WINTER 2020–21

On Call

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

Sheltering Support

Helping at-risk animals and those who care for them each day

The Value of Diversity

Focus continues on improving equity, inclusion, and access

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On Call

WINTER 2020–21

Features

Committed to Inclusion

For years the School of Veterinary Medicine has worked to create a more diverse and inclusive culture within the school and beyond, striving to foster a place and profession where all feel invited, involved, and successful. In the newly created position of director of diversity, equity, and inclusion, Richard Barajas now leads these efforts — work that he says will yield better outcomes for everybody.

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Life-Saving Work

The Shelter Medicine Program provides a needed resource for at-risk animals and those who care for them each day, helping animal shelters save more lives and improve staff welfare at the same time.

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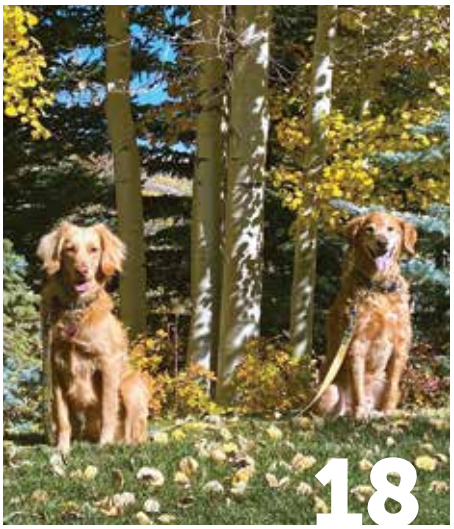

Special Gratitude Section

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

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In Each Issue

More

On the Cover

Shakuntala Makhijani, a 2020–21 Maddie's Shelter Medicine intern, conducts a wellness check on Beau, a Labrador mix at the Dane County Humane Society. (Photo: Bryce Richter/ University Communications)

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School of Veterinary Medicine
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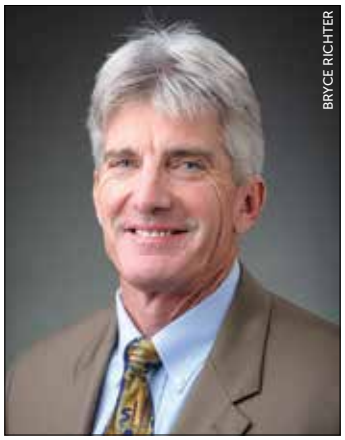
Message from the Dean

An Interesting Time


BRYCE RICHTER

Mark D. Markel

Welcome to the winter issue of *On Call*. In this issue, you will find a profile of our recently hired director of diversity, equity, and inclusion, Richard Barajas. Richard will help lead the school's efforts in this critically important arena, made all the more significant during these challenging times, including the difficult but crucial conversations occurring both locally and globally around social justice and racial inequities. Other stories include the impact of the generosity of friends and donors of the school in ensuring our success, as well as an announcement of the inaugural School of Veterinary Medicine alumni award winners. Congratulations to these excellent recipients.

As is true for each of us, I suspect, COVID-19 has had a dramatic impact on UW–Madison and the School of Veterinary Medicine. Fortunately, we have been able to maintain in-person clinical instruction for our fourth-year students, although some clinical rotations are delivering instruction in a hybrid format. For our first three years of classes, laboratory experiences this fall semester were delivered in-person, but lectures were typically delivered virtually due to COVID-19 restrictions.

Although it has been a challenging period, our faculty and staff remain dedicated to delivering an outstanding education to our students through these daunting times. It is our hope that by fall 2021 we will be able to return to complete in-person instruction. One silver lining of the pandemic has been the enhancement of the school's ability to deliver positive and engaging educational experiences virtually. I suspect that these best practices will continue to be utilized even after we return to in-person instruction.

On the good news front, the new parking ramp across from the school will soon be open and available for use, significantly expanding the parking available to our employees and students, as well as our clients. In addition, we expect to break ground and begin construction on the school's expansion project in the summer. As a reminder, the expansion will be on the north side of the current School of Veterinary Medicine building, in the west half of what was the Lot 62 parking lot. This three-story addition will double the size of our small animal hospital and significantly improve our research and teaching spaces. Also, in the current SVM building, remodeling and additions will substantially enhance our large and small animal facilities and imaging capabilities.

Although navigating construction through the next three years will be difficult, with the new building's completion expected in 2023 and remodeling of our current building to be completed in 2024, I know that this project will position the school to excel in the coming decades. We were successful in enumerating the expansion project primarily because of the support of friends of the school, such as you, who gave of themselves either through gifts or assistance with advocating for the project to our state legislators, governor, and campus leadership. Once again, I want to thank all of you for your contributions to this important project, as well as your broader support of the school. When it is safe to do so, please come by and visit to see our progress.

Have a great rest of your winter and be well.

Mark D. Markel, Dean

On Call WINTER 2020-21

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Ask a UW Veterinarian

Puzzled by Dog's Snoring

*This expert response comes from clinical assistant professor **Elizabeth Alvarez** and clinical instructor **Maria Verbrugge DVM'03** with the UW Veterinary Care Primary Care service.*

Question: We have an old English mastiff; he has been to your hospital for leg surgery. His leg is fine, but his snoring is LOUD!!! Is this something I need to have checked out? Thanks.

Answer: We're so glad his leg is doing well — isn't our surgery team the best?

This is a great question. The sound of snoring can come from the nasal cavity or nasopharynx, the area connecting the nasal cavity to the back of the throat. Snoring is more common in some breeds of dogs, especially the brachycephalic or flat-faced types of breeds — including the English mastiff — because it's quite common for these dogs to have a soft palate (the roof of the mouth) that is too long for their flattened faces. This long soft palate flops over the airway when the dog is very relaxed, creating an obstruction that rattles around as they breathe in and out. Just like in people, recent weight gain in pets can also cause this noise to increase.

So, is snoring a problem? Usually, it is only a problem when dogs also have an obstruction when they are awake. Some flat-faced dogs will eventually need surgery to decrease the obstruction in their airways. If your dog ever seems to have trouble breathing when he is awake, can't cool off when he's hot, or seems to struggle to breathe when he exercises or plays, he should be examined by a veterinarian right away.

Additional causes of snoring would include other types of changes in the nasal cavity or nasopharynx, such as inhaling foreign material, certain infections, inflammation, or a mass. If your dog's snoring is new, meaning he never used to snore and now does; it seems to be getting progressively worse; or he has discharge coming from his nose, these would also be indications to have him evaluated.

We hope for many years of happy, restful snoring for your boy!

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...

As long as I'm on a break from working, I might as well help science! I am taking part in a canine cancer vaccine study. I am going to help the doctors try to develop a vaccine that will prevent cancer in dogs. Now I can help dogs as well as people!

–Therapy Dog Josie
Via SVM Facebook (@uwvetmed)

One part of campus is open 24/7 — three cheers for this after two days dealing with dog seizures. And talk about learning gain — the @uwvetmed students working here were so professional, amazing communicators, and extremely well informed.

–Kris Olds (@GlobalHigherEd)
Via SVM Twitter (@uwvetmed)

Hip dysplasia is a potentially debilitating disease in dogs. This invention from @uwvetmed makes it easier for a clinician to image and analyze the hips of puppies as young as six weeks of age. #WARFat95 #PatentArt

–@WARF_News
Via SVM Twitter (@uwvetmed)

Simpler COVID-19 Test Could Provide Results in Hours From Saliva

Volunteers at four sites in Madison are being tested for the virus that causes COVID-19 by spitting in a vial, which may prove faster, cheaper, and less complicated than other common tests, according to University of Wisconsin–Madison researchers.

Scientists from UW–Madison's AIDS Vaccine Research Laboratory (AVRL), a team that in recent years has also turned its attention to COVID-19 and Zika virus outbreaks as need arose, have tuned a relatively simple genetic testing process to find evidence of the novel coronavirus in saliva.

With support from a National Institutes of Health grant program that hopes to expand testing in the United States, the researchers have collected hundreds of samples from volunteers at three UW–Madison sites and a local elementary school. The tests were completed in hours, a stark contrast to common wait times of several days or even weeks for results from other kinds of COVID-19 tests.

"This sort of testing, if it is successful and can be expanded, offers hope that schools and workplaces could receive rapid turnaround testing to assist in the complex decision of managing education during the outbreak with a test that is still sensitive enough to catch the people who are contagious, but exceptional in terms of accessibility, cost, and turnaround time" says David O'Connor, professor at the UW School of Medicine and Public Health.

They made their early findings available in July in a brief study posted on medRxiv, a website for health sciences research that has not yet been peer-reviewed and published in a scientific journal. The test has not been approved for clinical diagnosis. The UW–Madison researchers are studying whether this type of test can be administered frequently and efficiently.

JEFF MILLER /UNIVERSITY COMMUNICATIONS

Scientists Miranda Stauss and Roger Wiseman process small vials of spit collected from volunteers as part of a trial of a new COVID-19 saliva test.

"Recent studies show that frequent, repeated testing is key to detecting infected people quickly," says **Tom Friedrich**, professor in the UW School of Veterinary Medicine. "Because people can be contagious before they show symptoms of COVID-19, rapid testing can allow them to isolate and protect others before they even realize they are infected."

The project started in February — even before the first COVID-19 cases appeared in Madison — when O'Connor and Friedrich were working with UW Hospital and Clinics to see if recent flu-like illnesses were actually the new virus.

"We were interested in knowing whether there was silent spread of the virus in Madison," says O'Connor. "Fortunately, diagnostic testing became available very quickly. We shifted gears to adapting an alternative type of nucleic acid testing."

Most testing for SARS-CoV-2, the virus that causes COVID-19, uses a chemical process called polymerase chain reaction, or PCR, to make copies of the genetic material in a small sample so they are easier to identify. The Madison group employs a different method, called reverse-transcriptase loop-mediated isothermal amplification (RT-LAMP) to amplify the identifiable parts of virus available in saliva samples.

"The advantage of RT-LAMP is that it is easier to set up than PCR, and doesn't require specialized instrumentation," O'Connor says. The team realized that this sort of testing might be more appropriate for places that require on-site, frequent, repeated testing.

RT-LAMP also uses different chemicals than the PCR process, which has become so vital to pandemic testing that supply chains and manufacturing capacity have been stretched thin.

