**OVC Scientist Spotlight: Dorothee Bienzle**

**Saving lives by changing the way disease is detected**

U of G research is providing new insights into how host immune systems interact with their environment and respond to infection.

Dr. Dorothee Bienzle’s work is leading to better ways to diagnose and treat inflammatory lung diseases such as asthma as well as blood cell disorders and feline immunodeficiency virus (FIV), which is almost identical to HIV in humans.

Bienzle leads a research team studying the effects of key proteins and their role in the development of recurrent airway obstruction (RAO) in horses, a chronic and debilitating disease also known as heaves. It is caused by recurrent lung inflammation in response to dust mites, bacteria and mould associated with being stabled indoors.

“It’s very common in older companion horses in colder climates like Canada’s where the animals are housed indoors during the winter months,” says Bienzle, who holds a Tier 2 Canada Research Chair in Veterinary Pathology. “The disease has been recognized for centuries but we are only just beginning to understand why some horses develop these exaggerated inflammatory responses that damage the airway over time, making them more likely to develop heaves.”

Bienzle’s lab has identified proteins that play a key role in counteracting lung inflammation, though how those proteins work is not yet fully understood. Last year, Bienzle and PhD student Olivier Côté published a study that found horses have three copies of a gene that normally exists as a single copy in mammals.

The gene, called secretoglobin family 1A member 1(SCGB-1A1), produces a protein secreted in large amounts in the airways. The researchers found that RAO-susceptible horses have much less SCGB-1A1 in their airways, and more inflammation. The team has also created a synthetic version of the protein in the lab in order to study its potential for treating RAO and perhaps asthma.

Bienzle’s studies on FIV have led to a more accurate way to detect the infection that affects about four per cent of cats in North America, and as many as 60 per cent in parts of the world where there are larger populations of stray and outdoor cats.

Just like HIV, FIV causes the animal’s immune system to gradually malfunction and cats with the virus eventually die from an opportunistic infection or cancer, most often lymphoma.

In a recent study supported by the OVC Pet Trust Fund, Bienzle’s team tested the accuracy of using polymerase chain reaction (PCR) to diagnose FIV. They found the
PCR test was not only able to detect cats that were positive for the virus, but it also ruled out false positives. The PCR test could be used as a follow-up for cats that test positive using the enzyme-linked immunosorbent assay (ELISA), the diagnostic tool currently relied upon by veterinarians. The ELISA detects virus antibodies but cannot distinguish between infected cats and those that are carrying FIV antibodies from being vaccinated, or kittens that have inherited antibodies from vaccinated mothers. That’s problematic, particularly for animal shelters where the medical history of strays and abandoned pets is often unknown.

Having a precise diagnostic tool will help ensure infected cats are separated from other cats and unable to spread the virus, says Bienzle.

“This is going to change the way we diagnose cats across Canada and eventually the rest of the world.”