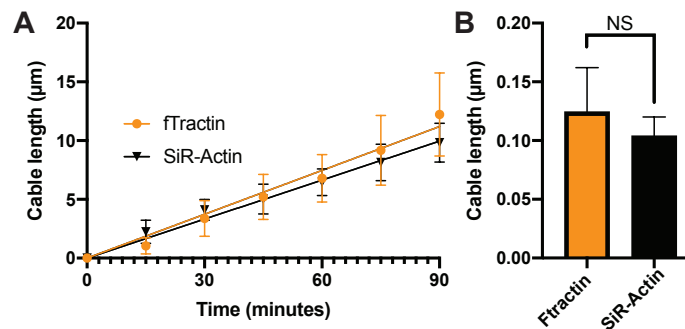
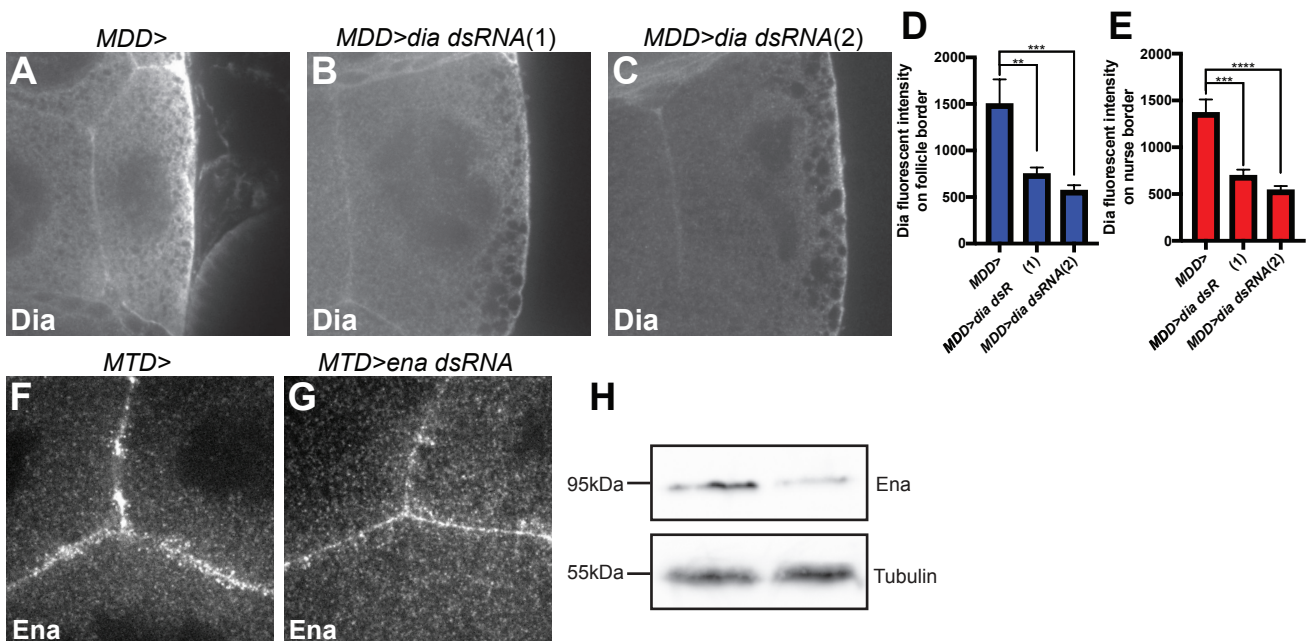


Figure S1



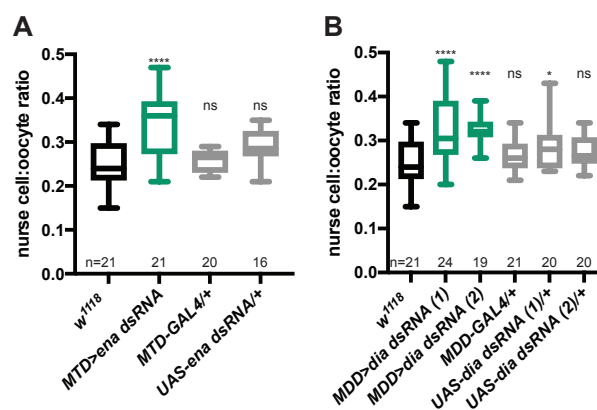
**Fig. S1.** (A,B) Nurse cable growth rate is indistinguishable in *fTractin-tdTomato* expressing nurse cells and *w<sup>1118</sup>* (wild type) nurse cells labelled with SiR-Actin. Two-tailed t-test, *n*=6.

