appropriate medical care. In 2018, the AGHI recruitment efforts expanded to sites beyond UAB campuses, extending access to the program throughout the state. In the first two years, the program exceeded annual recruitment goals, with an overall goal of enrolling 10,000 people over five years.

UAB is involved in another major precision medicine data gathering effort: the All of Us Research Program, a National Institutes of Health-funded effort to advance individualized prevention, treatment, and care for people of all backgrounds. The aim is to enroll 1 million or more volunteers, with a special focus on communities that have been historically underrepresented in biomedical research in order to make the program the largest, most diverse resource of its kind. All of Us participants are asked to share different types of health and lifestyle information through online surveys and electronic health records.

The All of Us Research Program kicked off on May 6 with a nationwide series of special events. The Birmingham launch event at Railroad Park featured an NIH mobile interactive exhibit where visitors could explore the All of Us Journey.
which will continue to be collected over the course of the program. Some participants will be asked to visit a local partner site to provide blood and urine samples and to have basic physical measurements taken, such as height and weight. In the future, participants may be invited to share data through wearable devices, join follow-up research studies, and receive results of genotyping and whole genome sequencing.

The NIH has funded more than 100 organizations throughout the U.S. as partners in the All of Us Research Program. UAB is the lead institution for the Southern All of Us Network that includes 12 universities and medical facilities in Alabama, Mississippi, and Louisiana, and aims to recruit 93,000 participants. In July, UAB announced it had received a $48 million, five-year award from the NIH to support the Southern All of Us Network.

UAB’s involvement in All of Us is led by Bruce Korf, M.D., Ph.D., UAB Medicine’s Chief Genomics Officer and the Wayne H. and Sara Crews Finley Endowed Chair in Medical Genetics in the School of Medicine, and Cora E. Lewis, M.D., MSPH, chair of the Department of Epidemiology in the School of Public Health. “This is a very significant recognition of UAB’s role as a leader in precision medicine,” says Korf. “We are honored to be a part of building one of the largest databases of its kind for health research, and we are excited that the data will reflect the diversity of our region and nation.” Other leaders involved in the effort include Mona Fouad, M.D., professor and director of the Division of Preventive Medicine; James Cimino, M.D., professor and director of the UAB Informatics Institute; Ashley Cannon, Ph.D., M.S., assistant professor in the Department of Genetics; and Sara Knight, Ph.D., professor in the...
RESEARCH SPOTLIGHT

PUTTING WRINKLES IN REVERSE

WRINKLED SKIN AND HAIR LOSS are hallmarks of aging. What if they could be reversed? Keshav K. Singh, Ph.D., professor in the Department of Genetics, and colleagues have done just that in a mouse model, according to a paper published in Cell Death and Disease in July 2018.

When a mutation leading to mitochondrial dysfunction is induced, the mouse develops wrinkled skin and extensive, visible hair loss in a matter of weeks. When the mitochondrial function is restored by turning off the gene responsible for the dysfunction, the mouse returns to smooth skin and thick fur, indistinguishable from a healthy mouse of the same age. “To our knowledge, this observation is unprecedented,” says Singh.

In humans, a decline in mitochondrial function is seen during aging, and mitochondrial dysfunction can drive age-related diseases. A depletion of the DNA in mitochondria is also implicated in human mitochondrial diseases, cardiovascular disease, diabetes, age-associated neurological disorders, and cancer.

“This mouse model should provide an unprecedented opportunity for the development of preventive and therapeutic drug development strategies to augment the mitochondrial functions for the treatment of aging-associated skin and hair pathology and other human diseases in which mitochondrial dysfunction plays a significant role,” says Singh. This research has been highlighted in Newsweek, U.S. News & World Report, Forbes, Vogue, International Business Times, Bloomberg, and many other news outlets around the world. — Jeff Hansen
NEXT-GEN MEDICINE

Precision medicine is treating common and rare diseases across the School of Medicine

BY RYAN BROUSSARD

The Hugh Kaul Precision Medicine Institute (PMI) at UAB serves as the hub for precision medicine research and implementation, where biomedical data is transformed into knowledge. The work is overseen by Matt Might, Ph.D., the institute’s director. Might, a computer scientist, joined UAB in 2017 from the University of Utah and Harvard Medical School. He was also appointed to the White House Precision Medicine Initiative by former President Barack Obama.

UAB established the PMI in 2015 with a $7 million gift from the Hugh Kaul Foundation as a research institute with a mandate to cultivate and advance the implementation of precision medicine. “We are doing the research to support a large and aggressive clinical mission,” Might says. Working alongside researchers in various centers, programs, and departments across UAB—including the UAB Informatics Institute and the UAB HudsonAlpha Center for Genomic Medicine—the institute is helping push the boundaries of precision medicine.

Among the PMI’s staff are UAB undergraduate interns who are enjoying unique and uniquely prestigious exposure to precision medicine technology and techniques. Might calls them “precision medicine specialists.” The three students, including UAB senior women’s soccer player and genomic sciences major Jordan Barham, handle cases as part of the research consultation service the institute offers.
When a physician or researcher contacts the institute for help with a mystery malady, the precision medicine specialists research a therapeutic strategy by “using all data available on a patient to do an initial scientific analysis of options for either obtaining a diagnosis or identifying a treatment,” Might says.

If the undiagnosed condition could be due to genetics, specialists may help the patient register for genetic sequencing through UAB or another company. If the patient has a confirmed genetic condition, then the interns study the mutation and gene to determine next steps using a guide developed in part at the PMI that Might calls “The Algorithm.”

“For example, if a patient has a gain of function in a specific sodium channel that is driving their epilepsy, specialists would turn to software we have developed at the institute to identify relevant sodium channel blockers,” Might explains. “They would also prepare a letter to the patient’s physician explaining the rationale behind the use of this blocker for the patient’s condition.”

Begun in 2018, the service has already received more than 150 cases, and that number is growing. “It’s climbing rapidly—from all over the country, all over the world actually,” Might says. “We had people from Dubai contact us.”

There were more than 50 applicants for the initial three intern spots, which shows the growing interest in precision medicine among students. Might says the experience of creating the internship is laying the foundation for a future doctoral theme in precision medicine within UAB’s Graduate Biomedical Sciences program. The precision medicine theme will combine genetics, genomics, and bioinformatics. Might and his colleagues are also working on creating a master’s program focused on genetic counseling.

Precision medicine specialists are making use of a state-of-the-art artificial intelligence called mediKanren (kanren is derived from a Japanese word meaning “connection”). Might and a team of collaborators from the PMI, the UAB Informatics Institute, and California’s Scripps Research Institute developed mediKanren to be, as Might says, “a reasoning engine for biomedical knowledge.” The program debuted at an NIH-sponsored “hackathon” in January 2018. Might and his collaborators programmed mediKanren with information from 50 online databases and the abstracts of every public medical paper. Its purpose is to find connections in biomedical data by seeking out logical relationships between concepts.

“If you took Spock, Sherlock Holmes, and Dr. House and mixed them all together, mediKanren is what you would get,” Might says. “It doesn’t just return results, but also provides an explanation for why they might work.” Users can see the chain of research papers and other clues mediKanren followed to arrive at its conclusions.

At the hackathon, each team’s software had to search through the medical literature and find possible new treatments for a disease that was announced on the spot (Fanconi’s anemia). “In an hour and a half, our tool generated the top two candidates in clinical trials right now, plus 10 more potential treatments,” says Might.

With a $600,000 NIH grant, the team is taking mediKanren to the next level by adding more databases, including large-scale biomedical data sets. Might notes adding more data sources will further develop mediKanren’s reasoning ability and improve its internal intelligence, which ultimately means it can work faster and be more precise in the connections it makes and the information it returns. “We’re very actively developing it, very actively using it,” Might says. “It’s transforming how we do medicine.”
VIRAL SENSATION

IN JUNE, AN EPISODE OF Freethink Media’s “Superhuman” series detailing Matt Might’s efforts to help his son went viral, garnering more than 15 million views on Facebook to date. After searching for answers for four years, Might, now the director of the Hugh Kaul Precision Medicine Institute at UAB, and his wife Cristina learned their son Bertrand suffers from a rare genetic disorder. Bertrand was diagnosed with NGLY1 deficiency, a disease that had never been documented before and for which doctors could offer no treatment. Might used his background in computer science to find ways to help Bertrand. In doing so, he formed a community of people who have been affected by the disease and who are pushing for new treatments. Since the video went viral, Might says it has generated new leads and cases for the PMI. Watch the video on the “Superhuman” Facebook page.

REVEALING RARE DISEASES

While UAB Medicine is implementing precision medicine approaches across the system, the PMI’s primary clinical focus is on three areas: undiagnosed and rare diseases, cancer, and pharmacogenomics. UAB’s growing expertise and experience in each field has already garnered national attention.

In September, the NIH added five academic medical centers across the nation to its Undiagnosed Diseases Network (UDN). The network takes advantage of cutting-edge technologies such as genomic sequencing, metabolomics, and assessing patient variants in model organisms to give clinicians new, powerful information to help understand the causes of extremely rare diseases. Since opening to applications in 2015, the UDN has already diagnosed over 200 cases that had long been mysteries to the medical community. UAB, in conjunction with Harvard Medical School, is the coordinating center for the UDN.

Harvard and UAB coordinate efforts at the UDN’s 11 clinical sites. Officials at Harvard oversee patient intake and evaluation procedures while UAB conducts case analysis and, when possible, diagnosis. Previously, the work done on special inquiries received by the PMI were funded through philanthropic donations. Now, Might says, that money can be used for other purposes. “This gives us the ability to really dream big about the treatments we can bring to patients,” he says.

UAB’s involvement with the UDN was preceded by the development of the School of Medicine’s successful Undiagnosed Diseases Program (UDP). Established in 2014, the UDP is an interdisciplinary effort that serves adult and pediatric patients with
The UAB Undiagnosed Diseases Program was established in 2014. Its success helped lay the foundation for UAB to become the coordinating center for the NIH’s Undiagnosed Diseases Network, in conjunction with Harvard Medical School.

Severe chronic medical conditions in whom a diagnosis has not been made despite extensive efforts by referring physicians. The program is a collaboration among UAB Medicine, Children’s of Alabama, and HudsonAlpha Institute for Biotechnology, and utilizes cutting-edge genetic and genomic technologies to try to uncover a diagnosis that will enable recommendations for effective treatment. Since its inception, the UDP has had 462 referrals, 195 of which were evaluated. Of those, 78 were given a diagnosis and another 27 are currently awaiting test results or pending further analysis. The program is led by Korf, Maria Descartes, M.D., professor in the Department of Genetics, Martin Rodriguez, M.D., associate professor in the Division of Infectious Diseases, and Anna Hurst, M.D., assistant professor in the Department of Genetics.

The School of Medicine is the state headquarters for the Alabama Rare Diseases Advisory Council (ARDAC), which held its inaugural meeting at UAB in August. With more than 400,000 residents affected by rare diseases, the state of Alabama created ARDAC to advise the governor and legislature on research, diagnosis, treatment, and education regarding rare diseases and their impact on the state.

The council’s duties include collecting data on rare diseases, including cost and economic impact on Alabama, as well as coordinating collaborations between stakeholder organizations. It also facilitates research opportunities between academic medical centers, biotech and pharmaceutical companies, nonprofit research and medical institutions, advocacy groups, and state/federal funding agencies. The council will report annually to the legislature with the goal of addressing rare disease policies that will positively impact the residents of the state.

“Alabama is now at the forefront of genomic medicine,” says Korf, who serves as the council chair. “New tools such as the Alabama Genomic Health Initiative and the All of Us Research Program are driving innovation and developing new knowledge of rare
diseases. The council will provide a comprehensive way for us to share those advances with state leaders, medical professionals, advocacy groups, and families across the state.”

GENE-GUIDED THERAPY

Eddy Yang, M.D., Ph.D., the ROAR Southeast Cancer Foundation Endowed Chair in Radiation Oncology, professor and vice chair of translational sciences in the UAB Department of Radiation Oncology, deputy director of the Hugh Kaul Precision Medicine Institute, and director of the UAB Molecular Tumor Board, is a leader in UAB’s precision oncology efforts. He and his colleagues are working to identify specific genes in each patient’s cancer tumors and match the therapy specifically to the tumor.

“We used to treat a patient based on the type of tumor—one size fits all,” Yang says. “With precision oncology, we treat based on the genetic signature of that tumor, not necessarily its location in the body.”

“Precision oncology is the poster child for precision medicine,” says Michael Birrer, M.D., Ph.D., director of the O’Neal Comprehensive Cancer Center at UAB and the Evalina B. Spencer Chair in Oncology. “For essentially every tumor in which scientists have validated a bonafide target and clinicians have used a small-molecule inhibitor, patient treatment has seen a huge impact. This is an exciting time in oncology—the most exciting time in my career. Things are moving very fast.”

In one case, Yang identified through blood testing that patient Mickey Nunn’s prostate tumor—which had survived 42 radiation treatments and 17 rounds of chemotherapy—had characteristics of ovarian cancer. Nunn, 66, began taking the ovarian cancer drug olaparib (Lynparza). His PSA (prostate-specific antigen) scores prior to taking the medicine had been astronomically high at 99—nearly 25 times the score that is considered a risk factor for prostate cancer. Six months after he began taking the medication, Nunn’s PSA was just over 10, and the score continues to decline. As of mid-December, almost a year since he began the medication, his PSA was 4.71.

