THE CHINESE UNIVERSITY OF HONG KONG

SCHOOL OF LIFE SCIENCES

Visualization of the plant organelles with the newly developed electron microscopy techniques

By

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Electron microscopy (EM) techniques are suitable to the acquire images of limited areas under high magnification, but not for wide-range regions such as plant tissues and large cells. We developed a "Giga-pixel EM" wide-range and high-resolution EM system using TEM and field emission scanning electron microscopy (FE-SEM). Giga-pixel images of plant tissues and cells were used to elucidate changes in organelle differentiation and distribution during different phases. Moreover, we are now developing the "EM atlas" zoomable user interface website using giga-pixel images, and start to examine serial slice SEM such as array tomography and serial block face SEM for 3D reconstruction. To link with ultrastructure-gene expression interrelationships, we started to develop correlative light & electron microscopy (CLEM) with fluorescence microscopy using organelles expressing green fluorescence protein (GFP) in plant cells. We developed and introduced a "MirrorCLEM" system of support software and specimen holder for CLEM. Using this system, we achieved rapid and accurate CLEM analysis for plant cells expressing GFP fluorescence using FE-SEM. In this seminar, I will give a talk about developing these systems and applying them for ultrastructural analyses of intracellular compartments and trafficking pathways in plant growth and development.

ALL ARE WELCOME