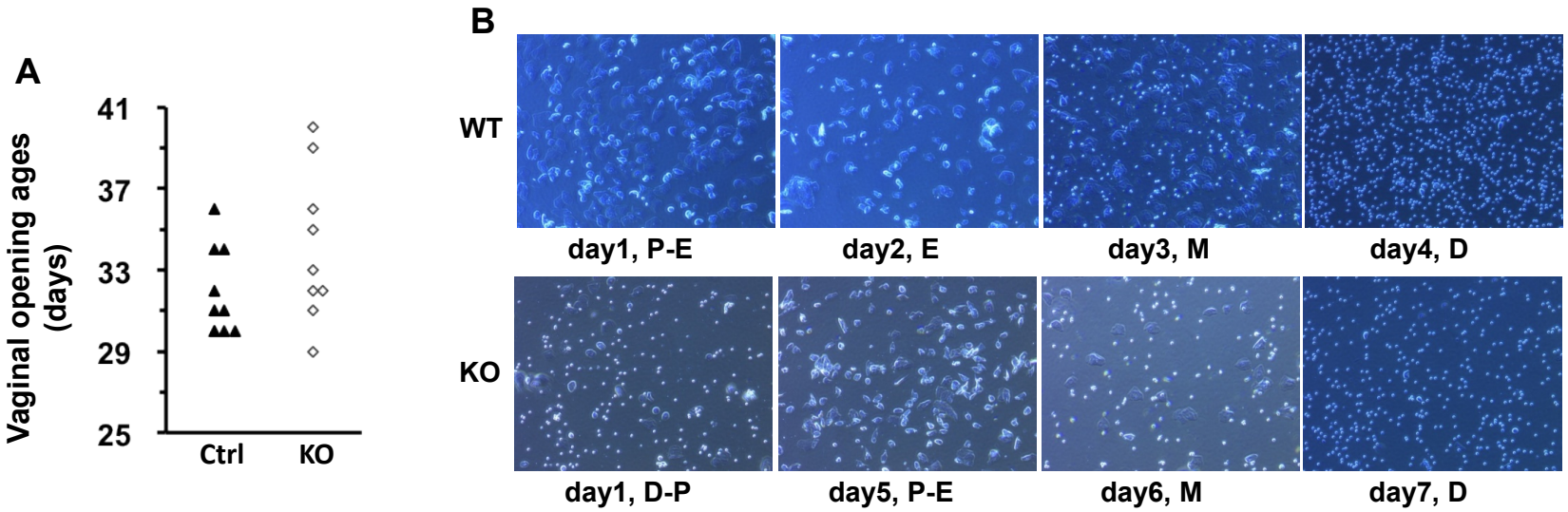

Figure S1. Kdm3b is required for normal estrous cycle but not for vaginal opening time.
(A). The average vaginal opening ages of wild type (WT, n=9) and *Kdm3b* knockout (KO, n=9) mice. There is no significant difference in vaginal opening ages between two groups by Student's t test ($p > 0.05$).
(B). Images of vaginal smears prepared from WT and *Kdm3b* KO mice. *Kdm3b* KO mice exhibited irregular estrous cycles. P, proestrus phase; E, estrus phase; M, metestrus phase; D, diestrus phase.