“In the past, when we began testing a new drug or therapy, we typically saw a response rate in 10-20 percent of patients during Phase 1 studies,” Yang says. “With genetic-based studies, we are seeing a drug response rate much higher in
patients who match to therapy, which is very exciting."

“I feel the best I have in 10 years,” Nunn says. “I used to have bad back pain, but I was able to stop taking my pain medicine just three days after starting on olaparib. Now I can get out, work in the yard and take care of the house like I used to.”

**PRECISION PRESCRIBING**

Nita Limdi, Pharm.D., Ph.D., MSPH, professor in the Department of Neurology, has been at the forefront of efforts to identify the genetic factors that influence individual drug response, with a special focus on racial variability. “If you use clinical algorithms that are derived only from European-Americans, you will do harm to African-Americans,” she says.

Limdi and her team have identified clinical and genetic factors that can influence dose requirements for warfarin, the most widely used blood thinning medication, prescribed to prevent stroke and treat blood clots. These factors can include the presence of genes that help the body metabolize the drug (CYP2C9) and activate clotting (VKORC1), and they can vary by race. The researchers found that, while genetic factors accounted for a larger proportion of the dose variability for European-American patients, clinical factors accounted for larger dose variability in African-Americans. They also noted that gene variants may have a different effect on dose across race groups. For example, European-Americans with a variant of the gene CYP2C9 required less of the drug according to race-specific dosing models, yet African-Americans did not.

While all participants, regardless of race, who carried VKORC1 required lower dose, according to race-specific dosing models, the proportional dose reduction was greater among European-Americans.

Researchers recommend using race-specific equations, rather than race-adjusted equations, to guide warfarin dosing. “This study brings attention to the need to conduct studies in racially diverse populations,” Limdi says. “It is the first step to developing race-specific algorithms to personalize therapy.”

Limdi’s NIH grant will enable further study of the impact of pharmacogenomics on anticoagulant-related bleeding. She is especially excited about this grant because it will allow her and her team to use local and regional data to provide an even greater benefit to Alabama and the Deep South.

“Discoveries are important and impactful when they can be incorporated into clinical care to improve patient outcomes,” says Limdi. To this end, her team is leading the implementation of genetics to guide medication therapy for patients receiving coronary stents. Approximately 30 percent of patients have inadequate response to clopidogrel (Plavix), an antiplatelet agent that is commonly prescribed after stent placement, because of genetic factors. A quick genotyping test can recommend alternative medications for these patients. Working with colleagues across nine institutions, genotype-guided therapy was shown to reduce the risk of stent thrombosis, heart attack, stroke, and death by 50 percent at the one-year mark.

“The next and greater challenge is implementation across disease states and implementation across health systems to improve population health,” Limdi says.

— **Jeff Hansen, Bob Shepard, and Matt Windsor contributed to this article.**
While other diseases have seen tangible improvements in treatment options in recent decades, the autoimmune disease lupus has proven to be stubbornly resistant to the development of effective new treatments. Since 1955, the FDA has approved only one new drug—Benlysta in 2011—designed specifically to combat lupus, and even it has proven to be only modestly successful. But that has not deterred UAB immunology researchers from forging ahead toward a better understanding of the root causes of lupus and the development of targeted therapies.

When a person develops lupus, their immune system no longer differentiates between the body’s healthy tissue and foreign invaders such as viruses, bacteria, and germs. As a result, the immune system begins to attack everything, producing antibodies that can damage a person’s organs, brain, and skin. That initial damage then prompts the immune system to escalate the attacks on tissues in the body.

“The end result is that instead of the immune system quieting down, it becomes more and more activated,” says Frances Lund, Ph.D., the Charles H. McCauley Chair of Microbiology in the School of Medicine. “So you fall into a vicious cycle where the immune system is now activated to respond against your own body.”

**EXCELLENCE IN IMMUNOLOGY**

UAB researchers are delving into the root causes of autoimmune diseases with an eye toward new treatment targets

**BY CARY ESTES**

Left to right: Frances Lund and Andre Ballesteros-Tato are exploring the cellular mechanisms that contribute to lupus.

**OVERCOMING HURDLES**

The biggest problem in treating lupus is that the best available drugs basically turn off the immune system entirely to keep it from attacking the healthy body. This also prevents the immune system from fending off legitimate invaders, making a person susceptible to an array of potentially life-threatening infections. “One of the goals in lupus research is to understand why the body starts to act against itself in the first place,” Lund says. “If we can identify the cells causing the damage, we can
try to develop drugs that block the activity of those cells without suppressing the entire immune system.”

Lund and fellow UAB researcher Andre Ballesteros-Tato, Ph.D., assistant professor of medicine in the Division of Clinical Immunology and Rheumatology, are working on developing targeted therapies for lupus with the help of $300,000, three-year grants from the Lupus Research Alliance. They were two of only nine researchers nationwide awarded the grants this year.

In lupus, specialized immune cells called T follicular helper cells act as a support system to aid and nurture the B cells that make the self-damaging autoantibodies. Ballesteros-Tato is seeking a way to selectively eliminate the T follicular helper cells without knocking out other types of T cells that are part of a healthy immune system. Such a targeted therapy would, in turn, power down the lupus-related B cells to block disease progression without the risk of profound immune suppression.

“What we want to do is prevent the development of these pathogenic antibodies,” Ballesteros-Tato says. “There are two ways to do this. One is to eliminate the cells that normally produce antibodies. People have tried this for years. The problem with that is these cells are very resilient; they are not easy to eliminate. But those cells need help from other cells, so we’re trying to eliminate the helper cells instead.”

Lund is focusing on the immune system’s B cells that normally make antibodies to defend the body against infectious diseases but in lupus produce the self-damaging antibodies. Specifically, she is investigating a subclass of rogue B cells found in some people with lupus but not in healthy people. Learning how these rogue B cells are different can reveal new targets for safer lupus treatment.

“We’re interested in the cells that make the antibodies, called plasma cells, because Benlysta doesn’t eliminate or inactivate these cells,” Lund says. “We’re trying
to determine where plasma cells live in the body and what nutrients and environmental cues they need to live there. If we disrupt the cues that allow them to survive over the long term, we may be able to selectively eliminate those pathogenic cells.”

**THE ROOT OF THE PROBLEM**

Uncovering the root causes of lupus is the objective of John Mountz, M.D., Ph.D., the J. W. and Virginia Goodwin and Warren D. Blackburn, Jr., Research Chair in Rheumatology. In late 2017, Mountz became one of two recipients of the Dr. William E. Paul Distinguished Innovator Awards in Lupus and Autoimmunity. The award provides up to $1 million over four years to encourage investigators to pursue innovative research projects that pair unconventional creativity with sound science.

Mountz is investigating a new explanation for how lupus develops and why some people are at greater risk for flares and kidney disease. He has found that patients with high levels of the molecule interferon-beta in their early developing B cells are more likely to have higher levels of autoantibodies and kidney disease. Furthermore, African-Americans with lupus have higher levels of interferon-beta in these cells compared with Caucasians with lupus.

Mountz and fellow researcher Hui-Chen Hsu, Ph.D., associate professor in the Division of Clinical Immunology and Rheumatology, are working closely with the UAB Lupus Clinic—directed by W. Winn Chatham, M.D., professor and clinical director of the Division of Clinical Immunology and Rheumatology—in an expanded study to investigate whether the high level of interferon-beta within those developing B cells causes them to grow into adult, autoantibody-producing B cells that trigger lupus. If so, this could lead to treatments to block interferon-beta for use in people with lupus.

UAB immunology researchers are making strides in other areas as well. For example, preclinical experiments led by Laurie Harrington, Ph.D., associate professor in the Department of Cell, Developmental and Integrative Biology, have discovered a subset of immune cells that create and sustain chronic

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**LUPUS FACTS**

- Approximately 1.5 M Americans have a form of lupus
- 90% of individuals diagnosed with lupus are women
- 80% of patients develop lupus between the ages of 15 and 45

John Mountz is investigating the role of the molecule interferon-beta in the development of lupus.
David Standaert will lead the new Udall Center of Excellence in Parkinson's Disease Research at UAB.

inflammatory bowel disease. These cells could become potential therapeutic targets against Crohn's disease and ulcerative colitis. Plus, if this subset of cells plays a similar role in other autoimmune diseases such as Type 1 diabetes, multiple sclerosis, or rheumatoid arthritis, those also could be targets for therapy.

“We think these cells could be in a number of auto-inflammatory diseases,” Harrington says. “Our hope is if we could treat these cells, it could be curative.”

INFLAMMATION IN PARKINSON’S

Understanding the role of inflammation in another devastating disease is at the root of a significant honor UAB received in 2018. Parkinson’s disease affects about 1 million people in the U.S. and 10 million people worldwide. UAB has become one of nine Udall Centers of Excellence in Parkinson’s Disease Research by the National Institutes of Health. The Udall centers, begun in 1997, are funded by congressional legislation in honor of former U.S. Rep. Morris Udall of Arizona, who died in 1998 after a long battle with the disease.

The Alabama Udall Center is the result of a new NIH award of nearly $10 million over five years. The center is being led by David Standaert, M.D., Ph.D., the John N. Whitaker Endowed Chair in Neurology and an international leader in Parkinson’s disease. Standaert says the center will focus on the role of inflammation and immune response in the progression of Parkinson’s, which is a new approach to the disease.

“Parkinson’s is a progressive disease, which means it gets worse over time,” Standaert says. “There has been a lot of research on triggers of the disease, such as genetics and environmental causes. We have gained a good understanding of how that fire gets lit, but we don’t know how it spreads. Our efforts concentrate on the role of inflammation in the brain as a driver of the worsening of the disease.”

Standaert says the Udall designation builds on a previous P20 grant to UAB from the NIH’s National Institute for Neurological Disorders and Stroke, which established a core collaborative team in Parkinson’s, demonstrated the university’s ability to recruit patients for clinical studies, developed and standardized models and methods, and created a process to study immunomodulation in animal models and humans with early disease.

“Becoming a Udall Center of Excellence in Parkinson’s disease is a major step for our research and clinical programs at UAB,” Standaert says. “The Udall Centers network is the central organizing point for Parkinson’s research in the U.S. The establishment of this new Alabama Udall Center at UAB will be a catalyst. It will enable us to accelerate our own efforts and opens the doors for increased collaboration with the other leading research institutions in the nation. It will enable the critical work that needs to be done to find meaningful ways to slow or stop the progression of Parkinson’s disease.”

Udall Centers are also very involved in community outreach and educating of the next generation of Parkinson’s clinicians and researchers. The Alabama Udall Center will work with the Parkinson Association of Alabama, the American Parkinson Disease Association, and other regional and national organizations to enhance communication between scientists and the community of people affected by Parkinson’s disease. The Udall Center will also provide training to physicians and health care providers on state-of-the-art approaches to diagnose and treat Parkinson’s disease.

“The cure for Parkinson’s disease remains elusive, but if we can find a way to slow or stop the progression of the symptoms, we can help many people live full and active lives,” Standaert says. “We believe that studies the Alabama Udall Center will conduct on the role of immune signaling could lead to the discovery of desperately needed disease-modifying treatments.”

— Jeff Hansen and Bob Shepard contributed to this story.
It is an email that arrives all too often for UAB neurosurgeon Ichiro Nakano, M.D., Ph.D., a reminder of how far there is to go in the battle against brain cancer and the motivation to keep trying. About once a month, Nakano opens an email informing him that a former patient has passed away. It is a steady and sorrowful drumbeat, but one that is not entirely unexpected given that more than half of all brain cancer patients die within two years of diagnosis.

“It’s a devastating situation,” Nakano says. “With all the advances we’ve made in other cancer treatments—breast, colon, lung—brain cancer is now our overriding challenge.”

UAB is meeting this challenge through its work in the Neuro-Oncology Program at the O’Neal Comprehensive Cancer Center at UAB. Led by Nakano and L. Burt Nabors, M.D., professor and division director of neuro-oncology in the UAB Department of Neurology, the program includes laboratory and clinical research conducted by senior faculty and scientists.

“There is a lot of momentum in neuro-oncology research now,” Nabors says. “Many years of basic laboratory research across the neuro-oncology community are beginning to bear fruit on the clinical research side.”

A UNIQUE CHALLENGE

The biggest obstacle when it comes to treating brain cancer is its location. Tumors in other parts of the body often can be surgically removed or reduced through radiation without drastically altering the patient’s quality of life. However, those methods won’t work on the brain or spinal cord.

“This is a cancer that is in your nervous system,” Nabors says. “These organs provide our basic neurological functioning that allows us to be awake, to speak, to understand language,
to sense our environment around us. So cancer in these tissues is a whole different story than cancer in other parts of the body.”

Even though fewer than 28,000 people in the U.S. are diagnosed with the disease each year, brain cancer has received increased national attention because of the high-profile deaths of Sen. John McCain in 2018 and Beau Biden, son of former Vice President Joe Biden, in 2015.

“Because some prominent people have had the disease, it has raised awareness,” Nabors says. “That certainly makes a disease that is not overly common become much more apparent to the general community.”

CELL COMMUNICATION

UAB’s neuro-oncology researchers approach the problem on multiple fronts and have garnered national attention for their efforts. Nakano led an international study involving institutes in the U.S., Russia, and South Korea that discovered a surprising form of cell-to-cell communication in glioblastoma tumors—a primary brain cancer—that led to increased aggressiveness and treatment resistance in the recipient cells.