Figure S2

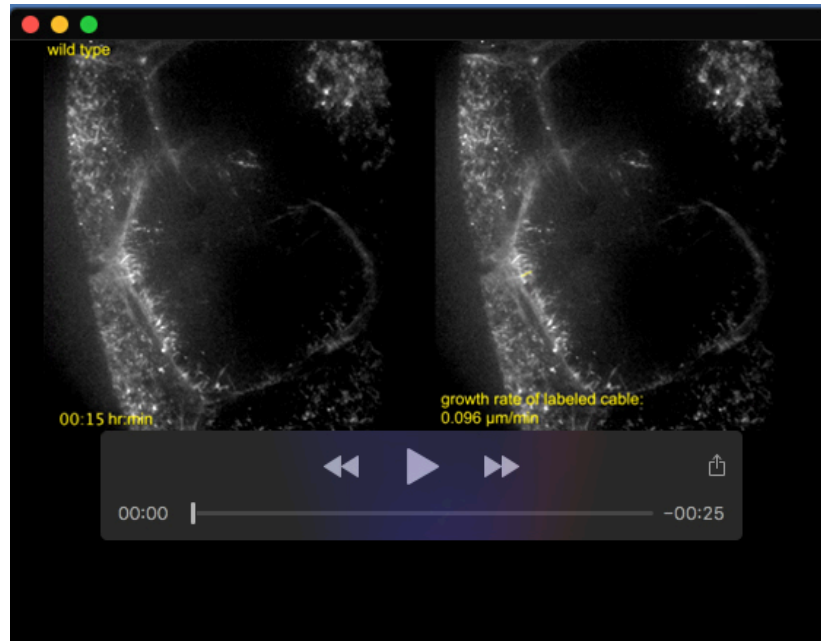


**Fig.S2.** (A-C) Dia immunostaining in fixed control (A) and *dia* knockdown (B-C) egg chambers. (D,E) Dia fluorescent intensity at the follicle border (D) and nurse border (E). (F,G) Ena immunostaining in fixed control (F), and *ena* knockdown (G) egg chambers. (H) Immunoblot of Ena and tubulin (loading control) in control and *ena* knockdown ovaries. One-way ANOVA Tukey's post-hoc analysis, \*\**p*<0.002, \*\*\**p*<0.0002, \*\*\*\**p*<0.0001.

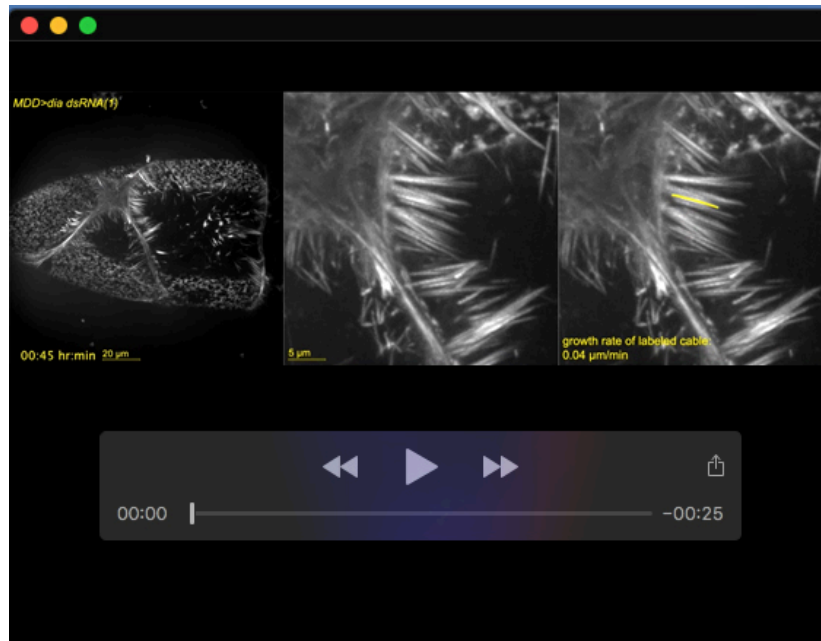
**Figure S3**



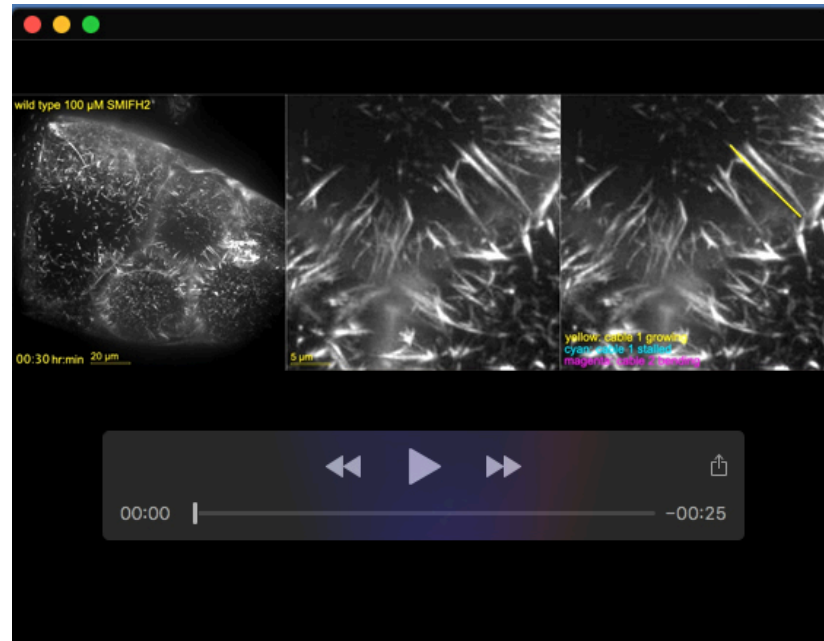
**Fig. S3.** *ena* (A) and *dia* (B) knockdown egg chambers have a significantly increased nurse cell to oocyte ratio consistent with incomplete dumping. n as indicated. One-way ANOVA Tukey's post-hoc analysis, \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\*\* $p < 0.0001$ .



