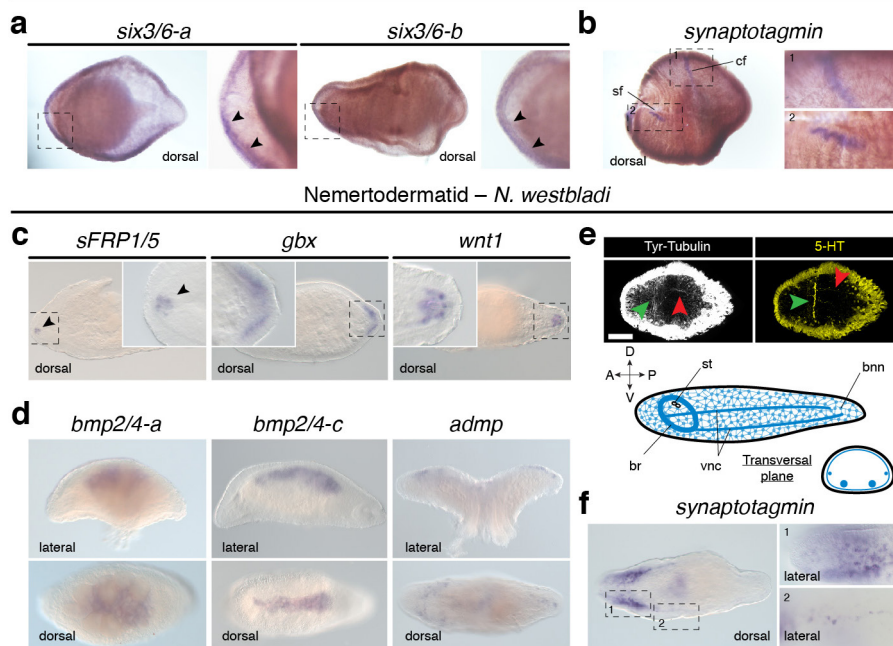


Xenoturbellid – *X. bocki***Extended Data Figure 2 | Gene expression in *X. bocki* and *N. westbladi*.**

**a**, Two *six3/6* paralogues are expressed in the anterior head margin in *X. bocki* (arrowheads). **b**, The neural marker *synaptotagmin* (*syt*) is detected in the circumferential (cf; inset 1) and side (sf; inset 2) sensory furrows in *X. bocki*. **c**, In *N. westbladi*, the anterior marker *sFRP1/5* (arrowhead) and the posterior genes *gbx* and *wnt1* are asymmetrically expressed along the anteroposterior axis of *N. westbladi*. **d**, The BMP ligands *bmp2/4-a* and *bmp2/4-c* are expressed dorsally, whereas the BMP

antagonist *admp* is expressed dorsolaterally. **e**, The CNS of *N. westbladi* comprises an anterior ring-like commissure (green arrowheads) and a main pair of ventral condensations (red arrowheads). **f**, The neuronal marker *syt* is highly expressed in the anterior part (inset 1), and in the nerve cords (inset 2). In the different panels, dotted rectangles indicate magnified areas. In all panels, the anterior pole is to the left. The schematic drawing in **e** is not to scale. Scale bar, 100  $\mu\text{m}$  in **e**.