Optical Coherence Tomography: Current Biomedical Applications and Future Clinical Utility

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Abstract

Clinicians are faced with an ever-increasing plethora of choices for the early detection of life-threatening medical conditions, such as heart disease or cancer. Many of these pathologies require invasive biopsy procedures to verify the presence and stage of disease progression. Once identified the patient must then undergo treatment, where current imaging techniques lack the resolution for treatment monitoring that can be correlated to the gold standard of disease-free survival, namely histology. Optical coherence tomography (OCT) is an exciting, high-resolution (~10μm) non-invasive, imaging modality that may provide solutions to these problems and aid in the early detection and treatment monitoring of diseases. As the technology matures there is great potential for optical coherence tomography to become a clinical tool to aid in the clinical decision making process in an effort to properly provide patient risk stratification and subsequent appropriate therapy. In this presentation, Dr. Standish will present how OCT technologies are currently being used for pre-clinical and clinical research along with a speculative view of additional future biomedical applications.

Biography of Speaker

Dr. Beau A. Standish has 7+ years of experience in the area of medical biophotonics and imaging. He holds a PhD in Medical Biophysics from the University of Toronto (2009), and a B.Eng in Engineering Physics from McMaster University (2002). His research has been highlighted in 20 peer-reviewed journal publications, 16 conference proceedings, several book chapters and a multitude of public lectures and conferences. His research has also 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 Centre of Excellence. Dr. Standish is very active in the commercialization of his biomedical research, where he is currently working with MaRS Innovation and several Ontario based companies to bring these products to market. His current research is focused on developing new combined imaging and therapeutic techniques for the early detection and treatment of cancer.