



# AESCULAPIAN

D a w g s ,  
A l o n e   T o g e t h e r





FROM THE DEAN

How things have changed since the previous issue of the Aesculapian! When last we spoke, accreditation was looming large in all our plans and was pretty much the only thing that worried us! Seems touchingly naïve now, as lives the world over have been turned upside down by COVID-19. But despite COVID's impact on our students, employees, and stakeholders, I want you to know that the College has continued its forward march to improve itself across all its missions.

But, before we consider the future, let's reflect on the site visit by our COE accreditors that occurred in February. The point of the site visit, which happens every seven years, is to verify we are doing what we say we are and are upholding the highest standards in veterinary education. Anticipation of this visit forced us to give our campus a hard look to determine if we were falling short in any of 11 standards and to address any problems we found. We also wanted our reviewers to leave campus impressed with our ability to provide a veterinary education second to none. I am pleased to say our hard work paid off with a very clean—even exceptional—site visit! We look forward to getting the COE's final ruling on our accreditation sometime later this year.

Shockingly, about a month after our site visit, COVID-19 reared its ugly spikes and changed everything. But, I want you to know that our people stepped up, relying on the same can-do spirit that lifted us past the accreditation site visit to do great things on behalf of those we serve.

Our hospital team, without our usual student help, rallied to continue to provide first-rate emergency animal care and follow-up services; our diagnostic laboratories continued to support their stakeholders all over the state without missing a beat; and our faculty pivoted to online education within days, ensuring that our students could continue their studies and the class of 2020 could graduate (albeit virtually). And, through it all, many of our researchers worked on understanding and defeating this new coronavirus.

Now we are engaged in expanding our clinical and diagnostic services and bringing our rising seniors back to campus so that they can begin to hone their clinical skills under the watchful gaze of our faculty. We are also getting ready for a new crop of VM1s, graduate students, and returning students, working hard to provide them the education they deserve while keeping them safe.

And we promise you, our friends and alumni, we will go at these tasks with great fervor, putting to good use every bit of knowledge we gained from our site visit prep and experience with COVID-19. For instance, we now know we can be nimble, flexible, and creative in dealing with whatever comes our way. So, we will use this knowledge to work every day to make you as proud of us as we are of our alumni!

You'll notice that flexibility in the delivery of your magazine this summer. We've shifted to electronic delivery for the time being for a variety of reasons. We'll keep you posted on when we'll return to a print version, but let us know if you like this new way of reading our news!

Stay safe, and we look forward to seeing you again soon!

  
Dean Lisa K. Nolan

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### CVM faculty member awarded high honors

**DR. PULIYUR MOHANKUMAR** was recently named as one of five Josiah Meigs Distinguished Teaching Professors for 2020 and was also a recipient of this year's UGA Creative Teaching Award. Being named a Meigs Professor is the highest honor for excellence in instruction offered by the University of Georgia.

Of all the sciences, anatomy can prove to be the most difficult topic to master for students. The human body is vast enough, but students at the College of Veterinary Medicine are asked to master the anatomy of many animals. Learning the locations and attachments of organs, bones, and muscles is difficult enough when studying your own body!

Dr. MohanKumar has worked for years to take the stress out of learning anatomy. "I strongly believe that students under stress don't learn well," he says. "What we have tried to do is de-emphasize memorization and minutiae and focus on how to apply what they have learned to clinical situations and conceptual scenarios." Through the development of a new learning program called Clinical Correlations, the creation of anatomy iBooks with the help of the Educational Resource Center (ERC) and Dr. James Moore, anatomy dissection videos, and virtual dissection skills, Dr. MohanKumar has truly changed the mood in the anatomy classroom, and it has earned him the praise of students and the University of Georgia.

The Clinical Correlations program emphasizes the use of anatomical knowledge to solve problems in a clinical setting. For these classes, Dr. MohanKumar seeks out clinical cases pertaining to the anatomy currently being studied in class with the help of clinicians at the VTH. Groups of 10-12 students will visit the clinic and put their new knowledge to use in examining the case alongside the clinician. The students create a presentation which is then shared with their other classmates.

Dr. MohanKumar has found that this method helps to cement this knowledge for students. What was otherwise a "sea of details" is now useful information for solving a problem. "They get to appreciate that in practice by discussing a clinical case with the clinicians," he explains. "Because of the fact that they have been able to apply the anatomical knowledge that they have learned to these cases, they remember it better and apply it better when they are in the clinics." And this method carries into tests and lectures as well. Rote memorization is not the goal of his courses.



DOROTHY KOZLOWSKI

Dr. MohanKumar explains his philosophy best: "Learning anatomy is like learning your ABCs. If you learn anatomy well, you will do well in all the other courses. You will use anatomy in so many ways, knowingly and unknowingly. It is useful for understanding pathology, to be a good surgeon, to be good at imaging, and much more. Some people say that it is 'as dry as a bone,' but to me it is fascinating. It is even more fascinating watching students learn the subject and seeing their faces light up when they understand a difficult concept. Many times, my light bulb goes on when I am explaining things to students and makes it a great learning experience for me."

Dr. MohanKumar continues to modernize his classroom for generations of students to come. He has developed over 200 dissection videos available for students at any time, and he hopes to begin offering virtual dissections to his students soon. He has received numerous awards, including the David Tyler Award for Innovations in Teaching, the Zoetis Distinguished Veterinary Teacher Award, and the A.M. Mills Award for Outstanding Contributions to Veterinary Medicine and several faculty recognition awards. He has served as the principal investigator or co-PI on \$10.4 million in grant funding from agencies including the National Institutes of Health, the National Science Foundation, and U.S. Department of Agriculture.



## Nikolay Filipov Named Sharma Distinguished Professor

**NIKOLAY FILIPOV** has been endowed with the College of Veterinary Medicine's Lalita and Raghubir Sharma Distinguished Professorship. This professorship, named for Dr. Raghubir Sharma and his wife, is presented to a professor focusing on innovative research in toxicology and engaged in teaching, research, public service, or a combination of these duties. Sharma was the Fred C. Davison Chair in Physiology and Pharmacology at UGA from 1995 until his retirement in 2006 and a trailblazer in the field of toxicology since 1969.

