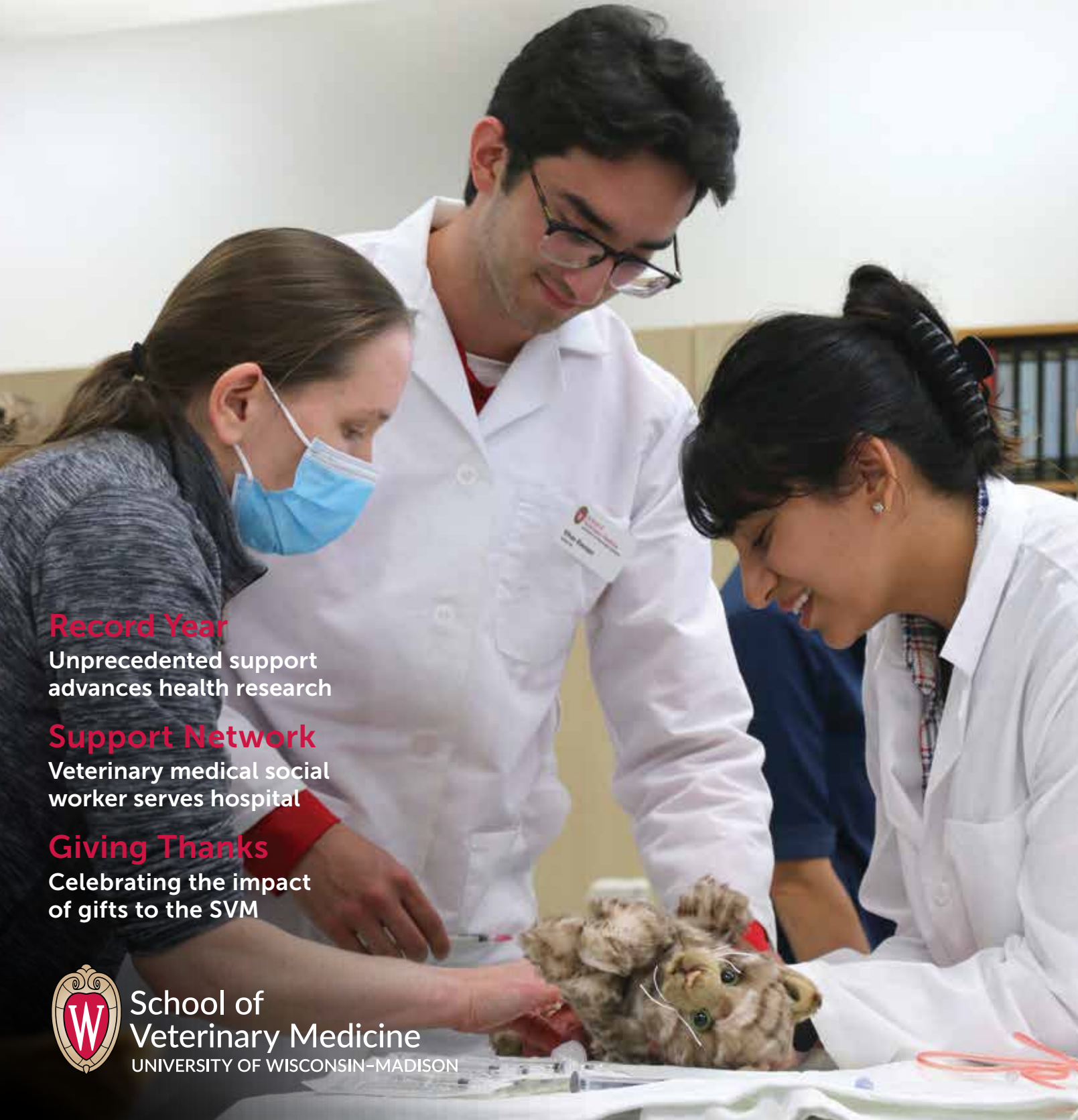


On Call

A MAGAZINE FOR FRIENDS OF THE UNIVERSITY OF WISCONSIN SCHOOL OF VETERINARY MEDICINE



Record Year

Unprecedented support advances health research

Support Network

Veterinary medical social worker serves hospital

Giving Thanks

Celebrating the impact of gifts to the SVM



School of
Veterinary Medicine

UNIVERSITY OF WISCONSIN-MADISON

Your legacy. Their future.

Including the University of Wisconsin School of Veterinary Medicine in your will is an opportunity to shape the future of veterinary medicine. Your estate gift can support the greatest needs or it can support something of particular interest to you such as student scholarships, the UW Veterinary Care teaching hospital, our research mission, and more.

What will your legacy be?

To learn more about including the School of Veterinary Medicine in your will, via the UW Foundation, or to discuss other planned gift options (charitable gift annuities, real estate gifts, etc.), contact **Pat Bowdish** at **608.332.4750** or pat.bowdish@supportuw.org or visit www.vetmed.wisc.edu/planned-giving.



**School of
Veterinary Medicine**
UNIVERSITY OF WISCONSIN-MADISON



Features



Record-Setting Research

Every day, faculty, staff, and students within the University of Wisconsin School of Veterinary Medicine advance cutting-edge studies focused on many of society's most pressing health questions. Continuing an upward trajectory, in 2022 the school received a record \$34.4 million in grants and extramural awards to advance this research and the cross-cutting impacts for animals and people.

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Helping Human Needs

A new licensed clinical social worker and social work intern have joined the School of Veterinary Medicine and UW Veterinary Care to support clients and the hospital team, part of a collaborative approach to compassionate care.

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With Gratitude

Hospital clients, clinic sponsors, alumni, industry partners, and more — in this special section, we honor the support of donors from all walks of life with gifts of every size, all of which make a difference in advancing the school's mission.

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On the Cover

Teaching assistant professor Karen Hershberger-Braker DVM'10, left, guides first-year Doctor of Veterinary Medicine students Ethan Elazegui, center, and Nandita Chittajallu, right, in practicing using a needle and syringe to draw blood from the rear leg of a feline model developed by lecturer McLean Gunderson in the school's Maeck Clinical Skills Training Center, where gifts from William and Shirley Maeck have expanded the resources available. (Photo: Seth Moffitt)



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Celebrating Our Successes and Donors

Welcome to the winter issue of *On Call*. In this issue, we highlight many of the UW School of Veterinary Medicine's successes, as well as our donors' impact on all that we do and have achieved.

In 2021, the UW School of Veterinary Medicine celebrated its best year of research funding in school history. I'm excited to report that in 2022, we substantially exceeded even that milestone, receiving \$34.4 million in total research and extramural awards. Much of that success is due to our faculty, staff, and students, who focus on advancing animal and human health.

The school continues to attract the best and brightest, and this year saw by far the greatest number of applicants — 1,942 — for the school's 96 slots. Importantly, each of the three most recent classes of DVM students represents the most diverse in the school's history.

As you likely have heard (or seen), the school is in the middle of a \$150 million building expansion and remodeling project. Groundbreaking occurred in June 2021, with the opening of our new north building projected for the fall of 2023. Please visit AnimalsNeedHeroesToo.com, where you can view a time-lapse video of this momentous building project.

We're also in the middle of significantly remodeling our current south building. By the end of 2024, this renovation and the construction of a new large animal arena and isolation facility should be complete.

None of this would be possible without the support of friends of the school, many of whom are our alumni or hospital clients. We are where we are today because of your generosity and the support from the UW–Madison campus, UW System, Wisconsin legislature, and governor.

I particularly want to direct you to the donor gratitude section of this magazine, beginning on page 16. Here we highlight some of the people and gifts that have significantly enhanced and supported the education we provide to our students and the research we conduct to benefit both animal and human health.

I hope you have an amazing fall and winter and enjoy this issue of *On Call*.



Mark D. Markel

Mark D. Markel, Dean

On Call WINTER 2022-23

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Lauren Trepanier, Assistant Dean for Clinical and Translational Research

Editorial

Editor/Writer: Meghan Lepisto

Contributing Writers: Maddie Arthur, Britta Wellenstein

Photography: Meghan Lepisto, Jeff Miller, Seth Moffitt, Bryce Richter, Britta Wellenstein

Design: Christine Knorr, University Marketing

Connect with Us

Please send your feedback and comments to oncall@vetmed.wisc.edu, 608-263-6914, or On Call Editor, 2015 Linden Drive, Madison, WI 53706.

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The printing and distribution of this magazine were funded by donations to the school. To make a gift, contact Pat Bowdish at 608-332-4750 or pat.bowdish@supportuw.org or Heidi Kramer at 608-327-9136 or heidi.kramer@supportuw.org.

Ask a UW Veterinarian



Canine Cancer Occurrence

This expert response comes from **David Vail**, a veterinary oncologist and **Barbara A. Suran Chair in Comparative Oncology at the UW School of Veterinary Medicine**.

Question: Three of the four dogs I've owned have had cancer (one twice). Is it known how many deaths of dogs in the U.S. are caused by cancer, which kinds of cancer are the most prevalent, and why?
—Margie

Answer: I certainly sympathize with your experience with cancer in your companion dogs. I have lost many of my dogs over the years to cancer. This is not unexpected as the number one cause of death (mortality) and morbidity (illness) in dogs over six years of age is cancer — roughly 60 percent.

This is partly due to the good care you provide your companions (cancer increases with age) through good nutrition, vaccination, and preventative healthcare. Additionally, dogs do not suffer from atherosclerotic heart disease like people. If you remove heart disease from the equation, cancer also becomes the number one cause of death in people. So, it is nothing we, as caregivers, do wrong. Rather, the natural aging process results in increased cancer incidence.

The most common cancers in dogs are skin cancer, cancer of white blood cells (lymphoma), and cancers of

connective tissue (called sarcomas). The most common types of sarcoma are soft tissue sarcomas, osteosarcoma (bone cancer), and hemangiosarcoma (sarcoma of blood vessels, usually in the spleen).

There are many factors involved in ultimately causing cancer. Dogs are now living longer to an age where cancer incidence increases. The longer a dog or person lives, the more chance for cancer-causing mutations in our DNA to build up. Additionally, as we age, our immune system (designed to recognize and kill abnormal cells before they become cancer) also ages, becomes "tired," and fails to recognize these abnormal cells.

Genetics and environmental factors — some known and many currently unknown — also come into play. We at UW are working towards a better understanding of cancer and ways to prevent and treat cancer in companion animals and people. To learn more, visit uwveterinarycare.wisc.edu/oncology.

