Apoe

Strain Name : B6/JGpt-Apoeem1Cd82/Gpt

Strain Type : knockout CRISPR/Cas9

Strain ID : T001458

Background : C57BL/6JGpt

Application

1. Atherosclerosis model
2. Cardiovascular disease research
3. Hypercholesterolemia research

Description of experiment:

Atherosclerosis is chronic disease caused by the deposition of fats, cholesterol, calcium, and other substances in the endothelium of arteries, which leads to loss of arterial elasticity due to vessel thickening and stiffening. Once that the thick plaques severely occlude an artery can significantly decrease the flow of blood to vascular in tissues served by the artery, thereby causing severe tissue damage. Thus, apolipoprotein knockout mice can provide an effective animal model for studying the role of atherosclerosis.

Apolipoprotein E (ApoE) is a major plasma lipoproteins involved in lipid metabolism and transportation. It functions as a ligand for the cell surface receptors including: low-density lipoprotein receptor (LDLR), the very-low-density lipoprotein (VLDL) receptor and chylomicron remnant receptor. We have now generated an ApoE knockout mouse in the C57BL/6J using CRISPR/Cas9 gene editing technology. Generally, a loss-of-function mutation of ApoE was introduced by an in-del insertion via NHEJ pathway at Cas9-mediated cleavage site (located) on Exon 3. In Apoe−/− mice, western diet can promote the incidence and development of Atherosclerosis. Meanwhile, LDLR mediates the endocytosis and metabolism of lipoprotein, primarily through the recognition of ApoB and ApoE proteins embedded in the outer phospholipid layer of LDL particles. Here, CRISPR/Cas9-based modification in exon 4 of Ldlr gene and embryos injection were conducted for screening the mouse model with frameshift mutation of Ldlr.

Details

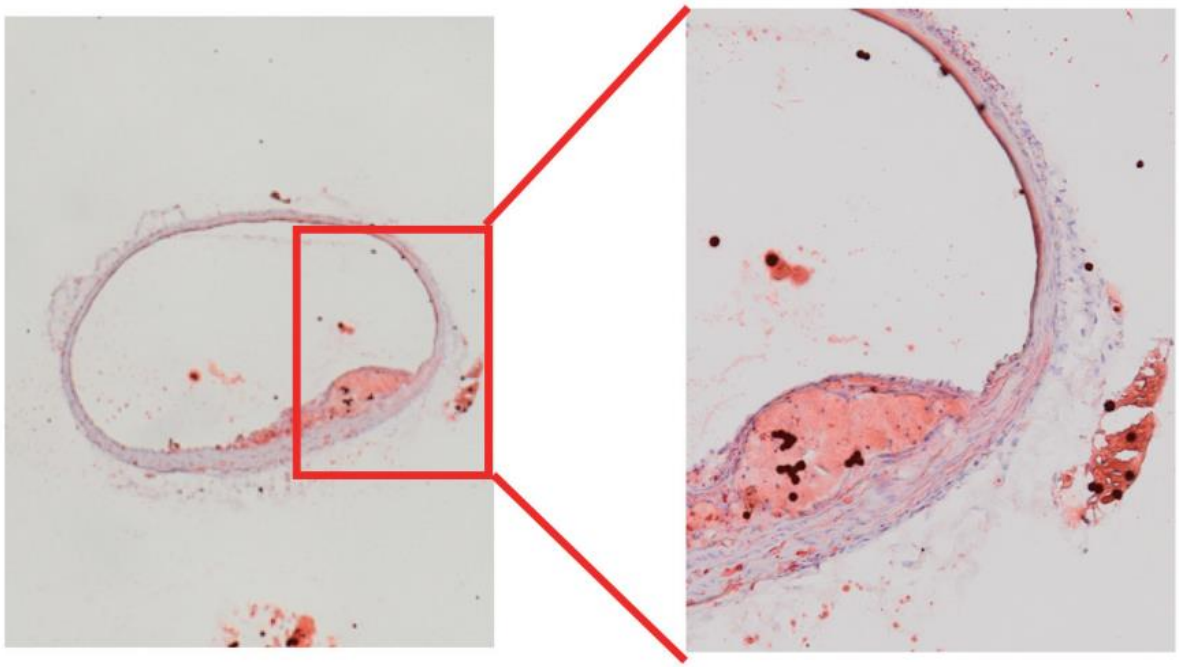
Strain：B6/JGpt-Apoe^{em1Cd82}/Gpt

Group Size：5-10 mice/group，3-8 group

Grouping：Control，Vehicle，Positive drug, Test drug（low, median, high）

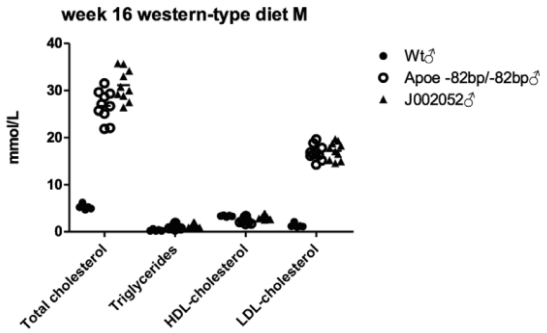
Experimental Period：8 weeks

Test items: body weight, blood lipids, pathological tests (immunohistochemistry, special staining, etc.), protein immunization, qRT-PCR, etc.



Mice were fed with western diet starting from 4 weeks of age;

Increased thickness of aortic wall were observed after 16 week feeding, Oil red O staining shows the lipids were attached to blood vessels.



Elevated levels of plasma cholesterol and low-density lipoprotein cholesterol were observed in ApoE-/- mice regardless of the diet type, western-type diet significantly promoted the further increase.