

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: A series of time-lapse super-resolution images of the process of lysosomal fusion and fission in live U2OS cells stained with Lysosome-565 at time intervals of 6 s.

File Name: Supplementary Movie 2

Description: A series of time-lapse super-resolution images of one hybrid organelle splitting into three lysosomes in live U2OS cells stained with Lysosome-565 at time intervals of 6 s.

File Name: Supplementary Movie 3

Description: A series of time-lapse super-resolution images of lysosomes slowed down by mitochondria in live U2OS cells stained with Lysosome-565 (green) and Atto 647N (magenta) at time intervals of 1 min.

File Name: Supplementary Movie 4

Description: A series of time-lapse super-resolution images of lysosomes trapped or slowed down by mitochondria in live U2OS cells stained with Lysosome-565 (green) and Atto 647N (magenta) at time intervals of 6 s.

File Name: Supplementary Movie 5

Description: A series of time-lapse super-resolution images of the dynamic process of mitochondria that were either bound to or transferred between lysosomes in live U2OS cells stained with Lysosome-565 (green) and Atto 647N (magenta) at time intervals of 6 s.

File Name: Supplementary Movie 6

Description: A series of time-lapse super-resolution images of the dynamics of the autolysosomes after serum starvation in live U2OS cells stained with Lysosome-565 (green) and Atto 647N (magenta) at time intervals of 10 s.