Northeastern University
College *of* Engineering

Please join us for a
Special Chemical Engineering Seminar

Wednesday, October 3, 2012
108 West Village H
11:45 a.m. – 1:15 p.m.
(*Host: Prof. Shashi Murthy)*

"Inertial Microfluidics: Label-free Cell Manipulation for Biomedical Research"

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ABSTRACT

Precise manipulation of bio-particles' positions in confined flow is challenging but important task for critical applications in biological research and medicine, including cost-effective hematology, rare cell detection and enrichment, tissue engineering as well as regenerative medicine. Inertial microfluidic devices are great candidates for such tasks since they can (i) continuously focus and order bio-particles to geometrically-determined equilibrium positions in flow, and/or (ii) isolate and maintain identical populations of cells in the designated regions in the channel without need for additional external forces. Research findings showed that dynamic equilibrium positions are strongly influenced by flowing particles' physical properties (e.g., size, deformability, and shape), the flow speed as well as the channel geometry. Using differences in dynamic equilibrium positions, we adapted the system to conduct passive, label-free and continuous cell enrichment based on their physical properties. In addition, vortex-generating inertial microfluidics' ability to contain cells in pre-determined locations and to release on-demand allowed to develop a simple molecular probe delivery system with improved single-cell transfection capability. My lab focuses on developing techniques that have potential for high-throughput target cell detection, cost-effective cell separation, and sequential gene delivery, useful for cancer research, immunology, gene therapy and regenerative medicine.

BIOGRAPHY: Prof**.** SJ. Claire Hur is currently a junior fellow at Rowland Institute at Harvard. She received her B.S., M.S. and Ph.D. in Mechanical Engineering from UCLA in 2005, 2007 and 2011, respectively. During her study at UCLA, she has received numerous awards and scholarships, including Edward K. Rice Outstanding Doctoral Student, HSSEAS academic scholarship, MAE department's Chevron scholarship and UCLA Dean's special fellowship. She has conducted her doctoral work under the supervision of Professor Dino DiCarlo in the Bioengineering department and her Ph.D. thesis focused on development of label-free rare cell purifying inertial microfluidic devices. She co-authored 10 peer-reviewed journal articles, including two articles featured as journal covers, 29 conference proceedings, 2 US patents, and 1 international patent. She was selected as one of two junior fellows at Rowland Institute at Harvard starting September 2011 with 5 years of research funding for conducting independent postdoctoral research.

Refreshments will be served