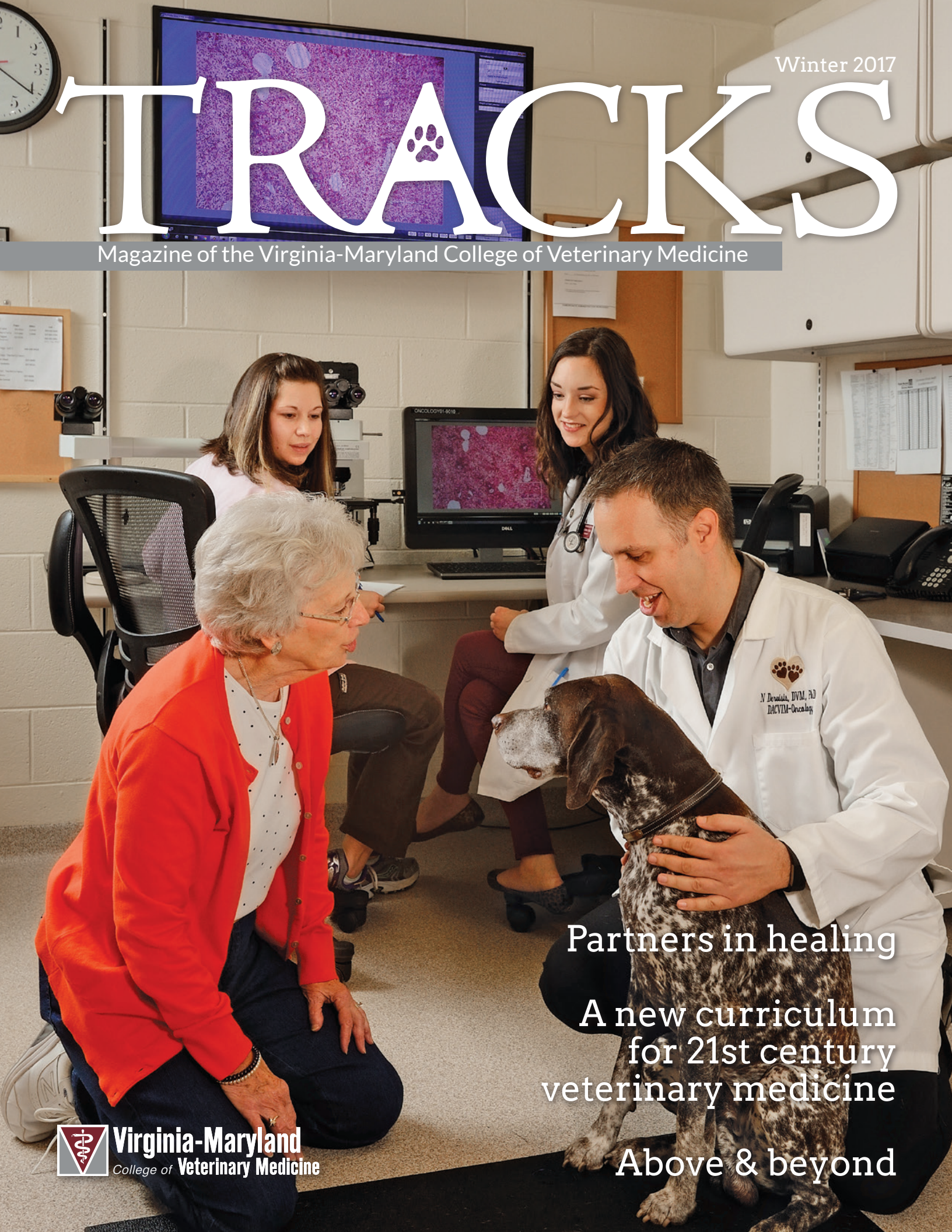

Winter 2017

TRACKS

Magazine of the Virginia-Maryland College of Veterinary Medicine

Partners in healing

A new curriculum for 21st century veterinary medicine

Above & beyond

Virginia-Maryland College of Veterinary Medicine

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Around the college

Cover

Clockwise from the top left, veterinary technician Stefanie Olsen and oncology resident Erin Fagan watch as Nick Dervisis, assistant professor of oncology, examines Seth, a German shorthaired pointer owned by Kathy Apffel of Pinehurst, North Carolina. **Photo by:** Jim Stroup

TRACKS

Winter 2017

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Dean Clarke and his golden retriever, Dudley

Message from the Dean

From welcoming veterinary students to a new curriculum, to making advances in biomedical research, to treating hospital patients in both Blacksburg and Leesburg, the college has a strong track record in our core missions of teaching, research, and service. Our continued success would not be possible without alumni, donors, and friends of the college who support our efforts to advance animal and human health.

In this fifth edition of TRACKS magazine, we bring attention to the ways in which our stakeholders contribute to the college. These include stories on grateful clients supporting our canine cancer research, faculty devising a new curriculum for 21st century veterinary medicine, and student achievement boosted by private foundation support. We also highlight hospital successes, service-oriented alumni, and students who traveled far and wide to further their education.

Recently, the college adopted the advancement model to bring together the college's development, communications, and alumni relations efforts. Our future depends on philanthropic support from individual and foundation donors, engagement with alumni, and communication and outreach efforts that effectively position the college. I am confident that these efforts will help further our ambitious vision for the college so that we will have even more accomplishments to share in the future.

Cyril Clarke

Improvements continue for college facilities

The Virginia-Maryland College of Veterinary Medicine is continuing to make upgrades to its facilities in Blacksburg and Leesburg.

"Planned capital projects not only improve our facilities for faculty, staff, and students, but also enable us to better achieve our missions of education, research, and clinical service," said Cyril Clarke, dean of the veterinary college.

Recent improvements include new collaborative learning technology in instructional spaces, an expanded anatomy cooler to make room for more specimens for anatomy and physiology classes, and renovated second-floor faculty offices for the Department of Biomedical Sciences and Pathobiology.

Research spaces at the Center for Molecular Medicine and Infectious Diseases have also seen a makeover with new windows, a new HVAC system, and renovated laboratory spaces to accommodate researchers from the veterinary college and the Edward Via Virginia College of Osteopathic Medicine. A new equine palpation barn is also planned.

This summer, the college also opened a new equine therapeutic podiatry facility at the Veterinary Teaching Hospital. This provides a dedicated space for the hospital's equine podiatry and farrier services and enhanced educational opportunities for equine-track students. The college is also in the planning stages for a renovated reception area and business office at the Marion duPont Scott Equine Medical Center in Leesburg to create a comfortable and welcoming area for clients that reflects the center's commitment to client service.

Visitors to the college might also notice other changes, including new directional signs, a renovated conference room and board room, new display screens in the hallway, an improved pharmacy "clean room," revamped space for residents, and expanded gnotobiotic and swine research facilities. The college will soon begin the design phase for an advancement suite, which will house its development, communications, and alumni relations faculty and staff and provide a central location for alumni, donors, guests, and activities.

Top: The veterinary college held an open house for the Veterinary Teaching Hospital's new equine podiatry center in late May. **Bottom:** College farrier Travis Burns makes a horse shoe inside the new facility that can hold multiple horses at a time.

PART

Donors at all levels to support the Virginia-Maryland College of Veterinary Medicine

By Courtney Sibiga

For almost 30 years, the experienced faculty, staff, and dedicated students at the Veterinary Teaching Hospital have been saving lives by providing the highest standard of veterinary care to our animal patients. But they haven't been doing it alone. The generosity of the hospital's grateful clients has provided critical support to fund facility improvements, groundbreaking clinical research, and state-of-the-art equipment, allowing the college to expand knowledge and deliver innovative treatments that improve animal lives.

