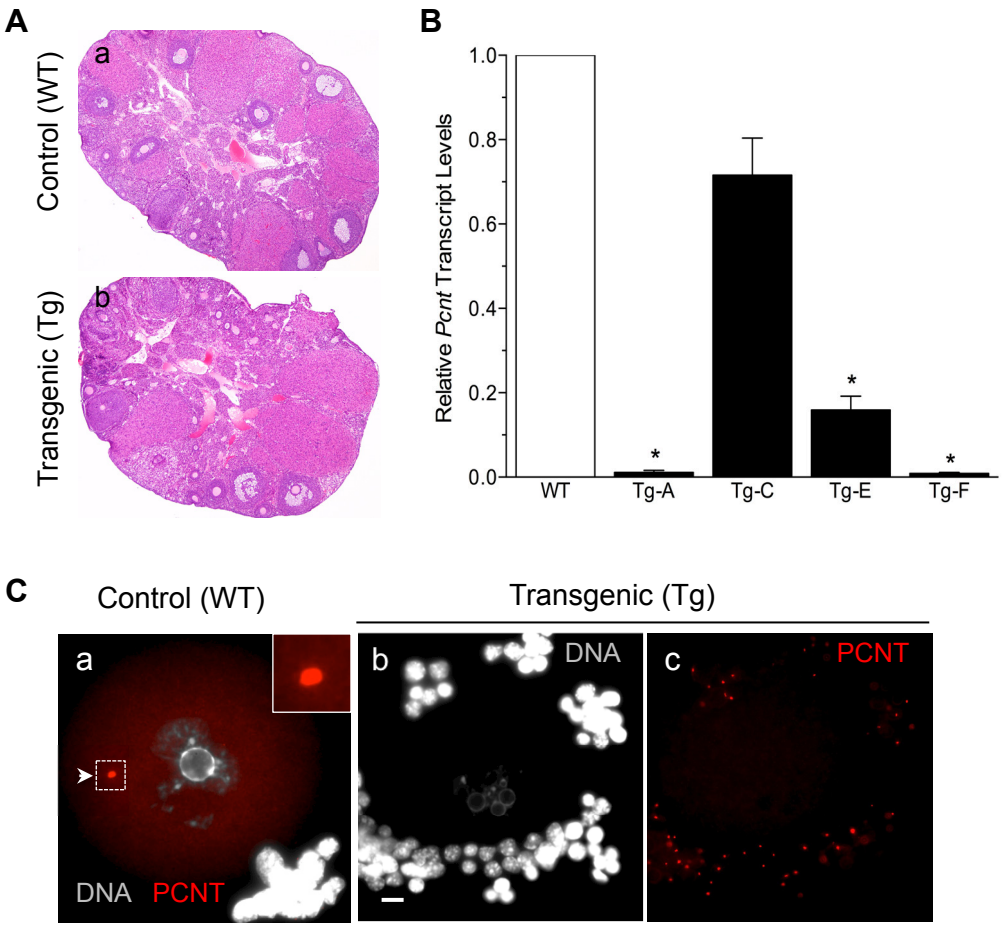
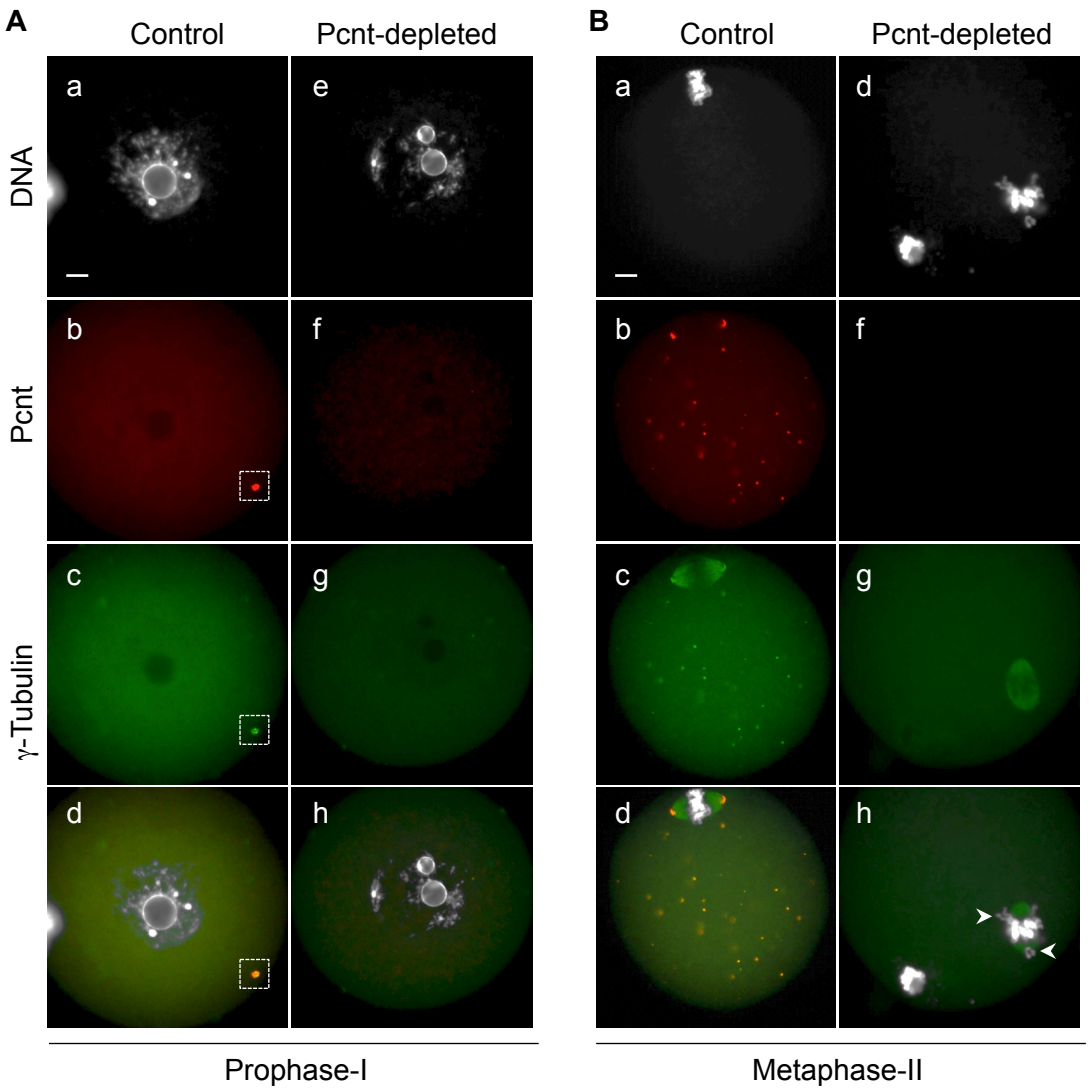