Scientists spent months adapting the test for saliva, because the group expected people would get tired of the common sampling method, a swab run sometimes deep into the nose.

"Collection is more comfortable, which is especially important if you are getting tested twice a week and important for children," says AVRL scientist Dawn Dudley.

Chris Barncard

Parasitic Worms Use Keen Senses to Wriggle Through Their Hosts

Parasitic filarial nematodes infect hundreds of millions of people, causing diseases such as river blindness and lymphatic filariasis, which can lead to elephantiasis, a severe swelling of the limbs.

Mosquitoes spread the parasitic worms, which engage in sophisticated migrations within their insect and mammal hosts. One worm, Brugia malayi, starts in the mosquito's gut, migrates to its flight muscles, then to its mouth. In its human host, the worm travels between the lymphatic system and the blood. Researchers have little idea how the nematodes achieve these nomadic lifestyles that are crucial for their survival.

In new research, UW School of Veterinary Medicine scientists provide the first look at the genetic underpinnings of the worms' migration. They identified two genes the nematodes use to respond to cues in their host environment. When the genes are disrupted, the worms are lost and less effective at infecting their hosts.

The genes are part of the nematodes' chemosensation network, a combination of chemical-sensing proteins and nerve cells that let the parasites detect and respond to molecules in their environment. Because these responses are key for the nematode's complex life cycle, they're a potential target for future treatments.

"We're hopeful that a better understanding of how worms are transmitted between hosts and move within them may lead to new approaches for parasite treatment and control," says **Mostafa Zamanian**, an assistant professor of pathobiological sciences and senior author of the report. The work was published in June in the journal *PLOS Biology*.

The researchers mined over 40 parasite genomes to identify sensory genes in filarial parasites. Then they measured the expression of chemosensory genes throughout the parasite's life cycle. They looked at chemoreceptors — proteins that detect a specific signal — during distinct stages of the parasites' life cycles within human and mosquito hosts, when the parasites migrate to different tissues by following specific chemical signatures their hosts produce.

"We saw chemoreceptors turned on and turned off at very specific time points, likely to help the nematodes get to the right destination at the right time," says **Nicolas Wheeler**, a postdoctoral researcher in the Zamanian lab and lead author of the study.

ZAMANIAN LAB

Researchers prepare to inject an anaesthetized mosquito infected with parasitic Brugia malayi nematodes with gene-disrupting molecules to study how the nematodes rely on chemical sensation to migrate within their hosts.

The researchers tested whether disrupting the chemosensation network would impair the worms' ability to migrate within and infect their hosts. They singled out two genes known to act as messengers for chemosensation in distantly related nematodes: OSM-9 and TAX-4.

When nematodes exposed to the OSM-9-disrupting chemical nicotinamide were fed to mosquitoes, the insects ended up infected with 20 to 40 percent fewer parasites. Those nematodes that did survive in the mosquitoes were worse at migrating to the insect's flight muscles compared to nematodes with normally functioning OSM-9.

The researchers also extracted larvae from mosquitoes during the stage when they can infect humans and exposed them to nicotinamide. In a petri dish experiment, the larvae became less likely to move toward chemical signals in mammalian blood.

Using another system, the research team was able to disrupt both OSM-9 and TAX-4 while the nematodes were developing within their mosquito hosts. They showed that both genes are involved in the infective larva's ability to crawl toward host signals in the blood. These are the first two genes to be linked to migratory behavior in these parasitic nematodes.

There are effective treatments against filarial parasites, but the complex drug regimens have potentially severe side effects, and the nematodes have developed drug resistance. There is also growing evidence that sensory systems play an important role in how parasites respond to existing antiparasitic drugs. A better understanding of how the worms detect chemical signatures and find their way within hosts could one day help researchers disrupt these critical migrations, potentially bolstering treatment.

Eric Hamilton

Study: Forming Reproductive Organs Requires Complex Dance Between Genes and Hormones

The most common congenital disorders of all, especially in baby boys, are differences in a newborn's sexual anatomy that is not standard female or male. In boys, they include undescended testicles, misplaced urethras, and improperly developed internal organs.

Some of these disorders may be treated with surgery and some also with hormonal supplementation. Scientists are troubled because the incidence of these disorders is increasing, especially in developed countries. While causes are unknown, researchers suspect that endocrine disruptors from environmental contaminants may be involved.

"It's hard to know how something goes wrong if you don't know how it goes right," says **Joan Jorgensen DVM'93**, a professor of comparative biosciences in the UW School of Veterinary Medicine.

So, Jorgensen, lead author **Anbarasi Kothandapani**, and others have set out to understand how functional reproductive systems are formed. Over several years, they studied how one gene, GLI3, coordinates the precisely timed development of the male reproductive organs. Using a mouse model, they discovered that GLI3 promotes the growth of the only cells capable of producing male hormones in a fetus. Without enough of those cells, development goes awry.

The researchers published their findings in June in the journal *PLOS Genetics*. Their works helps us understand how genes and hormones interact to develop male reproductive systems, a step toward researching why disorders in these organs have become more common and how we might prevent them.

The Jorgensen lab has long studied male and female sex differentiation in developing mice. Altogether, a male fetus must successfully have testes descend toward the scrotum, differentiate external genitals, and develop internal organs such as the prostate. Much of this process is controlled by a genetic pathway whimsically named Hedgehog — after the gene was discovered in flies covered in bristles — and hormones.

The GLI3 gene is part of the Hedgehog gene pathway and mutations in the gene are linked to reproductive tract disorders in humans. To study how GLI3 works, the Jorgensen lab turned to a line of mice carrying a mutation that models human mutations in the gene.

Kibble

Bits of news from around the school

Veterinary medical scientists: Seventeen DVM students participated in the national 2020 Virtual Veterinary Student Scholars Symposium in August, held online this year due to the COVID-19 pandemic, and presented virtual research posters. The annual symposium showcases research accomplishments by veterinary medical students completing summer research internships. Five dual-degree trainees also presented their studies during a related colloquium for combined DVM/PhD biomedical scientists.

Virtual walk-through: Ruthanne Chun DVM'91, associate dean for clinical affairs and teaching hospital director, brought viewers behind the scenes of UW Veterinary Care in June for a special tour delivered online as part of the university's Badger Talks statewide outreach series, providing insights into hospital operations, particularly amidst a pandemic. To date, the tour has been viewed more than 7,000 times. **go.wisc.edu/UWVCtour**

Record-breaking: In fiscal year 2019-20, the School of Veterinary Medicine was awarded over $28 million of research grant support, the highest award amount the school has ever achieved and 45 percent higher than the previous fiscal year.

Honored: Associate Professor **Chad Vezina** was among 11 extraordinary UW-Madison professors to receive a Vilas Faculty Mid-Career Investigator Award this year, recognizing research and teaching excellence. The award provides flexible research funding for three years.

Research mussel: In a study published in September in *Scientific Reports*, Professor **Tony Goldberg** and collaborators from the U.S. Geological Survey and U.S. Fish and Wildlife Service found the first evidence that a new virus could be the culprit of massive, unexpected die-offs among the world's wild freshwater mussels. The team will continue its research to unravel what factors, including infection, might be causing the die-offs.

Developing embryos of the mutant mice had several defects similar to humans with mutations in the gene. They experienced delays in the descent of their testicles within their abdomens. And in about half of the mutants, the urethra opened at the base of the penis instead of at the tip.

Suspecting a problem with the hormone-producing cells called Leydig cells, the researchers examined the testes. Although mutant mice had typical-looking gonads, Jorgensen's team saw their testes had fewer Leydig cells and these cells even grew weaker as the embryos developed.

"We concluded that the cells started off okay, but they weren't able to maintain their identity and they lost their function," says Jorgensen.

The researchers discovered that the Hedgehog pathway, through GLI3, stimulates the formation of Leydig cells, which produce the hormones necessary to develop male sex organs. And those hormones go on to reinforce the Hedgehog pathway, which is vital for developing the prostate and penis. They concluded that most of the defects in the mutant mice could be explained by dysfunctional Leydig cells.

Treating pregnant mice with extra testosterone wasn't enough to correct all the defects in developing embryos, because the GLI3 gene was itself necessary. But when the researchers reintroduced the non-mutant GLI3 gene into the mutant testes in culture, they were able to restore production of genes necessary for the production of testosterone.

The upshot is that researchers discovered a complex dance between genes and hormones. Any misstep in the waltz can spell disaster.

"There are several environmental disruptors out there that will impact the Hedgehog pathway. When you put that together with genetic mutation, it could make some individuals more susceptible to developmental disorders than others," says Jorgensen.

This improved clarity in how the genes are supposed to function could help researchers understand how environmental toxins might be to blame for a rise in sex development disorders — the first step toward prevention.

Eric Hamilton

Overheard

Recent commentary by and about those at the SVM

"I never thought we'd see a pandemic like this in my lifetime."

– Professor **Kristen Bernard** in a Cap Times Idea Fest presentation in October. Bernard, who studies animal-borne viruses, spoke about preparing for the next pandemic and battling the current COVID-19 outbreak: **go.wisc.edu/bernardpandemic**

"It's like the early stages of a wildfire, when there's all the fuel you can imagine to consume and you can just go unchecked. We are still globally in the initial upward swing of that epidemic curve of the initial onslaught."

– Professor and epidemiologist **Tony Goldberg** speaking with Spectrum News 1 in July about the novel coronavirus outbreak and how, when zoonotic diseases first make the jump from animals to people, there are typically no immunities against them.

"At the current infection rate of about 60,000 per day in the U.S., it would take years of living with current pandemic conditions, with all the attendant disease and suffering, to achieve herd immunity without a vaccine. Vaccines are so important because they allow us to get to the point of herd immunity faster and more safely than we would by just allowing the virus to infect people."

– Professor and virologist **Tom Friedrich** in August explaining how a COVID-19 vaccine fits into herd immunity. Read more: **go.wisc.edu/covidimmunity**

"If people are struggling with how to do something, we call and help each other. There is a learning curve. We are trying to support each other. The unity has been so positive."

– Lecturer **Karen Hershberger-Braker DVM'10**, speaking with *JAVMA News* about ways that UW SVM faculty and staff have exchanged best practices and support during a COVID-19-induced shift to hybrid instruction.

Connection, Conversation,

New position amplifies pursuit of diversity, equity, and inclusion

From the perspective of Richard Barajas, diversity, equity, and inclusion are crucial for both the current and long-term success of the School of Veterinary Medicine.

