



## RESEARCH PROGRESS REPORT SUMMARY

**Grant 02806-MOU:** Strategic Prevention of Canine Hemangiosarcoma: Lifetime Follow-Up

**Principal Investigator:** Jaime Modiano, VMD, PhD  
**Research Institution:** University of Minnesota  
**Grant Amount:** \$269,238  
**Start Date:** 8/1/2020      **End Date:** 7/31/2024  
**Progress Report:** Mid-Year 1  
**Report Due:** 1/31/2021      **Report Received:** 1/30/2021

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### **Original Project Description:**

The Shine On project is designed to utilize complementary technologies to reduce the impact of hemangiosarcoma in companion dogs. This novel, potentially disruptive approach is the first of its kind where artificial intelligence applied to the results of a blood test will be used to assign dogs to a risk category for the development of hemangiosarcoma. The test, called the Shine On Suspicion (SOS) Test is designed to detect hemangiosarcoma at its earliest stages of development before it becomes a clinically-detectable disease. Dogs that are considered to be at high risk based on the SOS Test results will be eligible to receive the drug eBAT for strategic prevention; that is, to eliminate emergent hemangiosarcoma tumors before they form. eBAT is a rationally designed drug developed in the laboratory to attack the cells that initiate and maintain the cancer, as well as to make the environment inhospitable for their growth. For the initial phase of the Shine On project, investigators developed and refined the SOS Test and the artificial intelligence methods to assign dogs to specific diagnostic categories and started to establish the utility of the test in early detection in a group of 209 presumably healthy, pedigreed Golden Retrievers, Boxers, and Portuguese Water Dogs, 6 years of age or older. In this continuation phase of the Shine On project, this group of dogs that had the SOS Test will be followed for their lifetimes to identify any diagnosis of cancer or another chronic disease, the cause of death, and date of death. In addition, a subset of dogs determined to be at high risk using the SOS Test will receive eBAT in the setting of prevention and also followed over their lifetime to establish their outcomes. This project expects to develop firm proof of concept to support larger clinical trials, and eventual deployment of this approach to the veterinary community setting for all dogs at risk of developing hemangiosarcoma.



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### **Publications:**

DePauw TA, Khammanivong A, Schulte AJ, Winter AL, Lewellen M, Kim JH, Stuebner K, Vallera DA, Cutter GR, Borgatti A, Dickerson EB, Henson MS, Modiano JF. Identification of hemangiosarcoma-associated cells in liquid biopsies for early detection. *Manuscript in preparation.*

### **Presentations:**

DePauw TA, Khammanivong A, Modiano JF. (2020). Machine Learning for Early Detection of Hemangiosarcoma. Proceedings of the Annual Meeting of the Veterinary Cancer Society (virtual). Abstract was selected for an oral platform presentation by Taylor DePauw.

### **Report to Grant Sponsor from Investigator:**

The goal for this project is to develop a reliable, accessible, and actionable test to identify dogs at risk for hemangiosarcoma during the earliest stages of disease and to use a strategic, rationally designed approach to prevent its occurrence in these high-risk dogs before it becomes clinically detrimental and life-threatening. The study has two objectives. The first is to determine the most reasonable duration of an SOS test result. In other words, how long can a low-risk SOS test result be trusted and how much time might elapse between a high-risk SOS test result and the development of hemangiosarcoma. The second aim is to continue periodic testing for dogs previously enrolled in the Shine On study whose test result would have placed them in a high-risk category for development of hemangiosarcoma, and to provide eBAT as a strategy for prevention in 12 of these dogs.

To complete the first objective, we are conducting surveys to determine the health status of every dog enrolled in Shine On phase-3 (the early detection phase) at 6-month intervals. This effort will continue throughout the duration of the study.

To complete the second objective, we have finalized the analysis of the data from Shine On phase-1 (used as the "training set" for SOS test) and applied those results to dogs from phase-3 to select candidates for continued, periodic testing. We expect to send out notifications to owners of eligible dogs and begin active testing during the first quarter of 2021 if the COVID-19 pandemic abates and conditions across the country are adequate and safe for individuals to take their dog to the veterinarian for blood draws, as well as for travel to St. Paul, MN for eBAT prevention.