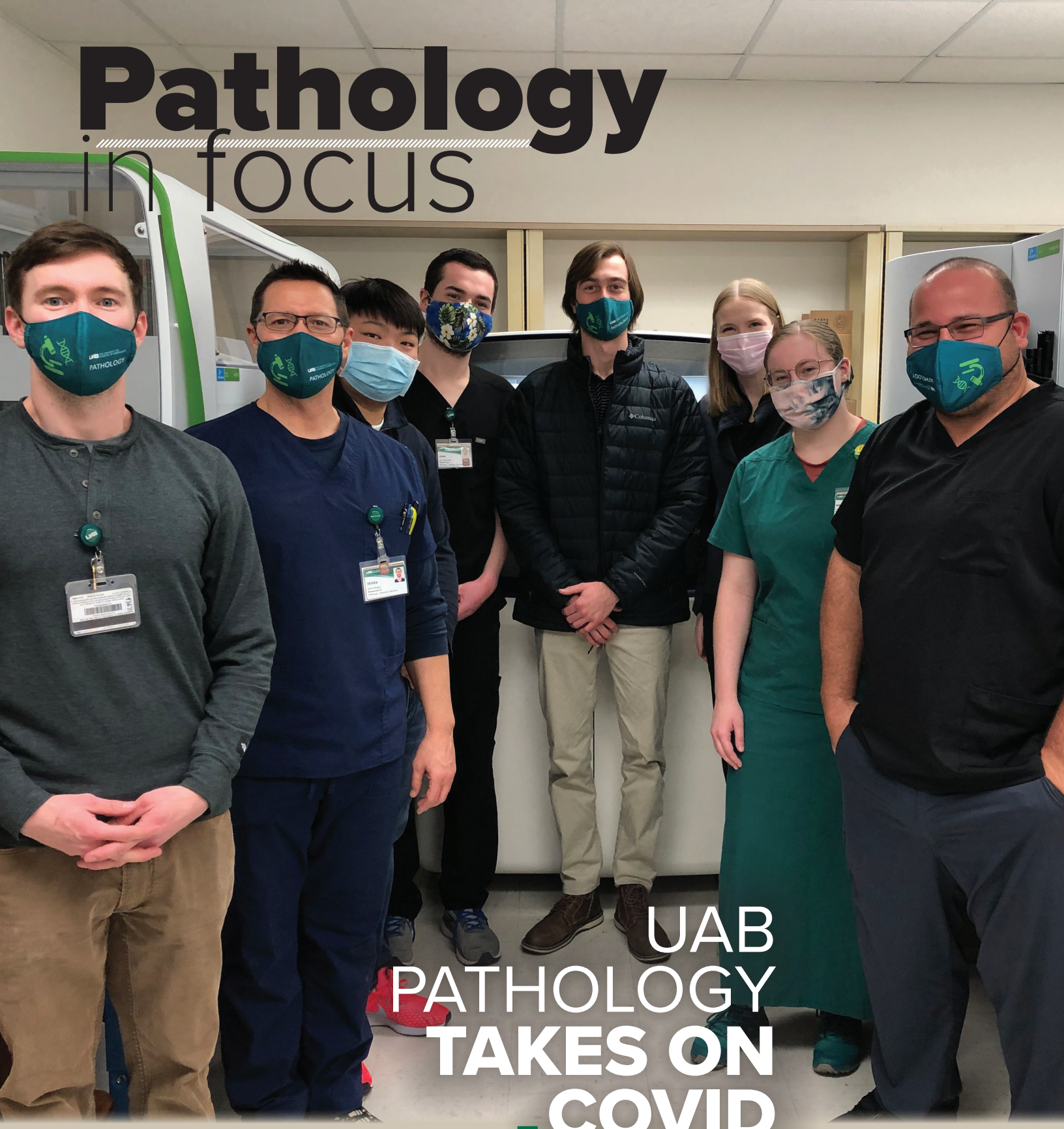
Pathology in focus



UAB PATHOLOGY TAKES ON COVID

+

Pathology's Strategy to Support GuideSafe Entry Testing

5 Tales: From UAB Trainee to Faculty

New Tools for Diagnostics

Expansion Stress Enhances Growth and Migration of Breast Cancer Cells

UAB SCHOOL OF MEDICINE
The University of Alabama at Birmingham

Volume 3 Issue 1
2021

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COVER: Fungal Reference Lab L to R: Drew Freeman, Derek Moates, Zheye Zhang, John Hernandez, Thomas Detchemendy, Sumner Adam, Mariah Pierce, Dr. Sixto Leal

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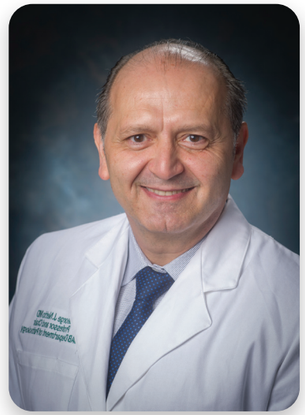
Catch up on our latest announcements, news and accomplishments at UAB.EDU/MEDICINE/PATHOLOGY. Follow us @UABPathology

WELCOME TO THE 3RD EDITION of our Pathology In Focus annual magazine—we are so glad to have you with us.



When we launched this publication in 2018, it was designed as a means of appreciating and sharing the accomplishments and accolades of our trainees, faculty and staff over the previous year. We were excited to share copies at the 2020 USCAP conference in Los Angeles, for example, with prospective trainees, faculty recruits, and interested friends. None of us imagined the changes that would come to the world shortly following, with the pandemic gripping us and greatly impacting all our lives.

As you will read, the field of pathology was uniquely poised to assist with tackling the COVID outbreak in many ways. By March, our faculty and hospital lab staff had collaborated with interdisciplinary teams across UAB Medicine to create a broad SARS CoV-2 testing approach (p. 3). Our research teams, many temporarily evacuated from their labs, pivoted to study various aspects of the new virus (pp. 2, 5). By summer's end, our labs had FDA emergency use authorization for a novel pooled testing approach that facilitated the testing of tens of thousands of students across Alabama (p. 8). This allowed for a safe return to college campuses statewide. With the support of the UAB School of Medicine and the institution at large, we were able to secure several new diagnostic testing platforms (p. 16) that will be used going forward for genomic testing, including molecular oncology and microbiology.

In the coming months, our teams will work to develop serology testing that will identify post-vaccine neutralizing antibody levels. We are sequencing viral samples with novel COVID strains in collaboration with area hospitals; and active sentinel testing and return-to-campus testing will allow our students to safely continue their academic studies.

Of course, work continues outside of the pandemic, and both our clinical and research faculty and staff rose to the new challenges brought on in 2020, logistically and mentally. Our clinical volumes stayed steady, and in some areas increased, despite the institution operating under a limited business model for a portion of the year. We masked up and "Blazed On" throughout 2020 with virtual celebrations for our graduating residents and fellows, retirees, faculty receiving promotion and tenure, and several faculty who were awarded grants, among other accolades.

We hope the events of this year will bring to the forefront the crucial work that those in our field do, from the most senior faculty member to the lab technician working around the clock receiving and processing samples. Everyone is critical to our mission. We are humbled by the dedication and professionalism of our people to their craft and to our institution as a whole. We look forward to celebrating our successes in person once again, and with you.

WITH THANKS,

George J. Netto, M.D.

Professor
Robert and Ruth Anderson Endowed Chair
UAB Department of Pathology

COVID-Related Research Flourishing in Pathology

top to bottom:
SIXTO LEAL, M.D., PH.D.
PAUL BENSON, M.D.
ONA FAYE-PETERSEN, M.D.
RALPH SANDERSON, PH.D.
ZDENEK HEL, PH.D.
RAJEEV SAMANT, PH.D.
RAKESH PATEL, PH.D.

The Department of Pathology is excited to highlight the work of several of our faculty who are conducting translational research projects related to SARS-CoV2.

SIXTO LEAL, M.D., PH.D. Dr. Leal's lab developed a protocol for testing for SARS-CoV2 infection and worked to further optimize and increase capacity four-fold to include the detection of other viruses (flu, RSV). This will speed up the time to an accurate diagnosis for patients and limit the need for unnecessary testing with expensive viral respiratory panels. Furthermore, in collaboration with Mike Crowley and Elliot Lefkowitz, Dr. Leal's group aims to sequence all of the RNA in diagnostic samples and determine their prognostic significance. This information will allow modification of the test to not only detect the virus but provide information on whether that patient is likely to overcome infection or require more intensive care. Leal, assistant professor, Laboratory Medicine, was awarded a School of Medicine grant to pursue this work.

PAUL BENSON, M.D. Dr. Benson's research includes autopsy of adult decedents death has occurred due to or with COVID19. Information gathered from the histopathologic examination is used for an autopsy report with a synoptic gross description, a histologic description of microscopic pathology, a list of diagnoses and findings (which could be coded to facilitate research) and a summary including an opinion regarding the mechanism and cause of death for each case. Specimens will be shared with the UAB research community for assessment of candidate mediators and markers that may provide insights into the underlying cause of disease and death.

ONA FAYE-PETERSEN, M.D.; VIRGINIA DUNCAN, M.D. The goal of these collaborative studies with Drs. Nitin Arora and Suresh Boppana of Neonatology and William Britt, M.D., of Pediatric Infectious Disease is to determine whether transplacental transmission of COVID19 occurs.

RALPH SANDERSON, PH.D. Dr. Sanderson's laboratory studies the enzyme heparanase and its function and inhibition in cancer. Based on evidence that heparanase and its substrate, heparan sulfate, are involved in the infection of cells by some viruses (e.g., HIV, HSV), Dr. Sanderson is working with Dr. Kevin Harrod (Anesthesiology) to screen the effectiveness of heparanase to inhibit the infectivity of COVID19.

ZDENEK HEL, PH.D. The central hypothesis being tested by Dr. Hel and his lab is that infection with SARS-Cov-2 results in accelerated recruitment of neutrophils from the bone marrow and emergence of specific neutrophil subpopulations with pathological properties. The elicited neutrophil populations display a higher capacity to undergo NETosis and promote the progression of ARDS, myocardial injury, and end-organ damage.

RAJEEV SAMANT, PH.D. Dr. Samant's group works on unraveling the contributions of IFN signaling pathway-mediating protein, NMyc (and STAT) interactor (NMI) to cancer biology. Based on its ability to influence JAK/STAT signaling, NMI may also modulate the host's response to viral infection and moreover NMI was identified as a binding partner of the severe acute respiratory syndrome (SARS) coronavirus non-structural protein 6. Via high throughput screening studies, Dr. Samant's group, in collaboration with Southern Research and the ADDA, has identified a series of compounds that upregulate NMI and propose to test these as potential anti COVID19 therapeutics.

RAKESH PATEL, PH.D. In collaborative studies with Drs Amit Gaggar and Jarrod Barnes (Medicine-Pulmonary, Allergy and Critical Care), and Kevin Harrod (Anesthesiology), two hypotheses are being explored: 1) PGP matrikines derived from breakdown of collagen propagate and mediate heightened lung inflammatory response mediated by SARS-CoV2 infection. They will test whether inhibiting PGP effects prevent epithelial and endothelial injury after viral infection; and 2) Interfering with viral-co-opting of cellular N-glycan biosynthesis pathways, specifically inhibiting modification of proteins with high mannose sugars, may prevent viral infectivity. Both projects utilize samples collected from autopsy (Dr. Paul Benson and Silvio Litovsky) and the Pathology Tissue Biorepository Core.

UAB Pathology **Takes on COVID**

By Christina Crowe

By definition, pathologists study and diagnose diseases of the entire human body, and that expertise came into stark relief over the last 12 months as a new virus expanded its deadly reach across the country and around the world.

The COVID19 pandemic thrust the field of pathology into the limelight in an unprecedented way, highlighting the crucial roles that pathologists' diagnostic and lab expertise have in tackling the myriad issues that arise with defeating a new disease.

Testing

UAB Pathology has been recognized throughout the pandemic efforts primarily for its development and ongoing support of testing for COVID19, led by **Sixto M. Leal Jr., M.D., Ph.D.**, assistant professor and director, Fungal Reference Lab (FRL). By March 1, with support from leadership of the department, the School of Medicine, and the institution at large, Leal had developed an assay to test for SARS CoV-2 (COVID19), validated the test, and submitted an Emergency Use Authorization application to the FDA.

On March 13, the Alabama Department of Public Health (ADPH) reported the first known case of COVID19 in the state. On March 17, the FRL went live with its SARS CoV-2 test.

In-house testing enabled the start of clinical trials and biospecimen repository collections across campus. The test's 24-hour turnaround time facilitated a return to operations for UAB hospitals and many regional hospitals. The acquisition of equipment to process multiple test systems, funded in part by the state's Coronavirus Aid, Relief, & Economic Security (CARES) Act, allowed for the ramping up of test capacity and expansion of tests offered.

Fast forward to June, when UAB and the state's other two-and four-year colleges announced a return of students to campus, with the caveat that each be tested prior to return. Dr. Leal's lab, in collaboration with UAB Hospital Labs and the ADPH, adapted its clinically offered lab-developed testing capabilities to a pooled testing approach. This cutting-edge program, paired with other technologies such as an app for symptom reporting and contact tracing called GuideSafe, allowed for testing of up to 250,000 students prior to their return to school, nearly 68,000 of which were conducted at UAB. Between July 28 and August 3, for example, the lab processed more than 11,000 tests per day.

By October, the lab incorporated Influenza A and B detection into the UAB FRL SARS CoV-2 test. Additionally, the team is now working on identifying and implementing prognostic markers into the diagnostic tests to distinguish infected individuals likely to do well during at home quarantine from patients that are more likely to progress to severe illness enabling optimized use of clinical resources, which at times have been difficult to procure.

UAB PATHOLOGY MOLECULAR LAB TEAM

Antibody Testing/ Blood Banking

In addition to testing for the virus itself, since April, UAB pathologists have participated in delivering convalescent plasma to hospitalized patients with COVID19, through participation in the Mayo Clinic Expanded Access Program. The UAB Blood Bank, led by **Marisa Marques, M.D.**,

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division director, Laboratory Medicine, has been working on two randomized controlled trials with convalescent plasma for outpatients with COVID19 or those with close contact with someone with the virus. **Jose Lima, M.D.**, assistant professor, developed a SARS-CoV-2 IgG test used for patient care and for the identification of potential donors for convalescent plasma based on high antibody titers.

Clinical

Autopsies of COVID patients are key in studying the effects of the virus on patients' bodies after death. One of the first concerns of an emerging pandemic for the autopsy/decedent affairs service

SPECIMEN RECEIVING TEAM

was the surge capacity of a potential natural mass fatality.

Paul Benson, M.D., associate professor and autopsy section head, worked closely with the Jefferson County Coroner/ Medical Examiner (ME)'s office, UAB facilities and the UAB autopsy technical dihelrector to ensure UAB had an appropriate response to such an event.

On March 31, the UAB autopsy service performed the first autopsy on a patient who died with COVID19. From March through the end of the year, the service had performed 69 COVID-positive autopsies from UAB Hospital, the Alabama Department of Corrections and surrounding hospitals.

Prior to any deaths from COVID occurring in the county the department's Forensic Division, with **Greg Davis, M.D.**, at the helm, worked with the Jefferson County Health Department (JCHD) to develop a plan for hospitals, nursing homes, and hospice services to report any death to the ME Office if the death were thought to be due to COVID, or if COVID were even suspected. Division faculty continue to send this information daily to the JCHD, where they cross-check it with information they receive from death certificates.

Additionally, the Neuropathology division, led by **C. Ryan Miller, M.D., Ph.D.**, has been involved in brain autopsies from COVID patients, and has a research study submitted to UAB's Institutional Review Board to continue looking at the neuropathological consequences of COVID19.

Research

Research about coronavirus and its effects on the body after a patient recovers from acute symptoms is another way pathologists at UAB are working toward a better understanding, and eventually a cure. **Zdenek Hel, Ph.D.**, professor, Molecular and Cellular Pathology (MCP), received a School of Medicine grant to study the development of acute respiratory distress syndrome (ARDS), a predictor of high mortality, in COVID19 patients.

Other department faculty such as **Sooryanarayana Varambally, Ph.D.**, professor, MCP, continue to analyze coronaviruses to differentiate COVID19, to facilitate finding a specific target to shut down the virus. This research is ongoing, collaborative work among investigators across the institution.

Department **Chair George Netto, M.D.**, Robert and Ruth Anderson Endowed Chair, was featured in The Pathologist magazine in April on how UAB Pathology rose to the challenge of combatting this virus.

"UAB Pathology was poised to take on the challenge of adapting to the needs of our patients, our colleagues, and our trainees during this unprecedented time," Netto said, "thanks in large part to the stellar team we have curated. Our clinical faculty and staff reacted nimbly, working tirelessly to accommodate testing needs. Our research faculty continue to offer innovative insight into the virus and its long-term effects on the body. Our support staff have all been willing to adjust to the fluid demands of this situation.

Netto continued, expressing the role of the larger community in supporting the efforts. "University, local and state leadership each have provided the support needed to continue our work safely," he said, "offering long-range vision to bolster future discoveries in this area. We are extremely proud of our entire UAB Pathology team." ■

Could **NET-wielding Neutrophils** Be Driving Respiratory Distress and Death in COVID19 Patients?

By Matt Windsor, UAB Reporter

It is the stuff of nightmares. Patients suffering from acute respiratory distress syndrome (ARDS) during COVID19 say it felt like "I was gasping my last breath" and "as if somebody had taken a scuba diving tank while I'm underwater and turned it off completely."

The development of ARDS is a predictor of high mortality in COVID19 patients. But clinicians do not currently have a reliable method to predict which patients will develop ARDS.

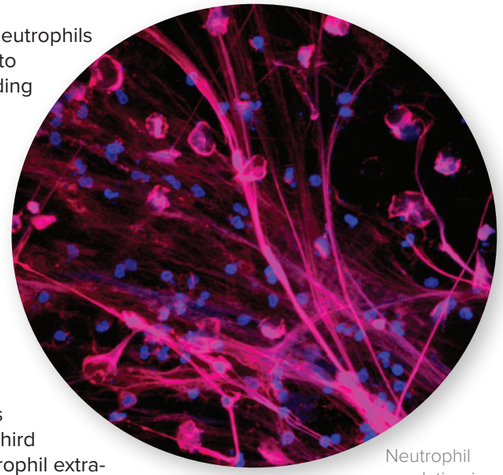
A group of UAB researchers have a hypothesis, however. Tracking the emergence of specific subtypes of immune cells as they respond to SARS-CoV-2, the virus that causes COVID19, could help predict the emergence of ARDS, the scientists suspect. Their work is funded through a pilot grant from UAB's urgent COVID19 research fund.

