

B6.Cg-Apoe^{tm1.1(APOE*4)Adiuj} App^{em1Adiuj} Cd2ap^{em1Adiuj} Trem2^{em1Adiuj} /J

Stock No: **033873** | Cd2ap promoter SNP/hAbeta/APOE4/Trem2*R47H

 Congenic, Endonuclease-Mediated Mutation, Targeted Mutation

Estimated to begin distribution on May 3, 2021

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This mutation is maintained with the hAbeta/APOE4/Trem2*R47H mutations (Stock No. [030670](#)) intended to increase risk of late-onset Alzheimer's disease: a humanized Apoe knock-in mutation (sequence coding for human isoform E4), a CRISPR/Cas9-generated *App* allele with a humanized Abeta1-42 region (G601R, F606Y, R609H in the mouse gene, corresponding to amino acid positions 676, 681, 684 in the human *APP* locus) and a CRISPR/Cas9-generated R47H point mutation of the *Trem2* gene.

Donating Investigator

Mike Sasner, The Jackson Laboratory

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GENETIC OVERVIEW

Genetic Background

Generation

Trem2^{em1Adiuj}

Alele Type

Endonuclease-mediated
(Humanized sequence)

Gene Symbol

Trem2

Gene Name

triggering receptor expressed on myeloid cells 2

*Apoe^{tm1.1(APOE*4)Adiuj}*

Alele Type

Targeted (Inserted
expressed sequence,
Humanized sequence)

Gene Symbol

Apoe

Gene Name

apolipoprotein E

App^{em1Adiuj}

Alele Type

Endonuclease-mediated
(Humanized sequence)

Gene Symbol

App

Gene Name

amyloid beta (A4) precursor protein

Alele Type	Gene Symbol	Gene Name
Endonuclease-mediated (Not Specified)	<i>Cd2ap</i>	CD2-associated protein

[VIEW GENETICS](#)

RESEARCH APPLICATIONS

Research Tools
Metabolism Research
Neurobiology Research
Mouse/Human Gene Homologs
Cardiovascular Research

[VIEW ALL RESEARCH APPLICATIONS](#)

BASE PRICE

Starting at:

\$255.00 Domestic price for female

510.00 Domestic price for breeder pair

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Details

Detailed Description

This Cd2ap promoter SNP/hAbeta/APOE4/Trem2*R47H quadruple mutant strain carries a humanized ApoE knock-in allele in which exons 2, 3 and most of exon 4 of the mouse *ApoE* gene were replaced by human *APOE4* gene sequence including exons 2, 3 and 4 (and some 3' UTR sequence), a mutant allele of the *App* gene containing G601R, F606Y and R609H point mutations, a mutant allele of the *Cd2ap* gene with a T-to-A point mutation in the promoter region (modeling human SNP rs4715019) and a knock-in of a point mutation into mouse *Trem2* gene containing an R47H point mutation with two silent mutations.

The targeted *ApoE* gene encodes apolipoprotein E, which is important in lipoprotein metabolism and cardiovascular disease as well as Alzheimer's disease, immunoregulation and cognition. The targeted *App* gene encodes amyloid beta precursor protein, a transmembrane cell surface receptor that is cleaved by secretases. Mutations in this gene have been

associated with Alzheimer's disease. The targeted *Cd2ap* gene encodes a scaffolding protein involved in the actin cytoskeleton regulation, endocytosis and cytokinesis. Mutations of the *CD2AP* gene are associated with Glomerulosclerosis, focal segmental, 3. The targeted *Trem2* gene (triggering receptor expressed on myeloid cells 2) encodes a protein that is part of a receptor signaling complex with TYRO protein tyrosine kinase binding protein, and that activates macrophages and dendritic cells during immune responses. The *TREM2* R47H mutation is a missense mutation in exon 2 that is one of the strongest genetic risk factors for late-onset Alzheimer's disease.

