High-lipid treatment regulates atherosclerotic development and aortic endothelial cells apoptosis via FOXO3 activation

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Abstract

Background: Endothelial cell apoptosis plays an important role in the progression of atherosclerosis. Oxidized low density lipoprotein (Ox-LDL) induces endothelial cell apoptosis through multiple signaling pathways. We investigated the role of FOXO3 activation in the development of atherosclerosis and ox-LDL induced mouse aortic endothelial cell (MAEC) apoptosis. **Methods:** In vivo, ApoE-/- mice atherosclerosis model was induced by high fat feeding and the FOXO3 expression in aorta endothelium were measured by IHC. In vitro,MAECs were induced with ox-LDL to establish an atherosclerosis model. The cell viability and apoptosis were measured by MTT and Hoechst 33342 staining. The FOXO3 expression was measured by Q-PCR. Then we constructed two plasmids: the interference vector for FOXO3 and the expression vector for FOXO3. The effects of the two plasmids on MAECs were evaluated. **Results:** The results of *in vivo* experiments showed that FOXO3 activation in mouse aortic endothelium was associated with atherosclerosis (ApoE $^{-/-}$ mice model of atherosclerosis). Furthermore, ox-LDL triggers MAEC apoptosis. FOXO3 activation was associated with Ox-LDL-induced MAEC apoptosis. RNA interference-mediated reduction of FOXO3 expression blunted Ox-LDL-induced MAEC apoptosis. In contrast, overexpression of FOXO3 promoted Ox-LDL-induced MAEC apoptosis. **Conclusions:** FOXO3 activation is therefore involved in the development of atherosclerosis and MAEC apoptosis.

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Fig1

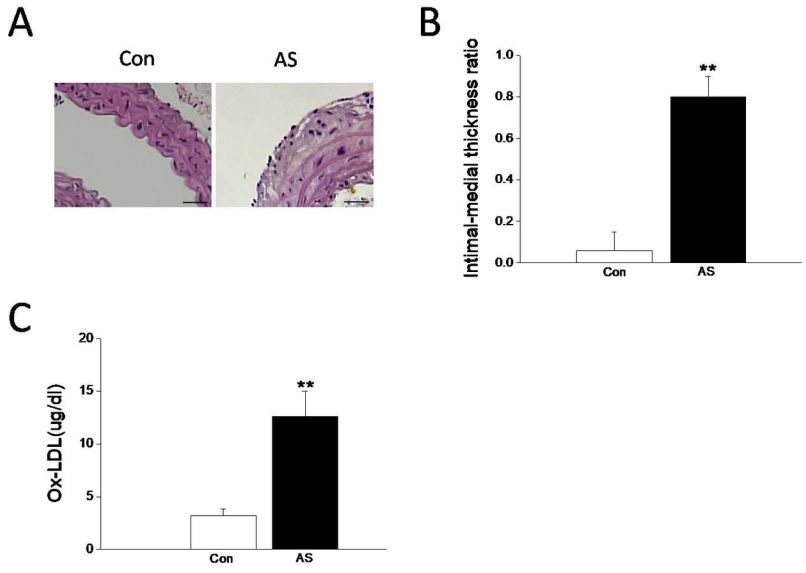
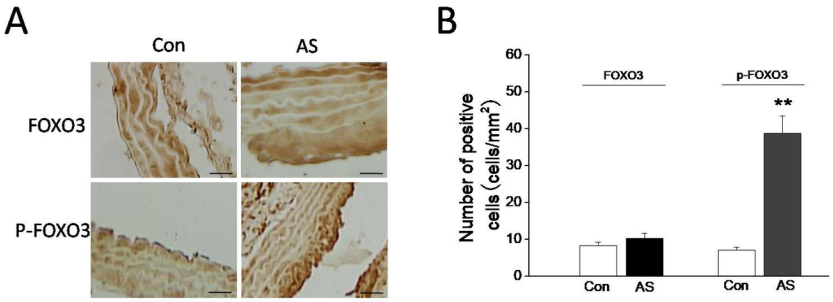


