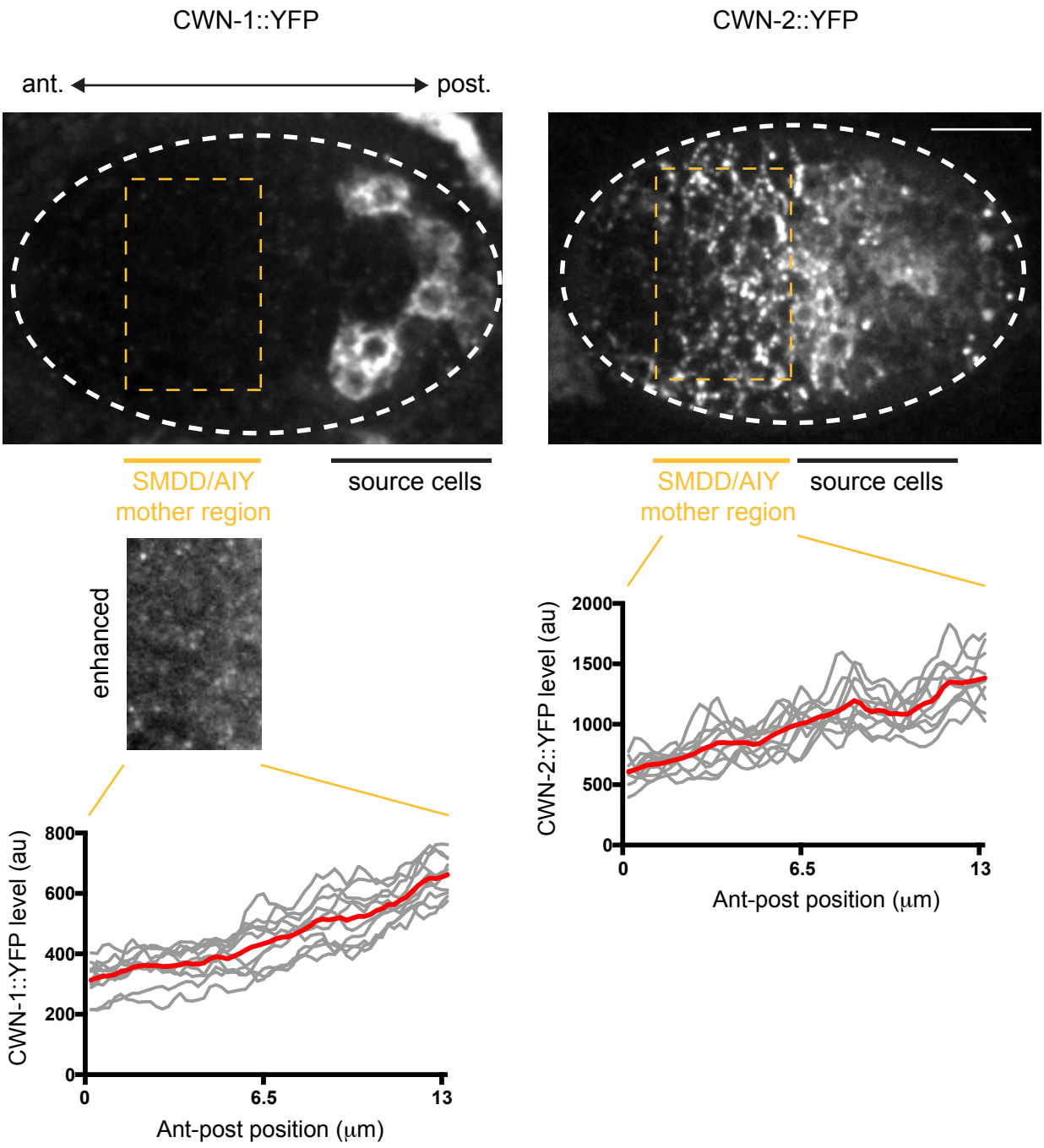

Fig. S1. Expression of CWN-1::YFP and CWN-2::YFP protein fusions. Expression of CWN-1::YFP (*vbaIs38*) and CWN-2::YFP (*vbaIs43*) protein fusions in the embryo at epidermal enclosure stage. Ventral view, scale bar = 10 µm. The orange boxes represent the region where the two SMDD/AIY mothers are located and where the CWN-1::YFP and CWN-2::YFP levels are measured. For CWN-1::YFP a version of the box where fluorescent signal is enhanced is also presented. Graph: CWN-1::YFP and CWN-2::YFP levels in the SMDD/AIY mother region (orange box) plotted along the anteroposterior axis. The grey curves represent individual embryos and the red curve represents the mean curve, n= 10 embryos for each genotype (the maximum anteroposterior elongation observed for the SMDD/AIY mother cell is 10 µm).

