

Vet Topics

IMPROVING THE QUALITY OF HEALTH CARE FOR YOUR BEST FRIENDS

Pouncing on a protein

By Brenden Van Wyk

Dr. Ahmad Al-Dissi hopes his research will someday lead to a better treatment for inflammatory liver disease (ILD), a chronic and painful condition in many cats whose cause still remains a mystery.

“There are a lot of cases of cats with liver disease. The cause of ILD is largely unknown and there are few things we can do to treat the disease, especially in advanced stages,” says Al-Dissi, an assistant professor in the Western College of Veterinary Medicine’s (WCV) Department of Veterinary Pathology.

Clinical signs of feline ILD include a loss of appetite, vomiting, diarrhea, jaundice, excessive urination and thirst. As the disease progresses, fibrosis (a build-up of connective tissue) increases and liver function decreases. In extreme cases, ILD will eventually cause death.

Al-Dissi is leading a study that may help researchers gain a better understanding of the defensive response initiated by the feline liver — information that could lead to the development of a better treatment option for cats with ILD.

“The focus is shifting from identifying causes of liver damage to understanding mechanisms (of disease and defense) within the liver,” says Al-Dissi, whose study is supported by the WCV Companion Animal Health Fund.

His project examines the presence and the ability of metallothionein (MT) — a heavy metal-binding protein — to potentially reduce microscopic markers of liver

disease, such as inflammation and fibrosis.

“The main role of metallothionein is to protect against damage caused by heavy metals,” says Al-Dissi. “It has a high binding capacity to such heavy metals as copper and zinc.”

Cells synthesize MT when heavy metals build up in the body. MT tightly binds to free metals to restrict their ability to damage liver tissue, but evidence has shown that MT does more than just remove free heavy metals. It has been shown to reduce liver inflammation, decrease fibrosis and help the liver regenerate.

Researchers observed these characteristics in mouse model experiments, which showed that MT levels increased after liver inflammation developed. Scientists eventually showed that MT reduced this inflammation, reduced fibrosis and promoted regrowth of destroyed liver cells.

These observations are fuelling Al-Dissi’s research study in which he and his graduate student, Dr. Jolanda Verhoef, will compare MT levels to the amount of inflammation seen in ILD-positive tissue samples.

Verhoef will analyze various liver samples at different levels of ILD progression. Within these samples, she will compare MT levels with the degrees of inflammation and fibrosis to see how they relate. The researcher will also correlate the MT levels with liver re-growth.

While scientists have never performed these experiments in cats, Al-Dissi recently



“The focus is shifting from identifying causes of liver damage to understanding mechanisms within the liver.”

published results from similar analyses conducted on canine livers that were affected by primary hepatitis.

Al-Dissi sees MT as a promising tool in the treatment of liver inflammation in cats, dogs, horses and other species. One day the protein may even improve the outcome of human patients dealing with acute and chronic liver inflammation.

Brenden Van Wyk completed his Master of Science (MSc) degree program at the Vaccine and Infectious Disease Organization (VIDO) in February 2016.

CAHF RESEARCH FELLOWS

As part of its efforts to support the advanced education of veterinary specialists, the CAHF annually provides financial support for talented graduate students at the WCVM. Here's a brief update on the fund's research fellowship program.

Dr. Roshan Madalagama is a PhD student in the WCVM Department of Veterinary Microbiology whose research work is supervised by Dr. Joe Rubin. As part of his PhD program, Madalagama is investigating antimicrobial resistance, virulence genes and molecular characterization of *Staphylococcus pseudintermedius* in dogs.

Madalagama, who was a CAHF Research Fellow from 2014 to 2016, has presented his research work at several national and international conferences in Canada. His research article, "Antimicrobial susceptibility of *S. pseudintermedius* colonizing healthy dogs," was published in the January 2016 issue of the *Canadian Veterinary Journal*.

In March 2016, Madalagama was also one of the graduate student presenters at the Canadian Association for Clinical Microbiology and Infectious Diseases' annual conference in Vancouver, B.C.

Dr. Jewel Milo, who was a CAHF Research Fellow from 2015 to 2016, is a small animal internal medicine resident in the WCVM's Department of Small Animal Clinical Sciences. She is also completing her Master of Veterinary Science degree program under the supervision of Dr. Elisabeth Snead. Milo's research project has focused on some groundbreaking work in feline kidney disease.

