RESEARCH PROGRESS REPORT SUMMARY

Grant 02561: Is Gut Dysbiosis Associated with Canine Idiopathic Epilepsy?

Principal Investigator: Karen Muñana, DVM,MS

Research Institution: North Carolina State University

Grant Amount: $104,453

Start Date: 2/1/2019 **End Date:** 1/31/2022

Progress Report: End-Year 1

Report Due: 1/31/2020 **Report Received:** 1/31/2020

(The content of this report is not confidential and may be used in communications with your organization.)

Original Project Description:

Idiopathic epilepsy is the most common chronic nervous system disorder of dogs. Its cause is poorly understood but is believed to involve genetic and environmental factors. Treatment with anti-seizure drugs remains the standard of care. However, approximately one-third of dogs fail to achieve satisfactory seizure control, highlighting the need to investigate factors that may influence disease course. An association between epilepsy and inflammatory gastrointestinal disease is well documented in humans, and several other nervous system disorders have been linked to alterations in gut microbial populations, with considerable attention focused on the bacteria Helicobacter and Lactobacilli. The aim of this study is to determine whether dogs with idiopathic epilepsy have shifts in the gastrointestinal environment that may influence disease course. The researchers hypothesize that dogs with idiopathic epilepsy have alterations in the gut microbial population characterized by the presence of Helicobacter, a decrease in Lactobacillus, and resulting inflammation that are associated with epilepsy development and outcome. The investigators will collect and study paired fecal samples from untreated and phenobarbital treated epileptic dogs and including an unaffected dog from the same household. The occurrence of Helicobacter and Lactobacillus species will be analyzed using molecular genetic techniques and specific biomarkers of inflammation and evaluated for associations with disease onset and outcome. In exploring the association between the gut microbial population and canine epilepsy, this study has the potential to improve our understanding of epilepsy, and ultimately guide the development of more effective therapies for this disorder.

Publications: None at this time.

Presentations: None at this time.

Report to Grant Sponsor from Investigator:

The aim of this study is to determine whether dogs with idiopathic epilepsy have shifts in the gastrointestinal environment that may influence disease course. We hypothesize that dogs with idiopathic epilepsy have alterations in the gut microbial population - characterized by the presence of Helicobacter, a decrease in Lactobacillus, and resulting inflammation – that are associated with epilepsy development and outcome. To date, 33 pairs of dogs have been recruited into the study, and fecal samples have been received from 18 of these pairs, including 12 untreated and 6 phenobarbital treated epileptic dogs, and an unaffected dog from the same household. Samples are currently being stored frozen at -80C. Analysis of samples is scheduled to begin in the second year of the study. We continue to actively recruit dogs for the study, and are working with the college's Marketing and Communications team to explore methods to increase the scope of our recruitment efforts. This investigation into the association between the gut microbial population and canine epilepsy has the potential to improve our understanding of epilepsy, and ultimately guide the development of more effective therapies for this disorder.