

Figure S1. Representative HBAD-mRFP-GFP-LC3 transfection images. Fluorescence images showing successful reporter expression 24 h after transfection. Scale bar, 20 μ m.

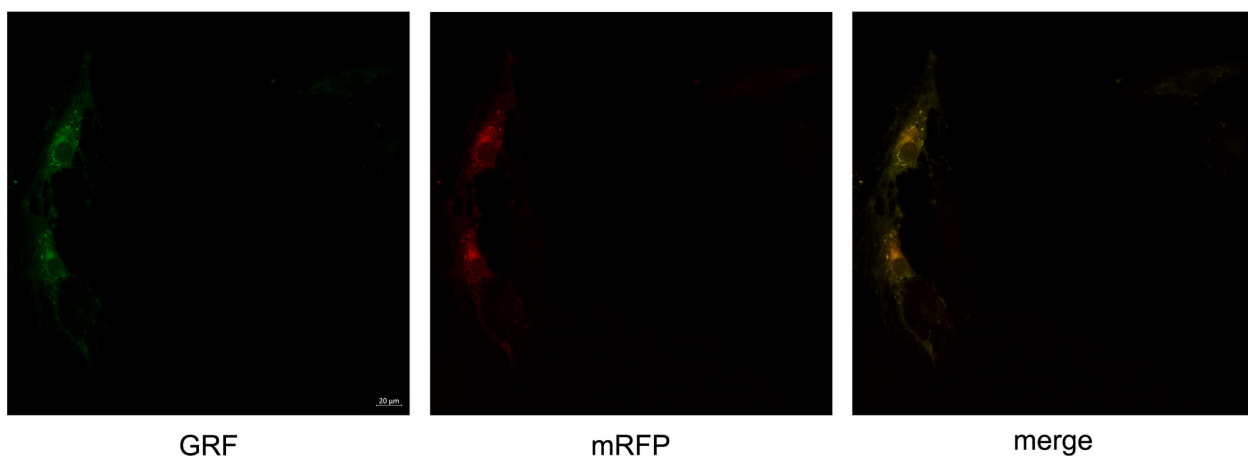


Figure S2. Histopathological examination of major organs in CON, OVX and BA groups (H&E staining; scale bar, 100 μ m). Representative sections of heart, lung, liver, and kidney are shown. OVX, ovariectomized; BA, betulinic acid.

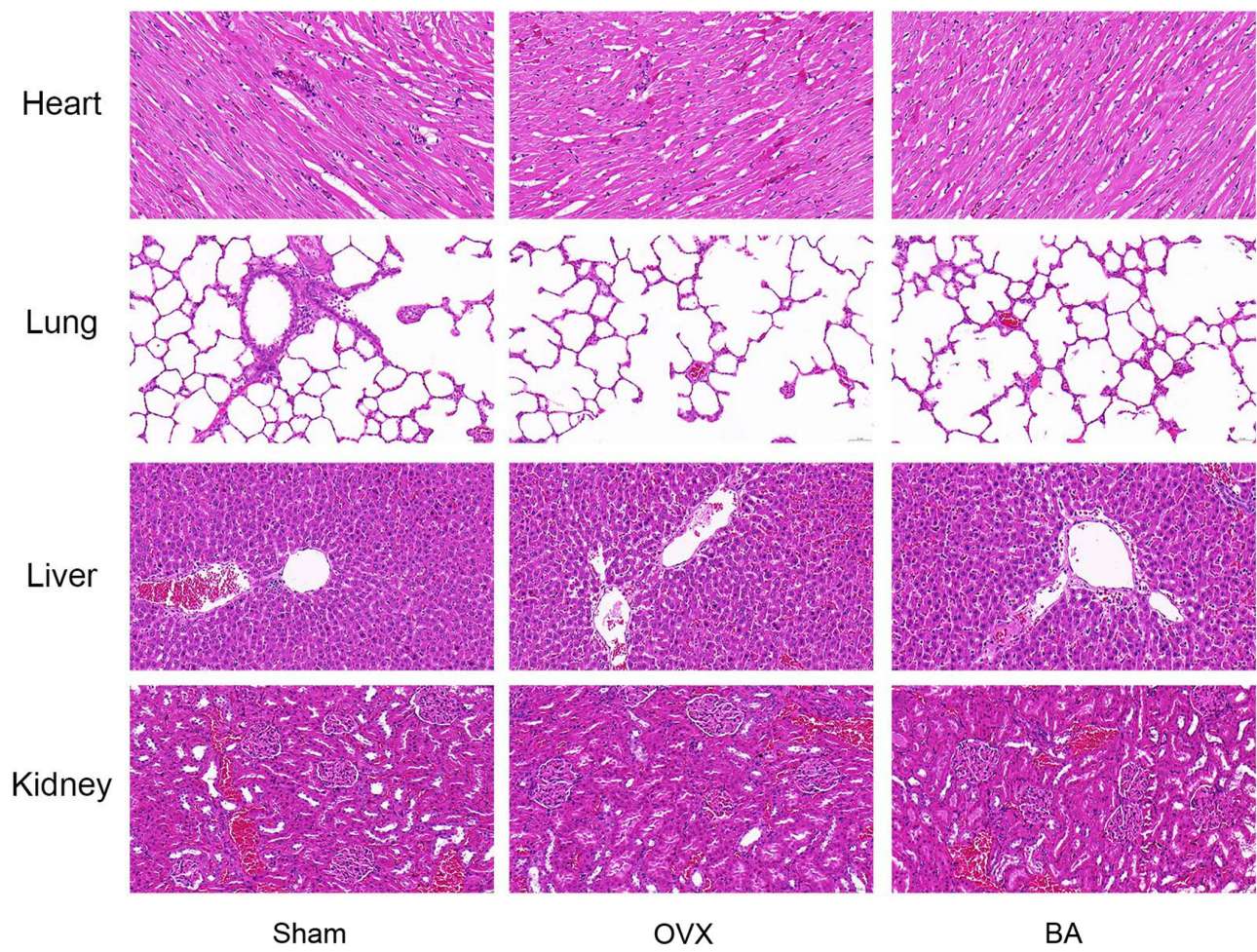


Figure S3. Assessment of autophagic flux via mRFP-GFP-LC3 puncta assay under different treatment conditions. (A) Laser confocal microscopy images showing GFP-LC3 (green), mRFP-LC3 (red), and merged puncta in cells. (B) Quantitative analysis of autophagosomes (yellow puncta) and autolysosomes (red puncta) per cell across treatment groups. Data are expressed as the mean \pm SEM. ##P<0.01 vs. corresponding H₂O₂ group; &P<0.05 and &&P<0.01 vs. corresponding H₂O₂ + BA group. BA, betulinic acid; N.S., not significant.

