Mutational Profiling in Canine and Feline Cancers

Proposed Start Date: **May 3, 2021**
Name and Title of Proposed Supervisor: **Geoffrey Wood, Associate Professor**
Email: gewood@uoguelph.ca
Department: **Pathobiology**
Restrictions: **DVM students or students with histology experience**

**Brief Outline of Proposed Research Project:** Cancer is a leading cause of death in dogs and cats. Acquired mutations in DNA underly cancer development and its progression to advanced disease in all species. Our goal is to establish the mutational profile of common cancers in dogs and cats, with a focus on known cancer genes, many of which are targetable with newer generation cancer therapies. To this end, we are performing targeted-exome sequencing of ~1,000 cancer genes in 1,400 tumor-germline pairs from 20 cancer types common in dogs, and cats where possible. The 50 cases of each tumour type will come from formalin-fixed, paraffin-embedded (FFPE) tissue blocks collected by veterinarians at time of biopsy or autopsy. The summer research student will core these blocks with the help of a PhD pathology student, selecting the most representative parts of the tumours. The same tumours will have nearby cores taken to construct a tissue microarray (TMA) which can later be sectioned onto glass slides such that hundreds of tumour cores can be evaluated for protein expression at one time. We will use the sequencing data to identify somatic protein-coding mutations, copy number alterations and germline predisposing alleles. We will also use the data to explore the etiology of these cancers by looking for the presence of potential environmental exposures, such as viral pathogens or chemical carcinogens through mutational signatures. The sequencing results from dog and cat tumours will: 1) help direct targeted cancer therapies tailored to individual cases, 2) provide insights into the causes of cancers in dogs and cats, and 3) allow cross-species comparisons with already sequenced human cancers for advancing our understanding of cancer across multiple species.

**APPLICATION PROCESS**

Please email Dr. Wood your CV and transcript