**Supplementary figures**



**Figure S1. Dynamic localization of Plk1 in mouse oocytes during meiosis.** **(A)** Oocytes at indicated meiotic stages were immunolabeled with Plk1 antibodies and CREST. DNA was labeled in blue, Plk1 in red and CREST in green. Scale bar =10 m. Plk1 was detected at centromere area (asterisk) and spindle polar area (arrow). **(B)** Oocytes at MI and MII stage were immune-stained with Plk1 antibodies and -tubulin. DNA was labeled in blue, Plk1 in green and -tubulin in red. Scale bar =10 m. 2× magnified viewer of centromeric (asterisk) and spindle polar area (arrow) localization of Plk1 are shown in insets. Plk1 was localized on spindle poles.



**Figure S2. Plk1 was consistently localizaed on chromosome centromeres in mouse oocyte.** Chromosome spread from pro-MI, MI, and MII oocytes were double-labeled with anti-Plk1 and CREST. DNA was visualized in blue, Plk1 in red and CREST in green. Plk1 was consistently accumulated at centromeric area among meiotic stages of pro-MI (a-d), MI (e-h) and MII (i-l). Asterisks denote the portion of Plk1 associated with MTOC.



**Figure S3. Persistent pPlk1Thr210 on chromosomses in BI2536-treated oocytes. (A)** Oocytes were fixed and double-labeled with pPlk1Thr210 antibodies and CREST after 8 h incubation with BI2536. DNA was indicated in blue, pPlk1Thr210 in red and CREST in green. pPlk1Thr210 was pronouncedly labeled across the whole structure of chromosomes in DMSO (a-d) and BI2536 group (e-h). Asterisks denote the lagged chromosomes. **(B)** Chromosome spreads were prepared and processed for double-labeling of pPlk1Thr210 (red) and CREST (green) after oocytes were cultured in DMSO or 100 nM BI2536 for 8 h. Scale bar = 10 μm. pPlk1Thr210 was detected on all the individual chromosomes.



**Figure S4. Reduced pPlk1Ser137 and pericentrin at MTOCs in BI2536-treated oocytes.** Representative images of oocytes double-labeled with pPlk1Ser137 (red) and pericentrin (green) in DMSO (a-d) and BI2536 group (e-h). Insets show 2× magnified viewer of spindle poles, as indicated by arrows. Scale bar = 10 m. Statistical analysis demonstrated the percentage of oocytes with weak MTOC pericentrin was significantly higher in BI2536 group than that in control group (*P* < 0.01).