College of Veterinary Medicine

One of a Kind Medicine for One of a Kind Patients
The WSU Program in Individualized Medicine

Nicolas Villarino, WSU assistant professor and pharmacologist
Katrina Mealey, WSU professor and pharmacologist
Michael Court, WSU professor and pharmacologist
I recently prepared a talk for the Bellevue, Washington, Breakfast Rotary. There is so much to be excited about in our college that I always risk delivering an exhaustive laundry list of good things.

Do I talk about Theia featured on page 3 of this newsletter, whose simultaneously heartwarming and heartbreaking story circled the globe numerous times? What an example of the good our team does every day in the WSU Veterinary Teaching Hospital. Or should I highlight our work to eliminate rabies as a global public health problem? People rarely die from rabies in the United States, but more than 59,000 do so each year in South Asia and sub-Saharan Africa. What an aspiration…and achievable in my lifetime (see go.vetmed.wsu.edu/Rabies). Then there is the critical role our Washington Animal Disease Diagnostic Lab has in protecting public health and agriculture—behind the scenes they have been protecting us without us realizing it, as they always do 24 hours a day and 365 days a year, most recently with respect to avian influenza. What about our many research programs to combat important tick-borne diseases of animals and people around the world? Or probiotics to fight disease in rainbow trout? Then there are important “one health” accomplishments as we seek to improve human health and well-being. As viral diseases kill people around the world, we work diligently to understand them and inform societal debates on issues such as vaccination. We develop exciting novel treatments for dementia and Parkinson’s disease, spinning off a biotech company to drive Washington’s economy (see wsu.edu/125/innovators). Then there is the recent NPR Morning Edition story about Tumor Paint, for which we and our veterinary patients played a critical role to move into human clinical trials (and not the University of Washington’s College of Veterinary Medicine as originally reported…oops!).

It is so hard to narrow it down. We do so much and so well, and often in areas that cause people to ask, “Why is a college of veterinary medicine doing that?” The answer is simple: we proudly take a broad view of how the veterinary profession serves society.

In this vein, I close by noting that we offer four undergraduate degrees; one of only three veterinary colleges in the country to do so. These are a point of pride for us, attracting great students who are mentored by a fantastic faculty. Our faculty are innovators in science, technology, engineering, and mathematics, or STEM, education, joining DVM program faculty in leading our college’s pioneering Teaching Academy (see vetmed.wsu.edu/innovative-education). They mentor talented students to high achievement—our programs have produced six of the last eight prestigious Goldwater Scholars at WSU, and 17 overall—and they seek to improve STEM education at WSU and around the region. I wish every dean could know the pleasure of offering such programs to educate the next generation of scientists and health professionals and enrich the life of the college.

At the conclusion of that Rotary talk about some of these marvels, the host, an alumnus of our rivals, the University of Washington, remarked that with such fantastic programs in our college, WSU would not be known as just a football school any more. Indeed.

Go Cougs!

Dr. Bryan Slinker, Dean
WSU College of Veterinary Medicine
The New Humane Society Alliance Education Program

The WSU College of Veterinary Medicine has partnered with regional humane societies to give our students an extraordinary educational opportunity in community-based, wellness-centered, primary care facilities during their final year in school. The experience better prepares them to enter the workforce after graduation. During the first year of the program (2013-14), almost 50 students elected to participate in a rotation at the Seattle Humane Society and in 2014-15 almost 75 students participated. Once the new clinical facilities are completed at the Seattle Humane Society and the Idaho Humane Society, we will have the capacity for up to 200 rotations each year. Beginning with the class of 2016, a WSU Shelter Medicine and Surgery-Pullman rotation is available for up to 39 students.

“My experience at the Seattle Humane Society made me a much better and more confident surgeon.”
—Caitlin Dooley ('14 DVM), staff veterinarian at the Seattle Humane Society.