> I am convinced that, once we learn how to regulate neutrophil activity, we will gain access to powerful new treatments of COVID19 and other respiratory diseases.

Zdenek Hel, Ph.D., professor in the Division of Molecular and Cellular Pathology, is the principal investigator for the new project, "Neutrophils as a driving mechanism of acute respiratory distress syndrome and death in COVID19 patients." His collaborators are Paul Goepfert, M.D., and Turner Overton, M.D., both professors in the Division of Infectious Diseases.

Neutrophils are the first responders of the immune system. They are everywhere: More than 100 billion neutrophils are produced every day. (With a half-life of 18 to 19 hours, they must be continuously replenished.)

Traditionally, neutrophils were thought to wipe out invading pathogens by eating them (phagocytosis) or using highly toxic, bleach-like granules to destroy the cell walls of foreign microorganisms. But in 2004, immunologists discovered a third strategy: neutrophil extracellular traps, or NETs. These are a meshwork of DNA-based fibers that some neutrophils expel to immobilize and kill invading microorganisms such as viruses and bacteria.



Neutrophil accumulation in the lung alveoli in an autopsy sample from a patient who succumbed to COVID-19.

Images courtesy Zdenek Hel, Ph.D.

But the generation of this entrapment mechanism, known as NETosis, recruits other neutrophils and additional immune cells to the area in a pro-inflammatory process. This accumulation of immune cells seems to amplify NET production and is thought to be a major cause of lung-tissue injury and breathing problems seen in ARDS.

"We hypothesize that in certain conditions, such as COVID19, populations of neutrophils arise that have a higher capacity to product NETs," Hel says.

Neutrophil accumulation in the lung alveoli in an autopsy sample from a patient who succumbed to COVID19. The immune mechanisms underlying ARDS are not well understood, the researchers noted in their project summary, although multiple studies have demonstrated an essential role for neutrophils in the syndrome and severe cases of COVID19. "In collaboration

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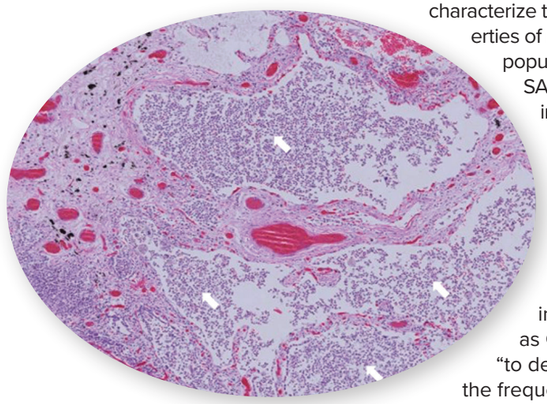
with Dr. Benson and other colleagues in the Department of Pathology, we have identified a large accumulation of neutrophils in the lungs of COVID19 patients," Hel says, "and our preliminary data show a significant perturbation of the phenotype of circulating neutrophils suggesting pathological properties."

Their project has three aims. First, the researchers will determine whether the emergence of pathological neutrophil populations and elevation of plasma markers of NETosis — such as DNA associated with myeloperoxidase — are predictive of disease severity. Then they will characterize the properties of neutrophil populations in SARS-CoV-2 infections. Finally, they will use a form of single-cell sequencing, known as CITE-Seq, "to determine the frequency, activation status and specific properties of immune populations in the blood of SARS-CoV-2-infected individuals," they write.



Neutrophils releasing neutrophil extracellular traps (blue).

ZDENEK HEL, PH.D.

"CITE-Seq is an amazing and powerful new technology," Hel says. "To my knowledge, our lab was the first at UAB to use it, although there may be more groups now." It uses the 10X Genomics platform available in UAB's Single Cell Sequencing Core Facility. "However, it adds antibodies connected to short strands of DNA," Hel says. "In this way, it provides the information on RNA expression inside the individual cell as well as the type and level of protein present on the cell surface."

"A clear definition of the role of neutrophils in SARS-CoV-2 infections will result in the design of new therapeutic approaches for pharmacological targeting neutrophil dysregulation and development," Hel and his colleagues write.

"Neutrophil activation and NETosis can be pharmacologically modulated by targeting NADPH oxidase, colony-stimulating factors and receptors, or CXCR2 chemokine receptor," Hel says. "Various promising modulators of neutrophil recruitment and activation are currently in Phase II and III clinical studies. I am convinced that, once we learn how to regulate neutrophil activity, we will gain access to powerful new treatments of COVID19 and other respiratory diseases." ■

NEUROPATHOLOGY FACULTY

Every year, our department faculty gather for a group photo, which hangs in the Chair's office on the UAB Medicine campus. This year, faculty came together by divisions to be photographed in our UAB Pathology masks. We are glad to have these images (here and on pages 21, 24, and 29) reflecting such an unique time in our collective medical history.

All photos in this series: Nik Layman Photo/Video

Leal and Other Innovators Praised for Combating COVID19

Faculty, staff, student and community innovators were recognized for their 2020 contributions to COVID19 research, innovation and entrepreneurship during the fifth annual UAB Innovation Awards presented by the Bill L. Harbert Institute for Innovation and Entrepreneurship (HIIE) October 29.

"We received an outpouring of nominations from across campus and within the community," says Kathy Nugent, Ph.D., executive director of the Harbert Institute and chair of the Department of Clinical and Diagnostic Sciences. "The many stories of cutting-edge research and cross-disciplinary collaboration underscore our resilience and the university's commitment to keeping our community safe." Awards were presented in four categories:

FACULTY INNOVATOR OF THE YEAR

Sue Feldman, Ph.D.
Mohanraj Thirumalai, Ph.D.

Feldman is an associate professor in the School of Health Professions (SHP), senior scientist in the School of Medicine Informatics Institute and director of graduate programs in Health informatics. Thirumalai is assistant professor in the SHP Department of Health Services Administration and director of Information and Communication Technologies for the UAB/Lakeshore Foundation Research Collaborative. Their teams worked to build and scale the GuideSafe and Healthcheck web applications and ensured UAB held a leadership role in addressing the COVID-19 pandemic across the state and beyond.

Sixto M. Leal Jr., M.D., Ph.D.

Leal directs the UAB Department of Pathology Fungal Reference Lab and has been working closely with UAB Hospital labs and private sector biomedical companies to scale up and support the GuideSafe Entry Testing program. Free COVID19 testing was provided to all students at Alabama colleges and universities in advance of the fall semester return to campus. More than 75,000 students were tested, making it the largest-scale higher-education testing initiative in the nation.

STARTUP OF THE YEAR

Solution Studios

Solution Studios, led by Joel Berry, Ph.D., associate professor in the Department of Biomedical Engineering, brings students together to collaborate in solving real world clinical problems. Along with his team, Berry officially launched the platform as a startup company this year, and pivoted quickly to create a pandemic-specific interface where clinicians could pose COVID-19 challenges, including addressing social needs amid the pandemic, tackling at-home care for discharged COVID-19 patients and keeping patients safe during routine treatments such as dialysis.

STAFF INNOVATOR OF THE YEAR

Brian Rivers

Brian Rivers is associate vice president and UAB chief technology officer and was the UAB lead in developing the GuideSafe Exposure Notification App in partnership with Google, Apple, MotionMobs and the Alabama Department of Public Health (ADPH). Rivers developed a novel method to verify positive tests, allowing automation of verification to reduce false positives. Alabama was the first state to introduce the method, which currently is in the patent process.

COMMUNITY INNOVATOR OF THE YEAR

Taylor Peake, MotionMobs

UAB alumna Taylor Peake is president of Birmingham-based software consulting and development firm MotionMobs. Together with UAB and the ADPH, MotionMobs developed GuideSafe, which has been downloaded by more than 70,000 residents across the state of Alabama. Alabama was the fourth state to launch such an app in the country.

During the virtual awards event, HIIE also unveiled its new online intellectual property disclosure process. Using BlazerID authentication, inventors can now disclose IP quickly via a portal and track the progress of their invention in real-time. Learn more at go.uab.edu/disclose. ■

Department of Pathology Develops Strategy to **Support GuideSafe Entry Testing**

By Christina Crowe

Nearly a quarter-million college students across Alabama were able to be tested for COVID19 with a free, rapid, non-invasive nasal swab-based procedure, to ensure a negative test — or quarantining in the case of a positive result — before returning to campus.

This opportunity was made possible by the implementation of GuideSafe Entry Testing, a large-scale testing strategy implemented throughout the state to ensure a safe return to campus for more than 200,000 college students for the fall semester. GuideSafe Entry Testing is part of GuideSafe, a multi-tool platform formally announced Aug. 3, that also includes GuideSafe HealthCheck, GuideSafe Exposure Notification Application, and GuideSafe Event Passport.

Sixto Leal Jr., M.D., Ph.D.

George Netto, M.D.

The Department of Pathology, led by George Netto, M.D., the Robert and Ruth Anderson Endowed Chair, adapted its clinically offered lab-developed testing capabilities to a pooling test approach. This strategy allowed for ramping up testing capacity tenfold for the 20-plus days leading up to the start of school.

"We opted for a simpler way of collecting specimens, by allowing students to do a nasal swab themselves, that makes it faster and easier than the nasopharyngeal swab, which requires a health care professional to administer," Netto says. "The utilization of nasal swabs coupled with our in-house-developed pooling strategy will enable us to significantly ramp up capacity while maintaining full testing accuracy."

Development of the testing strategy was led by the director the Microbiology Section, Division of Laboratory Medicine, Sixto Leal, Jr., M.D., Ph.D., an assistant professor of pathology.

"The pooled testing approach allows for labs to do preliminary screening from several student samples at once," Leal says. "Knowing that only a minority of those tests will be positive allows us to then focus on those few positive test results and pursue secondary confirmatory testing."

This approach greatly increases test capacity to accommodate the more than 200,000 college students statewide looking to return to campus in August.

All student testing is part of GuideSafe Entry Testing and was conducted in partnership with UAB, announced by Gov. Kay Ivey at the end of June. It is complemented by the GuideSafe tracking software to promote safe reentry and ongoing COVID19 monitoring. The app includes GuideSafe HealthCheck, which allows individuals to assess their health and symptoms, as well as GuideSafe Exposure Notification Application, which is backed by Google and Apple technology. That feature can anonymously alert someone if they are at risk from being in proximity to someone who has tested positive for COVID19.

A Three-Pronged Approach

Tackling the challenge of testing so many individuals in such a short time frame could only be achieved by a comprehensive three-pronged plan: Develop a logistics grid of specimen collection; information technology infrastructure to track specimens and reporting results while maintaining HIPAA privacy standards; and a high-capacity test at low cost, given that tests are offered free to students.

UAB Pathology faculty and staff partnered with UAB Hospital Labs staff, led by Sherry Polhill, associate vice president of Hospital Labs, to develop and assemble the test kits, which were used at 13 collection spots throughout the state. This allowed students to visit a testing site within a 30- to 60-minute drive from each campus.

"We developed the ability to multiply test processing volumes, testing 5,000 to 10,000 specimens a day at the UAB Department of Pathology, without infringing in any way upon the high volume of critical routine testing we are currently offering to our patients, our affiliate institutions, health care workers and our community," Netto says.

UAB also partnered with Everlywell to mail test kits to out-of-state students and those who were slated to return to campus early. Out-of-state students were able to self-administer their tests and send in for analysis.

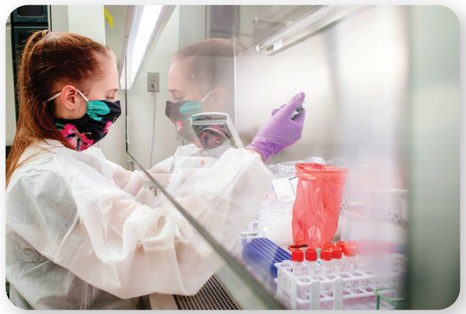
In a span of four weeks, the majority of these tests were processed at UAB, each with a 24-48-hour turnaround time. Pulling off this collaborative effort in a very short time frame required identifying lab space on UAB's campus and adding up to 20 laboratory technicians to increase specimen processing capacity.

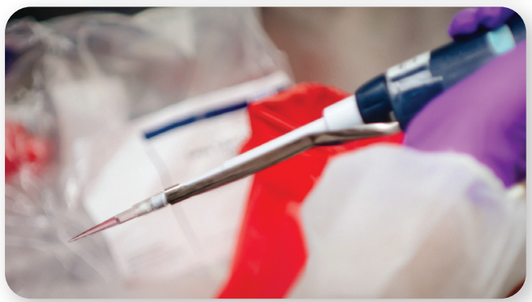
"Stepping up to this crisis has many additional benefits for future work with our partners," Netto says.

He outlined new relationships forged with private-sector companies to develop the IT infrastructure and utilize a mail-in testing approach to those patients outside Jefferson County seeking health care at UAB. Netto credits the state for its crucial support.

"The state of Alabama was very generous in its support," he says. "The return on investment of time and energy to get this up and running is an investment in our COVID19 testing capacity at UAB for months and years to come, to deploy in our ongoing fight against COVID."

UAB Pathology also worked with pathology departments and hospital labs at other statewide institutions, including the University of South Alabama in Mobile, to increase their testing capacity using a model similar to UAB's. ■





photos by Steve Wood, UAB Photography

3 Faculty Assume **New Leadership Roles**

PROFESSOR ANDREA KAHN, M.D., Anatomic Pathology, joined UAB Pathology in April 2020, and assumed the role of Interim Section Head for Gynecologic Pathology, effective July 1. Dr. Kahn joined the Department from the University of South Alabama, where she served as the director of Anatomic Pathology and Autopsy Pathology. "I would like to continue the work that has been accomplished, with the goal of continuous quality improvement, focusing on patients and clinicians needs," Kahn says. "In order to take the section to the next level, it will be important to engage faculty, residents and fellows in all aspects of GYN pathology."

Dr. Kahn has several years of experience in leadership roles, including directorships in surgical pathology and anatomic pathology.

"As interim head of the GYN pathology group, I would like to provide support and closely work with colleagues in the GYN section team, coordinate interdisciplinary efforts with clinicians and investigators, and actively participate in educational activities at all levels," Kahn says.

She earned her medical degree from Universidad Nacional de Córdoba, Facultad de Ciencias Médicas, Córdoba, Argentina, in 1990. Dr. Kahn completed residencies at CEMIC, Buenos Aires, Argentina, and the University of South Alabama and completed her fellowship in surgical pathology at Hospital de Clínicas, Universidad de Buenos Aires.

Kahn is board certified in Combined Anatomic and Clinical Pathology by the American Board of Pathology. Her research interest focuses on breast carcinoma, in particular, image analysis. She developed the image analysis laboratory for the Department of Pathology at the University of South Alabama. She is currently serving as the president-elect of the Alabama Association of Pathologists.

CHAD SINIARD, M.D., of the Transfusion Medicine Section was named assistant program director for Laboratory Medicine. In addition to serving on relevant committees such as the Clinical Competency Committee, the Program Evaluation Committee, and the Resident Selection Committee, the APDs perform crucial roles as liaisons between Residents and Faculty, and as mentors to Resident leadership.

Dr. Siniard has prior experience at UAB, having completed fellowships here in academic years 2015-16 and 2016-17. This was followed by a stint on faculty at UNC Chapel Hill in the Transfusion Medicine section. We are delighted that he has returned to UAB, and agreed to serve in this important post in Laboratory Medicine that has been unoccupied for some time.

PAUL BENSON, M.D., associate professor, Division of Anatomic Pathology, assumed directorship of the autopsy section on April 1, 2020, and recognizes Silvio Litovsky, M.D., professor, Anatomic Pathology, for his service as interim director since the previous June.

The section head oversees the day-to-day autopsy section operations in collaboration with Thurman Richardson, UAB Autopsy Supervisor, as an essential role in supporting the education, services, and research mission of the UAB Autopsy Service.

Dr. Benson earned his Doctor of Medicine from The Medical College of Ohio at Toledo before serving as a preliminary intern in Internal Medicine at the University of Maryland Medical System. He completed residency training in Anatomic and Clinical Pathology at the University of Virginia, and is board certified in Anatomic and Clinical Pathology. After fellowship in Forensic Pathology at the Office of the Chief Medical Examiner in Richmond, Virginia, Dr. Benson became board certified in Forensic Pathology.

Dr. Benson's responsibilities as director include scheduling faculty coverage, supervising medical students and residents on the autopsy service, tracking the academic milestones of autopsy faculty, ensuring efficient workflow, and serving as liaison between the Department of Pathology and the University Hospital as well as outside institutions such as the Alabama Department of Forensic Sciences, Alabama Department of Corrections, community hospitals, funeral directors, and coroners.

11 New Faculty Join in 2020

LABORATORY MEDICINE

Last January, José Lima, M.D., joined Laboratory Medicine as assistant professor. Dr. Lima, a native of Brazil, started his pathology career at UAB as a resident and then transfusion medicine fellow, as well as a pathology instructor. For the last decade he has worked as medical director of the American Red Cross Blood Services Southern Region, Central Division, in Douglasville, Georgia. He was also an adjunct assistant professor on transfusion medicine service at Emory University in the Department of Pathology. He is appointed as a director of the Clinical Immunology Laboratory.

Chad Siniard, M.D., joined the Division of Laboratory Medicine as an assistant professor coming from Chapel Hill, North Carolina, where he was a clinical assistant professor since 2017. He served as clinical director, therapeutic apheresis, in that role since January 2019.

Siniard served as the medical director of UNC Hospitals Blood Donor Center from October 2017; as director of the Pathology Residency Rotation in blood banking at UNC Chapel Hill from July 2018 to present. He was associate medical director, Transfusion Medicine and Special Coagulation at McLendon Clinical Laboratories at UNC Healthcare. His research interests include hemostasis and thrombosis, specifically thrombotic microangiopathies including thrombotic thrombocytopenic purpura (TTP). At UNC, he assisted in banking plasma from each TTP patient's first apheresis procedure, which allowed him to create a bank of research samples for additional studies. Dr. Siniard plans to continue this line of research at UAB.