Specifically she compared a new method of measuring glomerular filtration rate (GFR) called "Tikhonov regularization of

gamma variates (Tk-GV)" in healthy cats to three other more commonly used methods. Milo presented an abstract of her research work at the 2015 American College of Veterinary Internal Medicine (ACVIM) Forum in Indianapolis, Ind. She is now working as a clinical associate at the WCVM Veterinary Medical Centre.

In May 2016, the CAHF selected two new research fellows for the fellowship program:

Dr. Fany Marron-Lopez is a senior resident in anatomic pathology in the WCVM's Department of Veterinary Pathology, under the supervision of Dr. Bruce Wobeser.

Originally from Mexico City, Marron-Lopez studied veterinary medicine at the National Autonomous University of Mexico (UNAM) and then went on to the University of Prince Edward Island's Atlantic Veterinary College where she completed a combined Master of Veterinary Science-residency program in anatomic pathology.

Marron-Lopez's current research work focuses on an unusual presentation of respiratory infection in cats. In these cases, filamentous bacteria are attached to the cats' bronchial cilia. While these CAR-*Bacillus*-like organisms (CAR-LO) are not linked with interstitial pneumonia or bronchitis, they are strongly associated with bronchopneumonia. An interesting finding is that shelter cats may have an increased vulnerability to CAR-LO, particularly when the animals are kept in close quarters.



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Dr. Maria V. Carrozzo is an anesthesiology resident in the WCVM's Department of Small Animal Clinical Sciences, under the supervision of Dr. Barbara Ambros. Originally from Italy, Carrozzo earned her Doctor of Veterinary Medicine degree at Perugia University. She worked in private practice for five years before becoming a clinical associate in anesthesia at universities in France and Belgium.

In 2014, Carrozzo came to Canada to begin her residency program at the WCVM. She worked with Ambros on a CAHF-supported project that compared two different infusions of fentanyl for feline patients. Now, they're working on another CAHF study that compares two techniques for administering oxygen to dogs undergoing general anesthesia.



Dr. Roshan Madalagama



Dr. Jewel Milo



Dr. Fany Marron-Lopez



Dr. Maria V. Carrozzo



Want to make a difference in the lives of animals as well as people? A charitable estate gift to the Western College of Veterinary Medicine (WCVM) is one option that may work for you.

MAKE THE *gift* OF A LIFETIME

By Jennifer Molloy

An estate gift is often referred to as “the ultimate gift” not only because it is a donation of cash or property you make in your will, but because it is a reflection of the beliefs and values you support during your entire life. As well, a gift through your will can help you make a significant gift that may not have been possible during your lifetime — and it won’t affect your current lifestyle.

Bequests are the most common type of estate gift. When developing a bequest, it is important to accurately identify the WCVM as a beneficiary in your will. This step ensures that we receive your gift without delay so we can provide a receipt (as appropriate) and direct your gift to the area of support that is most important to you.

If you have questions about making a gift from your estate or any other type of charitable donation to the WCVM, please contact us:

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PET PROJECTS

2015-16 CAHF RESEARCH

- Could a method used to treat liver disease in humans be applied to cats?**
Drs. Ahmad Al-Dissi and Jolanda Verhoef, WCVM
- Is pulse oximetry reliable for measuring oxygen levels in anesthetized patients?**
Dr. Tanya Duke, WCVM
- Improving diagnostic tools for the treatment of dogs in emergency situations**
Drs. Matthew (Casey) Gaunt, Dr. Alison Khoo, Anthony Carr, WCVM
- Can a novel tool for assessing clotting in whole blood help improve emergency treatment for dogs?**
Drs. Marion Jackson, Sunita Seshia, Matthew (Casey) Gaunt and Anthony Carr, WCVM

- A new cost-effective method for accurately positioning dogs during radiation therapy**
Drs. Monique Mayer, Candace Lowe, Cheryl Waldner, Vivian Fan and Rachel Bloomfield (WCVM); Dr. Narinder Sidhu, British Columbia Cancer Agency; Dr. Susan LaRue, Colorado State University
- Is radiation therapy the right decision for your pet?**
Drs. Monique Mayer, Candace Lowe, Cheryl Waldner, Vivian Fan and Rachel Bloomfield (WCVM); Dr. Narinder Sidhu, British Columbia Cancer Agency; and Dr. Susan LaRue, Colorado State University
- Can a non-invasive imaging tool help to accurately diagnose retinal conditions?**
Drs. Lynne Sandmeyer, Bianca Bauer, Bruce Grahn and Marina Simair, WCVM