Students on rotation at the Seattle or Boise humane societies focus on primary care and surgery. Students spend over more than half of their time performing spay and neuter surgeries to shelter owned animals; most of those surgeries are on pediatric cases (puppies and kittens under 6 months of age). The remainder of the time is spent on diagnosis and treatment. Most cases are illnesses or injuries that students will typically see when they enter private practice. Students also have the chance to observe behavioral assessments, which helps them learn how they can communicate behavioral needs to potential owners. Students on the Pullman rotation train in primary care and spend approximately half of their time performing spay and neuter surgeries, doubling the surgical caseload. Field visits to the Whitman County Humane Society, Hope’s Haven, Humane Society of the Palouse, SpokAnimal, and the Spokane Humane Society provide outreach, animal care, consultation services, and educational opportunities such as surgery, population medicine, business models, and data tracking within real world settings.

Learn more about the program and the benefits to our students at go.vetmed.wsu.edu/HumaneSocietyAlliance.

Theia: An Incredible Story of Survival, Hope, and Compassion

Theia, an ownerless 1-year-old bully breed mix, came to the WSU Veterinary Teaching Hospital in March after being hit by a car, bludgeoned over the head with a hammer, and then buried in a field. She returned to Pullman weeks later to have surgery on her sinuses, which were badly damaged from the blows to her head. Because she was having difficulty breathing while she slept, the WSU surgery team, headed by Dr. Boel Fransson, recommended surgery to give her some relief. After two surgeries to remove the blockage and add a stent, Theia is doing well and is back at home with her caretaker, Sara Mellado.

Initial funds for Theia’s care came from the WSU College of Veterinary Medicine Good Samaritan Fund. Knowing that with multiple surgeries the expenses could get quite high, Mellado set up a crowd source funding site for Theia’s care. She raised more than $28,000 and has pledged that any remaining funds will be donated back to the Good Samaritan Fund. Find out more at vetmed.wsu.edu/GoodSam.

To read more about Theia’s remarkable story and her care at WSU visit go.vetmed.wsu.edu/Theia.
One of a Kind Medicine for One of a Kind Patients
The WSU Program in Individualized Medicine

Carlee, a 7-year-old yellow lab, is a mutant. Like many of her human redhead counterparts, Carlee has a mutation in the MC1-R gene, or melanocortin 1 receptor. The gene is responsible for producing melanin, a pigment that determines hair, or in this case, coat color. Because humans with red hair often have a lower threshold for thermal pain, researchers at the WSU College of Veterinary Medicine wondered if they would find similar results in Labradors.

Dr. Stephen Greene, WSU veterinary anesthesiologist, and Dr. Tania Perez, PhD student and clinical instructor, recruited 31 Labradors—black, chocolate, and yellow—for the study. After taking a cheek swab to test their genetic makeup, they observed the dogs’ reaction to mild heat and pressure by attaching special equipment to the dogs’ front legs.

“With the devices, we can measure the precise amount of pressure or heat the dog is receiving,” says Greene.

When the dogs feel the sensation, some pull their leg back, look at it, or start licking it, says Perez. When they see the reaction, the researchers record the temperature or level of pressure. They repeated the experiment several times and took an average to be confident the measurement was accurate.

But the results were not what they expected.

“We thought we’d find difference in thermal tolerance,” says Greene. But they found no difference between the dogs. Instead they found that when they compared yellow and chocolate labs that carry the mutant gene to black labs that don’t carry the gene, there was a significant difference in how they responded to pressure. Based on this research, veterinarians may be more likely to give additional pain medication after surgery when treating a yellow or chocolate lab with this genetic mutation if the animal seems distressed, since it is likely the animal also has a higher sensitivity to pain.

“Not all animals in the same breed will respond to drugs in the same way and it is challenging to understand pain in animals since they cannot talk,” said Greene. “Knowing genetic differences for pain tolerance will be helpful in getting optimal treatment to the patients.”

This research is just some of the exiting work happening as part of the Program in Individualized Medicine, or PrIME, at WSU—the only program of its kind in the world.

