

Correlative Imaging across Scales to Understand Membrane Remodeling at the Cell Surface

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Membranes, the foundation for cellularity and subcellular compartmentalization, are universally conserved. However, for cells and organelles to grow, change shape, and mix material and information membranes must be able to bend, divide and fuse. Hence, membrane remodeling is essential to life. To understand membrane remodeling at the molecular level we need to obtain a dynamic, high-resolution view of the changes in membrane architecture, and resolve the spatial and temporal organization of the protein machinery mediating these changes. Accomplishing these goals requires imaging membranes and proteins across different scales, and correlating information from multiple imaging modalities. I will show how correlative light and electron microscopy (CLEM) can be used to gain novel insights into the molecular mechanism of membrane remodeling in the context of biological processes such as endocytosis, exocytosis and cell-to-cell fusion.