ASHBi SEMINAR

Correlative Light and Electron Microscopy

Lecturer: Dr Bruno M Humbel

Section leader at Okinawa Institute of Science and Technology (OIST)

Date Friday, 9 April 2021

Time 2:00pm – 3:00pm

Venue Zoom Online Meeting*

*Register via the right QR code

Abstract

In recent years correlative microscopy, combining the power and advantages of light and electron microscopy, has become an important tool for biomedical research. Light microscopy has the advantage of easily searching large areas, even volumes, for the cells of interest, e.g., a special cell type in tissue, astrocytes in brain or for cells that have been modified either by transfections or by RNAi in a large population of nonmodified cells. Also on thin sections, the low magnification of light microscopy and therefore ease of searching large areas are very beneficial to speed-up the analysis of rare events. The predominant disadvantage of this technique, however, is that only the fluorescently labelled structures can be imaged in relation to each other. Electron microscopy reveals the cellular ultrastructure a high resolution and individual organelles, even large protein polymers like cytoskeletal filaments or ribosomes can unequivocally identified. Macromolecules of interest can be labelled with colloidal gold. Searching for a few gold particles within a few cells of a large tissue, however, is very cumbersome and can be extremely time consuming. In addition, labelling with colloidal gold particles can be very inefficient and barely get over background level. Seen the advantages of light and electron microscopy suggests that the optimal approach is to combine both techniques for cell biology and biomedical research. Localisation of rare cellular events are followed and identified by (fluorescence) light microscopy, the high-resolution data and fine localisation to cellular substructures are done by electron microscopy. In combination with super-resolution light microscopy, the fluorescence signal can also be used to label macromolecules by overlying the fluorescence signal with the electron micrograph. In this presentation we willdescribe the approach we have chosen to follow the cell(s) of interest from sampling the tissue until the analysis by electron microscopy.

Organizer : Dr Akiko Oguchi, Prof Yasuhiro Murakawa

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