"Ultimately, we are preparing students to go out and be the most successful people they can be in serving Wisconsin and the world," he says. "As professionals, we work with people from a variety of backgrounds. To be successful, we have to know how to engage with individuals who have had different experiences from our own."

No matter if students or alumni are interacting with multicultural clients or colleagues, creating a welcoming and inclusive community, or addressing access to veterinary medical care, diversity must be lived as a value in the profession, he says. The same is true for the school — diversity needs to infuse the SVM's curriculum, decision-making, and more. This includes acknowledging and incorporating the many ways that a variety of identities, cultures, backgrounds, and experiences enrich the school's teaching, research, clinical care, and outreach.

"In every decision, every day-to-day activity, we are thinking about these things," Barajas says. "It brings value to everything that we do. We all have a role to play in this work, and we will all benefit from an increased focus on diversity, equity, and inclusion."

Barajas joined the school in September as director of diversity, equity, and inclusion. He brings more than a decade of experience in the field through previous roles with Iowa State University and the University of Iowa.

In line with the School of Veterinary Medicine's larger commitment to diversity, equity, and inclusion, in 2019 the school made the decision to create this new position. The wave of racial unrest and resulting national dialogue across America this spring made the importance of the role — and the need to address longstanding racial disparities in veterinary medicine — all the more clear. More than 90 percent of veterinarians in the United States are white, and veterinary medicine remains one of the least diverse professions.

ISTOCK | UNITONEVECTOR

and Community

Written by Meghan Lepisto

> "We want to train our students to have the biggest impact possible and to serve all communities."

"My passion has always been to pursue equity, inclusion, and access," Barajas says. "Making sure faculty, staff, and students feel included, feel safe, and feel like we're listening to what they're experiencing is important."

Below, Barajas shares what drives his work and some of his hopes for the school.

ON CALL: Tell us a bit about yourself. What would you want the SVM community to know about you?

BARAJAS: I was born and raised in Sterling, Illinois, so not far from Madison. My mom was from Mexico City and most of my mom's side of the family is still in Mexico City. We would go back every summer — I spent all my summers growing up in Mexico City, so I really had a rather unique experience. I consider myself bicultural.

What led you to focus your career on diversity, equity, and inclusion, and what continues to motivate you?

Growing up in the Latinx community, as a Latino Mexican American, it's always something you think about. I wasn't an immigrant myself, but my mom was. I grew up in our household speaking Spanish and kind of grew up in an immigrant experience — especially the connection with Mexico. Issues of class disparities and other things you see growing up, you wonder why this is. Then once I got to college, my community and the people I most related to were the Latinx students, student organizations, and faculty. Having that connection, I wanted to help students that didn't have the opportunities that I had. I was a first-generation college student.

As I got into work, I saw there was a need to reduce the barriers that exist for students. Then you take the next steps — as those students become professionals, what barriers exist in the professional world? And how do we create models of success for the next generation?

The other thing that's joined in is how do we get students who haven't had the experiences of growing up in a diverse setting or as a minoritized population the tools they need. We want to train our students to have the biggest impact possible and to serve all communities.

The U.S. is diversifying, so no matter what area of veterinary medicine our graduates go into, they are going to see clients from diverse populations. How can you best serve their needs? Because that's everyone's goal, to serve the needs of clients and their patients the best way we can.

What's one of the biggest takeaways from your work so far in this field?

There are always nuances and things to balance, but knowing that the work is important for everyone and trying to build partnerships is one of the biggest things I've taken away. It's all of us together.

Moving Ahead

Among the diversity, equity, and inclusion initiatives advanced recently at the School of Veterinary Medicine:

- This spring, the Veterinarians as One Inclusive Community for Empowerment (VOICE) and Veterinary Medical Outreach Organization (VMOO) student groups, with faculty and staff support, began implementing the How We Role lesson plan with students at the Boys and Girls Club of Dane County. This national program for children in grades K-4 aims to increase outreach to diverse communities and inspire young people toward veterinary medicine.
- Beginning this summer, all SVM faculty and staff are required annually to participate in an experience that enhances their understanding of diversity, equity, inclusion, and anti-racism, and share the experience during their performance review.
- Announced in October, the SVM will pay the cost of registration for any faculty, staff, or student interested in completing Purdue University College of Veterinary Medicine's certificate in diversity and inclusion.
- Key questions related to diversity, equity, and inclusion were incorporated into the biannual SVM climate survey distributed in the fall, designed to identify how employees and students feel about working and learning at the school.
- The school's Equity, Inclusion and Diversity Committee began work on a school strategic plan focused specifically around diversity, equity, and inclusion, to be completed by spring 2021.
- A School of Veterinary Medicine Diversity, Equity, and Inclusion Fund, to support greatest needs in these areas, and a Diversity, Equity, and Inclusion Scholarship Endowment Fund, to support underrepresented students, were established (see page 13).

Richard Barajas, director of diversity, equity and inclusion at the UW School of Veterinary Medicine.

What are some of your first impressions around opportunities at the SVM?

There's a lot of good work going on. Faculty, staff, and especially students are very passionate in this area. And there's a lot happening around the larger campus and with other diversity officers.

One of the big focus areas, besides the strategic plan and climate survey (see sidebar at left), is curriculum. There's a great opportunity to think about how we infuse diversity, equity, and inclusion throughout all aspects of the student curriculum.

What role do you see for alumni in advancing diversity, equity, and inclusion?

Mentorship is key for our current students to connect with graduates in a variety of ways. A lot of mentorship is organic, but we can try to help forge connections, reaching out to alumni and saying are you willing to serve as a mentor and what areas of expertise do you have? I think it's also important to ask what identities do you hold. The more we can foster connections between current students and alumni, the better overall we all are.

But also going out to alumni and saying this is what we're doing, here's how you can help, what questions do you have, and how can we help you. I hope to connect with alumni from different populations and ask what was your experience at the SVM, what went well, what could have been different, and how can we constantly improve. It's always important to listen.

How else do you see the role of listening as important in this work?

I want to create a safe space for everyone to come and chat in a nonjudgmental way. Everyone's experience matters. We're all learning, so how can we navigate this together?

I think it's easy for people to get defensive and stop listening. My role has always been more listening than talking. I want to listen and then think about how do we make the SVM the best place it can be for everybody. And how can we change the profession, ultimately? You're going to be a student for four years at the SVM, but you're going to be an alum for the rest of your life. We want to impact students when they're here, but

we know they're going to have an impact when they're alumni as well.

Beyond the direct impact for the SVM community, why else is this work so important?

The wider world looks very different than Madison and academia. At the SVM we're doing everything we can to have an impact in the larger community — it's the Wisconsin Idea.

More often than not, you're going to be dealing with people who grew up with very different experiences than you. Despite that, how can we create connections and do work that is going to best serve our clients and their patients, and be the best stewards for Wisconsin and our larger community? The greatest outcome we can have is that people feel listened to, included, and that we're concerned about what they're concerned about. It ultimately leads to better outcomes for everybody.

What is one action we can all take to contribute to a more inclusive society?

Ultimately, it's about good communication skills — how do I have empathy, try to connect with people I'm not similar with, and try to listen to and hear them. Listening is important; hearing is more important. Not discounting their experience, and also sharing your own. Communication and conversation are, at least for me, all it ultimately boils down to.

Is there anything else you'd like to share?

I think the important part is the commitment is there — we're committed to continuously doing the work. There's never really a day where we're done and we've solved diversity, equity, and inclusion. It's constantly evolving.

Lessening Barriers for the Next Generation

For years the School of Veterinary Medicine has worked to create a more diverse and inclusive culture within the school and beyond in the field of veterinary medicine — striving to foster a place and profession where all feel invited, involved, and successful, and better able to respond to the varied and changing needs of society. This includes increasing the representation of minority and disadvantaged groups in the school and profession to be more reflective of society as a whole, and creating teaching and learning environments that support diversity.

The school has numerous efforts underway to help prospective students from underrepresented populations learn more about veterinary medicine, recruit to the school and profession a diverse population of students, and support students' success. This is in addition to school initiatives to recruit and retain a diverse workforce.

As one important sign of progress, students who are Black, Indigenous, or from other underrepresented racial and ethnic groups represent one quarter of the school's incoming Class of 2024 (24 of 96 students). Nationally, the number of racially and ethnically underrepresented DVM students currently stands at about 20 percent of total enrollment — a figure that continues to rise.

But much work remains. Two newly established gift funds will help bolster these efforts: the School of Veterinary Medicine Diversity, Equity, and Inclusion Fund, to support greatest needs in these areas, and the Veterinary Medicine Diversity, Equity, and Inclusion Scholarship Endowment Fund, to support underrepresented students.

The latter was established through a generous lead gift from **Kristen Bernard**, a professor of virology in the School of Veterinary Medicine, and her husband **Rick Ezell**. Below, Bernard shares what motivated the couple to support scholarships for underrepresented students and why they hope to inspire others to do the same.

On Call: What inspired the two of you to establish this endowed scholarship fund? Why is this important to you?

Bernard: First, we feel strongly about furthering diversity, equity, and inclusion in all aspects of society. In particular, veterinary medicine is very limited in its diversity, and we want to support the school's efforts to improve the culture for students, faculty, and staff.

Second, we believe in the power of education to improve one's life and community. Both of us benefited greatly from attending public universities, and we believe that everyone should have that opportunity. We both were fortunate to receive scholarships, and Rick would never have attended college without a generous scholarship to the University of Kentucky.

Finally, we feel compelled to help others achieve their goals through education just as we have been so privileged.

On Call: What do you hope will be the impact of this scholarship fund?

Bernard: We hope that by helping individuals, the scholarship will increase the diversity of the student body in veterinary medicine. Diversity is so important to bring different backgrounds and ideas to solve problems facing our society and to better serve our clients and animal patients.

We have not named this scholarship eponymously in the hopes that this will encourage all faculty, staff, alumni, and clients to feel part of this effort to make the veterinary profession more diverse and inclusive.

Ways to Give

- School of Veterinary Medicine Diversity, Equity, and Inclusion Fund (greatest needs): **supportuw.org/giveto/svmDEI**
- Veterinary Medicine Diversity, Equity, and Inclusion Scholarship Fund: **supportuw.org/giveto/svmDEIscholarship**

Some members of the UW Shelter Medicine team pose in July. Top row, from left to right: Shakuntala Makhijani, Sandra Newbury, and Uri Donnett. Bottom row, from left to right: Elizabeth Roberts, Peanut, and Stephanie Koester.

