

On Call

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



Cancer Crusaders

Today's canine patients guide better cancer therapies for pets and people

Client, Classmate, Friend

Remembering Morrie Waud, cherished member of the SVM family



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WE NEED YOU TO BE A HERO

Every day the UW School of Veterinary Medicine helps make animal and human lives better while training the next generation of veterinary medical leaders. However, our main building can no longer accommodate patient demand in our teaching hospital and critical research is in jeopardy because of limits on available space.

To continue saving lives and serving Wisconsin, the school must update and expand our current facilities. You can help by inviting your local elected officials to visit the SVM to learn more about our latest work and our future plans.

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Features



Cancer Crusaders

Man's best friend may hold the answer to battling cancer. Clinical studies of novel cancer therapies in canine oncology patients have yielded revolutionary technologies and more effective, less toxic treatments for both pets and people. Momentum is growing in this field of research, known as comparative oncology, with the UW School of Veterinary Medicine serving as an early and national leader.

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Champion of the SVM

Client, donor, classmate, and friend. Last fall, the UW School of Veterinary Medicine lost a cherished member of the SVM family with the passing of Morrie Waud. An honorary member of the Class of 2015, Waud advanced equine health, student scholarships, and the school's overall success through unparalleled generosity.

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Gus, a 9-year-old Rhodesian Ridgeback mix who recently completed treatment for osteosarcoma, a highly aggressive and painful bone cancer, is participating in an oncology clinical trial at UW Veterinary Care. The study will investigate a new approach to stimulate the immune system to attack any remaining tumor cells in dogs that have undergone limb amputation and chemotherapy for the treatment of osteosarcoma. (Photo: Meghan Lepisto)



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

Looking to the Future While Remembering the Past

The University of Wisconsin School of Veterinary Medicine is at perhaps its most critical juncture since its founding over 30 years ago. As you may have heard, the school has spent the last five years working with campus leadership, the UW Board of Regents, elected officials, and our supporters to construct an expansion to our building. Architects for the building are scheduled to be selected in April of this year.

As of the writing of this column, we have raised over \$24 million from our friends and alumni toward this project. Our goal is to be included in the current state capital budget so we can begin construction in the early winter of 2021. If all goes according to plan, the building should be completed in 2023. Importantly, a five-story parking garage will begin construction this fall and is scheduled to be completed in fall 2020 to accommodate our employees, students, and clients. I encourage you to contact your local legislators and ask them to support this expansion project, which is critical to our ability to continue to serve the citizens of Wisconsin in all that we do.

Despite the excitement that we all are feeling about this expansion, we are sad to have lost one of the school's and our students' greatest supporters and friends, Morrie Waud, this past fall. Morrie was caring, kind, and unassuming, but also extremely passionate about all that the School of Veterinary Medicine did not only for his beloved horses, but toward the creation of the next generation of veterinarians. Morrie will remain in all of our hearts and minds as we continue to make the school an even better place to learn and work.

In this issue of *On Call* we highlight several important ways that SVM researchers are advancing human health, in addition to that of companion animals. These include the contributions our oncology group has made through cancer research that benefits both pets and people, Professor Ian Duncan's latest findings related to myelin repair and diseases such as multiple sclerosis, and Professor Hannah Carey's studies of hibernation and its potential applications to human medical care.

Over the next four years, whenever you have the opportunity, I encourage you to visit the school to see what our changing landscape will look like. Whether it is the new parking garage, our new building to the school's north side, a new covered arena and large animal isolation facility, or improvements we create throughout our current space, each of these projects will significantly improve the research that we conduct, the clinical care we provide in our hospitals, and the education we deliver to our students. I look forward to seeing you when you have a chance to visit.



Mark D. Markel

Mark D. Markel, Dean

On Call SPRING 2019

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Ask a UW Veterinarian



Problems of the Prostate

This expert response comes from clinical assistant professors and board-certified specialists **Michelle Turek** (Medical and Radiation Oncology) and **Elizabeth Alvarez** (Primary Care).

Question: Have you made any progress in prostate cancer for male dogs and, if so, what are your suggestions for early onset of prostate enlargement? Also, why does prostate enlargement occur?

—Jo Elliott, Belvidere, Illinois

Answer: In both dogs and people, prostate development is hormone (testosterone) dependent. As male dogs age, hormone stimulation causes prostate enlargement called benign prostatic hyperplasia (BPH). BPH isn't always problematic, but if the prostate gets big enough, it can lead to difficulty with urination and defecation. Routine veterinary examinations, including rectal examinations, aid in diagnosing prostate enlargement prior to the development of clinical signs.

Neutering prevents prostate enlargement and causes regression of BPH. However, unlike in human men, testosterone stimulation in dogs is not related to the development of prostate cancer. Thus, neutering is not protective against canine prostate cancer.

Dogs with prostate cancer show symptoms like straining to urinate or defecate, urinary obstruction,

bloody urine, or ribbon-like stools. Unfortunately, these tumors often spread to other parts of the body. Metastases to lymph nodes and lungs are most common. Bone metastasis, resulting in bone pain and abnormal gait, can also develop. New, minimally invasive molecular tests allow for easy diagnosis of canine prostate cancer.

Although there is no cure, treatment can temporarily relieve symptoms and extend life. In early cancer, surgical removal of the prostate is considered. Most dogs are diagnosed with advanced disease, at which point surgery has a higher risk of complications, so it is rarely recommended. Delivery of targeted radiation therapy allows for improved treatment of the cancer without significant side effects. When relief from urinary obstruction is needed, placement of a stent in the prostatic urethra improves urine flow. Chemotherapy is often recommended to slow the cancer and address the risk of metastasis. Non-steroidal anti-inflammatory drugs can dramatically improve the quality of life of dogs with prostate cancer.

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...



Guess who joined the blood donor program at University of Wisconsin School of Veterinary Medicine. Ready to help save lives ♥

—Catt Hustad

Via SVM Facebook (@uwvetmed)



80 exams in one day! Our captive flock gets a full physical exam every year ... made possible through the efforts of local #veterinary students, other volunteers and our #aviculture staff.

—International Crane Foundation
(@savingcranes)

Via SVM Twitter (@uwvetmed)

Discovery Opens New Opportunities to Slow or Reverse MS

Nerve cells stripped of their insulation can no longer carry vital information, leading to the numbness, weakness and vision problems often associated with multiple sclerosis. A new study shows an overlooked source may be able to replace that lost insulation and provide a new way to treat diseases like MS.

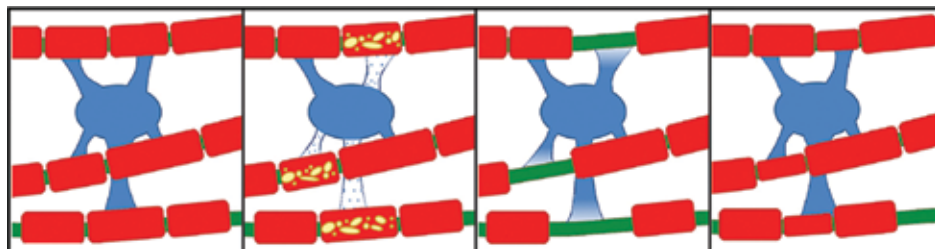
Cells called neurons make the central nervous system work by passing electrical signals along threadlike connections called axons. Axons do their work best when wrapped in an insulating coating of a fatty substance called myelin.

