inotiv
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Genetically engineered models **(GEMS)**

ApoE knockout rat

MODEL	ApoE knockout rat
STRAIN	HsdSage: SD-*ApoE*^{em1Sage}
LOCATION	U.S.
AVAILABILITY	Live colony

CHARACTERISTICS/HUSBANDRY

- 16 bp deletion within Exon 3 on chromosome 1
- Homozygous knockouts exhibit complete loss of ApoE protein via Western blot
- At an early age (5- and 10-week-old), ApoE knockouts demonstrate significantly higher serum cholesterol
- Administration of high fat diets to ApoE knockout (KO) rats has resulted in significantly reduced lifespan (Inotiv does not recommend administering high fat diets to ApoE KO rats)
- Background strain: Sprague Dawley

ZYGOSITY GENOTYPE

- Homozygous

RESEARCH USE

- Alzheimer's disease
- Neurodegenerative diseases

ORIGIN

The ApoE KO rat model was originally created at SAGE Labs, Inc. in St. Louis, MO. The animal inventory was acquired by Envigo in 2019 and then by Inotiv in 2021. The line continues to be maintained through the original SAGE Labs animal inventory and is distributed out of the Boyertown, PA facility.

DESCRIPTION

Apolipoprotein E (ApoE) is a critical apoprotein of the chylomicron that binds to a specific receptor on liver cells and peripheral cells. Defects in ApoE result in disrupted transportation of lipoproteins, fat-soluble vitamins and cholesterol into the lymph systems, and then into blood.

ApoE is essential for the normal metabolism of lipids. It is expressed in the liver, intestines and brain, preventing the accumulation of cholesterol-rich particles in plasma. Widely studied for its role in cardiovascular disease and lipoprotein transport, it has more recently been implicated in Alzheimer's disease and cognition, making this a useful model for the study of atherosclerosis, Alzheimer's and nerve injury.

CITATIONS

31695628 Berenji Ardestani, Simin; Matchkov, Vladimir V; Eftedal, Ingrid; Pedersen, Michael; A Single Simulated Heliox Dive Modifies Endothelial Function in the Vascular Wall of ApoE Knockout Male Rats More Than Females. Frontiers in physiology Vol.10, 2019

31796798 Cornelissen, Anne; Simsekyilmaz, Sakine; Liehn, Elisa; Rusu, Mihaela; Schaaps, Nicole; Afify, Mamdouh; Florescu, Roberta; Almalla, Mohammad; Borinski, Mauricio; Vogt, Felix; Apolipoprotein E deficient rats generated via zinc-finger nucleases exhibit pronounced in-stent restenosis. Scientific reports Vol.9, 2019

27277003 Hohl, Mathias; Linz, Dominik; Fries, Peter; Müller, Andreas; Stroeder, Jonas; Urban, Daniel; Speer, Thimoteus; Geisel, Jürgen; Hummel, Björn; Laufs, Ulrich; Schirmer, Stephan H; Böhm, Michael; Mahfoud, Felix; Modulation of the sympathetic nervous system by renal denervation prevents reduction of aortic distensibility in atherosclerosis prone ApoE-deficient rats. Journal of translational medicine Vol.14, 2016

29166645 Phillips, Evan H; Chang, Mandy S; Gorman, Sydney; Qureshi, Hamna J; Ejendal, Karin F K; Kinzer-Ursem, Tamara L; Blaize, A Nicole; Goergen, Craig J; Angiotensin II Infusion Does Not Cause Abdominal Aortic Aneurysms in Apolipoprotein E-Deficient Rats. Journal of vascular research Vol.55, 2018

29615808 Rune, Ida; Rolin, Bidda; Lykkesfeldt, Jens; Nielsen, Dennis Sandris; Krych, Łukasz; Kanter, Jenny E; Bornfeldt, Karin E; Kihl, Pernille; Buschard, Karsten; Josefsen, Knud; Fels, Johannes Josef; Mortensen, Alan; Christoffersen, Berit; Kirk, Rikke Kaae; Hansen, Axel Kornerup; Long-term Western diet fed apolipoprotein E-deficient rats exhibit only modest early atherosclerotic characteristics. Scientific reports Vol.8, 2018

