University of Missouri, College of Veterinary Medicine News

July - December 2022

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Mohan Recipient of More than $2 Million in Research Grants

Rajiv Mohan, MS, PhD, a professor of ophthalmology and molecular medicine in the CVM, was recently awarded three separate grants totaling more than $2 million for ongoing research. The National Institutes of Health funded two grants with the third awarded by the United States Department of Veterans Affairs.

Rajiv R. Mohan

The first award from the NIH supports Mohan's research as a co-investigator on diabetic retinopathy. The title of the research is, "The Role of S100 Proteins in Diabetic Retinopathy." This grant provides $500,000 in funding. The second NIH award totaling $429,000 is for Mohan's research as a co-principal investigator on chemical toxicity to the eye. The title of this research is, "Hydrogen Sulfide Toxicity to the Cornea."

The third award, a Veterans Affairs Merit Grant, will fund development of nanomedicine for treating corneal scarring. The title of this research is, "Targeted Gene Therapy and Nanomedicine Approaches to Treat Corneal Diseases." The grant provides funding of $1.1 million beginning in October.

By Nick Childress

Philip Johnson Named ACVIM Lifetime Achievement Award Recipient

Philip Johnson, a University of Missouri College of Veterinary Medicine professor of equine internal medicine, was recently presented the American College of Veterinary Internal Medicine Specialty Lifetime Achievement Award in the specialty of large animal internal medicine. Johnson, BVSc, MS, MRCVS, DACVIM-Large Animal Internal Medicine, DECEIM, who has been with the CVM since 1991, has been involved with the ACVIM since his time as a resident at the University of Illinois. He is a regular at the annual ACVIM Forum and has presented talks and served on various committees within the organization throughout the years. Johnson was presented with the award at the 2022 ACVIM Forum in Austin, Texas on June 24.

Johnson emphasized that his teachers are what led him to this award. “I have been fortunate that, throughout my career, I have been surrounded by amazing teachers with vast experience in veterinary clinical medicine,” said Johnson. “I have tried to emulate their teaching style, always being generous with regards to sharing knowledge and experiences.”

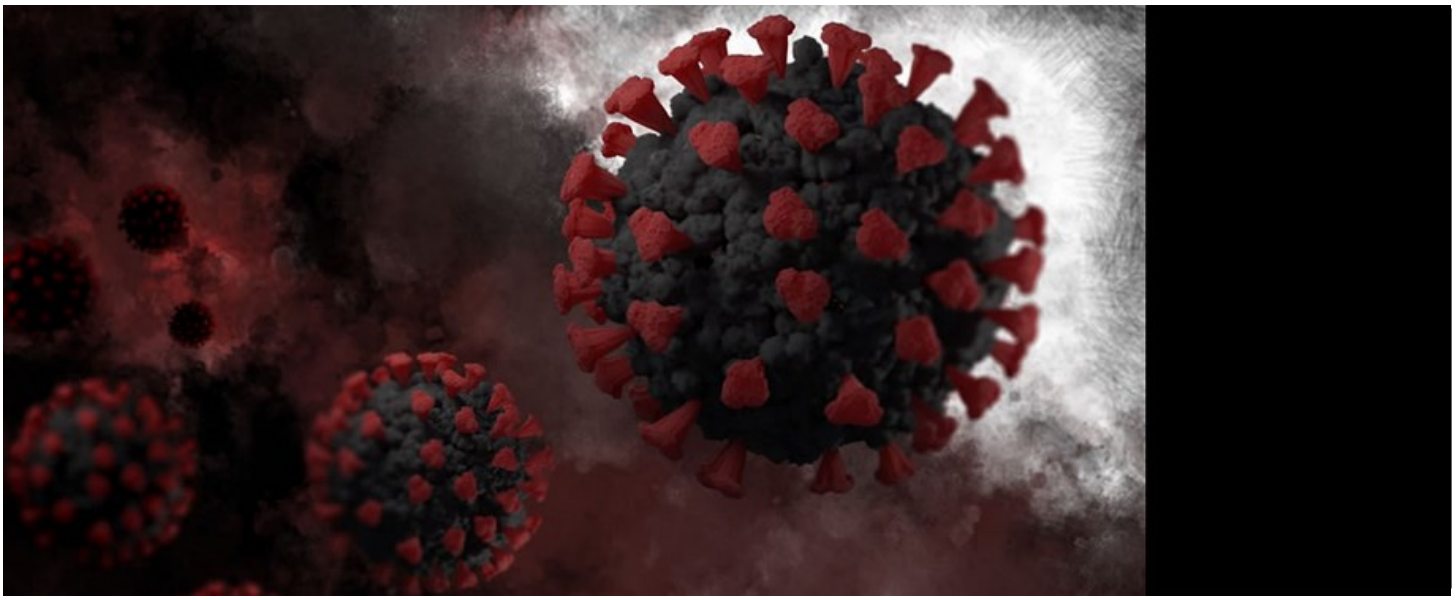
Among Johnson’s career highlights are receiving the Grayson-Jockey Club’s Dubai Millennium Memorial Equine Research Award, recognition as an MU CVM Top Faculty Achiever, invitations to speak at a number of international meetings, induction into the International Equine Veterinarian Hall of Fame and multiple teaching awards from the MU College of Veterinary Medicine.

Johnson said bestowing the values that his teachers taught him has created some of the most important highlights of his career in veterinary medicine. “As a teaching academician, many of the highlights of my career have involved seeing the positive outcomes of student learning and the results of research that have hopefully contributed knowledge and understanding to the health and well-being of horses,” he said. “Having been centrally involved with training veterinary students for so many decades, the memories, voices, and wisdom that I have received from my teachers and mentors thoroughly invests the words and actions that I have used and continue to use in the veterinary teaching environment.”

Lynn Martin, DVM, MPH, DACVIM-Large Animal Internal Medicine, an assistant teaching professor of equine internal medicine at the CVM, helped draft the nomination for Johnson’s award. In a press release from the ACVIM she said, “I have been exceptionally fortunate to have worked with Dr. Johnson throughout my veterinary career. You cannot find a more approachable, enthusiastic and passionate mentor in the clinic or classroom, and his continuous curiosity naturally leads to research and discovery. Just a brilliant individual!”

The ACVIM commended Johnson’s dedication to the veterinary profession and research that led to this honor. “Throughout his career, Dr. Johnson contributed to our collective understanding regarding the disease processes that lead to laminitis, an obviously important disease for hoses, ponies and the horse industry overall.”

By Nick Childress



Clever COVID-19

MU researchers show how the evolving virus evades antibodies from vaccines, previous infections.

As new Omicron subvariants of COVID-19 continue to sweep across the United States, researchers at the University of Missouri have identified specific mutations within the virus' spike protein that help Omicron subvariants evade existing antibodies humans have from either vaccines or previous COVID -19 infections. These mutations help explain why some people are continuing to test positive for the coronavirus, which, like most viruses, continues to evolve.

The findings can help developers of COVID-19 treatments and vaccines consider which parts of the virus to target going forward to produce the most effective outcomes.

Kamlendra Singh

Kamlendra Singh, a professor in the MU College of Veterinary Medicine and Christopher S. Bond Life Sciences Center principal investigator, collaborated with Saathvik Kannan from Hickman High School in Columbia and MU undergraduate student Austin Spratt, to analyze protein sequences from more than 10 million Omicron-related coronavirus samples collected since November 2021 from around the world. Singh, Kannan and Spratt have worked together to analyze protein sequences from COVID-19 samples since 2020, including the identification of specific mutations for both Delta and Omicron variants.

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“Throughout the pandemic, the virus has continued to get smarter and smarter. Even with vaccines, it continues to find new ways to mutate and evade existing antibodies,” Singh said. “Omicron now has more than 130 sublineages, and they have been here for quite a while. We are now just finally able to detect them and differentiate among them with this research. Previous variants, including Alpha, Beta, Gamma and Delta, contributed to many of the mutations occurring now with these Omicron variants. So our research shows how the virus has evolved over time with new mutations.”

Singh said that as the pandemic progresses, new variants and their sublineages will continue to evolve going forward. Additionally, investigators are beginning to see individuals infected with a combination of two variants, such as Delta and Omicron variants simultaneously.

“Vaccinated individuals or those that have previously tested positive may have the antibodies for one variant but not necessarily for any of the other variants,” Singh said. “The various mutations may seem like only subtle differences, but they are very important.”

Singh said that similar to the influenza virus, the coronavirus is likely never going to vanish from society, but new vaccines can be developed to target the virus’ most up-to-date version. However, with how rapidly the coronavirus has been mutating, the vaccines may become less effective over time.

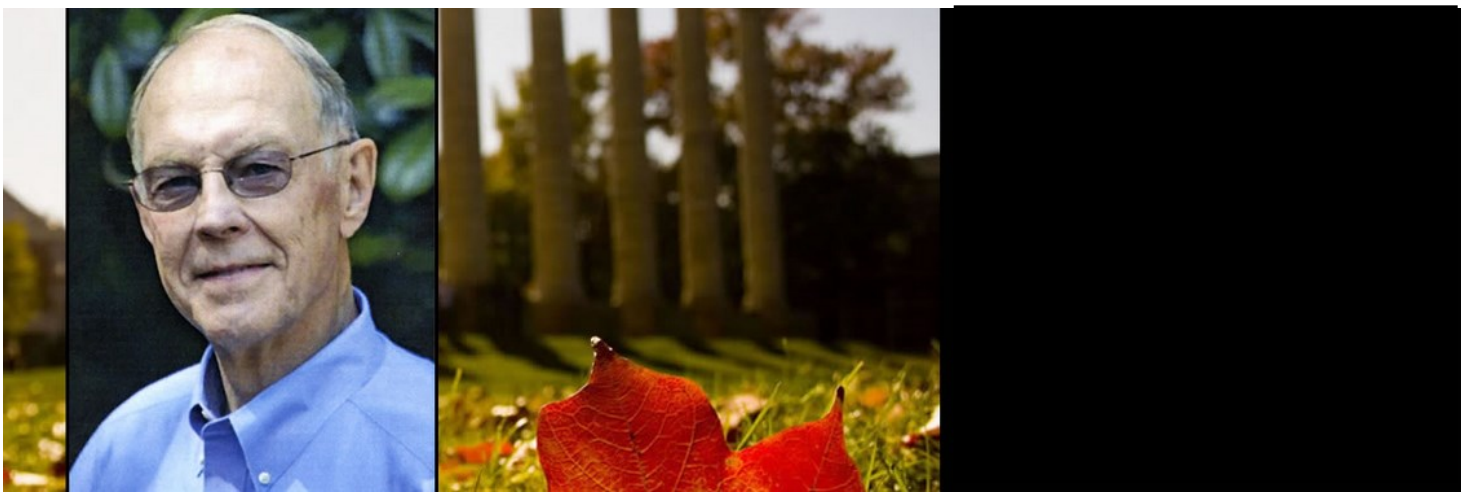
“The ultimate solution going forward will likely be the development of small molecule, antiviral drugs that target parts of the virus that do not mutate,” Singh said. “While there is no vaccine for HIV, there are very effective antiviral drugs that help those infected live a healthy life, so hopefully the same can be true with COVID-19.”

Recently, Singh, who has tested positive for COVID-19 multiple times himself, helped develop CoroQuil-Zn, a supplement that can be taken while infected with COVID-19 to help reduce one’s viral load. The supplement, which is currently being used by patients in India, southeast Asia and Great Britain, is awaiting FDA approval for use in the United States.

“I am proud of my team’s efforts, as we have identified specific mutations for various variants throughout the pandemic, and it feels good to be contributing to research that is assisting with the situation,” Singh said. “We will continue to help out, as there will surely be new variants in the future.”

“Complex mutation pattern of omicron BA.2: Evading antibodies without losing receptor interactions” was recently published in the *International Journal of Molecular Sciences*. Funding for the study was provided by the National Institute of Allergy and Infectious Diseases, the National Strategic Research Institute at the University of Nebraska, and the Christopher S. Bond Life Sciences Center.

Story courtesy of Show Me Mizzou
Story Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu



Retired Associate Dean Ronald L. Terjung Passes Away

Ronald L. Terjung

Ronald L. Terjung, PhD, passed away on Jan. 9, 2022, in Atlanta, Georgia, at the age of 80. He was born on July 5, 1941, in Lincoln, Illinois, the son of pastor George and Martha Terjung. He spent his formative years in Akron, Ohio.

He graduated from Wheaton College in Illinois. It was there that he met Carol Preedy. They were married Aug. 25, 1962. He earned a master's degree from San Jose State in 1965 and a doctorate in physiology from the University of Iowa in 1970. During that time, a daughter, Kathryn, was born. He completed a postdoctoral program at Washington University School of Medicine in St. Louis, Missouri.

Terjung dedicated his long and distinguished career to a vast amount of specialized physiology research along with teaching first-year medical and veterinary students. He began his career at the University of Illinois, Urbana-Champaign. During that time, the Terjungs' son, Steven, was born. The family moved to Syracuse, New York, where Terjung was a professor of physiology at the State University of New York's Health and Science Center for 20 years. In 1997, the Terjungs moved to Columbia, Missouri, where he was a professor and the associate chair of the University of Missouri College of Veterinary Medicine Department of Biomedical Sciences. He also served as the associate dean for research and graduate studies at the CVM. He was also professor of physiology at MU School of Medicine and a senior research investigator at the Dalton Cardiovascular Research Center.

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Terjung had conducted research with the Polish Academy of Science. In addition to several other awards and honors throughout his career, he was presented with an Honorary Doctorate at the Medical University in Bialystok, Poland in 1993. He was invited to lecture at numerous universities, conferences and symposiums across the United States and the world. In addition to being actively involved in the American Physiological Society and the American College of Sports Medicine, he served on an Olympic committee, the Gatorade Sports Science Institute Board and the National Institute of Health as a grant reviewer. He wrote and edited many books and manuscripts.

He enjoyed sponsoring many special students, postdoctoral fellows and sabbatical visitors. He loved mentoring and engaging with these people and his colleagues over the years.

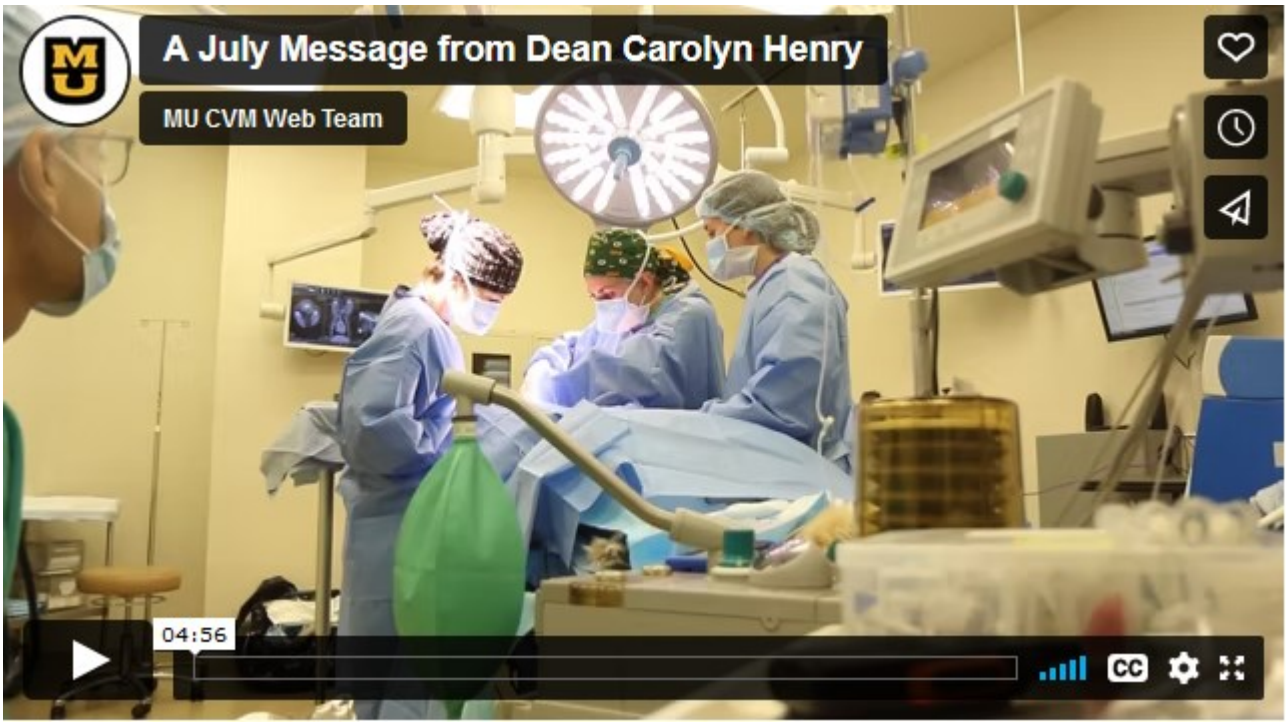
He retired to Atlanta to invest more time with his grandchildren. He delighted in taking family water skiing, tubing behind his boat, and making homemade ice cream.

As a lifelong athlete, Terjung enjoyed sports of all kinds. He played football at Wheaton College and was on the team that went undefeated in 1961. He was also an avid cyclist.

He is survived by his wife, Carol, and their two children, Kathryn (Weir) Kary and husband, Jason, and Steven and wife, Missy, along with their children Ellie, Audrey Kate, and Mason; sisters Joyce Mugg and Joan (Mark) Denholm, and brother Dale (Gayle) and their families. He was preceded in passing by his brother, Russell, brother-in-law, Jim Mugg, grandnephew, Benjamin Mugg, and son-in-law, Chuck Weir.

Written condolences may be left for the family at www.TitusFuneralHome.com.

The D.V.M. – The Dean's Video Message (July 2022)



In this month's Dean's Video Message, veterinary students talk about the strengths of the MU College of Veterinary Medicine and why they chose Mizzou for their professional training.

View the archive.

Prenatal Opioid Exposure May Trigger Neurological, Behavioral Changes Later in Life

MU study links changes in gut bacteria to prenatal exposure to oxycodone, a commonly abused opioid during pregnancy.