According to the study, which was published in Cancer Cell in June, glioblastoma cells undergoing programmed cell death, or apoptosis, send out signals via extracellular vesicles that are induced and released during apoptosis. These vesicles—small, membrane-bound blobs known as exosomes—carry components that alter RNA splicing in the recipient glioblastoma cells. This altered splicing promotes therapy resistance and aggressive migration.

Researchers can now use this communication mechanism as a potential target for new therapies to treat glioblastoma and possibly other cancer types. “Clinically, our data may provide the rationale for the molecular targeting of RNA splicing events or specific splicing factors for novel cancer therapies,” Nakano says. “This may lead to decreased therapy resistance, as well as inhibit migration of cancer cells.”

The discovery of the unusual communication began with a simple experiment. The researchers injected a combination of dying glioblastoma cells and healthy glioblastoma cells into a mouse xenograft model. That combination led to more aggressive tumor growth, as seen in brain scans, and greater therapy resistance compared to either healthy glioblastoma cells or dying glioblastoma cells alone.

A POWERFUL COMBINATION

In experiments led by Anita Hjelmeland, Ph.D., associate professor in the Department of Cell, Developmental, and Integrative Biology, a human-derived glioblastoma significantly regressed when treated with the combination of an experimental enzyme inhibitor called SLC-0111 and the standard chemotherapy drug temozolomide. The regression in this combination therapy was greater than that seen with the use of either temozolomide or SLC-0111 alone.

“Our experiments suggest that a strategy to target a carbonic anhydrase that is increased with low oxygen in glioblastoma cells will improve temozolomide efficacy,” Hjelmeland says. “We believe the drug combination could improve patient outcomes in glioblastomas sensitive to chemotherapy.”

The research team led by Hjelmeland and first co-authors Nathaniel Boyd, Ph.D., and Kiera Walker—who work in Hjelmeland’s UAB lab—studied glioma cells in cell culture
that were derived from an aggressive pediatric primary glioblastoma and from an adult recurrent tumor. The researchers also studied the tumor in mice, using the adult recurrent glioblastoma.

In experiments with mice, the researchers found that the combined treatment delayed tumor growth compared to temozolomide alone. It also improved survival of the mice when the xenograft was implanted in the brain, a placement that more closely models glioblastoma in patients.

HELPING THE YOUNGEST PATIENTS

UAB and Children’s of Alabama are collaborating on a pediatric study in which a viral immunotherapy using a herpes virus to treat brain tumors has been safe and well-tolerated to date. There is also preliminary data showing its effectiveness in killing malignant tumor cells. The findings were presented in July at the 2018 International Symposium on Pediatric Neuro-Oncology in Denver.

The virus, known as G207, is derived from the herpes virus responsible for cold sores. It is genetically altered so that it is unable to infect normal brain cells but can infect tumor cells. When infused into a malignant brain tumor, the virus enters the tumor cell and replicates. As it kills the cell, the virus’ progeny are released to hunt down and kill nearby tumor cells. Additionally, the virus can induce the patient’s own immune system to attack the tumor.

In the first part of the study, six pediatric patients with recurrent high-grade glioma were treated with G207, and no dose-limiting toxicities or serious side effects occurred. Five of the six patients had evidence of the virus killing the tumor, including a patient who is more than 21 months out with an ongoing response to the therapy without any other treatment.

“Our findings indicate that G207 is safe and tolerable in children with progressive malignant brain tumors,” says the study’s primary investigator, Gregory Friedman, M.D., associate professor and director of developmental therapeutics in the Department of Pediatrics. “Preliminary evidence of efficacy is very promising to date.

“In the current phase of the study, we are testing the safety of G207 combined with a single low dose of radiation, which is being used to enhance virus replication and the immune response against the tumor.”
GONE TO THE DOGS

Dogs and humans are among the few species that spontaneously develop naturally occurring brain tumors. Those tumors have a lot in common, too, which has led UAB scientists to consider whether studying tumors in dogs will help treat humans and vice versa. UAB is partnering with veterinary schools to conduct the first immunotherapy study for brain tumors in pet dogs, using an oncolytic herpes simplex virus known as M032. The five-year, $2.6 million project is funded by the Beau Biden Cancer Moonshot program through the National Cancer Institute’s Center for Cancer Research. The goal is to treat about 14 dogs per year at the participating veterinary schools.

“Brain tumors in dogs and humans are remarkably similar,” says Renee Chambers, DVM, M.D., professor in the UAB Department of Neurosurgery as well as a veterinarian. “They share similar rates of incidence and mortality, and they share similar symptoms such as seizures, which is often the first symptom observed in both humans and dogs. Treatment is very much the same too, with surgery, radiation, and chemotherapy the standard of care.”

M032 was developed at UAB by James Markert, M.D., the James Garber Galbraith Chair in the Department of Neurosurgery, who has been studying viral therapies for brain tumors for more than 25 years. M032 is a second-generation virus, following on the heels of a previously genetically engineered virus known as G027. “Both G207 and M032 have been engineered to minimize the production of any toxic effects for the patient receiving the therapy,” says Markert. “Both are now in human studies, an M032 study in adults at UAB along with a companion pediatric study of G207 underway at Children’s of Alabama. These studies mark the first time one institution has conducted trials of genetically engineered herpes virus in adult and pediatric—and now canine—populations.”

BUILDING A BETTER MODEL

A research team led by UAB is working to find a better model to help determine the most appropriate treatment approach for glioblastoma. The $3.6 million, five-year grant award, funded by the National Cancer Institute (NCI), was announced in October. The UAB team will join four other institutions—University of California, San Francisco, Duke University, University of Utah, and Cold Spring Harbor Labs/Jackson Labs—to form the Patient-Derived Models Consortium, or PDMC.

For years, the NCI has recommended using a set of cancer cell lines, called the NCI-60, which includes glioblastoma cells, for pre-clinical testing. Pre-clinical testing can provide researchers with important information on the makeup of tumors, guiding the development of new treatment approaches through clinical trial design and implementation. Unfortunately, the clinical success rate following NCI-60 panel testing
was not as effective as desired, particularly for glioblastoma. Use of the NCI-60 was phased out in favor of patient-derived xenografts, or PDX, in which a patient’s own tumor cells are grown in a mouse model. Xenograft models permit cancer cell interactions with other cells and conditions that cannot be replicated in a laboratory dish. Creating and testing patient-derived xenografts is a slow and expensive process, so the NCI is looking for the most effective ways to use the xenografts and related models to identify new ways to fight cancer.

The UAB-led research team is examining two new technologies, neurospheres and microtumors, and will compare them with PDX. “Neurospheres are self-assembling groups of cells that can be grown in defined media conditions,” says Christopher Willey, M.D., Ph.D., associate professor in the Department of Radiation Oncology. “Microtumors involve embedding the same type of tumor cells into a matrix material in a three-dimensional structure. Both allow for high-throughput screening of potential drugs, which should produce a cheaper and quicker way to identify compounds that might have therapeutic benefit.”

“Our intent is to see how these systems respond to typical therapies, such as chemotherapy or radiation,” says Yancey Gillespie, Ph.D., professor emeritus in the Department of Neurosurgery. “We will be able to determine which genes are being expressed and which enzymes are active in the same tumor cells growing in three different environments. These data will allow us to change the models or their environments to mimic the brain tumor environment in the patient and then assess how each model responds to therapy. The idea is to develop an accurate, patient-like model or models for human brain tumors.”

Researchers believe that the improved model will enable better understanding of which drugs will work best for a patient with a particular type of cancer.

WHAT’S NEXT

UAB’s research in neuro-oncology will continue to be assisted by the 2018 renewal of the Network for Excellence in Neuroscience Clinical Trials research program, or NeuroNEXT. UAB is one of 25 clinical sites participating in NeuroNEXT, and has been involved in the program since its establishment in 2011.

The National Institute of Neurological Disorders and Stroke renewed UAB’s program, which streamlines Phase II clinical trials for brain disorders and has a focus on biomarker research, for five more years. UAB has been a clinical site for five of the nine NeuroNEXT studies, including as the lead site for the glioblastoma multiforme study. Corinne Griguer, Ph.D., M.Sc., an associate professor at the University of Iowa, and Markert lead the study, titled “Cytochrome C Oxidase: Biomarker in Newly Diagnosed Glioblastoma Multiforme.” The study hypothesizes that the overall survival time of a subject with newly diagnosed glioblastoma multiforme tumors, treated with standard of care therapy, is a function of the differing isoforms, or subtypes, of CcO enzymatic activity in the tumor. NeuroNEXT provides equipment and helps recruit patients for this and many other studies.

“NeuroNEXT has proved to be an efficient and effective way to quickly design and launch clinical studies across a broad landscape,” says David Standaert, M.D., Ph.D., the John N. Whitaker Endowed Chair in the Department of Neurology. “We are honored to have been a NeuroNEXT member since its inception and look forward to further collaborations with investigators across the country as we seek new ways to treat and cure neurologic diseases.”

— Jeff Hansen and Bob Shepard contributed to this story.

Construction began on Alabama’s first proton therapy center at UAB in January 2018. Proton International at UAB is expected to be ready to treat cancer patients in 2020. Proton therapy uses highly precise proton beams instead of traditional X-rays to attack tumors and is available at only 25 locations in the U.S. It is used to treat tumors of the brain and central nervous system, spine, head and neck, lung, prostate, liver, gastrointestinal tract and colon, and some breast tumors. While it treats primarily single-site tumors, it can, in some cases, be used for treating cancer that has spread to surrounding tissue because of its focused dose capabilities.
Driven to Learn
The School of Medicine is proud to be associated with the University of Alabama at Birmingham, which was ranked the top young university in the U.S. and No. 10 worldwide in the Times Higher Education World University Rankings for 2018. For undergraduates who envision a future in health care, UAB’s College of Arts and Sciences (CAS) has always held the advantage of being tied to the nationally ranked School of Medicine (SOM). Capitalizing on that advantage, the two schools have created new, dynamic undergraduate programs in neuroscience, genetics and genomic sciences, immunology, and bioinformatics. Each program is co-directed by a faculty member from the College of Arts and Sciences and the School of Medicine.

The success of the Undergraduate Neuroscience Program spurred the development of several new collaborative undergraduate degree programs. Degree programs and majors that offer undergraduates unprecedented access to School of Medicine research opportunities, mentors, and other forms of preparation for future educational and career paths. They include undergraduate programs in neuroscience, genetics and genomic sciences, immunology, and bioinformatics. Each program is co-directed by a faculty member from the College of Arts and Sciences and the School of Medicine.

The UAB Undergraduate Neuroscience Program, launched in 2009, was the trailblazer of these and has grown to nearly 300 students. Cristin Gavin, Ph.D., assistant professor in the Department of Neurobiology (SOM), co-directs the program with Rajesh Kana, Ph.D., of the Department of Psychology (CAS). Gavin says that while other universities have similar programs, UAB offers significant advantages, especially in research. “Our students are not just going through the motions of laboratory science in a class. They’re actually helping to build the scientific literature with their mentors,” says Gavin. “That is...
a significant benefit to both the students and our research community.”

“The success of the neuroscience degree program has paved the way for these other new programs,” says Dan Bullard, Ph.D., professor in the Department of Genetics (SOM). He serves as assistant dean for undergraduate biomedical programs and co-directs the new Undergraduate Genetics and Genomic Sciences Program with Asim Bej, Ph.D., of the Department of Biology (CAS). “While the topic areas are different, they share an emphasis on undergraduate research, and there’s so much expertise in the School of Medicine to teach classes and serve as mentors in the labs.”

NEW FRONTIERS

The Undergraduate Genetics and Genomic Sciences Program launched in fall 2017 and has already grown to 80 students. Bullard points out that genetics and genomics, fields with far-reaching implications for precision medicine and other fast-moving medical advances, attract students interested in a wide array of future academic and career pursuits. “It’s not just one field,” he says. “You could use this major as a stepping stone toward becoming a physician or a researcher, or someone who works for companies or medical centers like UAB generating and analyzing genomic information.”

Also new in fall 2017 was the Undergraduate Immunology Program co-directed by Louis Justement, Ph.D., professor in the Department of Microbiology (SOM) and Vithal Ghanta, Ph.D., professor in the Department of Biology (CAS). The program, which Justement estimates is one of only a handful across the country, has currently attracted 42 students. He anticipates that number will grow quickly.

Justement says the program can be a launching pad for students pursuing medical school, graduate school, or research in the biotech or pharmaceutical industries. “If you envision a career in medicine, there are many disciplines where understanding how the immune system works is critical to your knowledge and ability to effectively treat your patients. This is also a great focus for undergraduates who want to become dentists or optometrists, because the immune system impacts every part of the body.”

The newest of these collaborative degree programs is the Undergraduate Bioinformatics Program. Elliot Lefkowitz, Ph.D., professor in the Department of Microbiology (SOM), is a co-director. “Bioinformatics is the convergence of computer science and biomedical sciences,” he says. “We have to work closely together, and we need people who know how to analyze the data generated by the disciplines that support precision medicine.”

