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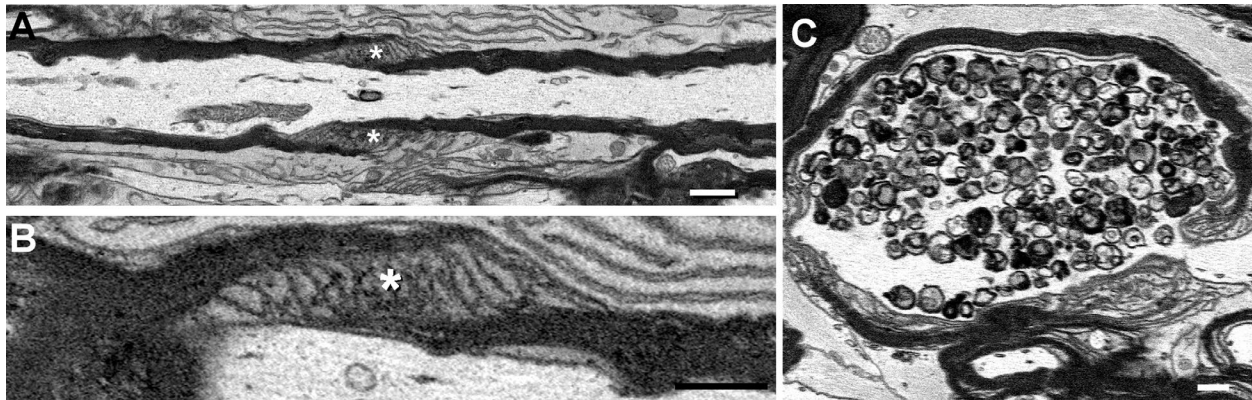


Figure S1. **Electron micrographs of optic nerve axons from 1- and 6-mo-old P₀-CNS mice.** (A and B) SLIs were not sites of intraaxonal organelle accumulation in optic nerves from 1-mo-old P₀-CNS mice. (B) Higher magnification confirms that this is an incisure, rather than paranodal membranes. (C) In axons from 6-mo-old P₀-CNS optic nerves, accumulations of mitochondria, dense bodies, and vesicles were common, in contrast to 1-mo-old P₀-CNS optic nerves (Fig. 2 B). Bars: (A) 0.5 μm; (B and C) 0.2 μm.

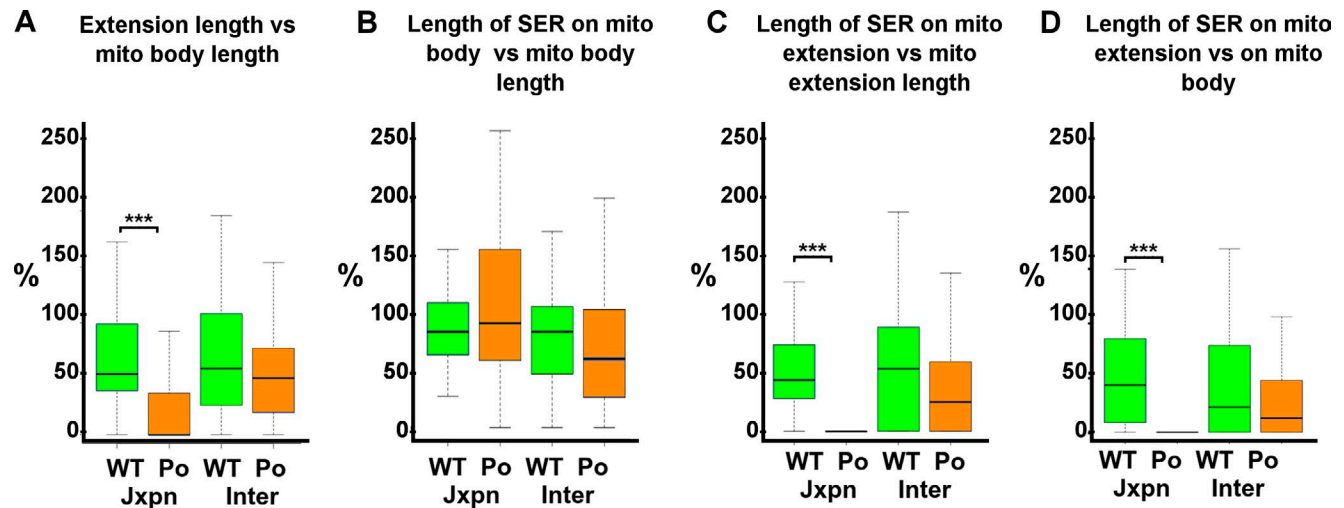


Figure S2. **Mitochondrial outer membrane extensions increase mitochondria–SER associations in optic nerve axons from 1-mo-old mice.** Relative lengths of extensions (A) and mitochondrial outer membrane–SER associations (B–D) expressed as a percentage of the length of the main mitochondrial body (A and B) and extension lengths (C). The contribution of SER on extensions to total SER length is shown as a percentage (D). Data and statistics are from Fig. 3 (N–Q). Box plots: bar, median; box, 25–75%; whiskers, 2.5–97.5%. ***, $P < 0.005$, Wilcoxon signed-rank test with Bonferroni correction; mitochondria pooled from three animals. $n = 28, 42, 63,$ and 62 .

Table S1. **Percentage of mitochondria with normal and pathological morphologies (Fig. 2, E–I) bearing outer membrane extensions**

| Location | Elongated | Round, normal | Round, few/absent cristae | No extensions |
|--------------------------------|-----------------|--------------------------------|---------------------------|-------------------|
| | % | % | % | % |
| WT Jxpn | 79.5 ± 2.3 (58) | 42.5 ± 5.2 (7) | 11.1 ± 13 (1.2) | 33.8 |
| P ₀ -CNS Jxpn | 79.3 ± 6.2 (17) | 12.6 ± 9.5 ^a (5.6) | 10.7 ± 6.1 (3.6) | 73.8 ^a |
| WT Internodal | 89.5 ± 4.4 (62) | 63.1 ± 4.3 (14) | 15.0 ± 6.7 (1.3) | 22.7 |
| P ₀ -CNS Internodal | 67.8 ± 7.7 (36) | 23.7 ± 18.3 ^a (7.5) | 7.0 ± 4.0 (1.1) | 55.4 ^a |

Numbers in parentheses indicate the proportion of total mitochondria in each category (from Fig. 2 I). $n = 3$ animals in each; total mitochondria, 1,528.
^a $P < 0.05$; P₀-CNS versus WT; *t* tests.