2016-17 CAHF RESEARCH

- Can combined CT-MRI images help to accurately define brain tumours in cats?**
Drs. Monique Mayer, Jerome Gagnon, Gillian Muir, Cheryl Waldner, (WCVM); Dr. Keijiros Shiomitsu, University of Florida; Drs. Hiroto Yoshikawa, Elissa Randall, Colorado State University
- Can a serum biomarker identify dogs that are more prone to side effects?**
Dr. Jerome Gagnon, WCVM
- How efficient is the “flow-by” oxygenation method?**
Drs. Barbara Ambros, Maria V. Carrozzo, Teela Jones, Carolina Palacios, WCVM
- What causes bacteria resistance to antimicrobial drugs?**
Drs. Joseph Rubin, Roshan Priyantha, WCVM

Visit cahfpets.ca for more information about the Western College of Veterinary Medicine’s current and past research studies that have received support from the Companion Animal Health Fund.

Inside look at palliative radiation therapy

By Evelyn Muma

Cancer. It's a diagnosis no one wants to hear. Unfortunately, nearly 50 per cent of dogs and 33 per cent of cats are diagnosed with cancer at some point in their lives.

In the past decade, veterinary researchers have made many advances in cancer therapy for companion animals, and it's becoming more common for pets to receive treatment.

In 2015, I was a summer research student with veterinary radiation oncologist Dr. Monique Mayer at the WCVM's Veterinary Medical Centre (VMC). My research project was a survey study that evaluated changes in companion animals' quality of life during palliative radiation therapy.

We collected data from veterinary oncology clinics across Canada and the United States, and we emailed surveys on a bi-weekly basis to clients who agreed to participate in the study. Survey questions focused on whether the owner's pet was experiencing any pain or discomfort, and whether the animal's quality of life had stayed the same before and after radiation therapy.

We also sent surveys to each client's veterinary radiation oncologist, asking questions about the type of tumour and treatment details for each patient.

Our study enabled us to follow up with families as their pets went through radiation therapy, and it also allowed the owners to assess their pets' quality of life.

The ultimate goal of our project is to help families decide whether radiation therapy is right for their pets. In addition, the results will help us find ways to improve the quality of life and duration of response for pets undergoing palliative radiation therapy.

One family who went through the process of palliative radiation therapy for their pet agreed to share their story.



Sasha was the dog of Dana Brass and Chris Baraniuk's dreams. They rescued her from the Saskatoon SPCA in 1996, and according to her owners, Sasha was one great dog.

"She never ran away and was very gentle. We never walked her on a leash and had no worry of her veering from the sidewalk," says Dana.

When Sasha was eight years old, Dana and Chris noticed a lump on her neck and odd facial swelling, so they took her to their local veterinarian.

After the lump was biopsied, it was discovered that Sasha had thyroid carcinoma (thyroid cancer).

The tumour was blocking her blood and lymph drainage, causing her face to swell. Although the prognosis for thyroid carcinoma is quite good (with a survival rate of over two years), further tests showed that the cancer had already spread to Sasha's lungs.

At this time, the cancer in Sasha's lungs

wasn't causing her any problems, but it was inevitable that she would experience issues within six to eight months. Once cancer has metastasized to the lungs, there is no cure.

The more urgent problem was the thyroid tumour blocking blood and lymph drainage; without any sort of treatment, Sasha's survival time was estimated at a few weeks.

Sasha was referred to WCVM radiation oncologist Dr. Monique Mayer for palliative radiation therapy. The radiation treatments would help to reduce the size of the thyroid tumour, alleviating Sasha's facial swelling and making life more comfortable.

Radiation oncologists use palliative intent radiation therapy to alleviate pain and discomfort in patients with incurable tumours. The goal is to improve quality of life by relieving cancer-related symptoms, not to cure or to extend survival time.

Dana and Chris weren't willing to

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“She just didn’t look or behave like she was sick. She still loved going for walks, was still eating normally and was able to carry on her with normal life. We had nothing to lose ... and we owed it to her to at least try.”



say good-bye to their friend yet, so they decided to give it a try.

