**Supplementary movies**

Video 1

Time-lapse confocal microscopy imaging of mouse one-cell embryo cultured in pure KSOM medium or in AUKRA inhibitor MLN8237 during the first division. Embryos expressing H2B-GFP (chromatin is presented in pseudocolor mode provided better contrast) were recorded every 5 min. See also Fig. 5A.

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Video 2

Time-lapse confocal microscopy imaging of mouse one-cell embryo cultured in pure KSOM medium or in AUKRA inhibitor MLN8237 during the first division. Embryos expressing EGFP-MAP4 (microtubules; green) and H2B-mCHERRY (DNA; red) were recorded every 5 min. See also Fig. 6A.