Questions

Have a question for our veterinary medical experts?

Please send it to the *On Call* editor at oncall@vetmed.wisc.edu. We cannot guarantee responses to all submissions. For any urgent pet health issue, please contact your veterinarian directly.

Socializing with the SVM

Friends of the school sharing their thoughts (and pets) on social media...



About 2 months ago we were spending what we thought could be our last few days as a family with Ollie. 7 weeks ago

we took a big chance and got him surgery @University of Wisconsin School of Veterinary Medicine. Today he is back to his old smiling self. We are eternally grateful to get so much more time with our little guy!

—Amy Joy

📍 Via UW School of Veterinary Medicine Facebook (@uwvetmed)



Ya'll, I can't get over how amazing the @uwvetmed oncology team is. Great support throughout our boy's treatment, always greeted w/ smiles, & they sent him home w/ this bandana full of well wishes today after his last day. Thankful to have them on our care team for this journey!

—@meganhinnners

📍 Via UW School of Veterinary Medicine Twitter (@uwvetmed)



SETH MORFITT

Teaching professor Calico Schmidt (second from right, foreground) offers guidance to members of UW-Madison's Precollege Enrichment Opportunity Program for Learning Excellence during a lab session at the School of Veterinary Medicine.

Local Youth Get Hands-on Look at Veterinary Medicine

Listening to a cow's stomach with a stethoscope or taking an up-close look at animal hearts isn't how some teenagers might envision spending a summer day. But that's exactly what two groups of high school students experienced during a visit to the University of Wisconsin-Madison School of Veterinary Medicine (SVM) in July.

A cohort of 18 teenagers, mostly rising high school seniors, from UW-Madison's Precollege Enrichment Opportunity Program for Learning Excellence (PEOPLE) learned about the path to earning a doctorate in veterinary medicine and the careers possible, from research to teaching to clinical work. PEOPLE serves traditionally underrepresented and overlooked groups, specifically low-income and first-generation college students.

"There's a lot more in veterinary medicine than I thought there would be," said one student during the program.

The students gained hands-on experience with animals and laboratory equipment. This included listening to the heartbeat and stomach sounds of cows with certified veterinary technician **Katie Harmelink** and using microscopes to check for parasites in patient blood smears with clinical

instructor **Allison Dusick**. They also learned about wildlife medicine with **Barry Hartup DVM'93**, an SVM clinical instructor and director of conservation medicine for the International Crane Foundation.

"It was amazing to see the kids show up and not know what diagnostic work looked like or how to perform a physical exam, to by the end of the week, wanting to take home samples they prepared and stick around to ask new questions," says **Keegan Lim DVMx'24**, a third-year SVM student and PEOPLE experiential coordinator.

Students from the Madison-based organization Maydm also got firsthand experience with various aspects of veterinary medicine, practicing sutures, physical exams, and intubation with animal models in the school's clinical skills lab. The local nonprofit hosts summer immersion and internship programs for girls and youth of color in grades six through 12 to demystify career paths in science and technology and provide skill-based training.

Richard Barajas, the SVM's assistant dean for diversity, equity, and inclusion, discussed with participants from both programs the importance of inclusion and diversity across all professions, particularly veterinary medicine.

"The veterinary profession is among the whitest in America," Barajas noted. Myriad efforts are underway to increase the representation of minority and disadvantaged groups in the school and profession, but much work remains. Barajas applauded programs like PEOPLE and Maydm that help not only teach about the opportunities in veterinary medicine but also make it more accessible.

"... these programs presented themselves as a pre-existing infrastructure through which we can make a real impact in diversity, equity, and inclusion."

Lim was excited to help coordinate these experiences because of the opportunity they offer students. He expressed that often with diversity initiatives, "it can be hard to push that needle. But these programs presented themselves as a pre-existing infrastructure through which we can make a real impact in diversity, equity, and inclusion."

"Even for those not interested in veterinary medicine, it offers a chance to ask questions about higher education or what it looks like to be and operate in this space as a community," he adds.

Britta Wellenstein

From Ireland to Alumni Park, by Way of Wisconsin and a Nobel Prize



THE NOBEL PRIZE

William Campbell MS'54, PhD'57, who with fellow scientists discovered the drug ivermectin and won a Nobel Prize in Physiology and Medicine, is one of 11 UW–Madison alumni inducted into

Alumni Park at a fifth-anniversary celebration of the park in October.

An initiative of the Wisconsin Alumni Association, the park includes artful exhibits, scenic green spaces, and featured alumni who exemplify the Wisconsin Idea: the UW's cherished principle that the university's influence should reach the borders of the state and well beyond. The park is located between Lake Mendota and Langdon Street, near the Memorial Union.

Campbell, who grew up in County Donegal in Ireland, never meant to come to Wisconsin. "It happened by chance," he says. As a high school student, he went to an agricultural show and tucked a brochure on animal illnesses in his pocket. Years later, while at Trinity College in Dublin, a teacher made him think of that brochure again.

"The professor, Desmond Smith, was a parasite guy," Campbell says. "It immediately crystallized or focused my interest. I had originally come to study medicine, but because of him, at the last minute, I changed my mind and switched to natural science, studied parasitology, and never stopped."

Chance intervened again after Campbell had finished his bachelor's degree — chance and Professor **Arlie Todd** of the UW's Department of Veterinary Science. Todd was a parasitologist, and he was looking for likely graduate students. He wrote to Smith at Trinity, and Smith suggested three names.

"I was the most naïve, uncultured, country guy compared to the other two," Campbell says. But both of the others

married and decided not to take an overseas graduate program. Campbell, not sure what else to do, crossed the Atlantic.

Under the guidance of Todd and Professor **Chuck Herrick**, Campbell earned his master's degree and doctorate, and he was introduced to the concept of One Health — the idea that humans are animals and so there's little difference between the practice of human and veterinary medicine. Campbell went to work in drug development for the pharmaceutical firm Merck.

He and his fellow scientists were looking for a treatment for heartworm in cattle. The drug they developed, ivermectin, soon proved effective at preventing heartworm in dogs, ferrets, and horses. And, later, it found an even more exciting use: it could attack the parasites that cause onchocerciasis — or river blindness — in humans.

Before the late 1980s, about 40 million people were infected with on-

chocerciasis in tropical Africa and Latin America, and as many as 600,000 ended up blind. But ivermectin destroyed the filarial worm that caused the disease.

With Campbell's urging, Merck donated the drug to developing countries. About 25 million people are now treated with ivermectin each year, preserving the sight of thousands of individuals. The drug has proved so successful that in 2015, Campbell and Satoshi Omura shared the Nobel Prize in Physiology and Medicine for discovering it.

Campbell credits the achievement not primarily to his own effort but to the good fortune of working with the right colleagues.

"Teamwork was the thing," Campbell says. "Nowadays, it is common for science to advance through teamwork. When it happens, each one is indebted to all the others."

To learn more: alumnipark.com.

Wisconsin Alumni Association



SETH MOFFITT

In August, a special pup named **Cola**, pictured above, visited UW Veterinary Care for his first check-up with clinical instructor **Elizabeth Alvarez** and **Kate Palmer DVMx'23** (left) of the Primary Care service. Cola is the second dog in the UW Health Kids Canine Health and Medical Pals (CHAMPs) program, which provides comfort animals, handled by a child life specialist, for pediatric patients at American Family Children's Hospital (AFCH). Specifically, Cola will work in the pediatric palliative care unit. He joins **Kiko**, another CHAMPs dog who began in the fall of 2021. The CHAMPs program includes a partnership with the UW School of Veterinary Medicine to provide all dogs' medical and infection control needs. It builds on the success of the SVM's Pet Pals therapy dog program, which for 25 years provided AFCH patients and their families group visits with volunteer teams of dogs and their owners.

New Understanding of ‘Superantigens’ Could Improve Staph Infection Treatments

The bacterium *Staphylococcus aureus* has long been known to cause infections in humans, ranging from pneumonia to more serious infections of the heart. In high-income countries, it’s the leading cause of a sometimes-fatal condition known as infective endocarditis, involving inflammation of the heart’s valves or lining.

In a new study, researchers at the University of Wisconsin School of Veterinary Medicine describe another way the bacterium can cause harm: by undermining the body’s ability to heal from those infections.

The findings may point the way toward improving the treatment of infections with *S. aureus*, more commonly called a staph infection.

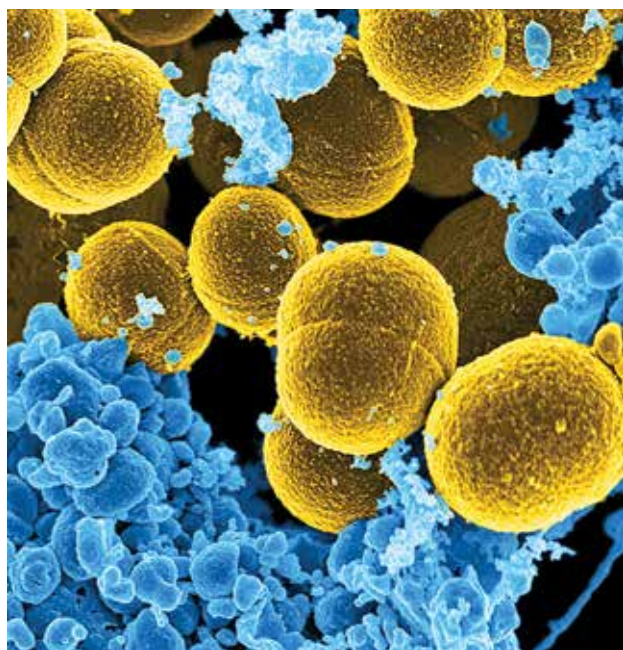
The *S. aureus* bacteria produce small toxins, called superantigens, that bind to white blood cells and over-activate the immune system, which can cause complications for the circulatory system.

The study in rabbits, published in *Science Advances*, found that a superantigen called SEC (superantigen staphylococcal enterotoxin C) prevents injured blood vessels from healing. It also stops the formation of new branching blood vessels crucial to the wound repair process.

“The role of many immune system molecules is to make the vessels around the infection more permeable, so they can enter and heal the infection,” explains senior author **Wilmara Salgado-Pabón**, professor of pathobiological sciences. “But when superantigens hyperactivate the immune system, your blood vessels can become leaky, leading to low blood pressure and organ dysfunction.”