Filipov, a 1998 College of Veterinary Medicine graduate, met and worked closely with Sharma during his time as a student of the Interdisciplinary Toxicology Program (ITP) at UGA. Sharma held a seat on Filipov's PhD advisory committee and acted as the ITP's graduate coordinator, a position Filipov now holds. "There are many parallels between Dr. Sharma's work and my own," says Filipov. "A lot of my time as a doctoral student was spent researching in Dr. Sharma's lab. In fact, I still have a cell counter in the lab labeled 'SHARMA' in permanent ink."

Filipov describes Sharma as an excellent collaborator, often interacting with researchers from other departments and colleges to form the best possible teams for his research and create a positive experience for students. "He always sought to foster the interest students have, not lead them in any particular career direction post-graduation," explains Filipov. In his own research, Filipov must now do more of the same, often interacting with scientists in departments within the college, around the university, and in universities around the country. Filipov's current research projects include characterizing Gulf War Illness, exploring the effects of fescue toxicosis on beef cow productivity, and performing translational research on the effects specific toxicants have on the brain, immune system, and the way the two interact.

On receiving the professorship, Filipov beamed: "I am so honored to receive this endowment. I consider Dr. Sharma to be a valued colleague and friend, and I hope to wear the title and carry on the Sharma legacy well."



## ACCREDITATION SUCCESS

The College completed their accreditation site visit from AVMA's Council on Education before the pandemic started. The team visited in February, and the College received notification that it had passed in early March. The site visit was the culmination of nearly three years of preparation by the College. To celebrate, we brought the Varsity to the VTH for an accreditation celebration and lunch!



## Change in leadership at Athens Veterinary Diagnostic Lab



**AFTER 15 YEARS OF SERVICE**, Dr. Jeremiah (Jerry) Saliki retired from UGA in May. Dr. Saliki had been the director of the Athens Veterinary Diagnostic Laboratory (AVDL) since 2007 and at the University of Georgia as a professor of virology since 2005. He is a renowned virologist who, since 1984, has dedicated his professional life to serving the needs of people and animals through research, diagnostics, and public service.

As director of the AVDL, Saliki oversaw the steady growth and modernization of the lab while expanding the scope of its activities to include niche services such as laboratory animal and marine mammal diagnostics. He is a highly accomplished virologist with over 125 scientific publications and served 11 years as the editor-in-chief of the *Journal of Veterinary Diagnostic Investigation*, the official publication of the American Association of Veterinary Laboratory Diagnosticians (AAVLD). The AAVLD is the largest association dedicated to advancing the discipline of veterinary laboratory diagnostic medicine in the United States. His many awards and accolades include the Practitioner to Faculty award (Oklahoma Veterinary Medical Association, 1997), Pfizer award for research excellence (Oklahoma State University, 2003), Charles Dobbins award for excellence in service (UGA, 2010), distinguished service award (AAVLD, 2013), life membership award (AAVLD, 2014), and EP Pope Memorial award (AAVLD, 2015).

Dr. Saliki has continuously advocated for the needs of the laboratory and all its stakeholders, meeting with government officials at the state and national level, with a focus on positioning the laboratory to adequately fulfill its disease diagnostic and surveillance missions to the state and the nation. He has served on grant review panels for national and international funding agencies, including the NIH, DHS, USDA, National Pork Board, Wellcome Trust, Qatar National Research Foundation, and Volkswagen Foundation. Dr. Saliki and his family will be moving to Stillwater, Oklahoma, where he will serve as director of the Oklahoma Animal Disease Diagnostic Laboratory. He will be sorely missed, but we wish him well in his next endeavor. Dr. Keith Harris, professor emeritus, has been appointed interim director during the search for a permanent director.



Professor Corrie Brown was recently in Ethiopia, delivering a short course on veterinary pathology, and her colleagues took her to a national park famous for baboons.

## CVM TAs honored for contributions to learning

**THE UGA CENTER FOR TEACHING AND LEARNING** recognizes graduate students annually for their significant contributions to instruction at the university. This year, three College of Veterinary Medicine teaching assistants were recognized.

Ahmed Hikal and Madelyn Krunkosky were awarded the Outstanding Teaching Award (OTA). This award is presented to the top 10% of teaching assistants in the classroom and laboratory. Nominees for this award are selected by the individual departments.

Hikal is a PhD student working with Russel Karls, research scientist in the department of infectious diseases. Together, they study *Mycobacterium tuberculosis*, the bacteria which causes tuberculosis in humans.

Hikal has taught two semesters of the Principles of Biology, teaching students basic lab skills and concepts of biology—as well as how to handle DNA and other genetic material. Hikal is passionate about his research and strives to be an effective communicator of his findings. This has translated perfectly into his teaching, where his students have reacted well to his personal didactic abilities. “I love science, and I love the details of it all,” Hikal explains. “And I enjoy sharing this with students and with people interested in my research.”

Krunkosky is in her third year of comparative biomedical science doctoral studies and is a Triple Dawg having earned her undergraduate and master of science degrees from the university as well. Working in the Tompkins lab, Krunkosky is researching the pandemic potential of influenza viruses that affect swine.



Ahmed Hikal

Krunkosky has acted as a TA for over two years now, beginning with Veterinary Immunology, teaching students how to perform blood smear analyses, run rapid antigen tests, and identify various immune cell types. For the past two years, she has taught Introduction to Anatomy and Physiology for undergraduate students. Krunkosky is very active in the education of her students, developing mini-practical exams for students and holding weekly review sessions. She also takes an active role in connecting her pre-med students with mentors working in their selected career paths.

Josephine Bou Dagher was nominated for the Excellence in Teaching Award (ETA). Students nominated for this award must have previously received or be currently nominated for the OTA—Bou Dagher received the award in 2019—representing the top 1% of TAs at UGA. Bou Dagher is a PhD candidate in neuroscience working under the supervision of Sheba MohanKumar, associate professor of veterinary biosciences and diagnostic imaging, and Philip Holmes, professor in the behavioral and brain sciences program. Her research focuses on the prenatal programming effects of endocrine-disrupting chemicals and the metabolic consequences in adulthood.

Bou Dagher has taught three courses: Sensation and Perception, Anatomy & Physiology II, and Psychopharmacology. Bou Dagher is committed to making learning fun and creating a student-centered experience. On teaching, she says, “Teaching is about learning how to ask the right questions and engage students, to spark brains that can change the world, to let the students’ thoughts emerge, and to raise generations that can make a difference.”

