C. elegans Presenilin Mediates Inter-Organelle Contacts and Communication that Is Required for Lysosome Activity

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Supplementary Figure 1. Lysosome acidification and morphological defects in sel-12 mutants are independent of gamma-secretase activity. Related to Figures 1 and 2. (A) Quantification of average lysosome volume within the ALM TRN soma of wild type, sel-12(art131), and sel-12(ok2078) animals co-expressing nuc-1::mCherry to mark lysosomes and mec-4p::GFP to mark the TRNs (n ≥ 20 animals). (B) Quantification of average hypodermal lysosome volume images in animals expressing nuc-1::mCherry as a marker for the lysosomal lumen (n ≥ 19 animals). (C) Quantification of the average pHTomato fluorescence intensity per lysosome in animals expressing nuc-1::pHTomato controlled by the heat-shock promoter, with increased pHTomato fluorescence intensity indicating increased pH (n ≥ 20 animals). (D) Lysosome volume (nuc-1::mCherry) in wild type, null sel-12(ts11), and sel-12(D226A), which carry a point mutation in a residue necessary for gamma secretase activity (n ≥ 20 animals). *p < 0.05, ****p < 0.0001 using Kruskal-Wallis with Dunn’s multiple comparison test. Comparisons are made to wild type unless otherwise indicated. Error bars indicate mean ± SEM.
Supplementary Figure 2. *sel-12(ty11)* mutants show fragmented mitochondria in the hypodermis. Related to Figure 2. (A) Representative images of hypodermal 2xMLS::GCaMP6f expression (scale bar = 20 μm) and (B) quantification of hypodermal mitochondrial length. ns p > 0.05, ***p < 0.001 using chi-squared test. n = 20 animals. All comparisons are made to wild type animals unless indicated. Error bars indicate mean ± SEM.
Supplementary Figure 3. SEL-12 localizes to the ER. Related to Figure 4. Confocal image of ALM soma in animal co-expressing a functional SEL-12 GFP fusion protein (sel-12p::sel-12::GFP) and pan-neuronal ER reporter (rgef-1p::mCherry::SP12) (scale bar = 5 µm).