In July, the Department announced the addition of John Choi, M.D., Ph.D., as professor, Division of Laboratory Medicine, led by interim director Marisa Marques, M.D. Choi comes to UAB from St. Jude Children's Research Hospital Pathology Department in Memphis, Tennessee, where he was an associate member and director, Hematopathology, Hematology, Immunopathology and Special Hematopathology.

Dr. Choi completed his residency in Anatomic Pathology and a fellowship in hematopathology at the Hospital of the University of Pennsylvania. Upon completion, he joined the Department of Pathology at the Hospital of University of Pennsylvania as a hematopathologist. After three years, he was recruited and to establish a pediatric hematopathology program at the Children's Hospital of Philadelphia. After 10 years and successfully building a highly regarded pediatric hematopathology service, Dr. Choi was recruited and moved to St. Jude Children's Research Hospital in Memphis, Tennessee, where he maintained a top pediatric hematopathology service and established clinical flow-based minimal residual disease (MRD) assays for national acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML) protocols. After 9 years, he was recruited to UAB.

top to bottom:
José Lima, M.D.
Chad Siniard, M.D.
John Choi, M.D., Ph.D.
Nirupama Singh, M.D., Ph.D.
Erin Eun-Young Ahn, Ph.D.

Nirupama Singh, M.D., Ph.D., assistant professor, Laboratory Medicine, joined our faculty in September after having completed a Transfusion Medicine fellowship at UAB in June 2020. Dr. Singh also completed a Molecular/Genetic Pathology Fellowship at UAB in July 2019, and residency in pathology in AP/CP at Brookwood Baptist Health, in Birmingham, where she was chief resident. She has a Ph.D. in Cellular and Microbial Biology from the Department of Biology of The Catholic University of America, Washington, DC. Dr. Singh completed a Clinical Pathology residency in 2004 from the Medical College Baroda, The M.S. University, Baroda, Gujarat, India, where she also completed her medical degree.

MOLECULAR & CELLULAR PATHOLOGY

Erin Eun-Young Ahn, Ph.D., joined the department as an associate professor, coming from the Department of Biochemistry and Molecular Biology and the Mitchell Cancer Center at the University of South Alabama. Ahn earned her M.S. in Cell and Molecular

CONTINUED ON NEXT PAGE

top to bottom:
Vivek Nanda, Ph.D.
Girish Melkani, Ph.D.
Xiao Huang, M.D., Ph.D.
Andrea Kahn, M.D.

Biology at Seoul National University, South Korea and her Ph.D. in Molecular and Cellular Pathology here at UAB. In 2017, Ahn was named the recipient of the Mayer Mitchell Award for Excellence in Cancer Research. Ahn's research focuses on the regulation of gene expression in cancer development and progression, with a special interest in leukemia. In 2015, she was awarded a five-year $1.7 million R01 grant from the National Cancer Institute to study the role of the SON protein in the development of leukemia.

Vivek Nanda, Ph.D., joined us last January as an assistant professor who most recently worked as an instructor at Stanford University in California. Nanda earned his M.S. and Ph.D. in Pharmacology from the University of Rochester in New York. He is interested in identifying the heritable component of a wide range of cardiovascular diseases which include coronary artery disease and peripheral artery disease.

In October, the Department welcomed Girish Melkani, Ph.D., as associate professor in the Division of Molecular & Cellular Pathology. Dr. Melkani comes to UAB from San Diego State University, where he did his postdoctoral studies, followed by his faculty tenure. His research focuses on disruptions of circadian rhythms associated with cardiometabolic, muscular, and sleep disorders that are hallmarks of many genetic, metabolic, and aging diseases. His lab has been at the forefront of developing and using clinically-relevant genetic models of human systemic metabolic abnormalities, cardiometabolic disease, myopathies, neuropathies, and aging using pathophysiological, cell-molecular, genetics, and nutritional approaches. Dr. Melkani brings his well-established research program to UAB, including three funded R01s. His research team has developed Drosophila cardiac and skeletal muscle disease models of laminopathies and validated Drosophila phenotypes in human muscle biopsy tissue from laminopathy patients. His group is also examining the impact of LMNA mutations on cardiac health in mice.

ANATOMIC PATHOLOGY

Xiao Huang, M.D., Ph.D., assistant professor, Anatomic Pathology, joined us in September after having completed a fellowship in Breast Pathology at the Department of Pathology, MD Anderson Cancer Center, in June. She completed a fellowship in Cytopathology in June 2019 at the Department of Pathology, Northwestern University Feinberg School of Medicine in Chicago. Dr. Huang did Anatomic and Clinical Pathology residency programs at Northwestern (2016-18) and at the Department of Pathology at George Washington University in DC (2014-16).

Dr. Huang's professional experience includes serving as Co-principal Investigator on research with the Department of Pathology, Roswell Park Cancer Institute in Buffalo, New York, as well as an observership there. She worked as graduate research assistant in the Department of Chemistry and Biochemistry at the University of South Carolina in Columbia, and received a Ph.D. in 2010. Dr. Huang was a medical oncologist for two years in the Department of Internal Medicine in China. Dr. Huang's clinical research focuses on the biomarkers of triple negative breast cancers.

Andrea Kahn, M.D., professor, Anatomic Pathology, joined the department in April 2020 and was named interim section head, Gynecologic Pathology, in July. Dr. Kahn joins us from the University of South Alabama where she served as the Director of Anatomic Pathology and Autopsy Pathology. She earned her medical degree from Universidad Nacional de Córdoba, Facultad de Ciencias Médicas, Córdoba, Argentina, in 1990. She completed residencies at CEMIC, Buenos Aires, Argentina and the University of South Alabama, and a fellowship in surgical pathology at Hospital de Clínicas, Universidad de Buenos Aires, Argentina.

Dr. Kahn is board certified in Combined Anatomic and Clinical Pathology and the American Board of Pathology. Her research interests focus on breast carcinoma—in particular image analysis. She developed the image analysis laboratory for the Department of Pathology at USA. Dr. Kahn currently serves as the President-elect of the Alabama Association of Pathologists.

Manuel Lora Gonzalez, M.D., assistant professor, Anatomic Pathology, had an extensive educational history before joining us in September having most recently completed a selective Head & Neck/ Surgical Pathology Fellowship at Washington University in St. Louis, Barnes Jewish Hospital, St. Louis in 2020. This follows a Cytopathology Fellowship in 2019 from the University of Miami (UM), UM Hospital-Jackson Medical Center. He completed AC/CP Residency at The University of Kansas, Kansas University Medical Center in 2018, with a research elective month of study on renal cell carcinoma with Ondrej Hes, MD, PhD, at the Charles University Plzen Czech Republic. In 2016, Dr. Lora Gonzalez completed a Dermatopathology elective rotation for four weeks with Jerad Gardner, M.D., at the University of Arkansas, Little Rock. He also has experience working as surgical assistant in his native Dominican Republic. Dr. Lora Gonzalez won several teaching awards from his peers as a resident and fellow, and was involved with several quality control, quality assurance, validation, and test utilization projects as a trainee.

NEUROPATHOLOGY

Rati Chkheidze, M.D., assistant professor, Neuropathology, came to UAB in September from the University of Texas Southwestern Medical Center, where he completed a Neuropathology Fellowship after having completed anatomic and clinical pathology residency there. Dr. Chkheidze is originally from the country of Georgia, where he graduated from Tbilisi State Medical University, Tbilisi in 2007. He worked as a senior visiting scientist in the Department of Neurology and Neurotherapeutics at UTSW and as a visiting scientist in the laboratory of Dr. James Lee, Department of Biochemistry and Molecular Biology, University of Texas Medical Branch. In 2017, Dr. Chkheidze received the Arthur G. Weinberg, M.D., Resident Research Award from the Department of Pathology at UTSW; Bruce D. Fallis, M.D., Resident Teaching Award from the department in 2018; and Janet Caldwell Memorial Award for Research in Pathology Fellowship in 2020. He has multiple publications including a book chapter in Tumors of the Central Nervous System (Springer 2011). Dr. Chkheidze's research interests focus on image analysis and machine learning applications in neurodegenerative and tumor neuropathology. ■

top to bottom:
Manuel Lora Gonzalez, M.D.
Rati Chkheidze, M.D.

Gregory Davis, M.D.

Forensic Pathology Director **Comments on Floyd Autopsy**

Forensic Pathology division director Gregory Davis, M.D., was consulted as an expert on the autopsy results of George Floyd. Floyd, 46, died on May 25 after being restrained by three Minneapolis police officers. Davis is the medical examiner for Jefferson County, Alabama.

The Associated Press reached out to interview Dr. Davis and asked him and other forensic pathologists to review the full government autopsy report. The experts who spoke with the AP had no involvement with Floyd's case in an article published June 4.

The article states that Floyd had drugs in his system and severe heart disease when a Minneapolis police officer restrained Floyd's neck with his knee. The autopsy report, by Hennepin County Chief Medical Examiner Andrew Baker, says Floyd died of "cardiopulmonary arrest, complicating law enforcement subdual, restraint, and neck compression." A statement by that examiner's office says Floyd had "a cardiopulmonary arrest while being restrained by police."

Dr. Davis commented that Floyd, "has some 'underlying conditions,' that made it more likely he would not fare well under stress...But the circumstances of Floyd's May 25 death are not ignored in Wednesday's report, which said, 'restraint and neck compression are part of why he died.'"

Hildreth Elected to ASBMR Committee

Eason Hildreth, Ph.D., assistant professor, Molecular & Cellular Pathology, was selected to serve on the Advocacy and Science Policy Committee of The American Society for Bone and Mineral Research (ASBMR) by two colleagues within the ASBMR and was recommended and appointed by the Nominations Committee and Council. His appointment took place September 2020, and his term runs through September 2023.

The Advocacy and Science Policy Committee is charged with generating recommendations in response to proposed government research initiatives, regulatory requirements, NIH research grant submission policies, and reviewing issues that affect basic and clinical researchers who are members of ASBMR. The committee is also charged to work in close collaboration with the Federation of American Societies for Experimental Biology (FASEB) and other coalitions to track the effect of science policies that most impact members.

In addition, the Advocacy and Science Policy Committee collaborates with the National Bone Health Alliance (NBHA) and FASEB to provide expert testimony and educational material to aid efforts on Capitol Hill and suggest scientific directions for new grants and funding mechanisms to federal research funding institutions.

Hildreth says he wishes to advocate for new and multidisciplinary/multi-thematic research areas attempting to stay "ahead of the curve" in emerging fields of bone and musculoskeletal research. This would mainly focus on the growing evidence of bone's importance in global physiology in the body and in many disease processes.

He also aims to serve as a voice for health disparities for many musculoskeletal diseases in the Southeast and increase awareness and emphasis on the impact of cancer and cancer therapies on musculoskeletal health.

Lalita Samant Selected for Board of Cancer Biology Training Consortium

Lalita Samant, Ph.D., professor, Molecular & Cellular Pathology and Senior Scientist, O'Neal Comprehensive Cancer Center, has been elected as a Board member for the Cancer Biology Training Consortium (CABTRAC).

CABTRAC is a national organization that serves as a forum for faculty leaders in cancer education and training at their respective Institution. It provides a platform to institute mechanisms and guidelines in cancer training — at all levels.

Over the past 15 years, CABTRAC has engaged with the National Cancer Institute Training Branch as well as the NCI Office of Cancer Centers to make recommendations for policies in cancer training and its portfolio within Cancer Centers. Dr. Samant has been been an active member of CABTRAC since 2011.

"Being elected a Board Member (3-year term) is definitely a nod to national recognition of leadership in cancer education and training, and gives me a seat at the table to engage in discussions with the NCI and ADs in other Cancer Centers in the country," she says.

Congratulations to Dr. Samant on this prestigious honor.

Wei Elected an International Skeletal Society Member-at-Large

SHI WEI, M.D., PH.D., professor, associate director, Anatomic Pathology, was elected, on October 26, as a 2020-2022 Uncontested Executive Committee Member-at-Large for the International Skeletal Society (ISS).

The ISS mission is to provide leadership in the practice, science and teaching of musculoskeletal medicine through an interdisciplinary and international membership recognized for its achievement in the field. ISS brings leaders in musculoskeletal science, education and clinical practice together. The organization is both international and multidisciplinary. ISS members represent more than 30 countries and represent radiologists, pathologists, surgeons, and radiation oncologists.

Dr. Wei obtained his M.D. from China Medical University and received his Ph.D. from Okayama University in Japan. He completed a research post-doctoral fellowship on Bone Biology at Washington University in St. Louis prior to coming to UAB, where he finished his pathology residency followed by a surgical pathology fellowship focusing on bone and soft tissue pathology. He also obtained additional clinical subspecialty training on soft tissue pathology at Emory University. Dr. Wei is board certified in Anatomic and Clinical Pathology and has been a faculty of UAB since 2008. In addition to his roles both as professor and associate division director, he is also the Breast Section Head.

Wei's research interests focus on the evaluation of prognostic factors in malignant bone tumors and tumor bone metastasis. He has published more than 120 manuscripts in some of the leading peer-reviewed journals, of which he first or senior-authored approximately two-thirds. Dr. Wei is a Scientist at UAB's O'Neal Comprehensive Cancer Center, Experimental Therapeutics Program. He co-edited Atlas of Bone Pathology and Frozen Section Library: Bone, and contributed several book chapters on bone tumors. Dr. Wei has served as a member of the ISS since 2013 and has been a frequent contributor to the member meetings.

SHI WEI, M.D., PH.D.

Rajeev Samant **Appointed to ICI Study Section**

Rajeev Samant, Ph.D., professor, Molecular & Cellular Pathology, has been appointed to serve on the Intercellular Interactions (ICI) Study Section of the National Institutes of Health, under the Center for Scientific Review, under the Division of Basic and Integrative Biological Sciences (DBIB).

The section reviews grant applications in the area of cell-cell interactions, including adhesion, migration, signal transduction and mechanotransduction in the context of development, homeostasis and differentiation. The dysregulation of these interactions leading to diseases is also a major area of interest of this study section. Some of the key focus areas of ICI include biology of the extracellular matrix, matrix remodeling, integrin signaling; epithelial-mesenchymal transition (EMT), mechanobiology, paracrine and juxtacrine factors in cell-cell communication, cellular interactions mediated through signaling pathways, e.g., Wnt, Notch and Hh in the context of development, carbohydrates and proteoglycans in cell-cell adhesive structures, in signal transduction, in development and in pathogenesis and immunity.

Dr. Samant's appointment on the study section as a chartered member is for a four-year term that started July 1, 2020.

New Year, **New Tools**

Better Genomic Diagnostics for Alabama

Genome diagnostics are poised to play an increased role in precision medicine at UAB and throughout the state, if Alexander **“Craig” Mackinnon, M.D., Ph.D.**, division director, Genomic Diagnostics and Bioinformatics, has anything to say about it. Last year we brought you the story of how Mackinnon joined the Department of Pathology, and under the leadership of **George Netto, M.D.**, Robert and Ruth Anderson Endowed Chair, outlined several initiatives for 2020, including the creation of a precision diagnostics laboratory. That plan was part of Netto’s vision for the department when he came to serve as chair four years ago.

> You can generate a lot of data that will live in Alabama, rather than sending the work out of state to third-party reference labs.

At the start of 2020, those plans were coming together with an expansion of laboratory space in West Pavilion underway and a signed agreement between several departments and UAB Hospital to support the creation of a larger, freestanding space.

Then COVID hit, and everyone’s priorities shifted. The Division of Genomic Diagnostics pivoted to assist the department’s and institution’s efforts to provide COVID testing by identifying information technology support for the GuideSafe program. With funding from the CARES (Coronavirus Aid, Relief and Economic Security) Act, the department and hospital labs purchased a laboratory information management system (LIMS) and several instruments to allow for DNA/RNA extraction and high-throughput testing of biological samples, which Pathology’s faculty and staff helped take online (see sidebar).

“As much as the lab work is so crucial, managing the work flow is another component of successfully handling the large volumes of tests that we continue to do at UAB,” Mackinnon says. He and colleagues **Shuko Harada, M.D.,** professor**, Diana Morlote, M.D.,** assistant professor, GDB, and **Sixto Leal, M.D., Ph.D.**, helped design programs and processes to take these new machines live and coordinate the dozens of laboratory staff running them. This includes informatics support by joint faculty member **Elizabeth Worthey, Ph.D.**, associate professor and Informatics section head, Pathology and Pediatrics.

The acquisition of these instruments will allow UAB to become a so-called “COVID Center of Excellence,” Mackinnon says, which will have the capacity to avoid issues such as the complete cessation of work due to a supply issue, such as a plastic tube shortage, for example. “These machines allow for a great deal of testing for Alabama,” he says, “and the sequencing machines can do rapid COVID sequencing.”

What does this mean?

Mackinnon offers the example of a nurse working in a pediatric intensive care unit where a COVID outbreak affects the patients and nursing staff. “If the patient transmitted COVID to the nurse, this would indicate the unit’s preventative measures are failing,” he states. Alternatively, the individuals could be independently infected. “You need to know the difference. By having COVID sequencing capabilities at UAB, we are able to sequence the COVID viral genome in both patients and compare the sequencing results. I think that has a huge benefit for managing outbreak.”

The instruments do not work exclusively on COVID, of course, but for any type of viral infection or other diseases. “From a molecular genetics standpoint, what’s cool about viruses and other infectious organisms,” Mackinnon says, “is that you can identify the organism by the sequencing, and then work to pinpoint its origin and isolate it.”

The sequencers UAB has acquired allow for fast turnaround times delivering results in 24-36 hours rather than the current standard, which can be up to 7 days. This benefits the entire state, he argues. “Alabama has long been an underserved state with populations that can be hard to reach. Now with GuideSafe in place, combined with these test capabilities and instrumentation, we have the capacity to become a regional genomic diagnostic center,” he says.

QIAGEN QIASYMPHONY SP SAMPLE PREPARATION/DNA RNA PURIFICATION

Returning to the shared vision

of a freestanding Genomic Diagnostics Laboratory (GDL), Mackinnon praises institution and hospital leadership for allowing for the renovation of 1,000 square feet in West Pavilion this year, and the acquisition of two pieces of equipment that will help promote tumor cancer genetics and pharmacogenomics. Staff are also being hired to help with this expansion, which Mackinnon calls, “a bridge—but it’s short term.”

The longer-term goal is a freestanding GDL in the former Southern Research building purchased by UAB Health System in February, as part of a block of properties along University Boulevard between 22nd Street and 23rd Street South. Mackinnon is working on approval to make this multimillion-dollar renovation to a 24,000-square-foot space a reality.