Madelyn Krunkosky



Josephine Bou Dagher







# Veterinary Medicine in Space:

## Third-year DVM student sets course for NASA

*By Alec Lee*

**KRISTEN PEAGLER**, third-year DVM student, recently completed a six-week internship with NASA at the Kennedy Space Center in Florida. This experience has been the jumping-off point for a series of opportunities with NASA, as Peagler will participate in an aerospace medicine clerkship with the agency in the coming year. She is the first veterinary student and the youngest participant to be accepted into the program.

It all began with a phone call to NASA's Chief Veterinary Officer, Joseph Bielitzki. Working from Kennedy Space Center in Florida, Dr. Bielitzki has worked with NASA since 1996 and oversees the care and use of animals for the entire agency. Peagler has dreamed of working for NASA, but opportunities for veterinary students within the agency are limited if not entirely non-existent. Regardless, in what she describes as a cold call to the highest-ranking veterinary officer in the space program, Peagler sealed the deal on a six-week internship with Dr. Bielitzki himself.

From late February until early April, Peagler was treated to a VIP experience at the Kennedy Space Center. Peagler had a hands-on role during the time she spent in Florida. "I thought, 'Maybe I should just stand back here and not touch anything,' but they encouraged me to get involved as much as I wanted," Peagler explains. "Our sole goal was to make sure the animals' needs are met at all points—from the ground to the ISS."

As one could imagine, animal care at NASA is complex. Much like with our human astronauts, special accommodations must be made for animals to be as comfortable as possible on their journey past our atmosphere. "It's the basic things you wouldn't necessarily have to think about with gravity on your side," explains Peagler. "Things like waste, food, moisture content.





When you have gravity, everything just falls to the floor. In microgravity, that's obviously not the case."

In planning her time at NASA, Peagler was most interested in seeing what the day-to-day is like for a veterinarian in the space program. During her internship, she was able to experience meetings with international space agencies, assist in the logistics of a space launch, and develop problem-solving skills that will lead her through her fourth and final year at the College of Veterinary Medicine. Peagler succinctly summarizes the qualities necessary for working in space travel, "Contingency, collaboration, compromise, commitment to constant learning, and flexibility are essential."

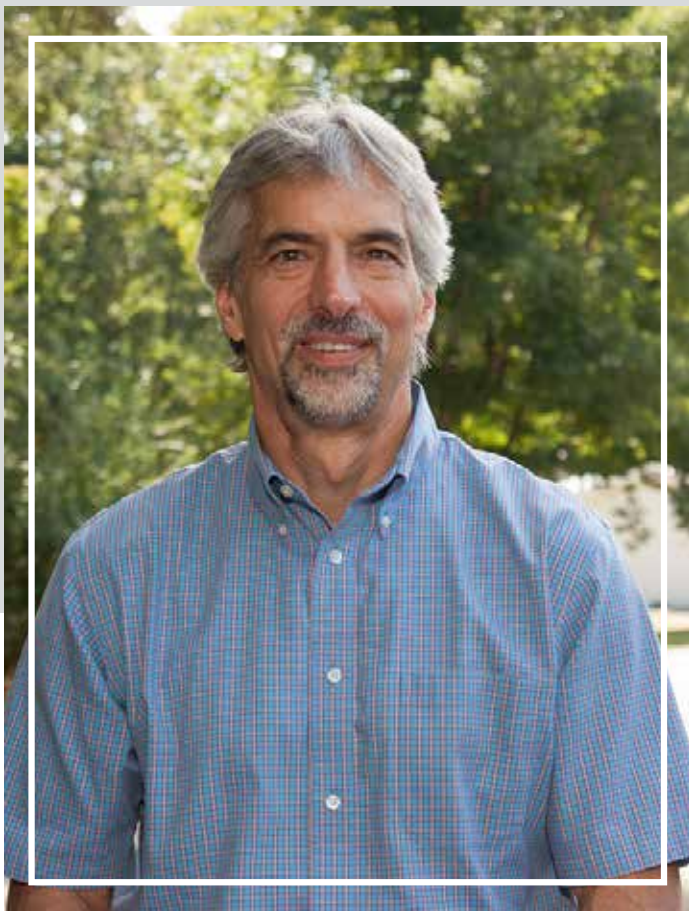
Peagler will return to NASA in October, 2020, for an aerospace medicine clerkship at Johnson Space Center in Houston. This program is developed for medical students, so Peagler's experience will be tailored to her veterinary background. During the four-week program, Peagler will dive deeper into the science of space travel, attending classes and tours of the facility while performing research which will be presented at the end of the experience.

We will keep in touch with Peagler and provide an update to this story after she has completed her clerkship.

*Photos provided by Kristen Peagler.*







## Georgia Bio names two CVM units Helix award winners

**TWO COLLEGE OF VETERINARY MEDICINE UNITS** were honored this year at Georgia Bio's Golden Helix Awards and Annual Gala in Atlanta. The Poultry Diagnostic and Research Center (PDRC) was awarded a Community Award and the Center for Vaccines and Immunology (CVI) received a Deal of the Year Award.

The Community Awards are presented to a small number of individuals, companies, or institutions who have made contributions to the state's life sciences community. The PDRC is one of five winners to receive this special recognition. The US poultry industry has an economic impact of over \$495 billion, with about 10 percent of this impact stemming from Georgia poultry production. The PDRC serves the poultry industry in Georgia and around the world through diagnostic service, education, and research.

The Deal of the Year Awards are presented to companies or institutions for the most significant financial or commercial transactions closed between Nov. 1, 2018 and Dec. 31, 2019, based on the importance of the transaction to Georgia's life sciences industry. The CVI was given the award in the public financing category for their receipt of a \$130 million National Institutes of Health contract establishing the Collaborative Influenza Vaccine Innovation Center (CIVIC). CVM faculty member and Georgia Research Alliance Eminent Scholar of Infectious Disease Ted Ross will lead the center and collaborate with teams from 14 other universities and research institutes to create and test new vaccines that may one day replace seasonal vaccines administered every year during flu season.

# FACULTY AND STAFF AWARDS

Pandemic aside, spring brings annual faculty honors and awards and staff appreciation day. This year, all in-person celebrations were tabled, of course, but the awards went on! Congratulations to our outstanding faculty and staff who were honored – while this year may be unusual, their contributions to the College are exceptional!

