

Fig.S1 OVX mice showed obviously decreased bone mass and increased pro-inflammatory cytokines in serum.

(A) Micro-CT image of distal femur of sham and OVX mice (n=3). (B) BMD, BV/TV, Tb.N and Tb.th analysis of distal femur of sham and OVX mice (n=3). (C) TNF- α and IL1- β expression in serum from sham and OVX mice were measured (n=3). Data are shown as mean \pm SD, *P < 0.05, **P < 0.01, ***P < 0.001.

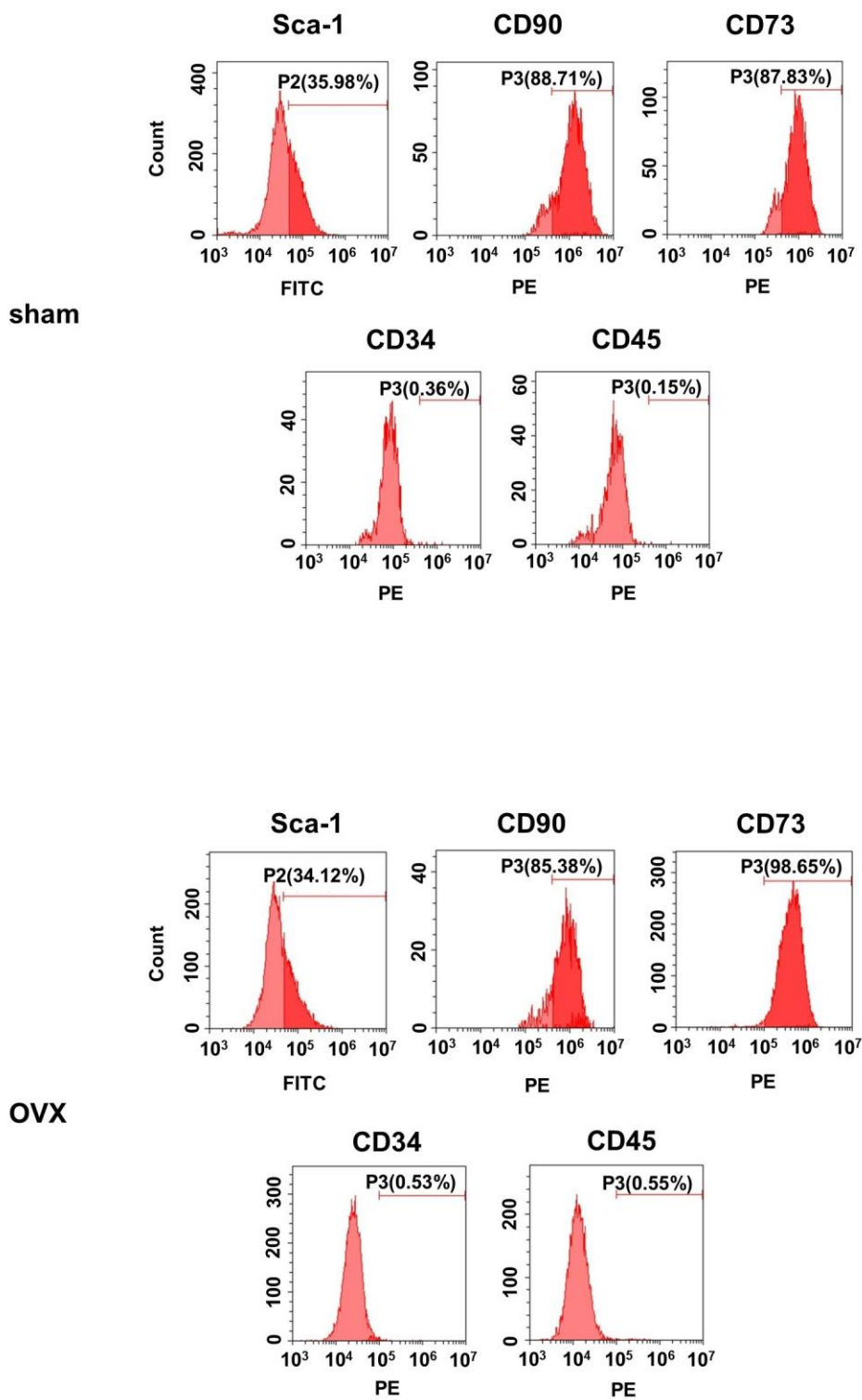


Fig.S2 Surface makers (Sca-1, CD90, CD73, CD34 and CD45) were detected in sham and OVX BMSCs at passage one by flow cytometry.

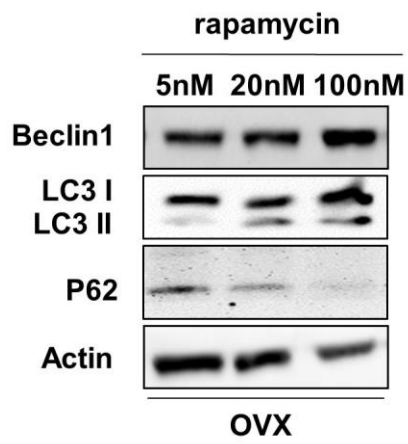
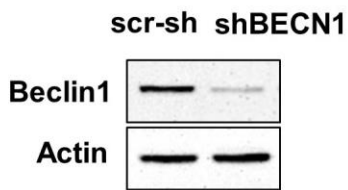


Fig.S3 Rapamycin promotes autophagy level in OVX BMMSCs.