It's About the Animals — and Humans, Too

UW's Shelter Medicine Program provides a needed resource for at-risk animals and those who care for them each day.

Written by Stephanie Haws | Photos by Bryce Richter

I sit next to Sandra Newbury DVM'03 in her silver Subaru hatchback — Peanut, her 14-year-old rescue pup, is in the backseat.

It's a Wednesday morning in October 2019, and we are en route to an animal shelter in Illinois, where Newbury — the director of UW–Madison's Shelter Medicine Program — will meet with a group of fellows who are there to learn how to improve the welfare of shelter animals.

Known as the Northern Tier Fellowship, it's one of several efforts that the program, housed within the UW's School of Veterinary Medicine, carries out for veterinarians and shelter leaders around the world. Started more than five years ago by Newbury, the program is a leader in the relatively new field of shelter medicine, which focuses on caring for animals in need.

The program conducts its work through education and outreach-based research — findings based on work with shelters rather than through clinical trials. Each year, this particular fellowship invites shelter directors and managers in northern states to visit shelters that the program has previously worked with to gain exposure to new ideas and practices that help improve animals' lives.

"There are limits to your superpowers, and so you've got to be sure that you're using them effectively."

Stephanie Koester, assistant director of the UW's Shelter Medicine Program, says hello to a kitten at the Dane County Humane Society.

It's a Balance

Back in the car that afternoon, Newbury, Peanut, and I return to Madison to meet a second group of fellows at the Dane County Humane Society. This time, Peanut shares the backseat with three mewing kittens, who are being transferred to help lower the Illinois shelter's cat population. The kittens — whose mother no longer wanted them — will receive the attention they need at the Dane County shelter.

That morning, Newbury demonstrated to fellows how to identify and manage overpopulation; she noticed that the shelter's number of cats was over capacity and made recommendations to lower it, such as starting a cat adoption sale and relocating the kittens to a different shelter.

Among the many practices covered during the fellowship, the program staff also emphasize an unexpected point: in what can be an emotionally taxing field, human welfare is critical to improving animal care.

Although the reasons aren't fully understood yet, veterinarians have high suicide rates. According to a 2019 study from the Centers for Disease Control and Prevention, female veterinarians are 3.5 times as likely and male veterinarians are 2.1 times as likely to die from suicide compared to the general population. The Shelter Medicine team aims to teach veterinarians and shelter staff the value of work–life balance. Newbury – a white-water kayaker, local circus performer, and aerial dancer – leads by example. Sometimes she will build in time for yoga and other activities during the fellowships.

"You can see how sheltering could really be consuming," she says. "What I try to teach, especially my veterinarians, is to balance their lives so that their career in sheltering will be sustainable and that they won't just come in, work in shelters for a year, and be so burned out that they never want to help again."

A Need for Structural Change

Formerly a full-time artist, Newbury was inspired to volunteer for a local shelter after seeing stray cats near her Chicago studio. As she gained more responsibility in the shelter, she saw firsthand veterinarians' limited involvement and was concerned by their lack of knowledge about shelter care.

"At that time, there really weren't veterinarians who were interested in animal shelters," she says. "There was no such thing as shelter medicine."

In addition, veterinarians working in shelters were often criticized for their role in making euthanasia decisions, especially those made to control crowding. No one wants to be called

Uri Donnett, the Maddie's Clinical Instructor at the Dane County Humane Society, examines a kitten during a health check.

"Dr. Death," and veterinarians would quit after a year, contributing to a shortage of professionals and creating a knowledge gap and missing skill set for animal care and welfare.

Even later on, as Newbury helped build a shelter medicine program at the University of California–Davis in the early 2000s, there was misunderstanding around what program staff meant when advocating for population management.

"People thought that all I wanted to do is euthanize animals," Newbury says. "I got to a point where, when I would give presentations on this, I would say at the beginning, 'If at any point you think I'm saying I want you to euthanize more animals, euthanize animals faster, or anything of the kind, please stop me and raise your hand, because I don't mean that, and I want to try and clarify that right at the time.'"

Starting in her early years of working for a shelter, Newbury sought to counter the spiraling negative trends she was noticing. She created a protocol to make the most of the shelter's limited veterinarian access, providing staff and volunteers with methods to try when a problem arose with one or more animals. If the protocol didn't help an animal, that informed staff members that the animal needed the veterinarian's attention — maximizing the veterinarian's time and helping as many animals as they could, as quickly as possible.

"I realized pretty early on that what was needed were these structural changes to animal shelters, instead of just trying to deal with each individual problem — which of course doesn't mean you don't deal with the individual problem. It's just a way of dealing with it more efficiently," she says.

Even with the protocol, Newbury was frustrated by the shelter's problems, such as outbreaks resulting from a veterinarian's distrust of vaccinations in cats. That's when she reached out to the UW's School of Veterinary Medicine, seeking input from **Ronald Schultz**, now a professor emeritus in the Department of Pathobiological Sciences. "I decided I should go to vet school after all, because there needed to be veterinarians who knew about animal shelters," she says.

Following veterinary medical school, she became the medical director at the Dane County Humane Society before working for UC–Davis, where she helped build the first shelter medicine program at any university. (The director of that program, Kate Hurley, was the first in the world to become a resident in shelter medicine.) Although employed by UC–Davis, Newbury continued living in Madison and teaching at the UW. Meanwhile, a few other universities, such as the University of Florida and Cornell, started their own shelter medicine programs. Then, in 2014, Newbury was invited to apply for a grant that would soon create UW–Madison's Shelter Medicine Program.

Limits to Superpowers

In a highly emotional field in which animals are in need of homes and at risk for health and behavioral problems, it's natural to want to help every animal. However, this feeling can often translate into shelter staff members taking in more animals than they can manage, which may lead to ongoing problems. Today, the UW's Shelter Medicine team provides veterinarians and staff with the guidance they need to increase adoption rates and improve animal care, while also helping them work within limits that set up both shelter animals and workers for success.

The program's staff members teach shelters a series of best practices aimed at upping adoption rates and enhancing animal care, such as giving vaccinations upon intake, decreasing animals' lengths of stay, and increasing shelters'

capacities for care. They also recommend making adoption applications and processes more approachable and less discriminatory; giving each animal separate spaces to eat and defecate; and offering preselection, permitting visitors to view animals and apply for adoptions before pets' holding periods are over.

These efforts also mean setting limits, which can be counterintuitive, Newbury says. For instance, the program encourages staff to monitor pet intake and think critically about whether being in a shelter is the best choice for an animal.

"There is recent research to show that, for example, cats are significantly more likely to get back home if you just leave them where they are than if you pick them up and bring them to an animal shelter," she says. "For a really long period of time, people would pick up every cat that was out walking around and bring it to an animal shelter, but national reclaim rates for cats were 1 to 2 percent."

To help shelters implement these practices and function within their limits, the program empowers them to tailor practices to their individual needs. If a shelter does not have a full-time veterinarian, for example, the program works with staff members to enforce protocols that help them work efficiently.

"There are limits to your superpowers, and so you've got to be sure that you're using them effectively," Newbury says. "We talk a lot about making choices for how [shelters are] investing their resources and energy and time."

When consistently executed, these methods help shelters stay in what Newbury calls the "positive cycle." That means shelters adopt out animals more quickly, avoid overpopulating, and increase their capacities for care so staff are able to give more attention to each animal. This compares to a "vicious cycle," in which shelters are not effectively managing these factors, leading to issues such as overpopulation and higher risks of infectious disease and behavioral problems in animals.

This approach helps shelters manage environments where stress levels can run high, as veterinarians and staff are required to make choices that can be matters of life and death for animals.

"We've seen [our practices] work enough times that we believe, and we know, [they'll] work," Newbury says.

A New Support Network

Newbury and her team not only give shelters recommendations for improving animal welfare, but also foster a support network that, not long ago, didn't exist.

Marta Pierpoint, who attended the program's inaugural Northern Tier Fellowship and returned as a mentor, says it's hard to count the number of ways the fellowship has helped her.

"You're not only learning from the experts at the University of Wisconsin. You're learning from your peers, you're taking away big-picture thoughts, and you're also taking back small things that you can implement," says Pierpoint, who is executive director at the Humane Society of Western Montana. "I have no hesitation if I have a question — whether it's medical or administrative — I know that I can pick up the phone and call. And that kind of professional support is priceless."

Newbury says she's "overwhelmed" with happiness knowing that the fellows will leave feeling more knowledgeable and empowered to make change at their shelters. "[Our work is] about the animals, but these are great people, and they're trying so hard to do these amazing things, and so whatever we can do to support [them] is incredible to me."

This article was originally published in the fall 2020 issue of On Wisconsin magazine and has been edited for length. To view the full article, visit ***go.wisc.edu/sheltermedicine.***

Give Shelter

The Shelter Medicine Program is a national leader — but it wouldn't be at UW–Madison without the assistance of private support.

"My position is one of the only UW Shelter Medicine positions that's funded by the university," says program director **Sandra Newbury**. "The rest of the program is funded through donations."

Deep commitment to the program by Dean **Mark D. Markel**, the School of Veterinary Medicine, and the university impressed philanthropic partners. Because the university was supporting the primary faculty position, foundations and donors stepped in to offer additional support. Almost instantly, the UW's Shelter Medicine program became one of the most respected in the country. **Jeff and Sara Wiesner**, who had previously supported the program through a scholarship, established a shelter medicine endowment, making the UW program one of only a handful in the country with this type of support. After Newbury was hired, **Margaret A. Cargill Philanthropies** (MACP) invited the UW to apply for a grant to help establish a shelter medicine outreach program that, today, is national and international in scope. UW Shelter Medicine is honored to work in strategic partnership with MACP in its animal welfare funding. **Maddie's Fund**, a family foundation, has funded the program's educational branch and outbreak response work, supporting fellowships, internships, residencies, and a shelter medicine rotation for veterinary medical students.

With this financial help, the UW program has been able to train the next generation of shelter medicine veterinarians and leaders and is able to help shelters around the country face disease outbreaks. "That's one of the most important things I think we do as a program is really offer sound diagnostic testing and interpretation to animal shelters," says Newbury.

