



The Chinese University of Hong Kong
Department of Biomedical Engineering



Time: 10:30 am, 26 August 2019 (Monday)
Venue: Room 513, William M.W. Mong Engineering Building

Engineering cell niches with biomaterials topographies for tissue engineering applications



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Abstract

Stem cells respond to both physical and biochemical changes in their stem cell niche. An ideal scaffold for tissue engineering application should mimic the microenvironment for natural tissue development and present the appropriate biochemical and topographical cues in a spatially controlled manner. Studies have shown that physical forces from the substrate topography play a role in stem cell proliferation, migration and cell fate determination. Our research group is interested in studying the interactions of adult and pluripotent stem cells with nanotopography, the mechanism of the topography-induced cell behavior and how to apply this knowledge to direct stem cell differentiation for tissue engineering applications. In this presentation, nanotopography-regulation on adult stem cells and pluripotent stem cells (PSCs) will be presented as examples of applying nanotopography in stem cell regulation. Examples of nanotopography-modulation on cell behaviors for neuronal differentiation and applications in vascular device and corneal tissue engineering will be also be discussed.

In attempt to understand the sensing mechanisms for nanotopography, we investigated the roles of focal adhesion signaling and cytoskeletal contractility in topography-induced differentiation. The potential mechanisms for topography-induced cell behavior will be discussed in the last part of the presentation.

Biography

Evelyn Yim received her Ph.D. in the Biomedical Engineering at the Johns Hopkins University before performing undergoing her post-doctoral training at the Johns Hopkins School of Medicine and in the Department of Biomedical Engineering at Duke University. Between 2007 and 2015 Evelyn worked in Singapore, where she held a joint appointment from the National University of Singapore, as faculty in the departments of Biomedical Engineering and Surgery, and the Mechanobiology Institute Singapore, a Research Center of Excellence supported by the National Research Foundation Singapore, as a principle investigator studying how chemical and biomechanical cues influence stem cell behavior.

Evelyn joined the Department of Chemical Engineering at the University of Waterloo in 2016. Experienced with nanofabrication technologies and stem cell culture, Evelyn and her group are interested to apply the knowledge biomaterial-stem cell interaction to direct stem cell differentiation and tissue regeneration for vascular and corneal tissue engineering.

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

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