While infants exposed to opioids during their mother's pregnancy have been linked to adverse health outcomes, a new study at the University of Missouri has found prenatal opioid exposure could trigger long-term neurological or behavioral effects later in a child's life.

The key is the opioid's impact on the developing fetus' gut microbiome – a collection of bacteria and other microorganisms that naturally live inside the guts of all humans and animals and can serve as a barometer for overall health and wellness.

Cheryl Rosenfeld, a professor in the MU College of Veterinary Medicine, collaborated with Trupti Joshi, an assistant professor in the MU School of Medicine, to compare the gut microbiome of adult mice who were exposed during gestation to oxycodone, a commonly abused opioid that treats pain, in utero with the gut microbiome of mice who were not exposed to any opioids.

"Opioids are increasingly being prescribed to pregnant women to treat pain, yet when they are consumed, we are learning it is not just the mother who is being exposed, but also the fetus at a time when their organs are still developing," Rosenfeld said. "These findings highlight the potential long-term health effects for the offspring, not just when they are born, but well into adulthood as well."

After collecting fecal matter from both groups of mice at 120 days of age, the researchers identified significant changes and disruptions to the natural balance of bacteria in the guts of the mice who were exposed to oxycodone in utero. These changes were linked with alterations in metabolic pathways, which impacts metabolism and potentially both neurological and behavioral health long-term.

Rosenfeld added that the gut microbiome of humans is very similar to the gut microbiome of mice, making the animal a useful biomedical model for translational and precision medicine research.

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“While this research can lead to human studies down the road, those can take 20 to 30 years due to the much longer lifespan of humans compared to mice,” Rosenfeld said. “The opioid epidemic, one of the biggest public health crises facing the United States, is causing real harm right now, so our goal is to raise immediate awareness and hopefully protect the health and well-being of women who are currently pregnant or seeking to become pregnant and their offspring from the potential negative and longstanding effects of opioids.”

The research is personal for Rosenfeld, whose niece was in utero when her sister-in-law was given Quaaludes to relieve anxiety. While her niece was born healthy and seemed fine early in childhood, she later developed respiratory issues, neurological issues and behavioral abnormalities in her teen-age years, and is now living in a nursing home in her 30s.

“For these children who were exposed to opioids in utero, there is also now an increased risk for them to get addicted to opioids themselves, so I do worry about them as they progress into adulthood,” Rosenfeld said. “Hopefully by identifying these correlations as early as possible, potential interventions can be developed and alternative treatment options can be discussed for dealing with pain in pregnant women.”

Joshi, a bioinformatics scientist in the MU School of Medicine’s Department of Health Management and Informatics, was a clinical doctor who occasionally assisted with pregnancies in India before coming to the United States to study bioinformatics.

“Genomic sequencing technology, bioinformatics tools and computational techniques can all be applied together to help us as researchers start to find the links that tie together our physiology and our overall health,” Joshi said. “We are starting to learn how changes in the gut microbiome can potentially impact one’s mood and mental health later on in adulthood. This research helps us start to better understand the gut-brain axis, as there is a lot of communication among the brain, central nervous system, endocrine system, immune system and gut microbiome.”

“Long-term effects of developmental exposure to oxycodone on gut microbiota and relationship to adult behaviors and metabolism” was recently published in the *American Society for Microbiology*. Funding was provided by the National Institute of Environmental Health Sciences. Co-authors on the study include Zhen Lyu, Robert Schmidt, Rachel Martin, Madison Green, Jessica Kinkade, Jiude Mao and Nathan Bivens.

Story courtesy of Show Me Mizzou
Story Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu

MU Veterinary Emergency and Critical Care Facility Certification Renewed

The Veterinary Emergency and Critical Care Society recently renewed the certification of the Small Animal Emergency and Critical Care Service at the University of Missouri Veterinary Health Center as a level II facility. The VECCS offers a certification program to veterinary hospitals that provide patients with emergency and critical care. The purpose of this certification is to recognize those hospitals that meet and exceed VECCS minimum standards and guidelines published by VECCS. VECCS established certifications in the hope of raising standards of care while also increasing public and professional awareness of veterinary emergency and critical care.

The certification program identifies three levels based on facility operating hours, equipment and personnel. VECCS identifies level II facilities as providing 24-hour acute care with the medical staff, personnel and training necessary to provide emergent and critical patient care. The facility must be open to receive small animal emergency patients 24 hours per day, seven days per week, 365 days per year.

The VHC's Veterinary Emergency and Critical Care Service treats cases that range from minor respiratory issues to severe trauma. Common emergencies that are treated include gastrointestinal issues from the ingestion of foreign bodies, as well as neurologic emergencies resulting in paralysis or seizures. Under the VECCS level II certification, it indicates that the facility at the CVM can diagnose and treat all these cases and more.

"What certification does is it basically tells the public what capabilities you have at your hospital," said Tony Mann, DVM, MS, director of Small Animal Emergency and Critical Care at Mizzou. "With all of the specialists we have in our hospital, it was very easy to satisfy the medical criteria."

More information regarding the certification requirements for a level II facility, can be found on the VECCS website at www.veccs.org under the facility certification tab.

CVM Welcomes New Faculty to Mizzou

The University of Missouri College of Veterinary Medicine recently welcomed new faculty members who are serving in a variety of roles.

Matthew Allen, DVM


Matthew Allen

Matthew Allen, DVM, is a clinical instructor in emergency and critical care. Allen is an alumnus of the CVM and most recently practiced emergency veterinary medicine in Las Vegas before returning to mid-Missouri in 2020. Allen's passion for emergency veterinary medicine, paired with his passion for teaching, what made this role a perfect fit. "In addition to teaching future veterinarians, being here also allows me to watch and learn from some of the smartest people in our field," said Allen. "As a veterinarian you can never stop learning, it is an ever-changing field, which is why it was so important to me have the opportunity to learn even more from the CVM faculty.

Wendy Picking, PhD


Wendy Picking

Wendy Picking, PhD, is has joined the CVM as a professor of veterinary pathobiology. Picking earned her PhD at the University of Kansas and has completed postdoctoral fellowships at the University of Texas at Austin, St. Louis University and Washington University. Picking most recently served University of Kansas as a research assistant professor in molecular biosciences. Picking says she is looking forward to continuing her development of subunit vaccines against bacterial pathogens and is excited to join the faculty at the CVM. "I look forward to developing projects with the colleagues that I have come to know over the years," said Picking. "I also look forward to developing interdisciplinary projects with new colleagues."

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William Picking, PhD


William Picking

William Picking, PhD, is serving the CVM as a professor of veterinary pathobiology. Picking, who is the husband of Wendy Picking, also attended the University of Kansas for his PhD and attended the University of Texas at Austin for a postdoctoral fellowship. Picking most recently served at the University of Kansas as the Foundation Distinguished Professor at the KU School of Pharmacy in the Department of Pharmaceutical Chemistry. William and Wendy Picking were both recruited to Mizzou through the Mizzou Forward program, which is an effort by Mizzou to strengthen innovation in research disciplines around the university. Picking says the CVM provides him the opportunity to continue developing his research with new colleagues. “Joining the CVM allows us to create new collaborations and professional relationships, and to see our research through fresh eyes with the possibility of adapting new methods to our work,” Picking said. “It is also an opportunity to be able to adequately apply the One Health philosophy to our research.”

Bess Pierce, DVM


Bess Pierce

Bess Pierce, DVM, DABVP, DACVIM, DACVSMR, has been hired as a teaching professor of veterinary sports medicine and rehabilitation. Pierce earned her DVM from Auburn University and then spent time in variety of roles within the United States Army Veterinary Corps, and most recently worked as a professor of veterinary medicine at Lincoln Memorial University College of Veterinary Medicine. Pierce’s role comes with the newly introduced clinical service and facility in sports medicine and rehabilitation, in which she is board certified. “This is a wonderful opportunity and I’m really passionate about teaching,” said Pierce. “This is a once-in-a-career opportunity, to build up the sports medicine and rehabilitation service and work with a really great group of folks.”

Luis Rivero, DVM


Luis Rivero

Luis Rivero, DVM, has taken a position as a clinical instructor of food animal medicine at the CVM. Rivero earned his DVM at the Virginia-Maryland College of Veterinary Medicine and completed his residency at Mizzou. It was that residency training that brought Rivero to Columbia where he honed his expertise in farm animal internal medicine. Rivero is excited to be a member of the CVM faculty while he teaches on cases in the Large Animal Hospital. “I’m joining a great team of clinicians who are passionate about teaching and patient care,” said Rivero. “I hope to contribute to this atmosphere and make it an even better one.”

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Kevin Shull, DVM

Kevin Shull, DVM, has joined the CVM as a clinical instructor of both shelter medicine and emergency services. Shull most recently worked as an adjunct instructor of shelter medicine at the CVM, beginning in October 2021. A Mizzou alumnus in both his undergraduate and veterinary studies, with a graduate certificate in shelter medicine from the University of Florida, Shull says that he has found joy in teaching. “I have discovered during my career that I enjoy teaching, and I have been blessed with many great teachers throughout all of my life that have inspired me to pursue this work full-time,” said Shull. “I was drawn to the CVM because it’s my alma mater, and it’s here where the foundation of my career was established.”

Kevin Shull

Jessica Thiele, DVM

Jessica Thiele, DVM, is serving the CVM as a clinical instructor of shelter medicine. Thiele is an alumna of the CVM and has most recently worked with the Central Missouri Humane Society and Columbia Second Chance. A Columbia, Missouri native, Thiele says this role is a good fit professionally and personally. “Practicing and teaching shelter medicine, in a supportive academic environment, while also doing so much good for the community through MU’s shelter and rescue partnerships is fulfilling work,” said Thiele. “Columbia is also my hometown, which means I have family nearby. Education is incredibly important to me and it’s very meaningful for me to be trusted with helping students gain surgical skills and confidence while also giving them exposure to the unique challenges and rewards of shelter medicine.”

Jessica Thiele

Kile Townsend, DVM

Kile Townsend, DVM, MS, is serving the CVM as an assistant professor in equine medicine. Townsend received her DVM from the Atlantic Veterinary College in Prince Edward Island, Canada, and came to Missouri to pursue further training in equine medicine. She completed a residency at Mizzou in equine internal medicine and is now a board certified equine internal medicine specialist. “I was attracted to the CVM because of the strong equine program and supportive team,” said Townsend. “I’m now working in my dream job as teaching faculty on the clinic floor of the Equine Hospital and teaching veterinary students how to become veterinarians. I am excited to continue to push the boundaries of what we know and can perform in equine medicine and veterinary education.”

Kile Townsend

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Yoshimi Iwaki, DVM, clinical instructor of oncology

Amy Molitoris, DVM, clinical instructor of small animal emergency and critical care

Celeste Morris, DVM, MBA, MPV, assistant teaching professor of food animal ambulatory medicine

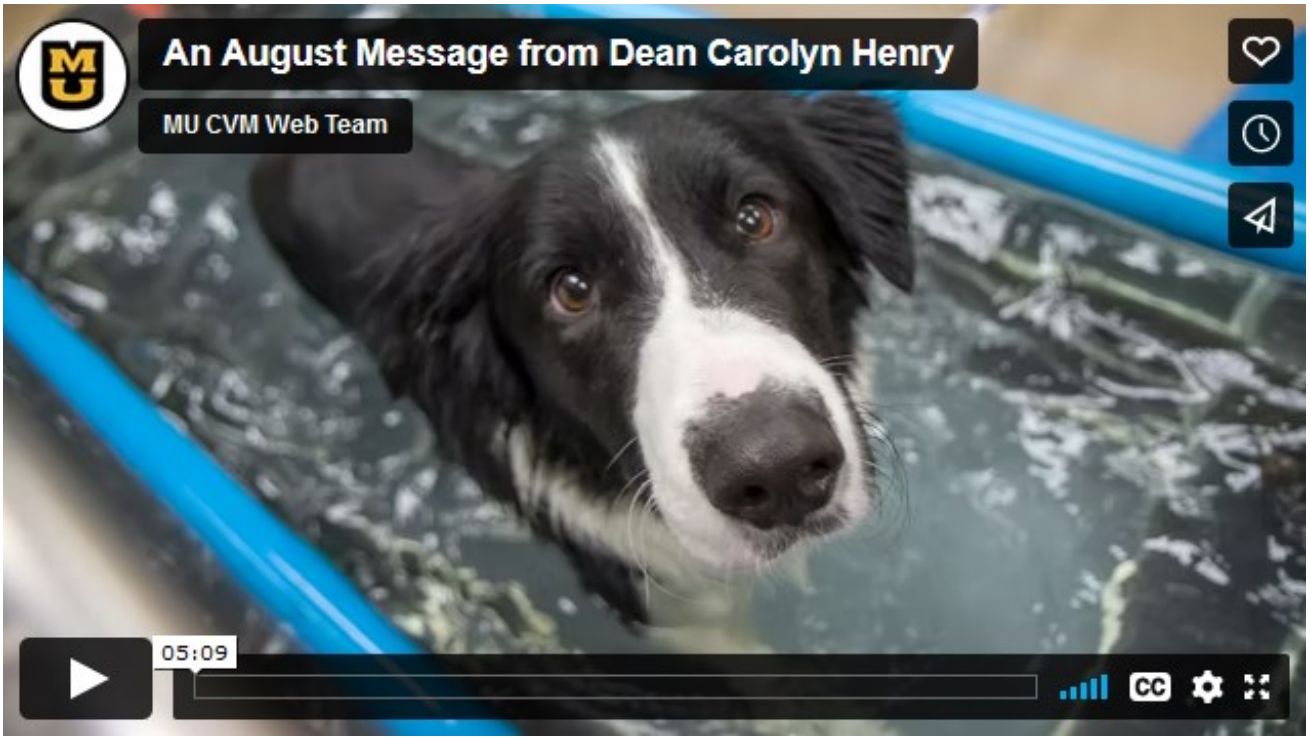
Celeste Morris

Jerry Toporis, DVM, assistant teaching professor of small animal emergency and critical care

Jerry Toporis

By Nick Childress

The D.V.M. – The Dean's Video Message (August 2022)



The MU Veterinary Health Center recently launched a new service that brings sports medicine and rehabilitation services to the region.

View the archive.

Veterinary Technician CE Event

OCTOBER 8 | 8 a.m. – 3 p.m. | Adams Conference Center

Download flyer

Track One

8-8:50 a.m – Angelina Johnson, RVT
Veterinary Anesthesia: Take the Trouble Out of Troubleshooting
9-9:50 a.m. – Laken Schwarzlose, RVT
Don't be an Airhead – Utilizing Capnography
10-10:50 a.m. – Alyssa Langsdorf, RVT
Cardiology – Canine Acquired Diseases
11a.m. – 12:50 p.m – Lunch and Tours
1-1:50pm – Joshua Berhorst, RVT
Neurologic Emergencies
2-2:50 p.m. – Anastasia Glahn, RVT , VTS (Oncology)
Oncology Emergencies: When Cancer Can't Wait

Track Two

8-8:50 a.m. – Michelle Biermann, RVT
Dental Exam and Charting
9-9:50 a.m. – Savannah Smith, RVT, ALAT
The Basics of Emergency Triage: A Technician's Role
10-10:50 a.m. – Erin Wiley, RT
Basics of Radiology
11a.m. – 12:50 p.m. – Lunch and Tours
1-1:50 p.m. – Danielle Hurd, RVT
Canine Hip Dysplasia
2-2:50 p.m. – Sia Early, RVT
Canine Reproduction and Artificial Insemination

Registration Information

Please send an email with your name and the hospital/clinic you are employed with, to Adrienne Siddens (siddensa@missouri.edu).
Registration is $40, payable by cash or check on the day of the event.

Equine Health Seminar 2022

Horse Owner Seminar: Keeping Horses Healthy
October 29, 2022

You are invited to the Horse Health Seminar Series and Open House, Oct. 29, 2022, at the University of Missouri College of Veterinary Medicine Adams Conference Center in Columbia. Join us for a series of educational talks covering a range of equine health topics. We will also offer tours of the Equine Hospital.

Download flyer

Register online

The Missouri Veterinary Medical Board has approved 6 hours of continuing education credit for veterinary technicians. Cost is $20 for general participants or $50 for CE credit.

Register online or contact Laura Graeler, LA office supervisor, at lbgd5k@missouri.edu or 573-882-3513.

We will revert to ZOOM format if COVID19 restrictions are imposed and disallow an in-person meeting.