The program, Newbury notes, "has really been an amazing philanthropic partnership."

—John Allen and Stephanie Haws

Hospital clients, clinic sponsors, alumni, community members, industry partners, and more — the UW School of Veterinary Medicine receives the gracious support of donors from all walks of life with gifts of all sizes, all of which make a difference.

We are deeply grateful to all who have contributed. In the pages that follow, we recognize the impact of just some of this generosity and the people behind the gifts. Online, at **vetmed.wisc.edu/donor-honor-roll**, you can find a full list of individual and corporate donors who made gifts or pledges of $100 or more between July 1, 2019 and June 30, 2020, as well as listings of cumulative, alumni, and veterinary medical clinic donors.

Thank You!

MAKING A DIFFERENCE WITH DONOR SUPPORT

A Love for Dogs Inspires Endowed Chair in Canine Health

When associate professor **Gillian McLellan** goes to work each day, she is on the hunt for ways to eliminate or reduce the incidence of disabling and blinding eye diseases in companion animals.

A comparative ophthalmologist, McLellan (at left) studies glaucoma and other diseases affecting the retina and optic nerve. She combines compassionate veterinary medical care for individual animals with pioneering research to better understand the underlying pathology of eye diseases and advance new clinical applications that benefit both veterinary and human patients. Now she carries out this work in the name of **Tim and Nancy Speaker**.

This spring, the Speakers established the Tim and Nancy Speaker Chair in Canine Health at the UW School of Veterinary Medicine. This five-year award distributes grant funds annually to a faculty member whose research includes a specific focus on improving canine health and wellbeing.

Lifelong animal lovers, Tim and Nancy have supported the school for 10 years through the Speaker Family Foundation. But when they visited the SVM and its teaching hospital two winters ago, they were "blown away" and began looking for opportunities to contribute further.

"Once I got a tour of the veterinary school and saw what they did for animals and the community, I was impressed," says Nancy. "I wanted to do more," adds Tim. "I feel very strongly about animal health and welfare."

In particular, the couple was inspired — and in some ways surprised — by the school's breadth. While aware of the SVM's role in training future veterinarians and treating animal patients, they weren't as familiar with other aspects of the school's programming, including an outreach initiative to provide veterinary medical care for homeless and low-income pet owners in Dane County, and researchers' efforts to advance vaccines and treatments against infectious diseases like influenza and COVID-19. "Those are things that I didn't know when I started giving," says Tim. "It's been really interesting to learn about the veterinary school, what they do, and how they do it."

In February, the Speakers saw a perfect chance to enhance their giving when UW alumni John and Tashia Morgridge announced a one-for-one gift matching opportunity aimed at helping UW–Madison recruit and retain world-class faculty. The Morgridge Match is available to donors wishing to establish or enhance endowed faculty awards.

"That was the real catalyst," said Tim and Nancy, noting that because their gift was doubled the chair was fully funded sooner than would have otherwise been possible.

In July, McLellan was named the inaugural recipient, an appointment that will extend through June 2025. "From the bottom of my heart, I thank the Speakers for their tremendous generosity in support of our research program," she says.

At their home in Mequon, Wisconsin, Tim and Nancy's two dogs remind them daily of the special bond shared with pets and what drives their support of canine health research. Willie, a 9-year-old Goldendoodle, "is the smartest dog I think I've ever had," says Tim. Auggie, a 1-year-old Comfort Retriever, is more mischievous — "he's like a naughty little brother," says Nancy.

The couple's four children, now grown, share a love for dogs. Throughout the children's youth, two golden retrievers, Maggie and Ruby, provided constant companionship. Maggie, in particular, "was the gentlest golden retriever," notes Tim. "Our oldest son would climb on her and she wouldn't do anything. When he cried, she cried, or howled I should say."

This kinship motivates the Speakers' contributions to the School of Veterinary Medicine and efforts to help animals live longer, healthier lives.

"It's my passion," says Tim. "That's how we got started and why we will continue."

Meghan Lepisto

ALLISON SPEAKER

The Speaker family dogs, Auggie (left) and Willie, enjoy an excursion.

A Gift for Newman is a Gift for Many Others

Some people have a way of perceiving that enables them to see what is missing — to understand what is needed to make things even better. That's surely the case with **Mary and Jeffrey Brown's** care of their horse **Newman** and their gift of a hay steamer to the Morrie Waud Large Animal Hospital.

The Browns bring Newman from Milwaukee to be treated by UW School of Veterinary Medicine faculty because of the team's combined expertise in equine care. As an equestrian for over 25 years, Mary has come to value the resource even more. "As a teaching hospital, it's a very special place," she says. "I'm so grateful to have such a hospital in our area."

Last winter, Newman, their 9-year-old Canadian Sport Horse, began experiencing digestive upset. "Show horses are under a lot of stress and 2019 was a weird summer with low-quality hay — too much rain and mold. It was very hard to find good hay," recalls Mary.

Mary had read about hay steamers and asked her veterinarian if using one would be a good idea to support Newman's health. Yes was the answer because of a steamer's ability to reduce bacteria, mold, and other allergens or irritants in hay, so Mary bought one for Newman. "Whatever Newman needs," quips Jeffrey. "Anything you can do to help relieve problems in their gut is well worth it."

In May, Newman had two episodes of colic (abdominal pain in horses that can range from mild to severe, sometimes even requiring surgery) within 10 days. These recurring episodes led to Newman being admitted to UW Veterinary Care for a four-day stay. During this period of medical care, Mary's idea of a gift to the school began taking shape.

DENISE GARLOW

Newman, a 9-year-old Canadian Sport Horse, visits UW Veterinary Care for follow-up care in October 2020.

Knowing how Newman benefited from his steamed hay regimen, she asked large animal surgery intern **Kristi Bowers** if the school had a hay steamer and learned they did not.

> With the hay steamer on site, the quality of patient care has definitely improved. It's just one more thing we can do to make an animal happier.

DENISE GARLOW

The new Haygain hay steamer purchased for UW Veterinary Care.

COURTESY MARY BROWN

Rider and owner Mary Brown guides Newman over a jump.

UW VETERINARY CARE

Veterinary medical students and UW Veterinary Care staff pose with gratitude with the new hay steamer from Mary and Jeffrey Brown.

Clinicians put her in touch with **Pat Bowdish**, the school's managing senior director of development. "The process was very easy. Pat helped facilitate and the staff researched the purchase," says Mary. By summer, a new full-bale Haygain hay steamer was installed at the hospital.

The hay steamer has been put to use for a wide variety of conditions and species at UW Veterinary Care — some surprising.

"I use the hay steamer on asthmatic equine patients because it reduces particles and mold," says **Alex Powers**, a third-year internal medicine resident who helped research and select the Haygain steamer. The steamer also makes hay more palatable for finicky patients. "We see a lot of very sick animals who refuse any type of feed, who have a poor appetite because they are not feeling well," she explains. "When the hay is steamed for an hour it becomes quite aromatic. So often, the steamed hay is the only thing we can get them to eat. We use it for horses, cattle, sheep, even goats."

In addition, the steamer increases the water content of hay — beneficial for equine patients with colic and digestive disorders who don't like drinking water routinely, according to Powers.

"With the hay steamer on site, the quality of patient care has definitely improved," she says. "It's just one more thing we can do to make an animal happier."

Denise Garlow

> As a teaching hospital, it's a very special place. I'm so grateful to have such a hospital in our area.

Charitable Gift Changes in 2020

Charitable gifts are vital to ensuring the School of Veterinary Medicine and its UW Veterinary Care teaching hospital can continue providing excellence in patient care, training the next generation of veterinary medical leaders, and advancing animal and human health through research.

For those considering a charitable gift in 2020, it is important to consider recent changes to the philanthropic landscape. The Coronavirus Aid, Relief, and Economic Security, or CARES Act, was signed into law in March 2020. In addition to funding health care changes and providing economic relief for businesses and individuals affected by the pandemic, this legislation also includes several provisions to encourage charitable giving.

Are you planning to take the standard deduction?
The CARES Act allows non-itemizers to take an "above-the-line" deduction of up to $300 for philanthropic cash contributions. This means that an individual can take the standard deduction plus an additional charitable deduction of up to $300. Importantly, this deduction does not apply for gifts made to Donor Advised Funds or supporting organizations — only to public charities like the University of Wisconsin Foundation.

Are you planning to itemize your taxes?
In the past, itemizers could deduct their charitable giving up to 60 percent of their adjusted gross income. In 2020, the CARES Act allows individuals to deduct up to 100 percent of their adjusted gross income. Like the above-the-line deduction for non-itemizers, this modification only pertains to cash contributions to public charities.

Are you considering a Qualified Charitable Distribution from your IRA?
Under the CARES Act, there are no Required Minimum Distributions in 2020 for IRA account holders regardless of age. However, the CARES Act does not prevent individuals from making a Qualified Charitable Distribution (QCD) to the public charity of their choice and the limit on QCDs remains up to $100,000 per year.

Are you interested in contributing to your Donor Advised Fund?
For contributions to Donor Advised Funds (DAF), there have been no changes. You may still deduct up to 60 percent of adjusted gross income for cash contributions and up to 30 percent adjusted gross income for appreciated securities contributions to your DAF.

Each individual's financial and tax situation is unique, so we recommend consulting a tax professional or other financial professional about specific questions and situations.

How to Give

To share a gift for the School of Veterinary Medicine, or for more information on ways to give, please visit **supportuw.org/giveto/vetmed** or contact **Pat Bowdish** (pat.bowdish@supportuw.org or 608-332-4750) or **Heidi Kramer** (heidi.kramer@supportuw.org or 608-327-9136).

COURTESY BARB CONSTANS

Sailing Through Life's Adventures, Cocker Spaniel at Their Side

How many dogs have sailed from the Midwest to the Caribbean and back again? **Zephyr** for one.

For nine months beginning in fall 2002, the little parti-color cocker spaniel was one-third of a seafaring crew aboard a 31-foot vessel.

"It was a great adventure," says **Barb Constans**, who made the journey with her wife **Deb Rohde** and Zephyr.

In many ways, Zephyr was a natural at sea. Perhaps because she was named for a warm west wind, "which is always our favorite breeze," says Constans.

