

IMCB Invited Speaker



Speaker : A/Prof. Yoh Wada
*Associate Professor, Division of Biological Sciences,
Institute for Science and Industrial Research,
Osaka University, Japan*

Date : 16 December 2013, Monday

Time : 11:00AM - 12:00PM

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

Host : Prof. Walter Hunziker

Seminar :

**Endosome-Lysosome dynamics during the early stage of embryogenesis
and its implication in patterning of mouse gastrulae**

Endocytic pathway is considered to play essential roles in signal transduction, although its significance in a multi-cellular context remains largely unknown. We show that the endocytic delivery of activated signalling molecules plays essential roles in embryogenesis. In rodent perigastrulation embryos, signalling molecules as well as maternal nutrients must cross a tightly sealed epithelium, visceral endoderm (VE), to reach the embryo proper, implicating importance of endocytic and exocytic functions. We found that the endocytic delivery in VE cells proceeds by microautophagy: large vacuoles engulf incoming pre-vacuolar endosomes without forming a continuous membrane. This unique membrane dynamics is quite different from the canonical endosome-lysosome traffic that involves the fusion of two distinct membranes. The microautophagic delivery of endosomes is highly dependent upon the functions of a HOPS (homotypic vacuolar protein sorting) component, mVam2/mVps41, and a small GTP binding protein, rab7. The genetic impairment of either *mVam2* or *rab7* gene leads to early embryonic death at peri-gastrulation stages, with severe defects in patterning of morphogenetic signalling activities. These results show that endocytosis and microautophagy plays an essential function during the gastrulation, a key developmental process by which animals establish the three germ layers, ectoderm, endoderm, and mesoderm.

About the Speaker :

Dr. Yoh Wada is an Associate Professor in Institute of Science and Industrial Research, Osaka University. After finishing undergraduate study in University of Tokyo, Dr. Wada received his D. Sci. from University of Tokyo. Dr. Wada studied yeast vacuolar assembly in his DSc studies, then moved into the endosome/lysosome function in higher organisms including mouse and Arabidopsis. He is specifically interested in regulatory roles of endocytic trafficking during the early embryogenesis.