“When you lose myelin, axons don’t conduct at their normal speed or don’t conduct at all,” says **Ian Duncan**, a neuroscientist at the University of Wisconsin–Madison School of Veterinary Medicine. “And if enough of them are affected — such as in a big area of demyelination in MS — you develop clinical symptoms related to that part of the nervous system.”

Myelin is made by oligodendrocytes, cells that can reach out to several nearby axons to wrap parts of them in the protective myelin sheath.

Consensus has held that once an axon is robbed of its myelin, the only way to bring it back is by starting with fresh oligodendrocytes. Only oligodendrocytes arising from precursors called oligodendrocyte progenitor cells can apply a new coat of myelin to axons, goes the dogma. Thus, MS treatments aimed at remyelination have focused on recruiting progenitor cells in demyelinated areas (called plaques), and spurring them to develop.

However, researchers led by Duncan have shown in a study published in November in the *Proceedings of the National Academy of Sciences* that starting from progenitor cells is not the only route to remyelination. In cats and rhesus macaques experiencing a severe loss of



Nerve cell extensions called axons (green) are sheathed in protective myelin (red) provided by nearby cells called oligodendrocytes (blue). New research shows oligodendrocytes can respond to damage to myelin sections by creating a thin replacement coating of myelin.

DUNCAN ET AL. PNAS, 2018

myelin, Duncan found fully developed oligodendrocytes already in place were reaching out and beginning to coat affected axons with myelin once again.

The catch, if there is one, is that to be helpful and remyelinate damaged axons, the adult oligodendrocytes may still need to have connections to surviving myelin segments — called “internodes” — on other axons.

“If this cell is still biologically active and maintaining these internodes, it can re-extend processes out to these demyelinated segments,” says Duncan, whose work is supported by the National Multiple Sclerosis Society. “Those processes can make new myelin sheaths, which end up being thinner and shorter than the previous internodes.”

But even thinner myelin will restore nerve function, as Duncan and colleagues reported in 2009.

In the new study, the researchers looked at cats’ nervous tissue and found a unique myelin mosaic — axons surrounded by thick layers of myelin (formed during development when the axons themselves grew) were interspersed with other axons surrounded by thin layers of myelin.

“The most likely explanation of that mosaic appearance is surviving oligos,” Duncan says. “Thick myelin sheaths are never seen following remyelination, just thin sheaths. And surviving adult oligodendrocytes are adjacent to these sites of demyelination, making them likely candidates for myelin repair.”

Sure enough, the researchers found oligodendrocytes connected to both thick and thin myelin sheaths in the spinal cord.

The process may not be playing out in human MS patients fast enough to help mitigate the progression of the disease, Duncan says. Or too many oligodendrocytes may lose so many of their internodal connections that they become inactive or die.

But the discovery of the mature myelin-producing cells’ capacity for repair opens new opportunities to slow or reverse the disease.

“Right now, the emphasis is on promoting the numbers of oligo progenitors and their differentiation, particularly into adult oligodendrocytes,” says Duncan. “What this work provides is a different target.”

That target will call for new therapeutic approaches — finding drugs, for example, that rally the oligodendrocytes to reach out with new lifelines to damaged myelin sheaths.

“In fighting complex diseases, such as MS, the more tools you have on hand, the better,” Duncan says. “If these adult cells are recruitable in some fashion, we should be looking at ways to do it.”

Veterinary medicine student **Lauren Wierenga DVMx’19** was a co-author on the study.

Chris Barncard

How Hibernators Could Help Humans Treat Illness, Conserve Energy and Get to Mars

Two scientists from the UW School of Veterinary Medicine (SVM), **Hannah Carey** and **Matthew Regan**, co-chaired a symposium in October to discuss the potential for hibernation and the related process, torpor, to aid human health in spaceflight.

To survive times when food is scarce and temperatures are low, some animals enter hibernation — a physiological process that reduces their normal metabolism to low levels for days or weeks at a time. These periods of low metabolism, known as torpor, allow the animal's body temperature to fall to just above the surrounding air temperature, thus conserving energy.

Humans do not naturally undergo torpor, but scientists are interested in the idea of producing states of “synthetic” torpor in certain situations, including spaceflight. The symposium, hosted by the American Physiological Society, explored how synthetic torpor might be induced by the brain, its similarities and differences to sleep, and how it could benefit astronauts.

“Synthetic torpor could protect astronauts from space-related health hazards and simultaneously reduce demands on spacecraft mass, volume, and power capacities,” said Regan, a postdoctoral fellow in Carey's lab at the SVM.

Studying hibernation in mammals — how they are able to safely lower their body temperature and metabolism for extended periods of time — may also aid treatment of people experiencing traumatic medical events, such as stroke, cardiac arrest, and severe blood loss.

Animals that use torpor have a natural resistance to various injuries that can happen due to lack of blood flow. They are also resistant to radiation injury. Such a resistance would be especially beneficial to humans in deep space.

At the symposium, Carey, a professor of comparative biosciences, discussed why use of synthetic torpor based on the biology of natural hibernators is preferable to current medical practices that use hypothermia-based methods to treat trauma patients. She also discussed how hibernation research can identify how to create synthetic torpor for space travel.

Defining the relationship between sleep and torpor has been fraught with controversy, but the two states appear to be intimately linked because of the neuronal connections they share. Research suggests that lack of available food sources may cause mammals to conserve energy and lower their body temperature, two hallmark characteristics of torpor. However, less is known about the specific fasting-related signals that initiate entry into torpor.

Some of the physiological adaptations that animals exhibit — such as the low-oxygen environments that seals and penguins experience with deep diving or that birds experience on a high-altitude flight — are impossible for humans. Understanding how animals adapt in extreme conditions may play a positive role in human medical science, especially in the extreme environment of space.

The increasingly real possibility of traveling to Mars — once just a science fiction story — emphasizes the need to resolve factors that have hampered the feasibility of long-duration spaceflight, including having an ample supply of food, water, and breathable air. Finding a way to induce torpor in humans could help eliminate limiting factors as well as protect astronauts from harmful radiation.

American Physiological Society



ROB STREIFER

SVM Professor Hannah Carey studies hibernating ground squirrels as models for adaptation to extreme change. She co-chaired a recent symposium exploring the potential for hibernation and a related process, torpor, to aid human health in spaceflight or in treating traumatic medical events.

On Hiatus

What happens when you have a room full of hibernating squirrels, tied to the biological rhythms of the natural world, and a government shutdown delays funding to keep the experiments going?

Physiologist Hannah Carey spoke with the *Wisconsin State Journal*, *Scientific American*, and other outlets about how this winter's partial federal government shutdown stalled distribution of her grant money for the year from the National Science Foundation. Carey had to pull from a university fund that helps researchers bridge funding gaps.

