The Chinese University of Hong Kong
Department of Biomedical Engineering

Date: 5 September 2024 (Thur)
Time: 2:00 pm Venue: ERB1122

Microfluidics for Single Cell Applications

Prof. HO, Yi Ping Megan

Associate Professor and Vice Chairman (Research)
Department of Biomedical Engineering
The Chinese University of Hong Kong

Abstract

Microfluidics has gathered significant interest for biomedical applications, particularly the analysis of targeted biomolecules from minute amount of samples. This presentation will summarize our efforts on exploiting microfluidics for the manipulation and analysis of individual cells and subcellular organelles. In particular, we have explored the possibility of modulating hydrodynamic shear stress at microscale to modulate cellular deformation, as well as to selectively disrupt cellular membrane while maintaining the mitochondrial membrane intact. We have also investigated a microfluidics-based method to encapsulate protein payloads into red blood cells by controlling membrane deformation either transiently or extendedly in a microfluidic channel. This presentation will also highlight our recent development of a novel surfactant based on fluorinated plasmonic gold nanoparticles, rendering a previously unavailable feature of photo-responsiveness in droplet microfluidics. Looking forward, we plan to study the fundamentals of how individual cells alter their phenotypes in response to environmental and therapeutic stimuli. These efforts are expected to find clinical applications in diagnostics, prognostics and treatment evaluation of infectious and chronic diseases, as well as to expand our fundamental understanding towards disease development.

Biography

Megan Yi-Ping Ho received her B.S. and M.S. in Power Mechanical Engineering from National Tsing-Hua University, Taiwan. She received her Ph.D. in Mechanical Engineering from the Johns Hopkins University. After her postdoctoral training at the Department of Biomedical Engineering in Duke University, she received the Young Elite Researcher Award from the Danish Research Council and started her independent career in the Interdisciplinary Nanoscience Centre and the Department of Molecular Biology and Genetics at Aarhus University in Denmark. In 2016, she relocated to the Chinese University of Hong Kong and co-founded the Department of Biomedical Engineering therein. She is also the co-founder of two start-up companies situated in Demark, Zymonostics and vPCiR, focusing on enzyme-based diagnostics. The results that she presented have been recognized internationally by the American Society of Gene Therapy and Controlled Release Society. Her research team is focused on developing nanosensors and microfluidics as diagnostic tools to expand the capacity of disease detection and treatment evaluation.

***** ALL ARE WELCOME *****

For enquiries, please contact Ms. Kitty CHUNG, Department of Biomedical Engineering at 3943-8261.