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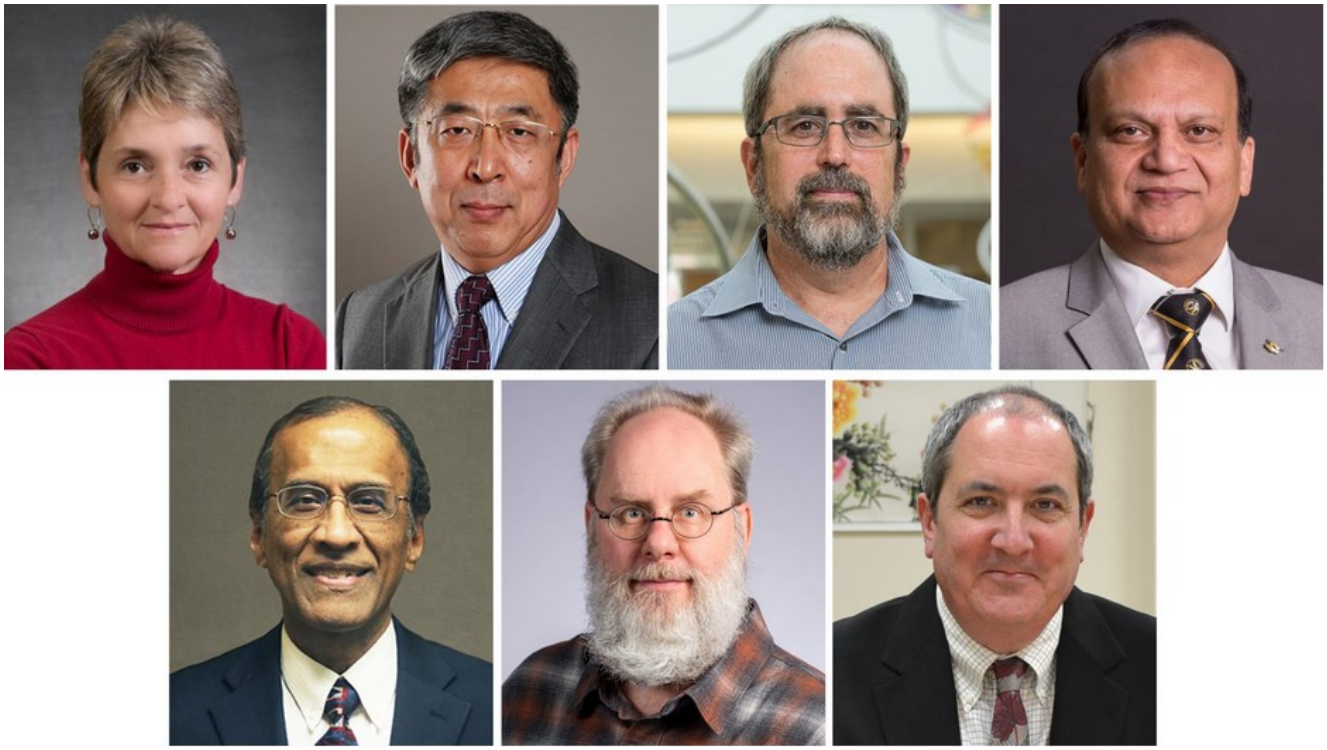
Schedule of Events

Time	Speaker	Title
9:00 – 9:25	Dr. Martha Scharf	Prevention and treatment of choke
9:25 – 9:50	Dr. Kevin Keegan	Modern lameness diagnosis
9:50 – 10:15	Dr. Brianna Hamrick	Sudden onset severe lameness
10:15 – 10:40	Dr. Lyndsey Hayden	Surgical colic – common findings
10:40 – 11:00	**Mid-morning break**	
11:00 – 11:25	Dr. Joanne Kramer	Equine podiatry for clients – restoration of the foundered hoof
11:25 – 11:50	Dr. Alison LaCarrubba	Care of our geriatric horses
11:50 – 12:15	Dr. Kelly Gravitt	Horse care under extreme weather conditions
12:15 – 1:00	**Lunch break**	
1:00 – 1:25	Dr. Megan McCracken	Horse Sinus disease
1:25 – 1:50	Dr. Gabrielle Gonzalez	Preventing infections of the newborn foal
1:50 – 2:15	Dr. Kourtney Dowler	Equine ocular cancer
2:15 – 2:30	**Afternoon break**	
2:30 – 2:55	Dr. Alexandra Warren	How we treat wounds that involve joints
2:55 – 3:20	Dr. Tim Evans	How Fescue affects broodmares and newborn foals – part 1
3:20 – 3:45	Dr. Lynn Martin	How Fescue affects broodmares and newborn foals – part 2

Sponsors

- Missouri Horse Council
- MFA Incorporated

Seven MU faculty named Curators' Distinguished Professors



Top row: Dorina Kosztin, Hongbin Ma, Ron Mittler and Rajiv A. Mohan
Bottom row: Kannappan Palaniappan, Thomas Sewell and John C. Walker

Sept. 15, 2022

The University of Missouri Board of Curators recently named seven University of Missouri faculty members Curators' Distinguished Professors. A Curators' Distinguished Professorship is the highest and most prestigious academic rank awarded by the Board of Curators. It is awarded to a select few outstanding scholars with established reputations. This year's recipients are:

- Curators' Distinguished Teaching Professor: Dorina Kosztin, teaching professor and associate chair of the Department of Physics
- Curators' Distinguished Professor: Hongbin Ma, chair and Glen A. Barton Professor of the Department of Mechanical and Aerospace Engineering
- Curators' Distinguished Professor: Ron Mittler, professor of plant science and technology
- Curators' Distinguished Professor: Rajiv Mohan, Ruth M. Kraeuchi Missouri Endowed Chair of Ophthalmology, professor of ophthalmology and molecular medicine
- Curators' Distinguished Professor: Kannappan Palaniappan, professor of electrical engineering and computer science
- Curators' Distinguished Professor: Thomas Sewell, professor of chemistry, adjunct professor of mechanical and aerospace engineering

Additionally, John C. Walker, emeritus professor of biological sciences, was named Curators' Distinguished Professor Emeritus.

MU VMDL Earns Five-Year Accreditation from AAVLD

The American Association of Veterinary Laboratory Diagnosticians recently awarded a renewal of full accreditation to the University of Missouri College of Veterinary Medicine Veterinary Medical Diagnostic Laboratory. The renewal is a five-year accreditation of the facility and its operators. The VMDL's previous accreditation cycle ends Dec. 31, 2022. The renewal runs from January 2023 to December 2027.

The current facility has space and biosecurity limitations. However, groundbreaking for a $30 million renovation and expansion of the VMDL will take place on Friday, Sept. 14. The AAVLD considered the 34,200-square-foot expansion plans when evaluating the capacity of the current facility. The larger, renovated facility will accommodate the requirements for full accreditation.

Mizzou's VMDL performs more than 167,000 diagnostic tests annually and plays a major role in the early detection, testing and post-outbreak of foreign and emerging animal diseases, including avian influenza, African swine fever, foot-and-mouth disease, rabies and chronic wasting disease.

Shuping Zhang, PhD, MU Veterinary Medical Diagnostic Laboratory director and CVM professor, said the full AAVLD accreditation means that the facility meets the highest standards for veterinary diagnostic laboratories in the United States. "It certainly ensures our capacity, capability and excellence in diagnostic services," says Zhang. "That means our clients and our patients will receive the best possible service, and our students and residents will receive the highest possible standard of education. It also means that our reports and diagnoses are recognized nationally and internationally, as well as making us eligible for external funding from the USDA."

The AAVLD accredits public veterinary diagnostic laboratories in North America relative to technical and operational competence compatible with appropriate standards. The agency also provides an administrative assessment. An accredited laboratory is one that can provide a full range of diagnostic services year-round in essential disciplines: necropsy, histopathology, clinical pathology, bacteriology, virology, mycology, parasitology, serology and toxicology.

AAVLD accreditation ensures a high-quality laboratory diagnostic program for veterinary education and research. It also assures VMDL clients that results are accurate, faculty and staff are competent, facility and equipment are adequate and properly maintained, all procedures are documented, and results are recognized by other accredited laboratories. Results from an accredited laboratory are accepted by other countries for live animal or animal products export, which is critical to the success of Missouri's animal agricultural industry and economy.

By Nick Childress

Groundbreaking Ceremony Celebrates Diagnostic Laboratory Addition

The University of Missouri held a groundbreaking ceremony Friday to mark the beginning of a project to expand and renovate the College of Veterinary Medicine Veterinary Medical Diagnostic Laboratory. Plans include building a 34,200-gross-square-foot addition to the existing building, which will also undergo renovations.

The cost of the project is $30 million, which is being funded by the State of Missouri, which provided $15 million, the MU College of Veterinary Medicine, which contributed $10 million, private gifts totaling $3.5 million, and the University of Missouri, which provided $1.5 million.

The existing VMDL was constructed in 1974 and comprises 21,144 gross square feet. It no longer meets space needs and is not conducive to implementing current biosecurity and biosafety protocols.

UM System President Mun Choi addresses the group gathered to witness the groundbreaking for the Veterinary Medical Diagnostic Laboratory.

Today's groundbreaking ceremony included remarks from UM System President Mun Choi, who noted the significance of the groundbreaking.

"This is a big deal because this investment shows that the University of Missouri cares about its roots in agriculture, animal science, and veterinary medicine," Choi said. "And through this investment, we will be able to meet not only our student success objectives, but research objectives that are tied in very closely to engagement with the agriculture community here in the state. In this state, there are more than 450,000 workers in this very important industry, and the industry contributes more than $94 billion to the economy. So, it is the most important industry in the state. It helps to not only feed the world but clothe the world, and the College of Vet Medicine is going to play a key role in ensuring that this investment will pay off."

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MU Provost Latha Ramchand also addressed the gathering. Ramchand spoke about the pride the university has in fulfilling its land-grant mission.

“Today is about reaffirming our commitment to every citizen in the state who is directly or indirectly impacted by the work we do,” Ramchand said. “And of course, there is a personal angle to this. The VMDL, as I’m sure many of know, is also about finding solutions to human health. (VMDL Director) Dr. Shuping (Zhang) takes pride in the fact that over the last couple of years, we’ve been on the forefront trying to do everything we can to test human samples in our fight against SARS-CV-2. And we could not do this without the work that is being done at the CVM and the VMDL,” she said.

College of Veterinary Medicine Dean Carolyn Henry spoke of some of the work that takes place within the VMDL and how the new facility will enhance the college’s service to the state.

“The VMDL team performs more than 167,000 diagnostic tests each year, and that provides support to veterinary practitioners, livestock and poultry interests, wildlife conservationists, researchers, and government officials and industry. The addition to the building will add 34,200 square feet. It will permit us to have separate receiving areas and laboratories for routine and high risk and foreign animal diseases so that we can prevent diseases from going beyond our borders by early detection,” she said.

VMDL Director Shuping Zhang offered her thanks to the VMDL faculty and staff as well as everyone who supported the VMDL expansion.

Other features will include space for client consultation, an after-hours sample drop-off area and space for laboratory teaching and research.

CVM alumni Missouri Rep. Kent Haden, DVM ’76, and Clark Fobian, DVM ’77 also shared remarks.

Haden spoke of the importance of the VMDL to provide rapid diagnoses to prevent disease outbreaks from spreading. He also related that the VMDL had provided support to him both as a farmer and as a foreign animal disease specialist for the state.

“I’m going to hold everybody to one health” he said. “Because any disease that we probably get in the future, or most, will probably be a transgenic disease,” he said.

Fobian, who was Haden’s lab partner while in veterinary school, spoke of the overlapping missions of the Missouri Veterinary Medical Association and the CVM and why the MVMA members had worked to gain support for the project.

“This laboratory, unlike any other in the state, has the full backing of the college, state-of-the-art equipment, it will have the infrastructure, we have unparalleled depth of expertise – the virologists, the toxicologists, the epidemiologists. We can bring it together here for the benefit of eliminating animal diseases and serving our population.

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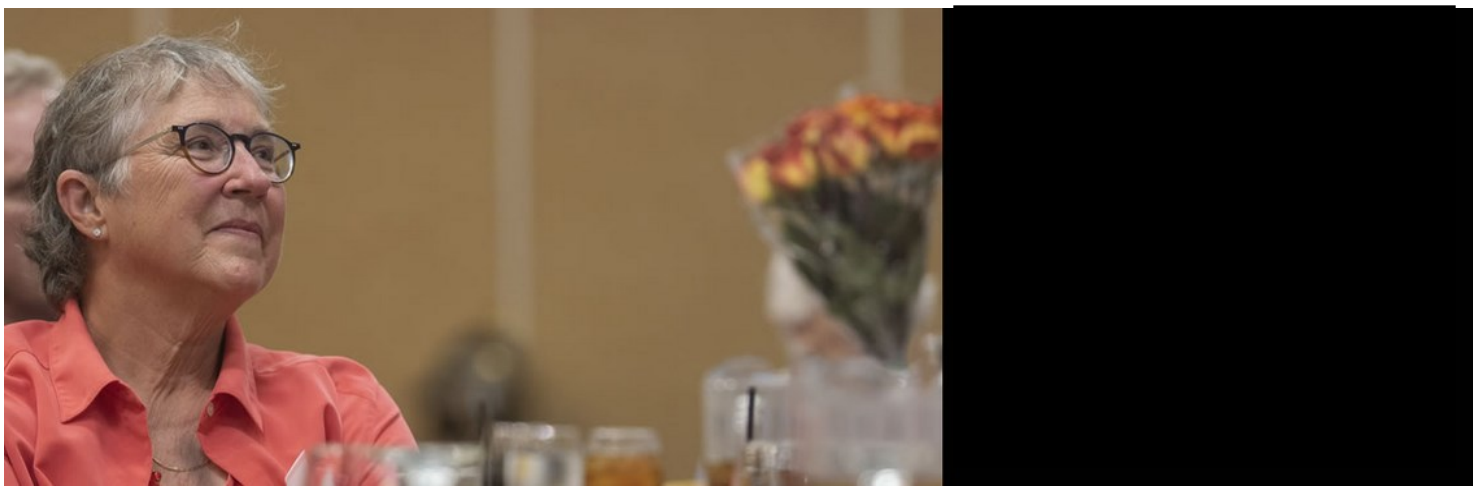
“It is a tool for the State of Missouri to fulfill the needs of its animal owning residents,” Fobian said.

VMDL Director Shuping Zhang was the final speaker. Zhang thanked Choi, Ramchand and Henry for their visionary leadership, lawmakers and leaders of state and government agencies for their support, the VMDL Advisory Board, and VMDL and college faculty and staff. Zhang also shared the news that the VMDL had recently received renewal of full accreditation from the American Association of Veterinary Laboratory Diagnosticians.

“Now with this great new facility, we will be able to enhance our biosafety, biosecurity, the testing capacity, and the capabilities to educate our students and residents to conduct animal health research and to provide much needed diagnostic services in order to protect and promote Missouri’s animal health, public health and agricultural economy,” Zhang said.

CVM Dean Carolyn Henry and VMDL Director Shuping Zhang celebrate the groundbreaking for the VMDL project.



CVM Alumna Honored for Disaster Response Efforts

The MU College of Veterinary Medicine held its annual Alumni Reunion Weekend Sept. 16-17, 2022, highlighted by the presentation of the Alumnus of the Year Award during the Friday evening banquet.

CVM Dean Carolyn Henry announced Mary Whitlock, DVM, a member of the CVM Class of 1981, as this year's honoree.

Whitlock was raised in Monett, Missouri, where her grandfather, who graduated in the last class of the Kansas City Veterinary College in 1918, was a veterinarian. As a little girl who loved cats, she aspired to be just like her grandaddy.

She graduated summa cum laude with a bachelor's degree in biology from what is now Truman State University. At the CVM, she was a member of Phi Zeta Honor Society, served as the VM-1 SAVMA representative, and was the third-year class president. She also received the Frank Wells Scholarship awarded to a third-year student.

MU College of Veterinary Medicine CVM Alumna of the Year Mary Whitlock, DVM, accepts her award from CVM Dean Carolyn Henry.

Whitlock began her professional career in a mixed animal practice in Omaha, Nebraska, and spent several months as a relief veterinarian in Missouri and Arkansas. She relocated to Eugene, Oregon, where she temporarily ran a solo practice for another veterinarian. She then purchased a one-doctor practice in Junction City, Oregon, a town of about 4,000 people, where she practiced for 27 years. She sold her practice in 2013 but continues to provide relief work for friends.

Whitlock said she learned the importance of giving back to one's community from her parents. Throughout her career she has given back, focusing on preparing for and providing help during disasters.

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Since 2008, she has worked with Lane County Animals in Disaster Response Team and the Oregon Veterinary Emergency Response Team. Her efforts have included coordinating fundraising and purchasing an emergency response trailer equipped with generators, lights, walkie-talkies, and large animal supplies. The trailer has been deployed to wildfire and flooding events and used during joint training between Lane County Animals in Disaster and Red Cross volunteers.

She also participated in annual disaster response training with the Oregon Veterinary Emergency Response Team and Oregon Department of Agriculture.

The countless hours spent preparing for an emergency have been put into service on numerous occasions, notably in 2018 when she joined a group of volunteers in Butte County, California, caring for more than 500 animals injured and displaced by one of the most devastating wildfires in California history.

The 2020 Holiday Farm Fire in Lane County, Oregon, burned more than 173,000 acres and 500 homes and offices from Sept. 7-30. Hundreds of residents were evacuated. Whitlock worked with Greenhill Humane Society, Lane County Animal Services and Lane County Emergency Management putting into place the county emergency response. She and another veterinarian set up a veterinary triage center to evaluate and treat animals emerging from the burn zone. She contacted colleagues to staff the triage center and assisted in ensuring Lane County Animal Services had large animal veterinary coverage available at another shelter. For three weeks she volunteered between 12 and 15 hours per day to help the animals and families affected by the fire.

In recent weeks, wildfires have again scorched her state, forcing evacuations, including a Level 3 evacuation of Oakridge, Oregon. Level 3 means “leave immediately.” Whitlock, along with the humane society disaster group volunteers, set up an animal shelter at the fairgrounds, co-sheltering next to the Red Cross shelter for people. During the first night of the evacuation, they checked in animals all night long as residents left their mountain homes.

“We had over a hundred people in our Red Cross shelter that had come down from Oakridge, a town of 3,500 people,” she said. The fire came within a mile of Oakridge, Oregon.”

“All night long these people came and they had nothing. They had the clothes on their back and their dogs and cats. And it’s the first time we’ve ever had a co-shelter, which means the Red Cross was right next to us, and we had 100-plus dogs and cats next door to them for five days. And thank God the wind shifted because otherwise Oakridge would have burned to the ground.”

Building on her experiences, Whitlock has authored papers and offered presentations to educate the public, veterinarians, vet students and techs to be ready for the next disaster. She encouraged her veterinary colleagues at the reunion to take a lead role in disaster response planning.

“This is a job veterinarians need to be doing in our communities. … This is a role in disaster response, in disaster animal response, that we, as veterinarians, need to realize, that is our job.”

Other Alumni Reunion Weekend activities included a tailgate brunch prior to the Mizzou Tigers football game versus Abilene Christian, tours of the Veterinary Health Center, rides with the CVM Mule Team and a 50-year reunion dinner for the CVM Class of 1972.

Retired VHC Technician Jane Ebben Passes Away

Jane M. Ebben, 67 of Columbia, Missouri, died unexpectedly Tuesday, Sept. 13, 2022. She worked at the University of Missouri Veterinary Health Center for 35 years before retiring in July of 2021.

