



RESEARCH PROGRESS REPORT SUMMARY

Grant 02880: Enhanced Surgical Margin Imaging with Polarization-sensitive Optical Coherence Tomography in Canine Soft Tissue Sarcoma and Mammary Tumors

Principal Investigator: Laura Selmic, BVetMed, MPH
Research Institution: The Ohio State University
Grant Amount: \$49,226.72
Start Date: 6/1/2021 **End Date:** 5/31/2023
Progress Report: Mid-Year 2
Report Due: 11/30/2022 **Report Received:** 11/30/2022

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Original Project Description:

Surgery is the most common treatment used for skin and mammary cancer in dogs. Currently, a pathologist determines whether surgery has removed all cancer cells many days after the procedure. However, rapid and accurate testing during surgery is needed to detect residual cancer to decrease cancer recurrence and the necessity for repeated surgery or treatments. Polarization-sensitive optical coherence tomography (PS-OCT) is a new imaging technology that uses near-infrared light waves to generate real-time, high-resolution images of the microscopic structure of tissues, specifically looking at the organization of the tissues. Investigators have performed initial evaluations using this optical coherence tomography for detection of residual cancer (including CHF grants 02758 and 02204-T), which has had very encouraging results. This study will focus on assessing whether PS-OCT could help us improve the accuracy to detect residual cancer in dogs following soft tissue sarcoma or mammary cancer removal. This project will open the door to veterinarians having the technology to allow accurate, real-time interpretation of surgical margins to minimize the necessity for additional surgeries or other treatments and to decrease tumor recurrence.

Publications: None to date.

Presentations: None to date.



Report to Grant Sponsor from Investigator:

Thank you for supporting our project titled “Enhanced surgical margin imaging with polarization-sensitive optical coherence tomography in canine soft tissue sarcoma and mammary tumors”. This project is investigating an emerging diagnostic imaging tool, polarization-sensitive optical coherence tomography that uses light waves to generate real time high-resolution images of tissues for detection of residual cancer cells immediately following surgical removal. Our team involves collaboration between veterinary medicine and pathology at the Ohio State University. We have had good progress in our patient enrollment, we completed enrollment of the 60 cases already! We are in the second phase of this project where we are looking at accuracy of surgical margin imaging soft tissue sarcomas and mammary tumors after surgical removal in dogs. In the first phase we will be performing initial comparisons between the images from polarization-sensitive optical coherence tomography with biopsy slides of these areas. This phase will allow us to identify features of the tissues and help us to train our imaging operators for the last phase of the project. Soon we will start evaluating the images and preparing the training and test sets of images for observers to assess. Completion of the final phase of the project will involve the observers looking at these images for evidence of residual cancer.

We are very grateful for your support! Our team will continue to work hard to perform the evaluation of this cutting-edge and promising technology for detection of residual cancer cells following surgery. Advancement of our knowledge of residual cancer cells at the time of surgery will help to improve options and outcome for dogs.