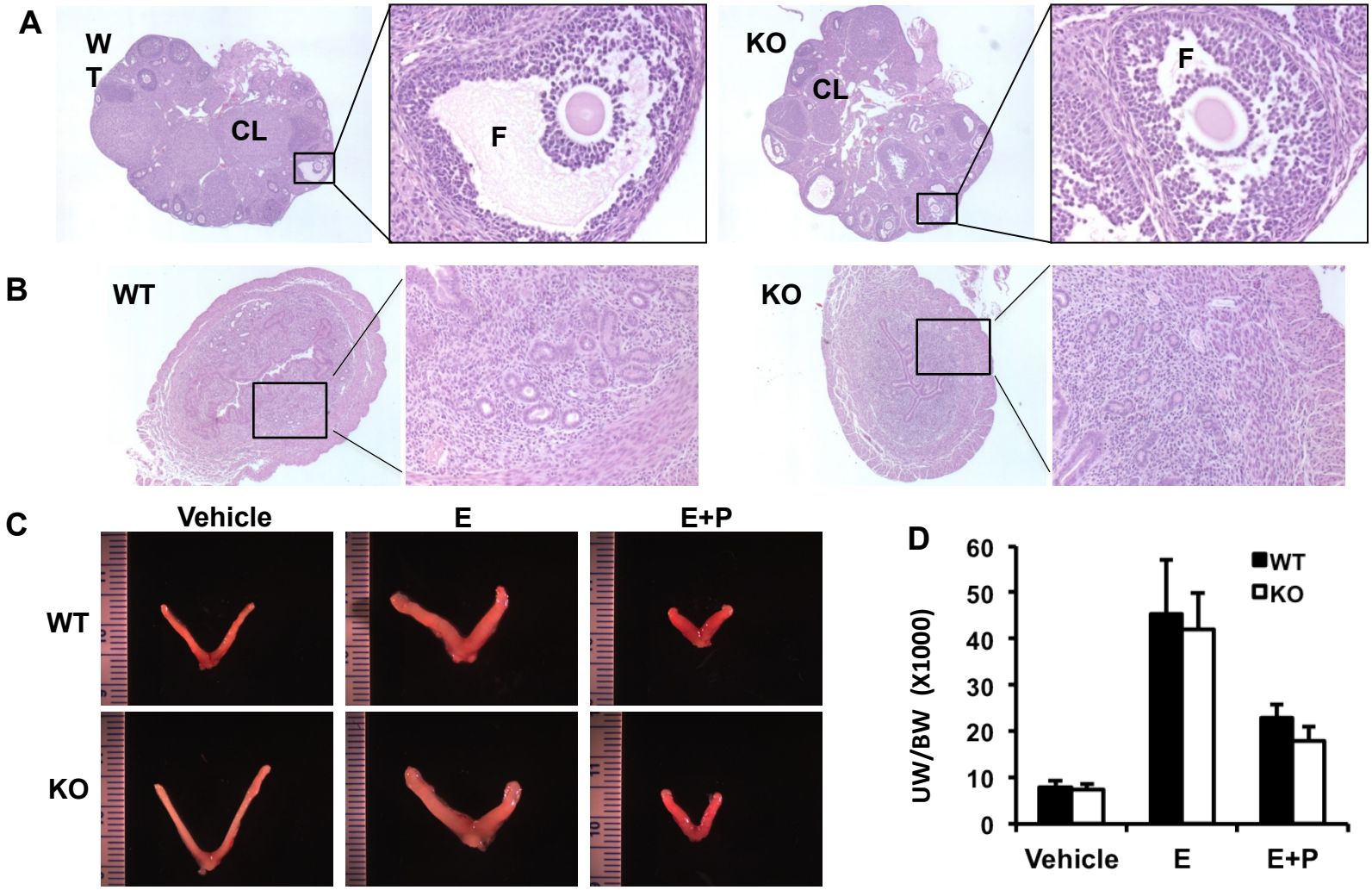

Figure S2. Kdm3b is not required for ovarian and uterine morphogenesis and for 17β-estradiol (E) and progesterone (P)-regulated uterine growth. ***(A).*** H&E-stained cross sections of ovaries prepared from WT and *Kdm3b* knockout (KO) mice. Normal histology and structure of the follicle (F) and corpus luteum (CL) were observed in mice with both genotypes (n=3 for each). ***(B).*** H&E-stained cross sections of uteri from WT and *Kdm3b* KO mice (n=3 for each group). Normal uterine morphology was observed in both genotype groups. ***(C)*** & ***(D).*** *Kdm3b* deficiency did not change E-induced uterine growth and P-suppressed E-dependent uterine growth. Ovariectomized WT and *Kdm3b* KO mice were treated with vehicle (sesame oil), E or E+P (5 mice in each group). The uterine wet weights of these mice were measured and normalized to body weights. Data are presented as mean ± standard deviation (SD). There was no significant difference of uterine weights between the two genotype groups ($p > 0.05$ by Student's t test). UW, uterine weight; BW, body weight.

Table S1. Kdm3bKO female mice have a reduced pregnant frequency and carried fewer embryos

	dpc 4.5		dpc 7.5	
Female Mice	WT (n=6)	KO (n=7)	WT (n=8)	KO (n=13)
Pregnancy	6/6	4/7	5/8	7/13
Total embryos	40	11	36	34
Embryos/mouse	6.7 ± 1.6	2.8 ± 2.4*	7.2 ± 4.5	4.9 ± 3.3

Eight-week-old females with indicated *Kdm3b* genotypes were housed with WT males at a 1:1 ratio. The morning of the day when the coital plug was observed was designated as dpc 0.5. *, $p < 0.05$ by Chi-square test.