As Carey explained to *ScienceNews*, delaying the project was not an option — the research requires monitoring brief periods of arousal during squirrels' natural hibernation cycles. Winter is when the squirrels in her lab are asleep and provide their most valuable research lessons. Regardless of the government impasse, “the squirrels carry on,” she said.

Story Update: ‘Miracle Mutt’ Sarge (AKA Buddy)

In the summer 2018 issue of *On Call* we shared the story of **Sarge**, who on a frigid morning was found abandoned and hypothermic, suffering from a broken leg and gunshot wound to the head. Today, the once-forlorn pup — now known as Buddy — is cozy and adored with a new adoptive family that includes Mila, a senior Weimaraner. The pair love to snuggle, watch nature movies, and enjoy other dog adventures.

“He is definitely living the good life,” says Sarah Erickson, manager of Northwoods Animal Shelter in Iron River, Michigan, where the resilient pup received care for months following his rescue and during recovery from orthopedic surgery performed at UW Veterinary Care.

Buddy’s new owner recently provided an update on his favorite pastimes and what it’s been like to welcome him into their home. Here’s some of what they shared:

“

Buddy is so happy all the time that I really have to stop and think about what might be his favorite things to do. I think going for walks.

Besides walks, cuddling is his other favorite thing to do. He’s about 50 pounds, but he considers himself a lap dog. Buddy presses his head and shoulders against me and if I massage his shoulders or rock with him, he will actually fall asleep. Maybe that’s my favorite thing to do!

Having Buddy in our lives has changed us all. I have always believed that dogs are here to teach us how to be better humans and Buddy’s lesson is all about forgiveness. He is in the moment and every moment is a happy one it seems.

Buddy keeps us moving forward and we don’t dwell on the past. Tomorrow holds too many promises of good times to come. We love Buddy and he loves us and everyone else too.”



Give back. Reach out.
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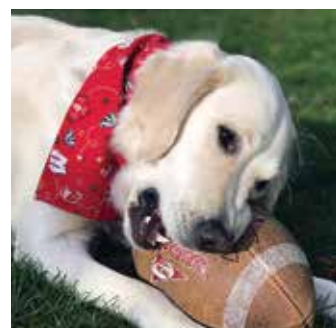
Get involved every way you can on April 9.
animalsneedheroestoo.com | #DayoftheBadger

THIS IS WHAT BADGERS DO.



Bucky's Furry Friends

These pets have spirit, how about you? From October through February, the SVM hosted Bucky's Furry Friends, calling for pictures of pets showing their UW pride for a chance to win a prize pack of Wisconsin Badgers pet gear. Here are just some of the hundreds of submissions. Congratulations to randomly selected winners Randy, Zoey, Boomer, and General Grant!



Making the Case

In December, then Governor-elect Tony Evers visited the UW School of Veterinary Medicine (SVM) for a tour and to learn more about the SVM and our proposed building expansion, which will allow the school to continue to serve the state of Wisconsin and lead the veterinary medical profession. Numerous state senators and representatives have also recently toured the school. To share your support with elected officials for this vital expansion project, visit animalsneedheroestoo.com/be-a-hero.



Morrie Waud:

Champion of the School of Veterinary Medicine

Remembering a cherished member of the SVM family

In November, the UW School of Veterinary Medicine (SVM) lost a long-standing friend and family member with the passing of **Morrie Waud**.

For more than two decades, Waud was a treasured client and donor to the SVM, advancing equine health, student scholarships, and the school's overall success through unparalleled generosity. But more than that, he was a beloved member of the collective SVM family, making tremendous efforts to support the school's dedicated veterinary medical students and even going so far as to "walk a mile in their shoes," following along with the Class of 2015 as they navigated the rigorous demands of earning a doctorate of veterinary medicine.

Waud's relationship with the SVM began in the late 1990s when he sought treatment for one of his horses at UW Veterinary Care. A lifelong lover of all things equine, he raised Belgian and Suffolk draft horses on his farm near Long Grove, Illinois.

Always impressed by the expertise and compassion of his veterinary care team at UW Veterinary Care, Waud's philanthropic passion was ignited. He established the Fund for Excellence in Equine Health to benefit the School of Veterinary Medicine's large animal hospital and its equine medicine, surgery, and teaching programs. In particular, he wanted to help the hospital purchase equipment that would advance large animal medicine. This fund has supported the procurement of modern ultrasound equipment and other new and innovative technologies.

During his visits to UW Veterinary Care, Waud saw the SVM's veterinary medical students hard at work. He witnessed student commitment firsthand and decided he could help once again, establishing a student support fund to benefit student scholarships and activities. Curious about what was required to become a veterinarian in just four short years, he became an honorary member of the Class of 2015, shadowing his classmates from orientation to graduation.

From 2011 onward, Waud graciously provided a range of gifts to each and every DVM student at the school, ranging from gift cards for movies and restaurants to warm blankets to study with to business card holders and a blue coat for fourth-year rotations — gestures of encouragement and pride for the students that he so admired.

In 2016, the SVM was proud to recognize Waud's longstanding commitment to the school by naming the large animal hospital in his honor.

Most recently, in spring 2017 Waud committed \$5 million to match gifts and pledges toward the school's Animals Need Heroes Too building expansion campaign, presenting special opportunities for SVM students, alumni and their immediate

families, faculty, and staff to have a significant impact on this critical campaign. In February 2019, the Morrie Waud Match was completed, generating a total impact of nearly \$9 million raised toward the SVM expansion.

Waud's ongoing generosity and caring spirit have had an immeasurable influence in helping students to succeed, allowing equine patients to prosper, and forging a legacy of support that will drive the school for decades to come.



LORI STRELOW (3)





"I will always remember Morrie for his support, friendship, gentle laugh, graciousness, and truly kind soul. He was my guardian angel, as is evidenced by the angel wings that hang in my office — a gift from Morrie."

-UW School of Veterinary Medicine Dean Mark D. Markel

Large Animal Hospital Named for Waud

In recognition of his generous gifts to the UW School of Veterinary Medicine in support of equine health and student scholarships, the UW Veterinary Care Large Animal Hospital was renamed in 2016 for Morrie Waud. In this photo from a 2016 unveiling of a new sign at the clinic entrance, Waud (second from right) is pictured with three individuals who he credits for his early involvement with the school (from left): Russ Austin, senior director of development at the Wisconsin Foundation and Alumni Association; Daryl Buss MS'74, PhD'75, SVM dean emeritus; and Ryland Edwards PhD'04, a former clinical assistant professor of large animal surgery at the school.

Cancer Crusaders

How today's canine patients help to advance better cancer therapies for pets and people



Successful clinical trials in dogs with nasal tumors at UW Veterinary Care, shepherded by Professor Lisa Forrest, pictured, led to widespread use of TomoTherapy in human medicine. This state-of-the-art technology allows for precise delivery of radiation therapy to attack tumors while sparing healthy tissue.