“She just didn’t look or behave like she was sick. She still loved going for walks, was still eating normally and was able to carry on with her normal life. We had nothing to lose ... and we owed it to her to at least try,” explains Chris.

Sasha became a regular at the VMC to receive her radiation treatments and the hospital staff adored her.

“Oddly enough, Sasha actually enjoyed going to the clinic for her treatments. It was not stressful for her at all,” says Dana.

Palliative intent radiation therapy doesn’t cause any side effects since the

goal is to improve quality of life. Palliative protocols usually involve delivering a few large doses of radiation over several weeks, minimizing the time that the pet spends away from its family.

Throughout Sasha’s radiation therapy, Dana and Chris felt her quality of life was the same as before she was diagnosed with cancer. She still did the things she loved – going for walks, barking at strangers outside and stealing cookies off the counter.

Sasha was able to live normally for six more months, but her quality of life started to decline in the last month. The cancer in her lungs had progressed and was making it difficult for her to sleep at night.

In March 2005, Dana and Chris chose humane euthanasia for Sasha.

Dealing with Sasha’s cancer took an emotional toll on Dana and Chris. However, they both agree that if put in a similar situation with a future pet, they would still choose palliative radiation therapy. They never viewed the process as trying to prolong Sasha’s life; instead it was about making their beloved pet as comfortable as possible for as long as the cancer would allow.

Evelyn Muma of Regina, Sask., is a fourth-year veterinary student who was part of the WCVM’s Undergraduate Summer Research and Leadership program in 2015.



Puppy makes remarkable recovery

Brian Stephenson, Ashley Woodvine and Sharley.
Photos: Caitlin Taylor.

By Jeanette Neufeld

Ashley Woodvine recounts the unbearable drive into Saskatoon, Sask., after her puppy Sharley was run over.

The puppy had been sleeping under the car, and Woodvine unknowingly backed over the then four-month-old, mixed-breed farm dog.

Sharley was in such extreme pain that she snapped at Woodvine and her partner Brian Stephenson. They quickly wrapped the puppy in a blanket and loaded her into the car, heading for the Western College of Veterinary Medicine's (WCV) Veterinary Medical Centre (VMC).

The 20-minute drive from their acreage felt like an hour.

"That was the most agonizing ride. She screamed every bump I hit and every time I shifted she would cry. It was pretty bad," says Woodvine.

As soon as they arrived, Sharley was wheeled into a treatment room where

clinicians quickly discovered that the dog had a fractured and dislocated vertebrae. The VMC team initially gave the dog a 70 per cent chance of recovery, but after taking further CT (computed tomography) scans of Sharley's shattered spine, the veterinarians' prognosis was less hopeful. They weren't sure she'd ever walk again.

The decision was heart breaking, and the family filled out the paperwork for euthanasia.

At the last minute, when Sharley was brought into the room for a last goodbye, Woodvine and Stephenson changed their mind.

"They wheeled her in, and her looking at us, we both had tears in our eyes. I knew. We said, 'We can't do this, let's do the surgery,'" says Woodvine.

Small animal surgical specialists immediately began a three-hour procedure. They placed pins in the bone and cemented

them together to stabilize the sixth lumbar vertebrae.

The fracture was "very significant," says small animal surgery resident Dr. Koji Aoki. Initially he wasn't sure whether she'd be able to walk again, but Sharley quickly began to show signs of recovery.

The puppy began physiotherapy three days after the procedure. She needed to learn how to stand and walk again, and nerve damage complicated her case.

Clinical associate Dr. Romany Pinto began using massage and putting Sharley's joints through range of motion exercises to ensure the joints stayed healthy and the puppy was comfortable.

Sharley went home, and the days following the surgery were tough. Her owners had to carry the injured dog in and out of the house and try their best to keep her calm.

"There were times when we said, 'Did

we made the right choice? I think we made a mistake,” says Woodvine, recounting their daily struggle to improve Sharley’s mobility.

Four days after her surgery, Sharley could move one of her back legs. Twelve days after the surgery, she could get up by herself and support her own weight, although her toes were still dragging.

Pinto used the veterinary medical centre’s aquatic treadmill to help with rehabilitation exercises, but she says most of the hard work was done at home.

While puppies have increased bone healing ability compared to an adult dog, rehabilitation also requires increased patience.

“They [puppies] have a short attention span. They want to chew on everything and they don’t always want to stay still for treatments,” says Pinto.