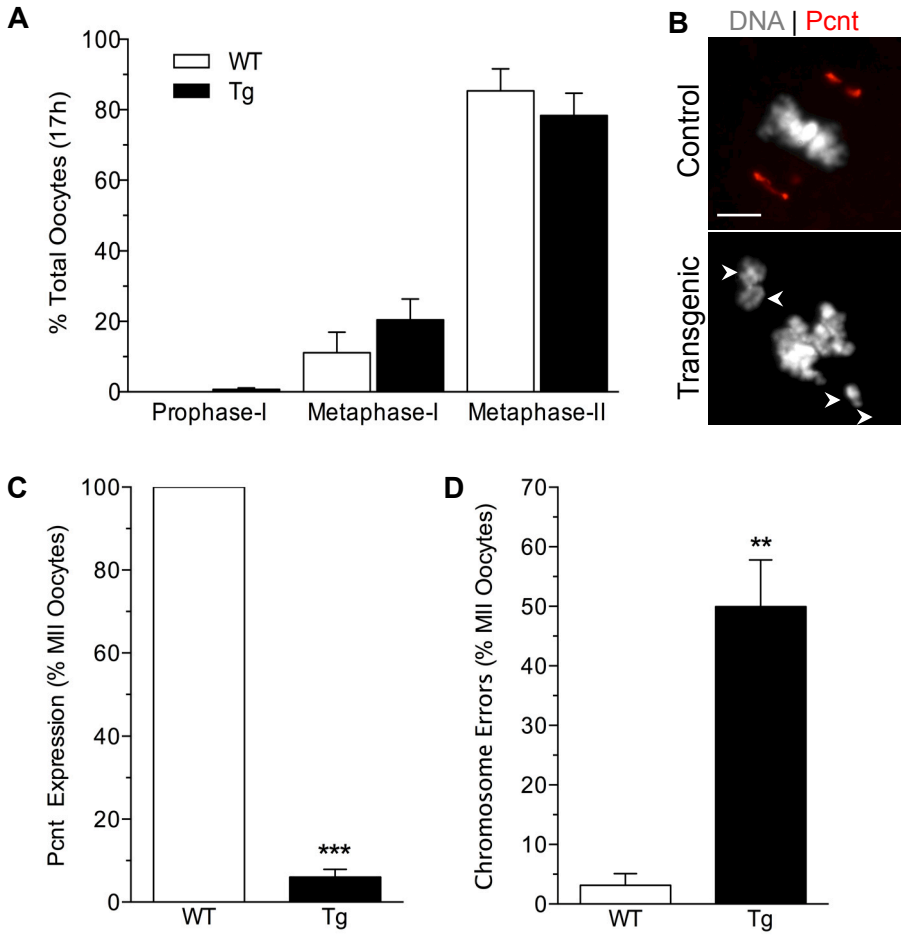