She was born on June 29, 1955, in Neenah, Wisconsin, to Robert and Margaret (Sensenbrenner) Williams. She married her high school sweetheart, and together they relocated to the West Coast, living in Washington for 10 years before returning to Minnesota where they had their daughter, Kessa.

Ebben loved horses and attended school to become a veterinary technician. She began her career at the University of Minnesota, where she helped start the neonatal foal unit. Six years later, she moved to Missouri and continued her career at Mizzou as a large animal medicine specialist. As section head, she was the go-to person on most equipment issues and many aspects of the biosecurity program. With equipment problems she would investigate the cause and research options for repair or replacement as necessary. From the biosecurity perspective, she would minimize risk factors while still providing efficient and client-friendly workups. She was passionate about the horses she cared for and was known for demonstrating compassion to both animals and their owners. When there was a loss of a beloved horse, Ebben would give the family a braided section of the tail as a keepsake.

She was a mentor to both colleagues and students. She was known for her sense of humor and ability to make friends and colleagues laugh. She welcomed many rescues throughout the years. She enjoyed taking her dogs for walks on the trail close to her house.

She leaves behind her daughter, Kessa (Michael), and grandsons Jeremiah and Malachi, sisters Anne (Bob) and Mary, sister-in-law, Lynne, brothers Chuck (Becky), Jim (Deb), and Bob (Lori), nieces, nephews, great nieces and nephews, and her devoted pups.

She was preceded in death by her parents and a brother, John.

Ebben will be missed by her many friends and family alike, especially her dear friend, Nellie. There will be a celebration of her life with the details to be determined.

CVM Students Participate in Wildlife and Conservation Externship in South Africa

This past July, a group of students from the University of Missouri College of Veterinary Medicine traveled to Rooiberg, South Africa, with the goal of gaining hands-on experience in wildlife veterinary medicine and conservation. Students transitioning into their third year at the college had the opportunity to join the two-week externship.

The group of 11 students worked with a variety of animals that they would not typically gain experience with during their veterinary education at Mizzou. “We mainly worked on Cape Buffalo and different types of antelope, such as roan and sable antelope, oryx, and black and white impala,” said Cassie Berlin, a third-year veterinary student. “We were also fortunate to work with black and white rhinos, cheetahs, a giraffe, a wildebeest, goats and Ankole cows.”

The trip was organized by Ron Cott, DVM, a CVM alumnus and the former associate dean for student and alumni affairs and executive director of advancement. Cott began organizing the Africa externships in 2010 when he was serving as associate dean. The venture became an annual event until Cott’s retirement in 2018. He resumed organizing trips for student groups in 2019 as an independent venture separate from the college. COVID prevented students from traveling to Africa in 2020 and 2021.

CVM students and wildlife veterinarian Andy Fraser pose next to a sedated cheetah.

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Berlin said Cott contacted her class to gauge their interest in visiting South Africa in the fall of 2021. “Dr. Cott organized the trip for us and has done it many times in the past for students at Mizzou,” said Berlin. “Our group collectively figured out what we wanted to do with our time there, as well as fundraising. We had monthly meetings to stay up to date, especially with new COVID vaccine policies.”

CVM students, Andy Fraser, and local workers assist in transporting a giraffe.

Andy Fraser, the local wildlife veterinarian who worked with the group, aimed to ensure the students gained as much hands-on experience as possible. Student Leigh Coonelly said their duties were always changing. “Every day was something different,” said Coonelly. “We were often tasked with administering vaccines and other preventive injections, as well as practice in safely restraining the animals, applying topical anti-parasitic medications, taking rectal temperatures, ear tagging, drawing blood samples, pregnancy checking, and reversing the immobilization drugs so the animals could wake up and be on their way.”

Coonelly praised their local mentor. “Dr. Fraser, the South African veterinarian who worked with and mentored us, was so knowledgeable and a wonderful teacher,” said Coonelly. “I learned so much about how to safely interact with and treat very large and potentially dangerous wild animals, and how this safety is important to both the animals and the humans working with them.”

The range of exotic animals created learning opportunities for students that otherwise may have been unavailable. Student Amy Wilhelm detailed some of these opportunities. “I learned about wildlife management, conservation efforts such as dehorning rhinos, drug selection for sedation of a variety of animals, how to wield a CO2-powered dart gun, which diseases are prevalent in the populations we were working with, and so much more,” said Wilhelm.

“I know it’s cheesy to say, but I truly believe this trip changed my life,” said Berlin. “I have dreamed about traveling to South Africa to work with the beautiful wildlife since I was 7 years old, and this trip was beyond what I could have imagined. It’s hard to remember why you entered veterinary school with all the stress we deal with on a daily basis, but this trip was exactly the reminder I needed to keep pushing myself.”

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“To me, this trip meant getting the opportunity to expand my veterinary curriculum in a hands-on manner,” said Wilhelm. “It also allowed me to travel to a new country and experience a new culture, thereby becoming a more educated, well-rounded individual.”

“This trip was truly amazing,” said Coonelly. “Every day I found myself wondering if it was real. The country and its animals were so beautiful, and the people we met were beyond gracious and kind to us. I got so much more hands-on experience than I ever expected and did things that not many people get to do. I’m so grateful to be part of the veterinary profession where we get the opportunity to work with such amazing animals and people.”

By Nick Childress

VM3 Cassie Berlin vaccinates a sable antelope.

Siteman to Collaborate with MU Health Care on Cancer Research, with Aim to Improve Care

Cancer research will get a boost in Missouri through a new collaboration between Siteman Cancer Center and MU Health Care's Ellis Fischel Cancer Center in Columbia. The aim is to improve cancer care throughout Missouri. Siteman is based at Barnes-Jewish Hospital and Washington University School of Medicine in St. Louis.

A major focus of the collaboration involves scientists at both institutions teaming up on research projects and jointly pursuing competitively funded research grants, including those supported by the NCI of the National Institutes of Health (NIH). The collaboration also will enhance efforts in cancer prevention.

Siteman Cancer Center is the only National Cancer Institute (NCI)-designated Comprehensive Cancer Center in Missouri. Such comprehensive cancer centers meet rigorous standards for cutting-edge research across multiple disciplines with the goal of developing new and improved methods to diagnose, treat and prevent cancer. Since 2015, Siteman also has held NCI's highest rating – "exceptional" – based on a rigorous review of its research programs.

Siteman Cancer Center director Timothy J. Eberlein (left), MD, the Spencer T. and Ann W. Olin Distinguished Professor and Senior Associate Dean for Cancer Programs at Washington University School of Medicine; and Gerhard Hildebrandt (right), MD, director of Ellis Fischel Cancer Center and chief of hematology/oncology and Nellie B. Smith Endowed Chair of Oncology at the MU School of Medicine.

"The Siteman and Ellis Fischel cancer centers are dedicated to improving the health and wellness of Missourians by advancing the science that informs cancer diagnosis, treatment and prevention," said Siteman director Timothy J. Eberlein, MD, the Spencer T. and Ann W. Olin Distinguished Professor and Senior Associate Dean for Cancer Programs at Washington University School of Medicine. "We can accelerate such efforts through the integration of our respective expertise in conducting clinical, translational, basic and population-based cancer research and training. The ultimate goal of this relationship is to maximize the cancer research capabilities at both centers and improve the health of the citizens of Missouri."

Ellis Fischel Cancer Center, Missouri's only state-designated cancer center, is accredited as an Academic Comprehensive Cancer Program by the Commission on Cancer, an American College of Surgeons quality program that recognizes health systems for ensuring their patients receive high-quality, coordinated care.

"By linking these institutions, the combined research teams will maximize their distinct strengths and collaborate in new ways to create a bigger impact than either could achieve independently," said Richard J. Barohn, MD, Executive Vice Chancellor for Health Affairs and Dean of the MU School of Medicine. "We are excited to engage our world-class clinicians and scientists from the University of

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Missouri's entire research enterprise, including the MU Research Reactor and the Roy S. Blunt Next Gen Precision Health Building to make this collaboration with Siteman Cancer Center a successful endeavor that benefits all Missourians."

The new relationship also will foster more collaborations between researchers investigating cancer in people and veterinarians treating cancer in animals. The University of Missouri College of Veterinary Medicine is one of the top veterinary medicine programs in the country, with tremendous experience treating cancer in animals and conducting comparative oncology research to help translate animal research to human studies.

"Ellis Fischel Cancer Center is associated with trust, and excellence in clinical care and research. Collaborating with Siteman Cancer Center will strengthen our ability to conduct more lifesaving research and bolster our clinical programs," said Gerhard Hildebrandt, MD, director of Ellis Fischel Cancer Center and chief of hematology/oncology and Nellie B. Smith Endowed Chair of Oncology at the MU School of Medicine. "Together with our NextGen Precision Health initiative, we will be able to save and improve more lives through theranostics, comparative oncology, cancer prevention and control, and immunotherapy. There is no limit to how we can improve the lives of individuals across our state in our fight to prevent and treat all forms of cancer."

According to Washington University's Bettina Drake, PhD, MPH, a professor of surgery in the Division of Public Health Sciences, the University of Missouri Extension – which has an office in every county across the state – provides a vital resource connecting cancer researchers and cancer prevention specialists to people in rural communities who don't always have access to care because they live far from major health centers.

"Access to cancer care is a problem in many rural areas of the state," said Drake, who is helping lead these outreach efforts. "Working with an institution like the University of Missouri, which has connections throughout Missouri, will help us identify barriers to care and develop strategies, resources and policies that we can implement to alleviate those barriers. University of Missouri Extension offices are already established in every county, and we look forward to opportunities to collaborate on community activities related to cancer prevention and screening, whether it's a cancer prevention education program or a mammography screening event."

The collaboration will expand access to Siteman's 8 Ways to Prevent Cancer campaign and widen distribution of information about Your Disease Risk™, a tool that helps estimate an individual's risk of developing cancer. The outreach program's goals include expanding knowledge about and access to important screening tests, including those that can provide early detection of cervical, breast, prostate, colon and lung cancers.

Longhorned Tick Discovered in Northern Missouri for First Time, MU Researchers Find

Discovery indicates looming problem for cattle health in the Midwest.

The Longhorned tick causes the loss of millions of dollars in agricultural revenue to cattle producers worldwide, and it is now in northern Missouri.

Originally found in eastern Russia and the Australasian region, this tick was first found in the United States in 2017 in New Jersey. It has since reached the Mid-Atlantic, New England and Midwestern regions of the U.S., and now has been discovered in northern Missouri for the first time by researchers at the University of Missouri.

Last year, the Longhorned tick was found in the southern part of the state. This latest discovery indicates an additional economic burden to cattle producers due to ticks; as the Longhorned tick infestation could lead to significant loss in weight gain for cattle, similar to an already widely prevalent disease called anaplasmosis; but so far, the threat from this species of tick to cattle — and people and their pets — in Missouri remains low. However, researchers emphasize that the discovery of the Longhorned tick in the state increases the need for more vigilance towards ticks in general.

Rosalie Ierardi collaborated with Ram Raghavan to conduct tick surveillance research.

While most ticks reproduce traditionally, female Longhorned ticks can lay thousands of eggs without the help of a male, which makes it easier for them to quickly establish in new areas. Infestation of the Longhorned tick can lead to possible transmission of bovine theileriosis, a disease that kills red blood cells in cattle.

While there have currently not been any confirmed cases of bovine theileriosis in Missouri cattle,

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this discovery further heightens the need for Missouri cattle ranchers to make informed decisions regarding quarantining protocols when introducing new cattle into their herds in an effort to protect the health of their livestock, which has significant economic implications.

“Studying the prevalence of invasive ticks in different geographical regions can help veterinarians and farmers take proactive, preventative steps that may ultimately protect the health of livestock, which has huge economic implications,” said Rosalie Ierardi, an anatomic pathologist at the MU College of Veterinary Medicine who recently discovered two Longhorned ticks in Linn County, Missouri, while conducting anaplasmosis surveillance research.

Ierardi collaborated on the project with Ram Raghavan, a professor in the MU College of Veterinary Medicine and MU School of Health Professions. Raghavan, who has been tracking the spread of various species of ticks in the U.S. for 15 years, predicted the potential geographic distribution of the Longhorned tick back in 2019. So far, the tick appears to be establishing in the areas that he had predicted in that study. He said there not only appears to be an increase in the abundance of all ticks in the Midwest in the past decade, but also an increase in the pathogens and diseases they transmit to cattle, humans and pets.

“Warmer temperatures in the Midwest seem to be creating perfect conditions for ticks and the pathogens they carry to thrive, and this problem may get worse going forward as the planet continues to warm, which is concerning,” Raghavan said. “We must be vigilant and devote resources toward trying to prevent these ticks from spreading diseases that harm the health of cattle, humans and their pets. The discovery of Longhorned ticks in northern Missouri greatly increases the need for more vigilance towards ticks in general and the need for routine monitoring of the pathogens they transmit.”

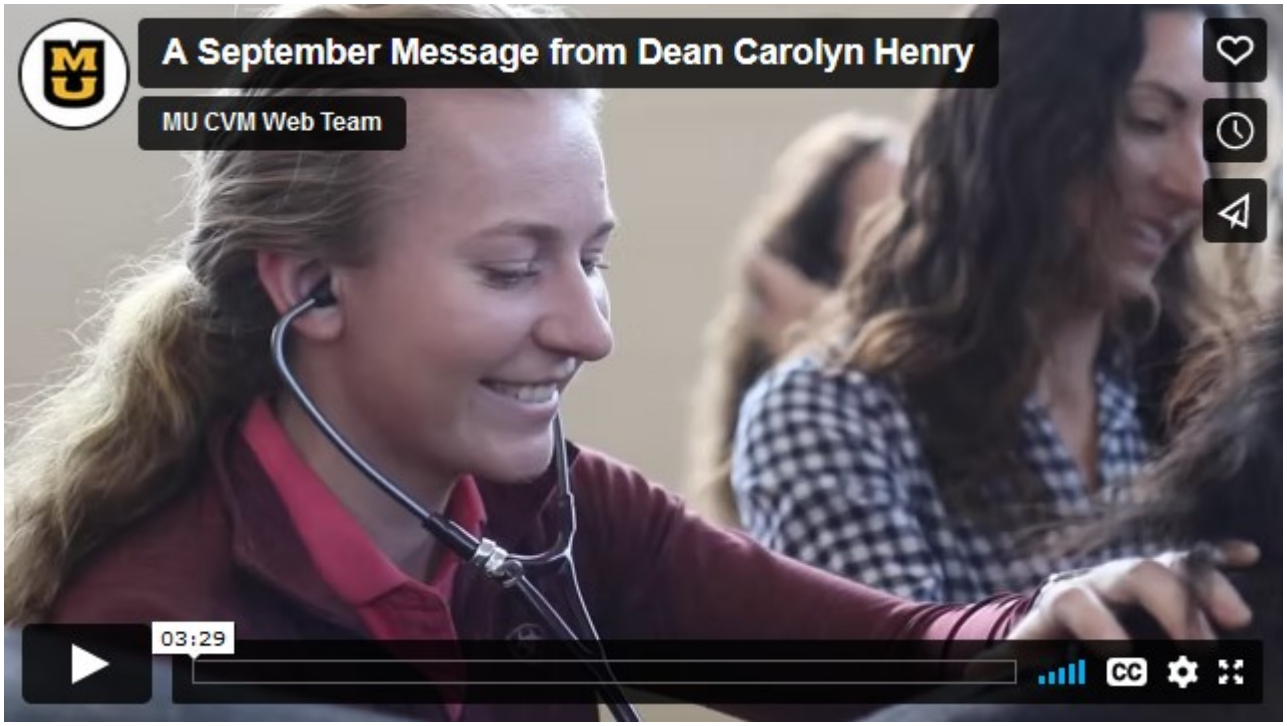
Ierardi encourages cattle ranchers who notice weakness, jaundice and pregnancy loss in their cattle to contact their local veterinarian and the MU Veterinary Medical Diagnostic Laboratory for assistance with tracking down the causes for such signs.

“Symptoms of this disease can be often mistaken for anaplasmosis, so we encourage producers and practitioners to be vigilant and get their animals tested whenever there is a doubt,” Ierardi said. “Although these Longhorned ticks are known to transmit a number of human disease pathogens, at the moment the threat from them appears to be mostly bovine theileriosis, which impacts cattle.”

For more information about Longhorned ticks, visit the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS) website.

Story courtesy of Show Me Mizzou
Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu

The D.V.M. – The Dean's Video Message (September 2022)



In this month's video message, Dean Henry invites folks to the Horse Health Seminar, and gives an update on the CVM mule teams.

View the archive.

Beast Friends

For nearly 40 years, the endearing Mule Team has been the University of Missouri's favorite troupe of ambassadors. Learn more about the students who care for the equines — and the deep bonds they form along the way.

Contact: Sara Diedrich, 573-882-3243, diedrichs@missouri.edu
Oct. 3, 2022

When John Dodam first joined the University of Missouri College of Veterinary Medicine faculty in the mid-1990s and heard about the mule team, he didn't understand the attraction.

A pair of mules named Hillda and Louise acting as ambassadors for the university?

"That's ridiculous!" Dodam thought.

Then he met the mules and noticed the parade of students from all over campus regularly dropping by the barn to visit Hillda and Louise. He watched in wonder as crowds cheered the marching mule team — with black-and-gold wagon in tow — clopping down the street, entertaining audiences statewide. Alumni raved about them; some even visited the mules during football weekends.

"The Mule Team is a phenomenon unique to Mizzou," said Dodam, who was so enamored by these intelligent, loyal, hard-working giants that he purchased a pair for his own piece of land. "It's incredible the impact Mizzou's mules have on people."

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Today, Dodam, professor and chair of the Department of Veterinary Medicine and Surgery, oversees the training of Mizzou's Mule Teams — three pairings: Tim and Terry; Boone and George; Bess and Rose — and the veterinary students who care for them.

It's been nearly 40 years since the first mule team was brought to MU in 1984 by Robert Kahrs, then dean of the College of Veterinary Medicine. The pair — Hillda and Louise — quickly became the goodwill ambassadors for the college, and, by extension, the university.