"Every client and animal patient that walks through the hospital doors benefits from the philanthropy of former and current clients and their shared passion for the hospital's work," said Terry Swecker, hospital director. "As an alum of the first graduating class at the college and a faculty member since 1990, I have seen first-hand the transformative impact that gifts from clients and friends have had on our ability to treat the most challenging cases and apply knowledge from research to develop new therapies and treatments that help us save more lives and advance veterinary education."

One area where the hospital has benefited the most from philanthropic support is canine oncology services and care.

Nick Dervisis, assistant professor of oncology in the Department of Small Animal Clinical Sciences, has helped build a successful oncology service at the teaching hospital that offers state-of-the-art services for cancer patients and opportunities to participate in clinical research. The service investigates spontaneously occurring tumors in dogs and cats with similarities to those in humans.

"Philanthropy in support of cancer research represents one of the greatest investments the public can make," Dervisis said. "This is the opportunity for the public, not only to support cancer research, but also to significantly guide and influence the direction of such research."

Long-time supporters

Kathy and Emmett Apffel of Pinehurst, North Carolina, are part of a community of donors who have supported the veterinary college's teaching, research, and clinical missions, after an experience with canine cancer. They first became clients of the Veterinary Teaching Hospital on Memorial Day weekend in 1994. Their German shorthaired pointer, Nick, had a bleeding ulcer.

"The day we walked through that door — they took care of us," Kathy Apffel said. "They called us every morning, every night."

The Apffels recall Nick being brought through the hallways so they could shower him with love. As he walked back and forth to see them, they could tell that Nick trusted the veterinarians. He survived and lived three more years to be 15 years old.

NERS in healing

Unfortunately, Nick was not the only dog they would own with an illness. They went on to have three dogs that battled canine cancer — including in the nasal cavity, in the intestine, and in blood vessel cells through an aggressive and malignant type of tumor called hemangiosarcoma. They have continued to bring their dogs back to the hospital for treatment, even though they could have taken them to other veterinary hospitals or colleges.

The Apffels, who started giving to the hospital after they lost Nick, explained that the veterinary college distinguishes itself with its dedication and attention to animals, from the veterinarians to the students. Since their many bouts of canine cancer, their personal mission has been to prevent others from having the same ordeal. Not only have they been giving annually to various hospital funds, but they have also left their estate to the hospital.

In addition, the Apffels are currently funding Dervisis' research on hemangiosarcoma. Their dog, Courtney, died suddenly and it was later discovered she had this form of cancer.

"If this money leads to a cure for an animal, then that researcher can then take this and take it to the human side," Kathy Apffel said.

Remembering Stuart

Hemangiosarcoma also touched the life of Nan Johnson of Richmond, Virginia. Johnson has been around dogs all her life. She and her husband, James, decided they needed a dog of their own shortly after their wedding day. Having grown up with many types of dog breeds, they came to enjoy the personality of terriers and eventually rescued a 4-month-old Scottish terrier, BoBo.

They first learned about canine cancer when BoBo was diagnosed with melanoma of the gum. He survived and lived to 16 years. Johnson never thought that she would own another dog until she met Stuart. It didn't take long for her to fall in love with the little misfit dog.

"He was brindle and had some white, literally, white, not even wheaten, on him. He just captivated us," Johnson said. "We were bitten once again by the Scottie bug."

Stuart was a special Scottie. In 2009, Johnson started a blog for him called The Scottie Chronicles which amassed a worldwide following. This allowed Stuart to have a voice and show off a personality that Johnson remembers fondly. Unfortunately, Stuart passed away suddenly in December 2015 from cardiac hemangiosarcoma. He was just 9 years old.

continue on page 6

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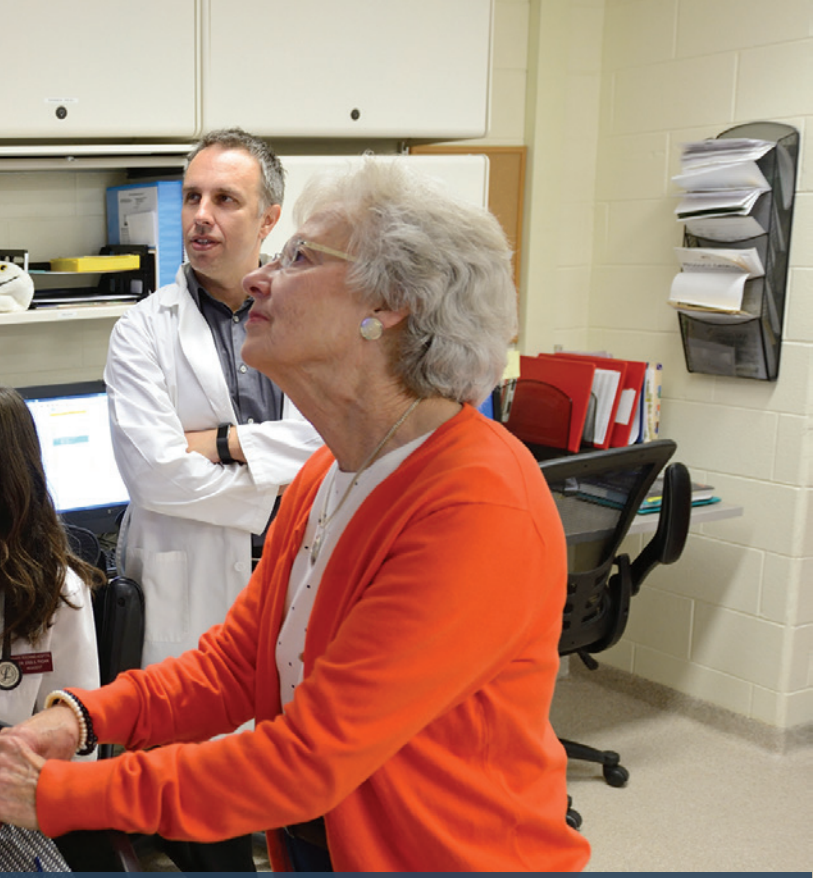

OR AN ANIMAL, THEN THAT
D TAKE IT TO THE HUMAN SIDE.”

Page 4: Oncology intern Brittanie Partridge and oncologist Nick Dervisis work together on canine cancer cases at the hospital. **Page 6: Top:** Courtney was a German shorthaired pointer owned by Kathy and Emmett Apffel. **Middle left:** Zoe, owned by Ginger Ashton and Bob Vernon, was a patient at the Veterinary Teaching Hospital. **Middle:** Fagan, Dervisis, and Kathy Apffel look at hemangiosarcoma cells in the college's oncology ward. **Page 7: Top right:** Stuart, a Scottish terrier owned by Nan Johnson, was the namesake of a fund to support tumor screening at the veterinary college.

After Stuart's passing, Johnson received a letter from the veterinary college letting her know a friend donated in honor of Stuart's life through the college's Veterinary Memorial Fund. That letter kick-started an idea for Johnson to make a difference.

She created “Stuart's Fund” to raise money for initial validation and tumor screening costs for 20 hemangiosarcoma samples. Johnson also decided to leave her estate to the veterinary college. These different channels for giving have allowed her the flexibility to match her passion with her financial resources.

“It's not about us,” Johnson said. “It's about him and all the many, many companion animals like him. I have to do it for all the Stuarts out there.”

Helping others

Ginger Ashton and Bob Vernon of Roanoke, Virginia, had never had an animal treated at the veterinary college when their dog, Zoe, was diagnosed with portal vein thrombosis in August 2015. Their veterinarian in Roanoke referred Zoe, who the Vernons described as being an active and “puppy-like” mature animal, to the Veterinary Teaching Hospital knowing the college's reputation.

