



Figure S1. Western blot depicting EB1 depletion by RNAi. Alpha tubulin was used as a loading control.

Movie S1a. Mitotic progression in a control cell stably expressing GFP/ α -tubulin. Note the kinetochore-driven formation of K-fibers.

Movie S1b. Spindle collapse in a *Drosophila* S2T cell depleted of CLASP by RNAi. Several kinetochore fibers were generated by kinetochores as the spindle collapsed. One of the centrosomes is not visible in some focal planes during the early recording stages.

Movie S2a. Control cell showing the re-growth of a K-fiber after severing by laser microsurgery.

Movie S2b. A CLASP-depleted cell in which a K-fiber was severed. Note that the fiber does not re-grow even as the spindle gradually collapses.

Movie S2c. K-fibers severed in dynein-depleted cells re-grow at the same rate seen in control cells.

Movie S2d. **K-fibers severed in EB1-depleted cells re-grow at the same rates seen in control cells.**