“What we’re doing with molecular medicine is important for the state because 1) it keeps us relevant with the high cancer and disease burden we have in our patient population, and 2) it can create added benefits for the state through commercialization of intellectual property, collaborations with drug companies on clinical trials, and partnerships with UAB affiliates. You can generate a lot of data that will live in Alabama, rather than sending the work out of state to third-party reference labs.”

The plan is to integrate efforts from the departments of Pathology, Genetics, Pediatrics, and the UAB Hospital, Mackinnon says. Pathology would occupy space in a newly designed clinical genetics lab to do molecular oncology (tumor testing); molecular microbiology (including continued COVID testing); pharmacogenomics, which look at how a patient’s genetic makeup influences how he or she metabolizes drugs; and bioinformatics.

A key to success for this collaboration will be a strategy for reimbursement for the testing, Mackinnon says, but to stay competitive with other healthcare systems nationwide, this next generation of tools is a must.

“This is not just another lab test,” he says. “We can take this testing and identify how to impact and improve patient care.” ■

The New Tools

These instruments were acquired by UAB Pathology and UAB Hospital Labs during 2020 with funding support from the CARES Act.

Janis G3 Primary Sample Reformatter

Provides safe and traceable barcode scanning and reformatting of up to 192 input biological samples from nasoparyngeal, oropharyngeal, and anterior nasal swabs into various destination labware to support viral nucleic acid extraction.

JANUS 3G qPCR Workstation

Enables traceable and reproducible real-time PCR sample preparation for high-throughput SARS-CoV-2 detection. This automated workstation offers walk-away PCR sample prep while reducing the risk of hands-on errors.

Chemagic 360

An innovative system with a small footprint that can be adapted to fit most nucleaic acid purification needs. Provides high yields of ultra-pure nucleic acids suitable for a wide range of downstream applciations, such as NGS, MLPA, genotyping, and PCR.

ZEPHYR G3 NGS

A compact, cost-effective multi-channel liquid handler ideal for key applications in compound management, HTS, genomics, proteomics, and bioanalytical assays.

QUANTSTUDIO DX 96W FAST

A real-time PCR platform that offers flexibility, expandability, and high performance standards.

GENEXUS SEQ System Instrument

The first turnkey next-generation sequencing (NGS) solution that automates the specimen-to-report workflow and delivers same-day results with just two user touchpoints. It makes it easy for your clinical research or testing lab to bring NGS in-house, regardless of expertise.

Hardy Retires After 30 Years

Robert Hardy, Ph.D., professor, Laboratory Medicine, retired effective July 1, 2020, after 30 years in the UAB Department of Pathology. In September, Hardy earned the title of professor emeritus.

Hardy worked the entirety of his pathology career at UAB—first joining as a postdoctoral fellow with his mentor and former department chair Jay M. McDonald, when he moved to Birmingham. He served as section head of Clinical Chemistry and laboratory director, Core Chemistry for UAB Hospital since 2004. He also worked for a year and a half as interim director of the UAB Hospital Immunology Lab.

ROBERT HARDY, PH.D.

Dr. Hardy is Senior Associate Editor for the journal Laboratory Investigation since 2008, and has served as ad hoc reviewer for dozens of journals on pathology and other medical disciplines throughout his career.

Hardy managed a continuously funded research lab for 20 years, focused on researching dietary fatty acids and their role in insulin resistance and breast cancer metastasis. He served as a principle investigator on many grants throughout his career, from the National Institutes of Health, American Institute for Cancer Research (NICR), National Cancer Institute, American Heart Association and American Diabetes Association, among others. Hardy also served on NIH, AICR and other grant review committees, and published 58 peer reviewed manuscripts. More recently, Hardy focused on clinical translational research via a collaboration with Victor Darley-Usmar, Ph.D., professor, Molecular & Cellular Pathology, aimed at developing a Clinical Mitochondrial Laboratory; and translational research related to clinical chemistry.

Dr. Hardy's teaching experience is as extensive as his work in the lab. He has taught some courses continuously for more than 20 years, and was the course director for Fundamentals I and 2 for the UAB Schools of Dentistry and Optometry for 8 years. He mentored dozens of graduate students as well as postdoctoral fellows over the course of his career.

Hardy is a Diplomate of the American Board of Clinical Chemistry (DABCC) and served on the ABCC for six years. He is a fellow of the Association of Clinical Scientists (FACSc) and the American Association for Clinical Chemistry (FAACC); President of the Association of Clinical Scientists, and in 2020 won the F.W. Sunderman Jr. Diploma of Honor presented by the Association of Clinical Scientists.

A native of Canada, Dr. Hardy moved to the United States in 1987 where he was a postdoctoral fellow at Washington University in St. Louis, and then came to UAB in 1990.

Dr. Hardy's colleagues laud him for his expertise and mentorship in his career, thanking him for his leadership, expertise, and guidance, as well as his collegial demeanor.

"Rob Hardy is a nationally renowned expert in his field who, throughout his career, patiently and thoughtfully trained others in order to pass on his expertise," says George Netto, M.D., Robert and Ruth Anderson Endowed Chair, UAB Pathology. "His absence from the department and hospital labs will be made less impactful only due to his effort to train so many others before his departure."

Marques Joins FDA Blood Products Advisory Committee

Interim division director, Laboratory Medicine, **MARISA MARQUES, M.D.,** has joined the FDA's Blood Products Advisory Commitee (BPAC), which reviews and evaluates data concerning the safety, effectiveness, and appropriate use of blood, products derived from blood and serum or biotechnology which are intended for use in the diagnosis, prevention, or treatment of human diseases, and, as required, any other product for which the Food and Drug Administration has regulatory responsibility, and advises the Commissioner of Food and Drugs of its findings.

Marisa Marques, M.D.

The Committee consists of a core of 17 voting members including the Chair. The core of the voting members may include one technically qualified member who is identified with consumer interest. Dr. Marques will serve a three-four year term.

Remembering **David Remember Baker** and the Baker Family Legacy

Roger Denio Baker, M.D., inaugural Chair, UAB Department of Pathology

Last spring, we learned of the passing of David Remember Baker, J.D., son of Dr. Roger Denio Baker, inaugural Chair of the UAB Department of Pathology. The Baker family has long supported the department and we are saddened to learn of Mr. Baker's passing.

The Baker family established the Roger Denio Baker Prize in memory of Dr. Roger Denio Baker, who was the first full-time faculty member of the new four-year medical school, the University of Alabama School of Medicine, having been hired by the new Dean, Dr. Roy R. Kracke, also a pathologist.

Dr. Baker was a 1928 cum laude graduate of the Harvard Medical School, followed by training in Pathology at Johns Hopkins University. He thus became responsible for establishing, leading, and growing the Pathology faculty of the University of Alabama School of Medicine from 1944 to 1952, at which time he left UAB for Duke University. The Department initially had five attending pathologists as well as three residents. One of the attending pathologists was Dr. J. A. Cunningham, founder of the Cunningham Pathology Group in Birmingham, still in existence to this day. Dr. Roger Baker's influence on pathology at UAB is deep and far-reaching.

In the year 2000, family and friends of Dr. Roger Baker (1902-1994), in conjunction with the Department, established the Roger Denio Baker Prize in Anatomical Pathology, which is awarded annually to the resident or fellow who exhibits the greatest skill in the disciplines of Anatomical Pathology. The prize was first awarded in 2002, and until this year has been presented annually by David Baker.

Mr. Baker passed away on March 20, 2020, and we will all miss the excitement he expressed at seeing his father's legacy continue. Current faculty who received the Roger Denio Baker Prize include **Dr. Shi Wei** (Section Head of Surgical Pathology) and **Dr. Brandi McCleskey** (Forensic Pathologist).

DAVID REMEMBER BAKER, J.D.

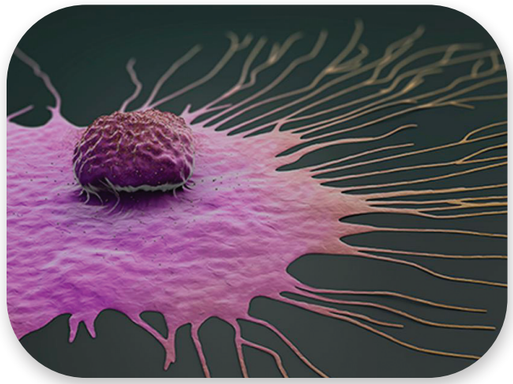
David Baker's enthusiasm for his father's legacy at UAB Pathology was evident in his presence at annual year-end receptions for trainees, where he distributed the award in his father's name. He was known for his keen mind, his generosity, his love of art and music, and his obsession with bow ties. On June 25, his wife Lois Baker along with family and friends hosted a memorial service via Zoom, which was attended by more than 100 participants who gathered to fondly remember Mr. Baker. ■

Expansion Stress Enhances Growth and Migration of Breast Cancer Cells

By Jeff Hansen, UAB News

Expansion stress can have an alarming impact on breast cancer cells by creating conditions that could lead to dangerous acceleration of the disease, an interdisciplinary team of University of Alabama at Birmingham researchers has found.

As breast tumors grow, biomechanical forces in the tumor microenvironment, or TME, cause elevated compression at the tumor interior, tension at the periphery and altered interstitial fluid flow — promoting aggressive growth, invasion and metastasis. Biomechanical forces also may modulate the immune response through cancer cell-immune cell crosstalk.



The UAB researchers — **Joel Berry, Ph.D.**, associate professor in the Department of Biomedical Engineering; **Jessy Deshane, Ph.D.**, associate professor in the UAB Department of Medicine's Division of Pulmonary, Allergy and Critical Care Medicine; **Roy Koomullil, Ph.D.**, associate professor in the Department of Mechanical Engineering; and **Selvarangan Ponnazhagan, Ph.D.**, professor in the Department of Pathology — created a novel, tissue-engineered, three-dimensional breast cancer mimetic system.

This system recapitulates the in vivo growth of breast cancer cells in the presence of tumor-associated fibroblasts, endothelial cells and immune cells, within a physiologically relevant extracellular matrix. The researchers found that biomechanical forces significantly altered the proteome of breast cancer cells and enhanced exosome production. Tumor cell-secreted exosomes, one of the intercellular mediators of signaling in the TME, are now recognized as key regulators of tumor progression.

IN THE STUDY, the exosomes directly promoted aggressive tumor cell growth, induced immune suppression and altered immune cell polarization in the TME. Furthermore, the researchers recently engineered an oscillatory compression device for real-time application of biomechanical force on orthotopic mammary tumors in vivo, which allowed them to observe exosome-mediated immunosuppression and aggressive tumor growth in mice.

Preliminary analyses of exosome migration, immune cell uptake and polarization superimposed onto a novel computational algorithm indicated the significance of exosome concentration gradient and time in predicting the kinetics of protumorigenic events, linking biomechanical force, exosome release by tumor cells, exosome uptake and polarization of immune cells in the TME.

The study, "Mechanical strain induces phenotypic changes in breast cancer cells and promotes immunosuppression in the tumor microenvironment," is published in the journal Laboratory Investigation.

Co-authors with Berry, Deshane, Koomullil and Ponnazhagan are Yong Wang, Kayla F. Goliwas, Paige E. Severino, Kenneth P. Hough, Derek Van Vessem, Hong Wang, Sultan Tousif and Andra R. Frost.

Support came from American Cancer Society Institutional Research Grant Award IRG-60-001-53-IRG, National Institutes of Health grants HL128502-01A1 and CA184770; a Breast Cancer Research Foundation of Alabama Collaboration Award, and a Research Foundation of Alabama Award.

Deshane and Berry are scientists and Ponnazhagan is a senior scientist in the O'Neal Comprehensive Cancer Center at UAB. ■

Ponnazhagan Publishes in Cancer Research on **Immunotherapies to Treat Prostate Cancer**

Selvarangan Ponnazhagan, Ph.D.

Selvarangan Ponnazhagan, Ph.D., professor, Molecular & Cellular Pathology, recently published an article in the journal Cancer Research on the need for a combination therapies when using immunotherapy to treat prostate cancer. The article, "Revisiting Immunotherapy: A Focus on Prostate Cancer," was featured in Renal & Urology News.

"Immunotherapy is reemerging as a powerful alternat therapy for many cancers," says Ponnazhagan in the Renal & Urology News interview. "However, the potential of immunotherapy as a standalone approach may not yield long-term benefits. Hence, based on patient-specific molecular signatures, immunotherapy needs to be combined with other therapies."

Dr. Ponnazhagan is a Senior Scientist of Experimental Therapeutics with the O'Neal Comprehensive Cancer Center, the Cystic Fibrosis Research Center, the Center for Biophysical Sciences and Engineering, the Comprehensive Diabetes Center, the Nephrology Research & Training Center, the Comprehensive Arthritis, Musculoskeletal Bone and Autoimmunity Center, and the Global Center for Craniofacial, Oral and Dental Disorders.

FROM THE RENAL & UROLOGY NEWS ARTICLE

> "He and his coauthors hypothesize that PCa outcomes may improve by combining patient-tailored immunotherapy and immune checkpoint inhibitors with conventional cytotoxic agents and androgen receptor (AR)-targeted therapies. Immune checkpoint inhibitors, which have demonstrated benefits in many solid tumors, may be part of combination therapies for PCa.
>
> Inflammation plays a significant role during different stages of PCa growth and metastasis, and this is characterized by molecular heterogeneity of driver mutations. PCa is a "cold tumor," meaning that it is characterized by low infiltration of T-cells at the tumor microenvironment. "Although the reasons vary for this phenomenon, an important reason is limited neoantigens," Dr. Ponnazhagan explained. "Some solid tumors, like a subset of colorectal cancers, are characterized by high mutation rates that make them immunologically reactive tumors, characterized by high T-cell infiltration. For successfully treating cold tumors by immunotherapy, approaches should take into effect strategies to overcome this limitation.

MOLECULAR & CELLULAR PATHOLOGY FACULTY

The Impact of COVID19 on Stroke Patients

By Jeff Hansen, UAB News

Stroke patients who also have COVID19 showed increased systemic inflammation, a more serious stroke severity and a much higher rate of death, compared to stroke patients who did not have COVID19, according to University of Alabama at Birmingham research led by Chen Lin, M.D., an assistant professor in the UAB Department of Neurology.

The research, published in the journal Brain, Behavior & Immunity – Health, is a retrospective, observational, cross-sectional study of 60 ischemic stroke patients admitted to UAB Hospital between late March and early May 2020. Ischemic stroke occurs when a blood vessel for the brain is blocked by a clot, depriving some brain tissue of oxygen. All patients were tested for COVID19 at admission.

Diana Lin, M.D., Assistant Professor

The UAB researchers mined electronic medical records of confirmed stroke cases for information on age, gender and race; clinical variables; laboratory data, including complete blood counts, blood chemistry and coagulation tests; and outcomes, including death, length of hospital stay and condition at discharge.

The ratio of the number of neutrophils to the number of lymphocytes, or the NLR, as calculated from blood count data, served as an index of the systemic inflammatory response. While other researchers have associated NLR with COVID19 disease severity, refractory disease and even as an independent factor for mortality, "our study is the first to associate the NLR in patients with COVID19 and ischemic stroke and stroke severity," Lin says.

Of the 60 hospitalized patients with acute systemic stroke, nine were positive for a COVID19 infection.

The UAB research had four major findings. First, patients who were positive for COVID19 presented with a more severe neurological deficit at admission, as measured by the National Institutes of Health Stroke Scale, or NIHSS, score, which averaged 18.4. Second, all patients with an NIHSS score higher than 4 — including uninfected patients — had a significantly higher NLR than those with lower scores. The NIHSS is used to predict lesion size and gauge stroke severity.

Third, patients with COVID19 had an increased inflammatory response, including significantly higher neutrophil counts, lower lymphocyte counts and an increased NLR, compared with uninfected patients. Finally, stroke patients with COVID19 had a significantly higher mortality rate — 44.4 percent, versus 7.6 percent for uninfected stroke patients.

Two other studies this year have reported clinical and laboratory differences in ischemic stroke patients with and without COVID19, Lin says, but neither addressed racial differences or NLR differences between groups.

"We have reported the first experience within the 'Stroke Belt' of the Southern United States, which has the highest proportion of African American stroke patients," says Lin, who is also the director of the Stroke Recovery Clinic in the UAB Division of Cerebrovascular Disease. In the UAB study, African Americans comprised 55.6 percent of those who had COVID19 and stroke and 37.7 percent of those with only stroke.

"Interestingly, in our patients with stroke and COVID19, the neutrophil and lymphocyte levels were only borderline high and low, respectively," Lin says, "yet the NLR was almost twice as high as in patients without COVID19. This potentially indicates that the systemic inflammatory response triggered by COVID19 can cascade from multiple components."

This potentially indicates that the systemic inflammatory response triggered by COVID-19 can cascade from multiple components.

Co-authors with Lin for the study, "Racial differences and an increased systemic inflammatory response are seen in patients with COVID19 and ischemic stroke," are Yurany Arevalo, UAB Department of Neurology; Hely Nanavati, Department of Epidemiology, UAB School of Public Health; and Diana Lin, UAB Department of Pathology. ■

Weaver Lab Publishes on TH17 Cells in Science Immunology

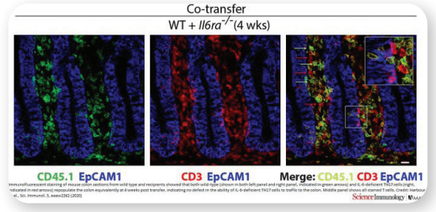
STACEY HARBOUR, PH.D., Scientist I, Anatomic Pathology, in the lab of **Casey Weaver, M.D.,** professor, Anatomic Pathology, published an article on T cell differentiation in the July issue of Science Immunology, titled, "TH17 cells require ongoing classic IL-6 receptor signaling to retain transcriptional and functional identity."

Research conducted by the group showed that the molecule IL-6, a common target of various disease therapies, was indispensable for maintaining the inflammatory effects of T helper 17 cells that are implicated in diseases like IBD and psoriasis.

The article is published with co-authors **Robin Hatton, Ph.D.**, associate professor, Anatomic Pathology; **Daniel DiToro, Ph.D.**, Graduate Student, Anatomic Pathology; **Steven Witte, Ph.D.**, Consultant, Anatomic Pathology; **Carlene Zindl,** Scientist I, Anatomic Pathology; **Min Gao, Ph.D.**, assistant professor, Medicine; **Trenton Schoeb, Ph.D.**, professor, Genetics.