According to Ginger Ashton, the clinicians and staff not only treated Zoe but also her husband and herself. “From the minute we got down there, the treatment… was so caring and so thorough,” she said.

Unfortunately, an exam revealed that an unidentified type of cancer in the liver and lungs caused Zoe's portal vein thrombosis, and she passed away within weeks. Knowing from personal experience how much needs to be done to find new treatments for diseases affecting animals and their families, the Vernons decided to get involved with the hope of helping alleviate someone else's pain.

They donated to the Veterinary Clinical Research Excellence Fund, which supports clinical trials at the veterinary college.

Because of the care they received at the veterinary college, the Vernon family was confident when another of their dogs was treated last year for a medical emergency. When it was apparent that their dog, Kate, needed emergency attention after an unusual reaction to medicine she was given after surgery, their first thought was, ‘how quickly can we get her to Virginia Tech?’

“Our animals have received excellent care — not just from the vets or the students, but from everyone we have encountered, start to finish,” Ashton said. “Both Zoe and Kate were treated with such compassion. We are fortunate to have such an outstanding facility in the area. Everyone who loves animals is benefiting from having advanced treatment available.”

In fact, these advanced treatments are made possible, in part, by the generosity of clients like the Apffels, Johnsons, and Vernons who are continuing a long tradition of giving back to the Veterinary Teaching Hospital. Although their contributions are advancing veterinary medicine within a One Health context where intersections between human, animal, and environmental health are becoming more and more important, the best part for them is making it easier for the next clients who enter the hospital's doors.

Courtney Sibiga is assistant director of development at the Virginia-Maryland College of Veterinary Medicine

FEATURE

A new curriculum for 21st

The revised Doctor of Veterinary Medicine curriculum encourages team-based learning and early entry into the clinics

By Michael Sutphin

Megan Graham of Princeton, West Virginia, knew that she wanted to be a veterinarian from a young age. After earning a bachelor's degree in biology and chemistry from Marshall University, she completed a master's degree in reproductive physiology at West Virginia University and worked for two years as a large animal technician at the Virginia-Maryland College of Veterinary Medicine.

"I was able to get an inside look at the students as they were coming through the large animal clinic, and they really seemed to be competent and know what they were doing," said Graham, who grew up with horses and hopes to be a large animal or mixed practice veterinarian in the future. "It really made me feel like this was going to be a good program."

What helped convince Graham, who is now a first-year student at the veterinary college, to apply was the promise of a new Doctor of Veterinary Medicine curriculum that integrates the basic and clinical sciences, incorporates team-based learning, allows early entry into the clinics, and introduces pass/fail grading. Graham and her peers in the Class of 2020 joined the veterinary college in August as the first cohort in the new curriculum.

"I absolutely love it," she said. "Within the first week of classes, we were doing hands-on activities with cows, horses, and dogs, and then within the first eight weeks, we did physical exams on these animals. It has been very hands-on, and that has really helped me connect what we are learning in the classroom and be able to apply it quickly afterwards."

The new curriculum combines the basic and applied sciences through integrated courses based on function. During their first semester, students spend the first eight weeks learning about The Normal Animal before moving on to Dealing with Threats and then Moving and Sensing in the spring. In their second year, students take courses with similar-sounding names: Breathing and Circulating, Eating and Eliminating, The Next Generation, and Healthy Populations.

"In the first course, we have incorporated anatomy, physiology, radiology, histology, clinical techniques, nutrition, pharmacology, and immunology," said Kevin Lahmers, clinical associate professor of anatomic pathology in the Department of Biomedical Sciences and Pathobiology and the course leader for The Normal Animal. "They actually have animal handling and restraint on day two of the curriculum, whereas it was in year two of the old curriculum. Students have animal labs almost weekly during their first course to get them developing those skills and gaining that confidence earlier."

A team approach

The curriculum also affords more opportunities for team-based learning, enabling students to share their different perspectives with each other. "For me, I have a lot of large animal experience, so I can bring that," Graham said. "Other people have had small animal experience, so we can all come together and apply what we know and share it with each other."

Ash Wells of Randallstown, Maryland, who joined the Class of 2020 after studying natural resources at a northern California university and working as an organic vegetable farmer for six years, agreed that the team assignments were a positive, even though it made her and her classmates step outside of their comfort zones at first. "I love my team," Wells said. "We do stuff together all the time and are like a family."

Wells also appreciated another part of the curriculum: integrative sessions. During these sessions, student teams are presented with a problem and rotate through stations where they address the problem with faculty experts.

"With this new curriculum, we'll have one class but we have many professors working in that class," said Wells, who hopes to pursue small animal medicine after graduation. "The integrative sessions are ideally going to be on a subject that involves all the professors who have been teaching us for the past couple of weeks."

Graham added that the integrative sessions allowed for interaction with faculty members outside of a traditional lecture hall. "You're broken up into smaller groups when you work in these stations, so it gives you an opportunity for more one-on-one instruction," Graham said. "It's one thing to be sitting in a class and learning all of these concepts, but it really helps connect the dots when you get to apply them to cases."

Faculty members have also been increasing their collaborations. In fact, 35 of them are a part of the instructional team.

"There's a great deal of time and effort required of the faculty to completely revamp what they have done and the way they have taught — to trim it down to the concepts that are essential," said Lahmers, who also teaches throughout the curriculum.

Early clinical experiences

According to Jennifer Hodgson, associate dean for professional programs, this extra work will pay dividends for students who will benefit from the additional hands-on learning and early entry into the clinics and for faculty who will have their hand in preparing future doctors of veterinary medicine.

"When we developed the new curriculum, we reviewed other models in both veterinary and human medicine, looked at emerging trends, sought input from a wide range of stakeholders, and moved forward with an approach that will best prepare students for 21st century veterinary medicine," Hodgson said.

century veterinary medicine

In the previous curriculum, students completed three years of classroom instruction followed by 12 months of clinical rotations. Students in the new model have a first round of clinical experiences in the summer after their second year and another round after a free summer between their third and fourth year. According to Hodgson, the amount of time in the classroom and clinics remains the same and students still choose a track in small animal, equine, food animal, mixed species, or public and corporate veterinary medicine.

Early entry into the clinics also appeals to students eager to gain real-world experience. "I feel like we are moving at a pretty good pace because we are trying to learn everything we need to know to enter the clinics," Graham added. "It's exciting to know that we are going to be able to get that extra experience a little bit earlier."

> "When we developed the new curriculum, we reviewed other models in both veterinary and human medicine, looked at emerging trends, sought input from a wide range of stakeholders, and moved forward with an approach that will best prepare students for 21st century veterinary medicine."

Top right: First-year student Ash Wells (second from left) and her teammates speak with Bill Huckle, associate professor of cell biology and pharmacology, during an integrative session in early September.

Middle: During the session, students rotated through stations in the Multi-Disciplinary Lab to better understand the skeletal anatomy of the distal forelimb.

Bottom: Greg Daniel, professor of radiology and head of the Department of Small Animal Clinical Sciences, discusses a radiograph with students during the integrative session.

ABOVE AND BEYOND

Graduate student Anne Nichols earns prestigious recognition as Stamps Scholar

By Kelsey Foster

Students in the Biomedical and Veterinary Science (BMVS) Graduate Program prepare to be the next generation of scholars and researchers who will advance animal and human health — and graduate student Anne Nichols is no exception.

The researcher, student leader, and volunteer not only exemplifies what the graduate program has to offer, but has also excelled in and out of the classroom thanks in part to the Stamps Family Charitable Foundation.