John Johnstone, Ph.D., associate professor in Department of Computer Science (CAS), co-directs the new degree program. “Computer science is transforming the field by allowing us to apply developments in data science to biological data in research and clinical applications,” Johnstone says. “This is an emerging discipline. We’re the only institution in Alabama to have this program, and there are very few of these undergraduate programs in the Southeast because it requires an unusual combination of elements. You need a good medical school and various other elements, which UAB has in great supply.” The new degree also benefits from the presence of the UAB Informatics Institute, which launched in 2015 under the direction of James Cimino, M.D. The institute serves as a hub for biomedical informatics activities throughout the university. Part of its mission is to expand educational opportunities, which extends to supporting undergraduates who want to study informatics.

WHILE THE TOPIC AREAS ARE DIFFERENT, ALL THESE PROGRAMS SHARE AN EMPHASIS ON UNDERGRADUATE RESEARCH, AND THERE’S SO MUCH EXPERTISE IN THE SCHOOL OF MEDICINE TO TEACH CLASSES AND SERVE AS MENTORS IN THE LABS.

DAN BULLARD
“Our goal is to create an internationally renowned center for informatics research, development, training, and service,” Cimino says. “I believe UAB is uniquely positioned with the resources, leadership, and infrastructure to achieve these goals.”

**KNOWLEDGE IS POWER**

Along with these new undergraduate programs, another new partnership in training is the Physician Experience Course, created by Nathan Erdmann, M.D., Ph.D., assistant professor in the Division of Infectious Diseases (SOM). The course launched in fall 2018 and is designed to give undergraduates a comprehensive understanding of what is involved in becoming a physician. The curriculum combines sessions led by Erdmann and others along with rare access to shadowing opportunities in the hospital. Topics range from navigating the hospital setting to the logistics of getting into medical school to understanding the cost of attending medical school.

Erdmann, who believes this might be the only course of its kind, says it succeeds if students come out with their eyes wide open and a renewed commitment to practicing medicine, but it also succeeds if students decide medical school is not for them and choose a different path. “I have a rather blunt approach,” he says. “So often everyone’s being polite, holding hands and saying, ‘Everyone should go and be a doctor,’ or ‘There’s nothing more satisfying than being a healer.’ But it’s also important to know there can be challenges in medicine, a lot of debt, and a long haul before you have the job you envision. These young people are 18, 19, or 20 years old, and I think they appreciate a frank approach with real-world information.”

On the other end of the spectrum, one of the oldest master’s degrees at UAB, the Master of Basic Medical Sciences, has been reintroduced with a newly defined role as a launching pad for students from a variety of backgrounds and areas of interest. The degree has been renamed the MS in Multidisciplinary Biomedical Science to more accurately reflect its aims. John Shacka, Ph.D., assistant professor in the Department of Pharmacology and Toxicology (SOM), directs the program. He explains that in the past this degree option offered an alternative degree to Ph.D. students who chose not to complete their doctoral program and decided instead to earn a master’s degree using credits they already accumulated. Now, for the first time it is focused on attracting its own cohort of students. Twenty-three were admitted into the program for fall 2018.

Shacka explains that the master’s program combines core curriculum with specialized electives to tailor the degree to the individual’s goals. They partner with other health sciences departments to offer concentrations in numerous themes, including genetics, pharmacology, and neuroscience. “People pursue our program for a variety of reasons and many different career paths,” he says. “We have students interested in research who may want to pursue Ph.D. programs in the future, and we have employees at UAB who are looking to advance their careers. We also have students interested in professional schools who use our program as an intermediary step. Our program and these other undergraduate degree programs fit a variety of needs and are helping build a diverse workforce in health-related and science fields.”
WARM WELCOME

Members of the 2018 incoming class started their first year of medical school with the White Coat Ceremony Aug. 12. Representatives from the School of Medicine’s regional campuses helped the students don their white coats (provided by the Medical Alumni Association) as symbols of the trust bestowed on them as they enter the field of medicine.
ask Mona Fouad, M.D., MPH, senior associate dean for diversity and inclusion in the School of Medicine, why diversity in medicine is important, and she’ll tell you in no uncertain terms. For Fouad, diversity in medicine is about providing the best possible environment for a wide range of ideas, experiences, and perspectives to flourish, which results in the best trained physicians who are able to provide superior care.

“Diversity is essential to excellence,” says Fouad, who also serves as professor and director of the Division of Preventative Medicine and is the founding director of the UAB Minority Health and Health Disparities Research Center.

“I strongly believe that diversity can only enrich the educational experience,” Fouad adds. “You can’t have a homogenous environment in medicine where everyone is the same. If you have people who are all the same, they’re more likely to think the same, ask the same questions, and have the same answers. But if you have a diverse group of students from different experiences and lifestyles, cultures, communities, and ways of thinking, it enriches the educational experience.”

Carlton Young, M.D., professor of surgery in the Division of Transplantation and assistant dean for medical student diversity and inclusion, agrees. According to Carlton Young, M.D., professor of surgery in the Division of Transplantation and assistant dean for medical student diversity and inclusion, “It’s extremely important to have diversity within the medical field because America is diverse. Having people from different ethnic and educational backgrounds is critical because of the different patients you’re going to take care of.” He adds that he took the position within the school’s administration in part to be an example to underrepresented in medicine (URiM) students. “I felt it was important, especially as an underrepresented minority, to serve in this office to help our underrepresented minority students as leaders.”
IT’S EXTREMELY IMPORTANT TO HAVE DIVERSITY WITHIN THE MEDICAL FIELD BECAUSE AMERICA IS DIVERSE. HAVING PEOPLE FROM DIFFERENT ETHNIC AND EDUCATIONAL BACKGROUNDS IS CRITICAL BECAUSE OF THE DIFFERENT PATIENTS YOU’RE GOING TO TAKE CARE OF.

CARLTON YOUNG

they navigate medical school. And that role has continued to grow as our efforts have expanded to include all types of folks who may be underrepresented.”

REACHING OUT

A critical moment in formalizing the School of Medicine’s efforts to build diversity came in 2013 when it established the Office for Diversity and Inclusion (ODI), whose mission is, “The pursuit of excellence through a commitment to diversity and inclusion in education, research, and patient care.”

The ODI has advanced a number of initiatives in support of this mission, including several pipeline and student recruitment programs. For the past three years, the office has received a grant from the Robert Wood Johnson Foundation to host the Summer Health Professions Education Program (SHPEP), a free, six-week summer enrichment residential program for undergraduates from across the country, including many from rural areas. The School of Medicine is one of only 13 sites nationwide to host SHPEP. The aim is to increase diversity in health professions by giving minority and socioeconomically disadvantaged students an up-close view and understanding of the range of opportunities available to them. The intensive program includes not only instruction in health care topics but also shadowing, sessions on application processes, mock interviews, and more.

“The summer enrichment program is one of the largest programs we do,” says Fouad. “We give the students experiences in the health sciences to prepare them to apply to medical school or to train in another health profession.”

The ODI also hosts recruitment events for prospective students, including pre-interview dinners that bring together prospective students with current URiM medical students; outreach efforts with

Left to right: Evelyn Jones, Mona Fouad, Jenna Blythe-Tjia, and Laura Heider of the Office for Diversity and Inclusion (not pictured, Carolyn Maddox).
high school and undergraduate student groups like Upward Bound and the Minority Association of Pre-Medical Students (MAPS); and campus visits at Alabama’s historically black colleges and universities (HBCUs).

Programming for current URiM students includes a student advisory board, which includes representatives from all four classes and numerous student organizations (Latino Medical Student Association, MedPride, American Medical Women’s Association, Student National Medical Association). The advisory board provides bilateral communication and feedback between the student body and the ODI. It also works to influence School of Medicine administrative policy and advocate for diversity and inclusion initiatives.

The ODI’s PRIMe Mentoring program is a series of career advising dinners for URiM medical students, house staff, and faculty. These dinners are an opportunity for students to gain knowledge, build a support network, and strengthen their sense of community with URiM faculty and house staff mentors. “Students really benefit from interacting with professionals who can relate to and validate their experiences,” says Young.

ELIMINATING UNCONSCIOUS BIAS

Diversity and inclusion programming doesn’t stop at the student level—it extends to residents, faculty, staff, and leadership. For example, the ODI offers training to department search committees on how to identify and eliminate unconscious bias. “We deliver training that highlights issues that might represent bias, like biased interview questions,” Fouad explains. “They need to be conscious about not excluding women or people from diverse backgrounds, and a lot of departments have requested this training.”

Fouad cites another initiative the ODI rolled out in 2018 called The Common Thread. Built around the theme, “Find Yourself in Everyone,” The Common Thread is a series of training modules designed to help people practically apply diversity and inclusion concepts to their environments. With topics ranging from building belonging to cultural competency, each module draws upon the real stories from members of the UAB community and tackles a different issue in depth. The modules include introductory videos of TEDTalk-style lectures, downloadable PowerPoint presentations, and instructions for guided discussions about building appreciation for diversity and inclusivity.

“It’s about getting people to think about how we are more similar than we are different,” Fouad explains.

Overall, she says, “There is a lot of work being done toward diversity, and we’re finding a lot of people among the faculty and others who want to help, which is a good thing. We have work to do, but I think we’re going in the right direction.”
Driven to Serve
According to the World Health Organization, an estimated 41 million people died from noncommunicable diseases like diabetes and heart disease in 2016, the same maladies that are the top killers throughout Alabama and the Southeast. Discovering new treatments for these and other diseases and sharing strategies to combat health disparities with partners in other countries are top priorities for various experts at UAB, and the UAB community has taken major strides in these areas in 2018.

CAPE TOWN CONNECTIONS

Ongoing partnership between UAB School of Medicine and the University of Cape Town (UCT) in South Africa moved forward this year when leaders from both schools outlined plans for joint service, research, and training collaborations.

In June 2017, School of Medicine Dean and UAB Senior Vice President for Medicine Selwyn Vickers, M.D., FACS, and Senior Associate Dean for Administration and Finance Dawn Bulgarella, MSHA, CPA, traveled to South Africa to foster the partnership with UCT. In March 2018, eight UCT leaders visited Birmingham to meet with UAB faculty. The two institutions aim to develop collaborations in focus areas that include anesthesiology, neurosciences, cancer, precision medicine, noncommunicable diseases, and health disparities.

“There are a lot of similarities between Alabama and South Africa in terms of our history,” says Rubin Pillay, Ph.D., M.D., MBA, School of Medicine assistant dean for global health innovation, who is from South Africa. “The two areas are also similar in the diversity of their patient bases and the burden of disease in the western cape of South Africa and parts of Alabama. There are many opportunities for this collaboration to be mutually beneficial.”

Following the March meetings, leaders from both schools developed more than 30 concept documents describing collaborative projects in the identified focus areas. They also discussed implementing health disparities research in South Africa, developing studies on surgical disparities and health literacy in both UCT and UAB populations, and expanding the Alabama Genomic Health Initiative to Cape Town to study the...
One well-established collaboration focuses on transplant surgery among HIV-positive populations. In 2007, South African surgeon Elmi Muller pioneered HIV-positive kidney transplants using deceased HIV-positive donors at Groote Schuur Hospital at UCT. According to UAB transplant surgeon Jayme Locke, M.D., who leads the UAB Incompatible Kidney Transplant Program, the achievement paved the way for the HIV Organ Policy Equity Act to be passed by Congress and signed into law in the U.S. in 2013. In fact, Locke says Muller helped UAB’s Division of Transplantation develop protocols that enabled Locke and other UAB surgeons to perform the Deep South’s first HIV-positive kidney transplant from an HIV-positive deceased donor in 2016.

Since then, Locke has traveled to Groote Schuur as part of the James IV Travelling Fellowship to share protocols with Muller for transplanting highly sensitized and ABO-incompatible patients. Muller’s team performed the continent’s first ABO-incompatible transplant in 2017 as a result of Locke’s visit. In February 2018, Locke and UAB nurses Katie Stegner and Sara Macedon returned to Cape Town to help Groote Schuur set up a paired exchange program modeled after the UAB Kidney Chain, the world’s longest ongoing transplant chain.

Pillay says building collaborations like these is important not only to enhance knowledge and clinical skills among faculty and trainees, but also to help them place their knowledge and skills in a broader context. “Health is a borderless space, and I think our physicians and students need to understand global context,” says Pillay.

“We live in a global village,” adds Michael Saag, M.D., associate dean for global health in the School of Medicine and director of the UAB Center for AIDS Research. “Maybe 100 years ago, we may not have been well-versed in issues going on beyond our borders, but now it’s easier for us to perceive and address international needs in health care.”

**UNDERSTANDING HEALTH DISPARITIES**

Part of what makes the School of Medicine an ideal collaborative partner for UCT is the depth of its expertise in health disparities. This is thanks in large part to the UAB Minority Health and Health Disparities Research Center (MHRC), which is led by Mona Fouad, M.D., M.P.H., director of the Division of Preventive Medicine and senior associate dean for diversity and inclusion in the School of Medicine. A nationally recognized expert in health disparities research, Fouad has been a central figure in establishing health disparities as a valid field of scientific study. In recognition of her contributions to medicine, she was inducted into the National Academy of Medicine in October.

“Social Determinants of Health from a Global Perspective” was the theme of the 13th Annual Health Disparities Research Symposium, hosted by the MHRC in Birmingham in March. The symposium highlights work by academic investigators, students, and community partners in basic science, clinical research, social and behavioral science, and health outcomes research in the field of health disparities.

The symposium’s panelists included researchers from Staffordshire University’s Centre for Health and Development (CHAD) in the U.K., including Judy Kurth, CHAD’s director; Chris Gidlow, Ph.D., CHAD’s academic director; and Aliko Ahmed, MBBS, M.Sc., M.St., the director of Public Health England for East of England and a public health professor at Staffordshire University. CHAD is a collaboration between public services and universities in Staffordshire and Stoke-on-Trent dedicated to minimizing health inequalities and improving the health of the population of those areas.