Supplemental Fig. S1: Oocyte-conditional knockdown of Pcnt in transgenic mice. (A) Representative ovarian H&E stained tissue sections collected from control (WT) and transgenic (Tg) females at 4-months of age. (B) Quantitative RT-PCR analysis of the relative *Pcnt* levels in ovulated oocytes (n=100) from control WT and Tg females from Lines-A, -C-, E and –F. *P<0.05 relative to WT. (C) Representative images of prophase-I (GV-stage) oocytes collected from WT and Tg females, labeled with anti-pericentrin. DAPI-labeled DNA is shown in grey and Pcnt in red. GC: Granulosa cells. Scale bar of 10 µm



Supplemental Fig. S2: **Loss of Pcnt disrupts γ-tubulin distribution in oocytes.** Representative images of (A) prophase-I arrested (GV-stage) oocytes and (B) ovulated MII oocytes collected from of WT control and Tg females. The oocytes were double-labeled with anti-pericentrin (red) and γ-tubulin (green) antibodies. DNA was counterstained with DAPI (grey). aMTOCs are highlighted by squares and arrows denote misaligned chromosomes. Scale bar of 10 μm.



Supplemental Fig. S3: ***In vitro*** **maturation of WT and Tg oocytes.** (A) The progression of meiosis in WT control (n=95) and Tg (n=155) oocytes was evaluated after a 17h culture. Bars represent the percent (± s.e.m) total oocytes at each stage. (B) Representative images of WT and Tg oocytes at the end of culture. DAPI-labeled DNA is shown in grey and Pericentrin (Pcnt) in red. Arrows denote lagging chromosomes. Scale bar of 10 μm. (C) Percent (± s.e.m.) of total WT and Tg oocytes that show positive Pcnt labeling. ***P<0.001 relative to WT. (B) Percent (± s.e.m.) of total WT and Tg oocytes with misalignment and lagging chromosomes. **P<0.01 relative to WT.