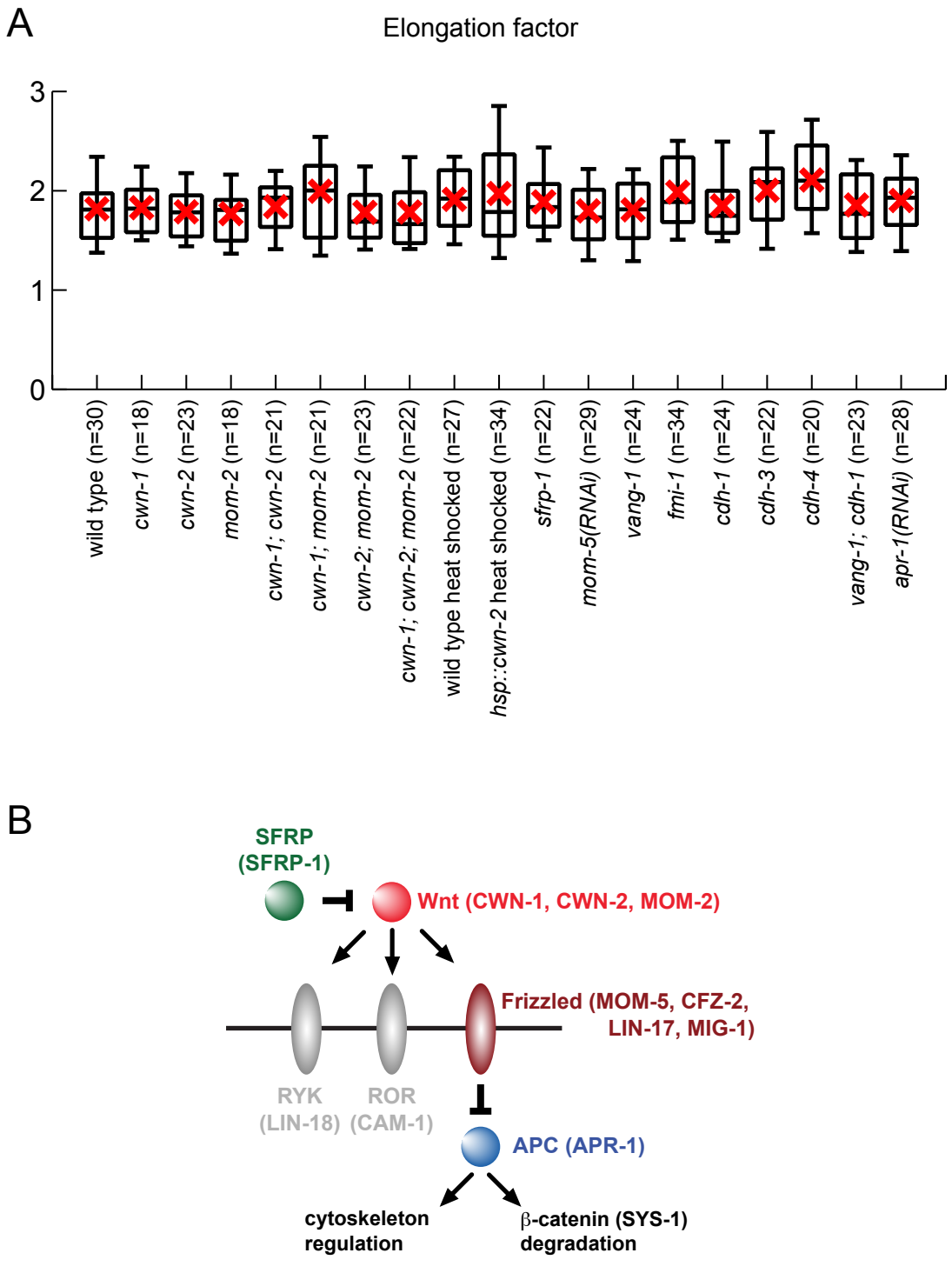

Fig. S2. Effect of various mutants on the elongation factor of the SMDD/AIY mother cell. (A) Elongation factor of the SMDD/AIY mother cell (labeled with *ttx-3p::gfp*) during interphase in various mutant or RNAi treated embryos. The black box represents the median and quartiles; the whiskers represent the 9th and 91st percentiles; the red cross represents the mean; n = number of cells. (B) Scheme of the Wnt pathway presenting the different components analyzed in this study.