## ► faculty awards ► ► ► ► ►



Class of 2023  
Faculty Recognition  
Award  
**Dr. Puliur Seshadri  
MohanKumar**



Class of 2022  
Faculty  
Recognition Award  
**Dr. Rachel Reed**



Class of 2020 AND  
Class of 2021  
Faculty Recognition  
Award  
**Dr. Michelle Barton**



Outstanding  
Hospital Service  
Award  
**Amie Koenig**



Outstanding  
Laboratory Service  
Award  
**Rita McManamon**



Charles Dobbins  
Award for  
Excellence in  
Service  
**Marcia Ilha**



Zoetis Award for  
Excellence in  
Research  
**Nikolay Filipov**



John M Bowen  
Award for  
Excellence  
in Animal  
Research  
**Frane Banovic**



Zoetis  
Distinguished  
Veterinary  
Teacher Award  
**Dr. Brandy Burgess**



Clinical Research  
Award  
**Dr. Janet Grimes**



David Tyler Award  
for Advances in  
Teaching  
**Dr. Andy Moorhead**



CVM Mentoring  
Awards  
**Dr. Kelsey Hart &  
Dr. Michael Yabsley**

## ► staff awards ► ► ► ► ►



Veterinary Teaching  
Hospital Staff Award  
**Amanda Dawson**



Research  
Technician  
**Kelsey Young**



Service Technician  
**Janet Holt**



Support  
Professional  
**Jarod Troutman**



Support  
Professional  
**Fran Cantrell**



Support  
Professional  
**Sarah Jaworski**





*Celebrating*  
THE DVM CLASS OF

2020





# COMBATING ANTIBIOTIC RESISTANCE

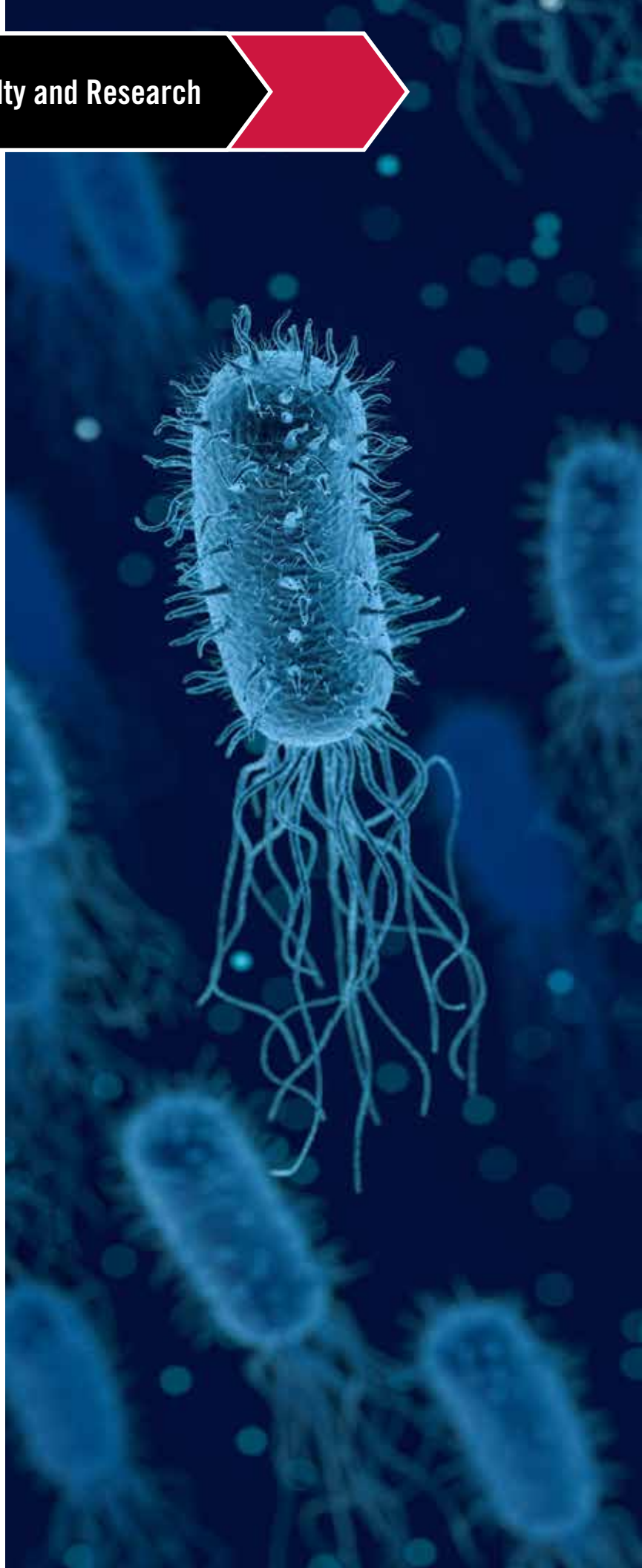
By Alec Lee

**A TEAM OF RESEARCHERS** led by Stephen Trent, professor of infectious diseases and UGA Foundation Distinguished Professor recently identified five compounds capable of boosting the effects of common last-resort antibiotics against treatment-resistant, Gram-negative bacteria. These compounds were also successful in lowering the dose of antibiotics necessary to facilitate bactericidal effects, reducing the risk of harmful side effects in patients. Four of the compounds were also effective against Gram-positive bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA).

