

Supplementary Figure Legend

Supplementary Fig. 1 Loss of *syg-1* or *syg-2* does not significantly alter overall PVP branch formation.

Percentage of animals exhibiting PVP collateral branching in wild-type (WT), *syg-1(ky652)*, and *syg-2(ky671)* hermaphrodites. Although branching frequency was modestly reduced in both mutants, neither difference reached statistical significance compared with WT. Numbers within bars indicate animals analyzed. Statistical comparisons were performed using two-sided Fisher's exact test; exact *P* values are shown.

Supplementary Fig. 2 Loss of *syg-1* does not disrupt F-actin enrichment at the PVP branch site.

a, Representative fluorescence images of PVP morphology, LifeAct-labelled F-actin, and merged signals in WT and *syg-1(ky652)* hermaphrodites. LifeAct enrichment remains evident at the PVP branch site in *syg-1* mutants. b, Representative LifeAct fluorescence profiles aligned relative to the vulval region in WT and *syg-1(ky652)* animals. The vulval region is indicated below. c, Quantification of LifeAct enrichment, expressed as the ratio of LifeAct fluorescence intensity within the vulval region to that in the adjacent non-vulval region. Each point represents one animal; horizontal lines indicate mean $\pm$ s.e.m. WT, *n* = 16; *syg-1(ky652)*, *n* = 13. Statistical comparison was performed using a two-sided unpaired Student's *t*-test; exact *P* value is shown.

Supplementary Fig. 3 Secreted SAX-3 ectodomain is insufficient to restore PVP branch orientation.

Percentage of animals exhibiting reversed PVP branches in WT, *sax-3(ky123)*, and *sax-3(ky123)* animals expressing the SAX-3 extracellular domain from CAN neurons (CAN::SAX-3 ecto). Expression of the secreted SAX-3 ectodomain did not significantly reduce the reversed-branch phenotype of *sax-3* mutants, supporting a requirement for membrane-associated SAX-3 in PVP branch stabilization. Numbers within bars indicate animals analyzed. Statistical comparison was performed using two-sided Fisher's exact test; exact *P* value is shown.