Nichols, a Ph.D. student from Abingdon, Virginia, is a member of the inaugural class of Virginia Tech Stamps Scholars, a cohort of top students who receive support from the Stamps Foundation. More than $2.25 million in donations support the fund, which provides full tuition, a stipend, and access to an additional enrichment fund for activities such as conferences, research, and travel.

The path to the college

Nichols did not always take a direct path to regenerative medicine research. Although she started as a biology major at James Madison University in Harrisonburg, Virginia, Nichols transferred her major and graduated with a bachelor's degree in studio art. However, she took all of the chemistry and biology courses required of a biology student and, after graduation, worked in a pharmacology laboratory at the University of Virginia. Ultimately, Nichols decided that she wanted to pursue a translational field of study.

Nichols found her way to Blacksburg after her husband received an opportunity in the area and the couple decided to move. Nichols began working with Linda Dahlgren, associate professor of large animal surgery in the Department of Large Animal Clinical Sciences, and was introduced to the veterinary college's graduate programs.

"When I first came, it was the very beginning of the Regenerative Medicine IGEP (Interdisciplinary Graduate Education Program)," said Nichols. "They were recruiting for the first class of students, and I thought that it sounded really interesting."

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Above: Ph.D. student Anne Nichols and Linda Dahlgren, associate professor of large animal surgery, are examining how different signaling pathways are affected by exposing stem cells to mechanical strain.

A well-rounded scholar

After she was accepted into the program in the fall of 2012, Nichols continued her research in Dahlgren's lab. The lab focuses on musculoskeletal regeneration and repair. "I work on tendon and ligaments and am really interested in a process called mechanotransduction, which is how cells sense physical forces and then turn those into some sort of meaningful response," she explained.

Nichols would like to continue with her research, which combines tissue engineering and basic biology, post-graduation. "I've realized since I got into the field that there's still a whole lot that's not known, and that's really exciting," she said.

Nichols has also used her Stamps scholarship to benefit other graduate students. Last spring, she and Miranda Vieson, former BMVS Ph.D. candidate and Stamps Scholar, used some of these funds to host a graduate career seminar session. "It was really successful and we hope to continue it in some form in the future," said Nichols, who also enjoys hiking, kayaking, backpacking, and camping with her husband and their two dogs.

> "I've realized since I got into the field that there's still a whole lot that's not known, and that's really exciting."

Service & beyond

Nichols and the college's other Stamps Scholars participated in the first Stamps National Day of Service in April 2016 by partnering with Giles Animal Rescue and arranging a supply drive to collect items such as litter, food, bedding, and collars to donate.

In addition, Nichols has used the enrichment fund to travel to two conferences and to complete a short course in bioinformatics. Throughout her time at the college, she has stayed in contact with the founders of the Stamps Foundation to thank them for their support and update them on her progress. "That's been the best part about it," she said.

Nichols, who is also a member of the Graduate Student Assembly, would ideally like to complete a post-doc after graduating but is also considering a career in the private sector. "Right now, I'm open to any opportunities that might come my way," said Nichols.

The Stamps Foundation

The Stamps Foundation was founded in 2006 by E. Roe Stamps IV, a private investor and business owner, and his wife, Penny Stamps, a former teacher and business owner, of Coconut Grove, Florida. In 2016, the foundation had over 1,000 current scholars at nearly 40 different schools, and had distributed $33 million in scholarships over the past six years. Top alumni employers include Google, Boeing, and Bain & Co.

In 2011, the Stamps Foundation began its relationship with the veterinary college with an initial gift that was its first to a graduate-level program. Today, the foundation has committed more than $1 million in tuition, travel, and research funding for BMVS graduate students with matching support from the veterinary college.

In addition to the graduate program at the veterinary college, Virginia Tech names five incoming freshman Stamps Scholars each year—three in-state and two out-of-state. Recipients of the scholarship are at the top of their freshman class academically and have demonstrated strong leadership skills. During their time at Virginia Tech, Stamps Scholars live in on-campus honors housing and receive full cost of tuition covered, in addition to access to an endowment fund and other enrichment opportunities.

MILLIE HARMAN WALKS AGAIN

AFTER DISC REPAIR AT VETERINARY TEACHING HOSPITAL

From her very first visit to the Veterinary Teaching Hospital, Millie Harman's sweet, spunky personality captured the hearts of everyone around her. "Millie is a firecracker," explained her owner Sandra Harman, a retired school administrator from Bland County, Virginia. "Everyone there at the hospital truly fell in love with Millie."

On Mother's Day, Millie, an 8-year-old Lhasa apso, was on the arm of the sofa where she routinely perched to gaze out the window, Harman explained. "She fell asleep and fell from her perch… and the fall caused disc damage in the cervical area of her spinal cord." When Harman got to her, Millie was completely paralyzed in all four limbs.

Harman immediately rushed Millie to her local veterinarian, Deidre Crutchfield at the Veterinary Associates of Princeton and the Bluefields in Bluefield, West Virginia, who in turn referred Millie to the Veterinary Teaching Hospital.

When she arrived at the hospital, Harman's first contact was with Ashley Moye, a fourth-year veterinary student from Chesapeake, Virginia, and Dottie Williams, a former intern of small animal medicine and surgery in the Department of Small Animal Clinical Sciences, who ordered an MRI to confirm that Millie needed C2-3 ventral slot surgery for a herniated cervical disc. Theresa Pancotto, clinical assistant professor of neurology in the Department of Small Animal Clinical Sciences, explained that the surgery is "one of the most common procedures we do," and is typically performed at the veterinary hospital several times a week.

> "That was a wonderful team that I had. They not only worked with Millie but they worked with me as well."

Above: Millie at a follow-up exam with her surgeon and neurologist Theresa Pancotto (right) and neurology technician Maureen Sroufe (left). **Bottom left:** Millie and her owner Sandra Harman spent time with the hospital's physical therapy team during Millie's recovery period.

As a recent widow who had lost her husband during a similar surgery, Harman was understandably devastated by the prognosis, but comforted by her contacts at the hospital. "I have never been surrounded by such a team of professional people," said Harman. "Ashley was a blessing," she continued, and would call Harman day and night to inform her of Millie's progress. Thankfully, the surgery went as planned and Millie was ambulatory two weeks later.

Then began the next journey — physical therapy with Flori Sforza, a veterinary technician and certified canine rehabilitation practitioner. Sforza completed the Canine Rehabilitation Certificate Program at the University of Tennessee in 2011 and works regularly with rehabilitation patients like Millie at the Veterinary Teaching Hospital.

Both Millie and her owner excelled during physical therapy and Millie was released to return to normal activity. "She was a fun patient to work with and her case clearly shows how beneficial physical rehabilitation is in the post-operative period," said Pancotto.

Harman added, "That was a wonderful team that I had. They not only worked with Millie but they worked with me as well."

Since the Harmans live in a small town, Millie became a "community icon," explained Harman. While she was recovering, community members at church, at the grocery store, and about town would inquire about Millie's progress. "We were all just so celebratory at the end of her journey," said Harman.

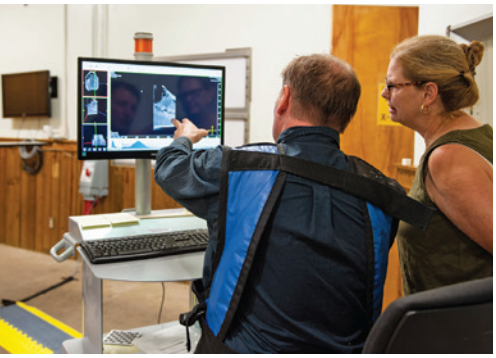
New, high-definition CT scanner arrives at Marion duPont Scott Equine Medical Center

New, state-of-the-art technology at the Marion duPont Scott Equine Medical Center (EMC) in Leesburg, Virginia, is offering enhanced imaging capabilities for equine patients. The Pegaso High-Definition CT, which is the first of its kind on the East Coast, allows veterinarians and staff at the center to perform high-definition CT scans on horses while standing or recumbent.

