AMERICAN KENNEL CLUB CANINE HEALTH FOUNDATION PREVENT TREAT & CURE

RESEARCH PROGRESS REPORT SUMMARY

Grant 02651:
Discovery of Novel Biomarkers of Canine Atopic Dermatitis through Lipid Profiling

Principal Investigator:
Harm HogenEsch, DVM, PhD

Research Institution:
Purdue University

Grant Amount:
$99,105

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Progress Report:
Mid-Year 2

Report Due:
10/31/2020
Report Received:
10/30/2020

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Original Project Description:
Canine atopic dermatitis (CAD) is a common allergic skin disease of dogs with a strong genetic basis. CAD can severely affect the health and well-being of dogs and current diagnosis of CAD requires time- consuming and expensive procedures for the owner. Furthermore, the molecular mechanisms underlying this condition are not well understood. Evidence from human studies suggests that several variants of atopic dermatitis (AD) exist with different mechanisms and responses to treatment. Therefore, new approaches to identify molecular markers that can help with better diagnosis and management are warranted. CAD and human AD are associated with changes in the composition of lipids in the epidermis which may precede the inflammation or result from the inflammation. The investigators will analyze the lipid composition of the epidermis and blood of healthy dogs in comparison to dogs with CAD using a novel analytical method developed by their interdisciplinary team. The results of this work could lead to new, minimally-invasive tests for the diagnosis of CAD and for the prediction and monitoring of the response of CAD patients to treatment.

Publications: None at this time.

Presentations: None at this time.

Report to Grant Sponsor from Investigator:
We enrolled 30 dogs with mild to moderate atopic dermatitis and 30 healthy control animals in the study. The dogs with atopic dermatitis were treated with either Apoquel® (n=17) or Cytopoint® (n=10), whereas one dog was switched from Apoquel® to Cytopoint®, one dog was treated with prednisone followed by Apoquel®, and one dog was treated with a topical shampoo. Both Apoquel® and Cytopoint® reduced the clinical severity of the skin lesions during 8 weeks of treatment. Skin swabs and blood samples were collected from the atopic and control dogs at Day 0, and from the atopic dogs at 4 and 8 weeks after initiation of treatment. Analysis of the lipid composition of the skin and blood samples by mass spectrometry showed significant differences between atopic and control dogs. In addition, nonlesional skin of atopic dogs had a different skin lipid profile from that of control dogs. Treatment changed the lipid composition both in the skin and the blood, however, there was marked variation in the direction and extent of the changes between individual dogs. This research suggests that atopic dermatitis is associated not only with changes in lipids in the skin but also systemic changes.

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Develop and communicate to Westie owners, Westie breeders, veterinarians and others who share our challenges.