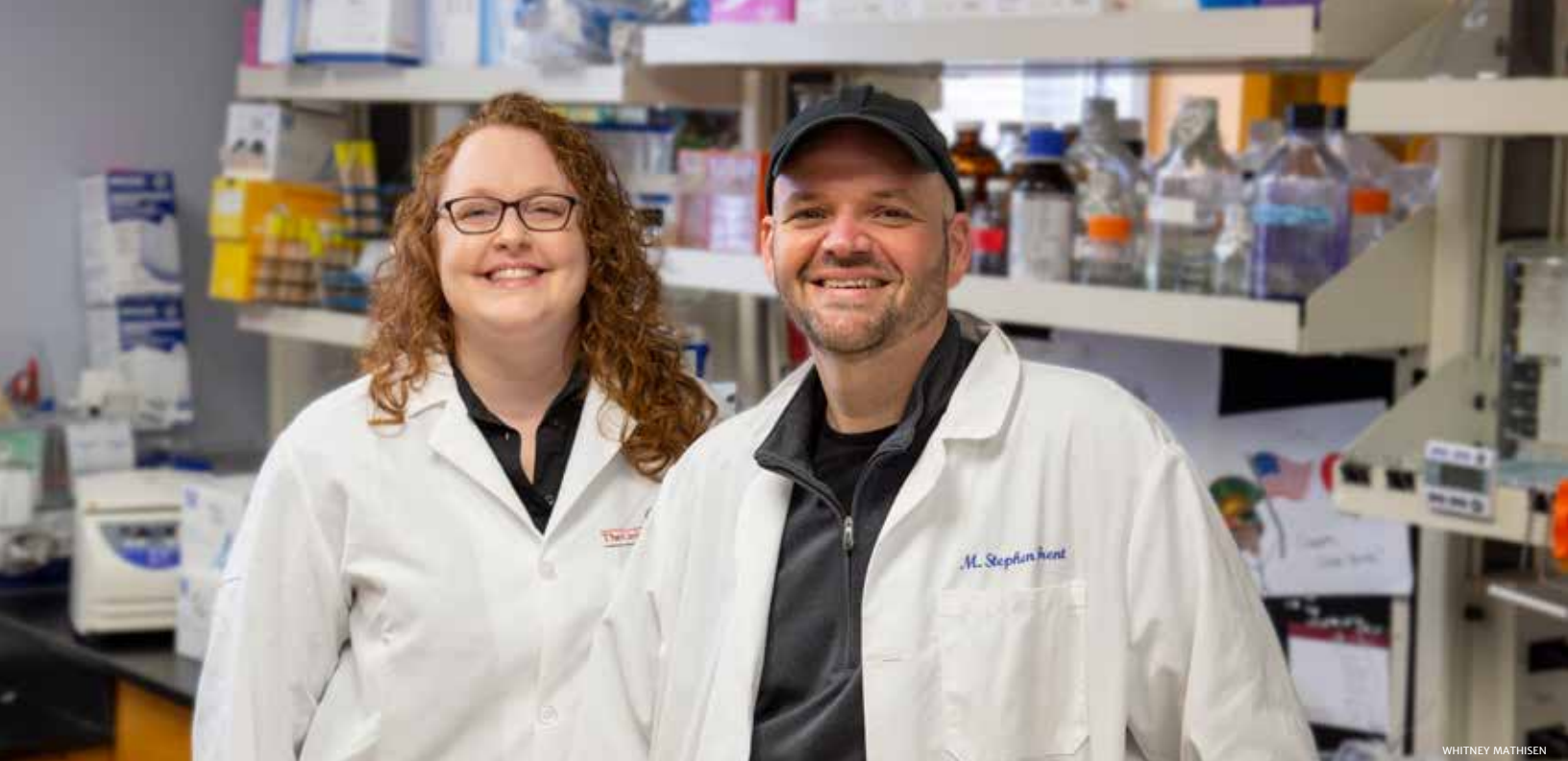
The report, titled “A Whole-Cell Screen Identifies Small Bioactives That Synergize with Polymyxin and Exhibit Antimicrobial Activities against Multidrug-Resistant Bacteria,” was published in *Antimicrobial Agents and Chemotherapy*.

The modern world is much smaller than it once seemed. As the world shrinks, ironically, so do its largest threats; it's possible that our worst enemies are only a few micrometers in length: antibiotic-resistant bacteria. But how did this start? That requires a short history lesson.

In 1928, a Scottish scientist named Alexander Fleming went on vacation while studying the properties of various *Staphylococcus* species, and he left his office in a bit of a mess. When he returned, he found that some of his cultures had been contaminated with a fungus that seemed to kill any







bacteria in its immediate area. This might have ruined his experiment, but it meant he had discovered something completely new. This fungus, a type of *Penicillium*, became the basis for the world's first antibiotic, penicillin, and began humanity's war against bacteria.

But bacteria, like us, prefer not to be killed, so they began to mount defenses against these compounds. Over time, their defenses have grown and expanded to protect them from a number of antibiotics, and without a way to treat them, mild diseases can become life threatening.

"Antibiotic resistance is a growing problem," explains Dr. Shawn Zimmerman, postdoctoral fellow and first author on the report. "Research indicates that drug-resistant infections could cause more than 10 million deaths per year by 2050. That's more than cancer kills today."

In their 2019 report, the CDC estimated 2.8 million infections and 35,900 deaths associated with antibiotic-resistant bacteria in the United States per year. As bacteria become resistant to more antibiotic compounds, healthcare providers are forced to use last-resort medications. One such class of antibiotics is known as polymyxins—polymyxin B (PMB) and polymyxin E (colistin) are the most commonly used. However, due to extensive use of colistin in animal production outside the US, bacteria have begun to develop and share defenses against these important drugs.

The first colistin-resistant bacteria appeared in the 1980s, but it was not until 2015 that scientists found the gene that causes it, *mcr-1*. And it had already spread to five continents. This gene is carried by a plasmid: a small, circular string of DNA that replicates independently of a bacterium's chromosomal DNA. Like humans, "parent" bacteria pass genes on to "children," but they can also share their genetic material with other bacteria. They don't have to wait

for the next generation. And the bacteria receiving the new gene do not always need to be related—or even the same species. The spread of *mcr-1* has created a dire need for either new antibiotics or adjuvants, compounds that can support antibiotics and boost their effectiveness.

Colistin and polymyxin B are last-resort antibiotics because they can be toxic to the liver and kidneys, but they are highly effective against Gram-negative bacteria. Unlike other types of bacteria, Gram-negative bacteria have an extra level of defense: a secondary membrane around the bacterium designed to keep it safe from invaders. Polymyxins break through the outer membrane allowing entry into the organism's interior where it can be destroyed. The *mcr-1* mechanism allows the outer membrane to fortify its defenses against threats, rendering treatment with polymyxins completely ineffective.

The compounds identified by Trent and his team work with PMB, boosting its effectiveness to destroy Gram-negative bacteria. While more research will be necessary to determine the exact mechanism, it appears that the compounds act in tandem with PMB to destroy resistant bacteria—either with PMB promoting activity of the compounds or forcing entry through the outer membrane. These compounds also decreased the amount of PMB needed to treat the infection, which can limit liver and kidney damage related to higher polymyxin concentrations. Four of the five compounds were successful at killing Gram-positive bacteria without an adjuvant compound.

"We are optimistic that with further investigation and optimization, these compounds could enhance our ability to combat these bacteria," said Trent. "We hope that these compounds can reinvigorate polymyxin use and inspire new treatments against antibiotic-resistant bacteria in the future."





