THE CHINESE UNIVERSITY OF HONG KONG
FACULTY OF MEDICINE
SCHOOL OF BIOMEDICAL SCIENCES

SBS PI Seminar Series 2023-2024

Prof. Mai Har SHAM

Pro-Vice-Chancellor / Vice-President (Research)
Choh-Ming Li Professor of Biomedical Sciences
The Chinese University of Hong Kong

will present a seminar entitled

"Irx3/5 genes in patterning of mammalian cochlear sensory and non-sensory structures"

Abstract

Irx3 and *Irx5* are two linked genes on the *IrxB* cluster, they encode homeodomain transcription factors that are broadly expressed in the developing mammalian inner ear. Human patients with *IRX5* mutations are known to have sensorineural hearing loss. To understand the roles of *Irx* genes in cochlear development and function, we have studied the phenotypes of *Irx* mutant mice and performed single cell transcriptome analysis using embryonic inner ears. We found that $Irx5^{-/-}$ mutant mice exhibited severe hearing loss. $Irx3/5^{-/-}$ double knockout mutant displayed significant abnormalities in non-sensory cell patterning. We showed that the $Sox2^{+}$ saccular and cochlear sensory regions failed to segregate from each other in *Irx3/5* knockouts. The Greater Epithelial Ridge (GER), a cochlear non-sensory structure, was replaced by sensory hair cells of vestibular identity. Using a series of conditional mutants, we further revealed that *Irx3/5* are temporally required before embryonic day 14 in regulating the separation of vestibular and cochlear sensory organs. The *Irx3/5* knockouts also displayed abnormal development of Lesser Epithelial Ridge (LER) and loss of Claudius cells. *Irx3* and *Irx5* are clearly collectively required to control non-sensory epithelial cell fates in the developing cochlea.

7 September 2023, Thursday, 4:00 – 5:00 pm

Room G02, Lo Kwee-Seong Integrated Biomedical Sciences Building,
Area 39, The Chinese University of Hong Kong