FROM THE ARTICLE —

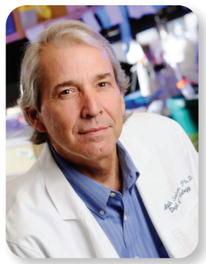
"The pathogenic role of the TH17 subset of CD4+ T cells in multiple immune-mediated diseases has prompted close scrutiny of the cytokine signals that promote differentiation and maintenance of TH17 cells. IL-6 and TGF-β are key cytokines for TH17 commitment by naïve T cells whereas IL-23 supports maintenance of a TH17 identity. Harbour et al. investigated whether persistent IL-6 signaling is also needed to sustain TH17 cell functions. IL-6Rα–deficient mouse T cells could not maintain a TH17 phenotype and were attenuated in their ability to elicit colitis in an in vivo cell transfer model. These studies provide deeper insights into the set of signals required for TH17 cell maintenance and suggest additional molecular targets for pharmacological interventions aimed at antagonizing pathogenic TH17 immunity.



Acting in concert with TGF-β, interleukin-6 (IL-6) signaling induces T helper 17 (TH17) cell development by programming TH17-related genes via signal transducers and activators of transcription 3 (STAT3). A role for IL-6 signaling beyond the inductive phase of TH17 cell development has not been defined because IL-23 signaling downstream of TH17 cell induction also activates STAT3 and is thought responsible for TH17 cell maintenance. Here, we find that IL-6 signaling is required for both induction and maintenance of mouse TH17 cells; IL-6Rα–deficient TH17 cells rapidly lost their TH17 phenotype and did not cause disease in two models of colitis. Cotransfer of wild-type TH17 cells with IL-6Rα–deficient TH17 cells induced colitis but was unable to rescue phenotype loss of the latter. High IL-6 expression in the colon promoted classic, or cis, rather than transreceptor signaling that was required for maintenance of TH17 cells. Thus, ongoing classic IL-6 signaling underpins the TH17 program and is required for TH17 cell maintenance and function."

Sanderson Co-Authors **New Book on Heparanase**

RALPH SANDERSON, PH.D., endowed professor of Cancer Pathobiology and division director, Molecular & Cellular Pathology, recently co-authored and edited the book Heparanase along with Israel Vlodavsky, Ph.D., the world's leading expert on heparanese, an enzyme that cleaves heparan sulfate-a linear polysaccharide found in all animal tissues.



RALPH SANDERSON, PH.D.

ISRAEL VLODAVSKY, PH.D.

Dr. Vlodavsky has collaborated with Sanderson for years in this work, and was the sixth annual Listinsky lecturer in 2019, for a lecture titled, "Heparanese: From Basic Research to Novel Therapeutics for Cancer Inflammation." Sanderson and Vlodavsky's collaboration began two decades ago. Their research now focuses on understanding the mechanisms underlying the ability of heparanase to promote tumor progression.

The book's premise is that heparanase is a master regulator of aggressive cancer phenotypes and crosstalk with the tumor microenvironment. It demonstrates an understanding of heparanase's multifaceted activities in cancer, inflammation, diabetes and other diseases, as well as its related clinical applications to scientists, clinicians, and advanced students in cell biology, tumor biology and onology.

Sanderson is the UAB endowed professor of Cancer Pathobiology and director, Division of Molecular & Cellular Pathology, Department of Pathology, UAB O'Neal Comprehensive Cancer Center. Sanderson earned a B.S. from the University of Alabama, and a Ph.D. at the University of Alabama at Birmingham. His research focuses on determining how tumor-host cell interactions mediated by heparan sulfate and the enzyme heparanase regulate the tumor microenvironment and promote tumor progression, and to use that knowledge to design new cancer therapies.

Vlodavsky is a professor of Cancer and Vascular Biology at Technion-Israel Institute of Technology's Rappaport Faculty of Medicine and Technion Integrated Cancer Center (TICC).

Vlodavsky's discovery of the extracellular matrix as a reservoir for bioactive molecules provided the basis for the current appreciation of the tumor microenvironment and its significance in cancer progression and treatment.

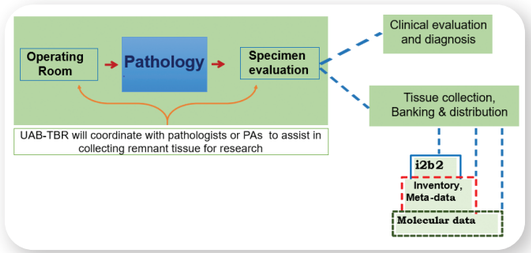
A pioneering achievement of Vlodavsky is the cloning and characterization of heparanase, the predominant enzyme that degrades heparan sulfate and fulfills important roles in tissue remodeling, cancer metastasis, angiogenesis, inflammation, diabetes, and kidney dysfunction.

Through the combination of basic and translational research, Vlodavsky is the leading scientist in this area of research, offering basic insights and new treatment strategies for various cancers and other diseases. He earned his bachelor's and Master's degrees from The Hebrew University of Jerusalem, and Ph.D. from the Weizmann Institute, Rehovot, Israel.

FORENSIC PATHOLOGY FACULTY

UAB Tissue Biorepository Housed in UAB Pathology

The UAB Tissue Biorepository (UAB-TBR), an important asset to the future of research at UAB, has officially launched. The UAB-TBR is housed in the Department of Pathology, and coordinated with the CCTS Biorepository.



A central commitment of the School of Medicine and the Health System is never to compromise our mission of patient care, as well as the safety and privacy of patients. With appropriate ethical and privacy guidelines, the UAB-TBR will collect, process, store, and distribute high-quality human tissue specimens to UAB investigators, including (but not limited to) the investigators of the O'Neal Comprehensive Cancer Center. The UAB-TBR will support clinicians and investigators in improving clinical care, while advancing personalized medicine.

Sameer Al Diffalha, M.D., assistant professor in the Department of Pathology, will serve as director of the UAB-TBR. Upender Manne, M.S. Ph.D., professor in the Department of Pathology and director of the Translational Anatomic Pathology Section, has been named co-director. Kathy Sexton will serve as the administrative associate director.

The UAB-TBR facility replaces the Tissue-Procurement Facility of the Department of Pathology. Several changes in procedures, made to enable the mission and goals of the UAB-TBR, became effective January 1, 2020. The key procedures are as follows:

1. All specimens, both for clinical care and research, must go through the Department of Pathology for evaluation. UAB-TBR personnel will transport diagnostic specimens, from which research material will be harvested as available.
   - Investigators should contact the UAB-TBR to coordinate tissue harvesting and/or storage.
   - UAB-TBR will ensure that investigators have all necessary IRB protocols and approvals prior to providing access to specimens.
   - UAB-TBR will work with operating room (OR) personnel to insure specimen pick-up and transport to Pathology.
   - UAB-TBR will coordinate with pathologists or pathology assistants (PAs) to assist in collecting remnant tissues for research.
2. The UAB-TBR will provide subspecialty pathologist expertise and quality control on collected tissues.
3. The banked specimens will be linked to UAB's i2b2 information hub and electronic database.
4. The UAB-TBR will provide the opportunity for investigators to establish PI-driven and task-specific banked specimens.
5. The UAB-TBR specimen access committee will include pathologists, surgeons, and basic translational and clinical researchers. If there is simultaneous demand for the same type of tissues, this committee will (after evaluating the merits of the projects) prioritize distribution of tissue specimens.

Establishing the UAB-TBR would not have been accomplished without the hard work and commitment of the UAB-TBR team, led by George Netto, M.D., Robert and Ruth Anderson Endowed Chair and chair of the Department of Pathology, and Cristina Magi-Galluzzi, M.D., Ph.D., director of the Division of Anatomic Pathology.

Cellular Metabolism **Regulates the Fate Decision** Between Pathogenic and Regulatory T Cells

by Jeff Hansen, UAB News

Patients with autoimmune diseases like multiple sclerosis, inflammatory bowel disease and rheumatoid arthritis have an imbalance between two types of immune system T cells. Destructive Th17 cells that mediate chronic inflammation are elevated, and regulatory T cells, or Treg cells, which suppress inflammatory responses and play a protective role in autoimmune disorders, are diminished.

Both cells differentiate from the same precursors — naïve CD4 T cells — and the beginning of their change to either Th17 or Treg cells starts with the same signal. Subsequently, a fate decision occurs, like a fork in the road, steering the changing CD4 cells to become either inflammatory T cells or regulatory T cells.

STRIKINGLY, it also was essential to promote inflammation of the central nervous system by Th17, as shown in a mouse model for multiple sclerosis.

New, preclinical research, led by **Laurie Harrington, Ph.D.**, associate professor in the UAB Department of Cell, Developmental and Integrative Biology at the University of Alabama at Birmingham, shows a pivotal role for cellular metabolism to regulate that fate decision, a decision that occurs very early in the activation of CD4 T cells. This opens a possibility that manipulating the cellular metabolism of T cells may provide a new, promising therapeutic intervention to modulate the balance between pathogenic Th17 and Treg cells in chronic autoimmune disorders. The research is published in the journal Cell Reports.

Upon activation, T cells were known to rapidly increase metabolism, including glycolysis and mitochondrial oxidative phosphorylation, or OXPHOS, to meet the energetic demands of differentiation. But the precise contribution of OXPHOS to that Th17 differentiation was not defined.

The UAB researchers, and one colleague at New York University, found that ATP-linked mitochondrial respiration during Th17 differentiation was essential to upregulate glycolysis and the TCA cycle metabolism. Strikingly, it also was essential to promote inflammation of the central nervous system by Th17, as shown in a mouse model for multiple sclerosis.

In the mouse model, experimental autoimmune encephalitis, Th17 cells cause the disease progression. For the experiment, harvested CD4 T cells were differentiated using a combination of Th17-polarizing cytokines. One group was the polarized control, and one group was polarized in the presence of oligomycin, an inhibitor of mitochondrial OXPHOS. Then the T cells were transferred into experimental mice. Mice receiving the T cells treated with oligomycin during polarizing conditions showed a significantly delayed onset of disease and reduced disease severity. Both groups of T cells proliferated robustly after transfer.

In mechanistic experiments, the researchers detailed the early molecular events that differ between cells polarized in the presence or absence of oligomycin. These included gene sets that are upregulated or downregulated, presence or absence of Th17 or Treg cell markers, expression of signature transcription factors needed for Th17 differentiation, and expression of gene products that play a role in T cell receptor signaling.

A SURPRISE was found in the timing of the fate decision. In an experiment, CD4 T cells were exposed to Th17-polarizing conditions with oligomycin present only during the first 24 hours. They were then washed and allowed to continue differentiation in the polarizing conditions. The effects of this brief exposure to oligomycin were T cells that lacked Th17 markers and instead showed hallmarks of Treg cells, including expression of Foxp3. Thus, the brief early exposure to oligomycin imprinted the Foxp3 fate decision.

Overall, Harrington says, “inhibition of mitochondrial OXPHOS ablates Th17 pathogenicity in a mouse model of multiple sclerosis and results in generation of functionally suppressive Treg cells under Th17 conditions.”

Co-authors with Harrington of the study, “Mitochondrial oxidative phosphorylation regulates the fate decision between pathogenic Th17 and regulatory T cells,” are **Boyoung Shin**, UAB Department of Cell, Developmental and Integrative Biology; **Gloria Benavides** and **Victor Darley-Usmar,** UAB Department of Pathology; **Jianlin Geng** and **Hui Hu**, UAB Department of Microbiology; and **Sergei Koralov**, New York University Grossman School of Medicine.

Support came from National Institutes of Health grants AI113007 and DK079337, American Heart Association grant 16PRE29650004, an AMC21 Award from the UAB School of Medicine, and a Blue Sky Award from the UAB School of Medicine.

At UAB, Darley-Usmar holds the Endowed Professorship in Mitochondrial Medicine and Pathology and is Senior Associate Dean, Research Compliance and Administration.

Victor Darley-Usmar, Ph.D., endowed professor of mitochondrial medicine and pathology; senior associate dean for research, School of Medicine

Surplus Antioxidants are Pathogenic for Hearts and Skeletal Muscle

by Jeff Hansen

Many heart diseases are linked to oxidative stress, an overabundance of reactive oxygen species. The body reacts to reduce oxidative stress — where the redox teeter-totter has gone too far up — through production of endogenous antioxidants that reduce the reactive oxygen species. This balancing act is called redox homeostasis.

But what happens if the redox teeter-totter goes too far down, creating antioxidative stress, also known as reductive stress?

Rajasekaran Namakkal-Soorappan, Ph.D., associate professor in the UAB Department of Pathology, and colleagues have found that reductive stress, or RS/AS, is also pathological. This discovery, they say, may have clinical importance in management of heart failure.

They report that RS causes pathological heart enlargement and diastolic dysfunction in a mouse model. This study, published in the journal Antioxidants and Redox Signaling, was led by Namakkal-Soorappan and **Pei Ping, Ph.D.**, David Geffen School of Medicine at the University of California-Los Angeles.

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Rather than genetic manipulation to induce RS, as was done in the heart study, the researchers used the chemical sulforaphane or direct augmentation of intracellular glutathione to induce RS in cultured mouse myoblast cells.

"Antioxidant-based therapeutic approaches for human heart failure should consider a thorough evaluation of antioxidant levels before the treatment," they say. "Our findings demonstrate that chronic RS is intolerable and adequate to induce heart failure."

The study used transgenic mice that had upregulated genes for antioxidants in the heart, which increased the amounts of antioxidant proteins and reduced glutathione, creating RS. One mouse line had low upregulation, and one had high upregulation, creating chronic low RS and chronic high RS, respectively, in the hearts of the mice.

Rajasekaran Namakkal-Soorappan, Ph.D.

The mice with high RS showed pathological heart changes called hypertrophic cardiomyopathy, and had an abnormally high heart ejection fraction and diastolic dysfunction at 6 months of age. Sixty percent of the high-RS mice died by 18 months of age.

The mice with low RS had normal survival rates, but they developed the heart changes at about 15 months of age, suggesting that even moderate RS can lead to irreversible damage in the heart over time.

Giving high-RS mice a chemical that blocked biosynthesis of glutathione, beginning at about 6 weeks of age, prevented RS and rescued the mice from pathological heart changes.

Gobinath Shanmugam, Ph.D., postdoctoral fellow in the UAB Department of Pathology, and Namakkal-Soorappan point out that a 2019 survey found about 77 percent of Americans are consuming dietary supplements every day, and within this group, about 58 percent are consuming antioxidants as multivitamins. Thus, a chronic consumption of antioxidant drugs by any individual without knowing their redox state might result in RS, which can induce pathology and slowly damage the heart.

Effect of RS on Skeletal Muscle

In a related study, published in the journal Redox Biology, Namakkal-Soorappan looked at the impact of RS on myosatellite cells, which are also known as muscle stem cells. These cells, located near skeletal muscle fibers, are able to regenerate and differentiate into skeletal muscle after acute or chronic muscle injury. The regulation of myosatellite cells is of interest given the loss of skeletal muscle mass during aging or in chronic conditions like diabetes and AIDS.

Recently, Namakkal-Soorappan reported that tilting the redox teeter-totter to oxidative stress impaired regeneration of skeletal muscle. Now, in the Redox Biology paper, he has shown that tilting the redox to RS also causes significant inhibition of muscle satellite cell differentiation.

Rather than genetic manipulation to induce RS, as was done in the heart study, the researchers used the chemical sulforaphane or direct augmentation of intracellular glutathione to induce RS in cultured mouse myoblast cells. Both treatments inhibited myoblast differentiation. Finally, authors attempted to withdraw antioxidative stress by growing cells in medium without sulforaphane, which removes the RS and accelerates the differentiation. Namakkal-Soorappan and colleagues found that a pro-oxidative milieu, through a mild generation of reactive oxygen species, was required for myoblast differentiation.

The researchers also showed that genetic silencing of a negative regulator of the antioxidant genes also inhibited myoblast differentiation.

Co-authors with Namakkal-Soorappan and Ping, and first-author Shanmugam, in the Antioxidants and Redox Signaling study, "Reductive stress causes pathological cardiac remodeling and diastolic dysfunction," are Silvio Litovsky and Rajesh Radhakrishnan, UAB Department of Pathology; **Ding Wang,** UCLA; **Sellamuthu S. Gounder, Kevin Whitehead, Sarah Franklin** and **John R. Hoidal**, University of Utah School of Medicine; **Jolyn Fernandes** and **Dean P. Jones,** Emory University, Atlanta, Georgia; **Thomas W. Kensler,** Fred Hutch Cancer Research Center, Seattle, Washington; **Louis Dell'Italia,** UAB Department of Medicine; **Victor Darley-Usmar,** UAB Department of Pathology; and **E. Dale Abel**, University of Iowa.

In the Redox Biology study, "Reductive stress impairs myogenic differentiation," co-authors with Namakkal-Soorappan are **Sandeep Balu Shelar,** UAB Department of Pathology; **Dean P. Jones,** Emory University; and **John R. Hoidal**, University of Utah School of Medicine.

Support for both studies came from National Institutes of Health grants HL118067 and AG042860, American Heart Association grant BGIA 0865015F, the University of Utah, and UAB.

In the two studies, Namakkal-Soorappan's name is listed as Namakkal S. Rajasekaran. ■

ANATOMIC PATHOLOGY & LAB MEDICINE FACULTY

GENOMIC DIAGNOSTICS & BIOINFORMATICS FACULTY

LABORATORY MEDICINE FACULTY

Changing of the Guard:
Saying Goodbye to Residents and Fellows

AT THE END of the academic year, our Residency Training Program sent out seven young Pathologists to great fellowship programs, including four who stayed at UAB for a first fellowship and another three who departed for fellowships at other programs including Moffitt Cancer Center, Medical University of South Carolina, and Emory University. Several also have second fellowships lined up. We are very proud of the accomplishments of these fine young pathologists, and expect to see them in the forefront of our profession in the coming years.

Fellowship directors gathered with outgoing fellows for a send-off.