# **Staying the course in the age of COVID**





**IN EARLY MARCH**, COVID-19 was first recognized as a pandemic by the World Health Organization. Around the world, people from all walks of life were asked to adapt to a new lifestyle—one of constant change and social distancing.

Despite the upheaval, the University of Georgia College of Veterinary Medicine and its units made daily contributions to the fight against COVID-19 providing vital equipment, research expertise, and continued care to our community's animals—a commitment that continues through the date of this publication. The Veterinary Teaching Hospital has remained open, operating on an emergency-only basis, with our faculty and staff providing care for more than 575 patients since March 16. Likewise, our Diagnostic Laboratories in Tifton and Athens, our Poultry Diagnostic and Research Center (PDRC), and our other affiliated laboratories have continued to provide critical services that ensure the health of our animal companions and safeguard the food supply both around the globe and here at home. Even today, the labs remain ready to jump into action for human testing if requested.

Additionally, researchers in the College have been engaged by Governor Brian P. Kemp's task force to perform research on COVID-19, develop testing protocols, and test the vaccines that might one day make this virus a threat of the past. Eleven researchers from across the College—including the Center for Vaccines and Immunology and four different academic departments—are actively engaged in projects related to the virus. This research is being conducted in the College's Animal Health Research Center in conjunction with universities around the state.

The College has also donated equipment to various hospitals and testing services around the state. The College's single human-appropriate ventilator is currently at Piedmont Athens Regional Medical Center. Likewise, vital testing equipment and reagents have been donated to Emory University and Georgia State University and personal protective equipment, such as N95 masks, has been donated to the state for distribution as needed.

The mission of the College is to create a healthier world for animals and humans. In the face of adversity, the College has stepped up and stayed the course—in their own way contributing to the cause during these unprecedented times. Dean Lisa K. Nolan summed it up nicely in a recent email: "We do what we do because we provide certain services no one else in the state can and because our clients and referring veterinarians count on us being here, supporting them."

# Combating COVID-19

ANDREW DAVIS TUCKER

**A TEAM OF RESEARCHERS** at the CVM has developed a COVID-19 vaccine candidate that has proven successful in promoting an immune response in early test models.

The team is led by Biao He, the Fred C. Davison Distinguished University Chair in Veterinary Medicine at UGA, and Drs. Stanley Perlman and Paul McCray of the University of Iowa department of microbiology and immunology. Together, they developed a promising vaccine for MERS-CoV, the coronavirus that causes Middle East Respiratory Syndrome, and quickly pivoted their research to focus on SARS-CoV-2. The MERS vaccine, detailed in a study published in *mBio*, successfully promoted immunity to the disease in lab studies, giving the researchers high hopes for the COVID-19 vaccine.

The vaccines are based on a viral delivery platform developed by He containing modified strains of the virus that causes kennel cough in dogs, parainfluenza virus 5 (PIV5). The modified viruses produce proteins found in the two coronaviruses, specifically the spike proteins that form the “crown” or corona for which they are named. After the vaccine has been administered, cells are infected with the PIV5 virus. The body then begins to mount a defense to the MERS spike proteins produced by the

modified virus—ultimately promoting immunity to infection.

He has focused his attention on this virus for years due to its safety in humans. “When your dog is immunized against kennel cough, a similar vaccine is used,” explained He. “After immunization, the dog will shed this PIV5 for days. If you have a dog, you have been safely exposed to this virus many times.”

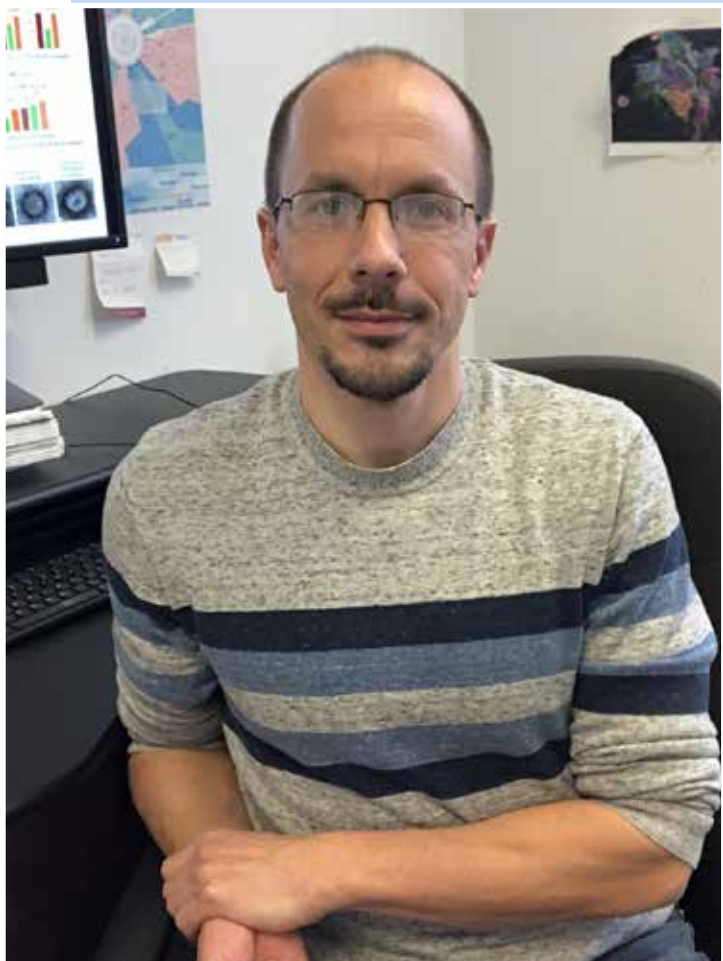
While vaccine development is still in the early stages, the researchers hope that it will be successful in further tests. He hopes that the SARS-CoV-2 vaccine will be ready for FDA approval by the end of the year.

“We have an opportunity now to use our technology to help people,” He said. “And, at the University of Georgia, we have the people, and we have the facilities. We have been able to quickly mobilize resources to develop this vaccine.”

**“We have an opportunity now to use our technology to help people”**



## EXPLORING INNATE IMMUNITY



**BALÁZS RADA**, associate professor of infectious diseases and head of the Laboratory of Mucosal Innate Immunity and Neutrophil Biology at UGA, is the principal investigator on two NIH-funded projects totaling \$2.3M. Rada and his team will study the body's innate immune response to influenza and a pneumonia-causing bacterium, *Streptococcus pneumoniae*, also known as pneumococcus.

