UNIVERSITY OF HOUSTON
CULLEN COLLEGE OF ENGINEERING

Center for Integrated Bio and Nano Systems
SPEAKER SERIES

PRESENTS

Microphysiological Systems for Emulating Human Tissues and Diseases

Yu Shrike Zhang
Harvard Medical School

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Classroom and Business Building, Room 122

LECTURE ABSTRACT

Microphysiological systems are microfluidic three-dimensional miniature human tissue and organ models that recapitulate the important biological and physiological parameters of their in vivo counterparts. They have recently emerged as a viable platform for personalized medicine and drug screening. These biomimetic organoids are anticipated to replace the conventional planar, static cell cultures, and to bridge the gaps between the current pre-clinical animal models and the human body. In addition, multiple organoids may be channeled together through the microfluidics in a similar manner they arrange in vivo, providing the capacity to analyze interactions among these models. In this talk, I will discuss our recent efforts on developing integrated multi-organ-on-a-chip platforms formed by sophisticated microfluidics and bioengineered organoids, which can operate in a continual and automated manner over extended periods. I will also discuss a series of bioprinting strategies including sacrificial bioprinting, microfluidic bioprinting, and multi-material bioprinting, along with various cytocompatible bioink formulations, for the fabrication of biomimetic organoids. These platform technologies will likely provide new opportunities in constructing functional tissue and disease models with a potential extension into clinical therapeutics and precision therapy.

SPEAKER BIOSKETCH

Dr. Zhang received a B.Eng. in Biomedical Engineering from Southeast University (Nanjing) in 2008, after which he then came to the US and obtained a M.S. in Biomedical Engineering from Washington University in St. Louis (2011) and a Ph.D. in Biomedical Engineering at Georgia Institute of Technology and Emory University School of Medicine (2013), both with Prof. Younan Xia. Dr. Zhang then pursued postdoctoral training in Prof. Ali Khademhosseini's group at Brigham and Women's Hospital, Harvard Medical School, Harvard-MIT Division of Health Sciences and Technologies, and Wyss Institute for Biologically Inspired Engineering.

He currently holds a faculty position of Instructor of Medicine and Associate Bioengineer at Brigham and Women's Hospital, Harvard Medical School. His research interests include organ-on-a-chip, 3D bioprinting, biomaterials, regenerative engineering, biomedical imaging, biosensing, nanomedicine, and developmental biology.

He has received enormous awards, including IEEE Sensors Council Technical Achievement Award (Early Career, 2017), Partners HealthCare Innovators Recognition (2017), ACS Nano Kavli Foundation Junior Fellow (2017), Rising Star in Oncology, Society for Translational Oncology (2016), NIH K99/R00 Pathway to Independence Award (2016), Baxter Young Investigator Award (2015), etc.

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