Rex (above) and the dogs that follow on these pages are participating in clinical studies of novel cancer therapies while battling osteosarcoma, helping to advance more effective treatment options for veterinary and human medicine.

By Meghan Lepisto

Rex, a five-year-old Cane Corso weighing in at 100 pounds, had a summer to remember in 2018. Swimming in Lake Michigan, enjoying walks in the woods, dipping his feet into a nearby creek, and relishing adventure after adventure. All the while adapting to life on three legs.

"Me and Rex had probably the best summer of our lives once he got his leg amputated," says owner **Trevor Smithson**. "We did so many fun things together."

Rex's left hind leg was amputated in July due to osteosarcoma, a type of bone cancer, and he began chemotherapy soon after. A few months later, it was discovered that Rex's cancer had spread to his

lungs. In the new year, cancerous tumors were found in two of Rex's other legs.

Rex and Smithson have faced each diagnosis with a brave spirit and a goodwill that may one day help other patients — both dogs and people — facing similar situations. As part of Rex's treatment regimen, he has taken part in several clinical studies — investigational trials of novel, potentially more effective treatment options with applications in veterinary and human medicine.

The UW School of Veterinary Medicine (SVM) is an early and national leader in this field of research, known as comparative oncology, studying naturally occurring cancers in pets as models for human disease. The goal is

to advance new cancer therapies and diagnostics that could benefit animals and people. The decoding of the canine genome in 2005 spurred a larger effort among researchers to apply a comparative, "one medicine" approach to better understand, diagnose, and treat diseases with a genetic basis, such as cancer.

"The answer to cancer may be walking beside us," notes **David Vail**, professor and Barbara A. Suran Chair in Comparative Oncology at the SVM.

Past clinical studies in oncology at the SVM have yielded new immunotherapy drugs in research first led by **Greg MacEwen**, one of the school's founding faculty members; chemotherapy and radiotherapy treatments with better

effectiveness and less toxicity; and revolutionary new technologies. For example, successful clinical trials in pet dogs with nasal tumors at UW Veterinary Care in the early 2000s, shepherded by Professor **Lisa Forrest**, led to widespread use of TomoTherapy in human medicine. This state-of-the-art radiation machine built into a CT scanner, developed at UW–Madison, allows for precise delivery of radiation therapy to attack tumors while sparing healthy tissue. More than 500 TomoTherapy units are now installed in human hospitals worldwide and the SVM remains one of only two veterinary medical hospitals in the world to offer this technology.

Conquering Cancer Together

An important goal of comparative oncology clinical trials is to raise the current standard of cancer care. In veterinary and human medicine, recurrence and metastasis (the spread of cancer) for aggressive tumors is “a very real problem,” says Vail. “We have such a long way to go both in physician-based and veterinarian-based oncology.”

“For some very aggressive cancers, we truly don’t have a good standard of care or the standard of care available fails our patients in that we’re not achieving high cure rates,” he adds. “Having the opportunity to use and apply this one medicine approach more globally in all species will allow us to help humans with cancer, while also helping our veterinary patients. It’s a huge need that we are working to move forward.”

Dogs and people not only share similar cancer rates — about one in four dogs and one in three people will develop cancer in their lifetime — but naturally occurring tumors in dogs and other companion animals often share almost identical characteristics to human cancers in terms of biological behavior, therapeutic response, metastasis, and more.

What sets dogs apart, as those who have loved and lost a canine companion know all too well, is their shorter lifespan, which also speeds the cellular

“You talk about one dog year equals seven people years; the same holds true for cancers. Chronologically, everything is compressed.”

clock. Cancers tend to develop, spread, and grow faster in dogs.

“You talk about one dog year equals seven people years; the same holds true for cancers,” says Vail. “Things progress quicker and occur at an earlier age. Chronologically, everything is compressed.”

This abbreviated timeline, while heartbreaking for an affected dog’s family, means that oncologists can determine much more quickly whether a cancer treatment works or doesn’t work. This is an important advantage of clinical trials in client-owned pets, potentially accelerating the development of better cancer therapies more rapidly and less expensively.

At Great Cost

According to Vail, it currently takes an average of 10 to 15 years and a cost of approximately \$1.5 billion per drug to develop a new FDA-approved oncology medicine. Some cancer drugs can cost human patients more than \$100,000 for a year’s treatment. Contributing to this toll in time and money is the high number of drug candidates that fail in human clinical trials. Only about five percent of oncology therapies make it from first-in-human clinical studies to final drug approval.

“Where we feel comparative oncology can really help is by including companion species in this preclinical work, as they may better recapitulate the human condition than artificial rodent models,” says Vail.

While important for studying cancer biology, the mouse models of

cancer that are often used in medical research — immunosuppressed, with tumors that have been implanted — lack many characteristics of human cancers. Thus, there is a disconnect between the number of anti-cancer therapeutics that work in mouse models versus in human patients, says Mark Albertini, an associate professor of medicine at UW–Madison and chief of oncology at the William S. Middleton Memorial Veterans Hospital. “In contrast, many human clinical trials have benefited from the translational dog model,” he says.

Cancer arising in dogs naturally “is genetically closer to the human condition, where each person is genetically distinct and their cancers are the same,” adds Jacques Galipeau, the Don and Marilyn Anderson Professor in Oncology and associate dean for therapeutics development at the UW School of Medicine and Public Health. In laboratory rodent models, all mice are genetically identical, he explains. “Though you can treat 100 mice, it is more like treating a single mouse a hundred times. Treating cancer in dogs is a more robust, reality-based test of innovative treatments.”





MEGHAN LEPISTO (2)

“With the treatments and novel therapeutics that we look at, the types of things that work in the dog tend to work in people, and the types of things that work in people tend to work in dogs.”

A Chance to Help Children

Osteosarcoma, a highly aggressive and painful bone cancer, has long been a poster child for the potential of comparative oncology, according to Vail. This disease affects both dogs and people and shares the same metastatic pattern and genetic profile between the two species.

In humans, osteosarcoma tends to occur in children, preteens, and teenagers. “It is a devastating disease,” Vail says. Only about 800 cases are diagnosed annually in North America, which has led to the disease being understudied in human medicine, he says. “It’s essentially been orphaned because there are so few patients.”

In dogs, however, the disease is far more common, often affecting the long bones of large breed dogs. More than 20,000 new cases are seen each year in North America. Despite therapy (limb amputation plus chemotherapy), most dogs succumb to the disease within a year of diagnosis due to cancer spreading to other parts of the body.

The large number of patients seen in veterinary medicine allows researchers to evaluate new therapeutics in a way that wouldn’t be possible by studying humans alone.

“Median survival for a dog with standard of care therapy is one year and median time to progression in kids, when the disease starts to worsen or spread, is about five years,” Vail explains. “So we get information that much quicker.”

SVM oncologists are working to un-

cover osteosarcoma’s underlying causes and develop more effective therapies. The school is one of several sites, for example, now investigating a new approach to stimulate the body’s own immune system to attack any remaining tumor cells in osteosarcoma patients. This clinical trial is sponsored by the Morris Animal Foundation and the National Cancer Institute as part of an innovative 5/5/5 initiative to test five drugs, in five years, for approximately \$5 million.