GRADUATING FELLOWS & their new roles

CYTOPATHOLOGY
- **Shoujun Chen, M.D., Ph.D.** Breast/GYN Fellowship, UAB
- **Josesph Kaminsky, M.D.** Pathology Services (private practice), Arkansas

DERMATOPATHOLOGY
- **David Ullman, M.D.**

FORENSIC PATHOLOGY
- **Farnaz Khalafi, M.D.** Forensic Medical (Nashville)

GASTROINTESTINAL PATHOLOGY
- **Meng-Jun Xiong, M.D.** Tift Regional Health System, GA

GYN/GU PATHOLOGY
- **Tyler Clemmensen, M.D.** Pathology Associates of Alabama

HEMATOPATHOLOGY
- **Jeff Ahlstedt, M.D.**
- **David Dorn, M.D.**

MOLECULAR GENETIC PATHOLOGY
- **Benjamin Saylor, M.D.** UAB Hematopathology Fellow

SURGICAL PATHOLOGY
- **Rong Chen, M.D.** GI Fellowship, University of Florida

TRANSFUSION MEDICINE
- **Nirapama Singh, M.D., Ph.D.**

GRADUATING RESIDENTS

- **Erin Baumgartner, M.D.** — PGY5 Hematopathology Fellow, Emory University; PGY6 Surgical Pathology at Johns Hopkins University
- **Paul Boothe, M.D.** — PGY5 Cytopathology Fellow, Moffitt Cancer Center, Magnolia Campus; PGY6 — GI Pathology Fellow, University of Florida

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ON June 23, George Netto, M.D., Robert and Ruth Anderson Endowed Chair, UAB Pathology, hosted an outgoing virtual ceremony to celebrate the graduating trainees transition. He announced the winners of several named fund awards for outstanding performance, including:

AP AWARDS

Best AP Faculty Teacher Award
KENNETH FALLON

Outstanding Trainee Teaching Award for Best Resident Teacher in Medical Student Education
CHRISTINE ARNESEN
DAVID DORN

Roger Denio Baker Prize in Recognition of Excellence in AP by a Resident
ADAM JONES

Roy D. Kracke Award for Best APSS Presentation
QING WEI

LAB MEDICINE AWARDS

Best CP Faculty Teacher Award
SIXTO LEAL

Jay M. McDonald Award for Best Lab Medicine Seminar Presentation
DAVID FIGGE

R. Pat Bucy Award for Best Lab Medicine Journal Club Presentation
ERIC OLLILA

4th Annual Alexander Lecture
Features Danny A. Milner Jr.

L to R front: Drs. Virginia Duncan, Danny Milner Jr, C. Bruce Alexander (seated), Forest Huls, Jason Wicker, Marisa Marques, David Dorn, Shi Wei.

This year's C. Bruce Alexander Lecture in Pathology Education featured **DANNY A. MILNER, JR., M.D., MSC, FASCP,** Chief Medical Officer and American Society for Clinical Pathology. The event took place on February 18 in the West Pavilion Conference Center to a full audience.

Milner's talk, titled, "Building a Career in Global Health: Traditional and Non-Traditional Pathways and the Value of Mentorship," focused on the importance of mentorship in healthcare. He highlighted his international work in Africa and discussed how to translate healthcare and pathology issues between cultures.

A mentor himself of many residents during his time at UAB, Dr. C. Bruce Alexander posed for a photo with several of his former resident trainees who are now on faculty in the department.

Milner earned his M.D. from the University of Alabama's School of Medicine in 2000. He completed his residency and fellowship in Anatomic Pathology, Clinical Pathology, and Microbiology in 2005 at the Brigham and Women's Hospital. In 1997, Milner started as a medical student working in Africa and since then has developed a reputation world-wide for his expertise on cerebral malaria. He has been involved in increasing pathology resources in a number of countries. He led the teams in Rwanda and Haiti that built anatomic pathology laboratories for advanced cancer diagnostics. Before Dr. Milner joined the American Society for Clinical Pathology (ASCP), he spent 10 years at Harvard teaching pathology, microbiology, and infectious disease. He earned many research grants for HIV and malaria.

Dr. Milner has authored over 100 publications and has presented his work in over 10 countries. He provides direction for many medical aspects of ASCP's policies and programs that relate to ASCP's global healthcare initiatives.

Editor's Note: This event was one of the department's last lectures to take place on campus prior to a campus-wide closure to events in early March.

RESIDENTS, continued

- **Bo Chen, M.D.** — PGY5 Surgical Pathology Fellow, UAB
- **Danielle Fasciano, D.O.** — PGY5 Dermatopathology Fellow, UAB; PGY6 Hematopathology Fellow, UAB
- **Adam Jones, M.D.** — PGY5 Hematopathology Fellow, UAB
- **Ashish Kurundar, M.D.** — PGY5 GI Pathology Fellow, Medical University of South Carolina
- **Morad Qarmali, M.D.** — PGY5 Cytopathology Fellow, UAB; PGY6 Breast Pathology Fellow, Moffit Cancer Center

GRADUATE TRAINEES

- Mohammad Abedelgawwad
- Kellie Regal-McDonald
- Alyncia Robinson
- Vinyak Khattar
- Jennifer Valcin

Dhall Assumes Surgical Pathology Fellowship Directorship

DEEPTI DHALL, M.D., professor, Anatomic Pathology, assumed the role of surgical pathology fellowship director in the Division of Anatomic Pathology beginning June 1. She replaces Shi Wei, M.D., Ph.D., professor, Anatomic Pathology, who has served as director since April 2015.


DEEPTI DHALL, M.D.

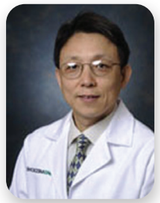
Dr. Dhall joined UAB Department of Pathology in June 2019 from Cedars Sinai Medical Center in Lost Angeles, CA, where she was an associate professor of Pathology and program director of Surgical Pathology Fellowship and Surgical Pathology Instructorship Program.

In her new role, Dhall will assist in leading the education and training activities for the division of Anatomic Pathology, and will work closely with the various subspecialty fellowship directors, residency program directors, and associate directors.

The Department thanks

Shi Wei, M.D., Ph.D., professor in the Division of Anatomic Pathology, for his excellent service and leadership as surgical pathology fellowship director, a role that he has covered since April 2015.

Dr. Wei is a senior scientist in the Experimental Therapeutics Program of the O'Neal Comprehensive Cancer Center, and scientist with the Comprehensive Arthritis, Musculoskeletal, Bone and Autoimmunity Center. He joined the department of Pathology in 2008 as an instructor and has moved up the ranks to professor in 2016.


SHI WEI, M.D., PH.D.

Please join us in welcoming Dr. Dhall to this new and important role and thank Dr. Wei for his years of service as surgical pathology fellowship director.

Inaugural **Ona Faye-Petersen Support Fund** Awarded

Rana Aldrees, M.D., a current PGY-4 resident in the UAB Department of Pathology, has been awarded with the inaugural Ona Faye-Petersen Educational Support Fund.


Rana Aldrees, M.D.

Dr. Aldrees used the fund to attend an additional course at the annual meeting of the U.S. and Canadian Academy of Pathology, USCAP 2020 in Los Angeles titled, "Major Advances in the Diagnosis and Management of Breast Disease." She presented a poster on March 2 titled, "Validation of the Revised 8th AJCC Breast Cancer Prognostic Staging System: Analysis of 5,321 Cases from a Single Institution."

Aldrees has contributed greatly to the work of the Program Evaluation Committee since becoming a member in her PGY-1 year. She recently accepted a cytopathology fellowship at Johns Hopkins School of Medicine's Department of Pathology, and will apply for breast pathology fellowships.

The Faye-Petersen Educational Support Fund was established in 2019 by Dr. Ona Faye-Petersen, professor, Anatomic Pathology, who has worked in the UAB Department of Pathology for 28 years and supported an annual trainee award for much of that time. Dr. Faye-Petersen created the fund to support trainees' attendance of courses, workshops, and symposia at national and international meetings held in the U.S.

"I very much believe in paying things forward, and this is one way to do that," says Faye-Petersen, "Providing trainees additional funds during a time in their careers when they're generally more financially limited is key."

The UAB Department of Pathology is grateful to Dr. Faye-Petersen for establishing the fund and congratulates recipient Dr. Aldrees on this unique opportunity for professional development.

Congratulations 2020-2021 Chief Residents

Christine Pesoli, M.D., Anatomic Pathology Chief Resident, originally from New Jersey, worked as a Pathologists' Assistant from 2006-2013 before attending medical school. She graduated from St. George's University School of Medicine in Grenada. She has presented at the American Society for Apheresis (ASFA) 40th Annual Meeting in May 2019 and the College of American Pathologists (CAP) in September 2019. She is also a CAP Resident Delegate for 2020 and who presented at USCAP in February 2020. She currently serves on the GME Wellness Subcommittee, the Residency Program Evaluation Committee, and is the Pathology resident representative for the ACGME CLER site visit.

Pesoli is active in teaching medical students and in residency recruitment. She enjoys cooking, the Atlanta Falcons, and community fundraisers in her free time.

Benjamin Daggett, M.D., Clinical Pathology Chief Resident, originally from North Carolina, graduated from Trinity School of Medicine in Saint Vincent and the Grenadines. He served as President and biochemistry tutor for the American Medical Student Association Chapter and he currently serves on the Residency Program Evaluation Committee.

Daggett is also active in teaching medical students and in residency recruitment. His hobbies include rock climbing, glass blowing, and blacksmithing.

Many thanks to our outgoing Chiefs, Dr. Adam Jones and Dr. Danielle Fasciano who worked in tandem for a month with the incoming Chiefs until March 1, 2020.

Residency Program Leadership Changes

The Department of Pathology is pleased to announce some exciting changes to the leadership team for our Residency programs, directed by DR. JAMES "ROB" HACKNEY, associate professor, Neuropathology, since 2015.

DR. BRANDI MCCLESKEY, assistant professor, Forensics, took over as director of the program effective January 1, 2021.

DR. ANDREA KAHN, professor, Anatomic Pathology, a recent addition to our faculty, took over the role of associate director of Anatomic Pathology from DR. VIRGINIA "GINGER" DUNCAN, assistant professor, Anatomic Pathology, effective January 1, 2021. We are grateful to Dr. Duncan for a job very well done serving as AD of our AP residents.

DR. CHAD SINIARD, assistant professor, Laboratory Medicine, also recently joined our faculty and the role of associate director of Clinical Pathology, which he will continue.

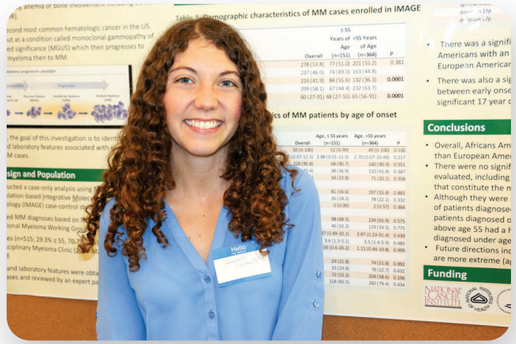
As always the directors, as well as all our residents, enjoy the support and dedication of Monica Henderson, Pathology Residency Training Program Coordinator.

Our residents are crucial part of our UAB Pathology family. This year, we created a recruitment video of our residents and leadership touring our many labs, offices and other shared spaces used throughout residency. View it on our website.


ABOVE:
Dr. James "Rob" Hackney
Dr. Brandi McCleskey
Dr. Andrea Kahn
Dr. Virginia "Ginger" Duncan
Dr. Chad Siniard

Medical Student Awarded a 2020 **AΩA Research Fellowship**

UAB medical student **HANNAH CUTSHALL** was awarded a 2020 AΩA Carolyn L. Kuckein Student Research Fellowship, designed to foster the development of the next generation of medical researchers. Cutshall conducts research in the laboratory of Elizabeth Brown, Ph.D., M.P.H., professor, Molecular & Cellular Pathology. Cutshall's award-winning proposal is titled, "Transcriptomatic Characterization of Multiple Myeloma." She received $5,000 to support her research project and up to $1,000 in travel reimbursement over a period of 1 to 2 years.



HANNAH CUTSHALL

Cutshall says the goal of her study will be to test the overarching hypothesis that distinct transcriptomic signatures correlate with the presence of multiple myeloma (MM), that transcriptomic differences by cell type will facilitate the delineation of mechanisms involved in cell-mediated disease, and similarities observed across cell types will advance blood-based biomarker discovery. The plan is to test this hypothesis by conducting whole transcriptome mRNA analysis in peripheral blood obtained from 50 treatment naïve MM cases and age-, sex-, ancestry-, geography-, and 50 healthy matched controls. It will then be compared to whole transcriptome mRNA analysis in CD138+ bone marrow plasma cells from 1,000 MM cases in the CoMMpass study, a publicly available national database.

Cutshall says she expects a significant limitation of published sequencing in MM is the inclusion of a diverse population of patients, including both African Americans and European Americans, who are not treated for their disease. This may distort transcriptome-disease relationships, meaning the extensive characterization of treatment-naïve MM cases and population-based controls and availability of comprehensive epidemiological, clinical and laboratory data will facilitate a robust evaluation and interpretation of the extent to which the transcriptome influences the presence of MM, while minimizing false discovery.

Current clinical practices are based on monitoring bone marrow plasma cell percentages and M-protein levels. These parameters are challenging because of low frequency of presentation in early disease and the technical challenge of diagnosing by a bone marrow biopsy when MM is spatially heterogeneous. Thus, discovering new blood-based biomarkers with improvements in positive predictive value offer a significant advantage in time, cost, feasibility and minimizing risk to the patient (i.e., non-invasive, high-throughput) over the current paradigm.

AΩA is the National Medical Honor Society. More than 4,000 students, residents/fellows, faculty, and alumni are elected each year. Since its founding in 1902, nearly 200,000 members have been elected to the society. Alpha Omega Alpha supports 13 fellowships, grants, programs, and awards for medical students and physicians at its 132 Chapters, and publishes a quarterly peer-reviewed, medical humanities journal The Pharos which contains articles on nontechnical medical subjects, including history, ethics, national issues, personal essays, and poetry.

Cutshall is one of 50 recipients of the award, selected from a national pool of applicants. ■

4 Faculty Selected as **2020 Argus Award Winners**

Students from the UAB School of Medicine honored their outstanding mentors, professors, courses and course directors at the Argus Awards Ceremony on October 27 during a live virtual ceremony. Among this year's winners were four Department of Pathology faculty members, and one former faculty member.

The Argus Awards, created in 1996, allow medical students to nominate faculty members by course evaluations and vote as winners in each category. Department winners of the 2020 Argus Awards are:

Pre-Clinical Awards

BEST INTRODUCTORY MODULE
Fundamentals of Medicine
Module director(s): Laura Fraser, Ph.D., Cell, Developmental & Integrative Biology; Block Leaders: Martin Young Ph.D., Medicine; Teresa Wilborn, PharmD, Ph.D., Pharmacology & Toxicology; **Peter Anderson, DVM, Ph.D., professor, Molecular & Cellular Pathology**; Rachel Lee, M.D., Medicine; Mukesh Patel, M.D., Medicine

BEST MS1 ORGAN MODULE
Cardiovascular
Module director(s): **Silvio Litovsky, M.D., professor, Anatomic Pathology**; Harish Doppalapudi, M.D., Medicine

BEST MS2 ORGAN MODULE
Neurosciences
Module director(s): Robin Lester, Ph.D., Neurobiology; Victor Sung, M.D., Neurology; Michael Lyerly, M.D., Neurology; Tobias Martinez, M.D., Psychiatry; **Kenneth Fallon, M.D., associate professor, Anatomic Pathology**; Teresa Wilborn, PharmD, Ph.D., Pharmacology & Toxicology; William Brooks, Ph.D., Cell, Developmental & Integrative Biology

BEST EDUCATOR: HEMATOLOGY/ONCOLOGY
Frida Rosenblum, M.D., assistant professor, Anatomic Pathology

BEST EDUCATOR: REPRODUCTIVE SYSTEMS
Jennifer Gordetsky, M.D., (now associate professor, Vanderbilt University)

Ponnazhagan Named Co-Director of Graduate Program P3

The Department of Pathology's **SELVARANGAN PONNAZHAGAN, PH.D.**, professor, Molecular & Cellular Pathology, has been named co-director of P3, a graduate program theme known as Pathobiology, Pharmacology, and Physiology. This is one of the eight themes of the UAB Graduate Biomedical Sciences (GBS) Doctoral Training Program. Ponnazhagan will serve alongside Robert C. van Waardenburg, Ph.D., associate professor, Department of Pharmacology and Toxicology.

The GBS is a common portal for PhD students in the UAB School of Medicine, designed to provide rigorous, interdisciplinary education and mentorship in a wide array of scientific disciplines. GBS trainees can perform doctoral research in more than 350 different labs across campus as well as at Southern Research and HudsonAlpha Institute for Biotechnology. The goal of the GBS program is to provide all participating students with the resources they need to cultivate excellence in their careers, irrespective of individual goals or aspirations. This is accomplished by taking advantage of the UAB community's exceptional research capacity, the commitment of faculty to excellence in mentorship, and modern, flexible methods for educating young professionals in advanced scientific topics.

The P3 theme in particular, provides graduate students the broadest training within the emerging and exciting field of molecular medicine. The educational program is flexible, didactic, integrated, and directed by faculty with diverse research interests ranging from molecules to whole organisms and disease processes to new therapies. The P3 theme consists of over 120 faculty from various departments of UAB and approximately 35 students in different stages of their doctoral studies.

From Trainee to Faculty
in UAB Pathology

In the Department of Pathology, we are fortunate to have several faculty members who worked as trainees at UAB at one point or another in their academic careers. Follow along with a few of them as they describe when they first came to UAB, and how they wound up as full-time faculty on our team. Their stories are varied, and we are thrilled to count them all as colleagues.

CLOCKWISE STARTING FRONT LEFT: Zheng Ping (class of 2017), Professor Shi Wei, Ruby Ma (2016), Jennifer Gordetsky, Assistant Professors Ginger Duncan (2017) and BRANDI MCCLESKEY (2016), Ren (2014), Dejun Shen.

DIANA MORLOTE
Assistant professor, Genomic Diagnostics and Bioinformatics

When did you come to UAB?

In July 2017 I became a Molecular Genetic Pathology Fellow and in July 2018 I started my Hematopathology fellowship. I've been an attending since July 2019.

HAD YOU EVER BEEN TO BIRMINGHAM AND/OR ALABAMA PRIOR TO COMING?

No. I relocated to Birmingham to train at UAB.

WHAT IMPRESSIONS DID YOU HAVE OF UAB BEFORE COMING (IF ANY)?