“One of a Kind Patients
More than a decade ago when Dr. Mealey discovered a MDR-1 gene mutation, she answered scientifically what veterinarians had long observed in their own patients. Veterinarians knew some dogs with white paws had an adverse reaction to ivermectin, often prescribed to prevent heartworm disease. Dogs with this mutation, generally herding breeds, do not produce enough P-glycoprotein to effectively pump the drug out of the brain, which leads to toxicity and causes the nervous system to shut down.

But even within herding breeds, not all have the mutation. About 50 percent of Aussies do, while only approximately 10 percent of Old English Sheep dogs do. The only way to know for sure if a dog has the mutant MDR-1 gene is to have the dog tested.
Researchers in the individualized medicine program often start by looking at why a patient had an unusual response to a particular medication. Similar to dogs with white paws, veterinarians have known that some Greyhound or other sighthound breeds do not always wake up easily after general anesthesia, but no one really knew why.

Michael Court, professor and pharmacologist who joined the individualized medicine program in 2012, directed his research to answer that question. He discovered that a metabolic genetic mutation causes them not to regain full consciousness very quickly.

“We are currently working to develop a test that can be offered to dog owners within the next 12 months,” says Court. Once a patient is identified as having the mutant gene, then veterinarians will be able to prescribe a different dosage of anesthesia.

And it’s not just dogs. They are also finding that cats are quite different in how they respond to medicine. “Cats are not little dogs,” says Court. “But there are few articles that evaluate how drug effectiveness or toxicity differs between species.”

Nicolas Villarino, assistant professor and pharmacologist who joined the program in 2014, is looking specifically at cats and drug toxicity. He uses metabolomics, or changes to metabolites in the body, to study drug effects at a molecular level. He is currently researching why cats are more susceptible to toxic reactions to NSAIDs, such as ibuprofen.

The speed a drug is metabolized in the animal also affects what dosage a patient might need. Dr. Court found that for cats, certain drugs leave the body more slowly, which means they may need a different dosage than prescribed for a dog of a similar size. And recently Dr. Mealey has discovered that cats are also affected by the MDR-1 mutation.

“It is very important to identify the specific characteristics of the patient to provide optimal treatment,” says Villarino. By knowing how drugs are metabolized, they can identify predispositions to serious side effects and recommend optimal dosages.

**One of a Kind Medicine**

Often called precision medicine, customizing health care to individual needs has been used for decades in human medicine. But in veterinary medicine it is relatively new. Because animals may respond differently to many types of medications, the pioneering research conducted at WSU will help veterinarians tailor their care by giving them more treatment options.

“A drug may work in some animals, but not others,” says Mealey. And sometimes a drug can be more effective if it is combined with other drugs. “We often think of drug interactions as harmful, but they can be beneficial.”

The group is also currently working with a pharmaceutical company to change dosage levels on the label of a chemotherapy drug known to have adverse effects in some patients. “Roughly 90 percent of all drugs are prescribed with a fixed dose,” says Villarino. “By optimizing the dosage, we prevent or minimize adverse reactions, but the medication can still be effective.” Even a small change in recommended dosage can be beneficial for individual patients.

“Some drugs have a narrow therapeutic window,” says Mealey. “So the effective dose is not very different from the toxic dose.”

Dr. Court believes their research will one day lead to predicting the type of medicine or dosage levels needed for many commonly prescribed drugs based on an animal’s age, breed, sex, and biomarkers, such as metabolites or a patient’s genetics. The goal is to make what they learn from their research available to practitioners to be used in veterinary clinics and hospitals.

“Veterinarians have known that drugs cause reactions,” says Mealey. “Our work is answering the questions that veterinarians have had for a long time. We are bringing benchtop science to the clinical science that veterinarians use every day.”
When I think of our graduates, one word comes to mind—pride. I feel pride when I see them enter our program here at WSU and grow to become confident veterinarians, surgeons, and professionals when they graduate. I’m proud of them when they are hired for their first jobs, and when they succeed in their careers.