Dogs participating in the trial receive a vaccine made from the bacteria *Listeria monocytogenes*, which has been genetically modified to express a tumor protein found in many cancer cells, including canine bone cancer cells. When injected into the bloodstream, this modified *Listeria* stimulates the immune system to attack cells expressing the specific tumor protein. The goal is to delay or prevent the spread of cancer following removal of the primary bone cancer tumor and chemotherapy.

Veterinarians Serving Veterans

The SVM has also just launched a four-year trial of a new immunotherapy treatment for malignant melanoma. A common skin cancer in humans and a common oral cancer in dogs, melanoma frequently spreads within the body, resulting in poor survival rates once it reaches distant sites.

This investigational drug will be tested in dogs with melanoma at UW Veterinary Care and in a related study of human melanoma patients. The project is led by Albertini, who in addition to his roles at the Veterans Hospital and UW Health directs the Comprehensive Melanoma Clinic at the UW Carbone Cancer Center. He and Vail have worked collaboratively for several years to identify new melanoma treatments. This latest study is funded by the Department of Veterans Affairs; veterans who have served in the Middle East experience sunlight exposure and melanoma at rates higher than the general population.

“This is the first Veterans Administration-funded companion animal trial,”

Moreover, Galipeau says, researchers can deploy novel cancer treatments in client-owned animals at a rate that far outpaces the regulatory, pharmaceutical, and cost constraints of human studies. (Clinical trials in companion animals must meet their own strict criteria and are rigorously executed. All studies conducted at the SVM are reviewed and approved by the school’s Animal Care and Use committee to assure minimal risk to the patient and to guarantee that animal welfare requirements of the National Institutes of Health and Food and Drug Administration are met.)

“Our canine clientele can benefit from ethically sound, FDA-compliant clinical trials of therapeutic innovations far quicker and more cheaply than is achievable in humans,” Galipeau notes. “Lessons learned in dogs subsequently inform the best path to pursue in equivalent studies in people — hence the ‘comparative therapeutics’ angle.”

This bidirectional flow of new technologies and therapies is critical for veterinarians such as Vail. “Yes, we’re informing human clinical trials, but at the end of the day we are veterinarians and it’s really important to ensure that our veterinary patients are benefiting as well,” he says.

says Vail. “We see a lot of malignant melanoma in canine populations — in our clinic, almost daily — and this granting agency recognized the value of the comparative approach.”

The study involves injecting an immune stimulant directly into melanoma tumors to turn the cancerous tumor, while still in the body, into its own anti-cancer vaccine. The treatment may allow patients with melanoma to live longer or even be cured.

“We know that in a tumor developing in a person or dog, it’s no longer presenting as foreign to the immune system, otherwise the immune system would do the job it’s supposed to do,” Vail explains. “We’re trying to trick it back and make the tumor immunogenic again, provoking an immune response.”

MRI and CT scans of dogs who have received the treatment show promising preliminary results. “The tumor becomes very quiet after immunotherapy, with fewer cancer cells dividing,” says Vail. “Importantly, the lymph node, which is kind of the immune fort that gets turned on to attack the tumor and send in anti-cancer cells, becomes more active.”

SVM researchers are collaborating with oncologists at the UW Carbone Cancer Center to develop novel ways of using advanced medical imaging to determine which patients are benefiting from immunotherapy and which are not — an emerging need as more and more immunotherapies are deployed across cancer types. “That’s important because

these drugs are very expensive and they do have side effects,” Vail says.

Gaining Momentum

Writing in *The Veterinary Journal*, Vail and coauthor Douglas Thamm of Colorado State University note that “a new era of clinical trial awareness, brought on by new consortia and cooperative groups, is beginning.”

The Comparative Oncology Program at the National Cancer Institute and the Comparative Oncology Trials Consortium, of which the SVM is a founding member, are among the initiatives that have emerged to bring researchers together and provide needed resources.

In 2015, a national workshop hosted by the Institute of Medicine’s National Cancer Policy Forum served to build momentum among scientists, veterinarians, physicians, and the general public toward greater integration of pet clinical trials into translational cancer research.

Last year, the Open Philanthropic Project awarded a \$6 million grant for the largest clinical study conducted to date for canine cancer. This five-year trial, being performed at the SVM and two other institutions, will test a novel vaccine strategy for the prevention, rather than the treatment, of many types of cancer in dogs — a potential paradigm shift in veterinary and human medicine.

Most recently, the V Foundation for Cancer Research launched a grant-making program to accelerate comparative oncology research through grants to five top veterinary schools, including the UW School of Veterinary Medicine, paired with five leading human cancer centers. As part of this effort, the SVM has partnered with the UW Carbone Cancer Center to form the Comparative Oncology Working Group, together conducting studies and clinical trials aimed at more efficient cancer prevention, diagnosis, and treatments for pets and people.

Vail says the thousands of pets and pet owners that take part in the school’s oncology clinical studies are critical partners in advancing this work, “helping to push the envelope as far as

BY THE NUMBERS

Cancer is the leading cause of death in dogs and number two in cats. In people, cancer is the second-leading cause of death (following cardiovascular disease).

Approximately 1 in 4 dogs will, at some stage in their life, develop cancer.

In the United States, 1 in 2 men and 1 in 3 women will be diagnosed with cancer.

In 2018 there were 17 million new cancer cases and 9.5 million cancer deaths worldwide in people.

Source: Centers for Disease Control and Prevention, American Cancer Society, International Agency for Research on Cancer

what can be done to prevent and treat cancer in the future.”

“Our clients come to us demanding high quality care and access to novel therapeutics and novel technologies,” he says. “They’re highly motivated.”

For Smithson, who has logged countless miles driving from Chicago to the University of Illinois, Ohio State University, and then to UW to allow Rex to participate in oncology clinical trials, the novel therapies have offered optimism in Rex’s battle with cancer. “It’s always good to have a little hope blown into your sails,” he says.

The decision to enroll in the trials hasn’t always been easy for Smithson, who says Rex’s quality of life has guided his decisions. “If Rex didn’t want to live, we wouldn’t have even considered it.”

“I talked to him quite a little bit about this, even before he had his leg amputation, and said ‘If you want to live and you want to fight, I’ll fight with you. And if you don’t want to do it, I’m not going to make you.’ Because there’s no point in doing all this if he’s not happy,” Smithson adds. “But he still finds it in him to wag his tail, eat his food, and chew on his toys. As much as he’s been through, it hasn’t hampered his spirit one bit.”





JAYSHREE SAMANTA

Assistant professor of neuroscience,
Department of Comparative Biosciences

Hometown: Mumbai, India

New Faculty Focus: Jayshree Samanta

What attracted you to UW–Madison and the School of Veterinary Medicine?

The world-class stem cell and neuroscience research community.

What was your first visit to campus like?

