BIOENGINEERING
Spring 2019 Seminar

Date: Thursday, February 7, 2019
Time: 12:00 pm - 1:00pm
Location: Krasnow, Room K229

Yun Chen, Ph.D.

Biography: Dr. Yun Chen is an assistant professor in the Department of Mechanical Engineering, at Johns Hopkins University. Dr. Chen is specialized in developing multi-scale, multi-modal imaging tools to study how mechanics integrates with other biophysical and biochemical factors factors to sustain normal physiology or to cause pathology.

Title: Developing a multi-scale toolbox to study biophysical effects on phenotypes and behaviors of the cells.

Abstract: It is important to understand how cell mechanics integrates with other biophysical and biochemical factors in biological systems to sustain normal physiology or to cause pathology such as cancer, muscle atrophy, Down syndrome, etc. across molecular, cellular and tissue levels, in order to develop better therapies. In the first part of the talk, Dr. Chen will present their ongoing effort to apply 3D bioprinting and other bio-fabrication techniques to investigate the mechnochemical interactions between microenvironment and cells. In the second part of the talk, she will present a high-throughput microfluidics technique recently developed by our group to facilitate measurements of cell mechanics parameters at the dorsal side of the cell, including molecular binding strengths, local traction forces, and viscoelastic properties. By adjusting the flow rate, the force magnitude exerted on the cell can be modulated ranging from sub-pN to nN to perturb various force-dependent processes in cells. Up to 50 events can be measured simultaneously in a single experiment. Integrating the microfluidic techniques with the analytic framework established in computational fluid dynamics, our method is reliable, accurate, economic and efficient.

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