Supplemental Table S1:

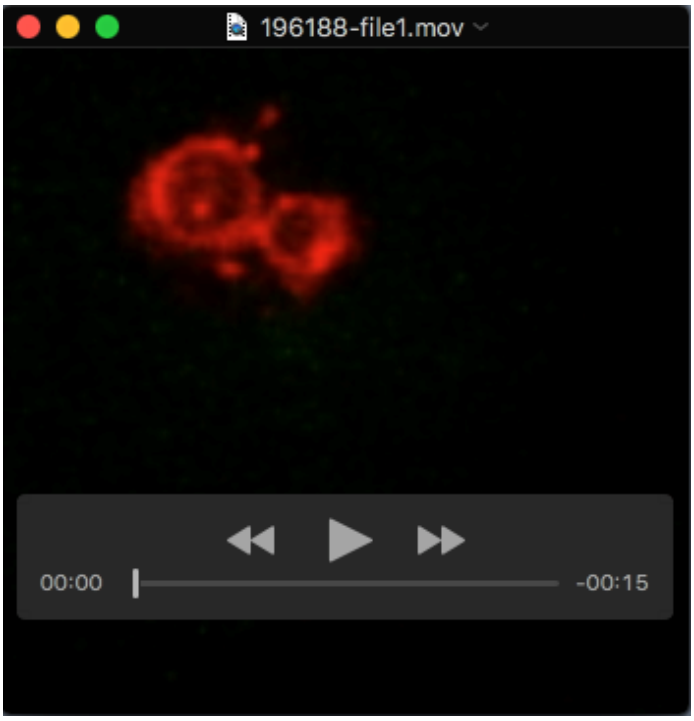
Fertility Assessment of control (WT) and ZP3-*Pcnt* RNAi Transgenic (Tg) Mouse Lines

	Line A		**Line F**	
	WT	Tg	WT	Tg
Mating Pairs	3[§]	3	3	3
Total Litters	13	19	16	14
Total Pups Born (Viable / Total pups)	151 / 160	93 / 123	159 / 172	39 / 53
% Perinatal mortality	5.6%	24.4%	7.5%	26.4%
Total Pups / Litter (mean ± s.e.m)	12.31 (±0.99)	6.47 (±0.50)**	10.75 (±0.82)	3.79 (±0.45)***
Viable Pups / Litter (mean ± s.e.m)	11.62 (±0.93)	4.89 (±0.78)***	9.94 (±0.77)	2.79 (±0.59)***