I also feel pride when I think of how many of our alumni give back to the college. Our graduates are some of the most loyal and have some of the highest giving participation rate of any WSU alumni. There are countless examples of generosity, but I wanted to list just a few.

- As their senior gift, this year’s graduating class of 2015 gave over $2000 to the MRI campaign fund. The DVM class of 2018 has already started a scholarship fund as their senior gift to the college.
- Students who received scholarships with a “moral obligation” stipulation, meaning they agree to pay them pack, are paying them back even earlier than requested, which means they are being paid forward for our students who need them today.
- Alumni have established endowments of $25,000 or more to support areas they believe are important in veterinary medical education today.
- Other alumni have given back in honor of a beloved teacher, or added us to their estate plans.
- One alumna has given $250 a year to add to the scholarship she received as a student.

Shawn Sanders (’09 DVM) is also one such alumnus. As you will read in the supporter profile on page 7, Shawn and his wife started a student scholarship just a few short years after his graduation. It was something they’d plan to do while he was a student, but after seeing the story of fellow WSU graduate, Aaron Gibbons (’11 DVM), they decided the time was now. The Shawn and Heather Sanders Support the Family Scholarship is awarded to students of any year who have family obligations, are interested in mixed or large animal medicine, and are gainfully employed.

We often hear from students that WSU is a special place. I believe it is, in part, the generous spirit of our students and alumni that help to make our college so extraordinary.

[From the Office of Development and External Relations]

[Photo of Lynne Haley, Director of Development]

[Photo of Jennifer Zambriski, clinical assistant professor in the Paul G. Allen School for Global Animal Health]

Jennifer Zambriski, clinical assistant professor in the Paul G. Allen School for Global Animal Health, has been awarded $291,000 from the Bill & Melinda Gates Foundation to study Cryptosporidium, a parasite that is the second leading cause of diarrhea in infants worldwide. Children under two years of age who contract this parasite are at an increased risk of malnutrition and stunting, which can irrevocably affect cognitive development. There is currently no vaccine to prevent infection, but two medications hold promise as effective treatments. Because calves are also susceptible to the same infection, Dr. Zambriski and her team will treat animals with the drugs to learn more about their effectiveness. Their results could help children in resource-poor areas, while also helping agriculture in the United States and abroad. Her work will be the foundation for a large-scale clinical trial in children in Africa.

[Photo of WSU’s Veterinary Business Management Association—ranked number one out of 40+ chapters worldwide]

Congratulations to WSU’s Veterinary Business Management Association—ranked number one out of 40+ chapters worldwide! Left to right: Dr. Richard DeBowes, chapter advisor; Melissa Boyer, president elect 2015; Melanie Bowden, president 2014; and Mary Linker president 2015.

[Photo of Jennifer Zambriski, clinical assistant professor in the Paul G. Allen School for Global Animal Health]
Awards and Achievements

Congratulations to the 2014 Jerry Newbrey Teaching Scholars!
The Newbrey Teaching Scholar is awarded for excellence in teaching during the first three years of the veterinary core curriculum. This award is given in memory of Jerry Newbrey, who joined the College of Veterinary Medicine faculty in 1975, and who died too young in a climbing accident in 1990. Jerry was an exceptional teacher and student advocate. Those who receive this award richly deserve our appreciation for their commitment to our students and to excellence in the classroom.

Cynthia Faux
Boel Fransson
Gary Haldorson
Joe Harding

Steve Hines
Steve Lampa
Chuck Leathers
Pam Lee

Bob Mealey
Katrina Mealey
Pete Meighan
Debra Sellon

Leslie Sprunger
Tricia Talcott

Your Gifts in Action

Supporter Profile: Shawn and Heather Sanders

Like a lot of little kids growing up in southwest Idaho, Shawn Sanders ('09 DVM) dreamed of being a cowboy on a ranch. By junior high, he knew he wanted to be a veterinarian. After earning his undergraduate degree, WSU’s College of Veterinary Medicine seemed like the perfect place to study large animal medicine and earn a DVM.