I was impressed with the collegiality of the faculty members in my department, the beautiful lakeshore, and the creative license plates in Madison.

How did you get into your field of research?

I wanted to be a neurologist, but during the course of my studies in medical school, I realized that most neurological diseases are medical mysteries and incurable. This kindled my interest in neuroscience research.

For my Ph.D. thesis, I studied how oligodendrocytes are generated from neural stem cells during development of the mouse embryo. Since oligodendrocytes are lost in demyelinating diseases like multiple sclerosis, I became interested in

studying how neural stem cells can be used to repair myelin in the adult brain.

In my postdoctoral work at New York University (NYU), I identified Gli1 as a therapeutic drug target for enhancing remyelination by neural stem cells. My lab is continuing this research to explore the mechanisms involved in myelination by neural stem cells in the healthy and diseased brain. My research may lead to the discovery of therapeutic targets for treatment of multiple sclerosis and other myelin disorders.

What is Gli1 and what does it mean for it to be a therapeutic drug target?

Gli1 is a transcription factor expressed by a subset of stem cells residing in the brain. As a therapeutic target, we can use drugs to block Gli1's function, which will increase remyelination and repair of myelin in the brain.

How are neural stem cells used to repair myelin and how could this be applied clinically?

In general, stem cells can be used for regeneration of tissues in two ways:

transplantation of stem cells into the organ and activation of a person's own stem cells that reside within an organ. Inhibiting Gli1 can enhance the activation of stem cells in the brain, such that it increases their migration to areas of myelin degeneration and increases the formation of new myelin from these cells.

Along with my co-mentors at NYU, I have a patent for using inhibition of Gli1 as a strategy for enhancing remyelination. NYU is now helping to translate this strategy into therapy for multiple sclerosis by identifying small molecules that specifically inhibit Gli1 and can be developed into drugs in the near future.

"My research may lead to the discovery of therapeutic targets for treatment of multiple sclerosis and other myelin disorders."

With your background in human medicine, what is it like to now work at a school of veterinary medicine? Are there benefits to having colleagues who study both animal and human medicine?

I am very fortunate to have the opportunity to work with colleagues in both human and animal health. My training in human medicine taught me about the pathophysiology and clinical aspects of the human diseases I am studying in my lab. Since I am using animal models to study these diseases, my interaction with veterinarians has helped me understand and interpret my findings at a greater depth. For example, I am collaborating with a veterinary radiologist for MRI imaging of one of the animal models of demyelination.

In addition, my colleagues at the School of Veterinary Medicine have introduced me to several different animals that can suffer from demyelinating diseases just like humans, such as dogs, cats, and hedgehogs.

What would you say to someone who is surprised to learn that a researcher such as yourself, studying important diseases affecting people, is based within a school of veterinary medicine?

I think lay people are still not familiar with the idea of One Health [forging connections and collaborations across the health of humans, animals, and the environment] and we as a scientific community have to do a better job of informing them about the benefits of animal research. Surprisingly, I have had to explain why I work in the vet school to colleagues in the School of Medicine. I think the concept of One Health is somewhat alien to even the educated medical research community.

What's something interesting about your area of expertise that will make us sound smarter?

Myelin makes our nerves conduct impulses at least 100-fold faster. The highest velocity in a myelinated neuron is about 150 meters per second.

**UW SCHOOL OF VETERINARY MEDICINE
RANKED IN THE**

TOP 10

**FOR ITS RESEARCH PERFORMANCE IN 2017-18
IN THE VETERINARY MEDICAL SCIENCES DISCIPLINE**
(Academic Analytics Database)

A Leader in Research and Graduate Training

The Comparative Biomedical Sciences graduate program at the UW School of Veterinary Medicine (SVM) ranked in the top 10 for the veterinary medical sciences discipline for its research performance in the 2017-18 academic year, according to the Academic Analytics Database. This is a distinction the program has received for many consecutive years.

Academic Analytics gathers and aggregates metrics on the research productivity of nearly 400 institutions nationally and abroad into a comparative database. The database compiles information in 26 categories, including grant dollars earned, number of books or articles published by faculty, and number of faculty with awards or honors. The goal is to provide clear, unbiased information that each graduate program can use for comparison at a discipline-by-discipline level as well as overall university performance.

One of 51 programs nationwide in the veterinary medical sciences discipline, Comparative Biomedical Sciences provides a path to master's and doctoral degrees through graduate research training in core areas of animal and human health, such as genomics, infectious disease, medical technology, neuroscience, and more. More than 90 faculty from the SVM's four academic departments as well as from departments across the UW–Madison campus serve as trainers for the integrative program.

In Memoriam

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

Brian Castle MS'86 passed away in July after a courageous battle with cholangiocarcinoma. Castle worked as a research scientist and retired in April from Boehringer Ingelheim Pharmaceuticals in Danbury, Connecticut, after 27 years of service with the company.

Dale Sorenson MS'50, PhD'53 passed away in September. Sorenson spent his career on the faculty of the University of Minnesota College of Veterinary Medicine and was a leading researcher and authority on large animal carcinoma. He concluded his career with the National Institute of Food and Agriculture at the U.S. Department of Agriculture.



Volunteer Care for Working Equids a 'Re-Energizing' Endeavor

*In October, the Wisconsin Veterinary Medical Association (WVMA) presented **Judith Batker DVM'95** of Country View Equine Clinic in Oregon, Wisconsin, with their 2018 WVMA Veterinarian of the Year award. In addition to Batker's leadership in clinical practice and her mentorship of youth, veterinary medical students, and fellow equine veterinarians, the WVMA also lauded her volunteerism with the Equitarian Initiative.*

This nonprofit corporation provides volunteer veterinary care for working horses, donkeys, and mules in areas of need in the United States and internationally, and empowers local owners and handlers to provide better health care for these animals. Batker has worked with Equitarian Initiative in the Pine Ridge Reservation in South Dakota for eight years and in Haiti for five years, and is a past board member.

We asked Batker to reflect on why she finds her service for working equids, their care providers, and communities to be so important and rewarding. Here is what she shared.

Veterinary medicine is a unique profession in many ways. One of the things I love about it is the ability to connect with people everywhere, from any culture and any socioeconomic class. Whether their animals are companions, food resources, or their only transportation, they need care.

I became involved in volunteer veterinary care and teaching nine

years ago. Equitarian Initiative was at the time a very new nonprofit that provides treatment for working equids (horses, donkeys, and mules) and teaching to their caretakers.

I travel yearly to Pine Ridge Reservation in South Dakota, to Haiti, and to Costa Rica to teach a workshop. We treat horses that receive no veterinary care and more

importantly we teach local owners and local veterinary students. We teach a variety of skills including injections, basic anatomy, deworming, medication dosing, nutrition, proper harnessing, wound care, suturing, and farriery. We are often fortunate to have farriers travel with us as well. Our goal is to teach ourselves out of a job as much as possible.



"It is so inspiring to teach people who have very little chance to learn, but so much desire. We work together as a team. Watching their skills and confidence grow is very rewarding."

