

## Research Spotlight

### Hemangiosarcoma

#### What is hemangiosarcoma?

- An aggressive cancer of the cells that line canine blood vessels
- It can develop in any tissue or organ, but most commonly affects the spleen, right atrium of the heart, and skin.

#### Why study it?

- While cutaneous masses (those affecting the skin) are often treatable by tumor excision, tumors affecting internal organs are associated with poorer prognosis and are almost always incurable.
- Hemangiosarcoma is often called the “silent killer” because tumors may not be detected until the later stages of disease. Even dogs harboring large tumors may show no clinical signs or evidence that they have a life-threatening disease.
- Existing treatments have not improved the overall survival times for dogs with this disease.



#### How does this research help dogs?

- Characterization of the cells that initiate and maintain hemangiosarcoma tumors may lead to new prevention strategies.
- Exploring the potential association between vector-borne infection and hemangiosarcoma may offer targets for diagnosis, treatment, and prevention of the disease.
- Understanding how hemangiosarcoma tumor cells derive their energy may provide a point of attack for treatment.

## Research Grants

### **02234-MOU: A Novel Approach for Prevention of Canine Hemangiosarcoma**

Principal Investigator: Jaime F. Modiano, VMD, PhD; University of Minnesota

Total Grant Amount: \$432,000

### **02510: Identification of Novel Synthetic Lethal Partners to Optimize PI3K Targeted Therapies in Canine Hemangiosarcoma**

Principal Investigator: Cheryl A. London, DVM, PhD; Tufts Medical School

Total Grant Amount: \$168,857

### **02519: Prevalence of Bartonella spp. Infection in Dogs with Cardiac and Splenic Hemangiosarcomas within and between Geographic Locations**

Principal Investigator: Edward B. Breitschwerdt, DVM; Matthew Breen, PhD; North Carolina State University

Total Grant Amount: \$219,026

## Select Publications

Tamburini, B. A., Phang, T. L., Fosmire, S. P., Scott, M. C., Trapp, S. C., Duckett, M. M., ... & Wojcieszyn, J. W. (2010). **Gene expression profiling identifies inflammation and angiogenesis as distinguishing features of canine hemangiosarcoma.** *BMC Cancer*, 10(1), 619.

Schappa, J. T., Frantz, A. M., Gorden, B. H., Dickerson, E. B., Vallera, D. A., & Modiano, J. F. (2013). **Hemangiosarcoma and its cancer stem cell subpopulation are effectively killed by a toxin targeted through epidermal growth factor and urokinase receptors.** *International Journal of Cancer*, 133(8), 1936-1944.

Kim, J. H., Graef, A. J., Dickerson, E. B., & Modiano, J. F. (2015). **Pathobiology of hemangiosarcoma in dogs: research advances and future perspectives.** *Veterinary Sciences*, 2(4), 388-405.

Rodriguez, A. M., Graef, A. J., LeVine, D. N., Cohen, I. R., Modiano, J. F., & Kim, J. H. (2015). **Association of Sphingosine-1-phosphate (S1P)/S1P Receptor-1 Pathway with Cell Proliferation and Survival in Canine Hemangiosarcoma.** *Journal of Veterinary Internal Medicine*, 29(4), 1088-1097.

Im, K. S., Graef, A. J., Breen, M., Lindblad-Toh, K., Modiano, J. F., & Kim, J. H. (2017). **Interactions between CXCR4 and CXCL12 promote cell migration and invasion of canine hemangiosarcoma.** *Veterinary and Comparative Oncology*, 15(2), 315-327.

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