"We are very excited to offer this advanced technology for safer and clearer diagnoses of our equine patients," said Mike Erskine, EMC director.

When a patient undergoes a CT (short for "computed tomography") scan, multiple X-ray images are taken at different angles to produce cross-sectional images, allowing a clinician to see inside the body without cutting. The new imaging technology provides 3-D images at resolutions several orders of magnitude higher than a conventional CT but with vastly less radiation.

Top: James Brown, clinical assistant professor of equine surgery, guides a horse into the new Pegaso High-Definition CT scanner.



The purchase of the Pegaso scanner, which was created by Epica Medical Innovations, was made possible by a generous donation from the James Hale Steinman Foundation, as well as additional supporting gifts. There are only a handful of such scanners in use in the world.

The new technology enables CT scans to be performed on the head and neck of horses while standing and the distal limbs, stifle, and vertebrae to C7-T1 while recumbent.

"Two aspects of this technology will be incredibly rewarding: the ability to image the stifle in three dimensions, and the ability to image fractures, particularly complex fractures, in three dimensions for surgical repair," said Jennifer Barrett, the Theodora Ayer Randolph Professor of Equine Surgery. "These additions greatly enhance our ability to provide the best treatment outcomes for orthopedic patients at the EMC."

Teaching hospital now offers nutrition appointments

The Veterinary Teaching Hospital has been offering nutrition services for small and large animal veterinarians for years, but this spring it introduced a new service: in-person and remote nutrition appointments. These are helpful for veterinarians who wish for their clients to speak directly with a veterinary nutritionist.

During these appointments, a veterinary nutritionist meets with clients to discuss nutritional goals and options. Services include commercial diet recommendations, homemade recipe plans, and large animal ration plans.

"We have historically offered nutrition consultations to referring veterinarians, but many of these involved patients we never saw at the teaching hospital," said Megan Shepherd, clinical assistant professor of nutrition in the Department of Large Animal Clinical Sciences. "Now we have a formal appointment process where we will see patients in Blacksburg and talk to clients on the phone. This takes the pressure off of referring veterinarians because we can go over a patient's diet and medical history with the owner."

Shepherd, who is board-certified with the American College of Veterinary Nutrition, added that the service supports both resident and student training in veterinary nutrition.

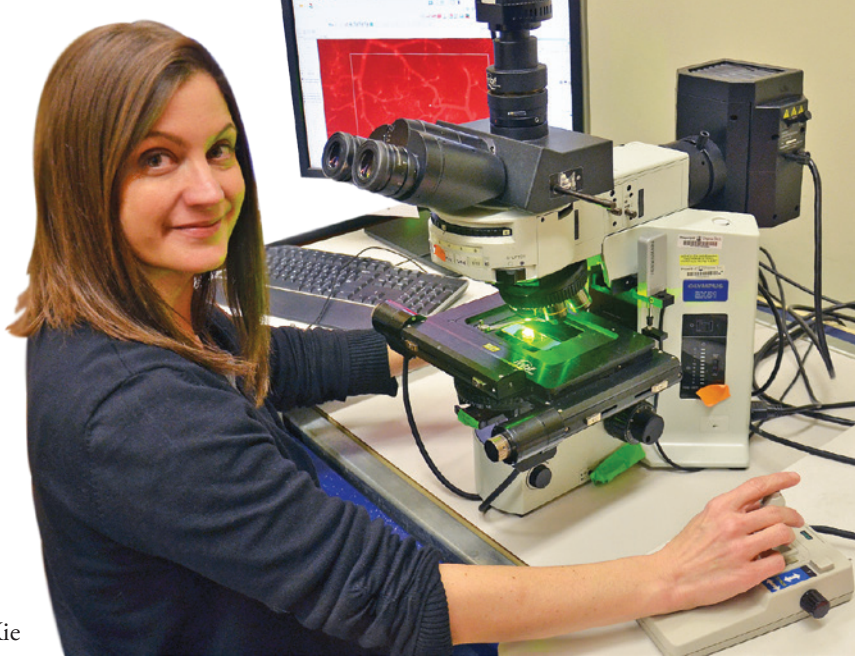
Michelle Theus investigates traumatic brain injury

Every year, traumatic brain injury afflicts more than 1.7 million Americans and leads to 52,000 deaths, according to the latest figures from the Centers for Disease Control. Virginia Tech researchers are studying the role of cerebrovascular health in the onset of traumatic brain injury with the hopes of identifying new targets for safe and effective drug therapies.

Michelle Theus, assistant professor of molecular and cellular neurobiology in the Department of Biomedical Sciences and Pathobiology, and co-investigators John Chappell at the Virginia Tech Carilion Research Institute and Hehuang "David" Xie at Virginia Tech's Biocomplexity Institute are leading the research.

The researchers are focusing on a specialized group of blood vessels called "collaterals," or natural by-pass vessels in the brain which act as a bridge between major vessel branches, providing an alternative route for blood to flow in the event of a blockage.

"Collateral vessels are normally inactive, or have a zero net flow, but quickly work to re-route blood to vulnerable tissue regions in case of an emergency," Theus said. "Our work focuses on whether the growth of these specific 'by-pass' vessels can be protective in a number of conditions affecting the brain, heart, and peripheral tissue."



Above: Michelle Theus, a neuroscientist at the veterinary college, is the principal investigator on the NIH grant for traumatic brain injury research.

Because it consumes about 20 percent of daily energy intake, the brain is at greater risk when blood flow is substantially reduced. Theus and her colleagues are building on earlier research which shows that individuals with more collaterals in the brain recover faster from brain injury.

In 2016, the research team received a five-year, $1.7 million grant from the National Institutes of Health for this work.

Diagnostic laboratory makes progress toward accreditation

The veterinary college's diagnostic laboratory is now the first in Virginia to earn provisional accreditation from the American Association of Veterinary Laboratory Diagnosticians (AAVLD). This is the first step toward full accreditation.

Virginia Tech Animal Laboratory Services (ViTALS), a full-service veterinary diagnostic laboratory housed at the college, conducts more than 40,000 tests each year for veterinarians at the Veterinary Teaching Hospital and other animal clinics throughout the country, plus 1,200 tests for researchers.

"This is a prestigious accolade among veterinary diagnostic laboratories," said Tanya LeRoith, clinical associate professor of anatomic pathology in the Department of Biomedical Sciences and Pathobiology and director of ViTALS. "Not only are we the first such laboratory to receive this recognition in Virginia, but there are no AAVLD-accredited veterinary diagnostic laboratories in our neighboring states of Maryland or West Virginia."

According to Jen Rudd, quality manager for ViTALS, faculty and staff began making changes to policies and procedures to prepare for accreditation in 2012. The college formally applied in November 2015 and underwent a site visit in May 2016.

The diagnostic laboratory offers a wide range of specimen analysis in several service sections, including anatomic pathology, clinical pathology, clinical microbiology, clinical immunology, and clinical parasitology. It also prepares veterinarians for careers in either veterinary clinical pathology or anatomic pathology through a residency program.