The horses are used very differently in these communities, but are so vital to their cultures and the ability to break the cycle of poverty.

It is so inspiring to teach people who have very little chance to learn, but so much desire. The relationships we develop are extremely important. We work together as a team and watching their skills and confidence grow is very rewarding. Each trip, we return to the same communities and have a long-term commitment to their education.

Veterinary students accompany us on all these trips. We also try

to include in-country students whenever possible. Teaching and mentoring enthusiastic students is critical to making volunteer work sustainable. Several of the students who have traveled with me have now joined ongoing projects as veterinarians or started their own projects too.

Volunteer veterinary work has re-energized my career and reminds me of why I wanted to be a vet. All of my colleagues who do this work with me agree, we get more than we give.

Judith Bather DVM'95

A Message to DVM Alumni

Help Wanted



2019 promises to be an important year for the University of Wisconsin School of Veterinary Medicine. The most significant project to the future of the school — our building expansion — is

being considered for inclusion in the state's capital budget. With approval from the legislature and the governor, we can begin moving forward with construction plans that will alleviate the significant space challenges currently constraining our teaching, clinical, and research programs.

As you know, we've been working hard on this expansion for the past several years. Many of you have already contributed with your gifts and through your advocacy. I offer you my most sincere appreciation. Your support has been, and will continue to be, critical to our success.

In April, the Wisconsin Foundation and Alumni Association is sponsoring two events that will further help our efforts. The first is the Day of the Badger giving day on April 9. The Foundation will send more information soon, but gifts to the school's building expansion campaign on this day will be matched. All gifts of any size truly make a difference.

The second event is the annual UW–Madison Day at the State Capitol advocacy day on April 10. The school's building expansion project is one of the top priorities for the university and we look forward to having many alumni (from across campus) and friends join us in asking elected officials for support of our building.

I hope you will consider participating in these events. With your help — making a gift, advocating, or both — you can ensure the success of the school for its next 35 years.

In gratitude,

Kristi V. Thorson

Kristi V. Thorson

Associate Dean for Advancement and Administration

P.S. If you can't be in Madison on April 10, you can still reach out to legislators by visiting animalsneedheroestoo.com and clicking on Get Involved. You will make a difference by letting elected officials know how important this project is to the veterinary medical profession in the state.

McGuirk Honored as Mentor of the Year



"My teaching stays enthusiastic and excited because it's an opportunity to impart new knowledge. It's an opportunity to give people power to make a difference. It's an opportunity to make the world a better place, and that drives my enthusiasm for my profession and for what I do in life."

-Professor Emeritus Sheila McGuirk, speaking to *Hoard's Dairyman*.

Left: University of Wisconsin veterinarian Terri Ollivett (right) presents Dr. Sheila McGuirk with the 2018 Merck Mentor of the Year Award.

In September, Merck Animal Health and the American Association of Bovine Practitioners (AABP) presented **Sheila McGuirk** with the 2018 Mentor of the Year Award for her commitment to mentoring the next generations of bovine veterinarians.

McGuirk retired in 2016 after 33 years on the UW School of Veterinary Medicine (SVM) faculty. She is a key reason for the school's international reputation for expertise in dairy cattle health.

"McGuirk's contributions to veterinary medicine and her ongoing passion as a resource for students is unparalleled," says Norman Stewart, livestock and technical services manager for Merck Animal Health. "McGuirk has made a tremendous impact on the lives of countless veterinary medical students, colleagues, fellow veterinarians, and dairy farmer clients. She is a role model, a tremendous educator, and a true leader."

Ken Nordlund, a clinical professor emeritus of food animal production medicine at the SVM, adds, "McGuirk has made outstanding contributions to the University of Wisconsin in all areas of teaching, outreach, service, and research. She was one of the founding faculty of the School of Veterinary Medicine and helped shape the curriculum and culture of what has become one of the country's outstanding veterinary schools."

McGuirk is known worldwide for her contributions to dairy calf health and bovine internal medicine. However, it is her caring and encouraging personality that has made her such an effective mentor.

"She takes advantage of every single opportunity to teach and provide guidance," says UW SVM alumna **Jennifer Rowntree DVM'16**, a technical services veterinarian for Vita

Plus in Madison. "She has the unique ability to make both peers and pupils feel empowered to make a difference."

McGuirk has received countless other awards for her dedication and service to the dairy industry, including the Carl J. Norden Distinguished Teaching Award in 1990 and 1994 and the AABP Award of Excellence in 1998. She was named Kansas State University's Legend in Academic Medicine in 2010; Wisconsin Veterinary Medicine Veterinarian of the Year in 2000 and 2016; and World Dairy Expo Industry Person of the Year in 2012.

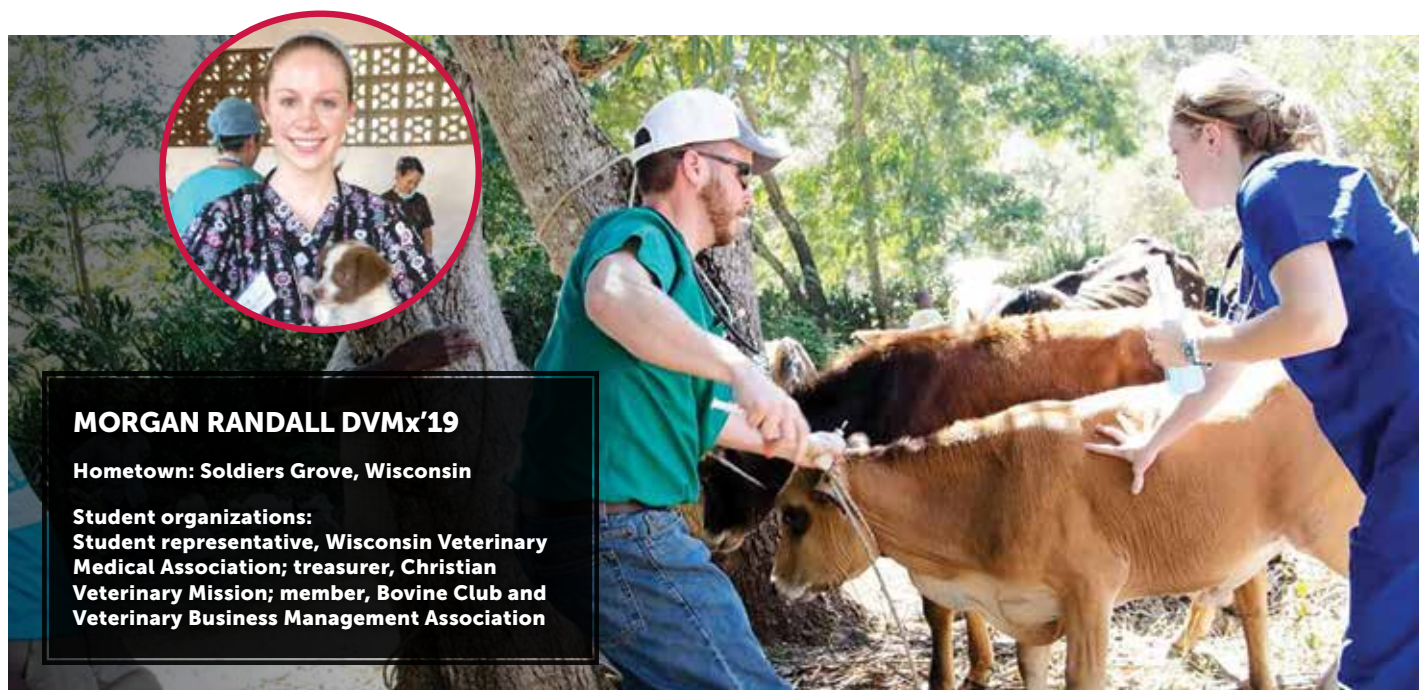
"McGuirk has guided countless veterinary students toward their career goals," says Fred Gingrich II, executive vice president of AABP. "Many of those students exceeded their goals because of [her] ability to recognize their potential and provide the encouragement they needed."

