Exploring Reproduction and Development through Functional Optical Imaging

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Room W122, Engineering Building 2

LECTURE ABSTRACT

Understanding the dynamic process of reproduction and embryonic development is essential to advance the understanding and improve the management of reproductive disorders, such as infertility and ectopic pregnancy, and congenital defects. However, the majority of what we know about the dynamics of these events is assumed based on histological analysis of extracted organs, low-resolution visualizations, and extrapolation of studies in invertebrate animal models. To address this lack of knowledge, we developed a set of OCT-based imaging methods for in vivo structural, dynamic and functional visualization of features of the mouse reproductive tract, cilia function and sperm activity, which previously have not been accessible. The micro-scale spatial resolution, millimeter-level imaging depth, large transverse field of view, high temporal resolving ability, functional capacity and compatibility with live imaging make this approach applicable for variety of reproductive and developmental studies. These approaches reveal puzzling observations, which might contribute to uncovering the mechanisms of mammalian reproduction.

SPEAKER BIOSKETCH

Dr. Irina Larina has received MS degree in Physics from the Saratov State University in Russia in 1996, and PhD degree in Physiology and Biophysics and Bioengineering from the University of Texas Medical Branch at Galveston in 2005. She completed postdoctoral training at the Department of Molecular Physiology and Biophysics at the Baylor College of Medicine, and since 2009 is an Assistant Professor in the same Department. Her research is on the interface of developmental and reproductive biology, optical engineering, and computational modeling and analysis. Through development of innovative optical imaging methods and using them in mouse models of human disorders, Larina laboratory studies dynamic functional aspects of these disorders to understand the nature of congenital and reproductive defects in humans.

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