Epithelial cells are common in the body. They cover all body surfaces, line body cavities and hollow organs, and make up the largest part of our glands. These cells can also serve a purpose in the human immune system within our airways. A gene called *DUOX1* allows these cells to generate reactive oxygen species to destroy foreign invaders and defend the body against bacteria, viruses, and fungi.

The two grants awarded by the National Institute of Allergy and Infectious Diseases will allow Rada to test how effective these cells are in combating the influenza virus and the most common cause of pneumonia, *Streptococcus pneumoniae*. "It has been proven that this gene is effective against a wide range of microorganisms in the laboratory in a Petri dish, but we hope to confirm its antimicrobial activity and to unravel its mechanism of action in living tissue," Rada explains.

The first award, an R01 grant, will be distributed over five years and focuses on influenza. Rada will collaborate with co-principal investigator Ralph Tripp, Georgia Research Alliance Eminent Scholar and professor of infectious diseases who is an expert on influenza as well as other respiratory viruses. Together, the team hopes to learn more about the effectiveness of *DUOX1* in vivo. Specifically, they are interested in determining the molecular and cellular mechanisms that give epithelial cells their antibacterial and antiviral properties and determine whether airway oxidants are effective in reducing lung disease and viral replication during influenza infection.

The second award, an R21 exploratory grant, has similar goals but a different focus. For two years, Rada and his team will study the effects of this oxidant-generating system against *Streptococcus pneumoniae*. Influenza sufferers are much more likely to develop pneumonia, and pneumococcus is its leading bacterial cause. When the body is infected with viruses like influenza, the immune system is severely weakened, leaving easy access for other bacteria like pneumococcus to enter the lungs. For this project, Rada will partner with University of Mississippi Medical Center Professor of Microbiology Larry McDaniel, an expert on pneumococcus.

In performing this research, Rada and his team hope to deepen our understanding of how the body fights back against invasion by two particularly dangerous microorganisms. Influenza alone can be a deadly disease, and its danger is only amplified with the risk of co-infection. This study will be the first to see these reactive oxidant-based mechanisms in action against influenza and pneumococcus outside of a test tube. Research of this nature can be beneficial for future understanding of our own immune system and for developing therapies to boost our immune responses against respiratory pathogens.

Rada explains, "As we learn more about the antimicrobial role of these airway oxidants, we gain essential knowledge about the innate immune system of the lung and learn ways to strengthen the immune response to influenza and pneumococcus."



## Two million lives touched

Infectious disease alumna lends expertise to Roche team

By Alec Lee



**JAMIE PHILLIPS IS A SENIOR SCIENTIFIC AFFAIRS MANAGER** for Roche Diagnostics Corporation. In her everyday role, her focus is on Roche's solution to point-of-care microbial tests for influenza A and B, respiratory syncytial virus, and strep A—for which she acts as a liaison between units of Roche and research scientists to support further implementation of their technology as the company works to reach those most in need. But once it became clear that SARS-CoV-2 was going to spread, medical providers, medical technology producers, and pharmaceutical companies knew they would need to be ready. Phillips, with her extensive background in virology—specifically coronaviruses—was asked to put her regular role aside to aid in building Roche's plan of attack.

Phillips is a Double Dawg, meaning she earned two degrees from the University of Georgia: a master of science ('09) and a Ph.D. ('11). While earning her degrees, both in infectious diseases, Phillips was advised by Mark Jackwood, department head of population health and the J.R. Glisson Professor of Avian Medicine. Jackwood also happens to be a coronavirus expert, largely focusing on infectious bronchitis virus (IBV), or avian coronavirus. Over his career, he has shed light on many aspects of the disease which threatens poultry populations around the world. Under his tutelage, Phillips's passion for virology grew, leading her to study influenza, West Nile virus, and other coronaviruses.

In Jackwood's lab, she received hands-on experience with several strains of IBV as the team sequenced their genomes. Understanding the genome of a virus allows scientists to learn about them quickly—seeing exactly what the constituent parts of a virus do and how they

affect their hosts. Because of Phillips's experiences in the lab, she became invaluable as Roche raced to develop a test for SARS-CoV-2. With her knowledge, combined with that of others within the organization, Roche was able to develop and release a test for the novel coronavirus in just six weeks—a test that has, in the words of Phillips, “touched over two million lives.”

Phillips has committed herself to better the health of others, whether through her role as a proponent for point-of-care testing access and antimicrobial stewardship or in response to the pandemic we are currently fighting. She attributes this feeling of commitment to her four years studying in Jackwood's lab. “Dr. Jackwood spent so much time investing in his graduate students to ensure they are successful in graduate school and beyond,” she explains. “Working with Dr. Jackwood has helped me navigate through life with a strong basis in science and a strong sense of morality.”

In her role, Phillips must look at the future of medicine to determine how to best serve those in need of access to healthcare and medical testing. She is fueled by a passion for science, specifically the study of virology. “RNA viruses, like SARS-CoV-2 and other coronaviruses, are very interesting, but it's the impact we can make on the world that inspires me the most,” explains Phillips. With a solid background in molecular virology, Phillips is prepared to help in any way she can in everyday life or a life-altering pandemic. She credits her time at UGA and with Dr. Jackwood as being integral to her success. “Graduate studies are difficult, but it's so worth it,” Phillips explains. “Pursuing a higher level of knowledge is rewarding—and at UGA you get that and the solid foundation you need to make a difference.”

# Alumni Notes

## ► CVM alumnus named Virginia Veterinarian

**of the Year**—The Virginia Veterinary Medical Association (VVMA) recently named CVM Class of 1975 graduates Drs. Bayard and Margaret Rucker the Paul F. Landis Veterinarians of the Year for their contributions to the field and the state of Virginia. The awards were presented at the Virginia Veterinary Conference on Feb 28th at The Hotel Roanoke Conference Center. Per the VVMA President Elect Dr. Terry Swecker, “The Ruckers have been amazing ambassadors for the veterinary profession at the local, state, and national level. These activities include, but are not limited to local service like sponsoring a non-profit to find homes for strays, statewide service on the Board of Veterinary Medicine or the Virginia Veterinary Medical Association, or national service to the American Animal Hospital Association or the American Association of Equine Practitioners. Their willingness to give back to the profession while supporting their own community through Southwest Virginia Veterinary Services is an inspiration to all of us.”