Protein analysis of Beclin1, LC3 and P62 in OVX BMMSCs treated with rapamycin at concentrations of 5 nM, 20 nM and 100 nM (n=3).

A



B

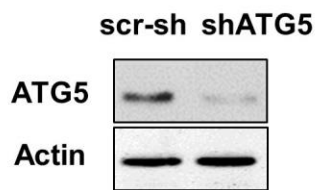


Fig.S4 Transfection efficiency of ATG-related genes knockdown in sham BMMSCs.

(A) Western blotting analysis of Beclin1 in sham BMMSCs 48 h after transfection with shBECN1 (n=3).

(B) Western blotting analysis of ATG5 in sham BMMSCs 48 h after transfection with shATG5 (n=3).

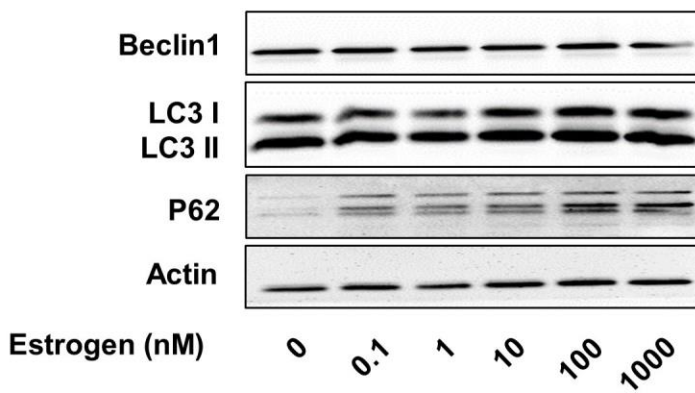


Fig.S5 Effect of estrogen on autophagy level in BMMSCs.

Protein analysis of Beclin1, LC3 and P62 in BMMSCs after 48-hour exposure to a range of concentrations of estrogen (0, 0.1, 1, 10, 100 and 1000nM).

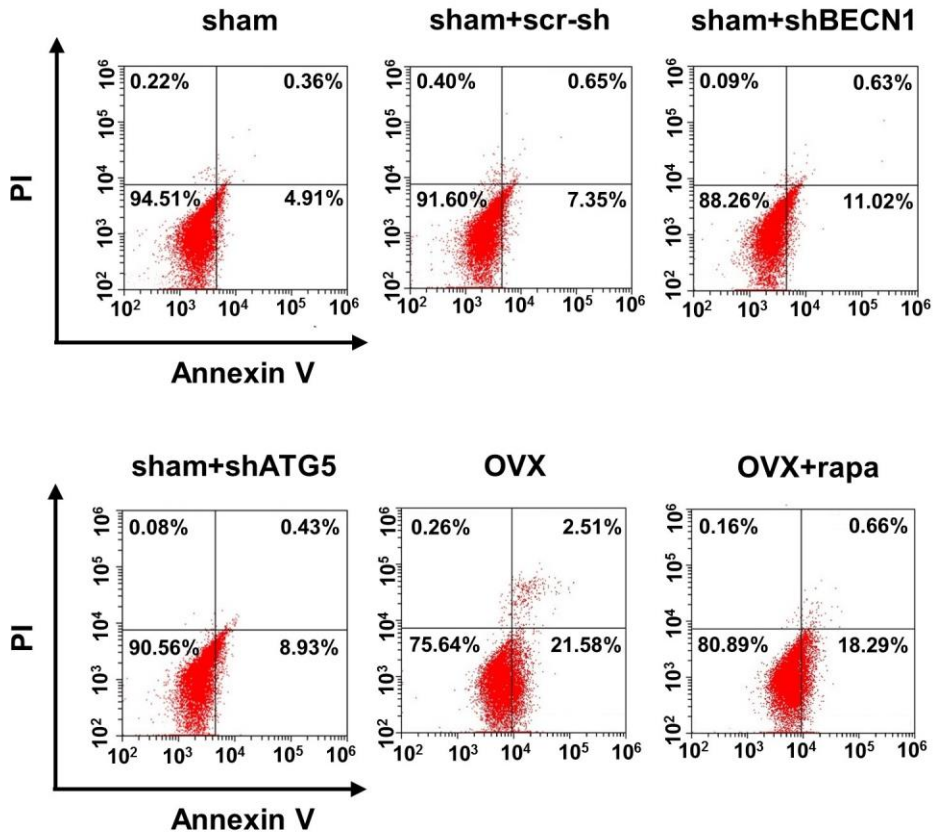


Fig.S6 Autophagy level effects apoptosis of BMMSCs. Dot plot of FITC-Annexin V (x axis)/PI (y axis) in sham BMMSCs, sham BMMSCs+ scr-sh, sham BMMSCs +shBECN1, sham BMMSCs+shATG5, OVX BMMSCs and OVX BMMSCs +rapamycin (n=3).