



B 6 . C ^{tm1.1(APOE*4)Adiuj} Apo e ^{em1Adiuj} A b c a 7 ^{em1Adiuj} Trem 2* | J

Stock No: 030320 | Abca7 KO/APOE4/Trem2*R47H

Congenic, Targeted Mutation



AVAILABLE

P L A C E O R D E R

Live mice available in varying quantities. Ask Customer Service for details.

Overview



MODEL-AD

Model Organism Development & Evaluation for Late-Onset Alzheimer's Disease

Also Known As: *Abca7* KO/APOE4/*Trem2**R47H

This triple mutant strain carries a humanized ApoE knock-in mutation (sequence coding for isoform E4), a CRISPR/cas9-generated knock-out (33bp deletion exon 32) mutation of the *Abca7* gene and a CRISPR/cas9-generated R47H point mutation of the *Trem2* gene. These mice may be suitable for use in studies related to Alzheimer's disease, lipoproteins, arteriosclerosis, and coronary heart disease.

Donating Investigator

Mike Sasner, The Jackson Laboratory

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GENETIC OVERVIEW

Genetic Background	Generation
	?+pN1F3 (2019-07-17 00:00:00)

Trem2^{em1Aduj}

Allele Type	Gene Symbol	Gene Name
Endonuclease-mediated (Humanized sequence)	<i>Trem2</i>	triggering receptor expressed on myeloid cells 2

Abca7^{em1Aduj}

Allele Type	Gene Symbol	Gene Name
Endonuclease-mediated (Null/Knockout)	<i>Abca7</i>	ATP-binding cassette, sub-family A (ABC1), member 7

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

Allele Type	Gene Symbol	Gene Name
Targeted (Inserted expressed sequence, Humanized sequence)	<i>ApoE</i>	apolipoprotein E

VIEW GENETICS

RESEARCH APPLICATIONS

Research Tools
Metabolism Research
Cardiovascular Research
Neurobiology Research

VIEW ALL RESEARCH APPLICATIONS

BASE PRICE

Starting at:

\$255.00 Domestic price for female

510.00 Domestic price for breeder pair

VIEW PRICE LIST

Details

Detailed Description

This triple 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 knock-out (33bp deletion exon 32) allele of the *Abca7* gene; and a knock-in of a point mutation into mouse *Trem2*, triggering receptor expressed on myeloid cells 2, gene containing a 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 *Abca7* gene encodes an ATP-binding cassette (ABC) transporter protein that moves lipids across membranes. Mutations in this gene have been associated with susceptibility to Alzheimer's disease.

The targeted *Trem2* gene 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 the *ApoE*^{tm1.1(APOE*4)Adiuj} and *Trem2*^{em1Adiuj} alleles, and heterozygous for the *Abca7*^{em1Adiuj} allele are viable and fertile. Homozygous viability/fertility has not been tested for the *Abca7*^{em1Adiuj} allele (June 2018).

As the mice are characterized, we will modify the strain description and add phenotype data.

Of note, in brains of mice homozygous for the *Trem2*^{em1Adiuj} 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*^{em1Adiuj}

+ *Abca7*^{em1Adiuj}

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

- Disease/Phenotype

+ Disease Terms

+ Research Areas By Genotype

+ Mammalian Phenotype Terms by Genotype

+ References

- Technical Support

C H A T O F F L I N E

C O N T A C T T E C H N I C A L S U P P O R T

Genotyping Protocols

End Point Analysis: [Trem2^{em1Adiuj}-EP](#)

Standard PCR: [ApoE^{tm1.1\(APOE*4\)Adiuj}](#)

Probe: [Abca7 Founder 17-3 \(KI + 33bp del\) - EP](#)

[Genotyping resources and troubleshooting](#)

Breeding Considerations

When maintaining a live colony, mice homozygous for the *ApoE*^{tm1.1(APOE*4)Adiuj} and *Trem2*^{em1Adiuj} alleles, and heterozygous for the *Abca7*^{em1Adpmc} allele may be bred.

Homozygous viability/fertility has not been tested for the *Abca7*^{em1Adiuj} allele (June 2018).

As the mice are characterized, we will modify the strain description if necessary and add data related to viability and fertility.

[Additional Breeding and Husbandry Support](#)

Mating System

Homozygous for Apoe^{tm1.1(APOE*4)Adiuj} Heterozygous for Abca7^{em1Adiuj} Homozygous for Trem2^{em1Adiuj} X
 Homozygous for Apoe^{tm1.1(APOE*4)Adiuj} Wildtype for Abca7^{em1Adiuj} Homozygous for Trem2^{em1Adiuj}
 and reciprocal

Citation

When using the Abca7 KO/APOE4/Trem2*R47H mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #030320 in your Materials and Methods section.

[Animal Health Reports](#)

[Facility Barrier Level Descriptions](#)

 [AX9 \(Standard\)](#)

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Live Mouse

AGE	SEX	GENOTYPE	PRICE
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	Male	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Heterozygous for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$255.00
Approx 4-8 weeks	Female	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Wild-type for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$255.00
	Male	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Wild-type for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$255.00

Breeder Pair

SEX	GENOTYPE	PRICE
Female	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Heterozygous for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$510.00
Male	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Wild-type for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$510.00
Female	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Wild-type for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$510.00
Male	Homozygous for Apoe ^{tm1.1(APOE*4)Adiuj} Heterozygous for Abca7 ^{em1Adiuj} Homozygous for Trem2 ^{em1Adiuj}	\$510.00

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