



TEXAS TECH UNIVERSITY
Department of Mechanical Engineering

ME SEMINAR SERIES IN FALL 2013

Biologically Inspired Micro- and Nanofluidic Systems for Biomedical Applications

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Date: October 7, 2013 (Monday)

Time: 2:00pm-3:00pm

Venue: Livermore 101

Coordinator: Dr. Qing Hui (qing.hui@ttu.edu)

Abstract: Major advances in science and engineering have greatly enhanced our understanding of the fundamental principles that nature uses to build, control, and manipulate living systems. These insights into the inner workings of nature offer unique opportunities to develop new engineering principles inspired by biological systems and utilize them to create devices and materials that may potentially lead to transformative breakthroughs in biomedicine. This talk will present multidisciplinary efforts directed towards the development of biomedical micro- and nanofluidic systems inspired by the human body. Specifically, I will talk about i) a bioinspired microsystem that reproduces the key structure, dynamic mechanical activity, and complex organ-level functionality of the living human lung, ii) a microengineered model of human small airways and acoustically detectable cellular-level lung injury, and iii) tunable elastomeric nanochannels for nanofluidic manipulation of nanoparticles, DNA, and polymeric nanostructures.

Speaker Bio: Dr. Dan Dongeun Huh received a Bachelor's degree in Mechanical Engineering from Seoul National University in 2000, Master's degrees in Biomedical Engineering and Mechanical Engineering in 2002, and a Ph.D. in Biomedical Engineering from the University of Michigan in 2007. He then joined Don Ingber's group at Harvard Medical School and Children's Hospital Boston as a postdoctoral research fellow. From 2009 through 2012, he was appointed as a Wyss Technology Development Fellow and a Research Associate at the Wyss Institute for Biologically Inspired Engineering at Harvard University. In 2012, Dr. Huh joined the Department of Biomedical Engineering at Seoul National University in Korea and served as an Assistant Professor until he moved to the University of Pennsylvania in 2013. He is now Wilf Family Term Endowed Chair and an Assistant Professor in the Department of Bioengineering at the University of Pennsylvania. Dr. Huh has authored over 28 papers in Science, Nature, Nature Materials, PNAS, and other major research journals, and has won several honors and awards including the SLAS Innovation Award from the Society for Lab Automation and Screening, a Finalist for INDEX: Design for Life Award, Scientific Breakthrough of the Year from American Thoracic Society, Best Publication Award and Best Postdoctoral Award from the Society of Toxicology, Wyss Technology Development Fellowship from Harvard, Organ Self-Assembly Challenge Award from Harvard, Distinguished Achievement Award from Michigan, Widmer Award from microTAS, and Horace H. Rackham Predoctoral Fellowship. His research focuses on developing bioinspired microsystems that mimic complex functionality of living human organs.

