NANYANG TECHNOLOGICAL UNIVERSITY

School of Biological Sciences

Seminar Announcement

Genome editing of human stem cells for studies of intracellular trafficking

Date: 26 July 2016, Tuesday

Time: 3:00pm to 4:00pm

Venue: SBS-01n-33 Classroom 1

Host: Nanyang Asst/Prof Miao Yansong



Speaker: Professor David G. Drubin
Department of Molecular and Cell Biology (MCB),
University of California, Berkeley, USA

Abstract

Clathrin-mediated endocytosis (CME) is the best-studied pathway by which cells selectively internalize molecules from the plasma membrane and surrounding environment. To analyze endocytic dynamics in human cells in which endogenous protein stoichiometry is preserved, genome editing is being used to generate numerous stable cell lines expressing combinations of fluorescent protein fusions expressed at endogenous levels from their genomic loci. The genome-edited cells exhibited enhanced endocytic function, dynamics and efficiency when compared with previously studied cells, indicating that CME is highly sensitive to the levels of its protein components. In the last few years, we have begun to edit human stem cells rather than tissue culture cells. These cells have normal ploidy, they can be differentiated into many different cell types isogenically, and they can be used to form tissue-like organoids for the study of cellular processes in the tissue context. CME dynamics are vastly different between isogenic fibroblasts, stem cells and neural progenitor cells.

Biography

Professor Drubin did his undergraduate studies at the University of California at Berkeley. Professor Drubin obtained his Ph.D in Biochemistry from University of California at San Francisco in 1985 and performed his postdoctoral research at MIT. Professor Drubin has been the faculty at the UC Berkeley for 28 years, and previously served as head of the Division of Cell and Developmental Biology and the Graduate Program in the MCB Department.

Professor Drubin is currently the Editor-in-Chief of the American Society for Cell Biology's research journal, **Molecular Biology of the Cell**. The Drubin Lab is interested in the molecular mechanisms that underlie highly dynamic actin-mediated membrane trafficking events. David's lab became the first to use genome editing to express fluorescent fusion proteins at native levels in mammalian cells to avoid perturbing the processes being investigated.