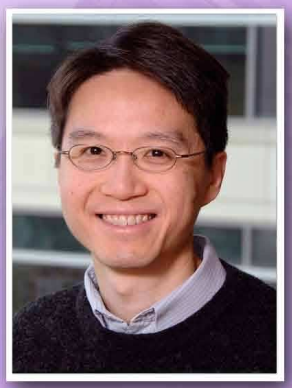
IMCB Invited Speaker



Speaker : **Dr. Ho Yi Mak**
Assistant Investigator, Stowers Institute for Medical Research, USA

Date : 28 June 2012 (Thursday)

Time : 11:00AM - 12:00PM

Venue : Level 3, IMCB Seminar Room 3-46, Proteos

Host : Prof. Wang Yue

Seminar :

Regulation of cellular fat storage at the ER-lipid droplet interface

Lipid droplets are evolutionarily conserved organelles for cellular fat storage. An increase in lipid droplet size or number is a protective mechanism to accommodate fattyacid influx. Failure to do so has been proposed to cause cellular stress and lipotoxicity that is central to the pathology of diabetes and cardiomyopathy. Although many conserved enzymes for fatty acid metabolism and neutral lipid (such as triglyceride) synthesis have been identified, the molecular mechanisms thatcouple triglyceride synthesis with its deposition into lipiddroplets are poorly defined. In addition, close apposition of lipid droplets with the endoplasmic reticulum (ER) has been observed but the molecular mechanisms that enable their physical and functional coupling are not known. Our long-term goals are: (1) understand how fat deposition and mobilization are regulated at lipid droplets in fed and fasted states; (2) identify proteins and regulatory mechanisms that modulate ER-lipid droplet interaction and cellular fat storage.

My lab uses C. elegans as a model organism for rapid identification and functional analysis of fat storage regulators invivo. We have generated transgenic worms that express fluorescent lipid droplet protein markers at physiological levels. This allows us to study genetic and nutrient regulators of lipid droplet dynamics and ER-lipid droplet interaction in a live multi-cellular organism at single-cell resolution. We also use mammalian cells to establish functional conservation of new fat storage regulators. Using a combination of genetic, biochemical and imagingapproaches, we seek to identify genes that may be new targets for intervention of lipotoxicity anddiabetes. These genes will also guide the identification of human genetic variations that underlie fat storage dysregulation.

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