"The mules are a hit everywhere they go," Dodam said.

Former dean Robert Kahrs, left, holds the reins to Hillda and Louise in the mid-1980s — shortly after the mules arrived at Mizzou.

Making mule memories

The mules also make an indelible mark on the veterinary students who feed, groom and care for them. Twice a day, every day of the year, no matter the weather, members of the Mule Club tend to the animals. They also learn how to hitch, harness and drive the mule team for public events.

The secret to caring for the mules isn't control or dominance — it's about establishing a relationship.

"Mules are superior to horses because they are stronger, more disease resistant, feed efficient heat tolerant and smarter, for better or worse," Dodam said. "They have to be comfortable with what you are asking them to do, and that's the part that makes training them tricky. It's a relationship that requires trust."

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For students like Emily Shanks, a second-year veterinary student and president of the Mule Club, building that relationship is what has made her bond with the mules so strong because she had to earn the animals' trust, not demand it.

Shanks remembers the early days with the mules when they would test her patience by bolting through open gates or galivanting through the pasture, refusing to come in the barn.

"What am I doing wrong?" she lamented.

But Shanks remained committed and cool-headed. In time, the mules cooperated.

"Eventually, when I had built that bond with them, and they would go the way I wanted them to go because they knew the expectation, it made me feel so good," Shanks said. "It made me pretty proud."

Today, Mizzou has three mule teams — Tim and Terry; Boone and George; and Bess and Rose.

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Missouri Mule Club members Emily Shanks, Lily Jensen and Alison Riddle pose with mules George and Boone.

One of the main responsibilities of the Mule Club members is to groom the draft animals. It's a relaxing activity — both for the mules and the students.

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Jensen preps George and Boone for a ride. "They're really just now getting into their swing of being able to listen and being able to drive and be trusted," Jensen said.

Shanks and Jensen take George and Boone for a drive. "One of my favorite parts of working with the mules is getting to show them off and see how everyone else response to them," Shanks said. "People always want to take pictures with the mules, and the mules love it. They're big, gentle giants."

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Mules on my mind

Shanks grew up in Vienna, Missouri, where her grandfather raised Percheron draft horses on the family farm. During the summer, she'd ride with him in a horse-drawn wagon to feed cattle in the field. She loved the large, gentle-natured horses. So, when she came to Mizzou and discovered the mules, Shanks was over the moon with the sweet smell of hay, those velvety noses and the clop, clop, clop of sturdy hooves.

"It was so nice to come down here and see the mules," Shanks said. "It was like having a little bit of home in the middle of school."

Rarely does a shift pass that Shanks isn't met by someone eager to visit the mules. She remembers a journalism student decked out in cap and grown who arrived at the barn for a graduation picture with the pack. Students even rush down before tests to rub a mule's nose for good luck.

"They truly lift peoples' spirits," she said.

Shanks understands the appeal and can't imagine her Mizzou experience without the mules. For her, there is nothing like the sight of the long-eared giants, racing across the pasture to greet her after a long day of school.

"They know when I'm coming, especially if I'm the only truck in the lot or I'm a little late," Shanks said. "They'll come running down the hill like 'She's finally here!' It feels so good."

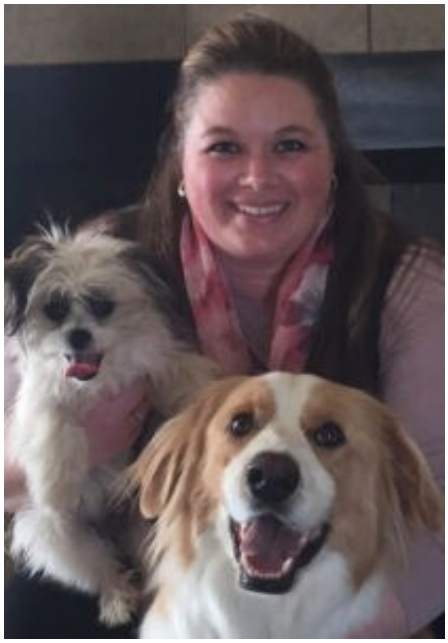
Missouri Mule history

Folks in Missouri have a soft spot for mules because these mammoth creatures play an important role in the state's history. According to tradition, in 1822, William Becknell of Howard County led the first trading party over the Santa Fe Trail and returned with a herd of mules and donkeys from Mexico. With a growing number of pioneers traveling west, Missouri breeders recognized the need for a hardy animal to endure the rigors of the 900-mile journey and decided to breed big draft mares with mammoth donkeys.

The result — the incredible Missouri Mule, which anyone with any equine sense will tell you is hard to match for power, wit and endurance. Besides that, they're good looking and huge, weighing between 820 and 1,500 pounds. Missouri designated the Missouri Mule as the official state animal in 1995.

Today, Mizzou has three mule teams — Tim and Terry, who retired two years ago after pulling the wagon for 27 years; Boone (named after John William "Blind" Boone) and George (named after George Washington Carver), who are now the main mule team; and Bess (named after Bess Truman, whose husband, former President Harry Truman, was the son of a mule breeder) and Rose (named after Rose O'Neill, a Missouri artist), who are the mule-team-in-training.

BSVT Program Honored with UPCEA Engagement Award



Cindy Cravens

The University of Missouri College of Veterinary Medicine Bachelor of Science in Veterinary Technology Program was recently honored with the Engagement Award from the University Professional Continuing Education Association at the UPCEA Central Region Conference held Sept. 26-28 in Columbus, Ohio. The Engagement Award recognizes an outstanding partnership between a member institution and one or more external constituents such as local communities, corporations, government organizations or associations.

Since the approval of the program in June 2021, it has focused on developing articulation agreements with numerous community college veterinary technician programs, including 25 that are out of state and all five veterinary technician programs in Missouri. Moberly Area Community College and Jefferson College, both partners of the BSVT program, provided letters of support for the award nomination.

Cindy Cravens, DVM, BSVT program director, says the established partnerships have provided opportunities for more students and are what led to this award. “These agreements allow students’ associate degree credits to transfer to Mizzou and count toward the first and second years of their bachelor’s degree,” said Cravens. “Additionally, the agreements facilitate collaboration between our BS program and various community colleges’ associate of applied science programs, elevating the level of veterinary technician education nationally.”

The UPCEA is the leading association for professional, continuing, and online education. Founded in 1915, it now serves most of the leading public and private colleges and universities in North America. Cravens said that involvement in UPCEA was vital to the quality of the BSVT program.

“It is important to the BSVT program that we are cultivating our curriculum and offering content in alignment with evidence-based best practices,” she said. “I personally became a member of UPCEA as soon as our program launched. The BSVT admin and instructors want to have access to resources that will help us to mold the program as it grows and matures, as well as offer the best possible student experience.”

Cravens emphasized what the Engagement Award means to the program. “This award is a huge honor for the BSVT program, and I am thrilled that we can highlight the profession of veterinary technology,” said Cravens. “We are proud to provide access and opportunity to quality education that veterinary technicians desire and will continue to develop partnerships with community colleges to promote a fair transfer of credit for these hard-working veterinary paraprofessionals.”

By Nick Childress

MU VHC Small Animal Internal Medicine Short Course

Saturday, November 12, 2022
8 Hours of Continuing Education Credit

Please join us for this day full of updates in small animal internal medicine!

Lectures for Veterinarians and Veterinary Technicians:

The General Practitioner-Internist Partnership: Improving Collaborative Management of Small Animal Respiratory Diseases

Dr. Carol Reinero

Using clinical case examples, this lecture will review the capabilities and limitations of common respiratory diagnostic tests in general practice and highlight the value of referral for advanced diagnostics. Care of dogs and cats with respiratory disorders does not end with the final diagnosis. Optimal management strategies discussed will require a close collaboration between general practitioners and internists.

Biosecurity for Small Animal Clinics and Hospitals

Dr. Leah Cohn

Biosecurity refers to measures designed to prevent the introduction and spread of potentially harmful pathogens. These measures do not come naturally but require advanced thought and planning as well as regular assessment and re-evaluation. Veterinary clinics and hospitals are places where sick animals, many carrying pathogenic organisms, congregate in close proximity. Further, these same clinics hold animals with compromised physical and immunological defense mechanisms. Without strict attention to biosecurity these settings could bring a perfect storm of infectious disease transmission. This talk will concentrate on how clinics can protect their patients, and themselves, from the storm.

Pancreatitis: Diagnosis, Differential Diagnoses, and Why it Matters

Dr. Michael Barchilon and Dr. Joanna Murdoch

Acute gastrointestinal signs are commonly interpreted as pancreatitis, in part due to the challenges of accurately diagnosing this disease. For this reason, patients may be inappropriately labeled as non-responders in cases where another inciting disease process may be involved. This lecture will discuss the diagnostic workup for pancreatitis, including recent literature findings, as well as the important differentials to evaluate for in these patients.

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Antibiotic Therapy in Dogs and Cats with Diarrhea: Does the "Good" Outweigh the Bad?

Dr. Aida Vientos-Plotts

Diarrhea, one of the most common presenting complaints in general practice, is often treated with antibiotics. However, antibiotics may not be as benign as we think. This lecture will discuss how antibiotics can sometimes do more harm than good in these patients, as well as a novel approaches for treatment with acute and chronic diarrhea.

Management of Urologic Conditions in Dogs and Cats

Dr. Laura Nafe

Urinary conditions in dogs and cats can be frustrating for both pet owners and veterinarians. This lecture will discuss important aspects of the history and physical examination that can help to narrow your differential diagnoses. The primary focus will be on approach to diagnosis and management of urinary incontinence and urolithiasis.

Fees:

Veterinarians:

In-person: $275 – includes breakfast and lunch

Virtual: $225 – includes virtual link to the conference in real time & electronic conference proceedings for those that pre-register. A link to the online conference using Zoom will be provided 2 days prior to the conference.

Technicians:

Virtual and in-person: $50 – includes virtual ink to the conference in real time & electronic conference proceedings for those that pre-register. A link to the online conference using Zoom will be provided 2 days prior to the conference. In-person includes breakfast and lunch.

Location:

In person at the MU CVM (Adam's Conference Center)
1520 East, Rollins St, Columbia, MO 65211

Or

Live Virtual Option (via Zoom) – link will be provided 2 days prior to the event

Questions:

Contact Dr. Laura Nafe @ 573-882-7821 or NafeL@missouri.edu

Register Online

Download Flyer

White Coats Symbolize Transition in Training

The Class of 2024.

The CVM's annual White Coat Ceremony took place Sunday, Oct. 16, in the Missouri Theatre.

MU President Mun Choi congratulated the Class of 202 on reaching this milestone in th education.

The University of Missouri College of Veterinary Medicine Class of 2024 celebrated their progression into clinical training during the annual White Coat Ceremony held Sunday, Oct. 16, 2022, at the Missouri Theatre. The ceremony is held to celebrate the successful completion of their didactic studies and the beginning of their hands-on training in the Veterinary Health Center, Veterinary Medical Diagnostic Laboratory and during preceptorships in private practices and public agencies on their way to completing their DVM degree.

The 120 students selected a family member, friend or mentor to present and assist them in donning their laboratory coats. Prior to the coat presentation, UM President Mun Choi, PhD, addressed the

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class and encouraged the members to take a moment to tell the individual who would present their coat why they had asked them to participate in the ceremony. He reminded the students that they all bring different experiences and backgrounds, and he encouraged them to use their unique perspectives to enrich the college and to engage and learn from each other.

CVM Interim Associate Dean for Academic and Student Affairs, Leah Cohn, DVM, PhD, served as the emcee and welcomed the crowd. She spoke to the diversity of careers within the veterinary profession that the students should explore during the next 19 months of their education,

“I know all our students have been looking forward to this day, not only because they will finally enter clinics, but because this also means they are closer to the end then they are to the beginning of their four years of professional training,” she said. “At this time, we have chosen to present the traditional white laboratory coat as a symbol of medicine and surgery. Please recognize the diversity and all the professional choices this coat represents, including those that require coveralls and boots rather than lab coats.”

Cohn also presented a white coat to the family of Breanna Killian, a member of the class who passed away last year as the result of an accident. “Breanna will always be a part of this class and our hearts,” she said.

CVM Dean Carolyn Henry, DVM, MS, told the students that they are ambassadors for the college and the veterinary profession.

“Your success as a veterinarian will have more to do with your interactions with people than any other single variable,” she said. “This will become particularly important as it pertains to your ability to communicate with clients, demonstrate empathy, and provide quality service.”

She closed with words of advice: “When you fail, be resilient. When you succeed, be humble. When you see others struggling, be compassionate. When you’ve been helped, be grateful. And when you take that first step in your white coat, take a deep breath, and enjoy the moment. This is a moment in your journey that you have been dreaming about for a long, long time, and you are so very deserving! Your mindset is everything, and the best is yet to come.”

Class President Courtney Rice delivered a response on behalf of her classmates who began their veterinary curriculum during the early days of the pandemic.

“We were the class that started veterinary school during COVID, watching the majority of lectures on Zoom and Panopto from our own homes,” she said. “If online undergrad was a new beast, online vet school was like a final boss. It was a struggle to find a rhythm in this new learning environment. And yet, despite starting with minimal in-person interactions, we managed to form a community which has only grown stronger with each passing IP. We’ve faced challenges in veterinary school that nobody could have anticipated, and it is comforting to know that we have each other’s backs both now and moving forward.”

Department of Veterinary Medicine and Surgery Chairman John Dodam, DVM, PhD, offered the class a welcome “across the parking lot,” as they begin their rotations in the VHC’s hospitals and the diagnostic lab.

Edward Migneco, DVM, president of the Missouri Veterinary Medical Association and Julie Braun, executive director of MVMA, presented each student in the class with a name badge, courtesy of the Missouri Veterinary Medical Foundation.

Continued on next page —>

The Class of 2024

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Continued on next page —>

MU President Mun Choi congratulated the Class of 2024 on reaching this milestone in their education.

Leah Cohn, interim Associate Dean for Academic and Student Affairs, presents a white coat to the family of Breanna Killian.

Continued on next page —>

John Dodam, the chair of Veterinary Medicine and Surgery, congratulates VM3 Taylor Cook.

Abigail Hilton and Ben Greer celebrate receiving their white coats with Tim, one of the CVM mules.

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VM3 Anna Tarpey is joined on the Quad by family and friends following the White Coat Ceremony.

Vet Tech Career Ladder Provides Growth Opportunities at the CVM

The work that veterinary technicians do is vital to the daily function of the University of Missouri College of Veterinary Medicine and veterinary medicine as a whole. The work itself is taxing, and unfortunately, clinics around the country often operate with a short staff and have high turnover rates when it comes to technicians. Since 2015, the CVM has offered a solution to combat this turnover through a career ladder. The career ladder provides techs who are interested with opportunities to be rewarded through promotions, earning a higher salary, and taking on more responsibilities.

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Anastasia Glahn, RVT, a veterinary technician in the Veterinary Health Center's Oncology Service and the oncology nursing supervisor, has been a member of the technician staff for 13 years. When Glahn began at the Veterinary Health Center, the career ladder had not been implemented. She said that this lack of clear potential for advancement was a challenge for techs. "There weren't a lot of great options for technicians to advance personally or professionally," said Glahn.

That's why, in 2015, the career ladder was put into place. The ladder created a yearly potential for promotion for veterinary technicians who had fulfilled certain requirements. There are four different levels on the career ladder based on the number of years employed at Mizzou and other achievements. According to Peggy Bryan, the hospital administrator of the VHC, these include being a licensed veterinary technician, continuing education, evaluations from faculty, competency requirements within each service section, presentations, publications, memberships in national and state vet tech associations and letters of recommendation.

There are four different levels on the career ladder that scale based on the number of years employed at Mizzou and other achievements.

The career ladder was initiated and driven by the veterinary technicians themselves, said Bryan. "It was based on some other schools that were doing a similar thing. The veterinary technicians actually got together and created the career ladder for us here."

This system provides encouragement and benefits. "It's important because it recognizes and rewards a commitment to their career," said Bryan. "A lot of our vet techs are in this for life. It helps

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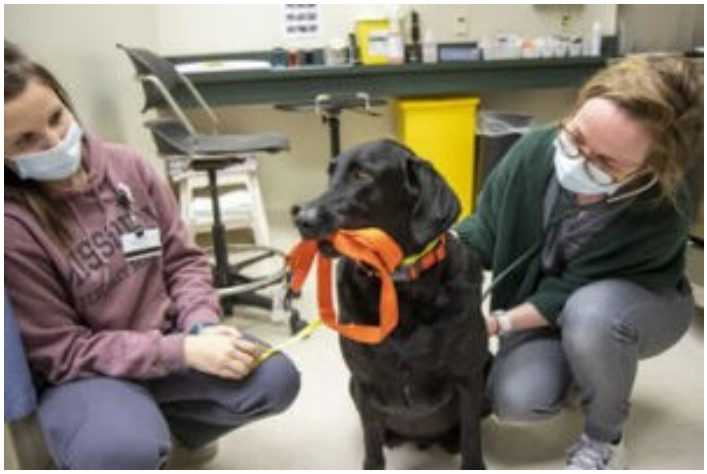
to get better at their skills and they're recognized by advancing up the ladder, which also corresponds to a reclassification of title."

Reclassification of title comes with each of the four steps on the career ladder, which all have different requirements. The first level that most staff come in at is veterinary technician, with the following levels being senior veterinary technician, lead veterinary technician and veterinary technician supervisor. Technicians submit advancement packets once they have achieved a specific number of years at Mizzou and what they believe to be a sufficient amount of increase in responsibility for promotion, and these are reviewed on a yearly basis. The minimum service requirement for level two is three years, level three is five years and level four is 10 years.

Veterinary technicians assist veterinarians in caring for both domestic companion animals and large farm animals, aiding with surgeries, farm calls, blood tests and routine care.