CHAD and UAB’s MHRC are partners in an exchange program that the Centers for Disease Control and Prevention and the Department of Public Health in England organized seven years ago to match three U.S. cities with three cities in the U.K. As part of the program, Fouad and the U.K. researchers have traded visits to exchange ideas around health care and addressing health disparities in their respective communities.

“Mona is an advisory board member for CHAD, so we’ve learned so much from her about what it takes to set up a research institution like this. I learned things that helped them along the way and difficulties to look out for,” says Kurth. “That’s been really helpful to us to escalate how quickly we can get established. It’s not at the scale we want it to be yet, but we are beginning to develop our track record. It’s helped to partner with an organization that has blazed this trail.”

**SHARED CHALLENGES**

Another quality that makes UAB a strong global health partner is that the population health challenges Alabama faces are similar to those faced in developing and developed parts of the world. Alabama has the third-highest rate of diabetes in the U.S., according to 2017 Behavioral Risk Factor Surveillance System (BRFSS) data. According to the World Health Organization, the global prevalence of diabetes has nearly doubled since 1980, increasing the need for new treatments.

In a groundbreaking study published in the journal *Nature Medicine* in July, researchers at UAB’s Comprehensive Diabetes Center found that regular oral administration of verapamil, a common blood pressure medication first approved for medical
use in 1981, is a safe and effective novel therapy for reducing insulin requirements and hypoglycemic episodes in adults with recent onset Type 1 diabetes.

Verapamil works by promoting a patient’s beta cell function and insulin production. This is the first such discovery to target diabetes in this manner. The researchers found that verapamil enabled patients to produce higher levels of their own insulin, limiting their need for injected insulin to balance their blood sugar levels.

“This trial’s results affirm that we are on the right track and are entering a new phase of discovery as it relates to this disease,” says Anath Shalev, M.D., UAB Comprehensive Diabetes Center director and principal investigator for the trial. “Diabetes impacts more than 30 million people in America alone, and hopefully our breakthrough will ultimately lead to approaches that can help improve the lives of all those affected by this disease.”

The high prevalence of cardiovascular disease is another major population health challenge for Alabama. UAB researchers are using a variety of approaches to tackle the problem. For instance, a review of over four decades of published studies found that taking popular multivitamin (MVM) and mineral supplements does not prevent strokes, heart attacks, or deaths related to cardiovascular disease.

For the study published in July in Circulation: Cardiovascular Quality and Outcomes, UAB Assistant Professor of Cardiology Joonseok Kim, M.D., led a team that reviewed 18 studies published between 1970-2016 that tracked more than 2 million participants for an average of 12 years.

“We meticulously evaluated the body of scientific evidence,” says Kim. “We found no clinical benefit of multivitamin and mineral use to prevent heart attacks, strokes, or cardiovascular death.”

The global nutritional supplement industry is expected to reach $278 billion by 2024. Kim says it has been difficult to convince people, including nutritional researchers, to acknowledge that multivitamin and mineral supplements do not prevent cardiovascular diseases.

“I hope our findings help decrease the hype around multivitamin and mineral supplements and encourage people to use proven methods to reduce their risk of cardiovascular diseases like eating more fruits and vegetables, exercising, and avoiding tobacco,” Kim says.

HEALTHY HABITS

Another UAB study shows that rest during normal sleep hours may help the heart repair itself. Martin Young, Ph.D., professor in the Division of Cardiovascular Disease, co-authored the study published in Life Sciences in February which shows that the heart replaces damaged proteins during the sleep period in animal models. However, the mechanisms responsible for the replacement of damaged proteins stop if food is consumed during this time.
“Imagine that once a week you take out the trash, and then suddenly you stop taking out the trash on that day; it will build up in your house, and your home will be dysfunctional,” says Young. “Our findings suggest that eating during the sleep phase prevents the heart from ‘taking out the trash,’ which we speculate might be one reason the heart becomes dysfunctional when food is eaten late at night.”

John Chatham, Ph.D., the study’s co-author and professor in the Department of Pathology, says the study could help scientists understand how interventions such as intermittent fasting lowers the risk of heart disease and diabetes.

A major contributor to Alabama and the South’s higher rates of cardiovascular disease is the higher incidence of smoking in the region. UAB researchers William Carroll, M.D., the John S. Odess Endowed Chair in the Department of Otolaryngology, and Isabel Scarinci, Ph.D., and Young-Il Kim, Ph.D., in the Division of Preventive Medicine, were awarded a grant from the National Institutes of Health (NIH) in 2018 to explore effective ways of implementing tobacco cessation in young African-American men in rural Alabama.

“Our preliminary data shows that 39.9 percent of African-American men in rural Alabama between 19 and 30 years of age smoke cigarettes, which is much higher than data provided by the Centers for Disease Control and Prevention among African-American men in the same age bracket in Alabama (15.5 percent),” Scarinci says.

Through his practice, Carroll noticed a spike in head and neck cancer cases in African-American men caused by tobacco use. “We kept seeing this devastating disease in the same communities,” Carroll says. “That’s what motivated us to try to make a difference. We would like to interrupt this cycle in young people before the habits become too ingrained so we might have a better chance of avoiding tobacco-related disease.”

The team plans to use the grant to train community health workers to promote tobacco cessation with the support of UAB experts who can deliver and manage the pharmacological component through telehealth. “We already know what works in tobacco cessation,” Carroll says. “It is the combination of cognitive-behavioral therapy and pharmacological management, but smokers in rural areas often do not have access to these treatments. We’ve tried to set this up in a way to be scalable to other parts of the country. If we can find success with this group, it can offer a template for other areas.”

— Tyler Greer, Savannah Koplon, and Adam Pope contributed to this story.

In 2018, Majd Zayzafoon, M.D., Ph.D., M.B.A., professor of pathology and medical education, became assistant dean for international medical education in the School of Medicine and assistant provost for international education in the Office of the Senior Vice Provost. In these roles, Zayzafoon works to expand the school’s and the university’s footprint in international health and international medical education.
2018 update from the Association of American Medical Colleges made dire predictions about the looming physician shortage, especially in primary care. According to “The Complexities of Physician Supply and Demand,” the U.S. could see a shortage of up to 120,000 physicians, including 14,800-49,300 primary care physicians, by 2030. In Alabama, the situation is particularly dire: The state ranks 45th in the nation in the number of active primary care physicians per 100,000 in population.

The UAB Department of Family and Community Medicine and the school’s Regional Medical Campuses in Huntsville, Tuscaloosa, and Montgomery are critical to our mission to expand the number of primary care physicians in Alabama. Several new developments are helping fulfill that goal.

Irfan Asif, M.D., became chair of the Department of Family and Community Medicine in September. Asif is a primary care physician specializing in sports and exercise medicine, and he has a national and international reputation for teaching and scholarship.

Asif came to UAB from the Greenville Health System and the University of South Carolina School of Medicine Greenville, where he worked most recently as the vice chair of academics and research in the Department of Family Medicine and as the sports medicine fellowship director.

“I hope to facilitate tremendous growth for the department,” Asif says. “Our department will seek new ways to prevent and treat diseases for the patients we serve, aim to develop new educational experiences for trainees, and expand opportunities for nationally recognized primary care research in population health using the principles of lifestyle and exercise medicine.”

REVIVING A RESIDENCY

After a nearly two decade absence, UAB will relaunch the family medicine residency program in Birmingham in 2019 in partnership with Cahaba Medical Care, an accredited, Patient-Centered Medical Home (PCMH) with clinics in Jefferson, Bibb, Autauga, Perry, Chilton, and Dallas counties. The program joins UAB’s existing affiliated family medicine residencies in Huntsville and Selma.
The new Cahaba-UAB Family Medicine Residency Program is a three-year program that will support 36 medical school graduates, or 12 per year, beginning June 2019. Residents will split their time between UAB's hospitals and Cahaba's rural or urban doctors’ offices.

“Most residency programs are housed strictly in hospitals,” says Craig Hoesley, M.D., senior associate dean for medical education. “We recognize that, to properly train and incentivize young physicians to pursue a career in primary care medicine, particularly in underserved parts of our state, we need to train them within that environment, so they see firsthand the rewards and challenges that come with that career path.”

The program will place seven residents at Cahaba Medical Care’s West End Birmingham clinic, an underserved urban community, and five at its rural Centerville clinic. They’ll spend the majority of their time seeing patients in those clinics, mentored by Cahaba's physicians, with additional training at UAB in family medicine, as well as specialty areas that include internal medicine, pediatrics, obstetrics, and emergency medicine.

John Waits, M.D., Cahaba Medical Care’s chief executive officer, says he and his practice partner Lacy Smith, M.D., developed their own rural residency program to provide care in communities experiencing primary care shortages. Since 2014, Cahaba Medical Care has had a memorandum of understanding with the School of Medicine to have Cahaba’s residents rotate through several UAB departments. In 2017, Waits says they came upon an opportunity to expand the number of residents.

“We wanted to do it in a way that kept us in parallel with our partners at UAB,” says Waits. “So we started conversations on how we could expand and make it a win-win for our residents in terms of more rotations and be more closely aligned with what the dean of the medical school wanted to do.”

Cahaba Medical Care and UAB decided on a plan where Cahaba would offer a community-based primary care setting for residents. “The idea was to put a training program in a shortage area to teach residents and medical students that it can be done—that you can train there, practice there, and that it can be a great life,” Waits says.

In addition to specialty care training, UAB will provide residents with family medicine experiences that offer innovation in clinical practice. The Highlands Family Medicine Clinic, for example, will offer a virtual scribe model to reduce the administrative burden that contributes to physician burnout. Family medicine residents exposed to these practices will be better prepared to navigate the future landscape of health care.

Asif says the new program fits in with UAB’s commitment to build a larger primary care presence in the state. “Projections indicate that Alabama will face a shortage of more than 600 primary care providers by 2030 unless steps are taken now to recruit and retain family medicine physicians and other health care providers,” he says. “Growing the residency program will create a pipeline for new family physicians to help serve Alabama and the Southeast using high-quality patient care.”

REGIONAL OUTREACH

At the Huntsville Regional Medical Campus, the first class of integrated residents for the Family Medicine Residency Program graduated in 2018. This inaugural class completed a unique curriculum combining fourth-year medical school studies and the residency intern year prior to matching into the Huntsville Family Medicine Residency Program. Through this program and others, the School of Medicine remains committed to training future physicians—especially primary care physicians—at sites around the state.

This includes the UAB Montgomery Regional Medical Campus (MRMC), which is located at Baptist Medical Center South and hosts 19 third-year and 16 fourth-year students. It is also home to the UAB Montgomery Internal Medicine Residency Program. In January 2018, the school transitioned oversight of the Selma Family Medicine Residency to the MRMC. As a result,
MRMC staffers are better able to enhance faculty development and assist residents, says Gustavo Heudebert, M.D., MRMC interim dean.

Heudebert says that to foster more primary care physicians for the region, the MRMC plans to launch an integrated internal medicine program similar to the Huntsville campus model that will provide incentives for fourth-year medical students to remain at the MRMC for their residencies.

“Every effort we make to recruit students to train with us gives us a better chance to increase the number of physicians in Alabama’s River Region.”

Gustavo Heudebert (second from right) is the interim dean of the Montgomery Regional Medical Campus, one of four regional campuses affiliated with the School of Medicine.

“Similar goals drive the school’s other regional campuses. The first group of medical students admitted to the new Primary Care Track, a medical education track within the four-year M.D. program operated in collaboration with the University of Alabama’s College of Community Health Sciences (CCHS) in Tuscaloosa, began medical school in July.

The students will spend their first two years completing the requisite basic science curriculum at the School of Medicine’s main campus in Birmingham along with other UAB medical students. They will spend their third year of the Primary Care Track at the CCHS in a model of education that is a hybrid longitudinal integrated clerkship (LIC).

The Primary Care Track seeks to provide medical students with a strong foundation in clinical medicine focused on preparation for residency training in primary care and other community-based specialties through longitudinal experiences with patients and mentoring physicians, as well as special
programming on population health and physician leadership.

The goal is to increase the number of physicians going into primary care fields, says CCHS Director of Medical Student Education Grier Stewart, M.D. The Primary Care Track works like this: Students spend six months in “immersion blocks” at DCH Regional Medical Center in Tuscaloosa and other sites in a traditional model of clinical education, going through specialty rotations separately but continuously. Students also spend six months in “integrated blocks” at University Medical Center, the College’s clinical practice, and other sites, caring for patients and working alongside a mentor physician.

The integrated blocks are a modification of the traditional clinical curriculum, emphasizing key characteristics and skills for primary care—continuity, community leadership, and prevention and psychosocial skills. They allow students to see patients in the context of their families and communities, not just through isolated episodes of illness in the hospital setting. Stewart says studies show that students who participate in LICs perform well in this model of education, are strong residency candidates, and report higher rates of satisfaction.

In addition to offering its own Integrated Family Medicine Residency Program, the UAB Huntsville Regional Medical Campus (HRMC) strives to provide students with learning experiences that strengthen training and encourage interest in primary care. In 2018, HRMC students, family and internal medicine residents, full-time and volunteer faculty, and Regional Campus Dean Roger Smalligan, M.D., MPH, had a number of oral presentations and posters accepted to the Southern Regional Meeting (SRM) in February. The SRM is jointly sponsored by the Southern Society of Clinical Investigation and its partnering organizations.