During stormy weather on the boat, Zephyr would head below deck, burrowing in blankets under the boat's navigation station. "She could crawl in and nest during the worst of whatever it is we were going through," says Constans. "She had an ironclad stomach and did better in storms and rough weather than I did," adds Rohde.

That Zephyr was able to make the trip and take in her surroundings is a credit to UW Veterinary Care, Constans says. "She got to see every island that we went to in the whole of the Caribbean, and, wow, she had a wonderful adventure with us because of the vet school."

In the early 2000s, Zephyr developed dry eye, a condition that causes eye redness, pain, and irritation due to decreased tear production. Her local veterinarian referred her to UW Veterinary Care's Ophthalmology Service. According to Constans, this was before dry eye was commonly treated in dogs, but UW Veterinary Care clinicians helped arrive at a diagnosis and treatment. The hospital's pharmacy sourced for Zephyr cyclosporine eye drops, used to treat dry eye by increasing tear production and reducing inflammation. When the medication became unavailable due to a shortage ahead of the family's sailing trip, the pharmacy worked to compound enough eye drops to last through their travels.

"The vet school basically saved her eyesight," says Constans. "Without that treatment, Zephyr would have been a blind dog." (Chronic dry eye, without treatment, can cause eye ulcers and blindness.)

Zephyr's sight wasn't the only sense she utilized at sea, often positioning herself at the boat's bow to survey the scene. "She was our little radar station," Constans jokes. "She would smell land before we could see it," adds Rohde.

The couple recalls one time, as they neared the Dominican Republic, when "all at once Zephyr's nose popped up and she started pacing the deck. And about a half-hour later we could begin to see this little sliver of land," says Constans.

Likewise, Zephyr often forecasted dolphins' arrival moments before they could be seen at the water's surface. "All of a sudden, her ears would perk up and she would

be looking, and then suddenly we could see the dolphins," says Rohde.

"Zephyr was an amazing little dog," adds Constans. It was with gratitude for the dedication shown to Zephyr by UW Veterinary Care staff that Constans began making annual gifts to the School of Veterinary Medicine in 2004. Following Zephyr's passing in 2006, the couple purchased a memorial brick outside of UW Veterinary Care to honor their "forever-loved sailor dog."

Constans and Rohde have continued to support the school annually and have utilized UW Veterinary Care services for more than 16 years. Their next cocker spaniel, **Gracie**, had surgery at the hospital to repair a luxating patella, followed by physical therapy. She also visited the Ophthalmology Service for the treatment of glaucoma. Later in life, she was seen by the hospital's Cardiology Service for rechecks and management of lifelong heart conditions.

"We were frequent fliers," says Constans. "It was wonderful to have those specialists."

Like Zephyr, Gracie earned her sea legs — often sailing on Lakes Mendota and Michigan — and also came to enjoy traveling in a bike trailer. "We're pretty active people," says Rohde. "We like to bike, hike, kayak, and sail. And the dogs do what we do."

Sadly, Gracie passed away from cancer in April at the age of 15. This summer, the couple welcomed into their home **Paris**, a 1-year-old black cockapoo who happens to share the same March birthday as Constans. The adopted dog's name embodies the couple's traveling spirit — an aspiration to one day travel to Paris with their dog by their side.

Now in retirement after careers with UW Health and the City of Madison, the couple recently chose to include the School of Veterinary Medicine in their estate bequests.

"When we were doing retirement planning and thinking about our future, we decided that we needed to pick a couple of larger things that have had a long-term impact on our lives," explains Constans. "We both love animals. We both think that our lives were greatly enriched by Zephyr, Gracie, and now Paris, and Topaz before all of them, and the vet school made a lot of that possible."

"A lot of our lives have circled around our pets so the vet school just seemed an obvious choice as one of our major aid organizations when we're gone," she adds.

In addition to Constans and Rohde's legacy living on through long-term giving, Zephyr's carries on as well.

"We named the sailboat that we keep here on Lake Mendota 'Zephyr,' so Zephyr is still sailing with us every time we go," says Constans. "We don't like to forget them."

Meghan Lepisto

Companion Animal Fund Clinic Sponsors

Years of Clinical Participation Effective June 2020

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 SVM 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.

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Marshfield Veterinary Service
Metro Animal Hospital
Northwoods Animal Hospital

Successful Dairying Built on Cows' Well-Being

Since the onset of the COVID-19 global pandemic, The Dairyland Initiative hasn't missed a beat.

They hosted their first virtual workshops, offered virtual farm consultations, created guidelines to combat the spread of COVID-19, and incorporated other changes to continue to support dairy industry professionals during these ever-changing times

Because that is what they do. Launched in 2010, The Dairyland Initiative provides farmers the information they need to build better cattle housing that optimizes cows' well-being. The program centers around scientific principles developed by School of Veterinary Medicine faculty and staff, recognizing that successful dairying requires well-designed, comfortable facilities for cattle. Their recommendations are continually updated with the latest research findings and clinical experience, and provide economically viable, practical solutions for herds of all sizes.

The practices are sensible, humane, and profitable all at once, says **Nigel Cook**, professor of food animal production medicine and Dairyland Initiative director. An estimated 65 percent of new cow barns nationwide are built with Dairyland Initiative principles, yielding healthier cows, improved animal welfare, and more efficient and productive dairies. The programming helps keep the dairy industry — a $43 billion industry in Wisconsin alone — safe and productive, especially important in recent years as the industry faces financial challenges and other pressures.

"It remains all the more important that the decisions farmers make today are well-informed to ensure a profitable and sustainable future for their herds," Cook says.

Since 2015, Dairyland Initiative efforts have been bolstered by support from Saputo Inc., a Montreal-based company. They produce, market, and distribute various products, notably cheese, milk, and culture products. **Warren Skippon**, a veterinarian who serves as Saputo's director of

> Thank you for everything. Dairyland Initiative resources are so up-to-date and clear, it is easy to refer customers to your website when they ask questions about cow comfort, flooring, etc. I recently had a question about 12-month-old heifer stall dimensions and everything was right there. You are doing a great job to make it easy and simple to find the right information for producers.
>
> –Myriam Falcon, advisor, GENEX Canada; The Dairyland Initiative workshop trainee

From left to right, outreach specialist Courtney Halbach, Professor Nigel Cook, and owner Mark Keller at Kellercrest Holsteins in Mount Horeb, Wisconsin. This summer, The Dairyland Initiative helped the farm evaluate their needs for transitioning from a naturally ventilated barn to a mechanically ventilated barn.

COURTESY OF DAIRYLAND INITIATIVE

animal welfare, says The Dairyland Initiative's mission aligns with Saputo's belief that high-quality dairy products begin with milk from healthy and well-cared for animals.

"With the launch of our initial Animal Welfare Policy in 2015, we felt it was important to support leading animal welfare experts advancing the field of dairy cattle welfare awareness, education, and training to a wide range of dairy professionals," he says. "As an established leader in providing valuable dairy animal care resources, we recognized the potential of The Dairyland Initiative to support even more producers in the U.S. and other key dairy-producing countries."

As just one example of the impact of Saputo's support, the Dairyland Initiative website was translated into Spanish and French, expanding the program's reach and making topical resources more accessible.

In 2020, Saputo expanded its support, which will allow faculty and staff to continue to provide twice-yearly workshops for farmers, veterinarians, nutritionists, and industry consultants. It will also enable the team to design new online courses, including a class on positive pressure tube ventilation — supplemental ventilation systems that help deliver clean air in dairy barns, especially important during cold weather. And the support will make possible essential website updates, including the continued development and launch of a module focused on optimizing calf health through nutrition, sanitation, and the treatment and prevention of calf respiratory disease.

"Saputo's generous commitment to The Dairyland Initiative has allowed us to provide valuable, up-to-date facility design recommendations, lameness prevention tools, and calf health management resources to dairy farmers and industry professionals globally," says outreach specialist **Courtney Halbach**. "As a result, we have been able to optimize cow well-being worldwide."

Dairyland Initiative offerings continue to evolve to meet industry changes. They're now working to understand the impact of automated milking systems and create programming to serve farms that adopt these systems.

The program also developed a new one-of-a-kind workshop in response to a growing number of animal welfare audits on farms and a lack of information available to farmers on how to enhance cattle welfare and performance after an audit. This session was offered for the first time in February and has been one of the most well-received to date. Among the comments from attendees: "Content was very useful. Training was excellent;" "It was so instructive;" "Time well invested;" and "Great job, best continuing education I've attended in two to three years!"

Skippon appreciates that the program's interactive workshops focus on practical aspects of health and welfare. "I participated in the calf barn ventilation and welfare-friendly barn design workshop and experienced first-hand the valuable information and concepts that can be implemented on the attendee's dairies," he notes.

The Dairyland Initiative also offers 13 smartphone apps to help farmers manage dairy health and productivity, with many of the apps available in English, Spanish, French, and German. And all content on the program's website is now available free due to the generosity of sponsors. In 2019, website visitors almost tripled from the previous year, totaling nearly 17,000 users around the world.

"Our goals align with Saputo's commitment to enhancing animal welfare on dairy farms globally, and we are delighted to work with them now and into the future," Cook says. "Without their commitment, it is unlikely that we would have been able to accomplish all that we have."

Meghan Lepisto and David Tenenbaum

With Gratitude

At the UW School of Veterinary Medicine, none of our accomplishments would be possible without the generous support of friends of the school. Our donors' gifts — your contributions — have driven substantial new commitments to scholarship support for students; allowed for investments in exceptional faculty, pioneering research, and life-saving discoveries; secured cutting-edge diagnostics and equipment for our teaching hospital; advanced essential renovations and the forthcoming building expansion; ensured long-term investments through future estate gifts; and much more.

From the bottom of our hearts — and from our students, faculty, staff, and hospital patients — thank you. Together, with your support, we are training the most outstanding students, providing the highest level of clinical care, and making discoveries that advance understanding of animal and human health. To view a list of all donors who made gifts or pledges of $100 or more between July 1, 2019 and June 30, 2020, visit **vetmed.wisc.edu/donor-honor-roll**.

