

PROGRESS REPORT



Curbing Tumor Growth and Chemotherapy Resistance in Canine Hemangiosarcoma

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Morris Animal Foundation-funded researchers at the University of Minnesota are looking at new ways to block hemangiosarcoma tumor growth and cancer spread. They are specifically studying propranolol, a drug commonly used to treat certain forms of heart disease as a promising, new treatment for hemangiosarcoma.

In laboratory studies, the team found that propranolol inhibits key metabolic pathways in hemangiosarcoma cells, preventing tumor cells from dividing and slowing tumor growth. Further studies in mouse models show propranolol alone inhibits tumor growth and works as well as a combination of propranolol with the chemotherapy drug doxorubicin. While doxorubicin alone also slowed growth, propranolol alone or in combination with doxorubicin worked better. The next step is genetic analysis of tumor samples from the different treatment groups (control, doxorubicin, propranolol and propranolol combined with doxorubicin) to better understand the mechanisms used by propranolol to slow or stop tumor growth.

In concurrent studies, the team is studying chemotherapy resistance in hemangiosarcoma cells. So far, they have developed doxorubicin-resistant cell lines and found propranolol sensitizes (increases the effect of) these cell lines to doxorubicin. Further studies are underway to better understand propranolol's effect on drug-resistant cell lines. Identification of changes induced by propranolol in cell lines and tumor samples may provide clues for additional promising treatments combining propranolol with other FDA-approved drugs.

Findings from these studies may help change standard-of-care treatment for canine hemangiosarcoma. Data already is being used to help inform a multi-center clinical trial to determine if propranolol in combination with doxorubicin will improve the overall survival of dogs with hemangiosarcoma compared to doxorubicin alone. If successful, results easily can be translated into a veterinary clinic setting as propranolol is well-tolerated by dogs and can be given orally.

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