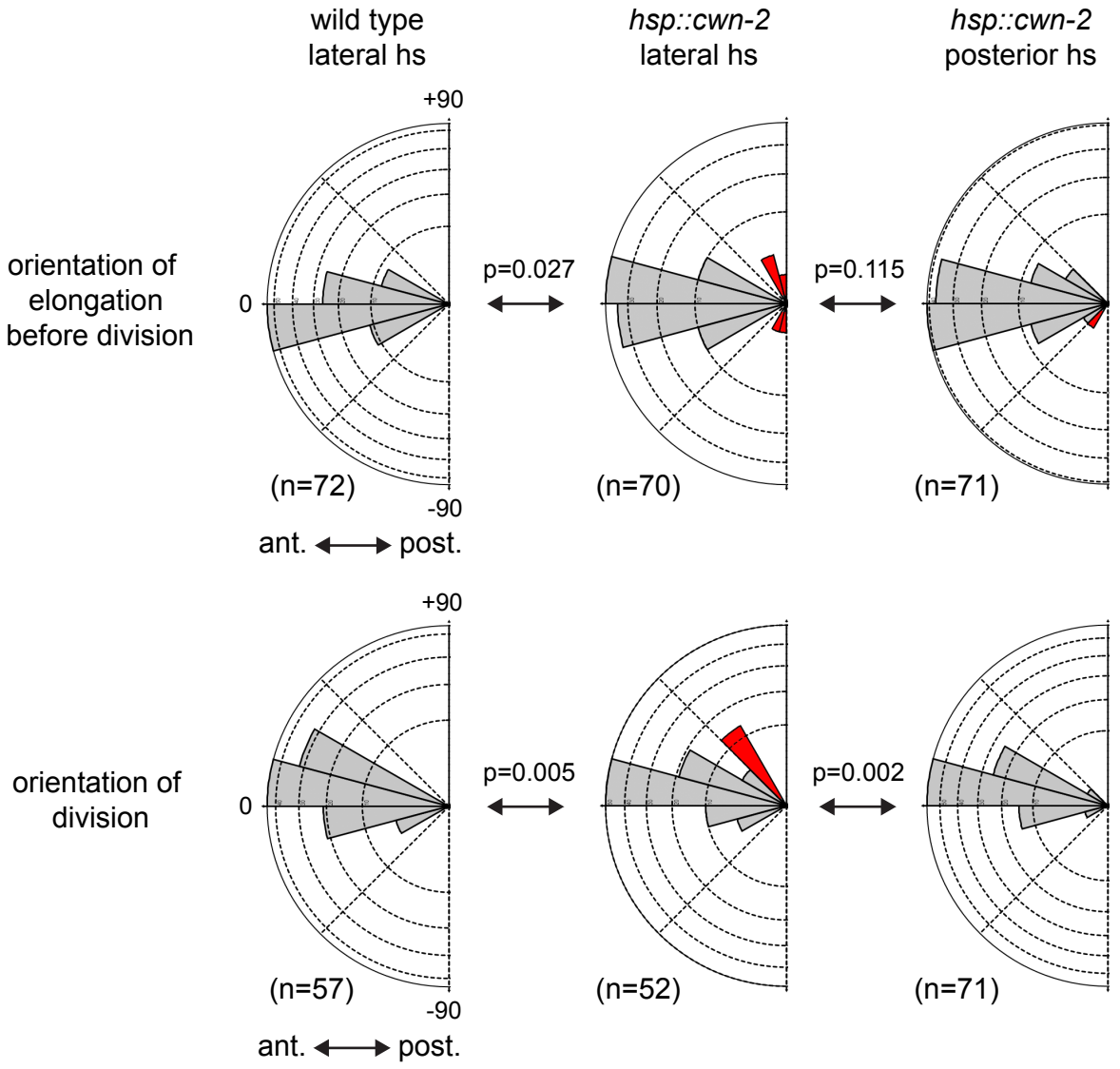

Fig. S3. Induction of a local source of Wnt in the embryo using a laser. Orientation of the elongation of the SMDD/AIY mother (labeled with *ttx-3p::gfp*) before division or of the SMDD/AIY mother division in wild type or *hsp::cwn-2* (*vbaIs5*) embryos. Local heat shock was performed laterally or posteriorly. Rose plot: 