EFFECT OF β3-AR ON THE SCAVENGER RECEPTOR CLASS B TYPE 1 (SR-B1) AND ITS SIGNAL TRANSDUCTION MECHANISM IN MICE WITH APOLIPOPROTEIN E GENE KNOCKOUT

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Objectives To investigate the effects of β3-AR on the lipids, atherosclerosis plaques, scavenger receptor class B type 1 (SR-B1) and its signal transduction in mice with apolipoprotein E gene knockout.

Methods Ten C57BL/6J mice (10 weeks) were selected as control group, and 50 Apo E−/− mice (10 weeks) were randomly divided into five groups: high-fat model group, positive medicine group, small dose β3-AR agonist group, large dose β3-AR agonist group, β3-AR antagonist group. Since 36 weeks, β3-AR agonists or β3-AR antagonists were administrated to mice.
antagonists were given for 12 weeks. Total cholesterol (TC), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C) were examined by automatic biochemical analyser. Thoracic aortas were taken for pathology. SR-B1, P-MeK1/2 and P-ErK1/2 were detected by western blot. Activities of protein kinase C (PKC) were measured by non-radioimmunoassay.

**Results** The serum levels of TC, TG and HDL-C were (2.58±0.35) mmol/l, (0.67±0.039) mmol / L and (1.87±0.11) mmol / L in control group, while (22.20±1.29) mmol / L, (3.19±0.049) mmol/l and (2.26±0.274) in high-fat model group, which were significantly higher (p<0.01) compared with the control group. The serum levels of TC, TG and HDL-C were (18.27±1.30) mmol/l, (1.88 ±0.143) mmol/l and (5.60±0.226) mmol/l in small doses of β3-AR agonist group, (17.06±1.52) mmol/l, (1.55±0.062) mmol/l and (4.53±0.257) mmol/l in large dose group. Compared with high-fat model group, the levels of TC, TG were significantly lower (p<0.01), HDL-C levels were significantly higher (p<0.01) in β3-AR agonist group, and large dose group was better than the small dose group (p<0.05). Compared with high-fat model group, thoracic aortic atherosclerotic plaque areas decreased (p<0.01), lumen areas decreased (p<0.01), the expression of SR-B1, P-MeK1/2 and P-ErK1/2 increased (p<0.01), activities of liver PKC increased (p<0.01) in β3-AR agonist group. Large dose group was better than small dose group (p<0.05).

**Conclusions** Excited β3-AR may decrease the levels of serum TC and TG, increase HDL, reduce the plaque area of thoracic aorta, increase liver SR-B1, P-MeK1/2 and P-ErK1/2, increase liver PKC activity in order to anti-atherosclerosis.