High-tech teamwork tackles brain cancer

By Mindy Quigley

Don't let that teddy bear face fool you — Charlie Spillman is a fighter. The tenacious terrier survived two brain surgeries, countless procedures, and two different clinical trials while battling a brain tumor. His most recent clinical trial took place at the Virginia-Maryland College of Veterinary Medicine at Virginia Tech.

"An MRI scan in July 2015 showed that Charlie had a golf ball-sized tumor on the left hemisphere of his brain," explained owner Tony Spillman of Nashville, Tennessee. Charlie had a meningioma, the most common type of brain tumor in dogs. These tumors can grow quickly, putting pressure on the brain and threatening the patient's life. In a tiny dog like Charlie, the brain is smaller than a tennis ball, so when a meningioma of that size showed up, quick action was needed to save his life.

An initial surgery at the University of Tennessee Veterinary Hospital wasn't able to remove the entire tumor, so Charlie's owners, Richard Deese and Tony Spillman, pursued enrollment in a clinical trial at the Virginia-Maryland College of Veterinary Medicine.

> "An MRI scan in July 2015 showed that Charlie had a golf ball-sized tumor on the left hemisphere of his brain."

Left: Charlie and owner Richard Deese pay close attention as John Rossmeisl explains a procedure. **Left bottom:** Charlie, the first dog to be treated with high-frequency irreversible electroporation for brain cancer, the day after his procedure. Four months after his treatment, Charlie's recheck MRI showed no evidence of the tumor. **Middle:** Radiology technician Jen Gaskins monitors Charlie as he undergoes a follow-up MRI scan. **Right:** Charlie with (from left) owners Tony Spillman and Richard Deese, neurologist John Rossmeisl.

Charlie initially enrolled in a study using a modified form of the Newcastle Disease Virus to target cancer cells, but when that experimental therapy only shrunk the tumor by 3 to 5 percent, John Rossmeisl, professor of neurology and neurosurgery in the Department of Small Animal Clinical Sciences, suggested a new approach. So in March 2016, Charlie became the first brain cancer patient to undergo high-frequency irreversible electroporation, or H-FIRE. This technology, developed by Virginia Tech biomedical engineering professor Rafael Davalos, is a minimally-invasive surgical technique that destroys cancer cells using a series of short, intense electric pulses delivered via small electrodes placed around the tumor. The technology had been tested on other species and other types of cancer, but Charlie was the first to undergo H-FIRE in the brain.

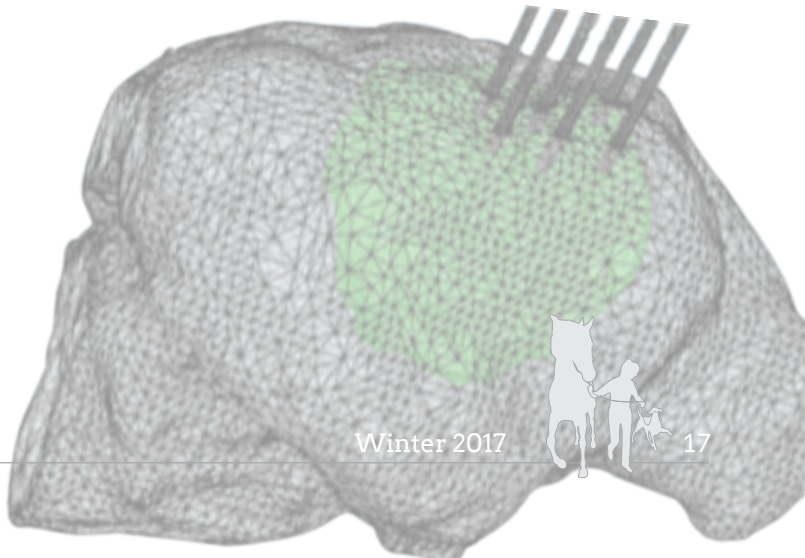
"The theory is you kill the tumor cells and spare the healthy cells. And in the brain, that's a very important process," said Rossmeisl, who is one of several veterinary college researchers building on university-wide strengths in the adaptive brain.

Charlie's brain tumor was featured during Virginia Tech vs. Tennessee game halftime. To listen to the radio spot go to: http://bit.ly/terrier-beats-cancer

Charlie recovered well from the pioneering procedure and is back to his normal routine, "co-piloting" the car, going to work with owner Spillman, and getting plenty of love and attention. Two follow-up scans have shown no return of the cancer. Spillman and Deese were overjoyed to discover that the procedure had successfully eliminated the tumor.

Mindy Quigley is clinical trials coordinator at the Virginia-Maryland College of Veterinary Medicine

Bottom: Specialized software creates a detailed 'map' to help investigators plan the placement of the electrodes. The series of electrodes, shown here as dark lines, are positioned into the tumor (green) to deliver the electrical pulses that will kill the tumor. The treatment planning process also allows for visualization of the energy distribution in the tumor and brain, which allows for safe and precise treatment.



CREATING SUSTAINABLE PUBLIC HEALTH SOLUTIONS IN TANZANIA

By Julia Sherry

Julia Sherry, a second-year student in the Master of Public Health (MPH) program, spent her summer in Tanzania working with Water Mission, a nonprofit Christian engineering organization dedicated to creating sustainable water solutions in developing countries. While in Tanzania, Sherry applied skills learned during the MPH program to real world crisis scenarios and, in turn, expanded her understanding of concepts explained in the classroom. Sherry, who is also pursuing a master's degree in geography at Virginia Tech, received funding from the Sidman P. Poole Scholarship and a World Bank grant.

In an introductory level class on natural resources my freshman year of college, I heard a lecture on the global water crisis and learned that almost a billion people lack access to safe drinking water. I couldn't sleep that night, imagining how hard a life without safe water would be, and lay awake in my bed considering both the nightmare of people sick and dying due to preventable waterborne diseases and the dream of this problem being solved.

Five years later, I found myself in Dar es Salaam, Tanzania, working as a research assistant on a project designed to provide sustainable water services to people in Tanzania. The project was funded by the World Bank and carried out by the Government of Tanzania and Water Mission, a nonprofit humanitarian organization.

Only around half of Tanzania's population has access to an improved water source, and many people have to travel long distances, wait in long lines, or drink poor quality water on a daily basis. Even in the big city of Dar es Salaam, very few people in the communities where we worked had water piped into their home, and most had to walk to a kiosk somewhere around them to buy and carry buckets of water to their house to drink, and to use for cooking, cleaning, and bathing.

Top left: Two Water Mission engineers inspecting a water kiosk at one of our project sites (one of the three project sites listed on the map). Middle: The taps on the wall are one of the water sources that the community uses. Top right: The map marks out three research sites in Dar es Salaam, Tanzania.

I spent the first week in Tanzania walking around the communities where we were doing research and learning about how people get their water resources. We conducted our research in a part of Dar es Salaam that is full of densely packed homes made of cinder blocks arranged in small and seemingly random alleys, where streams of water, waste, and trash cut through the neighborhood. People do not have property rights, and this settlement developed informally over time, as people headed to the city from rural areas in search of economic opportunity. Their water services are also piecemeal, with kiosks where people can come buy water, random privately owned water tanks where people vend water, and even places where people illegally tap into the public water supply and resell this water to their neighbors.

As we talked to people and asked questions about where they buy water, how much they pay, and their satisfaction with their water services, we heard multiple stories about failed water projects in the past. People recounted stories of researchers, government officials, NGO workers, and development banks coming in with promises of better quality water. Some actually built new infrastructure; however, all of these stories ended with failure. The researchers never came back and fulfilled their promises, the new infrastructure broke and was never fixed, or officials promised to pipe water into their homes for a small fee but nothing ever came.

