

Halting Hemangiosarcoma through Research at UMN

Early on our team took the approach that better understanding of biology informs better trials. This strategic decision has allowed us to differentiate the Animal Cancer Care and Research Program (ACCRP) at the University of Minnesota from other programs, and save as many lives of our beloved family members as possible.

Our team is driven to understand the biology of this disease so that we can make informed decisions. For example, our team invested fifteen years of research effort to understand that the term hemangiosarcoma describes at least three different tumor types, not just one disease. This breakthrough discovery allows us to now identify treatment approaches that are more beneficial to dogs with a specific type of hemangiosarcoma rather than treating each dog in the same way. We feel strongly that the only way to make significant headway to improve health outcomes for the most animals possible is to apply our discoveries to precision medicine approaches. We are now poised to see transformational gains in the next decade because of the time we spent developing the necessary biological knowledge-base to move forward.

The following projects are just some of the work our team is undertaking where philanthropy would have great impact in advancing our knowledge of hemangiosarcoma.

Early detection coupled with treatment option

The Shine On Project has a bold vision to reduce mortality in dogs diagnosed with hemangiosarcoma by identifying the disease at the earliest stages of tumor formation and preventing its progression before its terrible symptoms become apparent. The Shine On Suspicion (SOS) test is a blood test we developed capable of identifying up to 90% of apparently healthy dogs that are at risk of developing hemangiosarcoma as early as two years before the disease becomes apparent. The blood test can also predict when treatment fails and the disease is poised to return, providing opportunities to alter the treatment strategies. These findings are significant when dealing with a disease that is known for its inexorable progression. Coupled with the UMN developed drug, eBAT which has demonstrated extended life expectancies for pets in clinical trials, the SOS Test now safely provides us novel tools to extend the life and wellbeing of all dogs, and in particular, those that belong to breeds that are disproportionately affected by hemangiosarcoma. The next stage of Shine On includes goals to expand testing to more dogs, extend the timeline to follow dogs who have gone through the trial for their life time, and invest in single cell sequencing to better understand how hemangiosarcoma grows in dogs.

Leveraging proven human therapies in innovative ways

The Propranolol Project was designed to determine if combining propranolol with doxorubicin chemotherapy could be used to treat dogs diagnosed with hemangiosarcoma. Originally developed to treat high blood pressure, a number of preclinical studies and clinical reports suggested that propranolol could be repurposed for the treatment of a type of cancer in people known as angiosarcoma. In the last few years, we have worked with clinicians and other scientists to understand the biological vulnerabilities of these tumors to propranolol. Because canine hemangiosarcoma closely models the biology of human angiosarcoma and follows a similar clinical course, we have applied our efforts to determine if propranolol can also be an

effective treatment for canine hemangiosarcoma. This has led to a clinical trial in dogs diagnosed with hemangiosarcoma to determine the efficacy of propranolol in combination with chemotherapy.

Because propranolol is commonly used for other applications in veterinary medicine, our initial goal was to provide a safe and effective therapy that could be easily used by veterinarians across the country. However, based on our previous discovery that hemangiosarcoma is not one, but at least three different diseases, we have also begun to ask if some dogs may benefit from propranolol treatment more than others. We have started to address this question using data collected from the current clinical trial. Our efforts have already identified a difference in how some dogs process or metabolize propranolol, and we will correlate this finding with the overall survival of dogs as the trial progresses. The next stage of this work will bring us closer to our goal of developing precision therapy to treat hemangiosarcoma in dogs.