

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Z-stack (z-steps of 500 nm) in meiosis II 2h after incubation in 200  $\mu$ M Monastrol from confocal images of a control (left) and an extra-soft cVCA oocyte (right) expressing Histone(H2B)-GFP (grey) to label chromosomes and MajSat-mClover (magenta) to label the Major satellite repeats. Related to FigS1A.

File Name: Supplementary Movie 2

Description: High-frequency time-lapse movies of a control (top) and extra-soft cVCA oocyte (bottom) in transmitted light (left) expressing Histone(H2B)-GFP together with either Ez-mCherry or cVCA-mCherry (right, both in grey). The movies start at BD + 6h30 with acquisitions taken every 500 mseconds for 5 minutes. The first 75 frames are shown.

File Name: Supplementary Movie 3

Description: High-frequency time-lapse movies of a control (top) and extra-soft cVCA oocyte (bottom) incubated in Nile Red at BD + 6h30 with acquisitions taken every 500 mseconds for 5 minutes. The first 75 frames are shown. Related to FigS3E.

File Name: Supplementary Movie 4

Description: Time-lapse movies of a control (top) and extra-soft cVCA oocyte (bottom) expressing Histone(H2B)-GFP to label chromosomes and EB3-GFP to label the spindle (both in grey) at BD + 6h30, first timepoint before laser ablation, then acquisitions taken every 20 seconds during 1 minute. Related to FigS4B.

File Name: Supplementary Movie 5

Description: Time-lapse movie of a control oocyte expressing Histone(H2B)-GFP to label chromosomes and GFP-UtrCH to label F-actin (both in grey) at BD + 6h30, first timepoint before laser ablation, then acquisitions taken every 20 seconds during 1 minute. Related to FigS4C.

File Name: Supplementary Movie 6

Description: Time-lapse movie of a control oocyte expressing Histone(H2B)-GFP to label chromosomes and EB3-GFP to label the spindle (both in grey) at BD + 3h, first timepoint before laser ablation, then acquisitions taken every 20 seconds during 1 minute. Related to FigS4E.

File Name: Supplementary Movie 7

Description: Time-lapse movie of a control oocyte expressing Histone(H2B)-GFP to label chromosomes and EB3-GFP to label the spindle (both in grey) at BD + 6h30. Acquisitions were taken every 20 seconds during 1 minute. Related to FigS4F.

File Name: Supplementary Movie 8

Description: Time-lapse movies of spindle morphogenesis in a control (left) and extra-soft cVCA oocyte (right, cVCA in red) expressing Histone(H2B)-GFP (blue) to label chromosomes and incubated with SiR-Tubulin to label microtubules (green). Z-projections, 10 sections of 4  $\mu\text{m}$  every 1h. The movies start 1h after NEBD and last until anaphase I with acquisitions every hour. Related to Fig2A.

File Name: Supplementary Movie 9

Description: Time-lapse movies of monoasters in a control (left) and extra-soft cVCA oocyte (right) expressing EB3-GFP (black) to label MT plus-tips and incubated with Monastrol to avoid spindle bipolarization. One Z-plane, every 250 ms. The movies start 2h after NEBD. Related to Fig2B and C.

File Name: Supplementary Movie 10

Description: Time-lapse movies of a control (left) and extra-soft cVCA oocyte (right) expressing Histone(H2B)-GFP (grey) to label chromosomes. The movies start at BD + 6h30 with acquisitions every 20 seconds for 20 minutes. Related to Fig3A.

File Name: Supplementary Movie 11

Description: Time-lapse movies of a control (left) and extra-soft cVCA oocyte (right) expressing Histone(H2B)-GFP (blue) to label chromosomes. The movies start at NEBD with acquisitions every 30 minutes until BD + 6h30. The magenta ellipses circle the chromosomes. Related to Fig3C.

File Name: Supplementary Movie 12

Description: Z-stack (z-steps of 500 nm) at BD + 6h30 from time-lapse movies of a control (left) and extra-soft cVCA oocyte (right) expressing Histone(H2B)-GFP (grey) to label chromosomes and MajSat-mClover (magenta) to label the Major satellite repeats. Related to Fig3D.