Infective endocarditis is responsible for high rates of in-hospital mortality, as it progresses very quickly and can cause complications in other organs throughout the body. Over the last 50 years, treatment for the condition has remained largely unchanged, consisting of a six-week course of antibiotics or heart surgery to clear the infection. The new findings offer potential for developing new and better approaches.

“You could not only neutralize the toxins’ vascular effects, but you could



This digitally colorized, scanning electron microscopic image depicts a number of mustard-colored, spheroid-shaped *Staphylococcus aureus* bacteria attempting to escape destruction by blue-colored, human white blood cells.

possibly treat patients to improve their vascular health,” says Salgado-Pabón, whose work is supported by the National Institutes of Health. “By strengthening a patient’s vascular health, you could proactively prevent the complications that lead to fatality.”

Now that the lab has identified this new biological function, it is working to define the structures and molecules critical to the process.

Maddie Arthur

School of Veterinary Medicine Receives Full Accreditation

The UW School of Veterinary Medicine has received a full seven-year reaccreditation from the American Veterinary Medical Association (AVMA) Council on Education, representing the highest standard of achievement for veterinary medical education.

Accreditation is a voluntary peer review process. It represents the school’s ongoing commitment to excellent veterinary medical education.

“Accreditation of a veterinary program means the curriculum and adjacent activities have been evaluated and judged to meet quality standards for the veterinary profession,” explains **Peggy Schmidt**, associate dean for professional programs.

The school began preparing for the process’s culminating site visit over a year in advance, outlining

how the SVM meets each of the 11 standards of accreditation established by AVMA, including for admissions, the DVM curriculum, research programs, and clinical instruction.

The UW School of Veterinary Medicine has received full accreditation status at each evaluation period since 1988, the first year the school was eligible.

Maddie Arthur



JEFF MILLER/UNIVERSITY COMMUNICATIONS

UW–Madison’s new chancellor, **Jennifer Mnookin**, enjoyed a warm welcome to the university even before officially beginning her role in August. In June, Mnookin, far left, toured the UW School of Veterinary Medicine and UW Veterinary Care as part of a weeklong visit to campus and the community. **Ginger**, one of two teaching cows at the school, displayed a big smile for the occasion as clinical professor **Ruthanne Chun**, center, led Mnookin through the large animal hospital.

Kibble

Bits of news from around the school

UW School of Veterinary Medicine faculty will pursue 10 new research projects to improve animal health care with grants from the school’s Companion Animal Fund program. Topics range from the accuracy of a flash glucose monitoring system in dogs during anesthesia to probiotics’ effects on intestinal inflammation. Learn more: go.wisc.edu/CAFstudies

Shelby Williams, pharmacy manager for UW Veterinary Care, received the 2022 Outstanding Educator Award from the Society of Veterinary Hospital Pharmacists.

DVM students **Kailey Wichman** and **Madeline Zutz** were awarded 2022 Veterinary Student Research Fellowships from the Foundation for Food and Agriculture Research and American Association of Veterinary Medical Colleges to support work to advance global food security, sustainable animal production, and environmental sustainability.

As avian flu continues to spread through birds in the U.S., winter migration poses an additional risk of transmission to new flocks, says **Keith Poulsen DVM’04, PhD’12**, Wisconsin Veterinary Diagnostic Lab director and SVM associate clinical

professor. Poulsen encourages those who own domestic poultry to register their flock with the state, watch birds for signs of sickness, and keep their flock away from wild birds.

The **Vaccination Against Canine Cancer Study**, conducted by the UW School of Veterinary Medicine and two other leading canine oncology centers, has completed full enrollment with 800 dogs. This five-year trial, testing a vaccine aimed at broadly preventing cancers in dogs, is the largest interventional canine clinical trial in the history of veterinary medicine.

The **Wisconsin Companion Animal Resources, Education, and Social Services (WisCARES)** clinic in South Madison, a collaboration of the UW–Madison schools of veterinary medicine, social work, and pharmacy, was awarded \$135,000 in grants from PetSmart Charities to increase access to care. WisCARES provides free and low-cost veterinary medical care, a pet food and supply pantry, housing resources, and more to pet owners experiencing homelessness and financial difficulty. The university, grants, and private gifts support the subsidized clinic.

Unparalleled Performance

Record-setting research portfolio embodies One Health approach



Written by Meghan Lepisto

Would you expect scientists studying influenza, human respiratory disorders, multiple sclerosis, cancer treatments, and more to be based at a School of Veterinary Medicine?

Every day, faculty, staff, and students within the University of Wisconsin School of Veterinary Medicine (SVM) advance cutting-edge studies focused on many of society's most pressing health questions.

Federal and non-federal sponsors, training grants, and fellowships make this work possible, and 2022 was a record-breaking year. Continuing an upward trajectory in research funding, the school received \$34.4 million in grants and extramural awards.

SVM research carries broad and significant benefits for animals and people, with findings incorporated into the curriculum, clinical practice, and industry partnerships.

"We have a bench to bedside approach," says **Marulasiddappa Suresh**, associate dean for research and graduate training. "Our clinical and translational studies have implications for both veterinary and human medicine."

The following examples demonstrate the cross-cutting impacts of some of the school's research over the past year.

Innovative Vaccines

The UW School of Veterinary Medicine's infectious disease research — encompassing nearly two-thirds of total research funding at the school — has proven critical to the global understanding and prevention of diseases affecting animals, humans, and our changing environment.

Yoshihiro Kawaoka, a professor of pathobiological sciences, plays a significant role in these efforts and has advanced numerous studies on the COVID-19 pandemic. Notably, the Kawaoka lab, which in 2022 amassed nearly \$12 million in research funding, leads the Pan-Coronavirus Vaccine consortium. This National Institutes of Health-funded initiative aims to develop a universal coronavirus vaccine that could train our immune systems to respond to SARS-CoV-2 (the virus that causes COVID-19), its variants, and other as-yet-unknown coronaviruses.

Marulasiddappa Suresh, the John E. Butler Professor in Comparative and Mucosal Immunology, has taken a deep dive into the mechanisms of vaccine protection against viral respiratory disease. He's found that a second line of defense — the immune system's T cells — may offer protection from COVID-19. His research shows that a new, protein-

based vaccine against the original COVID-19 virus could teach mouse T cells to recognize and kill cells infected with mutated versions of the virus. These findings have important implications for future T-cell-based vaccines that could provide broad protection against emergent SARS-CoV-2 variants.

On the influenza front, the Madison startup FluGen, a spinoff from UW–Madison co-founded by SVM virologists Kawaoka and **Gabriele Neumann**, is exploring a more versatile influenza vaccine that would offer broader protection than today’s flu vaccines. No universal flu vaccine is on the market, but FluGen’s candidate, based on an invention by Kawaoka and Neumann, is one of the most promising. In human trials, the vaccine has demonstrated a broad immune response and protection against infection and illness across seven years of virus drift (changes that make flu viruses slightly different each year). The company is now moving into larger clinical trials.

Disease Detectives

When COVID-19 emerged in Wisconsin, virology professor **Thomas Friedrich** and colleagues began sequencing the genes of SARS-CoV-2 samples from infected patients. To date, the group has sequenced the virus from thousands of infections. They quickly post their results online, contributing valuable findings to pandemic response. The work helps keep watch for virus variants more adept at infecting people or possibly carrying mutations that make vaccines and common treatments less effective. It also allows researchers to understand patterns of virus transmission and evolution. For years the Friedrich lab has conducted research to inform global campaigns against emerging and re-emerging pathogens like influenza, Zika, and HIV.

Tony Goldberg, a professor of epidemiology, also studies emerging infectious diseases and how to prevent them. His systems are varied, including solving “mystery diseases” such as fish kills in the Great Lakes, lethal outbreaks of respiratory disease in African apes, bald eagle die-offs in Wisconsin, and diseases affecting invertebrates. These studies reveal how pathogens move between species — not only from animals to people (zoonoses) but in all directions. The goal is to disrupt disease transmission, safeguard health, and conserve ecosystems.

In May, professor **Jorge Osorio** became director of UW–Madison’s Global Health Institute, overseeing local and global efforts to investigate and find solutions to current health challenges. Osorio has decades of international experience studying emerging diseases — especially viruses and other pathogens making leaps from animal hosts to humans — and ways to prevent their spread.

Professor **Lytic Bartholomay** co-leads the Midwest Center of Excellence for Vector-Borne Disease, a Centers for Disease Control and Prevention-funded consortium that in 2022 received renewed support for another five years. The

center studies West Nile encephalitis, Lyme disease, and other illnesses spread by mosquitoes, ticks, and fleas, as well as interventions and control methods to prevent transmission.

And faculty with expertise in parasitic diseases, including assistant professor **Mostafa Zamanian**, are uncovering insights into how existing anti-parasitic drugs work, mechanisms of drug resistance (a growing concern in veterinary medicine), and targets for new broad-spectrum anti-parasitics. This work provides diagnostic and therapeutic leads to battle widespread pathogens of companion animals and livestock — generating next-generation treatment options.

Disorder Origins

From respiratory physiology to neuroscience to developmental biology, UW School of Veterinary Medicine scientists are demystifying conditions affecting millions of people.

Professors **Michael Cahill**, **Jyoti Watters**, and **Tracy Baker** have shed light on the cognitive and behavioral impacts that sleep apnea — a common disorder in which a person repeatedly stops and starts breathing while they sleep — during pregnancy may have on offspring, from the development of neurodevelopmental disorders like autism to altering the intestinal microbiome. Another study led by professor **Sathish Kumar** found that maternal sleep apnea increases the risk of adult male offspring developing high blood pressure. Baker and Watters are now collaborating with an obstetrician-gynecologist to share their findings from rat models and determine if they apply to humans.

Several researchers are exploring diseases of the nervous system, including multiple sclerosis (MS), that degrade myelin, the essential insulation around nerve fibers. Assistant professor **Jayshree Samanta** studies the specific cellular pathways that regulate remyelination, or how myelin repairs itself naturally. Samanta’s goal is to help determine new strategies for promoting remyelination by neural stem cells in the brain. Professor **John Svaren** is focused specifically on understanding the myelin-producing cells of the peripheral nervous system (outside the brain and spinal cord) and identifying therapeutic drug candidates for several myelination disorders, including Charcot-Marie-Tooth Disease, which causes nerve damage in the arms and legs.