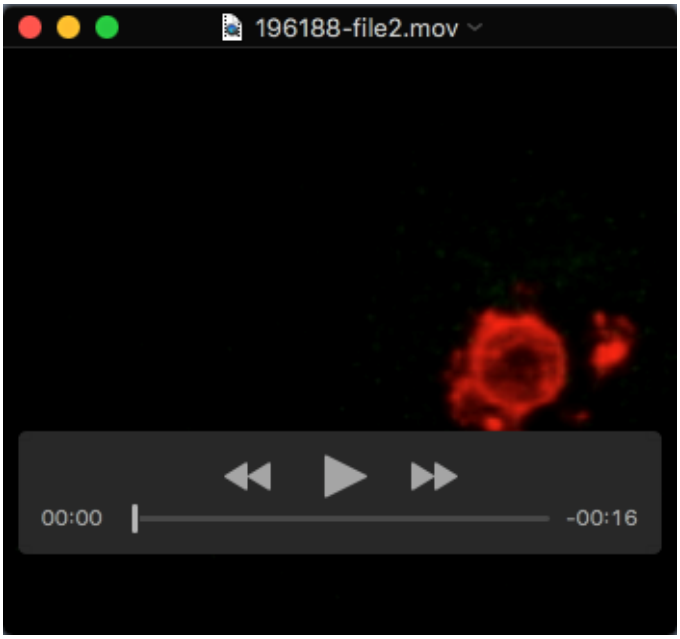
**P<0.01 relative to WT

***P<0.001 relative to WT

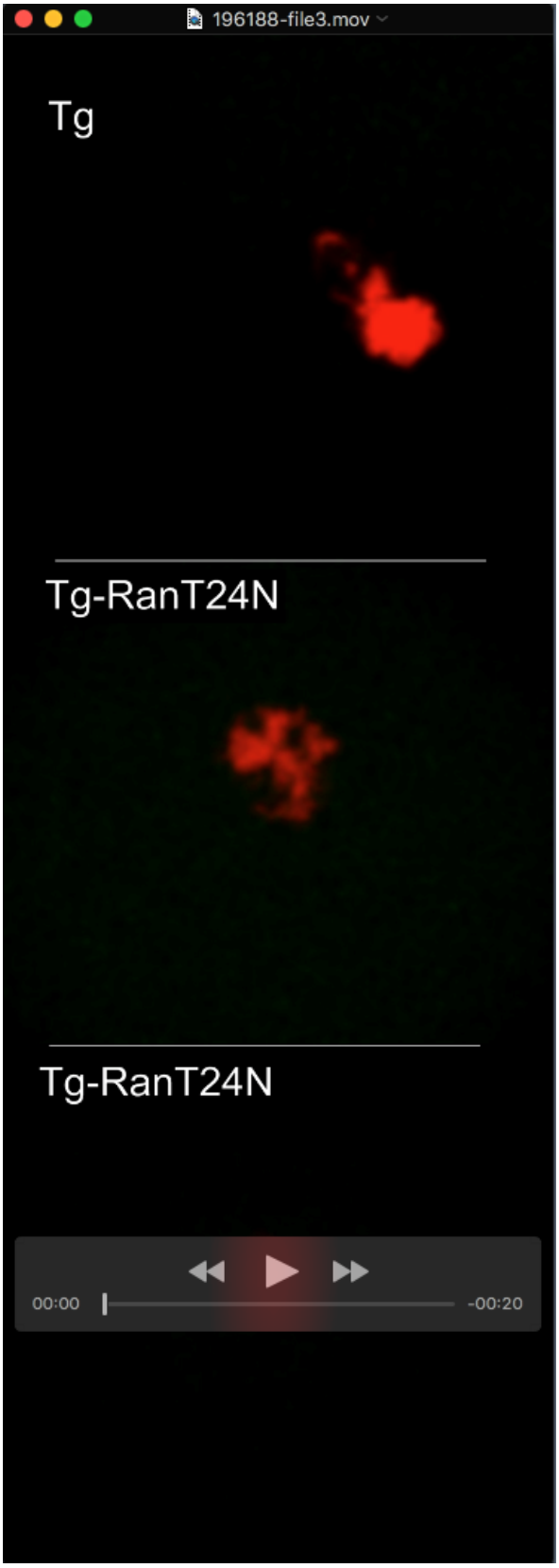
§ 1 female in the WT group from Line-A died after 4.5 months of mating



Movie 1: Time-lapse of a control (WT) oocyte during *in vitro* maturation. Time-lapse (20 minute intervals) movie of laser scanning confocal Z-stack reconstruction (every 5 µm) of WT oocytes expressing H2B-RFP (red) and MAP-4-EGFP (green) that label chromosomes and spindle microtubules, respectively.



Movie 2: Time-lapse of a transgenic (Tg) oocyte during in vitro maturation. Time-lapse (20 minute intervals) movie of laser scanning confocal Z-stack reconstruction (every 5 µm) of Tg oocytes expressing H2B-RFP (red) and MAP-4-EGFP (green) that label chromosomes and spindle microtubules, respectively.



Movie 3: Time-lapse of transgenic oocytes microinjected mutant Ran (Tg-RanT24N) relative to Tg control, during meiosis-I for 14h. Time-lapse (15 minute intervals) movie of laser scanning confocal Z-stack reconstruction (every 5 µm) of Tg oocytes expressing H2B-RFP (red) and MAP-4-EGFP (green) that label chromosomes and spindle microtubules, respectively.