0° anterior, -90° lateral, +90° medial, circular grid 10%, n = number of cells, p values Fisher.

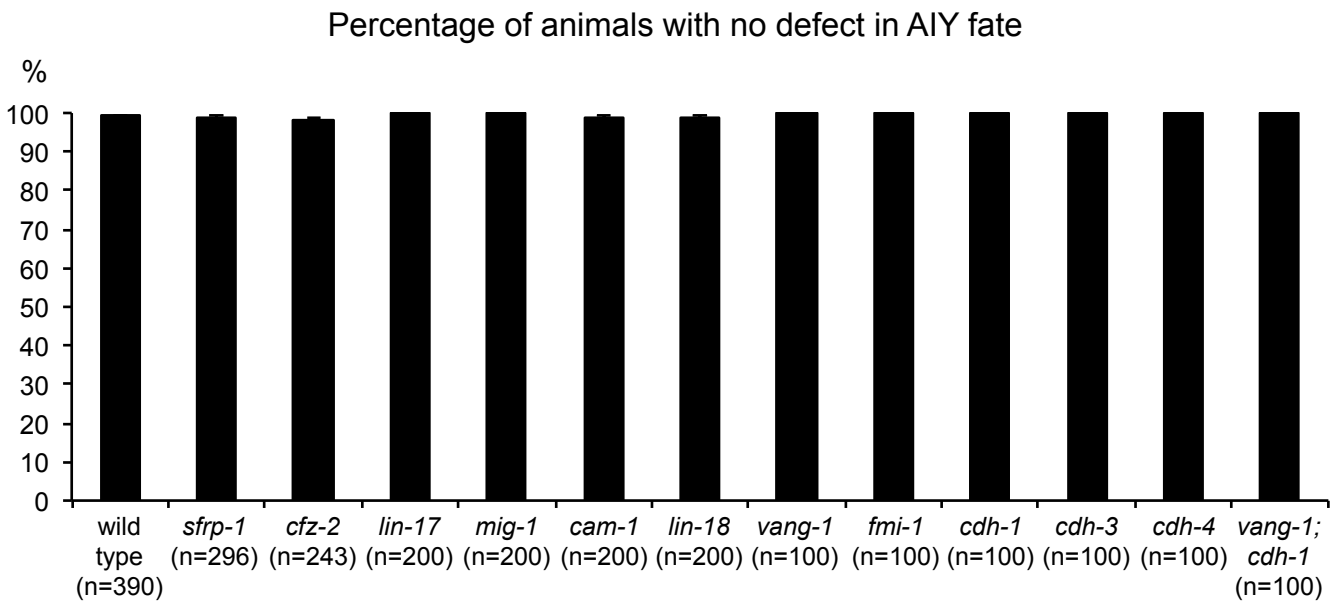

Fig. S4. Effect of various mutants on the fate of the AIY neuron. Percentage of animals presenting a wild type expression of *ttx-3p::gfp* in the two AIY neurons at late larval stage (L4). Error bars = s.e.p., n = number of animals.