Another group of SVM faculty, including professors **Ted Golos**, **Joan Jorgenson**, **Rob Lipinski**, and **Chad Vezina** are revealing new insights into placental biology relevant to human health, pregnancy, and fetal wellbeing (Golos); female and male ovary and testis development and adult reproductive diseases (Jorgenson); how genetic and environmental factors interact to cause birth defects of the face and brain, to develop prevention strategies (Lipinski), and the cellular anatomy of the prostate and urinary tract, informing new treatments for urinary dysfunction and prostate cancer in aging male people and pets (Vezina).



Translational Discoveries

UW School of Veterinary Medicine researchers are also world-renowned for advancing clinical treatments and technologies across species. The school is a leader, for instance, in comparative oncology research, investigating clinical cancer treatments in companion animals (with owner consent) with naturally occurring cancer. The goal is to inform clinical treatments with better effectiveness and less toxicity in both animal and human patients and accelerate therapy development. For example, to combat typically incurable metastatic cancers, a team led by professor **David Vail** is investigating immunotherapies designed to train a patient’s immune system to recognize cancer cells as foreign and remove them.

The Comparative Genetics and Orthopaedic Research Laboratory, co-directed by faculty members **Peter Muir** and **Susannah Sample**, studies genetic diseases that affect dogs, such as cruciate ligament rupture and laryngeal paralysis, which can serve as models for similar conditions in humans. This information not only helps dog



A \$150 million UW School of Veterinary Medicine building expansion and renovation, scheduled for completion in 2023-24, will increase and modernize labs to develop diagnostics and treatments and prevent naturally occurring infectious and non-infectious diseases of animals and humans.

breeders avoid carriers or individuals with high genetic risk when breeding but also the dog-owning public, as dogs identified as high risk for certain genetic diseases can get personalized care or preemptive treatment. The findings may also help genomic researchers advance discoveries in human equivalent diseases.

And innovative research into digital dermatitis has yielded sustainable, effective prevention measures and a computer vision model, developed by professor **Dorte Dopfer** and colleagues, using artificial intelligence for automated detection of this common hoof disease. Digital dermatitis is linked to severe lameness, infertility, decreased production, and economic losses in dairy and beef cattle. With the automated detection model, a small

One Health

A collaborative approach that recognizes the health of people is closely connected to the health of animals and our shared environment. One Health is not new, but has become more important in recent years. This is because many factors have changed interactions between people, animals, plants, and our environment.

Source: Centers for Disease Control and Prevention

camera captures images of cows' hooves as they pass by and transmits the images to a computer program trained to monitor hoof health. The system is now being implemented on dairy and beef farms, providing a new strategy to identify cows needing treatment promptly.

Future Leaders

Alongside advancing critical discoveries, the UW School of Veterinary Medicine is committed to developing outstanding scientists.

Federal training grants to the school support veterinarians in pursuing PhDs and developing skills as clinician-scientists — a recognized need in today's workforce. Several dual degree and certificate options supplement the DVM program with enhanced research training. Veterinary medical students in the school's Summer Scholars Program undertake a research program to enhance their appreciation and knowledge of career opportunities in biomedical research. And the Comparative Biomedical Sciences graduate program provides research training in core areas of animal and human health.

"That is how we blend research training and research," says Suresh. "We are generating the next generation of biomedical scientists."

Maddie Arthur, Chris Barncard, Leonardo Barolo Gargiulo, Eric Hamilton, and David Tenenbaum contributed writing.

BY THE NUMBERS

\$34.4 MILLION
TOTAL RESEARCH AND
EXTRAMURAL AWARDS
IN 2021-22
(FEDERAL AND NON-FEDERAL)

#4
NIH-FUNDED
VETERINARY MEDICAL SCHOOL
IN 2021
(BLUE RIDGE INSTITUTE FOR MEDICAL RESEARCH)



From Innovative Research to Invention

Occasionally, UW School of Veterinary Medicine scientists obtain patents for their innovative solutions or inventions, granting property rights to the inventor. Such patentable inventions include the discovery of new or improved processes, compositions (for example, new materials or drug molecules), or devices.

Often these innovations are shepherded through the Wisconsin Alumni Research Foundation (WARF), the patenting and licensing organization for UW–Madison, which advances transformative discoveries to market. From there, the invention is put to work for public benefit — another example of how innovative research makes a difference in the world.

6 PATENTS
issued to UW School of Veterinary
Medicine researchers **in fiscal year 2022**

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100 PATENTS
issued to UW SVM scientists **since 2010**

Examples of patents issued to UW SVM faculty, staff, and students in recent years:

- Improved influenza virus replication for vaccine development
- Use of retinoic acid and analogs thereof to treat central neural apneas
- Global gene regulators as vaccine candidates against paratuberculosis
- Method to predict heritable canine non-contact cruciate ligament rupture
- Methods and systems for isolating and identifying nucleic acid from a plurality of microorganisms and viruses
- DNA-based detection and identification of eight mastitis pathogens
- Stall floor heat exchanger reducing heat stress and lameness
- Biologically active sutures for regenerative medicine
- CT machine for multi-angle scanning of stationary patients
- Method for optimizing health and productivity of milk-producing animals

Stress Management

Veterinary social worker serves hospital team and clients



UW Veterinary Care social worker Rhonda Nichols, left, and social work intern Lee Xiong, right, support hospital clients, clinicians, staff, and students in processing difficult situations and emotions.

Written by Britta Wellenstein

When Kevin Kasza entered his oncology clinical rounds as a fourth-year student at the University of Wisconsin–Madison School of Veterinary Medicine, he knew it would have some challenges.

Oncology, the study and treatment of cancer, can be an emotional, stressful component of veterinary practice. Clinicians not only handle complicated medical situations but often communicate with pet owners navigating difficult decisions.

Kasza saw this first-hand throughout his rounds, but one appointment stuck out. A client struggled to process their pet’s situation and seemed to be experiencing a mental health crisis.

“As veterinarians, we are not trained in crisis care or how to handle difficult situations like that,” Kasza reflects.

Fortunately, Kasza and other members of the client’s care team were able to discuss the situation with **Rhonda Nichols**, UW Veterinary Care’s new social worker. She joined the School of Veterinary Medicine in March 2022.

Nichols began her career in social work in 2001, when she graduated with a master’s degree from UW-Milwaukee. She has primarily worked in human mental and physical health care and supporting people with eating disorders. However, when Nichols learned about the social worker position at the SVM, she was immediately intrigued.

“I hadn’t actually heard of social workers in a field like this,” she says. “I thought this was so exciting. It makes so much sense to me why a social worker is needed in veterinary medicine.”

The idea of veterinary social work emerged in 2002 when the University of Tennessee College of Veterinary Medicine and College of Social Work created a post-graduate Veterinary Social Work certificate program. Since then, more veterinary universities and hospitals have brought in social workers. “Social workers are slowly trickling into the field,” Nichols says.

When people think of social workers, human health care is often the first scenario to come to mind. A social worker may support the patient and their family, for example, by talking them through their care and situation. They also support clinicians, helping to address stressful situations they encounter or helping communicate clients' care options.

In veterinary medicine, a social worker operates similarly, working with an animal's family and care team to help them through a crisis. Typically, in veterinary medical hospitals, client management is placed on the veterinarian. However, as Kasza experienced, veterinarians don't often have abundant training in crisis management.

"Veterinary staff focuses their expertise on the animals. Social work is added to help the human needs involved, both with animal owners and staff," Nichols says.

The human-animal bond is a significant, mutually beneficial relationship. Animals are seen as family members to many, making the loss or sickness of an animal companion challenging to process. Nichols helps guide UW Veterinary Care clients through such stressful events.

Nichols strives to understand the client's relationship with their animal and their point of view when addressing

"Veterinary staff focuses their expertise on the animals. Social work is added to help the human needs involved, both with animal owners and staff."

that animal's care, hoping to help them make the best choice for their animal and minimize regret and second-guessing in these emotionally taxing situations.

"The patients and clients are why everyone is here," she says. "I'm trying to fill the emotional needs that come with the incredible relationships people have with their animals."

Nichols spends her days responding to requests from faculty, staff, and students, talking with clients, and supporting those experiencing a variety of difficult situations, including processing the death of an animal. Eventually, she plans to implement a pet loss support group for clients.

"I want to let people know they are not alone when they lose a pet and feel these really significant emotions," she says.

This summer, Nichols welcomed a social work intern, **Lee Xiong**, a graduate student from the UW-Madison Sandra Rosenbaum School of Social Work, who will build on the help provided.

In addition to client care, Nichols is also a resource for UW Veterinary Care employees. "Veterinary medicine is a highly demanding area of practice. I don't think many people are very aware of that stress," she says.

Mental health awareness in the workforce has been growing across all sectors, but especially in veterinary medicine. The job brings a range of stressors, including caring for ailing animals, compassion fatigue (the emotional and physical impact of caring for others), and financial stress over student loans. One in six veterinarians considers suicide, according to the U.S. Centers for Disease Control and Prevention. Veterinarians also have higher rates of anxiety and depression than other professions.

The pandemic brought even more pressures to veterinary clinics, with worker shortages amplifying an already stressful job. Many veterinarians and veterinary staff experienced increased burnout and compassion fatigue, with the effects still lingering.

The UW School of Veterinary Medicine is part of a global effort to take a more comprehensive look at the care and needs of veterinarians, staff, and students in training, implementing more mental health awareness and well-being practices. Nichols is part of this movement towards a better working and learning environment.

"Many schools of veterinary medicine are including licensed clinical social workers in the team-based approach to patient care," says **Chris Snyder**, UW Veterinary Care director. "Having a social worker helps manage some of the emotional stress of client management that was historically managed by the doctors and staff."

"In addition to being a great resource for clients, having a social worker available to debrief and discuss personal feelings and circumstances surrounding difficult cases helps staff process and maintain a healthy state of mind," he adds.

Through office hours and on-demand support, Nichols can ease high-stress circumstances.

"I work to be a connecting point for staff to find other resources," she says. "It's important to have someone there to help process difficult situations. It is more helpful if people can process situations like this sooner, instead of secondary traumatic stress building."