Fig2



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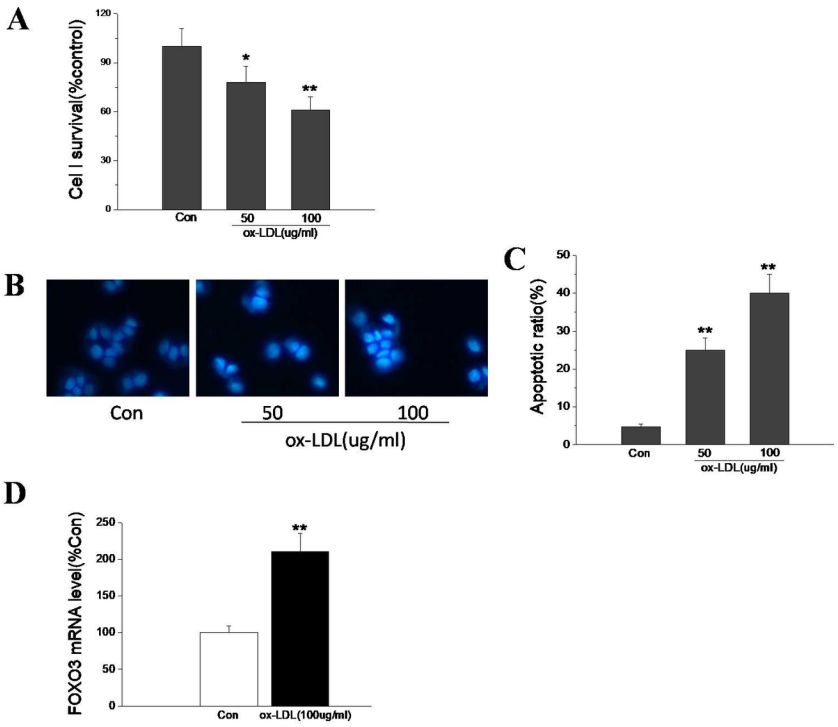

Fig 4

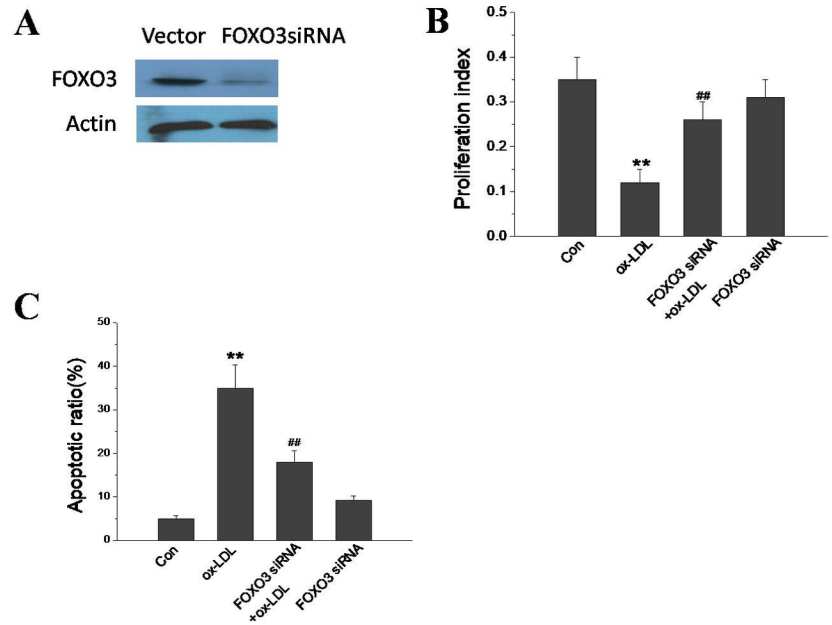

Fig 5