Pinto commends Woodvine and Stephenson for their dedication to Sharley’s well-being.

“Her owners were really committed and working really hard to do the exercises, so she was a very rewarding case,” says Pinto.

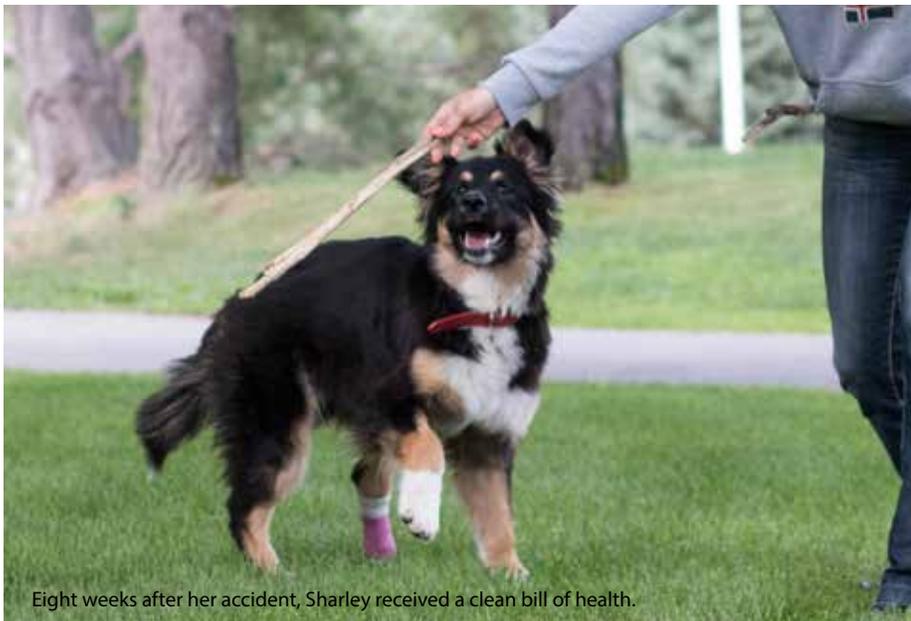
“They did a great job. She’s a pretty amazing puppy.”

Persistence and hard work paid off for their family. Eight weeks after the accident, Sharley bounced into the VMC for her final series of X-rays before her veterinary team gave her a clean bill of health.

“We made the best decision,” Woodvine says.



Sharley and her rehabilitation team.



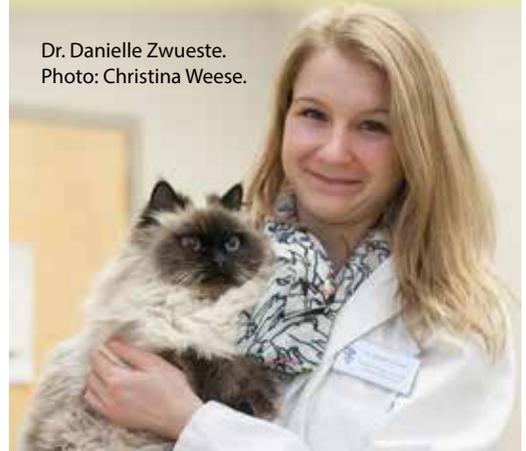
Eight weeks after her accident, Sharley received a clean bill of health.

Bits & Bites

Neurology service now available

Western College of Veterinary Medicine (WCVM) graduate Dr. Danielle Zwueste is leading the WCVM Veterinary Medical Centre’s new small animal neurology clinical service. After graduating in 2012, Zwueste moved to Toronto and worked at the Veterinary Emergency Clinic/Referral Centre as a clinical intern for one year. Her next move was to the United States where she became a neurology/neurosurgery resident at the University of California, Davis. After completing the three-year program, Zwueste returned to WCVM this fall as an assistant professor in small animal neurology. Her research interests include MRI (magnetic resonance imaging), neurosurgery and the diagnosis and management of intercranial diseases.

Dr. Danielle Zwueste.
Photo: Christina Weese.



Learn more

about this new neurology clinical service at usask.ca/vmc.



Exotic pet health

Does your household include a pet rabbit or ferret? If so, check out the following exotic pet health stories, written by veterinary student Gwen Roy, that address some important health issues:

- Rabbit dental health ever-growing concern
- Ferret adrenal disease demystified

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