Additionally, Nichols liaises with residents and interns (veterinarians pursuing advanced training in specialty areas) and DVM students to explore complex parts of their clinical responsibilities, such as the situation Kasza experienced. She shares ways to communicate effectively with clients, handle stressful situations, and adopt various wellness practices. One goal is to equip trainees with tools to approach these situations when a social worker may not be present.

Overall, Nichols' position helps move the school and teaching hospital towards a more supportive culture for those delivering and receiving compassionate veterinary medical care.

"As many communication rounds and classes as we may take, client communication and crisis help are not our main focus as a degree," Kasza reflects. "Rhonda's position is very valuable to make everyone feel safer and less burdened."

Thank You!



MAKING A DIFFERENCE WITH DONOR SUPPORT

The UW School of Veterinary Medicine's upward trajectories in teaching and learning, research, clinical care, and more are only made possible because of you, our supporters.

From a record-breaking year for research funding to a record number of applications for our incoming Class of 2026 to providing cutting-edge, compassionate care to tens of thousands of UW Veterinary Care patients annually, generous donors drive our success.

Your gifts are also reflected in our critical building expansion, now past the halfway point of construction, and the addition of several new faculty members with wide-ranging expertise who train, mentor, and inspire the next generation of veterinarians and researchers. Your support also drives continued strides forward in creating a culture of diversity, equity, inclusion, and belonging — amidst the highest number of admitted underrepresented students in the school's history. And your gifts grow scholarships that offset our graduates' debt.

All that the SVM does is bolstered by gift support — pursuing society's most pressing scientific questions to benefit animal and human health, preparing our graduates for every facet of work, providing the highest level of clinical care, and advancing the veterinary medical field.

We share a gracious thank you to all who have contributed. The stories across the following pages recognize the impacts of some of this generosity and those behind these gifts of all sizes, all of which make a difference.

To view a list of all donors who made gifts or pledges of \$100 or more between July 1, 2021 and June 30, 2022, visit **www.vetmed.wisc.edu/donor-honor-roll**.



How to Give

For more information on ways to give to the School of Veterinary Medicine, please visit **www.vetmed.wisc.edu/giving** or contact **Pat Bowdish** at pat.bowdish@supportuw.org or 608-332-4750 or **Heidi Kramer** at heidi.kramer@supportuw.org or 608-327-9136.



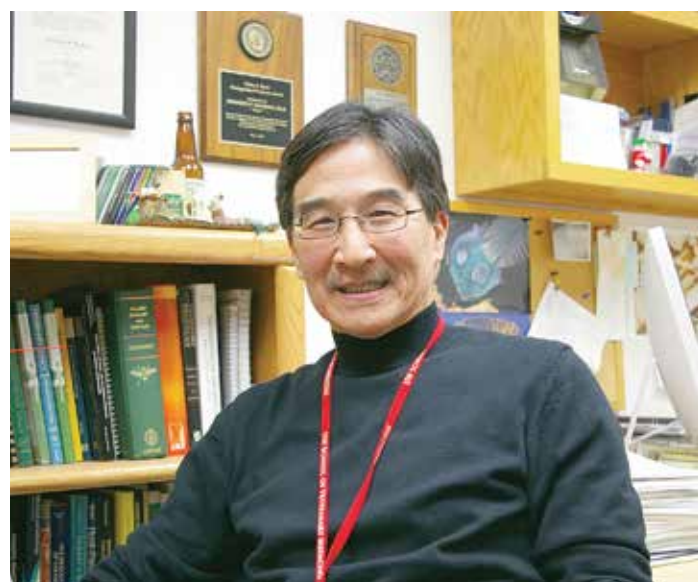
Toward Greater Representation

Lia Spencer (pictured at right), a member of the DVM Class of 2024 at the University of Wisconsin School of Veterinary Medicine, is the first recipient of the newly established Pan Asian Veterinary Medicine Scholarship award. **Tim Yoshino** (below), a professor emeritus with the school, and his wife **Laureen Yoshino**, a special education teacher and elementary school librarian in the Madison School District, established the scholarship in 2022 to help increase and support diversity in the veterinary medical profession.

“Through our experiences as educators, we recognize that members of the Pan-Asian community have limited representation, as students and professionals, within the local school district and the UW School of Veterinary Medicine,” Tim says. “We felt that establishing this scholarship would help to encourage more Pan-Asian participation in the veterinary medical profession, providing important role models for others to follow.”

The \$1,000 scholarship recognizes one recipient annually who represents “strong interest and commitment to veterinary medicine,” he says. Preference is given to applicants who are members of the Association of Asian Veterinary Medical Professionals (AAVMP) of UW–Madison and demonstrate commitment to or interest in one or more Pan-Asian countries and cultures.

Spencer exemplifies these standards. She is the senior delegate of the UW–Madison chapter of the Student American Veterinary Medical Association (SAVMA), vice president of the university’s AAVMP chapter, and the veterinary medicine program representative for UW–Madison’s Student Interprofessional Health Council. She also holds a certification in diversity and inclusion in veterinary medicine from Purdue University and previously served as chair of the Equity in Veterinary Medicine Grant for SAVMA’s Integrative Communications and Diversity Committee.



“Visibility is so important in any profession, but especially in this profession. I am excited for future recipients of this scholarship who are doing significant work in making this profession more diverse.”

Spencer’s journey into veterinary medicine was not a linear one. She explored many options in undergraduate education at Carleton College, but her curiosity, compassion for others, and biology knowledge led her to the veterinary medical field.

After graduation, Spencer intends to go into small animal practice with a community medicine focus. “Most of my experience has been in nonprofits, where I have witnessed the need to maintain the human-pet bond by increasing access to veterinary care,” she says.

She is incredibly thankful for this scholarship in more ways than one.

“As a non-resident student, this scholarship will help me cover much-needed expenses towards my veterinary medicine education,” she says.

Even more so, Spencer is thankful for what this scholarship represents and the Yoshinos’ intended purpose for establishing it.

“I would like to thank Tim and Laureen Yoshino for creating this scholarship and recognizing the need to highlight students who are raising awareness of the Pan-Asian community,” she notes. “As the daughter of a Taiwanese mother, I entered veterinary school without having met someone who looked like my mother in the veterinary medicine field.”

“Visibility is so important in any profession, but especially in this profession,” she adds. “I am excited for future recipients of this scholarship who are doing significant work in making this profession more diverse.”

Britta Wellenstein

27 Years of Dedication and Love



It takes a lot of love and dedication to keep up with something for 27 years. **Ramona Widick** sure knows this. For each of the past 27 years, she has made a donation to the University of Wisconsin School of Veterinary Medicine.

Widick made her first gift when her seven-year-old black lab and Irish setter mix, **Megan**, hurt one of her vertebrae.

“We don’t know how she did it,” Widick reflects. “She was completely paralyzed — couldn’t stand or walk.”

Megan was an active dog, which made the prospect of a spinal injury particularly worrying.

“She had a personality of ‘Irish shredder.’ She was wild,” Widick says. “I taught her to dive off the pier. She’d run twenty feet down and fly off. Every day I’d go swimming, and she’d swim with me.”

Megan’s veterinarian in Minocqua, Wisconsin, told Widick to go to the UW School of Veterinary Medicine’s teaching hospital for spinal surgery. The pair headed to Madison immediately.

“They were waiting for us at the doors and took Megan right away,” Widick recalls.

After Megan’s surgery, UW Veterinary Care clinicians called every day to see how she was recovering. They told Widick to anticipate that Megan wouldn’t be able to walk for a week.

“I had a sling and took her out to do her business,” Widick says. “But, almost one week to the day after her surgery, she just got up and walked to us.”

Just like that, Megan was back to swimming with Widick. Megan lived for seven more years, passing away at 14 years old.

Since Megan’s surgery, Widick has donated to the School of Veterinary Medicine. When asked why, she expresses thanks for the care the school provided her dog.

“I just think it’s a great program down there,” she says.

But even more so, Widick’s dedication and philanthropic spirit stem from her love of animals.

“When I was a young girl, I always wanted to be a vet,” she notes. “Growing up, we had horses, dogs, and cats, you name it.”

After Megan, Widick has continued to have several pets at her home in Woodruff, Wisconsin, including her current companion, a cocker spaniel.

Britta Wellenstein

Companion Animal Fund Clinic Sponsors

Years of clinic participation effective
June 30, 2022

The UW School of Veterinary Medicine receives tremendous support from veterinary medical clinics that make a donation to the Companion Animal Fund when a client’s pet has passed away. These donations are kind and thoughtful gestures by a client’s veterinarian at times of great sadness and loss.

The school is grateful for clinic sponsors who share in our efforts to ensure that all companion animals lead longer and healthier lives. Thank you to the following veterinary medical clinics for their generous participation in the Companion Animal Fund Clinic Sponsor Program from July 1, 2021 through June 30, 2022.

30-35 Years

Country View Animal Hospital
Dodgeville Veterinary Service
Northside Veterinary Clinic
Omro Animal Hospital
Park Pet Hospital
Shorewood Animal Hospital
Thiensville-Mequon Small Animal Clinic
Wright Veterinary Service
Kaukauna Veterinary Clinic
West Salem Veterinary Clinic

20-29 Years

All Paws Animal Hospital
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Bark River Animal Hospital
Family Pet Clinic
Jefferson Veterinary Clinic
Layton Animal Hospital
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Muller Veterinary Hospital
New Berlin Animal Hospital
Oregon Veterinary Clinic
Tecumseh Veterinary Hospital
Wittenberg Veterinary Clinic Companion Animal
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10-19 Years

Delafield Small Animal Hospital
Lake Country Veterinary Care
Metro Animal Hospital
Military Ridge Veterinary Service
Creature Comforts Home Veterinary Care
Northwoods Animal Hospital

1-9 Years

Birch Bark Veterinary Care
Dr. Noah’s Ark Veterinary Clinic
High Cliff Veterinary Service
Marshfield Veterinary Service
Southwest Animal Hospital



The Funderburgs' Labrador Retriever Opus had laryngeal paralysis and was part of a School of Veterinary Medicine study of the disease's genetic basis.

Client Support Helps Find Cause of Common Dog Disease

When **Allison Smith and Tom McManus** noticed their Labrador Retriever, **Beau**, was breathing noisily more often and walking differently, they knew something was wrong. After taking Beau to the veterinarian, they discovered he had laryngeal paralysis.

This degenerative neurologic disease is common in Labrador Retrievers. Primarily affecting older dogs, the condition decays the fibers of motor nerves, which control muscle movements. This decay leads to impaired muscle function around the larynx and restricted breathing.

