

Science@CornellVet

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[Home](#) [Divya Shiroor](#) [Canine allergies: scratching beneath the surface](#)



Canine allergies: scratching beneath the surface

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2

They sleep on our beds, eat our food (despite what the vet says, we both know where our table scraps go!) and share our lives in so many ways. Researchers studying canine allergies at Cornell are beginning to appreciate the scientific advantages of having dogs as constant companions. When Dr. Elia Tait Wojno, assistant professor of microbiology and immunology first came to Cornell, she established collaborations with Dr. William Miller and his team of dermatologists at the Cornell Companion Animal Hospital and with the Cornell Veterinary Biobank to explore the very challenging sphere of canine allergies. “When I started at Cornell, it became very clear that there was a unique opportunity to do some research in animal health and develop new tools to investigate the immunology of dogs,” says Tait Wojno. “This is particularly exciting because few people have the resources we have here at Cornell, with a strong basic science backbone complemented by patient cohorts.”

Dr. Tait Wojno researches the immunological responses that manifest in what is clinically known as atopic dermatitis. Triggered by a wide range of allergens present in food as well as the environment, the disease is challenging to diagnose, and current treatment strategies primarily involve managing symptoms. According to Tait Wojno, a general lack of reagents and tools to examine canine allergies has slowed down the study of this disease, as tools used in human medicine to study the immune system are not as readily available in veterinary medicine. To overcome these limitations, the Tait Wojno lab has developed protocols to look at immune cells in both canine blood as well as tissue. “We have fine-tuned new approaches to determine which immune cells are present and what the immune system is doing functionally. We have been able to apply these novel approaches to study allergic dogs and healthy dogs to come up with an immunological profile that characterizes allergic dogs,” she says. Dr. Simon Frueh, a veterinarian from Germany and currently a second-year graduate student in the Tait Wojno lab adds, “Not many studies have focused on examining canine allergies from a systemic point of view. If you look at food allergies, while they may be stimulated in the gut, the manifestations are often seen in the skin, so this is a strong indication of a systemic link and is one that we are investigating.”

Preliminary results from the lab reveal that allergic dogs have a subset of cells that are also detected in allergic humans and mice. This is particularly interesting as discoveries in dogs could potentially apply to humans as well. “Dogs share the same environment as us and there is emerging evidence that suggests that allergies in dogs may be on the rise. They could therefore serve as a naturally occurring disease model” says Frueh.

The study thus far has focused on the basic science aspects of canine allergies with an intent to really understand the mechanisms driving allergic responses in dogs. Going forward, Tait Wojno envisions various applications for her study. “One sphere could be to hone current diagnosis so as to be able to identify the nature of the responsible allergen. If distinct blood profiles were to exist in a dog suffering from a food driven allergy versus an environmental allergy, detection of this could serve as a complementary test to current tests in existence” From a therapeutic point of view the study could be especially important for dogs that fail to respond to primary therapeutic management. Her studies could also improve how we determine whether the immune system is responding to therapy in the first place. Based on preliminary results, Tait Wojno believes that “defining immune profiles of allergic dogs on anti-allergic drugs could potentially diagnose whether or not the dog is



Dr. Elia Tait Wojno with her dog Hank (Photo credits Rachel Philipson)

actually responding to treatment or getting better.” Future plans involve carrying out longitudinal studies of dogs looking from when they are diagnosed, to first treated, to when the entire treatment has been completed to see whether the immune profile of the treated dog goes back to looking like that of a normal dog. This will help evaluate whether the treatment is actually working on the immune system or is serving to merely palliate symptoms.

“I love dogs and I think dogs should have the same prospects as humans to be as healthy as they can be,” says Tait Wojno. “Additionally, what we learn from dogs could potentially be applied to human medicine as well. So whether you’re coming at it from a purely animal health perspective or comparative biology point of view, there is something to be learned.”

-Divya Shiroor (DVM seeking Ph.D. student, BBS program)

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