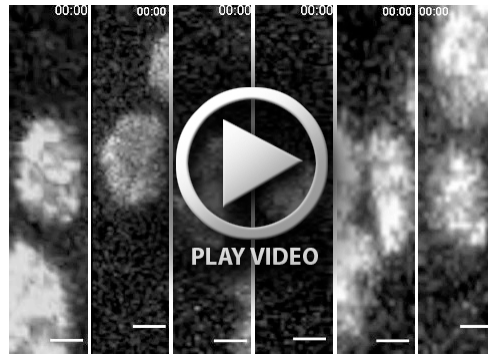


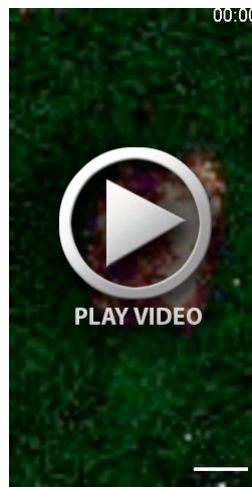
Movie 1: Microtubule organization is normal in *Khc*⁸ and *Dhc64C*⁴⁻¹⁹ mutant embryos

EB1-eYFP was expressed in control and *Dhc64C*⁴⁻¹⁹ mutant embryos and EB1-GFP was expressed in *Khc*⁸ mutant embryos. Movies are projections taken through the entire lateral transverse muscles at a rate of 1 stack/6 s. Number, direction and speed of comets are similar in each genotype.



Movie 2: Changes in nuclear direction

The *apRed* transgene (Richardson et al., 2007) was used to visualize nuclei moving in stage 15 embryos. Movies are projections of images taken through the lateral transverse muscles and correspond to the montages shown in Fig. 4B. Genotypes from left to right are Control, *Khc*^{8/+}; *Dhc64C*^{4-19/+}, *Dhc64C*⁴⁻¹⁹, *Khc*⁸, *Glued RNAi* and *Klc*^{8ex94}. Notice that in Control and *Khc*^{8/+}; *Dhc64C*^{4-19/+} embryos nuclei rotate and maintain the same leading edge during the change in direction whereas in *Dhc64C*⁴⁻¹⁹, *Khc*⁸, *Glued RNAi* and *Klc*^{8ex94} mutant embryos the direction changes are not accompanied by nuclear reorientation.



Movie 3: Nuclear U-turn

The *apRed* transgene (Richardson et al., 2007) was used to visualize nuclei moving in stage 15 embryos. This movie is of nuclei in a control embryo. Notice that the nucleus on the left changes direction by moving its trailing edge to the opposite side of the leading edge before moving toward the bottom of the movie.