“Regional and national scientific meetings provide a wonderful opportunity for our students and residents to compete, share their research and writing efforts, and network with people from other universities,” says Smalligan. “We are happy to support their efforts, and it improves the visibility and reputation of the School of Medicine’s Huntsville campus in the academic arena.”

Over the summer, the HRMC held its second annual simulation internship day for internal medicine and family medicine interns. The interns were placed in small groups, where they treated simulated patients in urgent or emergent clinical situations. Faculty members voiced and role-played the simulated patients (high-fidelity manikins complete with vital signs), who had chest pain, hypotension, shortness of breath, or mental status changes—all common scenarios the interns will encounter during their early days in the hospital wards. The event took place in the state-of-the-art University of Alabama in Huntsville College of Nursing Simulation Center.

After practicing patient simulation exercises in the morning, the interns were joined by UAH nurse practitioner students and Auburn University Harrison School of Pharmacy students to diagnose and treat patients with acute myocardial infarction and adverse drug reactions.

“It was a great time of learning and interprofessional collaboration, which will help our new interns feel better prepared for their first day on the job,” says Smalligan. “Experiences like these are what I hope sparks that interest in pursuing primary care as a specialty.”

— Brit Blalock, Holly Gainer, Bob Shepard, and Leslie Zganjar contributed to this story.
The Birmingham VA Medical Center (BVAMC), a longtime clinical partner and training site of the School of Medicine, received Whole Health (WH) Design Site designation from the Veterans Health Administration's Office of Patient Centered Care and Cultural Transformation in 2018. This is part of a paradigm shift among VA health care facilities from a system geared primarily toward treating disease to one rooted in forming continuous healing relationships and partnerships that support veterans in achieving their greatest overall health and well-being. In 2018, the VA launched the WH initiative in one flagship facility in each of the 18 Veterans Integrated Service Networks and several Design Sites across the country, including the BVAMC. Guided by a veteran’s personalized health plan, the WH approach focuses on empowering and equipping veterans to take charge of their health and well-being.

“The Whole Health System is a cultural transformation in the way we as health care providers practice the art of medicine and healing,” says Oladipo Kukoyi, M.D., M.S., VHA-CM, chief of staff for the BVAMC and clinical professor in the UAB Departments of Family and Community Medicine and Psychiatry (pictured above). “It addresses the full range of physical, emotional, mental, social, spiritual, and environmental influences that affect a person’s health.”

The WH System consists of three components aimed at empowering and equipping veterans to live their fullest lives:

• The Pathway (Empowering): Partners with the person and their family, exploring their mission, aspirations, and purpose and beginning their overarching personal health plan.
• Well-Being Programs (Equipping): Involves building skills and support and proactive, integrative health approaches such as stress reduction, yoga, tai chi, mindfulness, nutrition, acupuncture, and health coaching.
• Clinical Care (Treating): Includes VA and/or community providers trained in the WH approach, including healing environments and relationships, complementary and integrative health approaches, and health planning.

Encouraging patients to partake in supplemental therapies such as acupuncture, massage therapy, and yoga, the WH System acknowledges that self-care complements conventional medical care. In this approach, the patient is an active partner with the health care team, which consists not only of health care providers but also of peers, teachers, and coaches. Patients are encouraged to find a supportive community, which can be as simple as having other people to talk to, go to the gym with, meditate with, or engage with around a shared interest.

“We are truly engaging the veteran patient by partnering with them to create a personalized strategy for treatment, self-empowerment, self-healing, and self-care,” says Kukoyi. “Our No. 1 goal with this approach is simple: We want to help patients accomplish the goals they create for themselves. That is why we work with patients to find what health goals are important to each of them.”
These days, hospitals in rural parts of Alabama are under such financial strain that many face the possibility of closing their doors for good. Some already have—since 2010, five rural hospitals in Alabama have been shuttered. These smaller, rural hospitals are often located in communities where the poverty rates are high and the people are sicker and more likely to be uninsured.

In response to the crisis, the UAB Health System is working to expand its footprint across the state to bring better health care to its rural counties by developing supportive partnerships with struggling hospitals.

One such hospital, the J. Paul Jones Hospital in Camden, entered into a management agreement in 2018 to become a member of the UAB Health System. The year before, the J. Paul Jones Hospital board announced that the 30-bed hospital, which has been in operation for 60 years, would have to close its doors due to declining reimbursements.

Under the new agreement, UAB Medicine will provide managerial expertise and assist in supply chain logistics, revenue cycle management, and compliance issues. UAB will also help with clinical resources such as assistance in physician recruiting and staffing.

UAB Health System—which includes UAB Hospital, UAB Callahan Eye Hospital, Medical West, Baptist Health, Prime Care, and VIVA—now has management relationships at Bryan W. Whitfield Memorial Hospital in Demopolis, LV Stabler Memorial Hospital in Greenville, and J. Paul Jones. The Health System also has affiliate relationships with Eliza Coffee Memorial Hospital in Florence, Northeast Regional Medical Center in Anniston, and Russell Medical Center in Alexander City.

In March 2018, the UAB Health System entered into a new strategic and operational affiliation agreement with Infirmary Health, a five-hospital system based in Mobile with more than 700 active physicians and 5,600 employees. The affiliation will extend UAB’s clinical expertise to southwest Alabama, where Infirmary Health is the region’s leading health care provider.

“UAB does certain procedures—in cancer and transplantation, for example—that are not available anywhere else in Alabama,” UAB Health System CEO Will Ferniany, Ph.D., says. “This affiliation will improve access for patients in Mobile to those procedures at UAB when necessary, while continuing to get the bulk of their medical care at home.”

Opportunities for collaborative care are also growing in telemedicine. In 2018, the U.S. Department of Agriculture awarded UAB a $495,877 Rural Utilities Services Grant to grow its telehealth network. The goal is to reduce health disparities and improve specialized care delivery for patients living in rural counties by funding telehealth equipment that lets patients meet with their physicians by video instead of traveling long distances to and from appointments.

The equipment will be installed in nine hospitals and 10 Alabama Department of Public Health county health departments. The Tele-ICU in Selma and Telestroke in Demopolis are only two of the telemedicine programs already in place, Ferniany says. “UAB is committed to improving rural health, and telehealth is probably one of the best ways to do that,” he notes.

Also in 2018, the UAB Health System established an Accountable Care Organization (ACO) to partner with other health care providers to improve quality and care for Medicare patients in Alabama. The ACO members are UAB Hospital, the University of Alabama Health Services Foundation, Medical West Hospital, and two Federally Qualified Health Centers that are Christ Health Center and Cahaba Health Center.

ACOs are groups of health care providers who come together voluntarily to provide coordinated, high-quality care to their Medicare patients. UAB’s ACO manages more than 16,000 covered lives.

“The goal of coordinated care is to ensure that patients, especially the chronically ill, get the right care at the right time, while avoiding unnecessary duplication of services and preventing medical errors,” says Ferniany. “When managed properly, an ACO can succeed in delivering high-quality care while spending health care dollars more wisely and efficiently, helping to lower overall health care costs.”

— Holly Gainer and Bob Shepard contributed to this story.
Anniversaries
On May 8, 1968, UAB surgeons led by Arnold Diethelm, M.D., performed the first transplant in Alabama at the Birmingham VA Hospital. Since that landmark kidney transplant, UAB Medicine has successfully completed more than 14,000 organ transplants. UAB celebrated that 50-year legacy with a ceremony on May 8, 2018.

Diethelm, who served as chair of the Department of Surgery from 1982-1999, was honored at the ceremony for helping pave the way for transplantation at UAB and in the Southeast. Today, UAB Medicine—one of the busiest transplant centers in the nation—performs more than 400 transplants annually, including heart, lung, kidney, pancreas, liver, small bowel, and islet cell transplants, as well as multi-organ procedures.

“Today marks a day where we not only look back to the past, but also celebrate the future,” Devin Eckhoff, M.D., director of the Division of Transplantation, said at the event. “I am humbled to stand on the shoulders of what Dr. Diethelm did for this division.”

The first kidney transplant was only the start of many firsts. The first heart transplant in the Southeast took place at UAB in 1981, followed by the first liver transplant at UAB in 1984. In 1988, the first simultaneous heart-lung transplant in Alabama and the region’s first pancreas-kidney transplant occurred, followed by the state’s first lung transplant in 1989. The first simultaneous heart-kidney transplant in the Southeast was performed in 1995, and the region’s first HIV-positive kidney transplant from an HIV-positive deceased donor happened in 2016.

UAB continues to play a national role in transplant innovation. As of publication time, 105 living donors have changed the lives of as many recipients as part of the UAB Kidney Chain, the nation’s longest ongoing, single-center, paired kidney transplant chain. In a paired transplant chain, family or friends of a prospective transplant recipient with whom they are not a compatible donor can give a kidney to another person in need—essentially paying the donation forward on behalf of their loved ones and creating a life-saving chain of organ donation. “To me, these are miracles,” says Jayme Locke, M.D., surgical director of UAB’s Incompatible Kidney Transplant Program and UAB Kidney Chain coordinator. “This is a life changer for these patients, their families, and their friends.”

Finding new and inventive ways to pair donors with recipients is an important piece of the transplant puzzle. However, approximately 22 people die each day waiting for a transplant in the U.S. “We will never have enough human organs to solve this problem,” asserts Selwyn Vickers, M.D., FACS, senior vice president for medicine and dean of the School of Medicine.

UAB is pursuing a cutting-edge solution to address the lack of transplant organs through its pioneering Xenotransplantation Program, made possible by a 2016 grant from biotechnology company United Therapeutics Corp. The program is aimed at generating organ transplants from genetically modified pigs to humans. Several of the country’s foremost xenotransplant researchers—Joseph Tector, M.D., Ph.D.; David K.C. Cooper, M.D., Ph.D.; and Christopher McGregor, G.A., M.B., FRCS, M.D. (Hon.)—are the program’s principal investigators.

“In the South, we’re in the hotbed of organ failure,” Eckhoff says. “People are dying waiting for organs. Xenotransplantation is a natural fit for us, and we hope it will spur more opportunities in our region.”
THE POWER OF
TRANSLATION
Transforming research and advancing health
BY ANDRIA CIMINO

According to Christopher Austin, director of the National Center for Advancing Translational Sciences (NCATS), translation offers “boundless promise to transform science and medicine.” Since its establishment in 2008, the UAB Center for Clinical and Translational Science (CCTS) has worked tirelessly to deliver on that promise.

As the sole Alabama-based “Hub” in the NCATS-funded Clinical and Translational Science Award (CTSA) program, the CCTS has been a driving force for scientific innovation and excellence for the past decade. Through its leadership, as evidenced by an astounding array of research supports and collaborations, the CCTS is transforming the biomedical research environment at UAB and beyond.

The CCTS Partner Network—which comprises 11 academic and scientific research institutions in Alabama, Louisiana, and Mississippi—is the foundation of the center’s regional collaborative efforts and represents a signature achievement. Launched in 2015, the network shares a common purpose: to reduce the burden of cardiometabolic, vascular, and cancer-related diseases and health disparities that disproportionately affect the underserved minority and special populations in the Deep South.

The CCTS has since developed collaborative relationships with research institutions across the country. Notable among these is the Accrual to Clinical Trials (ACT) Network, a federated i2b2 infrastructure that enables feasibility studies at scale, providing members access to tens of millions of patient records. CCTS joined the ACT Network in September. “Only by joining together can we achieve the scope, scale, and unique translational research capacities that will catalyze the pace of discovery, leading to rapid improvements in health care,” says CCTS Director Robert Kimberly, M.D., the Howard L. Holley Research Chair in Rheumatology.

The transdisciplinary approach to science represents a paradigm shift for academic medicine. To prepare researchers for the collaborative projects needed to address our most complex health challenges, CCTS offers learning opportunities that create “translational thinkers” who are multilingual—i.e., familiar with the basic principles and terminologies of key fields in translation, from informatics, biostatistics, and study design to team science, ethics, and community engagement. The CCTS Clinical and Translational Science Training Program, a six-month experience that has introduced hundreds of investigators at all career stages to the language of translation, graduated nearly 50 trainees in 2018.

At the national level, CCTS is leading nine CTSA Hubs charged by NCATS to develop a translational version of the National Science Foundation’s I-Corp Program. Unveiled in 2018, the I-Corps@NCATS program prepares biomedical scientists to think like entrepreneurs, ensuring their projects meet real-world health needs by connecting them to the potential customers of their research.

CCTS has conducted nearly 1,000 scientific panel reviews over the past five years, enhancing investigator success in grant funding by more than three times the NIH pay line. Its latest peer review opportunity, the Innovation Panel (iPanel), helps researchers with potentially marketable discoveries navigate the commercialization pathway.

In addition to top-notch clinical support, CCTS provides critical leadership in the clinical trial space. In 2018, CCTS partnered with HSIS and the Clinical Trials Administration Office to roll out the OnCore clinical trial management system across the UAB enterprise. Together, they launched a pilot of the XpertTrial search engine, which enables patients to easily find all UAB studies that are actively enrolling subjects.

“As we anticipate our grant renewal in spring 2019, we will continue supporting the translation of scientific discoveries into human health improvements,” Kimberly says, noting that this barely scratches the surface of what CCTS does. “We help keep UAB and our other partner institutions at the forefront of biomedical research and academic medicine.”