During normal breathing, a dog's larynx, located at the back of the throat, will open for air to pass through. With laryngeal paralysis, dogs can have difficulty getting enough air into their lungs. Although surgery can lessen the severity of restricted breathing, it is not a cure.

The Comparative Genetics and Orthopaedic Research Laboratory at the University of Wisconsin School of Veterinary Medicine is working to better understand this disease and identify the genetic mutations associated with it.

Directed by faculty members **Peter Muir and Susannah Sample MS'07, DVM'09, PhD'11**, the lab's analyses of laryngeal paralysis will help improve veterinary care for the disease and help breeders reduce its prevalence in offspring.

Ultimately, the lab aims to create a genetic test for laryngeal paralysis in the Labrador and Golden Retriever (another breed where the condition occurs frequently). Then, they'll determine whether the test applies to other dog breeds. Once developed, this diagnostic test can be used to inform dog breeding and patient management.

The team is also studying other genetic conditions, including cruciate ligament rupture in Labrador Retrievers (see page 24), fibrotic myopathy in German Shepherds, and degenerative suspensory ligament disease in horses. This research not only benefits veterinary species; it also sheds light on similar genetic disorders in humans.

Genetic samples (often collected through a small blood sample or saliva swab) from client-owned animals naturally experiencing these diseases support the researchers' work. For example, for years, they have gathered samples from dogs across the U.S. and Canada to help unravel the mysteries of laryngeal paralysis.



"When I learned about the SVM's research, it gave me hope that someday there would be a genetic test to help prevent producing puppies that would be afflicted with laryngeal paralysis in their old age. I wanted to help support that and leave a legacy that would honor the human-animal bond and my wonderful dogs."

Beau's family enrolled him in the laboratory's laryngeal paralysis study in 2015, adding his genetic material to the sample population.

Sadly, Beau passed away in 2016. After losing Beau, his family was driven to find a way for Beau's legacy to live on.

"He was a therapy dog," Smith reflects. "He gave in life and we wanted to find a way to keep giving." So, Smith and



BRITTA WELLENSTEIN (2)

Hugh and Gail Funderburg, second and third from left, visit with members of the Comparative Genetics and Orthopaedic Research Laboratory.

McManus started Beau’s Fund for Excellence in Laryngeal Paralysis Research to raise money for the work done at the UW School of Veterinary Medicine, and they have encouraged others to support the research.

Hugh and Gail Funderburg also share an appreciation for this research, having first donated to the efforts in 2017 and recently contributing to Beau’s Fund.

Like the Smiths, the Funderburgs had a dog with laryngeal paralysis. Their dog, **Opus**, was diagnosed with laryngeal paralysis almost a decade ago. Over the course of Opus’ disease, he lost his bark.

“It was devastating,” Hugh says.

The family’s veterinarian in Rockford, Illinois, advised them to visit the SVM for surgery to open Opus’ paralyzed larynx. It was there they learned of the school’s laryngeal paralysis research and added Opus’ genetic sample.

Opus died in 2018, but the Funderburgs still bring other pets to the SVM for specialized care and continue to make gifts.

“I’ve been impressed with the people here. The honesty and quality is just outstanding,” Hugh reflects.

All the way in Montana, **Jaye Melcher** also contributed to the research, establishing the Slick and Zephyr’s Fund for Excellence in Veterinary Medicine Research in the spring of 2022. Melcher’s dog **Slick** developed laryngeal paralysis in 2014, which is when she discovered the School of Veterinary Medicine laboratory and added Slick’s blood sample.

After receiving a letter of gratitude from the lab for participating in the study, Melcher was touched by their care and determination and donated to the group’s work. Then, in 2022, when her other dog, **Zephyr**, developed laryngeal paralysis, she created the fund.

“It was heartbreaking to have first Slick and then Zephyr, both of whom are dog agility champions and were active going into their senior years, diagnosed with this terrible disease,” she says. “When I learned about the SVM’s research, it gave me hope that someday there would be a genetic test to help prevent producing puppies that would be afflicted with laryngeal paralysis in their old age. I wanted to help support that and leave a legacy that would honor the human-animal bond and my wonderful dogs.”

As a biologist herself, Melcher understands the difficulty of obtaining research funding, which further inspired her gifts. “I know what it’s like to get funding for research. It’s really hard,” she says. “I can help fill that gap and make funding available for research that will benefit animals and their families.”

The Comparative Genetics and Orthopaedic Research Laboratory relies on these public donations. Lab members have been touched by the widespread support of their work, partly due to the global reach of social media. Beau’s Fund, for example, has generated gifts from donors in 20 different states plus the United Kingdom.

“We could not do any of the research without outreach and support from the public,” Sample says. “Donations from the public have a massive impact on moving things forward.”

To learn more, visit www.vetmed.wisc.edu/lab/corl.

Britta Wellenstein

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SUCCESSIVE GIVING, SUCCESSFUL SCHOOL

Since the UW School of
Veterinary Medicine's founding:

473

INDIVIDUALS

and

105

COMPANIES

have shared gifts in
10 or more consecutive years

71

INDIVIDUALS

and

39

COMPANIES

have given in
20+ consecutive years

4

INDIVIDUALS

and

10

COMPANIES

have given in
30+ consecutive years

32 YEARS

The longest streak for consecutive years
giving to the school for an individual

36 YEARS

The longest streak for consecutive years
giving to the school for a company
(A COMPANION ANIMAL FUND CLINIC SPONSOR)

41 STATES

Consistent donors to the school hail
from near and far across the country

Place for Practice: Gifts Enhance Educational Spaces and Learning Tools

William and Shirley Maeck's impact on the University of Wisconsin School of Veterinary Medicine continues to live on in the Maeck Clinical Skills Training Center.

This bright and inviting state-of-the-art teaching space, which opened five years ago, allows members of the SVM community, including students and clinicians, to get more hands-on training in core clinical skills. It is part of a remodeled student-focused hub, the Renk Learning Center, which opened in 2017. The learning center as a whole was made possible by a major gift from the late **Walter and Martha Renk**, generous donations from SVM alumni and friends, and a significant contribution from the UW-Madison campus.

The Maecks have supported UW-Madison and the School of Veterinary Medicine for years. In 2020, after Bill passed away, an estate gift directed to the school's building campaign led to naming the clinical skills lab in his and Shirley's honor.

"Students can go to this space to practice whatever skill they want to improve their techniques or get familiar with new equipment or procedures," says instructional specialist **Diego Calderon**. "It's one of the most trafficked places in the building."

Bill and Shirley, who has also since passed, shared a love for animals and were passionate about the research advanced at UW-Madison. The pair met at UW while Bill was studying to become a nuclear chemist and Shirley worked as a surgical nurse. They married and moved to Idaho Falls in 1954. Throughout their life, they had many Labrador Retrievers and participated in several veterinary medical clinical trials with their dogs.

"Bill loved animals. They were a passion for him," says family attorney and friend **Terri Frickey**.

Before his death, Bill established the William J & Shirley A Maeck Family Foundation, which has provided additional gifts to help purchase equipment for the Maeck Clinical Skills Training Center. The foundation's most recent



Members of the Maeck family visit the clinical skills training center in October to see the new teaching equipment and meet faculty, staff, and students.

Clinical assistant professor Jessica Pritchard, right, demonstrates to students how to use a new endoscopy simulator to practice guiding an endoscope through internal organs.



donation allowed the school to expand the resources and equipment available in the skills lab.

“It’s important to us to be able to maintain this relationship with the school,” notes Frickey.

Twelve new technologies will be added to the lab through the Maecks’ generosity, from improved life-sized cow and horse models to an endoscope training tool and 3D molding device. These models and machines help students and faculty practice technical veterinary medical skills and become more confident.

“We wouldn’t have been able to get this equipment without this donation,” Calderon says.

And, likewise, without this equipment, students wouldn’t have the opportunity to get repeat, hands-on experiences that mimic real-world clinical scenarios. For example, with the recently purchased life-sized cow model, students can practice repositioning the fetus and palpating the ovaries — common skills needed for large animal veterinarians — “and get an understanding of what it feels like,” Calderon explains.

With the new endoscopy simulator device, instructors can create their own exercises, giving students specific and varied challenges in guiding an endoscope into mock internal organs or body cavities to examine these spaces. Students can practice the instructors’ exercises and others shared by veterinarians worldwide.

All of the new equipment will be in place by the spring 2023 semester.

“It’s going to make a huge, huge impact on the school,” Calderon says.

Britta Wellenstein

Students can go to this space to practice whatever skill they want to improve their techniques or get familiar with new equipment or procedures. It’s one of the most trafficked places in the building.

Special Recognition

The UW School of Veterinary Medicine is proud to introduce the Dean’s Circle — a new way for our most loyal friends to connect with the school on a closer level. The Dean’s Circle recognizes donors who have shown a commitment to the school and its lifesaving mission through leadership-level gifts, estate plans, or as loyal supporters over a significant number of years. For questions regarding the Dean’s Circle, please contact **Kristi Thorson** at 608-265-9692 or kristi.thorson@wisc.edu, or visit www.vetmed.wisc.edu/deans-circle.

New Genetic Test Identifies Dogs' Risk of Common Ligament Rupture

By looking at him, you might not know **Thabiso** had ruptured cruciate ligaments. “He was a massive dog, 125 pounds,” **Allison Smith** says about her beloved Labrador Retriever.

When Smith got Thabiso in 2010, he was three and a half years old with a slight limp. Smith didn't think much of it until a visit to the veterinarian revealed Thabiso had two ruptured cruciate ligaments, which serve as a primary stabilizer in the knee joint. Thabiso's knees had been injured so long that he had “learned to cope” with the pain, Smith says.

Thabiso isn't alone. Cruciate ligament ruptures are one of the biggest health problems in the veterinary medical field of canine orthopedics.


However, there is now a way to help prevent this disabling disease through genetic testing. Scientists in the Comparative Genetics and Orthopaedic Research Laboratory at the University of Wisconsin–Madison School of Veterinary Medicine have found a way to determine whether a dog is susceptible to the condition. The screening test, the first of its kind in companion animals, requires only a saliva swab

that can be collected at home or a small blood sample.

