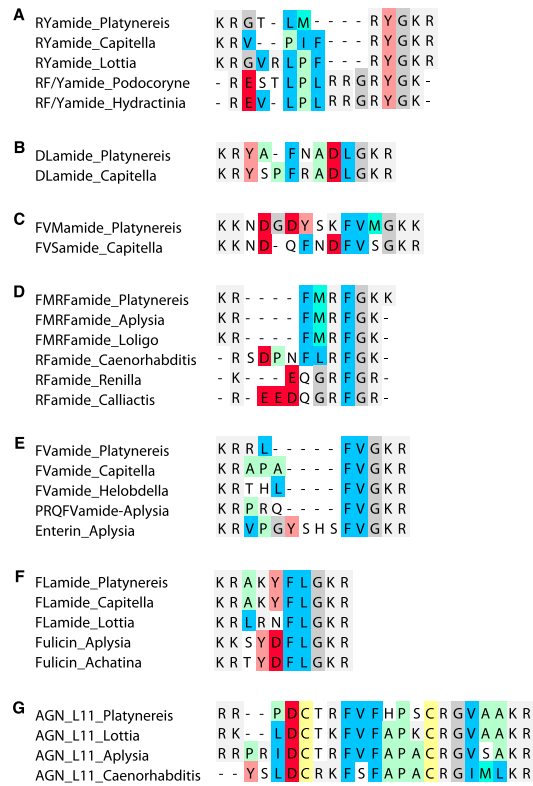
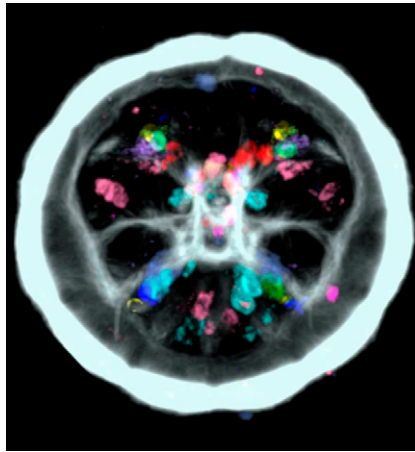


# Supporting Information

Conzelmann et al. 10.1073/pnas.1109085108

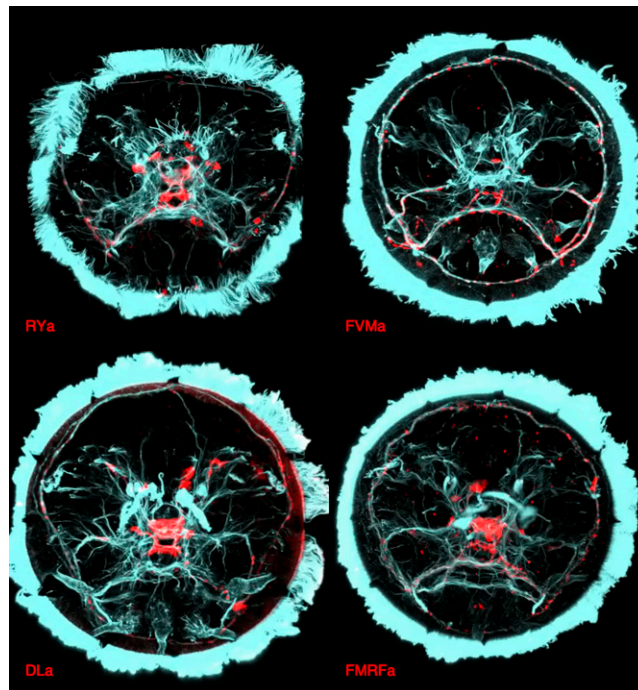


**Fig. S1.** (A–G) Multiple alignment of conserved neuropeptides. Multiple alignments of *Platynereis* RYa, DLa, FVMa, FMRFa, FVa, FLa, and L11 neuropeptides are shown with related neuropeptides from other metazoans including cnidarians (*Podocoryne*, *Hydractinia*, *Renilla*, and *Calliactis*), Lophotrochozoans (*Capitella*, *Lottia*, *Helobdella*, *Aplysia*, *Loligo*, and *Achatina*), and Ecdysozoan (*Caenorhabditis*).