In the past few decades, hundreds of thousands of dollars have been poured into the water supply infrastructure in Tanzania. The stories people recounted to us bring to life the unfortunate reality that investments in the Tanzanian water sector are not always successful or sustainable. A 2014 study conducted by the Ministry of Water in Tanzania revealed that of the 74,331 water points surveyed, 38 percent were nonfunctional and another 7 percent were in need of repair. I learned that a primary mission of public health work is not just to do good things, but to be thoughtful and to do good work that will last. In classes, we talk about ownership and community based participatory research — that communities themselves have knowledge that we do not have as outsiders, and that they are the best people to design and inform strategies to meet the real needs of the community. I saw this truth come to light through my work in Tanzania.

I worked alongside an amazing team of people who work for Water Mission Tanzania. Water Mission is a nonprofit Christian engineering organization that provides sustainable safe water solutions to people in developing countries and during disasters. The office was filled with hard-working people who are passionate about transforming people's lives through sustainable safe water solutions. I learned that creating partnerships with the government and other existing community resources is vital. I got to work at the office alongside many Tanzanians passionate about seeing universal access to safe water in their country. I also learned that I did not waste my time trying to learn statistics and data mapping software in class, as I got to apply those skills to real life problems.

This experience has changed the way I approach my classes this year and grounded concepts I learned in class in real life. It made me even more passionate about water and health, and even more convinced that sustainable access to safe water can transform lives.

Bottom left: At one of the project sites, Water Mission engineers will rehabilitate and improve this water kiosk to provide better water services to people in the surrounding community. Bottom right: Community members rely on water pipes like the one in this picture, fill buckets with water from these pipes, and carry water to their homes for use.

Veterinary student Amber Roudette broadens her horizons with Maui clerkship

By Amber Roudette

Amber Roudette of Richmond, Virginia, is a fourth-year veterinary student pursuing the mixed species track at the Virginia-Maryland College of Veterinary Medicine. She is the past president of Veterinary Students as One In Culture and Ethnicity (VOICE).

Above: Amber Roudette with a 10-week-old puppy. Roudette's most memorable case during the trip was a 10-week-old puppy with an acute onset of lethargy and ataxia.

As I planned my fourth year clinical rotations, I decided to seek an opportunity that would allow me to explore someplace new. I made a list of the cities where I had friends who could host me, and out of Nashville, Philadelphia, Indianapolis, Seattle, and Maui, the obvious winner was Maui. I did a quick Google search and called eight small animal clinics within an hour radius of my friend Christopher, who had moved to the island in 2015. One clinic called me back to offer an externship. I was ecstatic.

My last major trip was a veterinary study abroad program in India in 2015, and it was an incredible, eye-opening experience. It pulled me way out of my comfort zone and ignited my desire to keep traveling the world. That trip was made possible thanks to extensive organizing by the late Dr. Elankumaran Subbiah, as well as financial support from the Young Fund International Travel Scholarship. For my Hawaiian trip, I was fortunate to receive a domestic travel scholarship from the college, which covered my plane ticket. To keep my expenses low, I rode the bus to the clinic every day and bought groceries every week.

The externship took place at a five-doctor, small animal private practice in northern Maui. During weekdays, I performed physical exams, drew blood, placed catheters, monitored anesthesia, and observed surgeries. On the weekends, I was able to spend time at local beaches, Haleakala National Park and Crater, wineries, waterfalls, and a goat dairy, as well as take a road trip around the entire island.

Island medicine

Even though Hawaii is part of the United States, it sometimes felt like a whole new world. Because there are no veterinary or veterinary technician schools in Hawaii, the veterinary professionals there tend to come from all over the country, which exposed me to several different ways of practicing medicine.

One of the most memorable cases I saw in Maui was a 10-week-old puppy with an acute onset of lethargy and ataxia. The owners had just adopted her a week before, and suddenly their playful puppy wasn't acting like a puppy anymore. The physical exam revealed severe neck pain, blood work showed eosinophilia (elevated eosinophils, a type of white blood cell), and radiographs were unremarkable. We learned that other puppies from the same litter had similar clinical signs.

The vet considered performing a spinal tap, but given the puppy's young age, she opted for a working diagnosis of parasitic meningitis. The vet treated the puppy empirically with a dewormer, a corticosteroid, and an antibiotic, as well as hospitalization and supportive care. Within 24 hours, the puppy had a remarkable improvement, and she was sent home two days later. The vet contacted the other clinics with the puppy's littermates and shared her treatment plan. Thankfully, all of the puppies recovered.

Cultural diversity

During the trip, I strived to appreciate as much as I could about another culture. My years with VOICE helped me keep an open mind when meeting and connecting with new people. I met people on the bus, on the beach, at the hospital, and in the neighborhood, all hailing from different parts of the world.

At the hospital, most clients were native Hawaiians who had long held cultural beliefs about pet ownership. For example, most native Hawaiians consider pets unclean and keep them outside or in a separate part of the house. Others see their pets as children and take them almost everywhere they go. I became quite used to seeing dogs on the bus as well as in the grocery stores and bars.

I am incredibly thankful to have spent three weeks in beautiful Maui. I want to sincerely thank the college for the travel scholarship, which made my externship financially possible, as well as At Home Animal Hospital for hosting and mentoring me. I also want to thank my friend Christopher for his wonderful hospitality.

Every Gift MATTERS!

It **MATTERS**... to the **STUDENT** who needs scholarship support to realize her dream.

It **MATTERS**... to the **CLIENT** who knows that his pet received the highest standard of care at the Veterinary Teaching Hospital.

It **MATTERS**... to the **ANIMAL PATIENTS** whose lives have been extended by our faculty, students, and clinicians.

It **MATTERS**... to the world-class **FACULTY** who are able to address the most challenging cases with state-of-the-art equipment and facilities.

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EVERY GIFT helps us make a difference to the VA-MD College of Veterinary Medicine and the many lives that are impacted through our work every day.

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Virginia-Maryland
College of
Veterinary Medicine

From Los Angeles to Blacksburg

Five students from a Southern California college's pre-veterinary program join the Class of 2020

Becoming a student at the Virginia-Maryland College of Veterinary Medicine — which has the second highest applicant pool in the U.S. and an acceptance rate of less than 10 percent — can be a difficult proposition for anyone. But for five students in the pre-veterinary program at Pierce College, a two-year public college in Los Angeles, this dream has become a reality.

The five students — Roberto Roca Hernandez, Marie-Victorine McKeown, Matt Sandler, Elaina Valencia, and Tracy Wachbrit — joined the Class of 2020 in August. They found out about the program when Jacque Pelzer, director of admissions and student services at the veterinary college, visited the Pierce College Pre-Veterinary Club.

"I wasn't looking into vet schools just yet, so I didn't know about Virginia-Maryland as an option," said Wachbrit, who previously studied horse racing in Kentucky. "Her passion for the school, the beautiful pictures, and the tight-knit community made it sound appealing, but I was sure I wanted to apply after senior students from Pierce came back from interviews in Virginia and confirmed it was a great place."

Pelzer began the veterinary college's relationship with Pierce College four years ago when she was contacted by Leland S. Shapiro, founder of the Pierce College Pre-Veterinary Science Program. She is now working with his successor, Lu Dau, professor of animal science and director of the program.

"They are a good group of students who not only come from a diverse set of backgrounds but have diverse interests," said Pelzer, who added that Pierce College began as an agricultural college and has a 226-acre farm in the western San Fernando Valley that affords students an opportunity to work with animals. "For many of these students, I was the only admissions person to visit with them."

