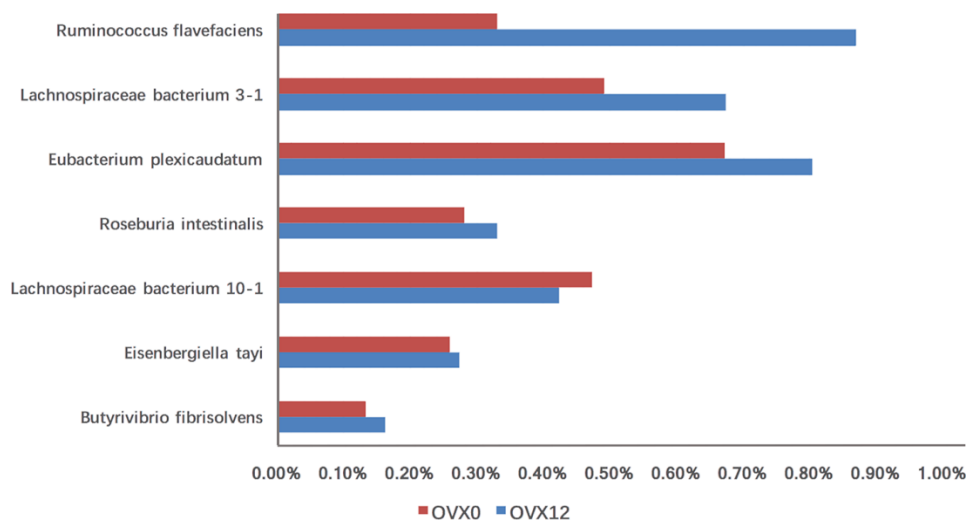
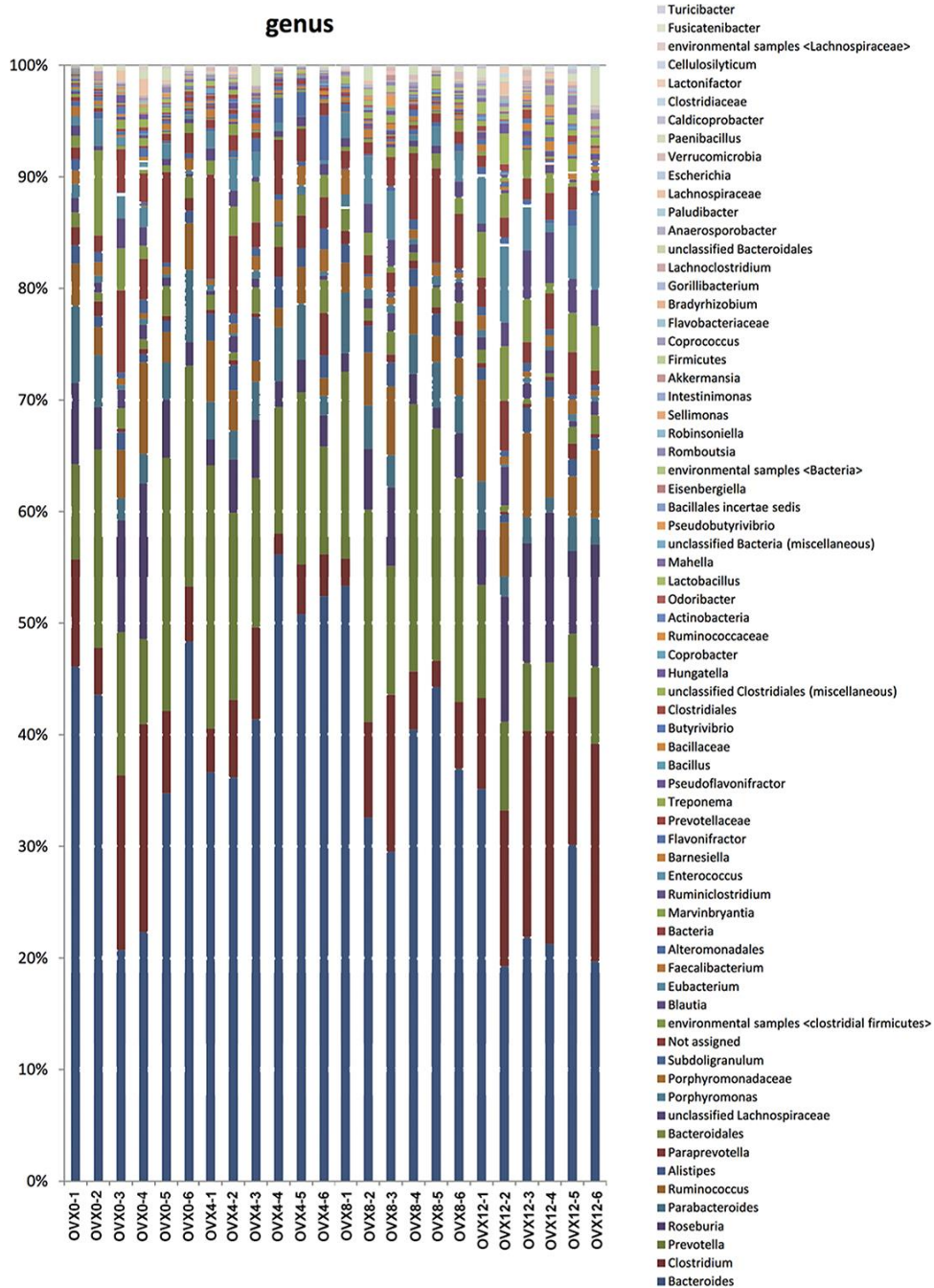


