PROGRESS REPORT

Studying Hemangiosarcoma Subtypes and Treatment Response

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SUMMARY: Researchers are studying if hemangiosarcoma (HSA) subtypes influence how affected dogs respond to treatment – a step toward precision medicine for these patients.

THE PROBLEM: Hemangiosarcoma is a serious and usually fatal cancer of dogs. Most dogs die of the disease by within 4-6 months post-diagnosis, even with aggressive treatment. However, some research suggests that hemangiosarcoma is not one disease but comprised of different subtypes, and these subtypes might be related to longevity and response to therapy.

THE PROJECT: This research team has previously found that dogs with one type of HSA are more likely to live longer than dogs that have a different type of HSA. This may explain why current treatments fail to help most dogs with HSA live longer despite aggressive care. To take a closer look at this finding, researchers will identify the HSA type or signature in tumors from dogs that have lived longer than other dog patients with HSA. The team is using data from a study in progress to inform their evaluation of archived tissues to assess prevalence and survival.

PROJECT UPDATE: The team's first objective was to look at whether HSA subtype was predictive for dogs likely to benefit from chemotherapy consisting of doxorubicin and propranolol. Their preliminary data suggests that dogs under the age of six might benefit from this combination. Their data also show that the immune signatures in dogs that survive longer differ from those that do not. They are expanding our studies in this area.

The second objective is to determine the prevalence of the identified subtypes in a cohort of archived HSA samples. The team screened ~300 archived HSA samples for further analysis and identified 117 samples suitable for RNA extraction and RNA-sequencing. They received the RNA-sequencing data a few weeks ago, and are waiting for the analysis from the bioinformaticist.

During the next 6 months, the team will work with a bioinformaticist to review the gene sequencing data. They'll determine if the signature they identified in the dogs that responded to treatment with propranolol and doxorubicin (PRO-DOX) is present in a subset of the tumors they're screening. In the next 12 months, the team will refine any signature(s) identified and validate the gene expression signature by staining the tumor sections for proteins encoded by the differentially expressed genes identified in their analysis.

POTENTIAL IMPACT: If the team is successful, their findings could have a major impact on how HSA is treated in dogs as well as provide information on long-term prognosis based on subtype. These results

could help both veterinarians and pet parents make more informed decisions for dogs diagnosed with this terrible cancer.

Thank you, PWDF, for making this study possible!

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