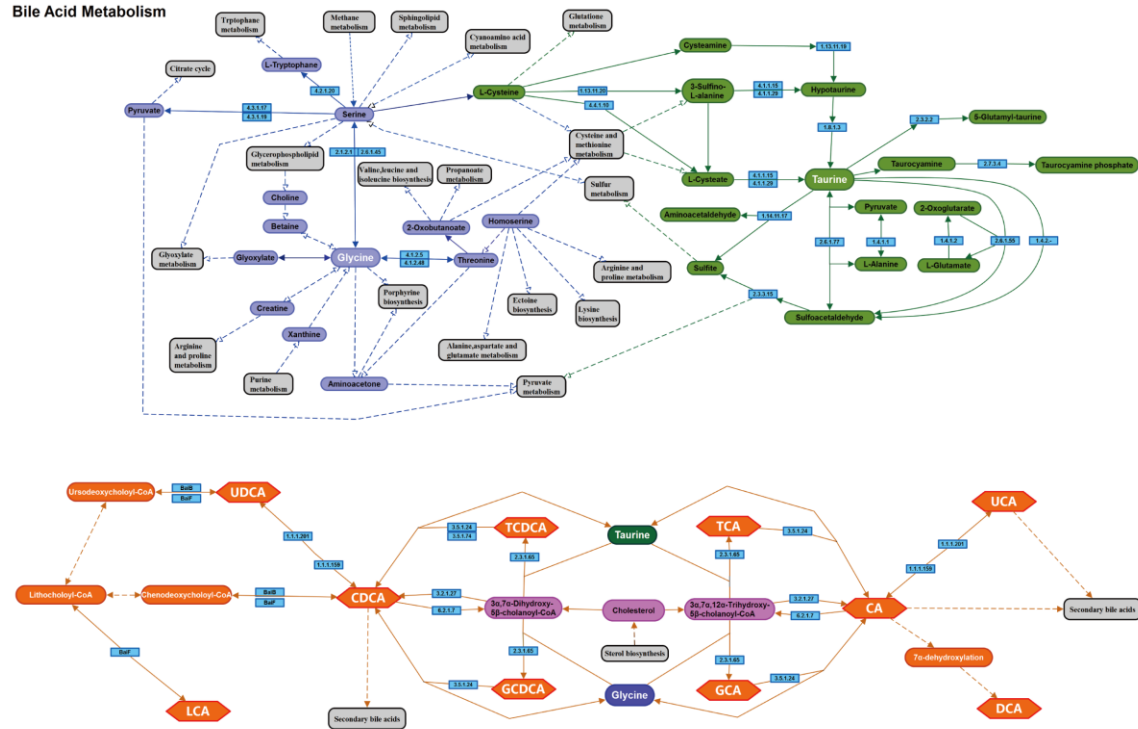