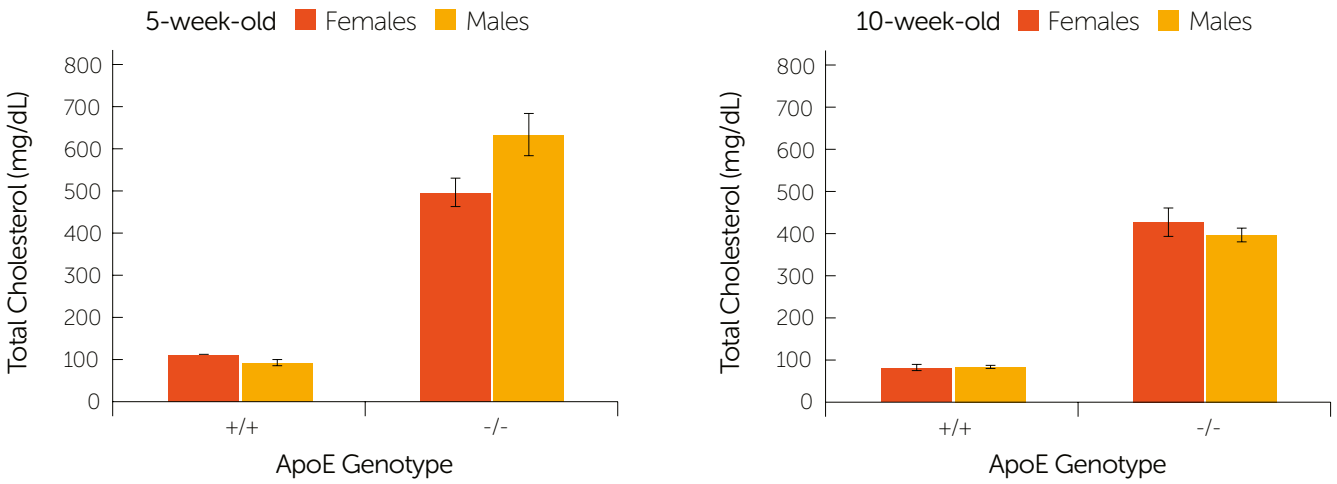

Figure 1: *5- and 10-week-old ApoE KO rats display increased serum cholesterol levels as compared to wild type animals when fed a normal diet.*

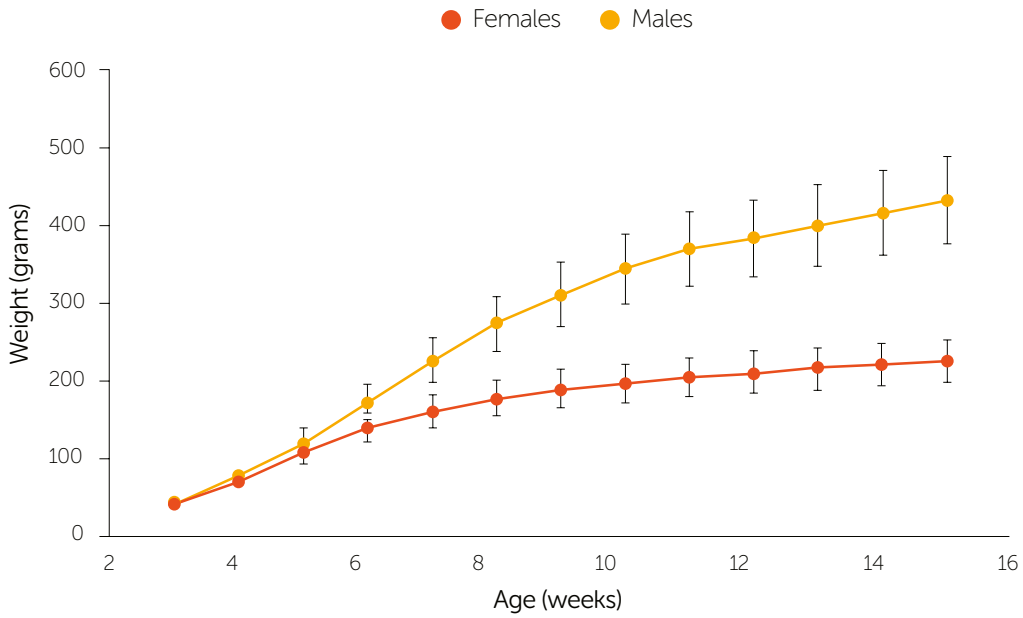

Figure 2: *Graph showing the correlation between the age and weight of ApoE KO rats.*