

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: A platform for single cell-cell trapping, pairing, sensing and measurements based on dielectrophoresis-chips and TFT array

Speaker: Mr. Yingzhe Piao (PhD candidate)
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Date: 4 May, 2021 (Tuesday)

Time: 4:30 p.m. (Hong Kong Time)

Zoom meeting: 1) Link to join the meeting:

<https://hku.zoom.us/j/9142609504?pwd=dVI4OTRJdklJUWRuSDVWbHR2OVBYdz09>

2) Meeting ID: 914 260 9504

3) Password: Sm1bC1

Abstract:

Micro fluidics for single cell-cell pairing have become an very important and powerful platform for in vitro analysis of cell interactions because the behavior of a single cell is strongly influenced by the neighbor cell. Understanding of the intercellular interactions is significantly important in the field of cellular biology including the immune system, tissue regeneration, cancer biology and stem cell differentiation. Until now, many approaches have been applied in microfluidics to realize cell trapping and pairing those can be broadly divided into non-contact mode and contact mode trapping technologies. The trapping methods

can be classified into magnetic trapping and acoustic trapping. Each of those methods is associated with some advantages and deficiencies which make them is preferable in certain conditions. Among these approaches, dielectrophoresis(DEP) is one of the versatile methods for cell manipulation because of its compatibility with living cells, label-free nature and capability to integrate with in situ cell measurements. Different scale size electrode can be integrated with the microfluidic systems for inducing electric field with in the liquid. Cells then can be manipulated using dielectrophoretic forces which is induced by the application of the voltages to the electrodes. After solving the problem of cell tapping and pairing, we can use TFT array for cell monitoring and measurements. We can use TFT to monitor the cells presence absence and we can also use it to apply stimulus to certain kinds of cells and measure the feedback of them. If we can combine this two part into a single system, it will be a very powerful platform for biomedical research. In this meeting, we will discuss the fabrication of the cell trapping microfluidics chip and the challenge of integrating the TFT array into the microfluidic chips.

ALL INTERESTED ARE WELCOME

For further information, please contact Dr. P.K.L. Chan at 3917 2634.

Research area: Advanced Materials