RESEARCH PROGRESS REPORT SUMMARY

Grant 02519: Prevalence of *Bartonella spp*. Infection in Dogs with Cardiac and Splenic Hemangiosarcomas Within and Between Geographic Locations

Principal Investigator: Edward Breitschwerdt, DVM

Research Institution: North Carolina State University

Grant Amount: $219,026.00

Start Date: 2/1/2018 **End Date:** 1/31/2020

Progress Report: End-Year 1

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

Original Project Description:

Splenic masses comprise ~50% of all canine splenic disease. Despite advances in imaging and pathologic definition, the etiology and medical relevance of splenic lesions in dogs are often ambiguous. While some splenic tumors are benign, approximately two-thirds are highly malignant and carry a poor prognosis. Hemangiosarcoma (HSA) accounts for the majority of canine malignant splenic tumors and occurs in many large dog breeds, including mixed breeds. A less common site of HSA localization is the heart (cardiac HSA). Risk factors for both cardiac and splenic HSA remain unclear, confounding development of preventative strategies. The investigators recently reported a high prevalence of species of the bacterial genus *Bartonella* in dogs with HSA from North Carolina, suggesting a potential role in the initiation and/or progression of this cancer. *Bartonella* species exist worldwide and are transmitted by blood-sucking arthropods (e.g. ticks, fleas) and their presence in splenic tissue could potentially be explained by the fact that the spleen is primarily responsible for removal of blood-borne parasites from the systemic circulation. The investigators will perform a comprehensive examination of the potential association between *Bartonella* infection and HSA by comparing the prevalence of *Bartonella* DNA in tumor and blood samples from both splenic and cardiac HSA cases, and also within and between distant geographical locations in the US. Ultimately, demonstration of a robust association between *Bartonella* infection and the development of HSA may lead to new opportunities for improved diagnosis, treatment and prevention of this devastating cancer.

Publications: Not at this time.

Presentations: Not at this time.

Report to Grant Sponsor from Investigator:

We are on track to accomplish all of our aims for this study. We were able to obtain the initial set of samples on April 26, 2018 so we had a short delay in starting the study. We have now received all samples for phase one, categorized, prepped, extracted and tested via qPCR the obtained DNA. A research abstract of the qPCR results has been submitted for the 2019 Annual ACVIM Forum. That abstract is currently under review. We will be publishing additional research from our AKC-CHF study #02287, which will define the criteria for serodiagnosis of Bartonellosis in dogs by Western Blotting (WB). Due to a number of unanticipated problems, that work required additional time and research effort to validate criteria for interpretation of *Bartonella spp.* WB testing.

We have processed all samples for IFA and WB in this study as well as performed qPCR on all EDTA and tissue samples. We have contacted the collaborating pathologists in the three designated regions. They have defined specific criteria for inclusion into the study. The pathologists have started identifying and collecting samples for testing during year II of the grant. One region has identified, collected and shipped all necessary samples from their region. The other regions will have theirs collected within the next month. These samples will be tested over the next twelve months.