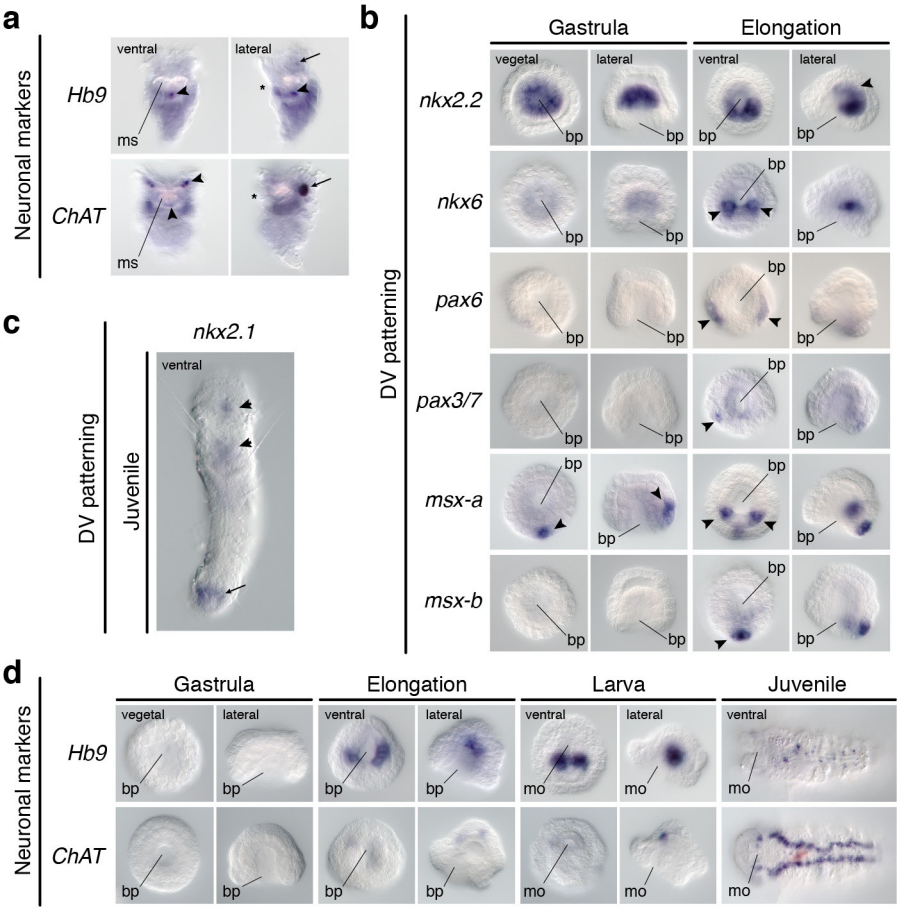

Extended Data Figure 9 | Molecular patterning and motor neuron markers in Rotifera and Annelida. a, Expression of the motor neuron markers *Hb9* and *ChAT* in juveniles of the rotifer *E. senta*. The gene *Hb9* is detected in neurons of the mastax (arrowheads) and weakly in isolated cells of the brain (arrow). The gene *ChAT* is detected in the brain (arrow), cells of the corona and mastax (arrowheads). **b**, Expression of dorsoventral patterning genes in gastrulae and elongating embryos of *O. fusiformis*. The genes *nkx2.2* and *nkx6* are expressed in the internalized endomesoderm (arrowheads). The gene *pax6* is expressed in two lateral rows during elongation (arrowhead) and *pax3/7* in two lateral cells (arrowhead). Of the two paralogues, *msx-a* is first detected in a posterior ectodermal domain (arrowhead) and in two additional bilaterally symmetrical posterior cells (arrowheads) during elongation. The gene *msx-b* is only detected during elongation in a posterior domain (arrowhead). **c**, Ventral view of the expression of *nkx2.1* in the juvenile of the annelid *O. fusiformis*. This gene is detected in the foregut (arrowheads) and hindgut (arrow). **d**, Expression of the motor neuron markers *Hb9* and *ChAT* in *O. fusiformis*. *Hb9* is first detected in lateral domains of the archenteron/gut during embryogenesis and in the larva, and in isolated cells of the ventral trunk of the juvenile. The gene *ChAT* is detected in three cells of the apical region of the embryo and larva, and in the neuropile and two lateral ventral cords of the juvenile. Abbreviations: bp, blastopore; mo, mouth; ms, mastax. The asterisk in **a** marks the position of the mouth.