Use of Optical Coherence Tomography for Directed Pathological Sectioning of Surgical Margins of Resected Tumors Christina J. Cocca\textsuperscript{1}; Laura E. Selmic\textsuperscript{1}; Jonathan Samuelson\textsuperscript{1} Marina Marjanovic\textsuperscript{2,4} P; Jianfeng Wang \textsuperscript{2,4}; Pin-Chieh Huang \textsuperscript{2,4}; Stephen A. Boppart\textsuperscript{2,3,4,5}

\textsuperscript{1}Department of Veterinary Clinical Medicine & \textsuperscript{2}Beckman Institute for Advanced Science and Technology &, \textsuperscript{3}Department of Electrical and Computer Engineering & \textsuperscript{4}Department of Bioengineering & \textsuperscript{5}Carle-Illinois College of Medicine, University of Illinois at Urbana-Champaign, Urbana, IL, USA

**Introduction:** Histopathology is the gold standard for surgical margin assessment in veterinary medicine. However, asymmetric growth and limited sampling of the surgical margins can lead to sampling error and lack of detection of incomplete margins. Optical coherence tomography (OCT) provides non-destructive, high resolution microscopic imaging of tissues and has been reported for human breast cancer and canine soft tissue sarcoma surgical margin assessment. This technique allows assessment of the entire surgical margin in minutes, having the potential to help guide pathologic interrogation of resected tumors. The objectives of this study are to develop a training set of OCT images to correlate histological features and to determine the diagnostic accuracy of OCT imaging used to direct pathological sectioning.

**Materials and Methods:** For the first objective, two areas of the surgical margins of resected anal sac adenocarcinoma or mast cell tumors were imaged with OCT and trimmed for histopathological processing. For the second, the excised specimen will be evaluated with OCT, suspect areas inked, followed by histopathological processing. OCT images from previously suspect areas will be correlated with known histopathological interpretation and the specimen categorized as completely or incompletely excised.

**Results:** There is a good correlation between OCT and histopathologic appearance in anal sac and mast cell tumors. Therefore, surgical margins of resected tumors may be examined with OCT and potentially help guide pathologic interrogation.

**Conclusions:** OCT may be used to guide pathologic trimming. The sensitivity of detection of incomplete margins of resected mast cell and anal sac tumors is being determined.