Growing up, Sanders said his family didn’t have much. Drive and determination to make a better life for his family led him not only to WSU, but to working part-time, and sometimes full-time, all the way through school.

“There were times when I had three or four jobs,” says Sanders. “When one didn’t have enough hours, I’d pick up more from another.” While a DVM student, he worked in various labs cleaning dishes, working with horses, goat and lamb herds, or thoroughbred horses and running them on treadmills. His titles included Farm Animal Tech, Equine Reproduction Manager, and Research Assistant.

“We had to pay our way through school,” says Sanders. “With a family, that was a challenge.”

When Sanders started veterinary school in 2005, he and his wife Heather, who were married in 2003, had a 9-month-old baby. “We had three children by the time I graduated,” says Sanders. Today they have 5 children, three girls and two boys.

Sanders owns a mixed animal clinic in Laramie, Wyoming, which he purchased in 2012, just three years after graduation. “The banks were hesitant at first because I’d only been out of school a short time,” says Sanders. “But it has been going really well.”

So in 2014, after years thinking about how they could help, he and his wife started the Shawn and Heather Sanders Support the Family Scholarship. They created it not long after he had read a story about a fellow WSU alumnus, Aaron Gibbons ('11 DVM), who had also funded a scholarship.

“We had been thinking about starting a scholarship since I was a student,” says Sanders. “What kick-started it for us was seeing Aaron’s story. We decided now was the time.”

Having received the Ernie & Beryl Stowe Large Animal Scholarship, the Dr. Jay Newhall Scholarship, and the Dr. & Mrs. E. Doyle Montgomery Scholarship as a student, Sanders knew what a big difference those scholarships made for him and his family. He wanted to pass that help on to other families.

“I knew quite a few families while I was a student,” says Sanders. “I knew how much more of a challenge it was having to struggle to make ends meet. We wanted to help those paying their own way.”

Giving back is second nature to Sanders. As a kid he was active in 4H and FFA, or Future Farmers of America. Today he supports his local 4H program and they are active members in their community. They plan to continue adding to the scholarship to help even more.

“As our business grows, we would like to increase the scholarship,” says Sanders, who hopes that scholarship recipients who buy their own practices will also give back when their businesses do well. “Hopefully our story will encourage other to do the same.”

The Shawn and Heather Sanders Support the Family Scholarship is awarded to first, second, third, or fourth year DVM students at WSU with family obligations, interest in mixed or large animal medicine, and gainfully employed.

To learn more about how your gift can make a difference please visit vetmed.wsu.edu/GiftsinAction.
Look for Gatherings of WSU Alumni, Friends, and Students at these Upcoming Events!

Mark your calendars

**Peter A. Zornes Memorial Golf Tournament**
The ninth annual Peter A. Zornes Memorial Golf Tournament will be held on **Saturday, June 20, at the Colfax Golf Club** to benefit the Peter A. Zornes Memorial Neuroscience Scholarship at WSU. To register, visit vetmed.wsu.edu/Zornes or contact Lynne Haley at lhaley@vetmed.wsu.edu or 509-335-5021. Remember to invite your friends to play!

- **June 20** Peter A. Zornes Memorial Golf Tournament in Colfax, Washington
- **July 13** Alumni reception at the American Veterinary Medical Association in Boston, Massachusetts
- **September 26** College hosts reception at the Pacific Northwest Veterinary Conference in Tacoma, Washington
- **October 17** College hosts Homecoming BBQ in Pullman (vs. Oregon State)
- **October 29–31** Golden and Diamond (50-year and 60-year) graduate reunions in Pullman

CE courses at WSU and online are offered year round; visit [vetmed.wsu.edu/CE](http://vetmed.wsu.edu/CE) for more information.

For more information about upcoming events visit [vetmed.wsu.edu/Events](http://vetmed.wsu.edu/Events).