In total, 17 out of 20 students in the Pierce College Pre-Veterinary Science Program's most recent cohort made it into veterinary school. Although they came prepared for the academic rigors of veterinary college, the five students who moved from Los Angeles to Blacksburg had to adapt to the cultural differences between southern California and southwest Virginia. "I certainly get homesick sometimes for the big city, but it's amazing to live in a place where you feel like a part of a big family," Wachbrit said.

Added Pelzer, "The biggest acclimation for some of these students is buying a winter coat."

Third-year student Ethan La Van and fourth-year student David Lahijaniha also came to the veterinary college after graduating from Pierce College. The veterinary college recently expanded its West Coast recruitment efforts to include California State University, Chico.

ALUMNI CORNER:

Where Are They Now?

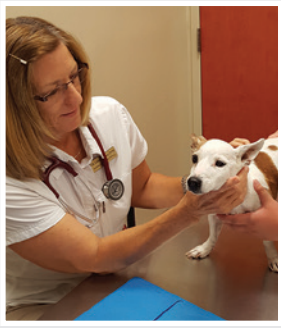
A Celebration of Our Alumni and Their Achievements

Herb Yee – From Veteran to Veterinarian

A Los Angeles native with a decorated military career, Herb Yee's (DVM '10) entrance into veterinary school was not a traditional one. After graduating from the U.S. Naval Academy, Yee pursued a naval aviation career and earned his wings as a navigator in 1983.

Throughout his 20-year military career, Yee moved throughout the continental United States and was deployed at sea. His last assignment was in southern Maryland, where he and his wife have owned a horse farm since 2003. After retirement, Yee was accepted into the veterinary college. He now runs Breton Equine Veterinary Services, a mixed animal practice in Leonardtown, Maryland, and serves on the college's Alumni Council.

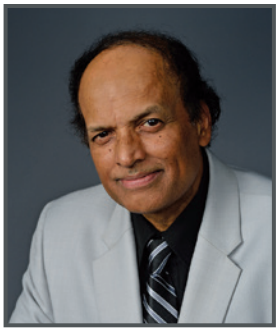
Lisa Carter – Leader and Musician



After Lisa Glasscock Carter (DVM '87) completed her doctor of veterinary medicine, she quickly became an integral member of Virginia's veterinary community. Throughout her career, she has led the Virginia Veterinary Medical Association, served as the Virginia delegate to the American Veterinary Medical Association, and received the Virginia Distinguished Veterinarian of the Year Award in 2008.

In February 2016, Carter was elected president of the Alumni Society Board. She's been a board member since 2008 and previously served on the Virginia Tech Alumni Association Board of Directors.

Carter works at the Augusta Valley Animal Hospital in Staunton and sings and plays guitar with a local blues band in her free time.



New leadership at the college

The college's senior leadership team has two new faces and one familiar one in a new role.

S. Ansar Ahmed, who serves as head of the Department of Biomedical Sciences and Pathology, has been named associate dean for research at the college. In his new role, Ahmed is responsible for developing and administering the college's research and graduate education missions, including its Biomedical and Veterinary Sciences M.S. and Ph.D. programs.

Alison Wainwright Davitt has joined the college as assistant dean of advancement. In this newly established role, she provides oversight of the college's development, communications, and alumni relations efforts. She previously held development positions for the Association of Zoos and Aquariums in Silver Spring, Maryland, and the Maryland Institute College of Art in Baltimore.

Laura Hungerford has joined the college as head of the Department of Population Health Sciences, which houses the Master of Public Health Program, the public and corporate veterinary medicine track, and international student programs. A veterinarian and epidemiologist, Hungerford hails from the University of Maryland School of Medicine in Baltimore.

South American partnership leads to research, educational opportunities

The veterinary college has been building upon its long-standing relationship with the Universidad Austral de Chile.

A student honors program leading to graduate education opportunities for Chilean veterinarians began in 1996. This partnership was recently expanded to include the University of San Francisco de Quito in Ecuador in a three-campus exchange involving two to four veterinary students from each institution. Last year, college leadership visited South America to identify new research collaborations.

"I led a delegation to discuss possible research collaborations that would build on the strengths of the two colleges and emphasize the role of One Health in solving healthcare challenges," Clarke said.

After these meetings, the two institutions established "seed" projects in the areas of infectious disease control, novel vaccine delivery systems, and animal welfare and the human-animal bond.

AWARDS & ACCOLADES

Clay Caswell, assistant professor of bacteriology in the Department of Biomedical Sciences and Pathobiology, was recognized as a Teacher of the Week by The Virginia Tech Center for Instructional Development and Educational Research.

Ludeman A. Eng, associate professor in the Department of Biomedical Sciences and Pathobiology, has been conferred the title of "associate professor emeritus" by the Virginia Tech Board of Visitors.

Cindy Ingram of McLean, Virginia, received the Distinguished Service Award from the Marion duPont Scott Equine Medical Center (EMC). Ingram, who has been an active member of the EMC Advisory Council since 2001, is the fourth recipient of the EMC's highest honor.

Thomas J. Inzana, the Tyler J. and Frances F. Young Chair in Bacteriology in the Department of Biomedical Sciences and Pathobiology, has published a reference textbook for veterinary practices and investigators studying bacterial pathogenesis on one of the leading causes of bovine respiratory disease called "*Histophilus somni*: Biology, Molecular Basis of Pathogenesis, and Host Immunity."

Tom Kerkering, professor of internal medicine at the Virginia Tech Carilion School of Medicine and adjunct professor in the college's Department of Population Health Sciences, received the Medical Society of Virginia Foundation's Salute to Service Award for International Service. The Salute to Service Awards recognize the outstanding efforts by a physician, medical student or resident that have substantially improved patient care, both locally and abroad.

X.J. Meng, University Distinguished Professor of Molecular Virology, received the 2017 State Council of Higher Education for Virginia Outstanding Faculty Award. Last year, he was elected a member of the National Academy of Sciences, one of the highest honors given to a scientist in the United States.

Nathaniel A. White II, professor emeritus of equine surgery at the Marion duPont Scott Equine Medical Center, was awarded the Al & Carolyn Schiller Distinguished Service Award by the American College of Veterinary Surgeons (ACVS). The award recognizes individuals who have demonstrated unusual and meritorious services to the ACVS.

Anne Zajac, professor of parasitology in the Department of Biomedical Sciences and Pathobiology, was awarded the 2016 AAVP-Merial Distinguished Veterinary Parasitologist Award by the American Association of Veterinary Parasitologists (AAVP), the organization's

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Upcoming Events

March 25 — 2017 Annual College Open House, *Blacksburg, VA*

April 7 — VMCVM Spring Awards Luncheon, *Blacksburg, VA*

April 23 — Spring Dog Wash, *Blacksburg, VA*

May 12 — DVM Commencement ceremony at the Moss Arts Center, *Blacksburg, VA*

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It's always a great time to give! By helping us to advance our strategic priorities and fulfill our mission of training veterinarians, your gifts also benefit pet owners, industry, and society at large.

To support the college or learn more about ways to give, contact our Development Office at 540-231-0465 or visit us online at www.vetmed.vt.edu/development

Join the Conversation!

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Above: The first cohort from the veterinary college's puppy raiser program graduated in early December. The college teamed up with Saint Francis Service Dogs, a Roanoke-based nonprofit, to raise the three puppies for service dog training. The charter class of "Puppy University" — Koda, Esme, and Tucker — spent their weekdays at the college where they learned foundational skills like walking on a leash or traveling on a bus.

The program not only supports puppies on their path to become professionally trained service dogs, but also offers students important lessons on the human-animal bond. Veterinary student puppy raisers have the option of earning course credit during their fourth year, and six undergraduate work-study students supported the care and training of the puppies.