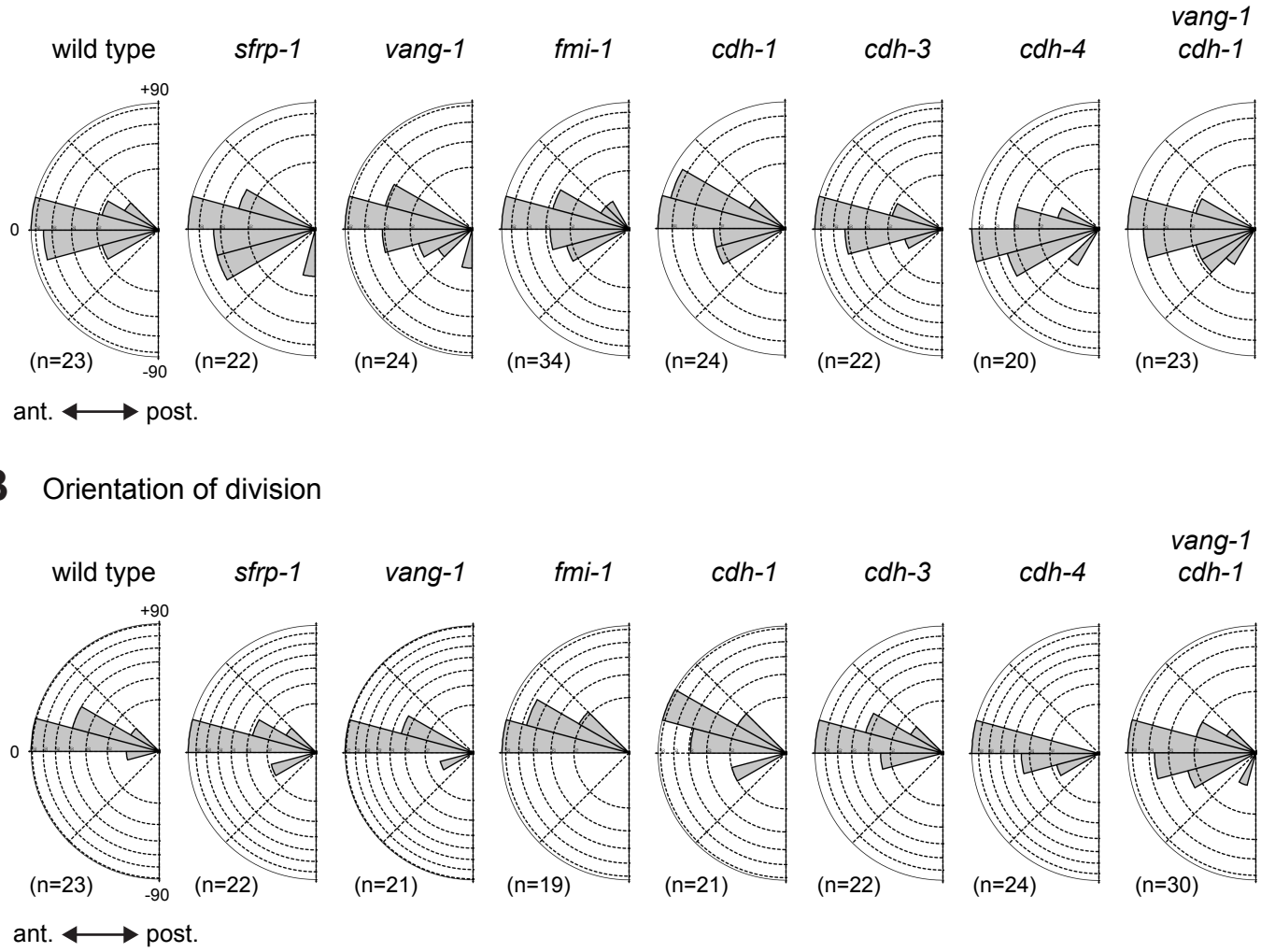

Fig. S5. Effect of various mutants on orientation. (A) Orientation of the elongation of the SMDD/AIY mother cell (marked with *ttx-3p::gfp*) before division. (B) Orientation of the division of the SMDD/AIY mother cell. Rose plot: 0° anterior, -90° lateral, +90° medial, circular grid 10%, n = number of cells.