"This is really the only way that techs can progress through those titles," said Bryan. "It does require that they complete these submissions, which is a big deal. It includes full binders of all their documentation, honors, awards, continuing education certificates, diplomas, letters of recommendation and other things compiled in a packet. Then those are reviewed by a committee that's made up of the hospital direct, hospital administrator, a small and large animal faculty member, and usually at least two veterinary technicians. Submissions also don't guarantee an automatic advance."

However, this year, all six people who submitted packets were promoted to the next level. Alyssa Ingerson, RVT, advanced from a veterinary technician to a senior veterinary technician, and Jamie Brueggeman, RVT, Darla Combs, RVT, Whitney Fahrendorf, RVT, Kiersten Gillman, RVT, and Rebecca Wiseman RVT, all advanced from senior veterinary technician to veterinary technician lead.



Since the approval of the BSVT program in June 2021, it has focused on developing articulation agreements with around 30 community college veterinary technician programs.

Glahn, who has progressed through to the fourth and final step of the career ladder through pursuing specialization in oncology and continuing her education in a variety of ways, says that it has been beneficial for her. "It's been really good for me personally and professionally," said Glahn. "It's one of the reasons that I pursued my veterinary technician specialization, because it was one of the ways to get to the top of the career ladder. The career ladder has certainly helped push me in looking at next steps and where I want my career to go. It really does create that empowerment for technicians to be able to look for that next step and not feel like they're stagnant.

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You definitely have that opportunity to grow in whichever way that you want to grow."

These benefits are just part of what the CVM is doing to encourage veterinary technicians to remain in the field. Additionally, the CVM has created an emphasis on the development of a larger pool of veterinary technicians. Through the creation of the Bachelor of Science in Veterinary Technology Program and a partnership with Moberly Area Community College to produce RVTs in central Missouri, the CVM is working to provide more opportunities for those who are interested in a pursuit a veterinary technician career.

Since the approval of the BSVT program in June 2021, it has focused on developing articulation agreements with numerous community college veterinary technician programs, including 25 that are out of state and all five veterinary technician programs in Missouri. Moberly Area Community College and Jefferson College, both partners of the BSVT program, provided letters of support for the award nomination.

Cindy Cravens, DVM, BSVT program director, says the established partnerships have provided opportunities for more students. "These agreements allow students' associate degree credits to transfer to Mizzou and count toward the first and second years of their bachelor's degree," said Cravens. "Additionally, the agreements facilitate collaboration between our BSVT program and various community colleges' associate of applied science programs, elevating the level of veterinary technician education nationally."

"Our partnership with MACC to produce registered veterinary technicians in central Missouri just started its second year," said Cravens. "The first cohort is training alongside our DVM students in the VHC and is progressing toward graduation this spring. Additionally, we developed the BSVT program to help RVTs stay engaged, providing quality advanced veterinary technician education that is clinically relevant and flexible. This program has met a definite need in the profession, and our fall 2022 enrollments are almost five times our first year."

By Nick Childress

CVM Alumnus James E. Nave Inducted to the Alumni Association Hall of Fame

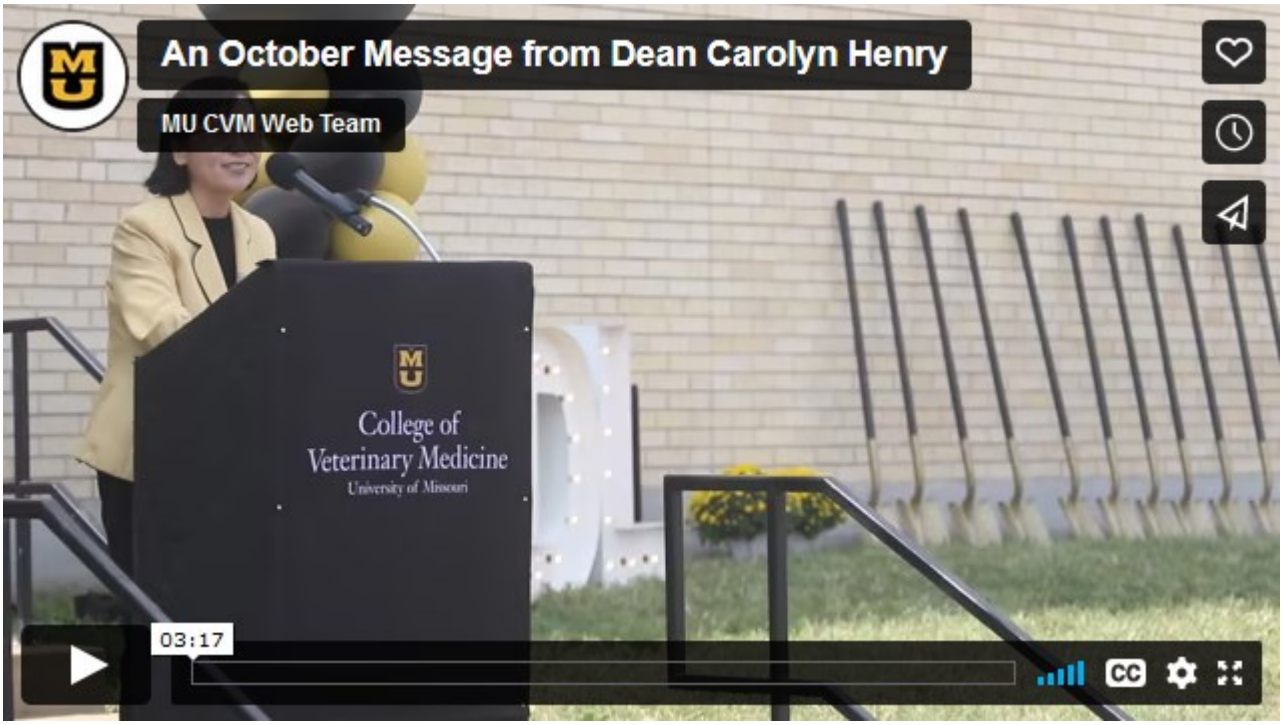
James E. Nave, BS Ag ’66, DVM ’68

Owner, The Nave Veterinary Group

Jim Nave opened his business, Tropicana Animal Hospital in 1974. Today, the Nave Veterinary Group includes over 21 free-standing veterinary hospitals in southern Nevada, including Tropicana, and is dedicated to the mentorship of young doctors who share the group's vision and high standards of veterinary medicine.

Jim is active in organized veterinary medicine at both the state and national level, serving as past president of the American Veterinary Medical Association (AVMA), past president of the Nevada Veterinary Medical Association, as well as past president of the Western Veterinary Conference. In 1987, the College of Veterinary Medicine named him their Alumnus of the Year, and in 2001, he received the Mizzou Alumni Association’s Faculty Alumni Award. Jim is a life member of the MAA and graduated from the College of Veterinary Medicine in 1968.

The D.V.M. – The Dean's Video Message (October 2022)



In this month's video message, Dean Carolyn Henry gives an update on the expansion and renovation of the Veterinary Medical Diagnostic Laboratory, and how the VMDL continues to serve the people of Missouri.

View the archive.

$1.5 Million Gift Supports Canine Genetics Lab at MU

MU College of Veterinary Medicine receives gift from the Orthopedic Foundation for Animals.

Today, the University of Missouri announced a $1.5 million gift from the Orthopedic Foundation for Animals (OFA). The gift will help fund a new director of the Canine Molecular Genetics Laboratory in the MU College of Veterinary Medicine, which works on finding causes of genetic diseases in dogs.

"The College of Veterinary Medicine has had an association with the Orthopedic Foundation for Animals for more than 50 years, shortly after it was founded in 1966," said Carolyn Henry, dean of the MU College of Veterinary Medicine. "For the past two decades, this collaboration has been much more than mutually beneficial, it has meant better health and improved life for countless dogs and the people who love them. Thanks to the generosity of the OFA and the vision of its board, our partnership will continue. Together we will continue providing testing services for veterinarians, breeders and dog owners, while furthering the quest to find the genetic causes of heritable diseases."

The Orthopedic Foundation for Animals pledged a gift of $1.5 million to the MU College of Veterinary Medicine Canine Molecular Genetics Laboratory. The laboratory and OFA are longtime partners in the quest to improve the health and lives of dogs. Dr. E.A. (Al) Corley OFA Program Endowment will help ensure that the lab's work identifying genetic mutations responsible for a variety of heritable diseases can continue. Pictured from left are Eddie Dzuik, OFA's chief operating officer, OFA President Frances Smith, Gary Johnson, director of the Canine Molecular Genetics Laboratory, and Christian Lorson, CVM professor of veterinary pathobiology and associate dean for research and graduate studies.

The lab conducts nearly 40 different DNA tests for specific mutations found in various recessive diseases, including degenerative myelopathy, a disease that impacts the spinal cord and leads to dogs losing control of their legs, bladder and bowels.

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“Missourians and their pets from all over the state benefit from the research conducted and services provided at the University of Missouri,” University of Missouri Board of Curators Chair Darryl Chatman said. “This gift will support efforts to find the causes of genetic diseases in dogs to improve their health and highlights Mizzou’s values as a tier-1 research, land-grant, AAU, flagship university.

Each year, the lab conducts nearly 9,000 tests for the OFA, dog breeders, veterinarians and dog owners.

Gary Johnson, DVM, PhD, is the director of the Canine Molecular Genetics Laboratory.

“Research at MU has demonstrated how the discovery of the genetic basis for diseases in animals can benefit both animals and humans,” said Mun Choi, president of the University of Missouri. “For example, recent work here at the University of Missouri on a genetic degenerative disease of dogs will also benefit humans who suffer from ALS, or Lou Gehrig’s disease. This gift allows our scientists to continue their groundbreaking discoveries which may lead to new therapeutic and clinical treatments, ultimately leading to better health for millions of animals and people throughout the state and nation.”

The lab currently has about 150,000 samples stored in its freezers, and researchers from around the world request these samples for their own investigations.

“For the past 20 years, the primary mission of our laboratory has been to discover the mutations responsible for heritable canine diseases and to provide veterinarians and dog owners with DNA tests for these mutations,” said Gary Johnson, an associate professor in the MU College of Veterinary Medicine and current director of the Canine Molecular Genetics Laboratory. “I am exceedingly grateful to the Board of Directors of the OFA for their gift to the University of Missouri which establishes the Dr. E. A. (Al) Corley OFA Endowed Program in canine molecular genetics. The endowed program provides a means for our laboratory’s mission to continue after I am too old to lead the laboratory.”

The lab is also involved in researching various types of Batten disease, a class of rare, fatal, inherited disorders of the nervous system. One of the lab’s accomplishments has been identifying gene mutations in dogs that are comparable to the defect in genes that cause the human forms of the disease.

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Orthopedic Foundation for Animals President Frances Smith, who is a veterinarian and dog breeder, said that the organization's intent with its gift is to ensure the long-term viability of the Canine Molecular Genetics Laboratory to continue its research, continue offering commercial DNA testing, and continue maintaining an extensive collection of samples in the DNA bank.

Orthopedic Foundation for Animals President Frances Smith, DVM, PhD, said that since its founding, the organization has awarded more than $3 million for canine health research and education initiatives to institutions worldwide, but that this is the largest single gift it has made.

"Based on our positive relationship with Mizzou that spans decades, we are excited that our first major gift will benefit the College of Veterinary Medicine at the University of Missouri. The OFA's mission is a simple, but noble one: to promote the health and welfare of companion animals through a reduction in the incidence of genetic diseases. Focused on Dr. Gary Johnson's Canine Molecular Genetics Laboratory, this gift falls directly in line with that mission."

"This gift is a remarkable investment in the future of Mizzou and the College of Veterinary Medicine," said Jackie Lewis, vice chancellor for advancement. "We're proud of the work our faculty and the Orthopedic Foundation for Animals have done together, and this gift will allow us to add a quality researcher who will only strengthen this partnership and our university."

The announcement comes on One Health Day, which highlights the interconnection among people, animals, plants and their shared environment with the ultimate goal of improving health outcomes.

Story courtesy of Show Me Mizzou
Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu

'Click' Chemistry May Help Treat Dogs With Bone Cancer, MU Study Finds

The scientific discovery, which recently earned a Nobel Prize in chemistry, may efficiently deliver radioactive cancer treatments to tumors while reducing side effects.

In September, researchers from California and Denmark were awarded a Nobel Prize in Chemistry for their development of 'click' chemistry, a process in which molecules snap together like LEGO, making them a potentially more efficient transportation device in delivering pharmaceuticals to cancer tumors.

Now, in a recent study, a researcher at the University of Missouri has successfully shown for the first time how click chemistry can be used to more efficiently deliver drugs to treat tumors in large dogs with bone cancer – a process that had previously only been successful in small mice.

"If you want to attack a tumor using the immune system, an antibody is an extremely specific way to deliver a drug or radioactive payload to the tumor, but the problem with antibodies is they are huge molecules that circulate in the bloodstream for days or even weeks," said Jeffrey Bryan, a professor in the MU College of Veterinary Medicine and author on the study. "If you put a drug or radioactive molecule onto the antibody, you leave radioactivity circulating in the bloodstream for a long time, which can spread to and negatively impact organs, bone marrow and the liver while not getting as much dose to the specific tumor as you were hoping for."

The goal with click chemistry is to maximize the delivery of therapeutic drugs specifically to the cancer tumor to increase effectiveness while minimizing the circulation of those drugs throughout the bloodstream and causing dangerous side effects.

From mice to man's best friend

For years, many chemists assumed that while click chemistry has been successful in mice, the strategy would not work in large dogs or people because the size of the body might be too big for the two sides of therapy-delivering molecules to find each other and snap, or 'click,' together. Bryan collaborated with Brian Zeglis, an associate professor at Hunter College in New York who specializes

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in click chemistry, to conduct the first-ever successful 'proof-of-concept' study at the MU College of Veterinary Medicine. Using click chemistry, doses of radiopharmaceuticals were delivered specifically to the tumors in five dogs that weighed more than 100 pounds and had bone cancer.

"It is a huge step forward for the field to show that this worked in a human-sized body," Bryan said. "Going forward, this may pave the way for click chemistry to be used to help humans with cancer in the future."

Bryan has been researching veterinary and comparative oncology for nearly two decades. He said some dogs with one known bone tumor have additional bone tumors hiding in their body's skeleton. An additional benefit of studies involving imaging scans and click chemistry is the ability to discover if additional cancer tumors are located in a dog's skeleton and impacting their health.

"Osteosarcoma, a common form of bone cancer, impacts both dogs and people, and it causes severe pain, limping, swelling in the limbs, and treating the bone tumors with various radiation therapy and immune therapy approaches to take away the pain is something I am passionate about here at MU," Bryan said. "Everything we learn about treating these dogs can be translated to help humans down the road."

A leader in treating cancer – for people and pets

The MU College of Veterinary Medicine, which earned more than $14 million in federal research funding last year from the National Institutes of Health, is the site of clinical trials for cancer that attract people and their pets from California, Florida, New York and states across the country.

"It is heartwarming to be a part of it because the patients' families realize it is not just about better outcomes for their specific dog, but they are also contributing to better outcomes for other dogs in the future and hopefully better health outcomes for people as we translate these advances from the dogs to the human side," Bryan said.

Jeffrey Bryan is a professor in the MU College of Veterinary Medicine.

While this was a successful 'proof-of-concept' imaging study involving click chemistry, Bryan's long-term goal is to develop a therapy using radiopharmaceuticals, potentially involving an antibody-targeting molecule, to treat dogs with bone cancer that may not be well enough for other treatments that involve surgery.

"This research is also an example of precision medicine, a key part of MU's NextGen Precision Health initiative, because we are using the molecules associated with the specific tumor to deliver the therapeutic dose of treatment," Bryan said. "We collaborate with the MU Research Reactor, the Molecular Imaging and Theranostics Center, and Washington University in St. Louis, so it is a team effort."

In 2020, Bryan collaborated with ELIAS Animal Health to create a precision medicine approach – a vaccine from a dog's own tumor – to target and kill cancer cells in dogs suffering from osteosarcoma. The success of the treatment in dogs led the Food and Drug Administration to grant a rare fast-track designation for ELIAS Animal Health's parent organization TVAX

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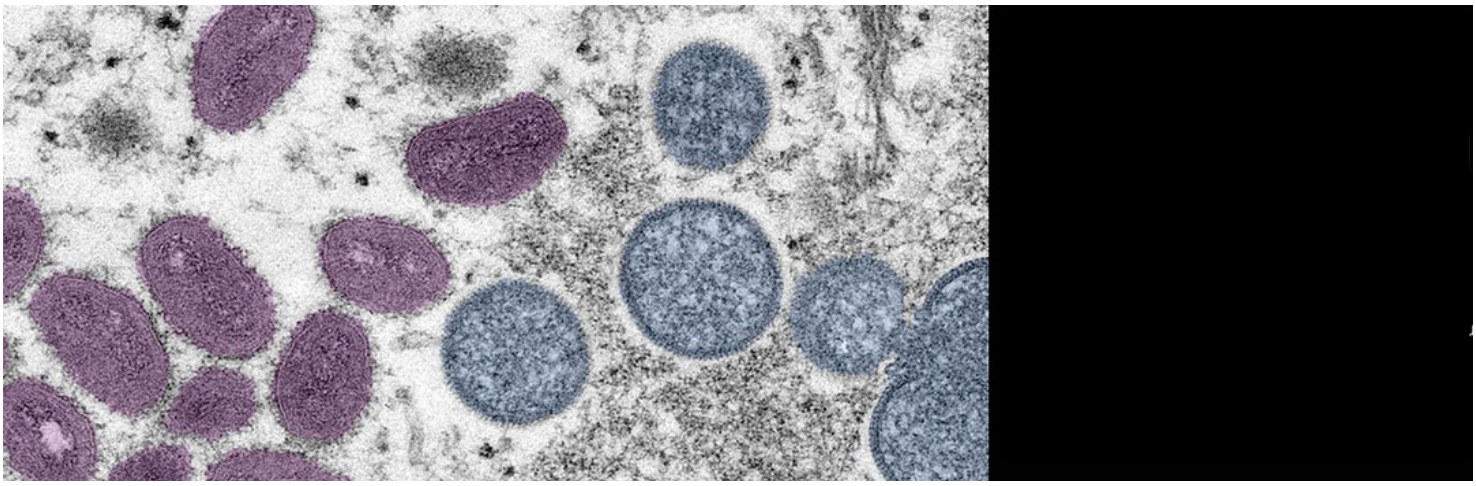
Biomedical, to study the ELIAS immunotherapy approach to treat glioblastoma multiforme, a cancerous brain tumor in humans.

