New Canine Cutaneous Mast Cell Tumor Panel Adds Certainty to Prognosis

The highly unreliable and variable nature of histologic grading for canine cutaneous mast cell tumors (MCT) has made it difficult for many veterinary practitioners to offer their clients an accurate prognosis. DCPAH now offers an exclusive panel of tests that dramatically increase prognostic certainty for these forms of cancer. The panel consists of a cell proliferation analysis, a c-kit PCR, and KIT immunohistochemistry (IHC) to analyze expression of this tyrosine kinase receptor. The cell proliferation analysis evaluates 3 markers to assess risk of systemic disease. First, IHC for Ki67 is used to determine the number of cells currently proliferating. Next, the lab determines the number of AgNORs in neoplastic mast cells to gauge the speed of cell proliferation. Finally, IHC for PCNA determines the cell-cycle phase of proliferating cells. Research indicates that tumor-cell proliferation activity cannot be reliably predicted using a single measure, but prognoses developed from this combination of tests are highly correlated with survival rates.

Additionally, a PCR test is run to check for activating duplication mutations in the juxtamembrane domain of the c-kit gene. Such mutations have been detected in about 20 to 30 percent of canine cutaneous mast cell tumors. Research indicates that cancers caused by c-kit mutations are highly aggressive, but respond well to tyrosine kinase inhibiting (TKI) therapies. Since tyrosine kinase inhibiting compounds are now available for the treatment of dogs, the detection of c-kit mutations has therapeutic as well as prognostic implications. DCPAH is currently the only laboratory offering this test as part of a mast cell tumor panel.

As part of the new panel, samples will also undergo IHC labeling to assess KIT expression within neoplastic mast cells. Three patterns of KIT localization in neoplastic mast cells have been identified. Patterns 2 and 3 characterized by increased amounts of intracytoplasmic labeling and loss of membrane-associated labeling have been linked with decreased survival rates and are highly likely to indicate a response to TKIs. Cell proliferation analysis, c-kit PCR, and KIT IHC results are all linked to MCT-associated mortality and survival times. While there is some association between each independent test, prognoses developed from interpretation of all 3 analyses offer your clients the highest level of certainty. When requesting the panel, please submit the paraffin block of the neoplastic mass, or at least 7 unstained slides. Please do not submit tumor margin slides. For more information about research concerning mast cell tumors prognosis or for current pricing information, please visit our website at: www.animalhealth.msu.edu.