

## S36-6 Mechanistic insights into organelle dynamics using semi-intact cell system

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Organelles exchange proteins and lipids each other by vesicular transport, while maintaining their specific morphology and components during interphase. At the onset of mitosis, the balance of vesicular transport between organelles is disturbed, resulting in the drastic change of organelle morphology. To understand the coupling mechanisms between organelle morphology and vesicular transport, we developed the reconstitution systems for the Golgi disassembly, the disruption and reformation of the endoplasmic reticulum (ER), mitotic disruption of ER exit sites, and vesicular transport between ER and Golgi in semi-intact cells using interphase or mitotic cytosol. Semi-intact cells are cells whose plasma membranes have been permeabilized with the bacterial pore-forming toxin, streptolysin O (SLO). Because semi-intact cells allow direct access of proteins, chemicals, and antibodies to the cytoplasm of the cells, we can exchange the intracellular environment to the mitotic one, and study the molecular mechanisms of the mitotic changes of organelle structures. In this paper, I will introduce the semi-intact cell system as a powerful tool for reconstituting the morphological changes of organelles and discuss the molecular mechanisms of the organelle dynamics during mitosis.