I did not know much about UAB, other than (former faculty member) Dr. Deniz Peker, who had trained in my residency program in Miami and was a Hematopathology attending. She always said UAB had great opportunities for trainees due to the diversity of specimens.

WHAT MADE YOU DECIDE TO COME TO THE DEPARTMENT?

When I interviewed for the Molecular Genetic Pathology fellowship I immediately felt at home. Everyone was so welcoming and attentive. The collegial atmosphere was a big draw for me. UAB's support faculty is one of the most helpful I have encountered.

I decided to stay as an attending because of the quality of the cases, which are always intellectually stimulating, and the opportunities to have great and very approachable mentors.

HOW HAS UAB CHANGED SINCE YOU STARTED HERE?

The molecular lab has been expanding at a rapid pace, which is very exciting.

WHAT DO YOU LIKE MOST ABOUT WORKING IN THE DEPARTMENT?

The collegial atmosphere and support from my peers and mentors.

WHAT WOULD YOU TELL OTHERS ABOUT WORKING AT UAB, IN THE DEPARTMENT OF PATHOLOGY?

It's a fantastic place to jump start your academic career and grow it to the fullest.

CHAD SINIARD, M.D.
Assistant professor, Laboratory Medicine

WHEN DID YOU COME TO UAB?

I first came to UAB in 2010 to attend the blood bank lectures as part of my residency training at Baptist Health. In July of 2015, I began my Transfusion Medicine Fellowship with Dr. Marques. I trained at Baptist Health for my AP/CP residency here in town.

I knew that UAB Pathology was very strong after attending the blood bank lectures as a resident. It was this experience that got me interested in Transfusion Medicine to begin with.

WHAT MADE YOU DECIDE TO COME TO THE DEPARTMENT?

I've always considered UAB home since completing my training here. The transfusion medicine training is very strong at UAB, and I wanted to be a part of that as faculty. After finishing my fellowship training, I took a job at UNC Chapel Hill. I did have plans to return!

I came back in March of 2020. (former division director) Dr. X. Long Zheng sent me an email asking if we could chat on the phone about the possibility of me coming back to UAB. Not long after that phone call, I was invited for an interview. I was very excited about the opportunity to come back!

HOW HAS UAB CHANGED SINCE YOU STARTED HERE?

Since I started right before the pandemic began, there have been lots of masks and social distancing. Otherwise, we are business as usual on the Transfusion Medicine and Apheresis services.

WHAT DO YOU LIKE MOST ABOUT WORKING IN THE DEPARTMENT?

My mentors and colleagues. I feel like I have so much support and interest from others in building my career.

WHAT WOULD YOU TELL OTHERS ABOUT WORKING AT UAB, IN THE DEPARTMENT OF PATHOLOGY?

That if you want to succeed and grow from a career perspective, it's definitely possible here in this Department. I've only been here for 8 months, and the opportunities for growth and leadership have been amazing. You just have to work hard!

ERIN EUN-YOUNG AHN
Associate professor in the Division of Molecular & Cellular Pathology

WHEN DID YOU COME TO UAB? (AND IF NOT TO PATHOLOGY—WHEN PATHOLOGY)?

When I came to UAB, the Pathology Department had its own Ph.D. program called the Molecular Cellular Pathology Graduate Program. I entered the program as graduate student in Fall 1998.

I came to Birmingham on the last day of 1997 after completing my undergraduate study as well as graduate study for my Master's degree in South Korea. That was my first time traveling to the US, and Birmingham was the first place I lived in within the US.

WHAT MADE YOU DECIDE TO COME TO THE DEPARTMENT?

When I applied, Dr. Tom Lincoln was the director of the Molecular & Cellular Pathology Graduate Program. When I had an interview with Dr. Lincoln, he was very nice, humorous and enthusiastic, which made me feel comfortable and excited. The program was also small (less than 10 new students per year), and I liked the small, family-like group. So, when I got an offer, I said, "Definitely, yes!"

WHEN YOU LEFT, WHERE DID YOU GO, AND DID YOU PLAN ON RETURNING?

After completing my Ph.D. study under my mentor Dr. Jay McDonald [former department chair], I left UAB in November 2003 and moved to San Diego, California, for my postdoctoral training at UC San Diego. I remember it was raining on my last day at UAB, and I was crying a lot on that day looking at the rain and thinking that this would be the last moment at UAB in my life!

WHEN DID YOU RETURN, AND WHY?

I came back to the Division of Molecular & Cellular Pathology as an associate professor in February this year (2020). After my postdoctoral training, I became a faculty member at the University of South Alabama and visited UAB and Birmingham a few times. Whenever I visited, I felt like I was coming back home and wanted to return. Also, I was amazed by how much UAB research had grown since I left.

HOW HAS UAB CHANGED SINCE YOU STARTED HERE?

When I was a graduate student, there were so many empty clearings around campus. When I left UAB in 2003, they were digging the ground to build the Shelby building. I returned to find that the campus had expanded so much, and I almost got lost when walking through the bridgeways connecting the new buildings. When I was a student here, I didn't have many options for lunch besides McDonald's, Burger King and Wendy's, and I think I ate Wendy's burger and baked potato at least three times per week. Now, it is wonderful to have so many nice places to go and to eat on campus!

MARISA MARQUES, AS A RESIDENT IN FORENSICS WITH DR. GREG DAVIS IN 1997.

WHAT DO YOU LIKE MOST ABOUT WORKING IN THE DEPARTMENT?

The faculty and staff members in our department are very supportive, understanding and cooperative. Also, our department has a nice blend of basic, translational and clinical research covering many different research areas, so

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I can keep educating myself by learning from my colleagues.

WHAT WOULD YOU TELL OTHERS ABOUT WORKING AT UAB, IN THE DEPARTMENT OF PATHOLOGY?

It is a pleasure working with people filled with passion, vision and genuine care for others!

When I was a graduate student working at LHRB, I had a little white toy dog on my lab desk. I brought it to San Diego and kept it on my lab desk during all the years of my postdoctoral training. The toy dog moved to South Alabama in 2012, finally returned back to UAB with me this year, and now it is in my office at WTI!

Another thing I liked: I was surprised to find out that my old Blazer ID was still alive and I didn't have to make a new one when I came back!

DR. CHAD SINIARD WITH DR. SHUKO HARADA AT HIS GRADUATION FROM A FELLOWSHIP IN MOLECULAR PATHOLOGY AND TRANSFUSION MEDICINE.

BRANDI MCCLESKEY, M.D.

Assistant professor, Division of Forensics

WHEN DID YOU COME TO UAB? (AND IF NOT TO PATHOLOGY—WHEN PATHOLOGY)?

2012: AP/CP Residency. Being from the south (Memphis area), I'd driven through Birmingham many times, but never had a reason to spend time here before residency. My husband is from north Alabama so he had familiarity with Birmingham and family still in north Alabama.

WHAT IMPRESSIONS DID YOU HAVE OF UAB BEFORE COMING (IF ANY)?

Based on my inquiry regarding programs for residency, the overarching theme of UAB Pathology seemed to be its successful track record of training phenomenal pathologists. That sounded like something I'd like to be a part of.

WHAT MADE YOU DECIDE TO COME TO THE DEPARTMENT?

I thankfully matched here for residency. The collegial department was what initially drew me here and I'm happy to say that feeling still exists (and why I continue to stay here)

HOW HAS UAB CHANGED SINCE YOU STARTED HERE?

The success of UAB has just continued to grow. Our department is no exception, and seeing the influx of "transplants" from all over the nation (and world) become a part of our department and our culture has been exciting.

WHAT DO YOU LIKE MOST ABOUT WORKING IN THE DEPARTMENT?

I feel like I grew up here (in a professional sense) and it could have been difficult to transition from trainee to colleague. That hasn't been the case. I feel like I entered a new family in 2012 and even though my roles have changed during my time here, I'm very much supported and respected by the members of this department.

WHAT WOULD YOU TELL OTHERS ABOUT WORKING AT UAB, IN THE DEPARTMENT OF PATHOLOGY

The shared vision that we all have for this department and the success we all share as it continues to achieve goals is electrifying. Our culture is one of collaboration, collegiality, and passion. I believe it's infectious once you get here, and it's exciting to see how our patients continue to benefit from the dedication of this Department.

MARISA MARQUES, M.D.

Professor of Pathology, interim division director, Laboratory Medicine

WHEN DID YOU COME TO UAB? (AND IF NOT TO PATHOLOGY—WHEN PATHOLOGY)?

In January of 1994 to start my AP/CP residency. I had come the first time in October of 1992 to accompany my husband, who was interviewing for a job.

WHAT IMPRESSIONS DID YOU HAVE OF UAB BEFORE COMING (IF ANY)?

Since I did research in Group B Streptococcus at Harvard and there was a group at UAB (under Dr. David Briles) working on the same subject, I knew of UAB through that research in Microbiology.

WHAT MADE YOU DECIDE TO COME TO THE DEPARTMENT?

My family moved here because of my husband's J1 visa. He needed to work in an underserved area for 2 years in order to receive the

CONTINUED ON NEXT PAGE

2020-2021
Welcome Incoming Fellows & Residents

INCOMING FELLOWS TO UAB PATHOLOGY
as of July 1, 2020

Bo Chen, M.D., Ph.D. — Surgical Pathology
Shoujun Chen, M.D., Ph.D. — Breast/GYN Pathology
Danielle Fasciano, D.O. — Dermatopathology
Richard Godby, M.D. — Transfusion Medicine
Mehenaz Hanbazazh, M.D. — Molecular Genetic Pathology
Jeffery Jones, M.D. — Hematopathology
Niraja Korremla, M.D. — Cytopathology
Haider Mejbel, M.D. — Surgical Pathology
Aysha Mubeen, M.D. — GYN/GU Pathology
Laura Oscar, M.D. — Surgical Pathology
Morad Qarmali, M.D. — Cytopathology
Benjamin Saylor, M.D. — Hematopathology
Sophia Sher, M.D. — GI Pathology

INCOMING RESIDENTS
ANATOMIC & CLINICAL PATHOLOGY

David Brown, M.D. — graduate,
University of Alabama School of Medicine
Jeffrey Chang, M.D. — graduate,
St. George's University School of Medicine
Igor Damasceno Vidal, M.D. — graduate,
Universidade Federal do Ceara Faculdade de Medicina Fortaleza
Kesley Green, M.D. — graduate,
Howard University College of Medicine
Jacob Havens, D.O. — graduate,
Rowan University School of Osteopathic Medicine
Steven Lamens Mari, D.O. — graduate,
Pacific Northwest University of Health Sciences College of Osteopathic Medicine

2020-2021 INCOMING FELLOWS

2020-2021 CHIEF RESIDENTS

Christine Pesoli, M.D. — AP chief resident
Ben Daggett, M.D. — CP chief resident

Thank you **J. Adam Jones, M.D.,** and **Danielle Fasciano, D.O.**, for your service as chiefs for 2019-2020.

Green Card. I had decided to start a residency since after finishing Medicine in Brazil, I had spent 7 years as a research fellow at NIH and Harvard Medical School. UAB gave me the opportunity to train in Pathology, which was I had decided my new specialty would be.

HOW HAS UAB CHANGED SINCE YOU STARTED HERE?

There are many more buildings, both in the hospital and the campus, as well as green areas and modern architecture. I remember when the Alys Stephens Center opened and became the home of the Alabama Symphony Orchestra.

WHAT DO YOU LIKE MOST ABOUT WORKING IN THE DEPARTMENT?

The camaraderie among everyone, including the staff in the offices and in the laboratories.

WHAT WOULD YOU TELL OTHERS ABOUT WORKING AT UAB, IN THE DEPARTMENT OF PATHOLOGY?

I would say that it allows you to be the best you can be as long as you put forth the effort to achieve your goals. There is ample collaboration and mentorship to help anyone who needs it. All you need to do is ask and you will find the right person(s) to help guide you.

While we came to UAB because of my husband's visa needs and we could have left after two years, we found it to be the right place to raise our two sons. It has been 27 years since we moved here, which is more than we lived anywhere, including our native country. Although our sons left Alabama for college in NYC, they love to return home to Birmingham. Now that they are in California, they miss the beautiful seasons, especially the fall colors which are gorgeous here.

5 Faculty Promotions and Tenures

The Department of Pathology is honored to announce the promotion and tenure of five of our esteemed faculty colleagues, effective October 1, 2020.

Shuko Harada, M.D.

PROMOTION TO PROFESSOR WITH AWARD OF TENURE

Genomic Diagnostics & Bioinformatics

Dr. Harada is the Section Head of the Molecular Diagnostics Section and former interim director of the Division of Genomic Diagnostics & Bioinformatics. She has particular interests in precision medicine in oncology and pharmacogenomics, and is a member of the Precision Medicine Institute and the O'Neal Comprehensive Cancer Center.

Sooryanarayana Varambally, Ph.D.

PROMOTION TO PROFESSOR

Molecular & Cellular Pathology

Dr. Varambally's research focus is on understanding the molecular basis of cancer using integrative genomic, epigenetic and proteomic approach. He is a scientist with the O'Neal Comprehensive Cancer Center. He is a cofounder of the UALCAN integrated data-mining platform for cancer data.

Douglas Hurst, Ph.D.

PROMOTION TO ASSOCIATE PROFESSOR

Molecular & Cellular Pathology

Dr. Hurst is a cancer researcher and associate scientist with the O'Neal Comprehensive Cancer Center and the Center for Clinical and Translational Science (CCTS). He was recently awarded a Breast Cancer Research Foundation grant for the research project, "RANK Signaling Pathways in Breast Cancer Development" with co-PI Xu Feng, Ph.D.

Huma Fatima, MBB

AWARD OF TENURE

Associate professor, Anatomic Pathology

Dr. Huma Fatima is Section Head for Renal (Kidney) in Anatomic Pathology. She joined the Department of Pathology at the University of Alabama at Birmingham in 2011, following being certified by the Anatomic Board of Pathology, Inc. In Anatomic Pathology and Clinical Pathology with added qualification in Cytopathology.

Adam Wende, Ph.D.

AWARD OF TENURE

Associate professor, Molecular & Cellular Pathology

Dr. Wende is a researcher and Scientist with the O'Neal Comprehensive Cancer Center, Center for AIDS Research, and Minority Health & Research Center; and associate scientist with the Comprehensive Diabetes Center, Center for Exercise Medicine, and Comprehensive Cardiovascular Center. Since 2000, Dr. Wende has explored the regulation of metabolism and mitochondrial function with a specific focus on glucose utilization in heart and muscle. He and Dr. John Chatham recently secured an R21 award to study how O-GlcNAc regulates function of a healthy heart.

Congratulations to our colleagues on their hard work and dedication to the UAB Department of Pathology.

3 Professors **Earn Emeritus Status in 2020**

William Grizzle, M.D., Ph.D., Anatomic Pathology, was named professor emeritus of pathology in the School of Medicine. Grizzle joined the UAB faculty in 1981 and retired in January 2020 as professor of pathology and surgery. He directed the Tissue Collection and Banking Facility from 1983 to 2019, including the Southern Division of the Cooperative Human Tissue Network from 1987 to 2019, and led the UAB-VA Autopsy Service from 1990-2000, among other leadership positions. His research focused on understanding the molecular features of epithelial cancers such as prostate, pancreas, mammary, colorectal and ovarian adenocarcinomas and oral, esophageal, lung, cervical and skin squamous cell lesions to identify biomarkers associated either with early pre-invasive neoplastic lesions or with advanced stage malignant lesions.

Ona Faye-Petersen, M.D., Anatomic Pathology, began as a full-time practicing pediatric pathologist in 1987 and has been an asset to UAB's Department of Pathology since then. She retired from teaching in the spring of 2019, but continues to keep clinical hours at UAB Hospital.

In the summer of 2019, she established the Ona M. Faye-Petersen, M.D., Educational Support Fund in support of the Pathology residency and fellowship trainees to provide them opportunities to attend high quality, multidisciplinary conferences in which pathology plays an important role.

Robert Hardy, Ph.D., Laboratory Medicine, retired July 1, 2020, after 30 years in the UAB Department of Pathology. He worked the entirety of his pathology career at UAB—first joining as a postdoctoral fellow with his mentor and former department chair Jay M. McDonald, when he moved to Birmingham. He served as section head of Clinical Chemistry and laboratory director, Core Chemistry for UAB Hospital since 2004. He also worked for a year and a half as interim director of the UAB Hospital Immunology Lab. Dr. Hardy is Senior Associate Editor for the journal Laboratory Investigation since 2008, and has served as ad hoc reviewer for dozens of journals on pathology and other medical disciplines throughout his career.

WILLIAM GRIZZLE. M.D., PH.D.

ONA FAYE-PETERSEN, M.D.

ROBERT HARDY, PH.D.

Alexander Elected to **AΩA Emeritus Board**

C. BRUCE ALEXANDER, M.D., professor emeritus, Anatomic Pathology, has been elected to the Alpha Omega Alpha National Honor Society Emeritus Board of Directors.

Dr. Alexander joined UAB Pathology in 1979 and became a professor in 1989. He was Vice Chair of the Residency Program from 1990 until his retirement in 2016, and section head, Autopsy Pathology from 2000 to 2015. He served as President for the Academy of Clinical Laboratory Physicians and Scientists in 2008, and of the American Society of Clinical Pathologists in 2011.

In 2012, Dr. Alexander was elected president of the Alpha Omega Alpha National Honor Society at the Annual Meeting of the AOA Board of Directors, making him the first ever pathologist to serve in the role.

AΩA was founded in 1902 as an organization dedicated to honoring academic achievement, professionalism and exceptional teaching in the field of medicine. A member of AΩA espouses the commitment to leadership, scholarship, professionalism and service in the medical field. There are currently 132 chapters in medical schools in the United States, and more than 200,000 members have been elected since the society's founding. About 4,000 students, alumni, house staff, and faculty are elected each year. AΩA is a leading advocate for scholarly attainment and moral purpose in medicine.

Laufer Receives William Boyd Medal

VINCENT LAUFER, M.D., PH.D

UAB medical student **Vincent Laufer, M.D., Ph.D.**, was awarded the William Boyd Medal at the University of Alabama School of Medicine Dean's Awards Zoom ceremony earlier this month. The Boyd Medal is given every year to the UAB medical student whose performance in all aspects of their pathology education has been most outstanding.