Mice that are homozygous for *Apoe*^{tm1.1(APOE*4)Aduj} (APOE4), *App*^{em1Aduj} (hAbeta), *Cd2ap*^{em1Aduj} (Cd2ap promoter SNP) and *Trem2*^{em1Aduj} (Trem2*R47H) are viable and fertile [March 2020]. If additional characterization of these Cd2ap promoter SNP/hAbeta/APOE4/Trem2*R47H mice is performed, we may modify the strain description accordingly.

Of note, in brains of mice homozygous for the *Trem2*^{em1Aduj} allele (and not carrying any other mutant alleles), expression of both transcripts of *Trem2* is decreased by about 50%. Mice expressing the *Trem2* R47H mutation also express a novel splice variant with a deletion of 119bp at the 5' end of exon 2, due to a cryptic splice acceptor site in exon 2 (see Stock No. 027918).

+ Development

+ Expression Data

+ Control Suggestions

- Genetics

+ *Trem2*^{em1Aduj}

+ *Apoe*^{tm1.1(APOE*4)Aduj}

+ *App*^{em1Aduj}

+ *Cd2ap*^{em1Aduj}

- Disease/Phenotype

+ Disease Terms

+ Research Areas By Phenotype

+ Mammalian Phenotype Terms by Genotype

+ References

Technical Support

CONTACT TECHNICAL SUPPORT

Genotyping Protocols

End Point Analysis: [Trem2](#)

Probe: [App](#)

Probe: [Apoe-Probe](#)

End Point Analysis: [Cd2ap_rs4715019-alt1](#)

[Genotyping resources and troubleshooting](#)

Breeding Considerations

When maintaining a live colony, mice homozygous for *Apoe*^{tm1.1(APOE*4)Adiuj} (APOE4), *App*^{em1Adiuj} (hAbeta), *Cd2ap*^{em1Adiuj} (Cd2ap promoter SNP) and *Trem2*^{em1Adiuj} (Trem2*R47H) may be bred together as they are viable and fertile. [March 2020]

Additional Breeding and Husbandry Support

Mating System

Homozygous for *Apoe*^{tm1.1(APOE*4)Adiuj} X Homozygous for *App*^{em1Adiuj} Heterozygous for *Cd2ap*^{em1Adiuj}
 Homozygous for *Trem2*^{em1Adiuj} X Homozygous for *Apoe*^{tm1.1(APOE*4)Adiuj} Homozygous for *App*^{em1Adiuj}
 Heterozygous for *Cd2ap*^{em1Adiuj} Homozygous for *Trem2*^{em1Adiuj}

Citation

When using the *Cd2ap* promoter SNP/hAbeta/APOE4/Trem2*R47H mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #033873 in your Materials and Methods section.

Pricing & Availability



Estimated to begin distribution on May 3, 2021

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LIVE MOUSE			
AGE	SEX	GENOTYPE	PRICE
Approx 4-8 weeks	Female	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} for <i>Cd2ap</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj} Homozygous for <i>App</i> ^{em1Adiuj} Heterozygous	\$255.00
	Male	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} for <i>Cd2ap</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj} Homozygous for <i>App</i> ^{em1Adiuj} Heterozygous	\$255.00
Approx 4-8 weeks	Female	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} for <i>Cd2ap</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj} Homozygous for <i>App</i> ^{em1Adiuj} Homozygous	\$255.00
	Male	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} for <i>Cd2ap</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj} Homozygous for <i>App</i> ^{em1Adiuj} Homozygous	\$255.00

BREEDER PAIR				PRICE
SEX	GENOTYPE			
Female	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Homozygous for Trem2 ^{em1Adiuj}	Homozygous for App ^{em1Adiuj}	Heterozygous for Cd2ap ^{em1Adiuj}	\$510.00
Male	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Homozygous for Trem2 ^{em1Adiuj}	Homozygous for App ^{em1Adiuj}	Heterozygous for Cd2ap ^{em1Adiuj}	

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