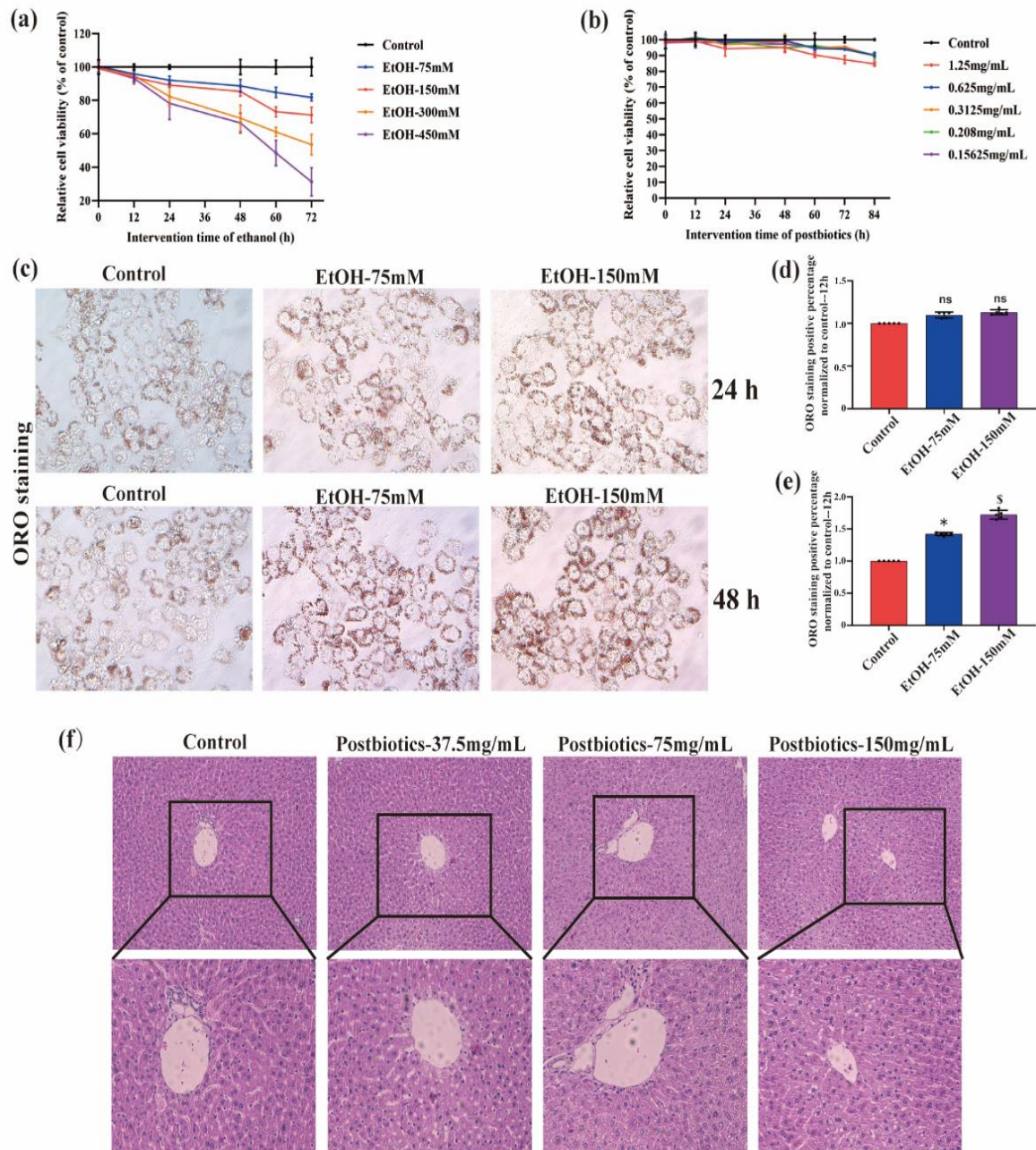