Laboratory co-directors **Peter Muir** and **Susannah Sample MS'07, DVM'09, PhD'11** are trainers in the school's Comparative Biomedical Sciences (CBMS) graduate program and mentor several CBMS students in their lab, including **Alexander Chu, Jackie Perino,** and **Ryan Anderson**. Alumnae **Lauren Baker MS '14, DVM'16, PhD'19** and **Emily Binversie MS'16, DVM'18, PhD'21** also contributed greatly to understanding the genetic basis of canine cruciate ligament rupture as members of the lab during their graduate studies. And **Mehdi Momen**, a postdoctoral scientist in the lab, has been pivotal in the development of this test.

The researchers made the screening test available for Labrador Retrievers in September. The breed has a high risk of developing the disease; five to 10 percent of Labradors rupture a cruciate ligament within their lifetime.

The team is now working to extend the development of predictive genetic testing to other breeds with a high risk of



The genetic test will allow pet owners to prevent cruciate ligament rupture. It will also help breeders reduce the incidence of this disabling disease in the Labrador Retriever population and improve the breed's genetic health.

“There are all these little variants that act together. So, any individual Labrador that inherits enough small effect variants in combination will have high genetic risk typical of a cruciate ligament rupture case.”

cruciate rupture, like the Rottweiler and Newfoundland.

The canine cranial cruciate ligament is much like a human’s anterior cruciate ligament (ACL), acting as an important stabilizer of the knee joint in both species. Although any dog can rupture the ligament, it is uncommon to happen through injury alone. Rather, genetics plays an essential role in the degeneration of the cruciate ligament, increasing the risk of a rupture.

“In dogs, ligament degeneration and progressive rupture of collagen fibers in the ligament tissue leads to the development of knee joint instability over time,” says Muir, a professor in the Department of Surgical Sciences.

Both genetic and environmental factors, such as physical health, body condition, and neutering, contribute to chronic ligament degeneration. Pinpointing whether a dog is more likely to rupture a cruciate ligament allows the dog’s owner and veterinarian to take preventative measures, such as keeping the dog physically healthy and monitoring for signs of emerging injury. It can also help avoid the expenses and recovery involved in a rupture.

Rupturing a cruciate ligament, either partially or entirely, is a lengthy, expensive process for dogs and their people. Gold-standard surgical treatment can cost between \$4,000-\$7,000 per knee in a dog. And once a rupture happens in one knee, there’s a 50 percent chance the other will tear as well.

Creating a genetic test for this disease was a long process. Muir, Sample, and other lab members spent years screening for the disease. They examined the genotype, or genetic makeup, of over 1,000 Labrador Retrievers across the country. Thabiso was one of these dogs, joining the study in 2016.

Muir explains that genetic testing for cruciate ligament rupture is more complex than testing for simple traits. Genetic tests currently available for dogs are for simple (Mendelian) diseases, where a single genetic mutation is responsible for a disease. However, cruciate ligament rupture results from multiple gene variations throughout the dog’s genome.

“There are all these little variants that act together,” Muir says, “So, any individual Labrador that inherits enough small effect variants in combination will have high genetic risk typical of a cruciate ligament rupture case.”

Researchers used a method called array genotyping to determine genetic markers for each dog. By analyzing the DNA and gene variants in multiple samples, they identified the small variants associated with cruciate ligament rupture.

These findings allowed scientists to determine the genetic risk of developing cruciate ligament rupture in Labrador Retrievers. They estimated a heritability at 0.62, meaning for each individual Labrador that develops cruciate ligament rupture, about 62 percent of the risk is genetic, and approximately 38 percent is environmental.

From this research, the lab can now test individual Labrador Retrievers for genetic risk of cruciate ligament rupture with 98 percent accuracy.

For Thabiso, his genetic risk was found to be high, which was not surprising given he had cruciate ruptures in both knees at such a young age. Although he has since passed away, the test will allow future pet owners to prevent this disabling disease. It will also help breeders reduce the condition’s incidence in the Labrador Retriever population over time and improve the breed’s genetic health.

These efforts not only benefit dogs, according to Muir, but further genetic testing research for animals and humans alike.

“Our interest in the disease is also as a spontaneous animal model for human orthopedic disease,” he explains, to better understand human ACL tears and genetics.

If you want to learn whether your Labrador Retriever is at high risk for developing a cruciate ligament tear, contact the Comparative Genetics and Orthopaedic Laboratory at genetics@vetmed.wisc.edu. Testing costs \$250 and will take four to six weeks for results.

Britta Wellenstein

Emily Binversie MS’16, DVM’18, PhD’21, a member of the School of Veterinary Medicine’s Comparative Genetics and Orthopaedic Research Laboratory as a doctoral student, received the 2022 basic sciences research manuscript award from the Society of Phi Zeta, the international honor society of veterinary medicine. The group recognizes and promotes scholarship and research related to the welfare and diseases of animals.

Binversie’s winning paper, published in the scientific journal *PLOS One*, examined the genetic origin of cranial cruciate ligament rupture in dogs. Binversie is now completing a residency in dermatology at Iowa State University’s College of Veterinary Medicine.

Drug Development Leader, Zoological Medicine Veterinarian Honored

The UW School of Veterinary Medicine Alumni Association has recognized two graduates with 2022 alumni awards for achievements in advancing the veterinary medical profession, animal and human health, and humanity. The awards were presented at the annual tailgate event in September. The Alumni Advisory Board launched the awards program in 2019 to recognize DVM and graduate degree program alumni. The board has since grown into the UW SVM Alumni Association, established this July to support the school's advancement through alumni engagement. Learn more: www.vetmed.wisc.edu/alumni-association.

DISTINGUISHED SERVICE AWARD (GRADUATE PROGRAM)

Thomas Kennedy MS'73, PhD'75



Across nearly five decades, Thomas Kennedy has led a celebrated career in veterinary pharmaceutical research and development.

After a short stint as a bench scientist, Kennedy founded a contract research company that developed disease models and novel therapies primarily in veterinary parasitology. He then held research and development leadership roles with Boehringer Ingelheim's animal health unit, Mallinckrodt Veterinary Inc., Bayer Animal Health, and Central Life Sciences. He has contributed to the registration of several patents and numerous veterinary therapies.

Currently, Kennedy serves as a partner and chief financial officer for ParaTheraTech Inc., a discovery company in parasitic diseases. He consults in veterinary drug development as Eleven Bravo LLC and is a co-founder and partner in Reliance Animal Health Partners. He is also a co-founder, partner, and chief operating officer of Covenant Animal Health Partners, which funds and develops novel therapies for diseases of livestock and companion animals.

His professional memberships include the American Society of Parasitologists, American Association of Veterinary Parasitologists (for which he served in every elected office), and World Association for the Advancement of Veterinary Parasitology (past president, executive board member and Scientific Guidelines Committee chair).

Kennedy guest-lectured for several years in the UW–Madison Department of Veterinary Science and School of Veterinary Medicine. He serves as a reviewer for several journals, has published scientific articles in his specialty, and presented parasite control programs to veterinarians and livestock producers. He received the American Association of Veterinary Parasitologists' distinguished service award.

DISTINGUISHED SERVICE AWARD (DVM)

Kurt Sladky MS'88, DVM'93



Kurt Sladky is a clinical professor and section head of Zoological Medicine and the Special Species Health Service at the University of Wisconsin School of Veterinary Medicine, where he has served as a faculty member since 2002.

Sladky lectures and teaches hands-on labs in a dozen courses, in addition to clinical teaching of fourth-year students. He has mentored and advised more than 150 residents, specialty interns, and veterinary and graduate students.

His impact extends across and beyond UW–Madison. Sladky is a member of the Master of Public Health faculty, serving as a primary advisor to dual-degree DVM/MPH students, and an Advisory Committee member of the Global Health Institute. Since 2003, he has served as course coordinator for a popular undergraduate class covering wildlife health and one health from a veterinary perspective. He has also helped initiate and maintain long-standing relationships between the SVM and Milwaukee County Zoo, Henry Vilas Zoo, and other zoological and wildlife institutions.

His research interests include analgesia and anesthesia of captive and free-ranging nondomestic species and the impacts of anthropogenic (human-generated) changes on wildlife health and diseases. His most recent international field project focused on the physiologic effects of common pesticides and herbicides on the health of free-ranging sloths in Costa Rica. He has published more than 90 research papers and popular press pieces, and authored several textbook chapters.

As an international leader, Sladky serves or has served on numerous committees for national and state zoological medicine organizations. He previously received Presidential Service Awards from the American Association of Zoo Veterinarians and the American College of Zoological Medicine.



Toward equal opportunities: 2022 marks the 50th anniversary of Title IX, the landmark legislation that created a major impact for women in collegiate sports. Coverage of the anniversary and **Kit Saunders**, the first director of women's intercollegiate athletics at UW–Madison, in *On Wisconsin* magazine led **Kris Ellingsen DVM'88**, left, to reminisce about her time with a women's club sport. After experiencing the fight for equal sports support at her high school in Greendale, Wisconsin, and taking second in the state volleyball championship, Ellingsen was thrilled to join Wisconsin's junior varsity volleyball team during her freshman year at UW–Madison in 1975. "I fondly recall being ankle taped before every daily practice, working hard, traveling by bus, and cheering the varsity team after we played. I also

remember not being able to afford decent shoes, resulting in blisters and losing toenails," she writes. "At 5'4", I was a setter and not destined to continue on the team after that first season – my grades took too big a hit!" Ellingsen shared a photo of the group, above; that's her in the front center wearing jersey number 25. Today Ellingsen is part of the veterinary medical team at Cat Care Professionals in Lake Oswego, Oregon, and a spay and neuter surgeon with the Feral Cat Coalition of Oregon and other local pet shelters.

In Memoriam

The UW School of Veterinary Medicine regrets to announce the loss of two alumni.

Dawn Thrall DVM'03 passed away peacefully in May. Dawn was an avid runner and workout enthusiast, a passionate wife, a loving mother, and a fierce friend. She had a love for animals that was clear through her work as a veterinarian, most recently at the Animal Emergency Clinic of Rockford. In her personal life, she was dedicated to the family hobby farm and beekeeping.

Christine Elaine Klein DVM'87 passed away in July after a stoic journey with cancer. Klein's love and devotion to animals began in childhood and continued throughout her life. She worked for 33 years at Riverbend Veterinary Clinic – a highly-skilled, hard-working, and loyal veterinarian. In addition to family and friends, Klein loved her dogs, cats, and horses, long-distance running, walking, and dog competitions.

