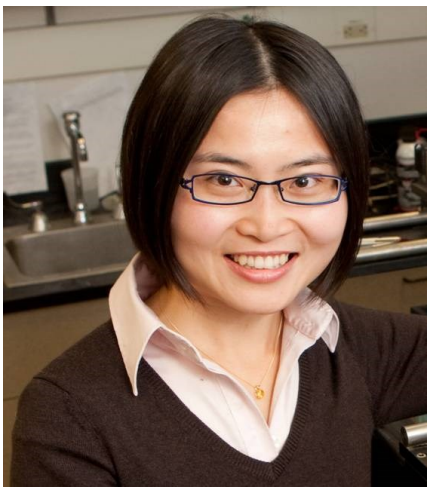
FIU Biomedical Engineering
FLORIDA INTERNATIONAL UNIVERSITY

Biomedical Engineering
Wallace H. Coulter Foundation
Lecture Series

"HISTOTRIPSY: IMAGING-GUIDED ULTRASOUND THERAPY FOR NON-INVASIVE SURGERY"

Dr. Zhen Xu
Associate Chair for Graduate Education &
Associate Professor
Department of Biomedical Engineering
University of Michigan



Friday, March, 24 2017
9:00 AM-10:00 AM
ENGINEERING CENTER
ROOM 2300
10555 WEST FLAGLER STREET

Abstract:

Wouldn't it be great to perform a surgery without incision or bleeding? "Histotripsy" is a new non-invasive ultrasound ablation technique that controls cavitation to fractionate the cells in the target tissue using focused high intensity ultrasound pulses. "Histo" means soft tissue in Greek, and tripsy means "breakdown." Using microsecond-length ultrasound pulses applied from outside the body and focused to the diseased tissue, histotripsy produces a cluster of energetic microbubbles at the target tissue with millimeter accuracy from the endogenous nanometer gas pockets in the tissue. The rapid expansion and collapse of the microbubbles produce high strain and stress to fractionate the cells in the target tissue. The overlying tissue between the target tissue and the skin is not damaged and no incision is needed. These microbubbles can be clearly visualized by ultrasound imaging, which is used to guide and monitor the histotripsy treatment in real time. Histotripsy has potential for many clinical applications where non-invasive tissue removal is desired. Dr. Xu is a co-inventor of histotripsy and the first author of the first histotripsy paper published in 2004. The first histotripsy human clinical trial has been recently completed. This talk will cover the core technology, mechanism, and the development of histotripsy for cardiovascular and cancer treatment.

Biography:

Zhen Xu is an Associate Professor and Graduate Chair of the Department of Biomedical Engineering at the University of Michigan, Ann Arbor, MI. She received the M.S. and Ph.D. degrees from the University of Michigan in 2003 and 2005, respectively, both in biomedical engineering. Her research is focusing on ultrasound therapy, particularly the development and applications of histotripsy for noninvasive surgeries. She received the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Outstanding Paper Award in 2006; American Heart Association (AHA) Outstanding research in Pediatric Cardiology in 2010; National Institute of Health (NIH) New Investigator Award at the First National Institute of Biomedical Imaging and Bioengineering (NIBIB) Edward C. Nagy New Investigator Symposium in 2011, and The Federic Lizzi Early Career Award from The International Society of Therapeutic Ultrasound in 2015. She is the co-founder of HistoSonices Inc, a startup company developing histotripsy for cancer treatment. She is currently an associate editor for IEEE Transactions on Ultrasound, Ferroelectrics, and Frequency Control (UFFC), and Women-In-Engineering (WIE) chair for IEEE UFFC. She is a principal investigator of grants funded by National Institute of Health, Department of Defense, American Cancer Association, The Hartwell Foundation, Focused Ultrasound Foundation, and The Coulter Foundation.