Supplemental figure 1. The schematic overview of ALD mice model and drug treatment.

# Bile Acid Metabolism

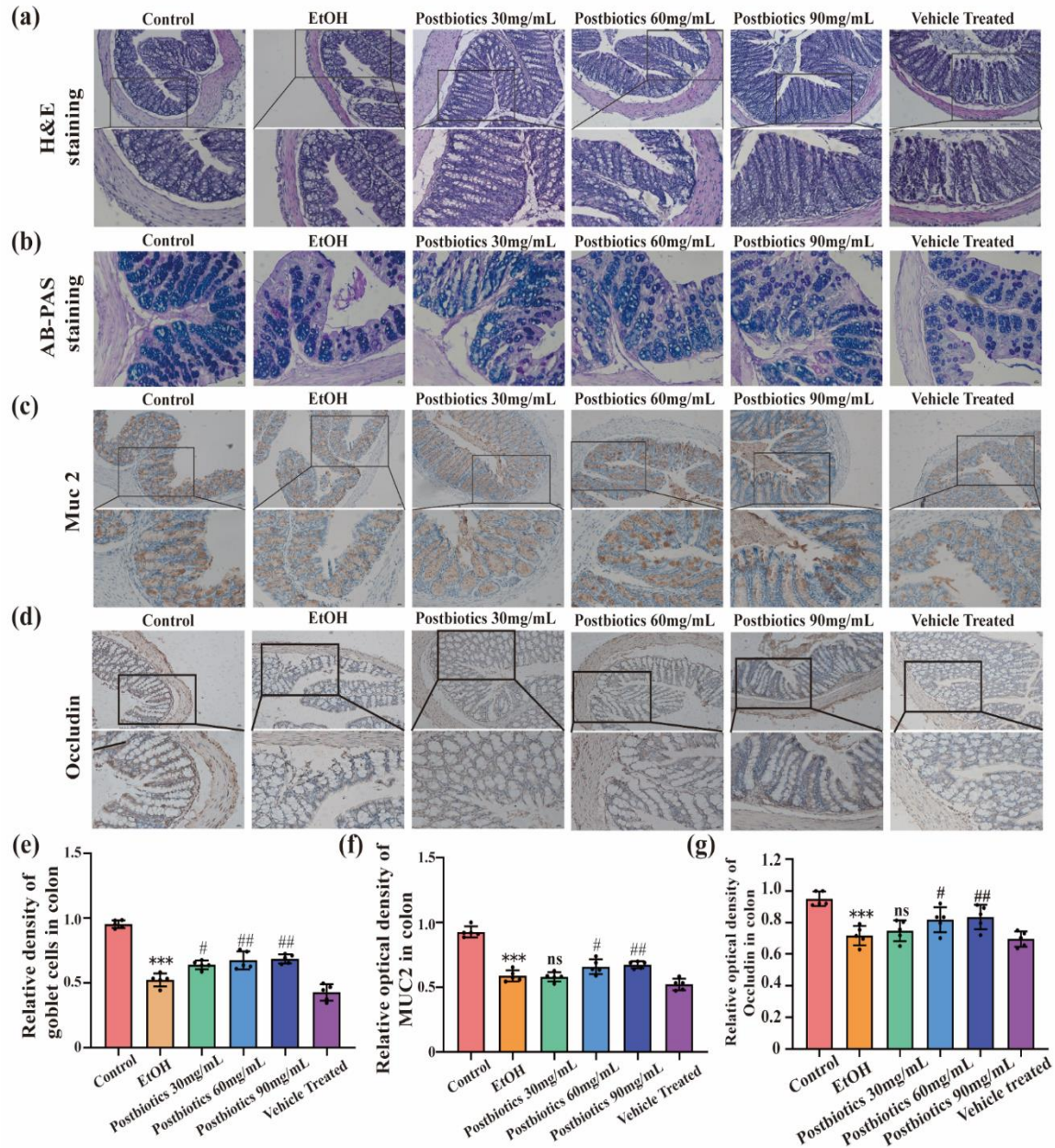


**Supplemental figure 2. A diagram of the possible metabolic upstream and downstream relationships of the detected substances based on the KEGG database. The color of grey represents the path name, blue represents enzyme, and the orange diamond frame represents some substances in the detection list; Nodes of the same color represent associated metabolites, and different colors distinguish different associated metabolites. The solid line indicates that it can be directly transformed by enzyme, and the dotted line indicates that it needs to be obtained by multi-step transformation.**