The CCTS has secured more than $123 million in competitive federal awards, including 14 supplemental awards. It has granted 62 pilot awards, producing nearly 1,500 publications and an overall ROI of 49:1 since 2008.
The UAB Acute Care for Elders (ACE) Unit, the first such specialty unit in Alabama, celebrated its 10th anniversary in August. Supported by UAB Hospital-Highlands and the UAB Comprehensive Center for Healthy Aging, the unit was created to address geriatric syndromes that can negatively affect outcomes for frail, older adults during a hospitalization. By utilizing an interdisciplinary care team trained in geriatrics, the unit has established best practices and a new model for inpatient geriatric care at UAB and around the nation.

Nearly one in five Americans will be 65 years or older by 2030. This dramatic increase in the elderly population has created challenges for patients, families, and hospitals. Recognizing that traditional models of inpatient care did not consistently focus on health conditions specific to elderly patients, UAB physicians partnered with the Division of Gerontology, Geriatrics, and Palliative Care to initiate the ACE program. They aimed to establish new and evidence-based methods of geriatric care.

Located at UAB Hospital-Highlands, the unit provides a “home-like” environment to promote comfort, safety, mobility, and cognitive stimulation. Among other elder-friendly amenities, the space utilizes low-glare lighting and flooring to help with low or limited vision, while large private patient rooms with sitting and sleeping areas allow families to stay close.

“The design of the unit takes into account every element of a user-friendly environment, but it specifically caters to the unique needs of geriatric patients,” says Emily Simmons, MSN, R.N., nursing professional development specialist for UAB’s Nurses Improving Care for Healthsystem Elders (NICHE) program. “Our patients and their families are immediately put at ease when they learn that the unit—both the team who provides care and the physical space itself—was designed specifically for them.

Families who have been here before now ask as soon as they arrive at the hospital that the elderly patient be placed in the ACE Unit.”

The ACE Unit’s interdisciplinary team includes geriatric and hospitalist physicians; geriatric and hospitalist nurse practitioners; nurses; physical, occupational, speech, and respiratory therapists; a registered dietician; pharmacists; an infection control nurse; social worker; care manager; pet and music therapists; an artist in residence; ACE coordinator; chaplain; and volunteers. The staff receives continuing geriatric education and training.

To help develop such a diverse team across all of UAB, a Geriatric Scholars Program (first created for nurses in 2009) was expanded in 2011 to include other licensed staff members to spread best practices throughout the organization. Participants undertake a two-year curriculum to gain in-depth knowledge of caring for hospitalized older adults and managing common geriatric syndromes through evidence-based care protocols. The program prepares providers to obtain gerontological certification.

Kellie Flood, M.D., associate professor in the Division of Gerontology, Geriatrics, and Palliative Care and founding medical director of the UAB ACE Unit, now serves as the geriatric quality officer for all of UAB Hospital. From the outset, she saw the program as a basis and guide for best practices.

“From day one of the ACE Unit launch in 2008, we set out to transform all of UAB Hospital by year three and be nationally recognized by year five,” Flood says. “Thanks to the amazing team of folks who work on the ACE Unit, those goals were not only achieved but surpassed. Outcomes demonstrating higher-valued care from the UAB ACE Unit were published in 2013, and now UAB is collaborating with the American College of Surgeons to finalize geriatric best practices for surgical patients that will be published in 2019.”
In 1988, contracting HIV was seen as a death sentence and those living with it were often ostracized by their communities. That same year, Michael Saag, M.D., professor in the Division of Infectious Diseases and director of the UAB Center for AIDS Research, opened the UAB 1917 Clinic to treat HIV. Saag and a small staff treated 100 patients in the first year.

In 2018, the 1917 Clinic celebrated treating more than 12,000 patients living with HIV over its 30-year history. During that time, the clinic defied the odds and helped shift both public perception and the conversation around HIV. The clinic has also grown into the largest HIV medical provider in the state and a national leader in care.

“HIV is now a manageable chronic disease,” says Saag, the Jim Straley Endowed Chair in AIDS Research. “The strides that have been made in 30 years from an awareness standpoint—in treatment, therapy, and even bipartisan federal recognition and funding through The Ryan White Care Act—have drastically changed the trajectory of this disease. It has also dramatically improved the way people living with HIV lead their lives.”

Today, the 1917 Clinic is an NIH-funded facility with a staff of more than 150. Its on-site care clinics include dental, psychiatric, and neurologic clinics. It offers prevention services aimed at educating the public about the disease and preventive measures for those at risk of infection.

Since 1997, the 1917 Clinic has received Ryan White Early Intervention Service funding, which helps support outpatient health services. It currently receives more of this funding than any other clinic in the country. The clinic has also received federal funding to implement HIV care into other practices, and serves as an education and training arm for the Southeast.

“What many people may not realize is that our clinic provides a continuum of care throughout the patient’s life,” says Clinic Director James Raper, Ph.D., CRNP. “We are still seeing patients who first came to the clinic in 1988. As we move closer to a cure, our clinic will continue to evolve to fit their needs.”

Turner Overton, M.D., co-director of the Alabama Vaccine Research Clinic and medical director of the 1917 Clinic, is enthusiastic about the future of treatment and research. “In the past, we were focused on only developing treatments to sustain patients, but now we are pushing the envelope and looking toward once-a-day regimens or even long-term shots that could be taken every four to eight weeks,” says Overton. “An even more aggressive forecast, we’re exploring medications that would only need to be taken every six to 12 months. We’re getting closer to identifying a cure for HIV and working on many strategies to eliminate HIV infection entirely.”

As part of their vision for the future, clinic leadership and staff—along with other local organizations, state agencies, and the city of Birmingham—pledged to achieve the following 90-90-90 plan by 2020, with the goal of ending the spread of AIDS by 2030:

- 90 percent of people living with HIV will know their HIV status
- 90 percent of those who know their status will be engaged in care and on antiretroviral therapy
- 90 percent of those on antiretroviral therapy will achieve full viral suppression

“Thirty years ago, none of us could have imagined how far we would come in treating patients living with HIV,” Saag says. “To know that UAB has played a tremendous part in eradicating the disease and helping prevent the infection of others is remarkable and something our community should be proud of.”
PHILANTHROPY
n addition to the transformational $30 million gift from O’Neal Industries Inc. and its shareholders to name the O’Neal Comprehensive Cancer Center at UAB (see page 5), the School of Medicine was honored to receive many gifts in 2018 that are propelling our clinical care, research, and medical education programs to new heights. All gifts, big and small, drive our innovation and excellence. The following is a sample of the generous support for which we are truly grateful.

A GIVING LEGACY

For Charles Anderson Sr., there is no question that UAB is a worthy investment. Anderson and his family have watched their philanthropic gifts make a difference by supporting the Hilda B. Anderson Endowed Chair in Nephrology and the Anderson Family Chair in Medical Education, Research, and Patient Care in the School of Medicine. “UAB holds a special place in our hearts,” Anderson says.

But after receiving expert care and developing a friendship with his physician, Anderson wanted to make an impact in another area, so he and his family endowed their third chair: the Anderson Family Endowed Chair in Urology.

A number of years ago, Anderson began receiving care from Keith Lloyd, M.D., a professor in the Department of Urology. “I found him to be one of the most outstanding doctors,” Anderson says. Anderson, whose family business Books-A-Million began with a single newsstand in 1917, adds that he and his relatives feel that Alabama has a big asset in UAB. “To have these outstanding departments and physicians so close to our home in Florence is a huge blessing,” he says.
Members of his family who helped endow the new chair are his brother Joel Anderson; his wife, Hilda Anderson; and his four sons, Charlie, Terry, Clyde, and Harold Anderson.

Dean Assimos, M.D., the Anton J. Bueschen, M.D., Endowed Chair in Urologic Surgery and Research in the Department of Urology, says the generosity of donors like the Andersons has been instrumental to the growth of the young department, which was elevated from the division level to a department in 2012. “We are very grateful that Mr. Anderson and his family wanted to honor Dr. Lloyd in this way,” says Assimos.

Anderson’s gift will help Lloyd continue his research on long-term management of neurogenic bladder, a bladder control condition. “Bladder dysfunction and its long-term effects on patients have been an area of research and interest for me for most of my career,” he says. “The Anderson family and, in particular, Charles Anderson have long been friends of the university. This endowed chair will assist the Department of Urology in recruiting new faculty, will strengthen our mission to perform valuable research, and will benefit the health of the people of Alabama and the country.”

Ranked 34th by U.S. News & World Report as a top urology program in the nation, the UAB Department of Urology provides the highest-quality comprehensive care for adult and pediatric patients from across Alabama and the surrounding region. Composed of 22 faculty and a large patient care team, the department provides expertise to evaluate and treat the spectrum of urologic subspecialties.

FOCUS ON THE FUTURE
Kelley and C.T. Fitzpatrick of Birmingham made a significant gift to support the UAB Department of Ophthalmology and Visual Sciences’ mission. A nationally recognized leader in vision research and patient care, UAB Ophthalmology is committed to preserving and restoring eye health at home and around the globe. The department recently ranked No. 6 in the country for National Institutes of Health funding, a substantial increase from its No. 17 ranking in 2017. Philanthropic support has been a critical catalyst for this remarkable growth.

“We are thrilled and humbled by the generous gift from Mr. and Mrs. Fitzpatrick,” says Christopher Girkin, M.D., MSPH, FACS, EyeSight Foundation of Alabama Chair of the Department of Ophthalmology and Visual Sciences. “The growth in the Ophthalmology Vision Research Program is a direct result of the generous philanthropy that UAB has received. The establishment of the Kelley and C.T. Fitzpatrick Endowed Chair in Ophthalmology is a critical step forward that will enable us to continue to recruit the best and brightest vision researchers

This endowed chair will greatly assist the Department of Urology in recruiting new faculty, will strengthen our mission to perform valuable research, and will benefit the health of the people of Alabama and the country.

KEITH LLOYD
in the world and maintain our competitive edge within top-tier vision research programs worldwide.”

Half of the gift will be used to establish the Kelley and C.T. Fitzpatrick Endowed Chair in Ophthalmology, which will help the department recruit or retain a visionary faculty member. An endowed chair is one of the most significant investments a philanthropic partner can make in an academic institution, further advancing the mission of the department. The other half will be used to establish the C.T. and Kelley Fitzpatrick Research Acceleration Fund in Ophthalmology. This fund will help translate knowledge from the lab to the patient bedside, provide robust training to the next generation of ophthalmologists, and improve eye health by alleviating blinding diseases. – Jessica Martindale

PROMOTING PRIMARY CARE

When Peyton Bryars III, M.D., began pursuing a medical career in the 1970s, he says he chose to focus on primary care partly because it was an opportunity “to treat the whole family and truly understand their situation.”

In the face of a growing national shortage of primary care physicians, Bryars has established a legacy gift that will create an endowed medical scholarship benefiting UAB medical students interested in primary care. The scholarship will be named in honor of his parents, Doris R. and Peyton R. Bryars Jr.

“My parents worked tirelessly and sacrificed so my sister and I could go on to higher education,” Bryars says. “I wanted to use this scholarship to honor them and to help incoming medical students with financial needs consider primary care.”

“There are serious shortages in primary care all over the country, especially in rural areas, and it’s only getting worse,” says William Curry, M.D., MACP, the School of Medicine’s associate dean for primary care and rural health. “The primary care workforce is aging and retiring, and we’re not replacing them as fast as we need. The good news is that with the right tools we can increase the number of students who want to fill those shoes.”

A Mobile native, Bryars graduated from the School of Medicine in 1972 and completed a residency in internal medicine at the University of California, San Francisco. He remained in San Francisco and worked in a group practice in internal medicine for eight years, then spent the remainder of his career as a regional medical director for the Chevron Corp. As part of that job, he established and oversaw primary care clinics in several developing countries.

Throughout his career, Bryars developed an appreciation for the deep connection with patients that comes from working in primary care, and he wants today’s medical students to understand the value and personal satisfaction of a career in the field. “In this world of super-specialization, we tend to think of individuals as parts,” he says. “Primary care encourages us to look at the individual as a whole person and often as part of a larger family. I want to encourage students’ interest in primary care. It is a very rewarding profession.”

Curry says some students who might be interested in primary care are instead pursuing higher-paying specialist
careers in an effort to offset the debt that can accompany medical school. That is what makes primary care scholarships such as the one Bryars has established so valuable.

“From his own successful career, Dr. Bryars knows firsthand the importance of access to primary care as a linchpin of healthy families and a healthy community,” says Selwyn Vickers, M.D., FACS, senior vice president for medicine, dean, and the James C. Lee Jr. Endowed Chair in the School of Medicine. “We are deeply grateful for his planned gift, which will honor his parents’ commitment to providing him and his sister with quality educations, while it strengthens our mission to train more primary care providers for our state.” – Cary Estes

AN ENDURING COMMITMENT

Paul W. Burleson, M.D., served the School of Medicine as an internist for 35 years, from his initial appointment in 1951 to his retirement in 1986. But perhaps his greatest legacy within the school is the lasting impact he and his wife Martha made through their philanthropic giving, which continues to shape students and internal medicine training at UAB.

