Label-free Optical Micro Imaging towards Tissue Histology *in vivo*

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**Abstract:** This talk reports on our recent development of high-resolution, nonionizing biophotonic imaging technologies, including optical coherence tomography (OCT) and multiphoton endomicroscopy. These fiber-optically based technologies have shown significant translational potential for imaging tissue microanatomies *in vivo* at a resolution approaching or at that of standard histopathology but without the need for tissue removal or staining. The physics principles, engineering challenges and solutions will be briefly discussed, including the development of advanced lasers, MEMS technology, custom optical fiber, and ultracompact, high-performance micro optics. Representative applications of these high-resolution technologies will be presented, including cancer detection, airway physiology assessment, preterm birth risk assessment, and intra-operative guidance for neurosurgery. Other potential applications towards basic research such as functional neuroimaging on awake animals will also be discussed.

**SHORT BIOSKETCH**

Dr. Xingde Li received his PhD degree in Physics from the University of Pennsylvania in 1998. He is currently a professor at the Department of Biomedical Engineering Johns Hopkins University with a joint appointment with the Department of Electrical and Computer Engineering. His research interest focuses on development of noninvasive and transformative optical micro imaging technologies for early disease diagnosis and interventional guidance. He has published about 90 peer-reviewed journal papers, with a total citation >10,200 and an H-index~42 (according to Google Scholar). He served as the chair for the Emerging technologies Committee of the IEEE-EMBS society (2006 – 2010). He has also been chairing many conferences such as the recent OSA Biomedical Optics Topical Meetings 2010-2014 etc. He currently serves on the editorial board of several international journals in the area of biomedical photonics including *the Journal of Biomedical Optics* (SPIE), *Biomedical Optics Express* (OSA), *the IEEE Transactions on Biomedical Engineering*, *Light: Science and Applications* (Nature Publishing Group and CIOMP). He is a Fellow of OSA, SPIE, and AIMBE.