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

Start Date: 5/1/2019 **End Date:** 10/31/2020

Progress Report: End-Year 1

Report Due: 4/30/2020 **Report Received:** 5/26/2020

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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:

Canine atopic dermatitis (CAD) is a common allergic skin disease of dogs with a strong genetic basis. Evidence from human studies suggests that several variants of AD exist with different mechanisms and

responses to treatment. Current diagnosis of CAD requires time-consuming procedures that involve a considerable cost to the owner. Therefore, new approaches to identify molecular markers that can help with better diagnosis and management of the disease are warranted. In this study, we are using our tailored methodology for lipid biomarker discovery in CAD. 30 atopic dogs and 30 healthy dogs have been recruited. Patients are males and females of several different breeds and ages with seasonal or year-round itch. CAD patients are being treated with either Apoquel®, Cytopoint® or prednisone and followed for 2 months to evaluate the lipid changes in their skin and blood. Using non-invasive sampling procedures, we have collected samples from the skin of healthy controls and from affected and non-affected areas of the skin of CAD patients, as well as blood. Preliminary statistical analysis demonstrates that lipid fingerprints of the blood and skin accurately classify samples from healthy dogs and CAD patients, whereas more overlap appears to be present in the lipid profile of lesional and non-lesional skin of CAD patients. MRM-profiling approach allows an unbiased analysis of the lipids that may result in new diagnostic biomarkers to classify disease phenotypes that will drive the development of new therapies.