A Message to DVM Alumni



I recently celebrated my 15th anniversary at the School of Veterinary Medicine and was reflecting on how much has changed in the world and at the school in that time. To offer some perspective, in 2007, the iPhone debuted, Facebook and Twitter went global, and Merriam-Webster added 3D printing to the dictionary.

In the last 15 years, the school has been at the forefront of leading research in response to urgent disease outbreaks, including H1N1, Zika virus, and SARS-CoV-2. Since 2007 we've added lecture capture and replaced our windowless student study area with a bright and modern learning center. We've seen our hospital caseload increase dramatically along with the demand for our graduates. (Though in my time here, I also witnessed national conversations about whether we had too many veterinarians!) In part due to increasing our class size ten years ago, we've nearly doubled our alumni numbers in the last 15 years.

What hasn't changed is that we graduate outstanding veterinarians and scientists year after year. Our students are why we exist, and we remain steadfast in our commitment to training the best and brightest to be skilled professionals prepared to succeed

in diverse career opportunities. From serving your communities in practice to conducting critical research and much more, we are incredibly proud of our alumni and want to tell your stories.

To that end, we are launching an alumni storytelling project so that current students and visitors to the school can learn more about our graduates and benefit from some of your wisdom and lessons learned. In the future, this information may also be available on our website.

I hope you will participate by submitting your written or video responses to five quick questions. This information will be shared on display screens currently on the first and second floors of the SVM building, with plans for a more robust display when the building project is complete. To learn more, please visit [go.wisc.edu/SVMstorytelling](https://www.wisc.edu/SVMstorytelling) or use the QR code below.

I am so honored to work on behalf of the school and you. Thank you for letting us tell your stories.



Kristi V. Thorson

Associate Dean for Advancement and Administration



COURTESY VETREUM

Alumnus Aims to Make Veterinary Medical Technology More Accessible



When **Zach Meyers DVM'22** took Artificial Intelligence in Veterinary Medicine as a fourth-year student, he didn't think it'd turn into a business.

"I have always been attracted to computer things," says Meyers, a 2022 graduate of the University of Wisconsin School of Veterinary Medicine. "It sounded wildly interest-

ing. Artificial intelligence is such a cool buzzword."

The class, taught by professor **Dorte Dopfer**, is one of several elective courses students can select during their fourth year of the Doctor of Veterinary Medicine curriculum.

Over two weeks, students explore the potential of machine learning in veterinary medicine. They spend a few days gaining skills in basic computer practices and the fundamentals of machine learning, then quickly start working on individual projects, creating their own machine

learning application relevant to veterinary medicine.

In Meyers' class, some students worked to train computers to interpret electrocardiograms or to diagnose Addison's disease in dogs. Meyers taught a computer to detect parasite eggs in fecal samples, an often time-consuming task for people. This concept eventually hatched a company Meyers co-founded called Vetreum.

The parasite egg detector worked better than Meyers had expected by the end of the course. Even after he



Artificial intelligence is about "leveraging computer power in a way that humans can't" and "is a way to improve confidence, accuracy, and efficiency along with the people you work with."

graduated in May and became a small animal general practitioner in Oregon, Wisconsin, Meyers couldn't get the idea out of his head. So, he enlisted the help of his childhood best friend Nic Herfel, now a lead data scientist at TDS Telecom, who matched Meyers's enthusiasm. "We got to talking one day and it just kept spiraling," Meyers recalls.

Artificial intelligence (AI) holds real potential for the field of medicine across both human and veterinary patients. "Lots of people think of AI as robots," Herfel explains. But really, it's about "leveraging computer power in a way that humans can't" and, in turn, making tasks easier and cheaper.

"AI is a way to improve confidence, accuracy, and efficiency along with the people you work with," Meyers adds. "The goal is to elevate the everyday veterinary professional."

This speaks to the mission of Vetreum, which Meyers and Herfel launched in January 2022. Their goal is to provide all veterinarians access to artificial intelligence in an "affordable, accessible way," Meyers says. "Right now, there are some programs similar to what we're producing, but they cost tens of thousands of dollars, so it's not accessible to people like me."



Vetreum's goal is to elevate the veterinary professional and provide access to artificial intelligence in an affordable, accessible way through smartphone-based technology.

Vetreum aims to utilize smartphones and preexisting technology to help veterinarians carry out oftentimes expensive or time-consuming tasks more efficiently. The company is still in its early stages, but they've made significant progress on several projects.

One area where Vetreum is thriving is with an automatic fecal float analyzer. Fecal flotation is a routine part of veterinary medicine, testing for the presence of parasites or worms in an animal through their fecal matter. However, these analyses take time and require a trained professional.

By building on the automatic parasite egg detector Meyers started in his coursework at the School of Veterinary Medicine, Vetreum has created an automated analyzer that identifies and counts parasite eggs faster, allowing more clinics the ability to perform fecal floats. Through computer vision technology, the program "can locate eggs almost as well as top-of-the-line software, but at a much lower cost," Meyers says.

Additionally, the team is creating a more affordable and efficient way to scan diagnostic microscope slides using smartphones, allowing for image storage in a patient's medical record or convenient sharing with colleagues.



Meyers' progress with Vetreum earned him the 2022 Merck Animal Health Veterinary Student Innovation Award, recognizing innovation, entrepreneurship, and creative forward-thinking.

Typically, after a doctor views a diagnostic slide through a microscope, the slide becomes just a memory. By placing all views of the microscope slide into one digital image, Vetreum's software "allows doctors to replace that memory with a digital copy of the slide," Meyers explains. Other technology exists to do this; however, the machines are costly and require precision. By utilizing smartphones, Vetreum can provide a lower point of entry to capture quality images of diagnostic slides.

Vetreum is also working on a white blood cell classifier. A complete blood count test is crucial in diagnosing a range of diseases. Vetreum's white blood cell classifier would provide the same results as a full blood test but is cheaper to run and less equipment-dependent.

Meyers and Herfel are still exploring how they will implement these technologies, but their system's AI origins allow for flexibility. Currently, they are beta testing a Vetreum app for the egg detector, white blood cell classifier, and image stitching technology while also open to new directions.

"That's kind of the beauty of where we are at," Herfel says. "There are different approaches we can take with it."

For now, they are focused on developing the programs and making them as accurate as possible. Meyers' progress with Vetreum earned him the 2022 Merck Animal Health Veterinary Student Innovation Award, a national recognition of students' innovation, entrepreneurship, and creative forward-thinking in developing a project or product that inspires others within the veterinary profession.

Despite the company's promising beginnings, Meyers wants to remain a practicing veterinarian. "Wherever Vetreum goes, it will always be helpful for me to be a clinician first," he says. "I think it puts into perspective what we should be doing and not forgetting our mission to support the average professional."

To learn more, visit vetreum.com.

Britta Wellenstein



Against All Odds: Subliminal's Journey to Star of the Breed

Tom and Kelli Cull knew **Subliminal** would be an excellent cow when they saw her exhibited as a three-year-old at a Holstein show in 2012.

For the ten years the Culls have had her on their Wisconsin farm, she has proven to be just that: exceptional. Most recently, Subliminal was named the 2021 Star of the Breed, capping off over a decade of wins and achievements.

The Star of the Breed award recognizes a registered Holstein cow that exemplifies milk production and breed standards. It's an extraordinary honor in its own right, but two things make Subliminal's win especially significant.

First, at 13 years old, Subliminal is the oldest cow to receive this recognition. And second, getting to this point came with bumps in the road.

Soon after the Culls purchased Subliminal in 2013 and brought her to their Budjon Farm in Lomira, Wisconsin, Subliminal took a fall and dislocated her hip. The Culls immediately transported Subliminal to the UW School of Veterinary Medicine's teaching hospital, where **Shelia McGuirk**, then a professor (now retired) of large animal medicine administered treatment with her surgery colleagues.

"Her prognosis was low when she went into the hospital," Kelli recalls. But in the days and months following, the Culls saw Subliminal handle her extensive care and healing with calmness and strength.

After surgery, Subliminal remained in a sling for 90 days. Then she spent the rest of the year with hobbles on her legs to limit movement.

Only a year after her fall, Subliminal returned to dairy competitions.

"It was a combination of amazing staff at the hospital and Subliminal's calmness that helped her heal as well as she did," Kelli reflects.

In 2015, Subliminal won Supreme Champion of the World Dairy Expo Junior Show — the top honor at this world-class cattle show in Madison.

"Seeing her out there as if nothing had ever happened, her mobility unquestioned, it was a magical moment for all involved in her journey thus far" Kelli told Holstein Association USA's magazine, *The Pulse*. "Subliminal definitely beat all odds."

Subliminal's strength only continued to grow as she went on to win more awards in the years following while continuing to breed and calf.

Last year, Subliminal received an EX-97 rating. This rating is among the highest for dairy cattle, meaning Subliminal is unmatched in her milk production, reproductive power, and muscular and fat build characteristics.

Subliminal's story — her performance in competitions and her resilience throughout her life — has touched others worldwide and gained her a devoted fan following.

The Culls continue to bring cattle to UW Veterinary Care and are grateful for the expertise in supporting Subliminal and their entire dairy herd.

"We are blessed to work with the vet school," Kelli says. "We are always very appreciative of what the vet school does."

Britta Wellenstein

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A Holiday Card that Helps Advance Animal Health

The holiday season is near and the UW School of Veterinary Medicine (SVM) has a unique gift for the animal lovers on your list – one that truly helps those special animal companions in our lives.

The SVM is pleased to present original artwork for its holiday card fundraiser each year. This year, “Winter Shimmer,” right, features the work of Wisconsin artist **Yongjing Li**. For a suggested \$10 donation per card, the SVM will send a holiday card to the recipient of your choice – a thoughtful gift for family, friends, neighbors, veterinarians, or even pets. These heart-warming, full-color cards will include a greeting stating that a donation was made to the school in the recipient’s name and that proceeds will support projects that advance animal health.

You can purchase cards online or download an order form at www.vetmed.wisc.edu/holidaycard. Questions? Contact Kristin Koester at kristin.koester@wisc.edu or **608-262-5534**.



Meet the Artist

Yongjing Li was born in China, invited to America as a visiting scientist in the 1980s, and worked at the UW School of Veterinary Medicine for many years. At a very early age, she started painting, and that remains her first love.