Dr. Laufer was a member of the Medical Scientist Training Program (M.D.-Ph.D.) at UAB. The subject of his dissertation research was the genetic basis of Rheumatoid Arthritis in global populations, work he conducted in conjunction with Dr. S. Louis Bridges, Jr., director of the Division of Clinical Immunology and Rheumatology. Laufer also collaborated with the Division of Genomic Diagnostics and Bioinformatics in the UAB Department of Pathology. Vincent has accepted a position in the Pathology Residency Program in the Department of Pathology at the University of Michigan.

The Boyd Medal has been awarded continuously since 1967 and is given on behalf of the Alabama Association of Pathologists and the faculty of the UAB Department of Pathology to the graduating medical student whose performance in Pathology throughout their medical school career has been most exemplary. This award was named in honor of Dr. William Boyd who came to UAB as a visiting professor from 1955 to 1962.

DR. BOYD IS CONSIDERED by many to be one of the fathers of modern pathology education. He was born in Scotland in 1885 and obtained his medical degree in 1908 at Edinburgh. He was a medical officer in the First World War and published his first book, With a Field Ambulance at Ypres in 1916, about his war experience. After the war he moved to University of Manitoba in Canada where he rose to the rank of professor of pathology. During his career Dr. Boyd published seven textbooks, one of which was the first pathology text to emphasize pathophsyiology and pathogenesis. This book was used worldwide as the primary pathology text for health professional students. Boyd was an excellent author noted for his clear prose, and also an excellent speaker who was often in high demand. One publisher once referred to Dr. Boyd as, "The pathologist with a silver tongue and a golden pen."

The Alabama Association of Pathologists and the faculty of the UAB Department of Pathology congratulate Dr. Laufer on winning the 2020 Boyd Medal.

Siegal Named to Inaugural Class of Sigma Xi Fellows

Gene Siegal, M.D., Ph.D., Robert. W. Mowry Endowed professor, Anatomic Pathology, and Interim Chair, UAB Department of Genetics, was recently sworn in as a member of the inaugural class of fellows, Sigma Xi, "for distguished contributions as a physician scientist and for exemplary scholarship as a teacher, mentor, author, reviewer and editor, and as a leader in academic medicine."

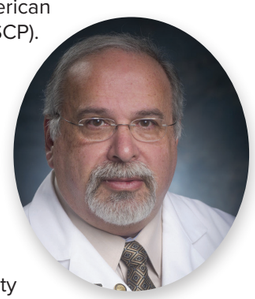
"With the challenges facing science in general and Sigma Xi, in particular, it became clear to me that it is once again time to come forward to support this eminent society which was so important to my own success and sense of self worth and assure its stabilization and growth into this next century," Siegal says.

Sigma Xi, a national scientific research honor society, announced the cohort's inductees in August, and Siegal was sworn in during their annual meeting the first week of November.

The Fellow of Sigma Xi distinction is awarded on a competitive basis to members who have been recognized by their peers. Fellows must be an active, full member for the last 10 years continuously, or a life member, with distinguished service to Sigma Xi and outstanding contributions to the scientific enterprise.

On their website, Sigma Xi detailed Dr. Siegal's distinguished career as an educator and leader:

> Dr. Siegal is an experimental and diagnostic pathologist whose research interest, for over four decades, has been focused on cancer biology. His clinical research interests have centered on studies of bone tumors and related conditions, a field in which he is a recognized world authority.
>
> Among multiple honor societies, Siegal is a Fellow of the Royal Society of Medicine, London and Phi Beta Delta, Honor Society for International Scholars. He has just completed a six-year term on the Mayo Clinic Alumni Association Board of Directors and currently serves on the Omicron Delta Kappa National Leadership Honor Society and Educational Foundation Board of Trustees. He has published more than 700 peer-reviewed manuscripts, book chapters, abstracts and other professional writings, along with nine books. He is the current editor-in-chief of Laboratory Investigation and is the 2019–2020 president of the American Society for Clinical Pathology (ASCP).
>
> Siegal completed medical school at the University of Louisville, in Louisville, Kentucky, his residency at the Mayo Clinic Graduate School of Medicine, Rochester, Minnesota, and a PhD at the University of Minnesota in Minneapolis. He completed fellowships at Mayo, the University of Minnesota, and at the National Cancer Institute, the National Institutes of Health, in Bethesda, Maryland.
>
> He has been a member of Sigma Xi for more than four decades, having been elected to membership as a young graduate student. He remained active on the local level while in Minnesota and Maryland but made a commitment to simultaneously "pay it forward" and "give back" when he joined the University of North Carolina at Chapel Hill faculty, eventually serving as the president of the chapter and helped the Society-wide organization transfer its corporate headquarters to Research Triangle Park, North Carolina, from New England. Eventually, he moved to UAB and returned to his previous role as a minor player. In 2018, he was appointed to the Ad Hoc Committee on Professional Development and was elected to Sigma Xi's Committee on Finances for a three-year term, for which he currently serves.



Gene Siegal, M.D., Ph.D.

Litovsky and Eltoum

2020 SOM Dean's Excellence Award Winners

The Dean's Excellence Awards are annual honors awarded to select UAB School of Medicine faculty for excellence in the areas of teaching, service, research, mentorship, and diversity enhancement. Awardees are chosen through a peer-review process and faciliated by a member of the dean's leadership team.

This year, the school recognized 16 faculty for their outstanding achievements, including Pathology's Silvio H. Litovsky, M.D., professor, Anatomic Pathology, and Isam Eltoum, M.D., M.B.A., professor, Anatomic Pathology, and Vice Chair, Quality and Patient Safety.

Silvio Litovsky, M.D.

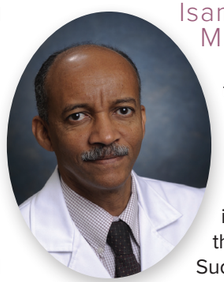
Dr. Litovsky is awarded the senior faculty Dean's Excellence in Teaching Award. He is an educator as well as a cardiovascular pathologist who has had an achievement-filled career since its start.

Litovsky earned his M.D. from the University of Buenos Aires Medical School, Argentina, in 1977. He received his board certification from the American Board of Pathology, Anatomic and Clinical Pathology, in 1995 and is licensed in six states.

Litovsky joined UAB in 2004 and taught the Cardiovascular Pathology Course in UAB Medical School until the MS-1 Organ Module was instituted in 2007. Since that time, he has served as the cardiovascular module director. Each year, his module has been nominated for the Argus Award for a total of 21 nominations and 18 awards. His achievements in teaching have been recognized with the President's Award for Excellence in Teaching in 2014.

He taught the graduate school course, "Biology of Disease," and gives four lectures each year on the histology and pathology of heart disease. He has led Cardiovascular Laboratory Demonstrations at the Children's Hospital of Alabama every other month since 2017 and also became the Alpha Omega Honor Medical Society UAB Councilor in 2015. Litovsky has acted as an advisor to the Medical Spanish interest group since 2014; an advisor to the Pathology interest group since 2018; and a department liaison with the Office of Diversity and Inclusion since 2015. As CAP Alabama State Commissioner and Inspector, when inspecting a laboratory, Litovsky and his group teach and advise on best pathology and laboratory practices.

He is a standout teacher in the department's Autopsy Section, signing out every explanted heart with the residents. Students and residents often praise him as an instructor who will go to great lengths to explain a concept until it is clearly understood. By his own account, he gets great joy from seeing students and residents learn.



Isam Eltoum, M.D., M.B.A

Dr. Eltoum is awarded the senior faculty 2020 Dean's Excellence Award in Service. A native of Sudan, he earned his MBBS (1983) and a Master of Science in Pathology (1990) from the University of Khartoum, Sudan. After three years as a research fellow at the National Institute of Allergy and Infectious Diseases (NIAID) Laboratory of Parasitic Diseases, he completed a pathology residency at George Washington University (1996) and two fellowships at UAB, in Cytopathology and Surgical Pathology. He joined the UAB Department of Pathology as an assistant professor in 1998.

Eltoum is board certified in Anatomic Pathology and in Cytopathology and has been head of the UAB Cytopathology Section since 2001. This section serves most clinical departments at UAB Medicine. He brought this section to prominence when the American Society of Cytopathology nominated UAB Cytology as a Center of Excellence in 2004-2006.

CONTINUED ON NEXT PAGE

Maynard Named **a 2020 Pittman Scholar**

The Department of Pathology's CRAIG MAYNARD, PH.D., assistant professor, Molecular & Cellular Pathology, was named one of UAB's 2020 Pittman Scholars for his research accomplishments. Dr. Maynard's current lab research is primarily focused on three areas: the role of T cell co-stimulation in promoting regulatory T cell (Treg cell) stability during chronic intestinal inflammation, the role of anti-commensal antibodies in the establishment and maintenance of host-microbiota mutualism, and, lastly, the potential impact of early life stress (ELS) on susceptibility to, and chronicity of, inflammatory bowel disease (IBD). Maynard's overall research seeks to better understand the etiology of IBD toward developing novel therapeutic options.

Along with Dr. Maynard, five other UAB School of Medicine faculty members were named the 2020 class of James A. Pittman Jr., M.D., Scholars. This program recognizes the impact of junior faculty and supports the recruitment and retention of highly competitive scientists and physician-scientists.

The Pittman Scholars, named for the late James A. Pittman, M.D., longtime dean of the School of Medicine from 1973 to 1992, are nominated by their department chairs based on their research achievements and their potential for continued discovery in the basic or clinical sciences. Pittman is considered a principal architect of the School for his ability to recruit top scientists and physicians to UAB.

Pittman Scholars are selected each academic year. The selected class of scholars each receive $12,500 per year for five years to support the faculty member's research-related activities or scholarly enrichment.

In 2002, Eltoum earned his MBA from UAB. He has excelled as a physician-scientist and diagnostic pathologist, and was promoted to professor in 2006. He serves as the vice chair for Quality and Patient Safety for the department.

Eltoum spends most of his time on the diagnostic service in both Cytology and Surgical Pathology. Beyond his role as vice chair for Quality and Patient Safety, where he is responsible for a variety of patient safety, risk reduction/mitigation, and regulatory management tasks, he also serves as Quality Officer and co-chair of the Quality and Utilization Committee. He has serves as a member of the Dean's Council and Health Information Management and was involved with various quality and patient safety committees. Over the course of his career, he has served as a member of NIH study sections, pathology trade organization committees or editorial boards.

In addition to his clinical work, Eltoum is well-published and has mentored junior faculty and several pathology residents; trained more than 30 fellows when he was the cytopathology program director; and has served as a thesis advisor for Ph.D. students.

Please join us in congratulating Drs. Litovsky and Eltoum on the recognition of their outstanding contributions to the Department of Pathology and School of Medicine.

Leal Receives **CCTS Pilot Program Award & SOM Research Award**

On The Department of Pathology's Sixto M. Leal, M.D., Ph.D., assistant professor, Division of Laboratory Medicine, received a 2020 CCTS Interdisciplinary Network Pilot Award of $60,000 from the Center for Clinical and Translational Science (CCTS) and the UAB Department of Pathology. Dr. Leal received the award after submitting his innovative proposal titled, "Development of a novel diagnostic test that can distinguish active infection with clostridium difficile from colonization."

Following is a lay abstract from the pilot grant proposal:

Sixto Leal, M.D., Ph.D.

Clostridiodes (Clostridium) difficile is a bacteria that can form dormant spores and persist in the intestinal tract indefinitely without causing disease. It can also become metabolically active and initiate a spectrum of diarrheal illness culminating in severe infection and death. High colonization rates in hospitalized patients (15-50%) renders the distinction between colonization and active infection particularly important and uniquely difficult. Currently available protein-based tests miss up to 40% of infected patients. In contrast, molecular tests targeting toxin DNA genes do not discriminate between dormant spores and active infection, resulting in high false positive rates, leading to the unnecessary treatment of colonized patients and failure to detect and treat the true cause of disease (ex. inflammatory bowel disease, other bacteria/viruses). We have developed a novel diagnostic test that combines the positive attributes of current methods into a single assay with significant potential to distinguish colonization from active infection better than current methods. In this proposal, we seek to optimize this novel assay (AIM 1) and evaluate its potential to promote more accurate diagnosis of patients with active C. difficile infection (AIM 2.) The proposed studies have significant potential to revolutionize C. difficile diagnostics and ameliorate patient morbidity and mortality associated with false positive test results. The collaborations, samples, data, and skill sets supported in this proposal will position our lab well to compete for external funds seeking to commercialize this assay, evaluate its clinical utility in particularly vulnerable populations (cystic fibrosis, inflammatory bowel disease), and thoroughly characterize host and microbial factors regulating colonization and active infection.

In April, Leal was awarded a grant from the School of Medicine to support research into COVID19 testing. Leal has been working since the outset of the pandemic to convert his labs into a COVID19 testing location.

Leal's proposal was titled, "Optimization of SARS-CoV-2 Diagnostic Testing Throughput and Prognostic Significance." It seeks to optimize the current assay to increase test capacity fourfold and include the detection of other viruses, such as flu and RSV on the differential diagnosis to speed the time to an accurate diagnosis for our patients and limit the need for unnecessary testing with expensive viral respiratory panels.

The second portion of this SOM COVID-19 grant proposal is a collaboration with Drs. Mike Crowley and Elliot Lefkowitz, to sequence all of the RNA in diagnostic samples and determine their prognostic significance, so as to modify the test and be able on initial diagnosis to not only detect the virus but provide information on whether that patient is likely to overcome infection or require more intensive care. For example, in addition to detecting the virus, the test would also detect key markers associated with the immune response that can help determine how well the patient would do.

This grant totals $50,000 with payments starting May 1. It supports the purchase of two pieces of equipment: Automated RNA extraction equipment that can process 48 samples at a time (~50,000), plus associated kits (~20,000) and a second RT-PCR instrument (~25,000).

Dr. Leal joined the Division of Laboratory Medicine in 2018 as an assistant professor, assistant director of Clinical Microbiology, and associate director of the UAB Mycoplasma Diagnostic Reference Laboratory. He completed his residency in clinical pathology at the University of North Carolina and his fellowship in microbiology at the Cleveland Clinic. He is board certified in clinical pathology and medical microbiology with a special interest in mycology, parasitology, mycoplasmology, and histopathologic identification of microorganisms. Leal serves on the CAP Clinical Pathology Education Committee and harbors a significant interest in medical education.

Pathology Employees Honored in Annual Service Awards

UAB Service Awards proudly honor those employees who have made a significant career commitment to the university. In March 2020, the program recognized and appreciated employees who had reached a five-year milestone of service to UAB by the end of 2019. UAB recognized 1,118 employees in the spring presentation. We appreciate our Department of Pathology recipients for their ongoing dedication to the continuing success of the University's mission and vision.

5 YEARS

Dr. Prachi Bajpai
Anatomic Pathology

Brenda Dale
Anatomic Pathology

Dr. Frida Rosenblum Donath
Anatomic Pathology

Dr. Todd Stevens
Anatomic Pathology

Carlene Zindl
Anatomic Pathology

Dr. Daniel Atherton
Forensic Pathology

Dr. Daniel Dye
Forensic Pathology

Melanie Fecanin
Laboratory Medicine

Dr. Craig Maynard
Molecular & Cellular Pathology

Dr. Rajasekaran Namakkal Soorappan
Molecular & Cellular Pathology

Dr. Joo-Yeun Oh
Molecular & Cellular Pathology

Florenda Bryant
Pathology Finance

Dr. Samuel Borak
Comm Practice Pathology Pgm

Adrian Flannery
Genomic Diagnostics & Bioinformatics

10 YEARS

Adam Martin
Anatomic Pathology

Dr. Kenneth Fallon
Neuropathology

Dr. Douglas Hurst
Molecular & Cellular Pathology

15 YEARS

Dr. Silvio Litovsky
Anatomic Pathology

Dr. Yabing Chen
Molecular & Cellular Pathology

20 YEARS

Susan Kloda
Laboratory Medicine

Dr. Marisa Marques
Laboratory Medicine

Telisha Millender-Swain
Molecular & Cellular Pathology

Dr. Rakesh Patel
Molecular & Cellular Pathology

Dr. Selvarangan Ponnazhagan
Molecular & Cellular Pathology

Andrea Jarrett-Wilson
Pathology Finance

Israel Ponce-Rodriguez
Pathology Finance

Dr. Walter Bell
Comm Practice Pathology Pgm

25 YEARS

Henrietta Turner
Anatomic Pathology

Michelle Johnson
Molecular & Cellular Pathology

Dr. Joseph Messina
Molecular & Cellular Pathology

35 YEARS

Donna Crabb
Laboratory Medicine

Timothy Awtrey
Pathology Finance

Pathology Takes 2nd in **SOM Diversity Fair**

On January 31, 2020, the Department of Pathology tied for second place in the 4th annual Diversity Fair, hosted by the UAB School of Medicine Office for Diversity and Inclusion. Held in North Pavilion Atrium, the fair featured a live international band and cuisine from around the world, courtesy of the UAB School of Medicine departments. Each department hosted a table that represented its department's cultural diversity. Judges evaluated the presentations, and chose the winner based on the table's design and array of food.

The entire Pathology department was asked to participate and contribute to the table in an effort to capture diversity as a whole. **Monica Henderson**, Residency Training Program Coordinator and **Susan Mills**, Fellowship Program Coordinator, played on UAB's retired motto to devise our theme of "Diversity that will change your world."

Contributors

Dr. Silvio Litovsky — empanadas (Argentina)
Israel Ponce-Rodriguez — Inka Kola (Peruvian)
Heba Alsheikh — Basbousa (Egypt)
Dr. Shuko Harada — mini rice balls (Japan)
Monica Henderson — pancit (Philippines)
Dr. Marisa Marques — decor items (Brazil)
Sandy Cummings — dolls from China, Vietnam & Japan
Susan Mills — decorations, setup & serving
Lisa Smoot — original artwork

UAB SCHOOL OF MEDICINE
The University of Alabama at Birmingham

DEPARTMENT OF PATHOLOGY
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UAB Pathology Launches Virtual Tour

2020 being the unprecedented year that it was, we took our trainee recruitment online. This included hosting numerous Virtual Open Houses (ongoing) and the creation of a virtual tour video, highlighting our people and our programs. We launched a YouTube channel to showcase this and other videos about our department's efforts, including selected Grand Rounds lectures. In addition we started an Instagram account to accent our Twitter account, both found @UABPathology. Please visit us and learn more about who we are and the work we do every day here in beautiful Birmingham.

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