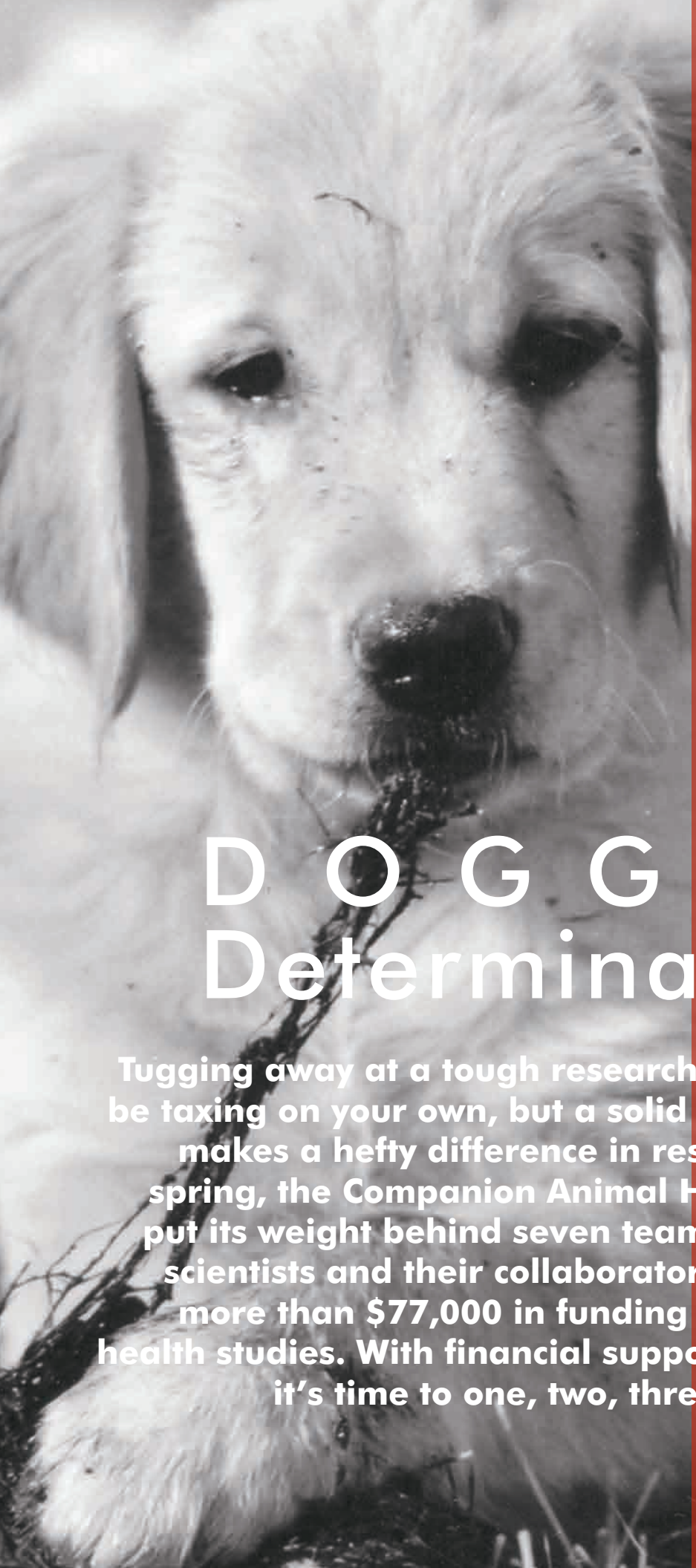

DOGGED Determination

Tugging away at a tough research theory can be taxing on your own, but a solid team effort makes a hefty difference in research. This spring, the Companion Animal Health Fund put its weight behind seven teams of WCVM scientists and their collaborators, granting more than $77,000 in funding to their pet health studies. With financial support in place, it's time to one, two, three . . . PULL!

Does one spaying procedure lead to post-spay urinary incontinence in dogs?

Drs. Kathleen Linn, Régine Bélanger and Cindy Shmon (WCVM).