$12.8 MILLION

TOTAL NEW GIFTS AND PLEDGES RECEIVED IN FISCAL YEAR 2019-20

8,900

TOTAL INDIVIDUAL DONORS TO THE SVM IN THE 2019-20 FISCAL YEAR

(JULY 1, 2019 TO JUNE 30, 2020)

New Vaccine Strategy Harnesses 'Foot Soldier' T-Cells to Provide Protection Against Influenza

Approach could also be used in the fight against COVID-19 and other respiratory pathogens

As Americans began pulling up their sleeves for an annual flu vaccine this fall, researchers at the University of Wisconsin–Madison provided new insights into an alternative vaccine approach that provides broader protection against seasonal influenza.

In a study published in *Cell Reports Medicine* in September, scientists describe a T-cell-based vaccine strategy that is effective against multiple strains of influenza virus. The experimental vaccine, administered through the nose, delivered long-lasting, multi-pronged protection in the lungs of mice by rallying T-cells. These specialist white blood cells quickly eliminate viral invaders through an immune response.

The research suggests a potential strategy for developing a universal flu vaccine, "so you don't have to make a new vaccine every year," explains **Marulasiddappa Suresh**, the John E. Butler Professor of Comparative and Musocal Immunology in the School of Veterinary Medicine.

The findings also aid understanding of how to induce and maintain T-cell immunity in the respiratory tract, a knowledge gap that has constrained the development of immunization strategies. The researchers believe the same approach could apply to several other respiratory pathogens, including the novel coronavirus that causes COVID-19.

"We don't currently have any vaccine for humans on the market that can be given into the mucosa and stimulate T-cell immunity like this," says Suresh, a veterinarian with specialty training in studying T-cell responses to viral infections, who led the research.

The strategy addresses the Achilles' heel of flu vaccines, which is to achieve specific antibody responses to different circulating influenza strains annually, by harnessing T-cell immunity against multiple strains. In particular, the new approach calls into action tissue-resident memory T-cells, or TRM cells, which reside in the airways and lining of lung epithelial cells and combat invading pathogens. Like elite soldiers, TRM cells serve as front line defense against infection.

"We didn't previously know how to elicit these tissue-resident memory cells with a safe protein vaccine, but we now have a strategy to stimulate them in the lungs that will protect against influenza," explains Suresh. "As soon as a cell gets infected, these memory cells will kill the infected cells and the infection will be stopped in its tracks before it goes further."

Flu vaccines work by arming the immune system with an enhanced ability to recognize and fight off the flu virus. Vaccines introduce proteins found on the surface of flu viruses, prompting the immune system to produce antibodies primed to react should the virus attack.

However, because strains must be predicted ahead of flu season in order to produce vaccines, the vaccine in any given year may not completely match the viral strains in circulation that season. Flu viruses frequently mutate and can differ across time and from region to region. In addition, protection is neither long-lasting nor universal.

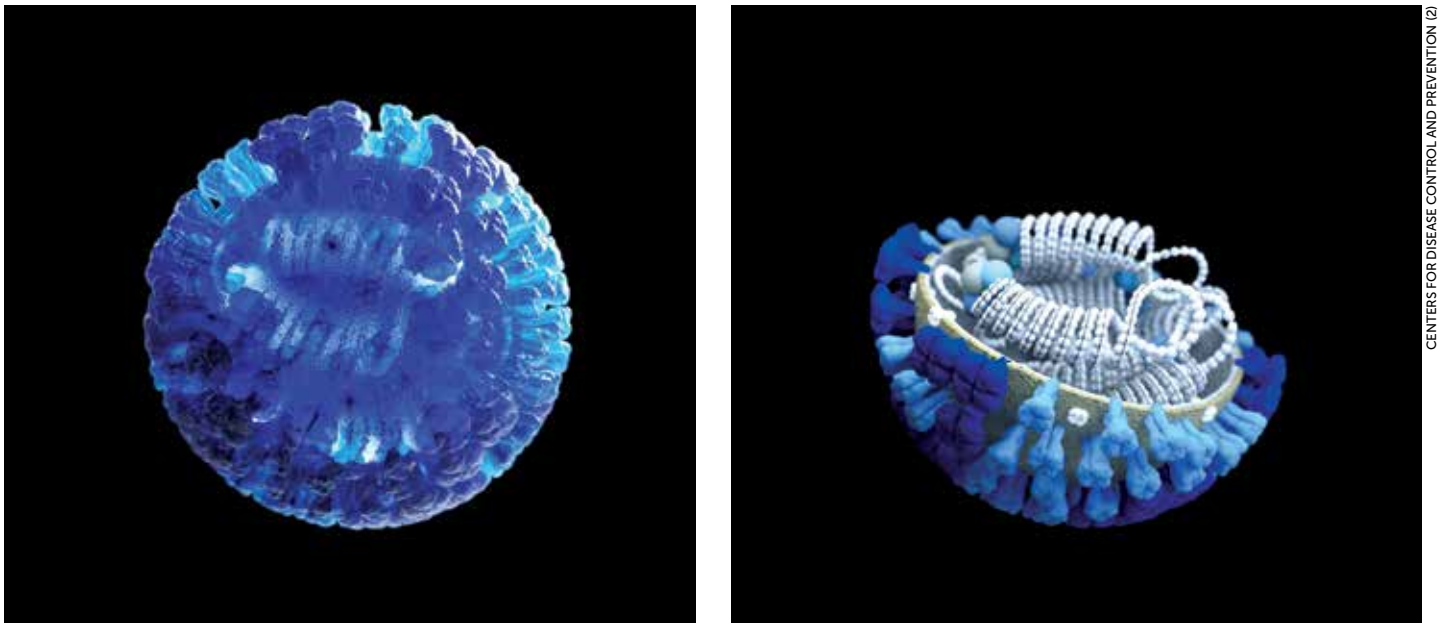
"Even though current vaccines that people get annually stimulate antibody responses, these antibodies don't cross-protect," notes Suresh. "If there is a new flu strain not found in that year's vaccine, the antibodies that we generated last year won't be able to protect. That's when pandemics happen because there is a completely new strain for which we have no antibodies. That is a really big problem in the field."

The vaccine developed by Suresh and his team is directed against an internal protein of influenza — specifically, nucleoprotein. This protein is conserved between flu strains, meaning its genetic sequences are similar across different strains of flu.

"We didn't previously know how to elicit these tissue-resident memory cells with a safe protein vaccine, but we now have a strategy to stimulate them in the lungs that will protect against influenza."

The vaccine also utilizes a special combination of ingredients, or adjuvants, that enhance an immune response, which the researchers developed to stimulate protective T-cells in the lungs. These adjuvants spur T-cells to form into different subtypes — in the case of the experimental flu vaccine, memory helper T-cells and killer T-cells. By doing so, the vaccine leverages multiple modes of immunity.

Killer T-cells hunt down and kill influenza virus-infected cells. Helper T-cells assist killer T-cells and produce molecules to promote influenza control. In



CENTERS FOR DISEASE CONTROL AND PREVENTION (2)

This three-dimensional, semi-transparent rendering of a whole influenza virus (left) shows both the clover-like surface proteins on the outside of the virus, as well as the internal ribonucleoproteins on the inside (at right). Existing influenza vaccines introduce proteins found on the surface of flu viruses to help induce immune protection. A new study by researchers at the UW School of Veterinary Medicine uses an internal nucleoprotein to stimulate the immune system in an effort to create a universal flu vaccine.

laboratory studies, the team found that both T-cell types were needed to protect against flu.

Researchers demonstrated in a mouse model of influenza that the vaccine provides long-lasting immunity — at least 400 days after vaccination — against multiple flu strains. Next, they will test the vaccine in ferrets and nonhuman primates, two animal models of influenza research more biologically similar to human infection and transmission.

The vaccine's combination of adjuvants makes it adaptable to other pathogens and "expands the toolbox" for vaccine research, notes Suresh. He and his team have devised ways to program immunity to target multiple respiratory viruses. They are currently testing the same vaccine strategy against tuberculosis, which infects more than 10 million people globally each year, and human respiratory syncytial virus, or RSV, a major cause of lower respiratory tract infections during infancy and childhood.

The researchers believe the same vaccine technology can be applied against SARS-CoV-2, the coronavirus that causes COVID-19. "Based on the COVID-19 immunology, we know this vaccine strategy would most likely work," says Suresh.

The team is now developing an experimental vaccine against COVID-19 and conducting laboratory tests to measure its effectiveness in mice and hamsters, animal models for COVID-19. Initial unpublished studies in mice show that the vaccine stimulates strong T-cell immunity against COVID-19 in the lungs.

Along with its adaptability, this vaccine approach may harbor important safety benefits. Typically, long-lasting T-cell immune responses are stimulated by live vaccines. For instance, the measles, mumps, and chickenpox vaccines administered worldwide are live, replicating vaccines — essentially benign versions of the pathogenic organism. These live vaccines stimulate strong, almost lifelong immunity. However, they can't typically be given to pregnant or immunocompromised individuals due to health risks.

In the case of the UW–Madison team's vaccine, because it is a protein vaccine and not a live vaccine, it should be safe for delivery to those who are pregnant or immunocompromised — an advantage in delivering protection to a broader patient population. Suresh says that vaccine development efforts have shifted away from live vaccines toward protein vaccines in recent years because an increasing number of people are living with compromised immune systems due to chemotherapy, radiation treatments, or conditions such as HIV/AIDS.

"Previously, we didn't know how to induce T-cell immunity in the lung without live viruses," says Suresh. "If we cleverly use a combination adjuvant, which we have developed, you can induce T-cell immunity that should stay in the lungs and protect longer."

Meghan Lepisto

Inaugural Alumni Award Recipients

In 2019 the UW School of Veterinary Medicine Alumni Advisory Board launched an alumni awards program to recognize graduates who have made significant contributions to society and whose accomplishments, affiliations, and careers have honored the legacy of excellence at the school. Congratulations to the inaugural award winners:

DISTINGUISHED SERVICE AWARD

Terrence P. Clark DVM'87, PhD, Diplomate ACVCP

Terrence Clark is a 1987 graduate of the UW School of Veterinary Medicine. He serves as president and chief executive officer of Nexcyon Pharmaceuticals, a company he co-founded in 2008. There he has led the development and approval of several veterinary pharmaceuticals commercialized through various business partners.

Following graduation from UW, Clark completed an internship at Oklahoma State University and practiced veterinary medicine for two years in Arizona. After completing a doctorate in biomedical science at Auburn University, he remained as an assistant professor of pharmacology, advancing research in basic and clinical endocrinology and pharmacodynamics. He also served as director of the university's clinical pharmacology laboratory.