“The last dog that participated in that study just died a few weeks ago, five years out from their original diagnosis of bone cancer, and the dog never relapsed with its cancer, so the dog was able to live the rest of its life cancer-free due to the immunotherapy,” Bryan said. “Our overall goal is to come up with different tools in our toolbox to effectively help treat dogs with cancer, and one day even people, too.”

“Pretargeted PET of Osteodestructive Lesions in Dogs” was published in *Molecular Pharmaceutics.* Funding was provided by Hunter College.

Story courtesy of Show Me Mizzou
Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu



Monkeypox Mutations Cause Virus to Spread Rapidly, Evade Drugs and Vaccines, MU Study Finds

Researchers show how monkeypox mutations cause virus to replicate, spread faster.

Monkeypox has infected more than 77,000 people in more than 100 countries worldwide, and — similar to COVID-19 — mutations have enabled the virus to grow stronger and smarter, evading antiviral drugs and vaccines in its mission to infect more people.

Now, a team of researchers at the University of Missouri have identified the specific mutations in the monkeypox virus that contribute to its continued infectiousness. The findings could lead to several outcomes: modified versions of existing drugs used to treat people suffering from monkeypox or the development of new drugs that account for the current mutations to increase their effectiveness at reducing symptoms and the spread of the virus.

Kamlendra Singh, a professor in the MU College of Veterinary Medicine and Christopher S. Bond Life Sciences Center principal investigator, collaborated with Shrikesh Sachdev, Shree Lekha Kandasamy and Hickman High School student Saathvik Kannan, to analyze the DNA sequences of more 200 strains of monkeypox virus spanning multiple decades, from 1965, when the virus first started spreading, to outbreaks in the early 2000s and again in 2022.

“By doing a temporal analysis, we were able to see how the virus has evolved over time, and a key finding was the virus is now accumulating mutations specifically where drugs and antibodies from vaccines are supposed to bind,” Sachdev said. “So, the virus is getting smarter, it is able to avoid being targeted by drugs or antibodies from our body’s immune response and continue to spread to more people.”

Needles in a haystack

Singh has been studying virology and DNA genome replication for nearly 30 years. He said the homology, or structure, of the monkeypox virus is very similar to the vaccinia virus, which has been used as a vaccine to treat smallpox. This enabled Singh and his collaborators to create an accurate,

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3D computer model of the monkeypox virus proteins and identify both where the specific mutations are located and what their functions are in contributing to the virus becoming so infectious recently.

“Our focus is on looking at the specific genes involved in copying the virus genome, and monkeypox is a huge virus with approximately 200,000 DNA bases in the genome,” Singh said. “The DNA genome for monkeypox is converted into nearly 200 proteins, so it comes with all the ‘armor’ it needs to replicate, divide and continue to infect others. Viruses will make billions of copies of itself and only the fittest will survive, as the mutations help them adapt and continue to spread.”

Kannan and Kandasamy examined five specific proteins while analyzing the monkeypox virus strains: DNA polymerase, DNA helicase, bridging protein A22R, DNA glycosylase and G9R.

“When they sent me the data, I saw that the mutations were occurring at critical points impacting DNA genome binding, as well as where drugs and vaccine-induced antibodies are supposed to bind,” Singh said. “These factors are surely contributing to the virus’ increased infectivity. This work is important because the first step toward solving a problem is identifying where the problem is specifically occurring in the first place, and it is a team effort.”

The evolution of viruses

Researchers continue to question how the monkeypox virus has evolved over time. The efficacy of current CDC-approved drugs to treat monkeypox have been suboptimal, likely because they were originally developed to treat HIV and herpes but have since received emergency use authorization in an attempt to control the recent monkeypox outbreak.

“One hypothesis is when patients were being treated for HIV and herpes with these drugs, they may have also been infected with monkeypox without knowing, and the monkeypox virus got smarter and mutated to evade the drugs,” Singh said. “Another hypothesis is the monkeypox virus may be hijacking proteins we have in our bodies and using them to become more infectious and pathogenic.”

Singh and Kannan have been collaborating since the COVID-19 pandemic began in 2020, identifying the specific mutations causing COVID-19 variants, including Delta and Omicron. Kannan was recently recognized by the United Nations for supporting their ‘Sustainable Development Goals,’ which help tackle the world’s greatest challenges.

“I could not have done this research without my team members, and our efforts have helped scientists and drug developers assist with these virus outbreaks, so it is rewarding to be a part of it,” Singh said.

“Mutations in the monkeypox virus replication complex: Potential contributing factors to the 2022 outbreak” was recently published in *Journal of Autoimmunity*. Co-authors on the study include Shrikesh Sachdev, Athreya Reddy, Shree Lekha Kandasamy, Siddappa Byrareddy, Saathvik Kannan and Christian Lorson.

Story courtesy of Show Me Mizzou
Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu

Celebrating First-Generation Students

Nearly 22% of new MU students are first-generation college students. In honor of First-Generation College Celebration Day, meet a few Tigers who are blazing new trails.

Left to right: Wensdai Brooks, Wyatt Eaton and Meadow Mobley.

Nov. 7, 2022
Contact: Deidra Ashley, ashleyde@missouri.edu

Wensdai Brooks, third-year law student in the School of Law

Hometown: Santa Cruz, California

What is the best part of being a student at Mizzou?

The Mizzou community is the best. There's nothing better than the feeling you have after you leave the library and you've found the answer you and your classmates just sat for hours trying to find; you

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feel so fulfilled. Having those types of experiences and being able to share them with my mom, who didn't have them, has been really special.

How has being a first-generation college student impacted your life?

It has opened doors for me that I don't think would have been opened otherwise. There's a lot that you can do without a college degree, but I also think that there are places in life that you can't go without one — those were always places that I wanted to go.

I now have the ability to make a life for myself that's better than the one I grew up in. I have a daughter now, and being that role model for her and showing her that this is the kind of life that we can have now — all because of education — is great.

What are your post-graduation goals?

I want to be an appellate advocate. I want to be the person who stands up in court and says, "This isn't the way that the law works. This isn't equitable." I want to be that person.

Wyatt Eaton, professional student in the College of Veterinary Medicine

Hometown: Doniphan, Missouri

What made you choose Mizzou?

I chose Mizzou for the veterinary school. I loved the idea of being in class for two years then in clinics for two years. I am a hands-on person; I learn best from seeing and doing with what's in front of me. Mizzou offered that, and it is only four-and-a-half hours from home.

What has been your family's response to you pursuing your degree?

My family members have always been my biggest fans and supporters. They wanted me to have the experience they did not get to have, and they pushed me to pursue my goals. Because of that, I was able to take off and have experiences that other people may never get.

What is your goal post-graduation?

I want to become a mixed animal practitioner in rural and suburban Missouri at my hometown clinic — serving the people of southeast Missouri the best I can.

Meadow Mobley, junior in the College of Education and Human Development

Hometown: Kansas City, Missouri

What made you decide to go to college?

I always knew I wanted to pursue my education and go further. My parents didn't have that opportunity, and they encouraged me to further my education. I knew Mizzou had a great education program, and when visiting Mizzou, I felt right at home and knew it's where I belonged.

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How has Mizzou helped you navigate your college experience?

My advisors have been helpful, and the activities I've been involved in have also helped me navigate college. I've met so many different people that I never would have been exposed to in my hometown.

What are your post-graduation plans?

I want to be a teacher. I also want to come back to school and get my master's so I can be a school counselor.

Story written by Madalyn Murry

Harris-Stowe Purina Scholars Program Improves Pathway to Veterinary Medicine at Mizzou

Beginning this semester, students at Harris Stowe State University in St. Louis have the opportunity, through a partnership between the Purina Scholars Program and the MU College of Veterinary Medicine, to participate in the Missouri Online Undergraduate Certificate in Veterinary Sciences. The Purina Scholars Program sponsors participation in the 16-hour veterinary certificate program for three students majoring in biology or who have an expressed desire to attend veterinary school.

Harris Stowe is a Historically Black College or University, or HBCU. The United States Department of Education defines HBCUs as any historically Black college or university that was established prior to 1964, whose principle mission is the education of Black Americans. HBCUs must be accredited by a nationally recognized accrediting agency or association determined by the Secretary of Education to be a reliable authority as to the quality of training offered or making reasonable progress toward accreditation.

According to 2017 figures from the United States Bureau of Labor Statistics, the veterinary workforce in the United States is made up of roughly 2 percent Black veterinarians. The aim of the partnership between the Purina Scholars Program, Harris Stowe and the CVM is to introduce Black students to the profession with a goal of improving future diversity.

The undergraduate certificate in veterinary science is a pathway for these students to take a first step toward the veterinary profession. The program was developed to better prepare pre-veterinary medical students for success when they entered the professional veterinary curriculum and for a future career in veterinary medicine. Laurie Wallace, DVM, MVSc, DACVIM, an associate teaching professor and the director of veterinary online and undergraduate programs at the CVM, emphasized the value of the program to students. “It provides them with courses that are directly preparatory and related to the type of courses that they would have in any college of veterinary medicine program,” said Wallace. “They’re all taught by our faculty members, with some being taught by faculty who also teach veterinary students. These students are not only being prepared with content, but also with rigor and getting to know some of the instructors that they might have as veterinary students.”

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Wallace said one of the goals of the partnership is to make the participating Harris Stowe students comfortable while introducing them to veterinary medicine. “We want to interest students from underrepresented groups in veterinary medicine,” said Wallace. “We want to allow students to get their feet wet and feel more at home with veterinary medicine. Offering this as an online program is very important because these students don’t have to move and can maintain their current circumstances while taking our classes. We’ve also set this up as a cohort experience with three students admitted in each group. Purina Scholars students enroll in the same classes each semester and have the opportunity to network with each other.”

“We have a lot to learn and a long way to go to reach our goal of creating a veterinary student population that accurately reflects the population of the state of Missouri,” said Wallace. “It gives us the opportunity to learn more about black students, their interests and why they want to go to veterinary school.”

By Nick Childress

BREATHE Easy: VHC Internal Medicine Specialists Launch New Clinic

In March 2021, Steve Kasper's 9-year-old beagle mix, Spirit, began refusing to go on her daily 4-mile walk. Suddenly, Spirit was easily getting winded. Based on her clinical picture and the appearance of her lungs on radiographs, her veterinarian suspected the dog had contracted a fungal infection and referred Kasper, of Battlefield, Missouri, and Spirit to the MU Veterinary Health Center.

Aida Vientós-Plotts, DVM, PhD, DACVIM, assistant professor of small animal internal medicine, ran a series of diagnostic tests on Spirit including a computed tomography (CT) scan of her chest. Based on those findings, she suspected that the dog had a condition called cryptogenic organizing pneumonia and began treating her with steroids while awaiting confirmation from a lung biopsy.

During a recheck of Spirit, Professor of Small Animal Internal Medicine Carol Reinero (right) and Assistant Professor of Small Animal Internal Medicine Aida Vientós-Plotts conduct an ultrasound to make sure the cryptogenic organizing pneumonia that they treated remains well controlled.

"Cryptogenic organizing pneumonia is a type of immune mediated lung disease that is rarely recognized in dogs and cats for two reasons," Vientós-Plotts explained. "It requires a lung biopsy for definitive diagnosis, and it is not often on veterinarian's differential list."

Spirit remained hospitalized for almost two weeks while Vientós-Plotts and the VHC's Internal Medicine Service treated her steroids. Today, Spirit remains on a low dose of prednisone and returns to the VHC periodically for a physical and CT scans to ensure her disease is well controlled.

"She acts like her normal self now," Kasper said.

Without Vientós-Plotts' expertise and the sophisticated diagnostic capabilities available to VHC patients, Spirit's story could have had an unhappy ending. To provide the best possible outcomes to patients like Spirit, Vientós-Plotts, and Carol Reinero**,** DVM, PhD, DACVIM, professor of small animal internal medicine, determined to establish a new clinical specialty service.

Last month they launched the Respiratory and Aerodigestive Disorders Specialty Clinic, also known as the BREATHE Clinic, focused on diagnosing and treating dogs and cats with respiratory and swallowing disorders.

"The inspiration behind the BREATHE Clinic is our patients and the desire to impact dogs and cats with respiratory and aerodigestive disorders," Reinero explained. "My career in respiratory medicine began with a cat named Sophie. She had a disease that in retrospect I couldn't diagnose because it hadn't been described yet. Not knowing how to help her set me on the path of making respiratory medicine my career focus, and a few years later, I was part of the team that ended up describing and reporting her disease in the veterinary literature."

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Reinero recalled other patients whose stories compelled her to want to advance diagnoses and treatment of respiratory conditions.

“My canine patient Emmie was another inspiration. She had a respiratory disease that should have shortened the quantity and quality of her life, but with the persistence of her owners and with close care and monitoring, she never let her illness affect the amazing life she had. Dodger was a dog who had been given a death sentence and came to me for a second opinion. I diagnosed him with a disease that was not reported in the veterinary literature. With aggressive therapy, he was cured. He lived for the births of his two human siblings and died at an old age of an unrelated disease. There are so many other patients that have helped me to build my expertise and in turn, have created their own legacies to benefit other canine and feline patients.”

Working in academia, Reinero has also trained and mentored promising future specialists, some who have been leaving their own marks in the field of respiratory medicine.

“One of them, Dr. Vientós-Plotts, joined our faculty in 2018,” Reinero said. “Together, we set out to establish the BREATHE Clinic with the goal of using our expertise to push the envelope and help dogs and cats that may not be able to find help elsewhere, either because other veterinarians had exhausted the diagnostics and treatments they have access to, or because there are many respiratory diseases that have not yet been discovered and characterized yet.”

The BREATHE Clinic helps dogs and cats with respiratory conditions like chronic cough, abnormal breathing noises like snoring, exercise intolerance, collapsing trachea, and brachycephalic obstructive airway syndrome. Digestive and swallowing disorders, like megaesophagus, are also sometimes responsible for respiratory problems and can be treated, Reinero said.

The VHC’s advanced imaging capabilities, in conjunction with the ability to collaborate with a broad spectrum of other specialists at the VHC, including those working in anesthesia, cardiology, critical care, dentistry, soft tissue surgery and radiology, and partner with the patients’ referring veterinarians, position the clinic to provide state-of-the-art care. The availability of advanced imaging, like fluoroscopy, which allows BREATHE Clinic clinicians to assess dynamic processes like swallowing and breathing, and other diagnostic equipment, is crucial for diagnosing respiratory and aerodigestive disorders.

“As an example, in the span of a single breath, the VHC’s CT scanner can obtain images of a cat’s entire chest,” Vientós-Plotts said. “As another illustration, when we perform videofluoroscopic swallow studies, we are using kennels developed and patented by one of our key collaborators at MU to allow for unrestrained, free-feeding behaviors to be observed.”

“Compared to many other subspecialties, respiratory medicine is still in its infancy,” Reinero said. “There are many respiratory diseases that are widely recognized and successfully treated in general and specialty practice. However, if our patients are anything like humans, we believe there may be up to a couple hundred disorders and sub-disorders yet to be described in veterinary medicine. It takes a multidisciplinary team of clinicians, diagnostic imaging specialists, and pathologists who have access to state-of-the-art diagnostics, and the time, expertise, and drive to describe and characterize new diseases. We have that team of collaborators within the University of Missouri and externally.”

Having more than one respiratory disease at a time is also common, so even correct diagnosis and

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treatment of one disease may not lead to an overall clinical benefit. If a diagnosis can't be made or if dogs or cats fail to respond to appropriate therapy for that disease, it is likely they need more sophisticated testing and consideration of other less common or poorly characterized diseases, Reinero explained.

"Aerodigestive disorders, aside from aspiration pneumonia, are relatively recently described but are not on the radar of many veterinarians. Based on work at Mizzou using fluoroscopy, aerodigestive diseases have been found to be common, occurring in more than three-quarters of the dogs we see. This means not only the respiratory disease, but also the digestive tract disorder needs to be diagnosed and treated. This is one of our areas of expertise."

Treatment at the VHC begins with a questionnaire crafted to gather as much information as possible about the patient, their medical history and client concerns ahead of time. This allows the clinicians to understand the clinical context of the respiratory or aerodigestive disease and start shaping consideration of possible disorders.

During the patient's initial visit, they undergo a comprehensive physical examination. The exam involves an evaluation of the respiratory and gastrointestinal tract, including an analysis of an animal's oxygenation levels. Clients are provided recommendations for any additional diagnostics that may be needed. These may include blood tests, imaging, lung sampling, and tests for infectious diseases. Once the evaluation is complete and all the results are received, a treatment plan and management recommendations are provided.

Aida Vientós-Plotts and Spirit

"We see a smaller number of cases per day than other specialty services," Vientós-Plotts said, "This allows us more time to spend time with our clients and patients. Dr. Reinero and I are board-certified internal medicine specialists trained to look at the entire clinical picture, including how diseases of other organ systems might be affecting overall health."

Vientós-Plotts added that another goal is to offer clinical trials for specific diseases focused on improving diagnostic testing and applying new treatments.

"These may provide some options not available elsewhere and in addition, may help offset some of the costs to clients. We currently have two such clinical trials and are seeking research funds or donations for others," she said.

Reinero and Vientós-Plotts said they hope that by establishing this clinic they will have a positive impact on the lives of patients that may have treatable diseases, not just by treating cases themselves, but also by using these cases to teach other veterinarians and veterinary students, and conducting research that will advance respiratory medicine in the future.

More information about the BREATHE CLINIC, including which patients may benefit from treatment, how to make an appointment, and what to expect from a visit, can be found on the Small Animal Internal Medicine Service webpage.

