



AN HONORS UNIVERSITY IN MARYLAND

Department of Mechanical Engineering

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Microfluidic Tools for Biological and Clinical Applications

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Abstract: Microfluidic systems have a great potential for biological and clinical applications. In this presentation, three examples will be introduced that are currently under development in the Lab-on-a-Chip and BioMEMS Laboratory at Drexel University. The first example is AC electrokinetic manipulation of bioparticles in microfluidic environments. Recent progress in the understanding of particle and fluid motions under non-uniform AC electric fields in microfluidic environments as well as fascinating particle manipulation techniques based on electrokinetic (dielectrophoresis) and electrohydrodynamic (AC electroosmosis) effects will be presented. The second example is a microfluidic platform for 3D epithelial culture-based assay that allows high throughput screening capability in a 3D cell culture environment. This innovative platform can expand the potential of studying epithelial cells in their natural environment thus leading to discoveries that may improve our ability to understand epithelial biology and tumorigenesis. The third and last example is an implantable microsystem for the treatment of hydrocephalus. A microfluidic system that mimics normally functioning biological microvalve is presented for the better treatment of hydrocephalus that is most frequently encountered in Neurosurgery.

Biographical Sketch: **Dr. Hongseok (Moses) Noh** is an assistant professor of Mechanical Engineering and Mechanics and director of the Lab-on-a-Chip and BioMEMS Laboratory at Drexel University. He holds a B.S. and M.S. in material science and engineering from the Korea University, and a Ph.D. in mechanical engineering from the Georgia Institute of Technology. His research areas are microfluidics, lab-on-a-chip, and bioMEMS. He teaches Microfabrication and Microfluidics courses for the graduate and undergraduate students of Engineering and Science at Drexel. He leads a group of faculty members in colleges of engineering and medicine in developing new techniques and micro-scale devices for the biomedical applications.

Refreshments will be served

Host: Dr. D. Bennett