



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

Seminar Notice

**“Genetic Basis of Neuronal Subtype Differentiation in
Caenorhabditis elegans”**

by

Dr. Chaogu ZHENG
Postdoctoral Research Scientist, Dept of Biology Sciences
Columbia University, USA

Abstract

A central question of developmental neurobiology is how the extraordinary variety of cell types with distinct morphologies and functions is generated in the nervous system. Because of the extreme complexity of mammalian brains, the use of simpler systems became instrumental for our understanding of the genetic basis of neuronal development. In this talk, I will use the mechanosensory touch receptor neurons (TRNs) of the nematode *Caenorhabditis elegans* as an example to discuss how neuronal differentiation is regulated at three major levels: 1) cell fate determination; 2) subtype specification; 3) neurite morphogenesis. First, I will describe how a unique combinatorial code of three transcription factors specifies the TRN fate and promotes specific features of these mechanosensory neurons. Second, I will discuss how the neurons sharing the same TRN fate further diversify into subtypes with different morphology and connections. In particular, our work suggested important dual functions of Hox proteins in this process, both ensuring the adoption of the common TRN fate as “transcriptional guarantors” and promoting the generation of subtype-specific features through a “posterior induction” mechanism. Third, I will talk about how various signaling pathways regulate the development of neurites during neuronal morphogenesis, in particular, the regulation of Wnt signaling in guidance, the role of Guanine nucleotide exchange factors in directional outgrowth, and the function of MTs in neurite extension. If time permits, I will also discuss the opportunities of using the *C. elegans* touch circuit to study fundamental principles of circuit assembly, modulation, and computation.

Date : 10 January 2018 (Wednesday)

Time : 2:30 p.m.

Venue : Lecture Theatre - H

**The Hong Kong University of Science & Technology
Clear Water Bay, Kowloon**

(Host faculty: Prof. King Chow)

ALL ARE WELCOME!!