



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY
Division of Life Science

LIFS Seminar Series

**Phase transition in postsynaptic densities
underlies formation of synaptic complexes
and synaptic plasticity**

by

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Abstract

Cytoplasm is more than just a bag of freely diffusible molecules. A critical challenge for eukaryotic cells is to distribute numerous molecules into distinct subcellular compartments and to orchestrate biochemical reactions spatiotemporally. In addition to compartmentalization through membrane-enclosed organelles, it is interestingly recognized that biomolecules like proteins and RNAs can automatically assemble into membrane-less structures through liquid-liquid phase separation (LLPS), which has been proposed as a novel mechanism for many cellular processes.

Subcellular compartmentalization is even more critical for neurons than for other cell types due to extreme polarity of neurons. Neuronal synapses are specialized structures where two neurons communicate and postsynaptic densities (PSDs) are membrane-semi open, condensed but dynamic protein complexes beneath the postsynaptic membranes that control synaptic signal receiving, processing and storage. What is the physical nature of the PSD? How does the physical nature dictate its physiological functions? Through studying several key PSD components including PSD-95, SynGAP, SAPAP, Shank and Homer, we propose that synaptic protein complex phase transition might be the underlying mechanism for PSD formation and organization. We attempt to reconstitute the multivalent PSD protein-interacting network in vitro, which exhibits features reminiscent of functional PSD in neurons.

Date : **5 May 2017 (Friday)**
Time : **4:00 p.m.**
Venue : **Padma and Hari Harilela Lecture Theater (LT-C)**
The Hong Kong University of Science & Technology
Clear Water Bay, Kowloon

(Host faculty: Prof Mingjie Zhang)

All are Welcome!!