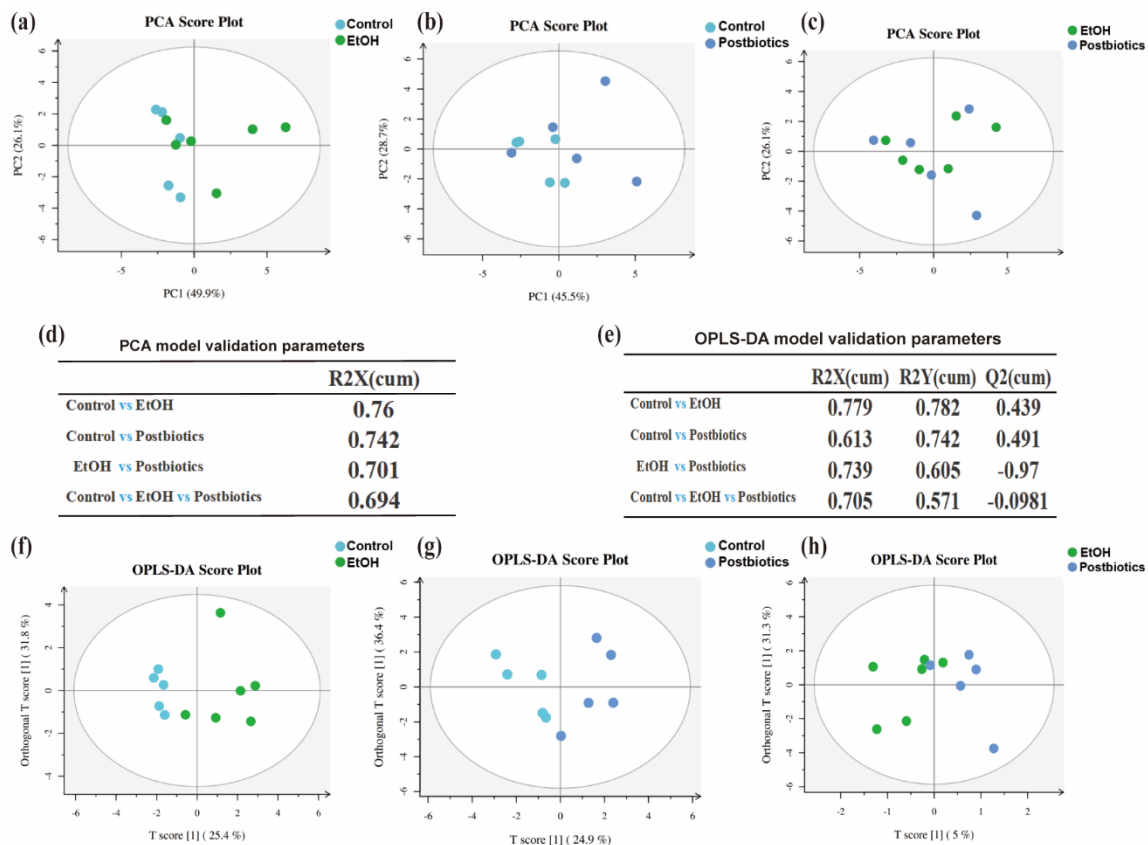


**Supplementary figure 3. Dose-response relationship of ethanol and postbiotics in LO2 cells.** (a, b) the dose-response relationship (D-R relationship) among postbiotics, ethanol and LO2 cells. (c-e) Results for ORO-positive staining were analyzed and quantified under different treatments. ( $n = 5$ , results are presented as mean  $\pm$  SEM). (f) Representative images of H&E staining in liver sections, respectively;  $*P < 0.05$ , compared with the control group;  $^{\$}P < 0.05$ , compared with the EtOH-75mM group; *ns*: no significance; Gly- $\beta$ -MCA: FXR inhibitor.





**Supplementary figure 4. The protective effects of postbiotics on the intestinal barrier.** (a) Representative images of H&E staining in colon sections from different groups. (b, e) Representative images of AB-PAS staining (blue) and relative density of goblet cells in the colon under different treatments. (c, d, f, g) Results for immunohistochemistry examination of Muc2 and Occludin expression and relative optical density of Muc2 and Occludin in colon among six groups. (n = 5 mice per group, 100× and 200× magnification) (Compared to the control group, \*\*\* $P < 0.001$ ; Compared to the EtOH group, # $P < 0.05$ , ## $P < 0.01$ ; ns: no significance)



**Supplementary figure 5. Results of multivariate statistical analysis.** (a-d) Score plot and detailed PCA model validation parameters of PCA model from different groups. (e-h) Score plot and detailed PCA model validation parameters of OPLS-DA model from different groups.