Up to 20 per cent of spayed female dogs develop *urethral sphincter mechanism incompetence* (USMI) after female neutering surgery. While the underlying cause of this long-term complication is still unknown, some clinicians suspect that traction on the uterus during an *ovariohysterectomy* (removal of the ovaries and uterus) might injure the nerves to the urethral sphincter.

During the next 12 months, a WCVM research team will use two female neutering techniques on 30 canine patients admitted to the College's Veterinary Teaching Hospital for elective spays. Half of the dogs will undergo an ovariohysterectomy — the surgical procedure taught to North American veterinary students. The second group of dogs will undergo an *ovariectomy* (removal of the ovaries) — the procedure taught to European veterinary students.

Before all of the surgeries, the research team will measure each patient's *maximal urethral closure pressure* (MUCP). Clinicians consider this measurement the most important parameter in evaluating urinary incontinence. Twelve months later, researchers will repeat the MUCP measurement during each dog's checkup. Once all of the study's results are evaluated, the research team will determine whether a particular spaying procedure does cause an increase in the incidence of post-spay urinary incontinence among female dogs.

Will synthetic corneal implants work in cats and dogs?

Drs. Bruce Grahn and Lynne Sandmeyer (WCVM) and Dr. May Griffith (University of Ottawa).

Blinding corneal disease is a common problem in cats and dogs. Veterinary ophthalmologists rely on corneal transplants to treat affected animals, but it's expensive and difficult to maintain corneal banks for animals.

As an alternative, two WCVM scientists will work with a researcher at the University of Ottawa to test the use of synthetic corneas that are stronger, more resilient and flexible enough to cover the full range of transplantation needs in companion animals.

In the project's first stage, veterinary ophthalmologists will implant synthetic corneas in rabbits, and if these models are successful, then the team will conduct synthetic corneal transplants in five dogs and cats that have been diagnosed with severe corneal disease.

Throughout the year after surgery, researchers will regularly assess each patient's recovery and determine whether synthetic corneal transplants are successful in restoring vision without significant ocular complications.

Continued on page 3

Is laparoscopy an option for obtaining pancreatic biopsies in cats?

Drs. Anthony Carr, Kevin Cosford, Susan Taylor, Cindy Shmon and Sherry Meyers (WCVM).

A pancreatic biopsy is the most reliable test for diagnosing pancreatitis in cats, but its invasive nature and veterinarians' concerns about potential complications have limited its use. As an alternative, a WCVM research team will evaluate the use of laparoscopy to obtain pancreatic biopsies for analysis — a minimally invasive approach that has been deemed safe and effective in dogs.

During this year-long study, members of the research team will use laparoscopy to examine the cranial abdomens of 12 cats. During the procedures, surgeons will obtain pancreatic biopsies from six of the cats while the rest of the animals will only undergo laparoscopic examinations. Four weeks later, surgeons will conduct *ovariohysterectomies* (female spaying procedure) on all of the cats. During the procedure, the specialists will inspect the cats' pancreas and take additional tissue samples at the sites of the previous biopsies.

After completing the procedures, team members will evaluate the quality of the pancreatic biopsies obtained through laparoscopy as well as the safety of using this approach. Based on the team's findings, using laparoscopy to obtain pancreatic biopsies may eventually become an accepted approach in diagnosing pancreatic disease in sick cats.

Does epidural dosing give better pain relief for cats?

Dr. Tanya Duke (WCVM), Drs. Paulo Steagall and Stelio Luna (Sao Paulo State University, Brazil), Dr. Polly Taylor (Ely, U.K.) and Dr. Peter Gilbert (WCVM).

An international team of researchers is investigating the effectiveness of administering painkilling drugs to cats through epidural catheters. Previous studies have shown that the epidural route produces long-lasting pain relief using lower doses of the drugs, plus there are fewer side effects in comparison to systemically administering drugs.

During the study, the research team will work with a group of eight cats to investigate the epidural use of an opioid called *buprenorphine* and an alpha-2 agonist called *medetomidine*. The team will also test the effectiveness of using a combination of both painkilling drugs. Researchers will measure the analgesic duration of each treatment using a mechanical and thermal threshold device that detects when a drug's effectiveness is wearing off on each cat.

