

FINAL REPORT



Finding Ways to Block Hemangiosarcoma Tumor Growth

Erin B Dickerson, PhD, University of Minnesota, D18CA-017

RESULTS: Researchers find potential adjunct therapy for hemangiosarcoma and set stage for new studies

Morris Animal Foundation-funded researchers at the University of Minnesota investigated how hemangiosarcoma cells use cholesterol and lipids to fuel cancer growth. Since healthy, non-cancerous cells are less dependent on cholesterol and fat for growth, the team looked at novel ways to block tumor cells from using these metabolic fuels while sparing normal cells. They were especially focused on the use of beta-blockers, a family of drugs commonly used to treat heart disease, as an adjunct therapy for hemangiosarcoma in dogs.

Hemangiosarcoma is an aggressive disease that most commonly affects large breed dogs. It accounts for tens of thousands of canine tumors with a mean age at diagnosis of 9 to 12 years. The cancer is nearly 100% fatal and new treatments are desperately needed.

Using cell lines to test their hypothesis, the team evaluated two beta blockers, propranolol and carvedilol. In addition to their use in the treatment of heart disease, beta blockers are used in human medicine to reduce disease progression and increase survival time in people with angiosarcoma, a cancer with some similar to canine hemangiosarcoma. Propranolol and carvedilol are already used in veterinary medicine to treat heart disease and high blood pressure in dogs, making a transition to use in the oncology clinic much easier.

The team found that carvedilol showed superior synergy with chemotherapies, suggesting that it may work better for the treatment of hemangiosarcoma.

In their work looking at cell metabolism, the researchers found that both propranolol and carvedilol blocked metabolic pathways that appear to be important for hemangiosarcoma cells to proliferate and grow the tumor, and these pathways were more susceptible to carvedilol.

The results are significant because they demonstrate that using carvedilol in combination with chemotherapy to kill hemangiosarcoma cells is superior to propranolol and chemotherapy. Furthermore, identification of pathways used by hemangiosarcoma cells to grow the tumor may provide new targets for the development of combinatorial drug treatment approaches.

This grant also has helped to establish a bench to clinic pipeline for studies in the lab, and to advance the team's expertise in the areas of basic and translational hemangiosarcoma research.

Thank you, American German Shepherd Dog Charitable Foundation, for your generous sponsorship of this study!