Optical Coherence Tomography: Current Biomedical Applications and Future Clinical Utility

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ABSTRACT
Both cancerous and non-cancerous conditions can vary dramatically from one patient to the next, limiting the overall success rates of treatments designed for the general population. If biologically relevant feedback mechanism(s) existed during these treatments, clinicians would be given a powerful tool to provide individualized patient care. One such solution includes the novel imaging modality of optical coherence tomography (OCT), which produces non-invasive 2D and 3D image data sets of tissue and microvascular images at the cellular level (~10 µm).

In this talk, a brief overview of several research projects will be presented that exploit these exciting capabilities including 1) cancer therapy quantification, 2) histological image correlation, 3) multi-channel OCT, 4) signal processing techniques and 5) next-generation theragnostic combined imaging and treatment catheters. These novel devices and imaging systems have widespread clinical potential for predicting and/or monitoring treatment response in a multitude of pathologic conditions and anatomical locations such as the brain, liver, lung, prostate, breast, heart and gastrointestinal tract.

BIOGRAPHY
Beau Standish is an assistant professor in the Biomedical Engineering stream within the Department of Electrical and Computer Engineering at Ryerson University. He holds a PhD in Medical Biophysics from the University of Toronto, where he was a Terry Fox Foundation scholar with the Canadian Cancer Society. His research has been celebrated at the national and international level receiving top scholastic and research awards from the International Society for Optics and Photonics (SPIE), the National Cancer Institute of Canada and the Ontario Centres of Excellence. Dr. Standish is also very active in the commercialization of his biomedical research, where he continues to build upon his previous industry experience and is currently working with several Ontario based companies to bring these products to market. His research is focused on developing new combined optical imaging and therapeutic techniques for the early detection and treatment of malignant and benign diseases along with optical surgical navigation technologies, where he has received funding from NSERC, CIHR, Ontario Brain Institute, Cancer Imaging Network of Ontario and MaRS Innovation.