

CORRELATIVE LIGHT AND ELECTRON MICROSCOPY: CAPTURING ULTRASTRUCTURAL SNAPSHOTS FROM THE LIVING.

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Our work is focused on the development of methods that enable high-resolution snapshots of dynamic events in cells and small model organisms. To achieve that, correlating light and electron microscopy is a powerful solution, because it combines functional imaging (fluorescence microscopy, intravital imaging) with an enhanced ultrastructural readout (electron microscopy). The major challenge while performing multimodal imaging is to retrace the precise localization of one given region of interest, especially through the drastic scale-change that occurs when switching from LM to EM. On cultured cells, adding coordinates is a routine solution that allows significant improvement in the precision together with an acceptable throughput in data collection. In multicellular organisms, anatomical or artificial landmarks can be utilized to build a 3D reference map that allows precise targeting to the sub-volume of interest. We are using both approaches to tackle fundamental questions in cell or developmental biology, as well as in cancer research, using various models such as adherent cells, zebrafish embryos and mice.