Merck Animal Health

Other Notable Honors

Professor Emeritus **Ron Schultz** was recognized as the meeting dedicatee at the 99th Annual Conference of Research Workers in Animal Diseases in December. Also at the meeting, **Sarah Raabis**, a clinical instructor at the SVM who is pursuing a PhD in the school's Comparative Biomedical Sciences program, earned the Don Kahn Award, the American College of Veterinary Microbiologists' top award for best graduate student presentation.

Students at Work



MORGAN RANDALL DVMx'19

Hometown: Soldiers Grove, Wisconsin

Student organizations:
Student representative, Wisconsin Veterinary Medical Association; treasurer, Christian Veterinary Mission; member, Bovine Club and Veterinary Business Management Association

Student Spotlight: Morgan Randall DVMx'19

What attracted you to UW–Madison and the School of Veterinary Medicine?

I knew that the UW School of Veterinary Medicine offered one of the best educations in the nation for future cattle veterinarians, so I decided to become a Badger. Lucky for me, it was also only a couple hours from home.

What was the most significant challenge you had to overcome to get into the university and the SVM, or that you've had to face since?

UW SVM admission is very competitive and I had to work hard during my undergraduate years to make sure that I would be a qualified candidate. Once in school, I had to adjust quickly to the different aspects of veterinary school compared to undergraduate study. I'll be honest, it was tough. That first year was filled with a lot of struggle, but now, sitting as a fourth year student in clinical rotations, I look back and realize that it was all necessary to get to this point.

After graduation, where will you be headed?

I will be joining the team of doctors at the Lena Veterinary Clinic in Lena, Illinois, as a large animal veterinarian. Most of my time will be spent serving beef and dairy clients in southwest Wisconsin and northwest Illinois. I am excited for what this new adventure will bring.

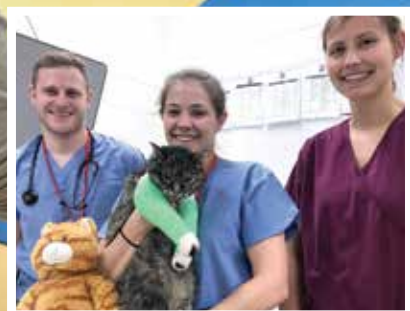
What are your long-term ambitions? Do you dream of making an impact in a particular area of practice or the world?

Once I receive my DVM degree, I hope to be able to use it to the fullest serving my future clients and patients. I grew up on a dairy farm and want to continue to work in the animal agriculture industry, assisting farmers in producing a safe and nutritious food supply for our growing world.

Ever since I traveled to Haiti on a veterinary mission trip with my colleagues in Christian Veterinary Mission, I have had a place in my heart for the people of Haiti and other countries where I have missioned. I have traveled to Costa Rica, Nicaragua, Ecuador, and Haiti. What stands out the most to me on these trips is how, despite the lack of material things, these people have a joy for life that far exceeds what we have here in America. They teach me to be grateful for what I have been blessed with and to share what I have to offer.

Often people in these countries rely much more heavily on animals and agriculture to make a living and survive. When we go on a mission trip, we offer our services and advice to help them keep their animals healthy so that they will have a way to make a living in the future and provide food for their families. I truly believe that the people of these countries teach me more than what I can offer them, and both parties gain a lot from these trips. I hope to continue to use my vacation time, or have time set aside when I am a practicing veterinarian, to continue to visit these countries on future missions.

Patient Profile



Willow Bounces Back

MEGHAN LEPISTO

How do you lure a reluctant cat through a rehab exercise program?

With feather toys, cooing, and lots and lots of treats.

For **Willow**, a three-year-old domestic shorthair who fractured both elbows last summer, physical rehabilitation has allowed her to regain strength and mobility.

Orthopedic surgery at UW Veterinary Care repaired Willow's broken bones. Then **Courtney Arnoldy**, a physical rehabilitation specialist, took it from there, helping to provide Willow with the best opportunity for a full recovery.

Arnoldy founded UW Veterinary Care's small animal rehabilitation program in 2003. Cats compose about 10 percent of her caseload, with dogs making up the majority of her client base.

Across several sessions, Arnoldy led

Willow through a variety of exercises, including leg lifts, stepping onto and down from a platform, walking up and down a ramp, and crawling under horizontal poles. The exercises, which slowly progressed in length and intensity, were aimed at improving Willow's sitting and standing posture and her walking mechanics. The ultimate goal: to allow Willow independence to move around the house and play safely following months of being restricted to a kennel, apart from short walks with a harness and leash, while her bones healed.

Michelle Ceizyk is fostering Willow in her home for Touched by a Paw, a cat rescue organization based in Whitewater, Wisconsin. She practiced the exercises daily with Willow while in return getting licks on her forehead from the sweet feline. The regimen at times required some creative license, for example digging out an old aerobic

exercise step to mimic a platform that was used at the teaching hospital.

Arnoldy says Ceizyk's strict commitment to the rehab plan helped optimize Willow's potential.

"Working with the rescue group, in particular Willow's foster mom, Michelle, was a wonderful experience," she says. "They have been so dedicated during Willow's recovery."

At a follow-up appointment in December, Willow's radiographs showed she was healing well, and she demonstrated more confidence and ease while navigating the exercises. Happily, Willow got the green light from her care team to gradually increase her activity at home and her time outside of the cage.

"She's ready to take off and play," says Ceizyk.

Meghan Lepisto



With Gratitude

"Thank you for joining Morrie and the school in our shared effort to make this building expansion a reality. Step by step, we are all helping to improve the lives of animals and people around the world."

Dean Mark D. Markel



Morrie Waud Match

Thank you to Morrie and the 235 match donors for making a difference for animal and human health by supporting the most important project our school will undertake in the next 30 years.

In February 2019, we successfully completed the Morrie Waud Match. In total, the \$5 million matching gift program had a nearly \$9 million impact on our building expansion campaign — a fitting final tribute to the life of a modest man passionate about his horses and our school.



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APRIL 7, 2019

10 a.m. to 3 p.m.

Veterinary Medicine Building

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