If results show that epidural administration of these drugs is more effective, these treatment protocols may eventually be used in feline patients that are in postoperative or critical care. *For more details about this study, turn to page 4.*

What's living in your cat's intestine?

Drs. Janet Hill and Anthony Carr (WCVM).

Intestinal health issues such as inflammatory bowel disease and diarrhea are among the top problems that prompt owners to bring their cats to veterinarians. These issues are directly or indirectly related to the structure and function of the bacterial community living in cats' intestines. But despite its significance to cats' health and nutrition, veterinary researchers know very little about the actual composition of the "normal flora" within the feline intestine.

During the next year, WCVM researchers will develop a comprehensive description of the microbial community of the cat's distal intestine. The research team's examinations will focus on fecal samples collected from a group of healthy indoor and predominately outdoor cats. After extracting DNA from these samples, researchers will use molecular methods to develop a sequence-based "fingerprint" of the microbial community.

This important body of work will lay the foundation for future studies aimed at understanding the dynamics of this microbial community and its role in feline and human health. Scientists will also use the study's sequence database for the future development of molecular tools that are used for quantitative analysis of intestinal population structure and dynamics.

Do pulmonary intravascular monocytes and macrophages induce anemia in dogs?

Drs. Baljit Singh and Anthony Carr

WCVM scientists are investigating the potential role of *pulmonary intravascular monocytes/macrophages* (PIMMs) in inducing *immune mediated hemolytic anemia* (IMHA) — one of the most common causes of anemia in dogs. Previous studies at WCVM have shown that recruited PIMMs promote an animal's susceptibility for endotoxin-induced inflammation and mortality. This happens through the production of inflammatory cytokines that play a vital role in the development of coagulation and thrombosis.

Researchers believe that pulmonary complications such as thrombo-embolism play a major role in the development of IMHA, but at this point, no one has thoroughly studied the mechanisms of these pulmonary complications.

To explore this possibility further, the WCVM research team will use a mouse model of IMHA to study if PIMMs are recruited. If PIMMs are part of the disease's progression, then the team will explore whether the depletion or inactivation of PIMMs can rescue a host animal from IMHA. If the latter is confirmed, this research study may lead to the development of better treatment strategies for IMHA.

Can dogs' noses detect canine bladder cancer?

Drs. Elisabeth Snead, Sue Taylor, Monique Mayer and Joe Stookey (WCVM); and Dr. Jim Walker (U.S. researcher).

A definitive diagnosis of *transitional cell carcinoma* (TCC) in dogs requires histopathological examination of tissues obtained by surgical biopsy or traumatic catheterization. But usually, clinicians only perform these tests in dogs that show significant clinical signs — an indicator of advanced disease.

Previously, researchers successfully trained dogs to sniff out the difference between urine samples from people with TCC, healthy people and people with other inflammatory but non-malignant disorders of the urogenital tract. In this study, the WCVM research team will evaluate and compare the sensitivity and specificity of canine olfactory detection of TCC to traditional diagnostic methods. If the results are promising, this may be one option that could help veterinarians make earlier diagnoses of TCC and achieve greater treatment success.

To learn more about the unknown marker that's detected by the "sniffer dogs" in the urine of TCC patients, researchers will also save urine samples from TCC and control dogs so animals trained in detecting human TCC cases can evaluate the samples. These findings, along with chemical analysis, may allow researchers to understand whether dogs and people diagnosed with TCC secrete the same substance — information that could potentially lead to future research. *For more details about this study, turn to page 8.* **V**

FRONT COVER: In WCVM's new treatment room, clinician Dr. Liz Snead supports a patient while small animal resident Dr. Kevin Cosford checks the dog's ear. **PREVIOUS PAGE:** "Meg." Photo by Linda Walker of Winnipeg, Man. Courtesy of the 2005 Great Manitoba Dog Party Photo Contest, organized by the Manitoba Veterinary Medical Association.