MU Veterinary Health Center Welcomes New Director

A permanent director for the MU Veterinary Health Center will start in her new role this week. Gerelyn Henry, DVM, MBA, DACVP, will take over the reins on Thursday, Nov. 17. She replaces Joan Coates, DVM, MS, DACVIM, professor of veterinary neurology and neurosurgery, who has served as the interim hospital director for more than a year. Coates became the interim director upon the retirement of David Wilson, DVM, MS, DACVS, who had held the post since 2008.

Gerelyn Henry

Henry, a veterinary pathologist, joins the MU College of Veterinary Medicine from Charlottsville, Virginia, where she founded and served as the CEO and president of YW August Companies, a healthcare consulting, education, information, research and clinical services firm. She brings more than 30 years' experience in veterinary, comparative, translational, toxicologic and forensic pathology and more than 15 years' experience teaching veterinary and human pathology to doctoral students.

"The Veterinary Health Center director is the champion for our faculty, staff and students to foster achievement of their greater goals in veterinary medicine and to help create, maintain, and sustain the type of organization that allows them to perform, conduct, and carry out their lifesaving work," Henry said of her new position.

"The VHC is the place where we integrate our scholarly work with patient care. As health care professionals, we are concerned with educating not only the students and house officers in our charge, but also alumni and clients who entrust the care of their family members to us. Our goal is to create and maintain an environment and ecosystem where our faculty, staff and students can continue to thrive, and I am excited to become a member of such a prestigious and elite organization," she said,

Henry earned both her bachelor's degree and doctor of veterinary medicine degree at Tuskegee University in Tuskegee, Alabama. She went on to complete an internship in anatomic pathology at Tuskegee. She then completed a residency in anatomic pathology at Michigan State University in East Lansing. She was an NIH postdoctoral fellow involved in cancer research at Michigan State. Henry also has a strong educational background in business having earned a global executive MBA at the University of Virginia, Darden School of Business.

"The Veterinary Health Center director serves to facilitate the business and educational functions of the hospital," she noted. "While I am a visionary leader, loving to focus on organizational design and development, there must be a balanced approach because we have a fiduciary responsibility to maintain a sound business enterprise which will provide the necessary resources to further grow the business side of our practice."

Henry said cultivating veterinary students' leadership skills will be another priority.

"In addition to clinical services and research, veterinary teaching hospitals and veterinary specialty hospitals are special places where leadership skills of the next generation of veterinarians are forged, and where innovations in veterinary medicine are created or perfected for the advancement of medicine," she said.

The D.V.M. – The Dean's Video Message (November 2022)

In this month's video message, Dean Carolyn Henry discusses the collaboration between the Orthopedic Foundation for Animals and the CVM's Canine Molecular Genetics Laboratory. This longstanding relationship has meant better health and improved life for countless dogs and the people who love them.

View the archive.

Associate Professor Emeritus James Thorne Passes Away

MU College of Veterinary Medicine Associate Professor Emeritus of Veterinary Pathobiology James Garrett Thorne, DVM, PhD, MPVM, passed away Monday, Nov. 21, 2022, at his home in Columbia, Missouri, at 85. A memorial service will be held at Broadway Christian Church at a future date.

James Thorne

He was born Feb. 22, 1937, the son of Oscar Alexander Thorne and Mattie Frances Thorne of Purdin, Missouri. He graduated from Linneus High School in Linneus, Missouri, and then attended the University of Missouri where he earned a bachelor of science degree in agriculture in 1960 and doctor of veterinary medicine degree in 1961. He went on to complete a PhD in physiology at the University of Georgia and earn a master of preventive veterinary medicine degree at the University of California–Davis.

Dr. Thorne began his professional career in 1961 at the Green Hills Animal Hospital in Marceline, Missouri. He served two years as director of veterinary services for the U.S. Veterinary Corps of the U.S. Air Force at Bergstrom Air Force Base in Austin, Texas. He became an instructor and research associate at the University of Georgia College of Veterinary Medicine beginning in 1969. In 1974, he returned to the MU College of Veterinary Medicine as an associate professor in the Department of Veterinary Medicine and Surgery. He served as the director of Veterinary Continuing Education and Extension from 1982 to 1988. From 1988 to 2000, he served as an associate professor and clinical epidemiologist teaching epidemiology. He retired in 2000 as associate professor emeritus.

He was also well-known for his role as an advisor and sponsor of the CVM's Mule Club. He spent countless hours traveling the state with the club, driving the mule team, and serving as a goodwill ambassador for the college. Through his teaching, research and mentorship, he touched the lives of

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thousands of veterinary students. While at MU, he collaborated with another colleague to establish a leadership and personal growth experience for new students. He was a recipient of the Merck AgVet award for Creativity.

He served on the Development Committee for the National Veterinary Board Examination, was an officer for the Association for Veterinary Epidemiology and Preventive Medicine, a diplomate and past president of the American Board of Veterinary Practitioners, and he served on numerous committees for the American Veterinary Medical Association. In 1987, he developed a microcomputer spreadsheet program to aid producers in determining the economies of mass therapy in beef feeder calf receiving programs. In 2001, he served in the United Kingdom to assist in the epidemiology of the foot and mouth disease outbreak.

In 2012, he received the CVM's Alumnus of the Year Award. The Missouri Veterinary Medical Association named him the Veterinarian of the Year in 2013, and he was inducted into the MVMA Foundation's Veterinary Honor Roll in 2014. The Mizzou Alumni Association recognized him in 2014 with a Faculty-Alumni Award.

He was an active member of Broadway Christian Church, where he was an elder and served as chair of the property and organ committees. He was involved with the Missouri River Valley Steam Engine Association, was an amateur radio operator, and volunteered in numerous capacities serving youth and adults in the Boy Scouts of America, including as a Scout leader, Wood Badge leadership course director, and National Jamboree health officer. He received the Boonslick District Award of Merit in 1983 and the Silver Beaver Award in 1993 from the Great Rivers Council.

He is survived by his wife of 64 years, MaryJane, sons David (Mary), Jim (Pam), and John (Kelly), grandchildren Garrett, Taylor, Daniel, Anna and Ralph, great-grandchildren Jillian, Parker and Owen, and sister, Ethelyn Dodson, as well as many nieces and nephews. His parents preceded him in death.

Memorials are suggested to the University of Missouri College of Veterinary Medicine Mule Team and Public Relations Endowment Fund. Memorials may be sent to the University of Missouri College of Veterinary Medicine with Dr. James Thorne memorial noted, to the Office of Advancement, W210 Veterinary Medicine Building, University of Missouri, Columbia, MO, 65211 or online at www.giving.Missouri.edu

Arrangements are under the direction of Parker-Millard Funeral Service & Crematory. Condolences may be left online for the family at www.parkermillard.com.

SEC Emerging Scholars Program Helps Guide Career Options for Biomedical Sciences Fellow

Rowena Woode, DVM, PhD, a postdoctoral fellow in the MU College of Veterinary Medicine Department of Biomedical Sciences and a 2016 graduate of the CVM, recently participated in the Southeastern Conference Emerging Scholars Career Preparation Workshop in Columbia. Mizzou hosted students from each of the 14 universities in the SEC for a three-day career preparation workshop, providing professional development courses and networking opportunities with faculty and other students who are considering higher education as a career path. The yearlong SEC Emerging Scholars Program was developed in 2021, but the in-person workshop was the first of its kind due to COVID-19 precautions.

Rowena Woode

Woode, who was the first recipient of the Elmer and Virginia Florman Scholarship that fully funds the education of one CVM student every four years, recently completed all the requirements for her PhD and will graduate in December. She was one of five scholars from Mizzou to participate in the SEC Emerging Scholars Program because of her interest in a potential career as a university faculty member.

Though she still has decisions to make about her future career path, she says the program provided her with valuable insight. “It’s been an opportunity for me to reflect on how I see my career developing going forward,” said Woode.

The pathway to becoming a university faculty member is not always straightforward. Woode says that fact stood out to her as she participated in the SEC Emerging Scholars Program. “The workshop was a good networking opportunity to talk with different faculty at these universities and learn how winding one’s journey can be to get from point A to point B,” she said. “It’s been great to get encouragement from that angle and to know what life as a faculty member is like, because I have this idea in my head, but when I asked questions, I realized it’s different from what I thought.”

While Woode’s goal is to pursue a position as a faculty member, she is still considering where and what kind of role she will pursue. One aim of the program is to help in that decision-making process. “It’s given me the tools and an opportunity to have time to make the best possible decision,” she said. “I’ve been given a chance to reflect on what I want to do and where I see my career going. As I’m getting more information about what life would be like at different types of universities, as well as the workshops, seminars and network building, it’s been invaluable for me.”

By Nick Childress

Feline Genetics Help Pinpoint First-Ever Domestication of Cats, MU Study Finds

Cat genes reveal how invention of agriculture bonded cats with people in ancient Mesopotamia, leading to worldwide feline migration with humans.

Nearly 10,000 years ago, humans settling in the Fertile Crescent, the areas of the Middle East surrounding the Tigris and Euphrates rivers, made the first switch from hunter-gatherers to farmers. They developed close bonds with the rodent-eating cats that conveniently served as ancient pest-control in society's first civilizations.

A new study at the University of Missouri found this lifestyle transition for humans was the catalyst that sparked the world's first domestication of cats, and as humans began to travel the world, they brought their new feline friends along with them.

Leslie A. Lyons, a feline geneticist and Gilbreath-McLorn endowed professor of comparative medicine in the MU College of Veterinary Medicine, collected and analyzed DNA from cats in and around the Fertile Crescent area, as well as throughout Europe, Asia and Africa, comparing nearly 200 different genetic markers.

"One of the DNA main markers we studied were microsatellites, which mutate very quickly and give us clues about recent cat populations and breed developments over the past few hundred years," Lyons said. "Another key DNA marker we examined were single nucleotide polymorphisms, which are single-based changes all throughout the genome that give us clues about their ancient history several thousands of years ago. By studying and comparing both markers, we can start to piece together the evolutionary story of cats."

Lyons added that while horses and cattle have seen various domestication events caused by humans in different parts of the world at various times, her analysis of feline genetics in the study strongly supports the theory that cats were likely first domesticated only in the Fertile Crescent before migrating with humans all over the world. After feline genes are passed down to kittens throughout generations, the genetic makeup of cats in western Europe, for example, is now far different from cats in southeast Asia, a process known as 'isolation by distance.'

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“We can actually refer to cats as semi-domesticated, because if we turned them loose into the wild, they would likely still hunt vermin and be able to survive and mate on their own due to their natural behaviors,” Lyons said. “Unlike dogs and other domesticated animals, we haven’t really changed the behaviors of cats that much during the domestication process, so cats once again prove to be a special animal.”

Lyons, who has researched feline genetics for more than 30 years, said studies like this also support her broader research goal of using cats as a biomedical model to study genetic diseases that impact both cats and people, such as polycystic kidney disease, blindness and dwarfism.

“Comparative genetics and precision medicine play key roles in the ‘One Health’ concept, which means anything we can do to study the causes of genetic diseases in cats or how to treat their ailments can be useful for one day treating humans with the same diseases,” Lyons said. “I am building genetic tools, genetic resources that ultimately help improve cat health. When building these tools, it is important to get a representative sample and understand the genetic diversity of cats worldwide so that our genetic toolbox can be useful to help cats all over the globe, not just in one specific region.”

Throughout her career, Lyons has worked with cat breeders and research collaborators to develop comprehensive feline DNA databases that the scientific community can benefit from, including cat genome sequencing from felines all around the world. In a 2021 study, Lyons and colleagues found that the cat’s genomic structure is more similar to humans than nearly any other non-primate mammal.

“Our efforts have helped stop the migration and passing-down of inherited genetic diseases around the world, and one example is polycystic kidney disease, as 38% of Persian cats had this disease when we first launched our genetic test for it back in 2004,” Lyons said. “Now that percentage has gone down significantly thanks to our efforts, and our overall goal is to eradicate genetic diseases from cats down the road.”

Currently, the only viable treatment for polycystic kidney disease has unhealthy side effects, including liver failure. Lyons is currently working with researchers at the University of California at Santa Barbara to develop a diet-based treatment trial for those suffering from the disease.

“If those trials are successful, we might be able to have humans try it as a more natural, healthier alternative to taking a drug that may cause liver failure or other health issues,” Lyons said. “Our efforts will continue to help, and it feels good to be a part of it.”

“Genetics of randomly bred cats support the cradle of cat domestication being in the Near East” was recently published in *Heredity*.

Story courtesy of Show Me Mizzou
Contact: Brian Consiglio, 573-882-9144, consigliob@missouri.edu

Doubling Her Efforts

Researcher, animal-lover and academic dynamo Katherine Meiser completes the first step of her dual-degree dream.

Katherine Meiser earned her undergraduate degree at Gallaudet University in Washington, D.C., the nation's preeminent school for the deaf. So, as she recounts her scholastic journey to the University of Missouri and graduate school, her hands tell the story via American Sign Language with graceful clarity.

But when she found herself at an academic crossroads in 2015, the way forward wasn't as clear. She loved biology (her undergraduate major), research and — as the owner of two dogs, two cats, two snakes and an iguana — animals. That love of animals even led her to a veterinarian internship in her hometown of St. Louis, but she wasn't sure it was a fit.

"I knew I wanted to help animals, but I wanted to focus more on infectious diseases that were high risk and dangerous," Meiser said. "It wasn't until I watched the National Geographic TV show *Hot Zone*, featuring a character who is a veterinary pathobiologist, that I thought, 'That's it! That's what I want to do.'"

Fascinated by big-picture interactions between human and animal health, Meiser set course for dual degrees — a master of public health (MPH) and a PhD in veterinary pathobiology through the School of Health Professions and the College of Veterinary Medicine, respectively. This week, she'll complete the first leg by receiving her MPH diploma — all while already progressing toward her PhD.

It is an accomplishment made possible in part by the mentorship of Pamela Adkins, assistant professor of food-animal medicine and surgery in the College of Veterinary Medicine. Adkins' laboratory focuses on bovine mastitis, a disease that reduces milk production in cattle and costs the dairy industry billions. It is in this lab that Meiser focuses on identifying antimicrobial properties among common dairy farm bacteria with the goal of curbing mastitis pathogens.

"Katherine's true passion for learning sets her apart," Adkins said. "Before coming to my lab, she had no experience with dairy cattle — or much knowledge of how a dairy farm works. She truly embraced the topic and wanted to learn as much as possible. Plus, she has a great sense of humor."

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As colleagues who spend a lot of time in close quarters performing complex research, Meiser and Adkins have come to appreciate said humor in keeping the mood light.

“Occasionally, I’ll test Pamela to see if she catches mistakes I’ve made,” Meiser said. “If I’ve messed up something or missed something in an experiment, I’ll test her to see if she catches on. It’s fun.”

Meiser chose Mizzou primarily because of her degree program, but she has come to appreciate the diversity of resources, people and opportunities that such a large campus community provides. As a deaf student, she frequently works with the American Sign Language interpreters through the MU Disability Center.

Outside of the classroom and lab, Meiser has embraced Mizzou’s classic collegiate atmosphere. She and her husband — who have two sons together — took in their first football game in September at Faurot Field. And she signs “M-I-Z!” with the enthusiasm of a Tiger spirit squad member.

“I would love to try to recruit more deaf people to come to Mizzou,” Meiser said. “Everyone has been so friendly and welcoming, and the Disability Center provides resources for everyone who needs them.”

Meiser is on track to receive her PhD in 2026. She envisions herself working in a high-level laboratory someday — perhaps for the National Institutes for Health or the Center for Disease Control. The hands-on experience she has gained in Adkins lab has prepared her for the next steps in her education and beyond.

“Katherine is a motivated and goal-oriented student gifted with perseverance and a positive attitude,” Adkins said. “I’m confident she will continue to build on these skills as she moves into the next phase of her education.”

Story courtesy of Show Me Mizzou
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Photos by Abbie Lankitus

The D.V.M. – The Dean's Video Message (December 2022)

In the December message, Dean Carolyn Henry takes a retrospective look at the past year.

View the archive.

Expertise, Collegiality Earn Tommy Thompson Dean's Impact Award

Tommy Thompson

Tommy Thompson, business manager in the MU College of Veterinary Medicine Department of Biomedical Sciences, is the recipient of a 2022 Dean's Impact Award. CVM Dean Carolyn Henry, DVM, MS, surprised Thompson with the awards during the college's winter breakfast Tuesday, Dec. 20.

The annual awards, established in 1993, honor faculty, staff and individuals from outside of the college for their sustained and significant positive impact on CVM programs. Thompson received the award presented to a member of the staff. Earlier this year, Gayle Johnson, DVM, PhD, professor emerita in the CVM Department of Veterinary Pathobiology, received the 2022 Impact Award for a faculty member.

Thompson, who has been with the college for more than 25 years, received several nominations and letters of support for the honor, with nominators citing his expertise in extramural funding and willingness to share his knowledge not only within his department, but also with his peers in other departments and colleges.

"He has become an in-house expert at both pre- and post-award budgeting, grant compilation and electronic filing for NIH and AHA, among others," BMS Department Chairman Doug Bowles wrote in his letter of nomination. "We have become quite spoiled for the full-serve approach Tommy has taken for years in making the grant process easy for the faculty. This is no doubt responsible for the success of our faculty in obtaining federal awards, over $25 million in awards since 2006 alone."

Assistant Professor Nicole Nichols, PhD, credited Thompson for guiding her through the grant applications and progress reports necessary for her research funding.

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“Tommy has helped me prepare many grant proposals to institutional, foundational, and external grant agencies,” she wrote in her nomination letter, noting that more than half of her proposals received funding. “And he has always been extremely supportive, patient and helpful.”

Sherry Oliver, PhD, PMP, senior research consultant in the CVM Office of Research and Graduate Studies, said Thompson’s knowledge of funding agency guidelines and helpful strategies increase the competitiveness of applications.

“I am grateful to know that I can reach out to Tommy at any time, and I am always confident that he will provide helpful advice and sound judgment when I have grant-related questions or simply need someone to listen to a problem or an idea that I want to share,” Oliver wrote.