► **Robert Williams (DVM '82)** was recently inducted into the Kentucky Poultry Hall of Fame sponsored by the Kentucky Poultry Federation. He worked in the industry for 33 years the last 27 with Keystone Foods. He retired in 2015.



## In Memorium

► **Gregory Bossart**—Dr. Gregory Bossart passed away on Tuesday, November 19, 2019. Greg was a pillar of the Georgia Aquarium and the zoological and conservation community.

Greg came to the Aquarium in 2008, and, as the senior vice president and chief veterinary officer, he oversaw all animal care and research projects culminating in one of the most experienced and world-renowned animal care and veterinary teams. He also helmed the prestigious Health and Environmental Risk Assessment (HERA) research project for bottlenose dolphins. Alongside his research partners, he identified re-surging and emerging diseases in dolphins, manatees, birds, and whales. His research and innovative techniques helped characterize the first viral diseases in manatees, and he was responsible for developing the first immunohistochemical technique for diagnosing brevetoxicosis (red tide poisoning) in both marine mammals and birds.

Greg's passion for marine conservation and ocean science went beyond his role at Georgia Aquarium. As part of the One Ocean, One Health program, he researched aquatic species' role as sentinels for the ecosystem, human health, and the effects of climate change.

► **Dr. John Edward McCormack**—Dr. John Edward McCormack, DVM, passed on Friday, December 6, 2019.

John graduated from Pulaski High School, The University of Tennessee, and received his DVM from Auburn University in 1960, returning to Auburn from private practice to receive his DVM-Masters in 1972 and his PhD in Theriogenology in 1978.

John spent his early years practicing veterinary medicine in rural Alabama where he cultivated many life-long friendship.

John left private practice in 1970 to share his passion and knowledge



of caring for creatures great and small with hundreds of veterinary students from Auburn, UGA, LSU, and California–Davis. He received the Most Outstanding Clinician Award from the UGA College of Veterinary Medicine as well as the College of Veterinary Medicine at California–Davis. In 1994, John was named Veterinarian of the Year for the Georgia Cattlemen’s Association, and in 1995, he was named the OTS Dr. Fred Davison Award Recipient. The impact John had on his students has rippled to generations of amazing Veterinary practitioners across the country.

John was a noted author and shared his immense humor with his fans across the globe. He penned over 200 articles and humorous stories in the *Hoard’s Dairyman*, veterinary publications, and even local newspapers. He eventually published a collection of the *Hoard’s Dairyman* short stories known as *Watch for a Cloud of Dust I and II*. His writing career culminated with the publication of a series of beloved novels: *Fields and Pastures New*, *A Friend of the Flock*, *Hero of the Herd*, and finally the cherished book of Christmas stories, *Santa Makes House Calls*.

In John’s honor, enjoy a Moon Pie and RC Cola while sharing a hearty laugh with family and friends.

► **Edward Lee Roberson**—Edward Lee Roberson, 84, passed away on March 4, 2020.

He was born in the small farming community of Conetoe in eastern NC and then attended Duke University for his undergrad. He then was accepted at the College of Veterinary Medicine at the University of Georgia.

In 1967, Ed took a teaching position on staff at the UGA Vet School. He developed a passion for teaching the second-year students in the parasitology class. Edward poured his love and his life into teaching, writing chapters for text books, and devoting time and energy to the Alpha Psi veterinary fraternity. Ed and Nancy’s home became a home away from home for many a student, graduate student, or alumnus as they opened their home for dinners, parties, and holiday celebrations.

Even in retirement, Ed continued to serve by working on neighborhood beautification, and he remained secretary/treasurer of Alpha Psi fraternity for years. All along, Ed kept in touch with friends and family and made new friends every chance he could.

► **David Tyler**—David Earle Tyler passed away May 26, 2020. He was born in Hartford, Iowa. He graduated from Hartford High School in 1946. He served in the Army at the end of World War II as an MP in Alaska. Following his military service, he enrolled at Iowa State University (ISU). He earned both a B.S. in Animal Husbandry and a Doctorate of Veterinary Medicine at ISU.

Following graduation from ISU, Dr. Tyler joined the faculty at Purdue University as an instructor in veterinary science. While at Purdue, he earned his M.S. degree. David then returned to his alma mater to join the faculty in the veterinary pathology department.

During his time as a faculty member at ISU, he completed his Ph.D. degree and became a Diplomate of the American College of Veterinary Pathology. In 1966, he was recruited to become the head of the veterinary pathology department at the University of Georgia (UGA). He accepted the challenge, and the whole family moved south to Athens, Georgia. He spent the remainder of his professional career at the UGA College of Veterinary Medicine until his retirement in 1991.

David was a highly respected scientist, veterinarian, and teacher. It was his role as a teacher that particularly brought joy to his professional life. His excellence as an educator was acknowledged on multiple instances by his students and his colleagues. He was named a Josiah Meigs Distinguished Teaching Professor by the University of Georgia. This is the highest honor for excellence in instruction at UGA. He was also the inaugural winner of the national Zoetis Distinguished Veterinary Teacher Award.

► **Dr. Fred Stringer**—Dr. Andrew Fred Stringer, Jr., 83, passed away on Wednesday, April 8, 2020. Born September 18, 1936, he was the son of the late Andrew Fred, Sr. and Carolyn Welborn Stringer. He was a graduate of Anderson Boys High, Clemson University, and the University of Georgia College of Veterinary Medicine.

Fred spent his childhood growing up and working on the family farm on Stringer Road—the first electric dairy farm in the southeast. Working alongside his family, he learned the value of hard work and developed a lasting love and compassion for animals. After graduating from the University of Georgia, he returned home to open Stringer Animal Hospital on Shockley Ferry Road in 1960.

Dr. Stringer was a beloved veterinarian for more than 40 years, caring for large and small animals. During much of those years, his blue hospital truck was seen speeding around Anderson County on the way to countless farm calls. A true family business, Frances ran the office while his sons Andy and Will did whatever they were told to do.

Dr. Stringer was noted for hiring and training young veterinarians, including his son Will. His service to the veterinary profession was recognized in 1991 when he received the prestigious Veterinarian of the Year Award, presented by the South Carolina Association of Veterinarians.



## In Development

A huge thank you to our donors and the members of our Development and Alumni Relations team! During the pandemic, they served up lunch and dinner to our essential staff and faculty at the Veterinary Teaching Hospital. Thank you, DAR, for everything you do.





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