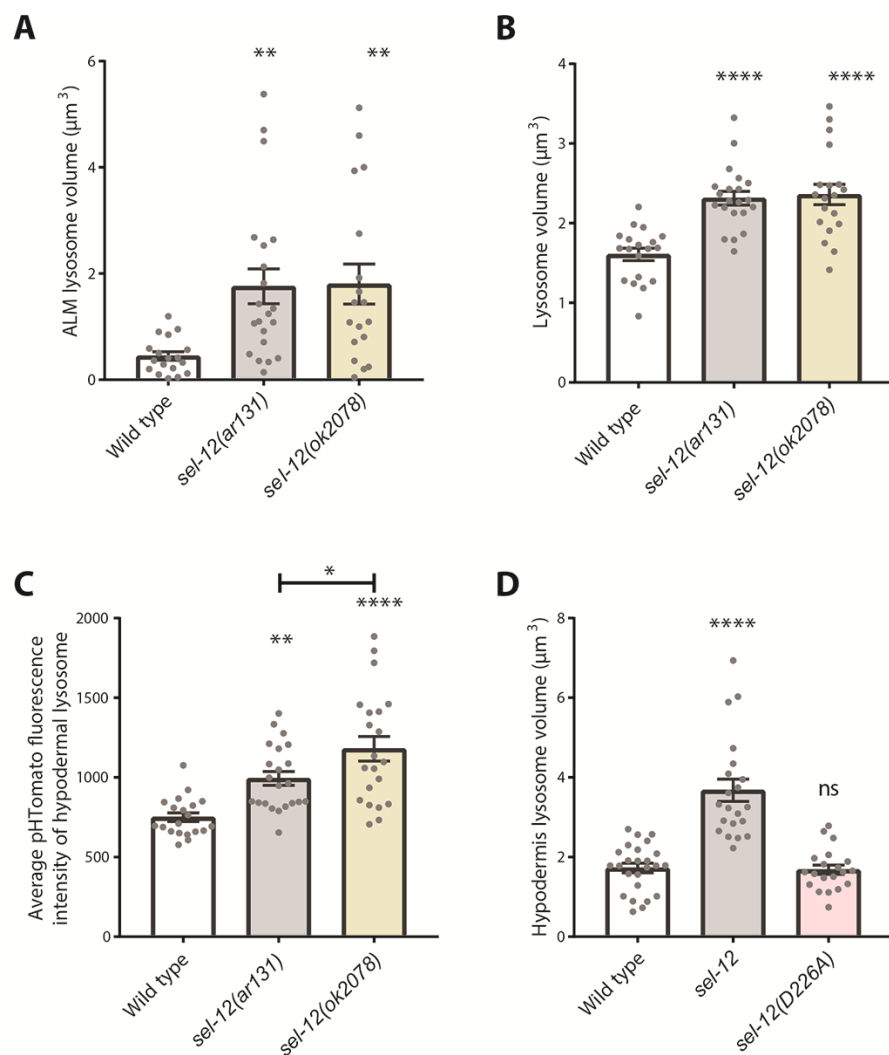


SUPPLEMENTARY DATA

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

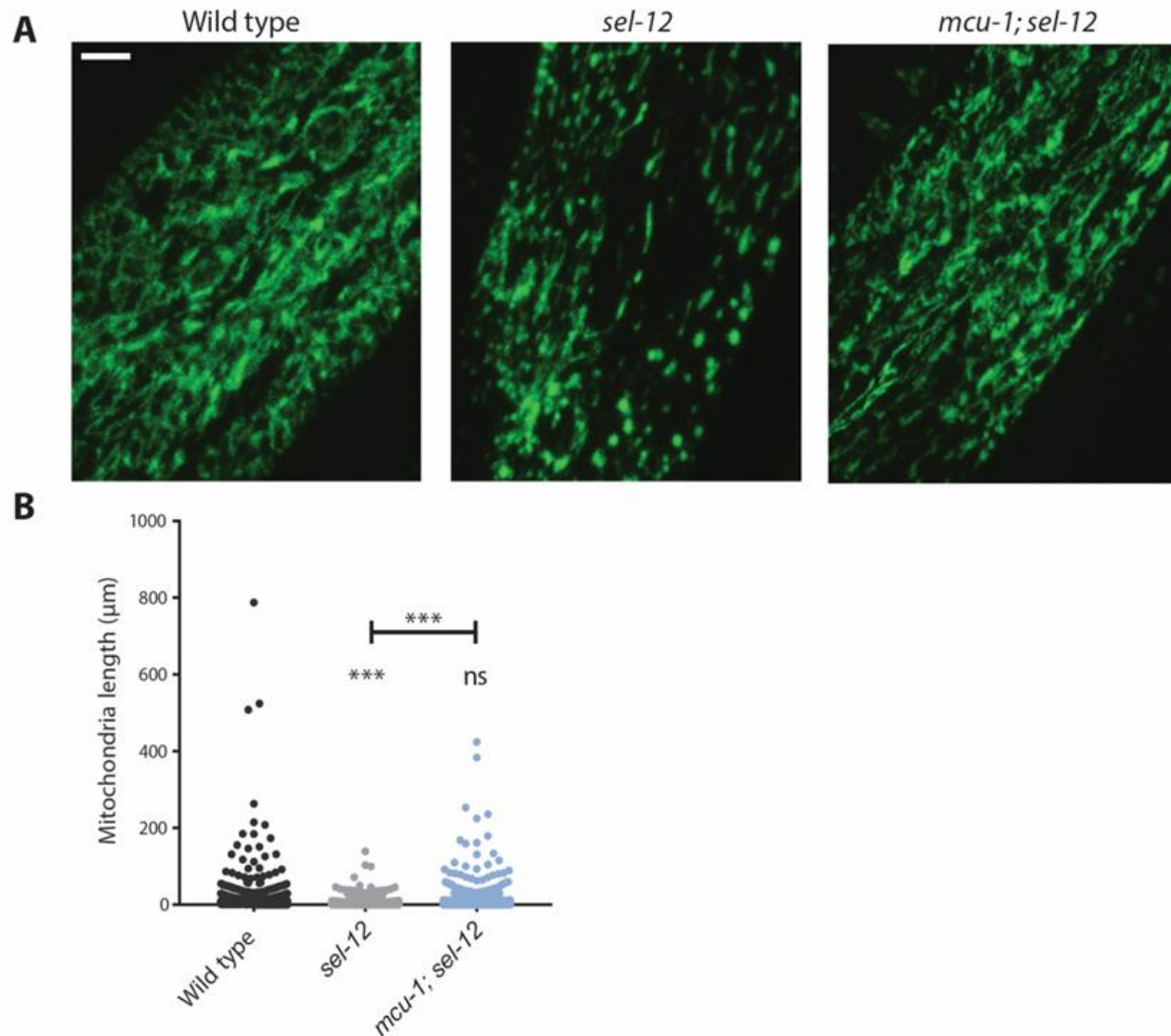
**Kerry C. Ryan, Zahra Ashkavand, Jocelyn T. Laboy, Ling Wang, Margarida Barroso,
Kenneth R. Norman**

SUPPLEMENTARY DATA



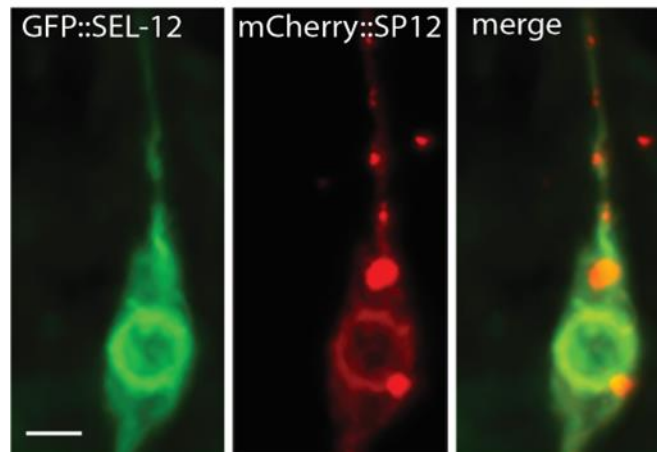
Supplementary Figure 1. Lysosome acidification and morphological defects in *sel-12* mutants are independent of gamma-secretase activity. Related to Figures 1 and 2. (A) Quantification of average lysosome volume within the ALM TRN soma of wild type, *sel-12(ar131)*, and *sel-12(ok2078)* animals co-expressing *nuc-1::mCherry* to mark lysosomes and *mec-4p::GFP* to mark the TRNs ($n \geq 20$ animals). (B) Quantification of average hypodermal lysosome volume images in animals expressing *nuc-1::mCherry* as a marker for the lysosomal lumen ($n \geq 19$ 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 ($n \geq 20$ animals). (D) Lysosome volume (*nuc-1::mCherry*) in wild type, null *sel-12(ty11)*, and *sel-12(D226A)*, which carry a point mutation in a residue necessary for gamma secretase activity ($n \geq 20$ 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 \pm SEM.

SUPPLEMENTARY DATA



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 \pm SEM.

SUPPLEMENTARY DATA



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 μ m).