Supplementary Material

Fig. S1. Meiosis I chromosomes visualized in *histone2A-gfp* oocytes. (A) The condensed bivalent chromosomes can be seen within a faintly autofluorescent bipolar spindle. (B, C) The bivalent chromosomes are observed in spindles whose shape can be inferred by the exclusion of the high background of fluorescent particles in the oocyte cytoplasm. Bar, 5 μm.

Movie 1. Anastral spindle assembly in a wild-type *ncdgfp** oocyte. Time-lapse sequence of meiosis I spindle assembly in a wild-type *ncdgfp** oocyte. NcdGFP* fluorescence is white. Images were collected at 30-second intervals and are displayed at 10 frames/second. See Fig. 1 for still images from the time-lapse sequence.

Movie 2. Movement of chromosomes in the meiosis I spindle. Time-lapse sequence of chromosomes in a meiosis I spindle from a wild-type *ncdgfp** oocyte (same oocyte as shown in Movie 1 and Fig. 1). NcdGFP* fluorescence is white. Images were collected at 30-second intervals and are displayed at 10 frames/second. See Fig. 3 for still images from the time-lapse sequence.

Movie 3. Anastral spindle assembly in a *histone2A-gfp* oocyte. Time-lapse sequence of meiosis I spindle assembly in a *histone2A-gfp* oocyte. Histone2A-GFP fluorescence is white. Images were collected at 30-second intervals and are displayed at 10 frames/second. Many fluorescent particles are present in the oocyte cytoplasm. The germinal vesicle is dark and the karyosome of condensed meiotic chromosomes, or endobody, is fluorescently labeled. The sequence starts at germinal vesicle breakdown. The dark outline of a bipolar spindle can be seen at the end of the sequence (36 minutes 30 seconds after the end of germinal vesicle breakdown).

Movie 4. Anastral spindle assembly in an *ncd^{2}gfp** oocyte. Time-lapse sequence of meiosis I spindle assembly in an *ncd^{2}gfp** mutant oocyte. Ncd^{2}GFP* fluorescence is white. Images were collected at 30-second intervals and are displayed at 10 frames/second. The sequence starts 2 minutes 40 seconds after the end of germinal vesicle breakdown. A bipolar spindle failed to form by the end of the sequence (72 minutes 12 seconds after the end of germinal vesicle breakdown).

Movie 5. Photobleaching of an *ncdNKgfp** spindle. The oocyte spindle is abnormal, consisting of multiple spindles. The spindle component closest to the surface of the oocyte was photobleached. The movie shows three pre-bleach images of the spindle, 30 bleach images and 15 recovery images. A region within the ROI containing the photobleached spindle was analyzed over time. The kinetics of fluorescence loss in the bleached region of the spindle is shown (Fig. 7).

Movie 6. Photobleaching of a wild-type 2-dose *ncdgfp** spindle. The oocyte spindle is a normal metaphase-arrested meiosis I spindle. The movie shows three pre-bleach images of the spindle, 30 bleach images and 15 recovery images. A region within the ROI containing the photobleached spindle was analyzed over time. The kinetics of fluorescence loss in the bleached region of the spindle is shown (Fig. 7).