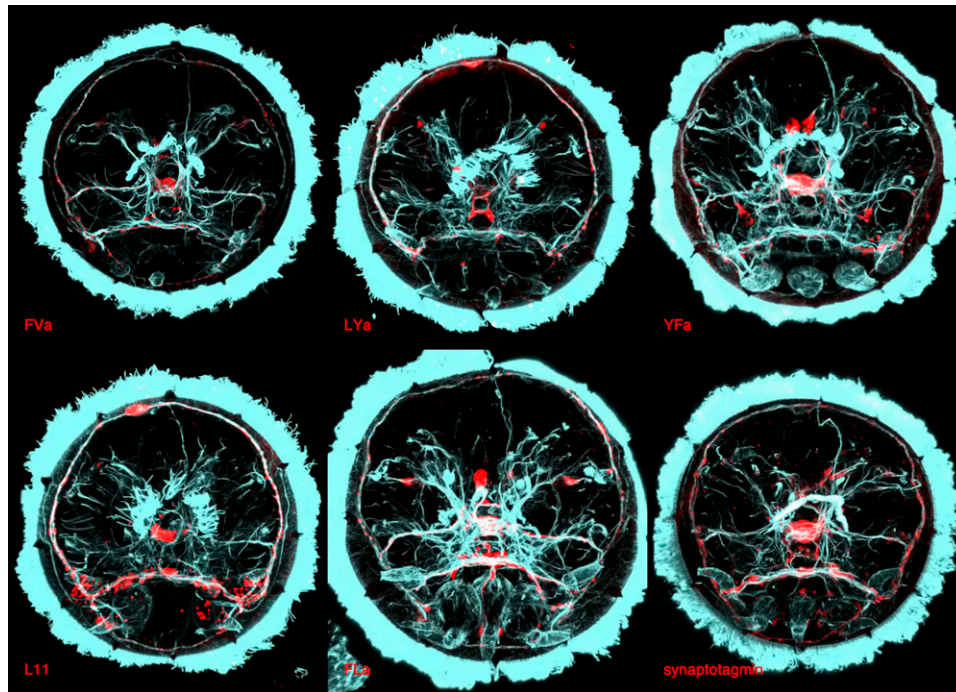
**Movie S1.** Neuropeptide expressions in the *Platynereis* larva. Average expression pattern of each neuropeptide was registered to the same acetylated tubulin reference. Anterior view of a 48-hpf larva is shown.

[Movie S1](#)



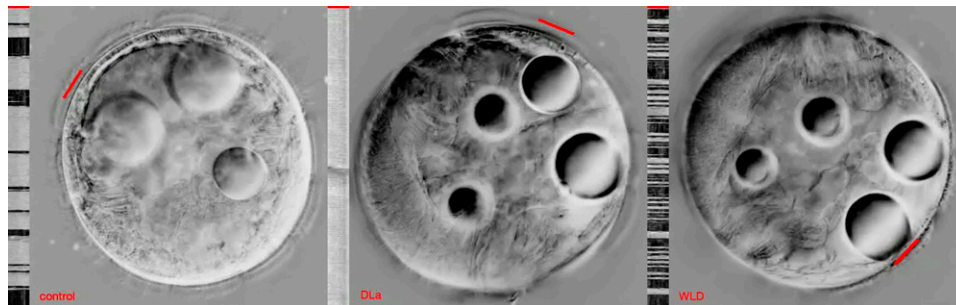
**Movie S2.** Neuropeptide antibody labelings in the *Platynereis* larva. Immunostainings with RYa, FVMa, DLa, and FMRFa antibodies (red) and the acetylated tubulin antibody (white) are shown. All images are anterior views of 48-hpf larvae.

[Movie S2](#)



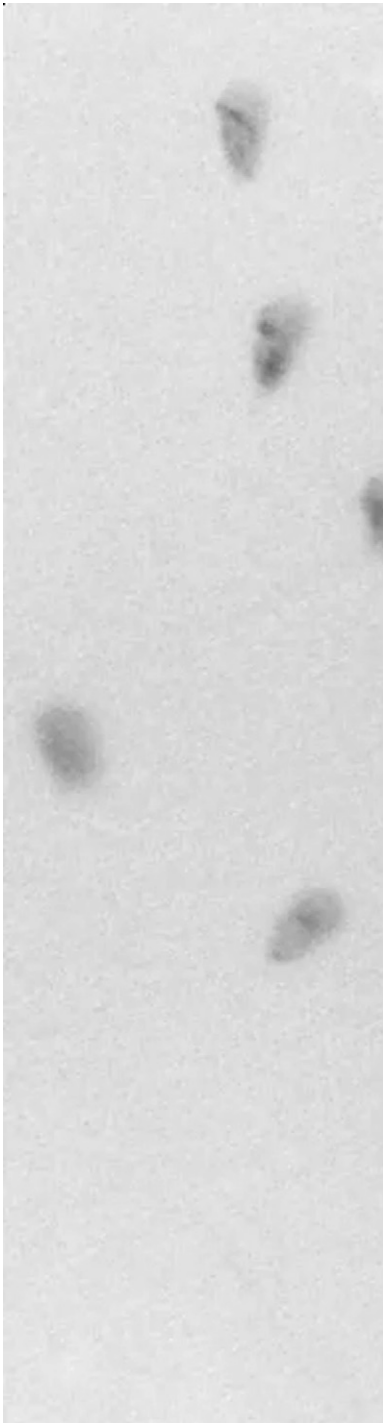
**Movie S3.** Neuropeptide antibody labelings in the *Platynereis* larva. Immunostainings with FVa, LYa, YFa, L11, FLa, and synaptotagmin antibodies (red) and the acetylated tubulin antibody (white) are shown. All images are anterior views of 48-hpf larvae.

[Movie S3](#)



**Movie S4.** Ciliary beating and arrests in *Platynereis* larvae. Ciliary beating and arrests in an immobilized, control 50-hpf *Platynereis* larva and larvae in the presence of 20  $\mu$ M YYGFNNDLa or WLDNSQFRDE neuropeptide are shown. The recordings were done at 15 fps.

[Movie S4](#)



**Movie S5.** Vertical swimming of *Platynereis* larvae. *Platynereis* larvae (50 hpf) swimming in a vertical column are shown (recorded at 30 fps).

[Movie S5](#)