### Title: Supplementary Movie 1.

**Description:** Fast airyscan microscopy imaging of mitochondria-lysosome contacts in xWt SH-SY5Y cells, stained with MitoTracker Deep Red and LysoTracker Green. Images (n = 500) were taken at an interval of 0.25s and movies generated at 7 frames/seconds. The scale bar = 1  $\mu$ m. Videos support data of figure 4.

# Title: Supplementary Movie 2.

**Description:** Fast airyscan microscopy imaging of mitochondria-lysosome contacts in PLD3 KO SH-SY5Y cells, stained with MitoTracker Deep Red and LysoTracker Green. Images (n = 500) were taken at an interval of 0.25s and movies generated at 7 frames/seconds. The scale bar = 1 μm. Videos support data of figure 4.

# Title: Supplementary Movie 3.

**Description:** Fast airyscan microscopy imaging of mitochondria-lysosome contacts in xM6R SH-SY5Y cells, stained with MitoTracker Deep Red and LysoTracker Green. Images (n = 500) were taken at an interval of 0.25s and movies generated at 7 frames/seconds. The scale bar = 1 μm. Videos support data of figure 4.

# Title: Supplementary Movie 4.

**Description:** Fast airyscan microscopy imaging of mitochondria-lysosome contacts in xV232M SH-SY5Y cells, stained with MitoTracker Deep Red and LysoTracker Green. Images (n = 500) were taken at an interval of 0.25s and movies generated at 7 frames/seconds. The scale bar = 1  $\mu$ m. Videos support data of figure 4.

### Title: Supplementary data 1

**Description**: Html file containing graphical representations of all lipid classes analyzed, with the option for both a quantitative and relative quantitation display.