

# WFA-Funded Study Makes Unexpected Findings in Disease Affecting 10 Percent of Canine Breeds

## Cornell Atopic Study May Help Improve Diagnosis, Treatment of Westies with Atopic Dermatitis, At-Risk Westies, Other Breeds

By Teresa Barnes, Vice President Communication

### Intro

The WFA is pleased to announce the results of an important Atopic Dermatitis study that was made possible because of support from the Westie owner and breeder community and the generous support of the WFA's donors, including the New Zealand West Highland Terrier Club that provided funding for 50 percent of the grant.

### Study Purpose

In 2018, the WFA granted \$20,000 to Cornell University immunology researcher, Elia Tait Wojno, PhD, for an investigation exploring a potential genetic link to atopic dermatitis in Westies.

### Summary of Findings

Healthy Westies with no signs of allergies had relatively high readings for Th2 cells (cells that are associated with allergy and that persist, “remembering” the allergen and reacting over and over). This is in contrast to healthy dogs of other breeds. We don't know what this means, though it could suggest that Westies have more pro-allergic cells to begin with. Allergic dogs had a different gene signature, specifically in the T cell compartment that was enriched for expression of Gata3 (pro-allergic protein.)

Dr. Tait Wojno and her team performed genetic analysis and found that allergic dogs with Atopic Dermatitis (AD) had a different gene signature [a rule that predicts health outcomes] than healthy dogs. The results of the study may help improve diagnosis and treatment of AD in Westies and in Westies with allergic symptoms but do not yet have AD.

According to the AKC Canine Health Foundation, 10 percent of dogs are affected by AD which is the second most common allergy in dogs behind flea bite allergy.

“The genetic analysis was really exciting,” said Dr. Wojno. “We observed that allergic dogs had a different gene signature, specifically in the T cell compartment that was enriched for expression of Gata3. These results were completely unbiased...

So it was quite striking that Gata3 came out of this analysis.”

Based on previous research in other breeds, the researchers had anticipated a cell called Th2 would be elevated in the Westies with allergies. They found that Th2 cells weren't actually elevated in AD Westies when compared with healthy Westies. What they did find is that Gata3 was. Another unexpected finding was that the Th2 cells were increased in Westies with no signs of allergies.

### Background

WFA wrote in our Summer 2018 issue of this newsletter that this research project could be pivotal in predicting a puppy's future allergic response which would allow breeders to make more informed decisions with dogs at an early age.

Specifically, the goal for Dr. Wojna's research project was to identify an immune cell profile of a AD Westie and how it differs from a healthy Westie. She expected that she and her team would be able to identify a profile in the dog that doesn't yet show signs of allergies and would then move to test the idea of a biomarker which would be helpful in determining response to therapy in future studies. Previous work by Dr. Wojna's lab showed dogs with severe AD that were seen at Cornell had unique immune signatures in their blood. The particular cells (Th2 cells) were associated with “remembering” an allergen and repeatedly reacting to it and the cells were increased in atopic dogs compared to healthy dogs.

(Continued on page 13)



---

*(WEA-Funded Study continued from page 12)*

So, Dr. Wojna and her team hypothesized that something similar could be affecting Westies with AD, as well. However, their results of the study did not show that there was a significant increase in the Th2 cells in atopic vs. healthy Westies. However, researchers made an interesting finding that there was an increase in Gata3 (a pro-allergic protein associated with Th2 cells) in Westies who were designated as healthy but showed signs of allergy. They also found something else of interest – that Westies with no signs of allergies had relatively high readings of Th2 cells – in contrast to healthy dogs in other breeds. Dr. Wojna believes this finding could be important because it may suggest that Westies may have pro-allergic cells to begin with (naturally).

“Having a way to measure if therapy is successful early on could be important,” she said. The work in the study, Dr. Wojna believes, could help lead to better diagnostic tools. Though readily diagnosed by doctors who treat Westies, atopic dermatitis in the general veterinary practice, she says, may be less familiar

and making such a diagnosis in a first visit can be complicated. She says looking to see if an immune cell profile in the blood could be used as a diagnostic factor, thereby improving the accuracy and speed of making the diagnosis.

Dr. Wojna says working with Westies adds an important element to her work in allergic disease in canines. “These dogs are allergic and it gives us an opportunity that we can work with a group of pedigreed dogs, can look at genetic information on the dogs and can look at immune profiles in a single breed--looking at the gene and environment interaction.”

## **How This Research May Help Westies**

Kay McGuire, DVM, MS Vice President of Health for the WFA said “How exciting it is to actually find unexpected changes at the cellular level. As Dr. Wojno’s work progresses, it would be wonderful if we had a simple test to predict allergic dogs as puppies. We could then select away from the problem when breeding.”