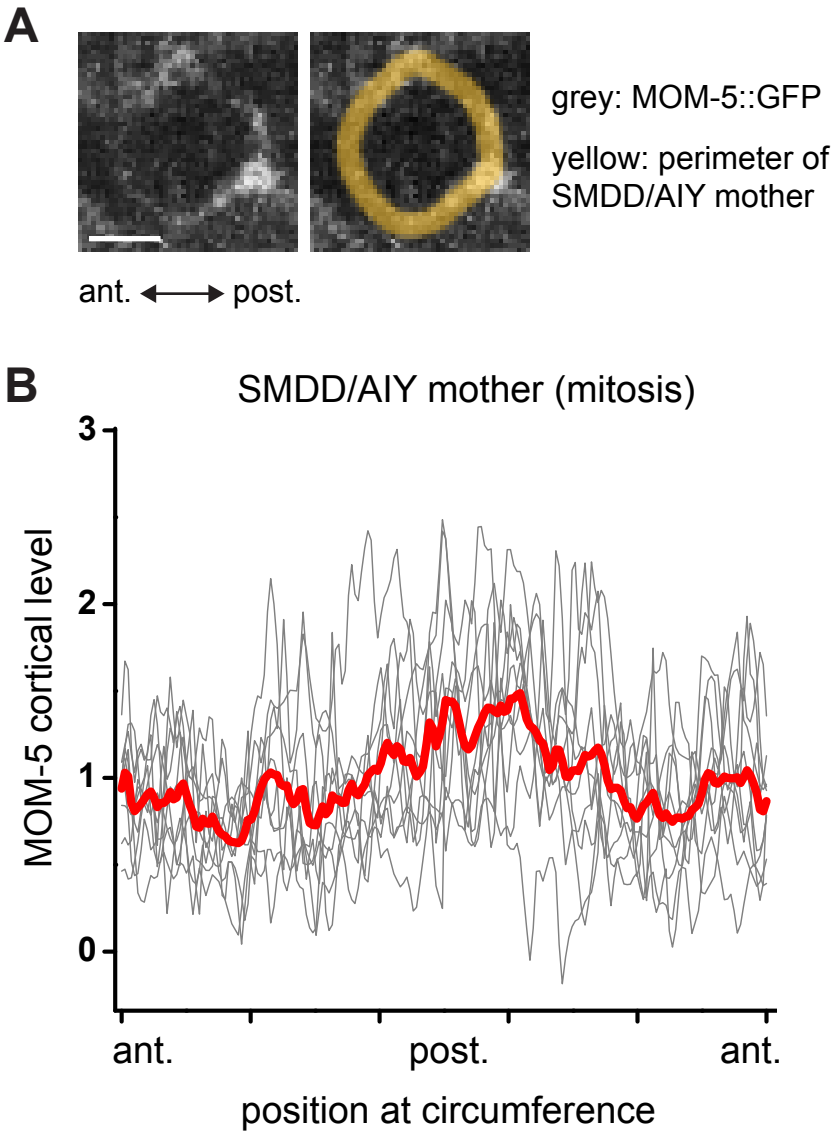

Fig. S6. MOM-5 localization. (A) Localization of MOM-5::GFP (*zuIs145*) in the SMDD/AIY mother cell (identified with *hlh-16p::mCherry*, *otIs10546*) during mitosis (cell rounded). The perimeter of the SMDD/AIY mother cell is indicated in yellow. Ventral view, scale bar = 2 µm. (B) MOM-5::GFP fluorescence intensity profile at the membrane of the SMDD/AIY neuronal progenitor. The x-axis presents the position at the circumference of the cell with the posterior pole in the middle and anterior pole at both ends. The grey curves represent individual cells and the red curve represents the mean curve, n = 10 cells.