During their lifetimes, the Burlesons made outright and testamentary gifts to the School of Medicine to establish the Paul W. and Martha R. Burleson Medical Scholarship Endowment and the Paul W. Burleson Scholarship Foundation, which provide medical student scholarship and internal medicine faculty support. To date, the School of Medicine has received nearly $4.7 million in gifts and pledges from the Burlesons and the foundation.

The Paul W. Burleson, M.D., Medical Scholarship is awarded to students with high academic standing and financial need, with preference given to those students who are residents of Alabama and who are interested in practicing internal medicine in the state of Alabama upon completion of their training. For the 2018 academic year, the foundation funded 10 medical students—three at full cost of attendance and seven at near-full cost of attendance. This is the most students it has supported in a single academic year and the most ever given for medical student scholarships in a given year for awarding outright. The foundation also made a $10,000 gift to the Medical Student Assistance Program, which helps students with severe hardship or who encounter an unexpected emergency.

In tribute to Burleson’s lifelong passion for internal medicine training, the foundation made another gift to the school to establish the Paul W. Burleson, M.D., Endowed Professorship in Internal Medicine, which the foundation aims to grow to an endowed chair as Burleson desired. The endowed professorship will be held by the Department of Medicine faculty leader engaged in a planned UAB Academy of Health Professions Educators. The purpose of the academy is to help busy clinician-educators carve out more time for teaching and mentoring, focus on developing the best curricular resources, and explore the most effective training methods.

Linda Draughn, Martha Burleson’s daughter and Burleson Foundation director and trustee, shares the Burlesons’ commitment to supporting the future of medicine in Alabama. “Paul knew he wanted to leave something to the field of medicine because it was his livelihood and his driving passion,” she says. “Most desirably, these gifts would help students and professors of medicine, alleviate doctor shortages in Alabama, and sustain a legacy of giving.”

“Dr. Burleson’s service to our school
and to medicine in Alabama continues more than a decade after his passing,” says Vickers. “We are deeply grateful for the Burlesons’ and the Burleson Foundation’s commitment to our students and to our internal medicine programs.” – Jane Longshore

**FRIENDS HELPING FRIENDS**

**B**irmingham resident Beth Seibels vividly recalls when her over 30-year battle with depression reached its breaking point five years ago. “People could see despair in my eyes. My vocal cords and facial muscles were shutting down,” remembers Seibels. “I became suicidal because the anxiety was unbearable and the future looked hopeless.”

A friend came to her rescue, encouraging her to see Richard Shelton, M.D., professor and the Charles Byron Ireland Chair of Psychiatric Research in the School of Medicine. “Dr. Shelton said, ‘If plan A doesn’t work, I have plans B and C,’” Seibels says. “No other doctor had given me hope like that.” Within two weeks, Seibels improved. The dramatic change inspired her friends to step in again. They launched a $10 million fundraising initiative, which included a $2.5 million investment from UAB, to support and promote Shelton’s work.

The group’s collective efforts have secured nearly $5 million in philanthropic gift commitments. Inspired by Seibels’ story, her friends’ outreach, and Shelton’s efforts, Raymond and Kathryn Harbert kicked off the fundraising initiative by pledging a generous matching gift. “We all have friends, relatives, or know someone who has mental health issues,” says Raymond Harbert, the founder, chairman, and CEO of Birmingham-based alternative asset investment management firm Harbert Management Corp. “Through Dr. Shelton and his team, I think we have the opportunity to make a tremendous impact and really help people.”

Shelton leads UAB’s Depression and Suicide Center, a cohort of scientists and clinicians developing more effective prediction, prevention, and treatment models. Their goal is to reach and provide immediate relief to patients with difficult-to-treat depression and thoughts of suicide. “These are very important public health problems,” Shelton explains. “We need better ways to address them in Alabama.”

The center brings together experts in psychiatry, psychology, neurology, precision medicine, and more. Together, these leading minds have taken on a six-year effort to develop new treatments—starting with ketamine, an anesthesia drug available in the U.S. since the 1970s. Shelton’s team helped establish that an extremely low dose can help many patients who aren’t responding to other treatments for depression and suicidal thoughts find relief in about 24 hours.

Ketamine is not a cure, and it may not help everyone. “However, we found that it works quickly in many patients and...
seems to maintain its effect long-term with repeated administration,” Shelton notes. Now Shelton and his team are working with a pharmaceutical company to develop a nasal spray version to help make ketamine more readily available to patients.

This fundraising effort will help Shelton’s team work to find new treatments for depression and suicidal ideation, which will benefit the whole state. It will also bring a less tangible, but equally important, result: hope for a restored life. – Emily Henagan

A SERVICE-MINDED LIFE

By any measure, James Estes lived a rich and successful life. Passing away in early 2018, Estes devoted his professional life to managing and owning nursing homes across Alabama. He dedicated his personal life to advocating for better care for the elderly. He also gave to causes within UAB that meant so much to him, one being Alzheimer’s disease.

“James always had giving on his mind,” says Pat Estes of her late husband. “It was the most important thing to him.”

He made his recent philanthropic donations through his estate. One of those gifts enables the UAB Alzheimer’s Disease Center to compete for a prestigious National Institute on Aging designation and the accompanying federal funding—translating into important access to research materials, brain and other tissue samples, and patient and family data. Estes also established the James and Pat Estes Alzheimer’s Disease Endowed Professorship and the James and Pat Estes Alzheimer’s Disease Research Scholar, which back a physician-scientist and recruit talented, young physician-scientists to expand the team and grow research efforts, respectively.

“Mr. Estes’ support provides critical funding to our center, which allows us to have the best and brightest minds here who get us closer to bringing life-altering new therapies to our patients,” says Erik Roberson, M.D., Ph.D., director of the UAB Alzheimer’s Disease Center and holder of the Patsy W. and Charles A. Collat Endowed Professorship in Neuroscience. “We’re grateful for his generosity.”

Alzheimer’s disease currently affects more than 5 million Americans, with 65 being the average age of diagnosis. The UAB Alzheimer’s Disease Center’s mission is to overcome Alzheimer’s disease and related disorders by conducting, fostering, and enabling research both within the university and through national collaborations. Estes’ backing helps the center fulfill that important mission.

Through his estate, Estes also provided generous gifts to the O’Neal Comprehensive Cancer Center at UAB. He funded cancer research and helped complete endowments that he started with his son Norman, who has followed in his father’s footsteps both philanthropically and professionally.

They each contributed to the Edward E. Partridge, M.D., Endowed Chair for Cancer Disparity Research and the Barbara and Edward Partridge Atrium.

“Mr. Estes had a service-minded heart both in life and in death, and his legacy will live on for years to come at UAB,” says Selwyn Vickers, M.D., Ph.D., senior vice president for medicine and dean of the UAB School of Medicine. – Emily Henagan

According to the Alzheimer’s Association, Alzheimer’s disease affects 5.7 million people and is the sixth leading cause of death in the U.S. Early and accurate diagnosis could save up to $7.9 trillion in medical and care costs.
FACTS & FIGURES

School of Medicine Entering Class 2018

- 4,500+ applications
- 448 applicants interviewed
- 186 students matriculated
- 508 average MCAT
- 3.76 average GPA
- 22-44 age range
- 105 men 81 women
- 30 underrepresented in medicine
- 161 Alabama residents
- 25 out-of-state residents

Match Day 2018

- 98% match rate
- Students matched into 75 institutions in 27 states

Top 5 Specialties

- Internal Medicine (26)
- Family Medicine (25)
- Pediatrics (17)
- Emergency Medicine (13)
- Surgery (13)

- 214 new residents matched into UAB residencies

GME Profile 2018

- 30 accredited residency programs
- 59 accredited fellowships
- 1,031 residents and fellows
UAB Research & Innovation

555 U.S. patents issued

1,960 U.S. patent applications filed

324 license agreements executed

60 startups

$88,919,767 cumulative revenue

For the first time in university history, UAB surpassed $500 million in research grant awards for the period running Nov. 1, 2017-Oct. 31, 2018, reaching $527,025,137. Every academic school saw funding award increases. This $48 million increase represents a 10-percent jump in research awards.

UAB Hospital

No. 1 in Alabama

4 specialties in U.S. top 20
  • Rheumatology (10)
  • Nephrology (13)
  • Pulmonology (16)
  • Cardiology & Heart Surgery (18)

6 more specialties in U.S. top 50
  • Gynecology (25)
  • Diabetes & Endocrinology (28)
  • Ear, Nose, & Throat (29)
  • Urology (34)
  • Neurology and Neurosurgery (36)
  • Geriatrics (42)

UAB Hospital was the only hospital in Alabama included in the Becker’s Hospital Review “100 Great Hospitals in America” for 2018.

UAB Medicine

1,400+ physicians

16,000+ employees

1.5 million outpatient clinical encounters in 2018

4,300+ babies delivered in 2018

FINANCIALS & FUNDING

Operating Revenues & Expenses FY2018

Total Revenues $771.1 Million

- Federal Grants Direct: $129.4M (17%)
- Other Grants Direct: $206.1M (27%)
- Clinical Enterprise (UH, HSF, HS): $43.9M (6%)
- Indirect Expense Recovery: $84.8M (11%)
- Tuition: $62.9M (8%)
- State Appropriations Including Earmarks: $181.8M (23%)
- Philanthropy: $23.1M (3%)
- Other: $39.1M (5%)

Total Expenses $694.6 Million

- Campuses, Departments, Centers: $383.5M (55%)
- Grants: $269M (39%)
- Space: $32.1M (5%)
- SOM Infrastructure: $9.9M (1%)
Endowment Assets

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NIH Ranking & Trends

NIH Grant Funding $232,996,499
Active Grants & Contracts $269,025,124
NIH Funding $186M $195M $232.9M
NIH Funded PIs 259 267 296 303 323
NIH Ranking 21
NIH-Funded Principal Investigators 323

Preliminary results for FY18
SCHOOL OF MEDICINE LEADERSHIP

Selwyn M. Vickers, M.D., FACS
Senior Vice President for Medicine and Dean
James C. Lee Jr. Endowed Chair

Anupam Agarwal, M.D.
Executive Vice Dean
Marie S. Ingalls Endowed Chair in Nephrology Leadership

Etty (Tika) Benveniste, Ph.D.
Senior Vice Dean for Basic Sciences
Charlene A. Jones Endowed Chair in Neuroimmunology

S. Dawn Bulgarella, MSHA, CPA
Senior Associate Dean for Administration and Finance, UAB School of Medicine
Chief Financial Officer, UAB Health System

Mona N. Fouad, M.D., MPH
Senior Associate Dean for Diversity and Inclusion

Craig J. Hoesley, M.D.
Senior Associate Dean for Medical Education
Chair, Department of Medical Education

Keith (Tony) Jones, M.D.
Senior Associate Dean for Clinical Affairs
UAHSF President
Chief Physician Executive, UAB Medicine

Robert P. Kimberly, M.D.
Senior Associate Dean for Clinical and Translational Research
Howard L. Holley Research Chair in Rheumatology

David A. Rogers, M.D., MHPE
Senior Associate Dean for Faculty Affairs and Professional Development
Chief Wellness Officer, UAB Medicine
UAB Health System

UAB Hospital - Established in 1945 as the teaching hospital for what now is the UAB School of Medicine. Licensed for 1,157 beds and among the 20 largest and best equipped in the nation. Facilities include:

UAB Hospital-Highlands - A general acute care facility providing emergency care, orthopaedics, pain management, occupational medicine, and the region’s first coordinated care unit for geriatric patients.

The Kirklin Clinic of UAB Hospital - Nearly 600,000 outpatient visits annually with more than 33 specialties under one roof.

Spain Rehabilitation Center - One of the Southeast’s foremost providers of comprehensive rehabilitation care with nationally recognized programs designed to address all aspects of patients’ rehabilitation, including physical, social, and psychological health.

Women and Infants Center - Designed with patient comfort and family-centered care in mind and providing advanced medical technology dedicated to healthy and high-risk pregnant women and newborns, as well as women receiving care for various gynecological problems, including cancer.

Center for Psychiatric Medicine - Provides inpatient clinical services including addiction recovery, child and adolescent treatment, and geriatric psychiatry in a dedicated facility.

The Kirklin Clinic at Acton Road - Offers a multidisciplinary approach to cancer, heart/vascular care, and an array of other services south of the city.

UAB Prime Care Clinics - Includes metro area neighborhood clinics in Hoover, Inverness, and Gardendale. For convenience, UAB physicians also are available at primary care locations in Leeds, Huntsville, Montgomery, Selma, and Tuscaloosa.

UAB Callahan Eye Hospital - The only specialty hospital in Alabama focusing on eye care and the nation’s first Level 1 Ocular Trauma Center.

UAB Urgent Care - A convenient office in Midtown Birmingham offering medical care seven days a week without an appointment.

University of Alabama Health Services Foundation (UAHSF)

An 1,100-member multispecialty physician practice serving UAB Medicine through more than 30 centers of excellence.

Joint Operating Leadership Committee

This committee includes Selwyn Vickers, M.D., FACS, senior vice president for medicine and dean of the School of Medicine; William Ferniany, Ph.D., CEO of UAB Medicine; Tony Jones, M.D., chief physician executive of UAB Medicine and president of the UAHSF; Ray Watts, M.D., UAB president; Cheri Canon, M.D., chair of the Department of Radiology; Herb Chen, M.D., chair of the Department of Surgery; and Seth Landefeld, M.D., chair of the Department of Medicine. The purpose of the group is to actively address issues within the Health System and support its financial and operational success, as well as the success of the academic enterprise.