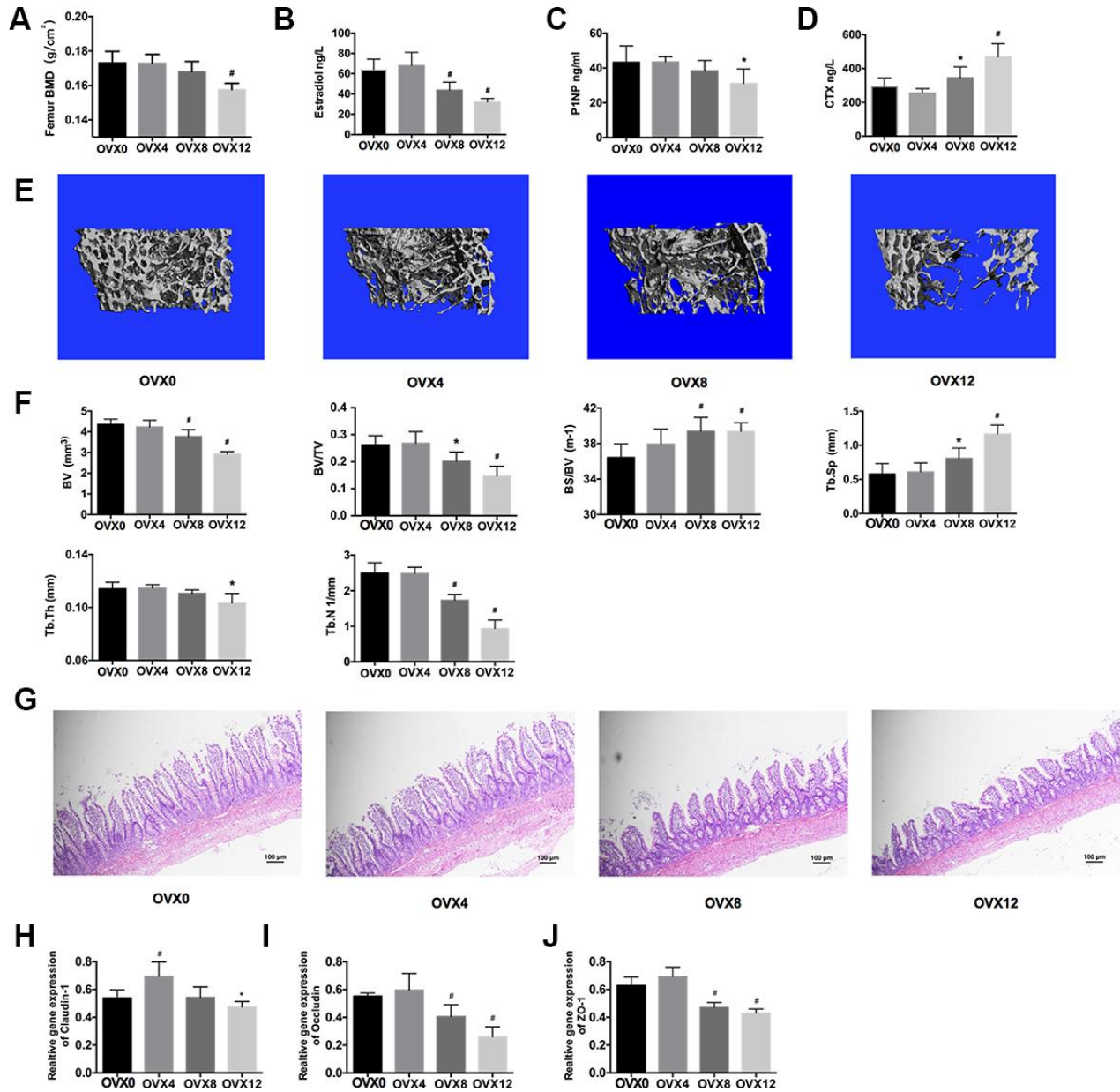
## SUPPLEMENTARY FIGURES



**Supplementary Figure 1. Abundance with significant differences in sub-group of Clostridiales at species level between pre- and twelve weeks post-ovariectomy,  $q < 0.01$ .**



Supplementary Figure 2. The changes of gut microbiota related to the estrobolome.



**Supplementary Figure 3. Dynamic changes in biological data after ovariectomy.** BMD (A), serum estradiol (B), P1NP (C), CTX (D), three-dimensional reconstruction of distal femur (E), and bone histomorphometric parameters (F): bone volume (BV), bone volume density (BV/TV), specific bone surface (BS/BV), trabecular spacing (Tb.Sp), trabecular thickness (Tb.Th), and trabecular number (Tb.N). Hematoxylin and eosin (H&E) staining of the intestine (100x) (G). mRNA expression of Claudin-1, Occludin and ZO-1 by real-time PCR (H–J). \*P < 0.05, #P < 0.01.