From there, Clark served in roles of increasing responsibility at Pfizer Animal Health and Eli Lilly and Company, leading or contributing to the development of numerous veterinary pharmaceuticals. He has mentored veterinary and graduate students and residents, and continues to teach at schools of veterinary medicine. He has presented and given continuing education talks at numerous national and global conferences and has published 80 peer-reviewed research papers, book chapters, or review papers. He also holds two patents for novel transdermal drug delivery.

Clark has contributed to organized veterinary medicine through service on various committees, including the American Academy of Veterinary Pharmacology and Therapeutics, U.S. Pharmacopoeia, American Association of Pharmaceutical Scientists, and American College of Veterinary Clinical Pharmacology (ACVCP). He is a Diplomate and past president of ACVCP.

Clark has maintained a professional and personal connection to the UW School of Veterinary Medicine, including supporting residency and graduate programs in clinical pharmacology. Since 2014, he has served on the school's Board of Visitors.

YOUNG ALUMNI AWARD

Ryan Wallace MPH, DVM'12

Ryan Wallace is a veterinary epidemiologist within the National Center for Zoonotic and Emerging Infectious Diseases at the U.S. Centers for Disease Control (CDC). Currently, he is deputy director for the CDC One Health Office. In this role, he is leading the implementation of surveillance of SARS-CoV-2 (the novel coronavirus that causes COVID-19) in animals in the United States and advising on public health policies related to One Health.

Wallace began his career in public health in 2004 at the Wisconsin Department of Health and Family Services, working on projects to improve refugee access to healthcare. In 2006, he received his master's of public health from Emory University with a focus on epidemiology and in 2012 his doctorate in veterinary medicine from the University of Wisconsin–Madison.

Wallace joined the CDC rabies program in 2012 and trained for two years with the center's Epidemic Intelligence Service, a post-doctoral training program in applied epidemiology for health professionals. For the past eight years, he has led the Rabies Epidemiology Unit at CDC, while also serving as a World Health Organization expert consultant for rabies and director of the CDC World Organization for Animal Health rabies laboratory.

He has led numerous domestic and international zoonotic disease investigations pertaining to human deaths and animal disease outbreaks. Wallace spends the majority of his time implementating disease surveillance systems in low-resource countries and improving understanding of how interspecies relationships impact the spread of rabies. In his free time, he enjoys camping and hiking with his wife, three children, and two dogs.

Award winner biographies provided by the Alumni Advisory Board. Nominations are now sought for 2021 alumni awards in three categories: Distinguished Service Award (DVM), Distinguished Service Award (non-DVM), and Young Alumni Award. View eligibility and submission details: **vetmed.wisc.edu/alumni-advisory-board**.

Navigating Resiliency

Each year, **Angie Treinen DVM'93** designs the corn maze for Treinen Farm in Lodi, Wisconsin, which she owns with her husband Alan. In choosing a design representative of the unprecedented challenges of 2020, the resilient tardigrade, which can survive conditions ranging from freezing ice to boiling water to deep space, came to mind. Usually microscopic, the tardigrade at Treinen Farm covered miles of maze paths, offering socially distanced visitors a temporary respite from current events.

A Message to DVM Alumni

Thank You

In this season of thanks, I want to recognize just some of the ways we are grateful to you, our alumni, for being a part of the school's success. Thank you:

- To those who serve on our Board of Visitors, our alumni advisory board, our PREPARE Graduates Task Force, and who are helping us tell the story of our alumni in more compelling ways. Your perspectives and engagement are so valuable as we continually strive to provide the best teaching, clinical care, and research.
- To those who directly work with our students. Whether through one-on-one mentoring, externships, or ambulatory rotations, the guidance and experiences you share greatly enrich the education we can provide at the school.
- To those who promote the profession and the school in your communities and with your elected officials. As I have noted before, your outreach helped to ensure that our much-needed building expansion project received state approval.
- To those who serve in veterinary medical associations at the local, state, and national levels. Your voice helps guide the profession, making it the best it can be for your colleagues and those preparing to join you.
- To those who participate in our Companion Animal Fund Clinic Sponsor program and who have made gifts in support of our students, facilities, and research. This year, gifts were especially important in helping us respond to the changes in instruction brought on by COVID-19.
- To those who refer patients to our teaching hospital. Our teaching success depends on that caseload and we are very grateful for your partnership.

Space limitations in the magazine prevent me from going on; I know there are many other ways in which you give back. We are not only very proud of you and your careers, but very grateful for your support.

Kristi V. Thorson

Kristi V. Thorson
Associate Dean for Advancement and Administration

In Memoriam

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

Joseph Herzog DVM'97, 58, of Kailua, Hawaii, died in April of metastatic prostate cancer. Herzog worked for several years in emergency medicine in California before relocating to Hawaii with his wife, where he worked at several clinics, volunteered at the Hawaiian Humane Society, and served on the Hawaii Veterinary Medical Association board. Herzog was also deeply involved in establishing, building, teaching in, and gaining AVMA certification for the first veterinary technician training program and associate's degree in the state. This March, the program dedicated the surgery suite in his honor.

Joseph Edward Kelley DVM'89, 59, passed away in November after a four-year battle with ALS. "Joe was the person who made everybody feel like a somebody," his obituary reads. Veterinary medicine was Kelley's passion. He was an outstanding clinician and surgeon at Sauk Prairie Small Animal Hospital and served as a mentor and teacher to many. Kelley went on seven international relief trips offering free spay and neuter clinics. Through these trips, he impacted many young veterinarians and built connections with all he met.

Rossana Pérez-Freytes DVM'10, 37, of San Juan, Puerto Rico, passed away in July. Pérez-Freytes served as medical director at Veterinary Healthcare Associates in Winter Haven, Florida. While earning her master of public health degree, she acquired further training in epidemiology and risk analysis at Cornell University. She also completed a rotating small animal internship at the University of Tennessee Veterinary Medical Center. Pérez-Freytes served as an emerging infectious disease research fellow in 2007 with the CDC and won the Edith Hambie Excellence in Public Health Award.

UNIVERSITY COMMUNICATIONS

Holstein Dairy cattle are brought into the milking parlor at the UW Dairy Cattle Center. A new computer vision model created by veterinary medical student Preston Cernek (right), intended for potential use in milking parlors globally, can examine the hooves of dairy cattle as they enter or stand in a parlor, helping to detect the disease digital dermatitis and identify cows in need of treatment.

Combining Veterinary Research and Computer Vision for Early Disease Detection

Preston Andrew Cernek DVMx'21 stumbled across an opportunity he wasn't anticipating the summer before last. "I was looking for a summer job and I literally just started knocking on people's doors down at the production medicine department," he recalls. Little did Cernek know that this hunt would land him a part in a research project with significant on-the-farm impacts.

One of the doors Cernek knocked on that day in the School of Veterinary Medicine was the office of **Dorte Dopfer**. An associate professor in the Department of Medical Sciences, Dopfer studies lameness in cattle and best practices to prevent and control diseases that cause lameness. She offered Cernek a role in a new and exciting research effort that would involve computer vision technology, training computers to interpret and understand the visual world. In this case, researchers would train computers to examine the hooves of dairy cattle as they enter the milking parlor on the farm. Examination of the hooves would help detect the disease digital dermatitis, identifying cows in need of treatment.

Digital dermatitis is a vicious disease, affecting 90 percent of U.S. dairy herds. It is linked to severe lameness and infertility in cattle and is one of the main causes of decreased milk production globally. Early detection is challenging on farms, which is where Cernek comes in.

To assist in this project, Cernek trained himself in Python, a high-level computer programming language system, and "you only look once," or YOLO, algorithms. Using Python, Cernek and collaborators in the Dopfer lab trained a computer vision model to detect digital dermatitis by scoring cows' hoof lesions. With live camera footage, the system provides in real time a label for the life stages of digital dermatitis — visual references for the different phases of the life of an infection.

Cernek's computer vision model can help facilitate detection of the disease more efficiently than people could. To test and refine the approach, Cernek and research specialist **Kelly Anklam** drove to a dairy farm in Eastern Wisconsin. At the farm, he and Anklam brought a laptop and camera into the rotary milking parlor. The camera, facing cattle's backside, captured photos of each cow's hooves as the animals slowly rotated past. Each photo went straight to the laptop, where the computer vision model labeled the image with a box surrounding portions of the hoof. These boxes are displayed in a multitude of colors, distinguishing if the hoof is healthy or not.

Cernek's work on the project was supported by a veterinary student research fellowship from the Foundation for Food and Agriculture Research, in conjunction with the SVM's Summer Scholars Program — an opportunity for current veterinary medicine students to gain research training.

In October 2019, he and Dopfer traveled to Munich to present their findings at BPT-Kongress, an annual meeting of veterinary practitioners. This fall, the *Journal of Dairy Science* published Cernek and his colleagues' achievements. According to this report, their formula for a YOLO computer vision model labels hooves with a 71-88 percent accuracy rate, showing high efficiency in spite of rapid processing.

Methods such as these could fill knowledge gaps in livestock medicine and provide a new strategy for battling digital dermatitis while improving cattle welfare. Cernek continues to work toward his doctorate, while Dopfer and collaborators — which most recently includes 2020 Summer Scholars students **Montana Lins DVMx'22** and **Claiborn Bronkhorst DVMx22**, and computer scientist **Srikanthmadhavan Aravamuthan**, who is pursuing a master's degree in comparative biomedical sciences with support from the USDA — work to put this model into practice and pursue new opportunities to utilize computer vision technology to detect disease in livestock.

At just 25 years of age, Cernek has made important contributions to the commercial dairy industry, providing findings valuable to veterinarians and scientists worldwide.

Sam Lazar

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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 gift list — one that truly helps those special animal companions in our lives.

Each year, the SVM is pleased to present original artwork for its holiday card fundraiser. This year, "Golden Moments" and "Short and Sweet" (right) feature the work of Wisconsin artist **Robin Raab**. 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 SVM 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 **vetmed.wisc.edu/holidaycard**. Questions may be directed to Marsha Callahan at **608-262-5534** or **marsha.callahan@wisc.edu**.

Meet the Artist

Robin Raab is a self-taught artist who resides in Delavan, Wisconsin, surrounded by numerous four-legged family members. For more than 25 years, she has specialized in traditional wildlife painting and pet portraiture with a particular interest in dogs and horses.