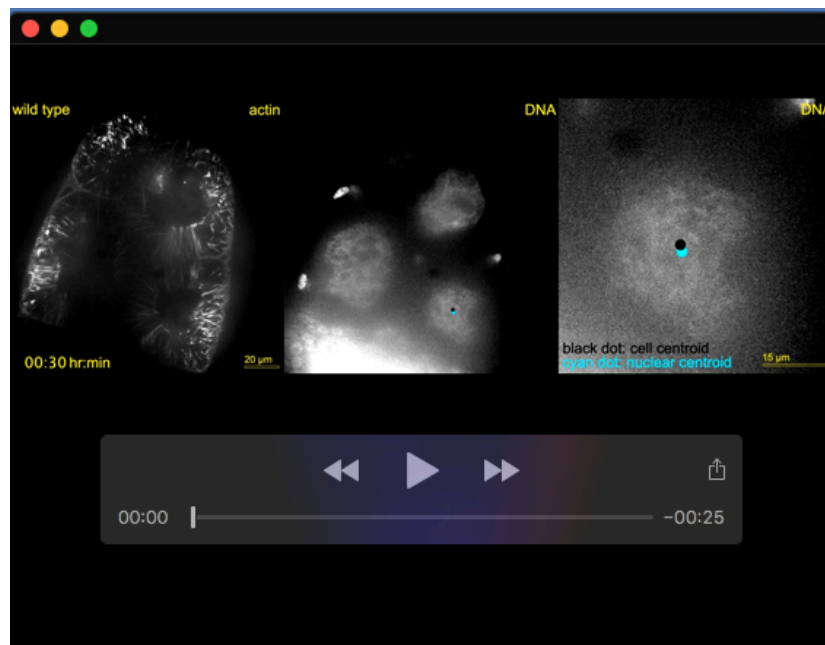
**Movie 1.** 120 min of actin cable growth in a SiR-Actin labeled wild type (*w<sup>1118</sup>*) stage 10B egg chamber. Images were taken every 15 min. The labeled cable is growing at approximately 0.096  $\mu\text{m}/\text{min}$ , typical for wild type nurse cables (Fig. 3B). Cable length was assessed by measuring the Euclidian distance between the cortex and the distal tip of an actin cable. Each frame is a maximum projection of 15 optical slices at 0.5  $\mu\text{m}$  step size.



**Movie 2.** 90 min of actin cable growth in a SiR-Actin labeled *MDD>dia dsRNA(1)* stage 10B egg chamber. Images were taken every 15 min. The labeled cable is growing at approximately 0.04  $\mu\text{m}/\text{min}$ , typical of the slow growing nurse cables in this genotype (Fig. 5G). Cable length was assessed by measuring the Euclidian distance between the cortex and the distal tip of an actin cable. Each frame is a maximum projection of 16 optical slices at 0.5  $\mu\text{m}$  step size.



**Movie 3.** 75 min of actin cable growth in a SiR-Actin labeled wild type ( $w^{1118}$ ) stage 10B egg chamber treated with 100  $\mu\text{M}$  of the formin inhibitor SMIFH2. Images were taken every 15 min. This video illustrates two significant differences we observed with inhibitor treatment of wild type egg chambers. For the first 30-35 min in the inhibitor, cable growth proceeds as normal (yellow), but by approximately 45 min the cables stop growing (cyan; Fig. 6A-C). In addition, some cables bent as they grew (magenta; Fig. 6G,H). Each frame is a maximum projection of 16 optical slices at 0.5  $\mu\text{m}$  step size.



**Movie 4.** 120 min of nuclear movement in a SiR-Actin and Hoechst labeled wild type ( $w^{1118}$ ) stage 10B egg chamber. Images were taken every 15 min. Each frame is a maximum projection of 5 optical slices at 0.5  $\mu\text{m}$  step size. This is an example of the type of data we used to calculate the nuclear movement trajectories and distances shown in Fig. 8K. In this example, we used ImageJ (Fiji v.1.53q) to calculate the cell centroids (black dots) using the actin images and the nuclear centroids (cyan dots) using the nuclear images for each frame. For the data in Fig. 8K, only the 0 min and 90 min time points were used to calculate trajectory and distance (see Methods for details). Thus, in our quantification, we did not track the specific paths that the nuclei take like we did in this example. More detailed tracking of nuclear paths in future experiments might generate novel insights into how the actin cable arrays guide nuclear movement.