

B6.Cg-Apoe^{tm1.1(APOE*4)Adiuj} Ptk2b^{em1Adiuj} App^{em1Adiuj} Trem2^{em1Adiuj} /J

Stock No: **033913** | Ptk2b intron 5 SNP/hAbeta/APOE4/Trem2*R47H

 Congenic, Endonuclease-Mediated Mutation, Targeted Mutation

Estimated to begin distribution on May 3, 2021

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risk variant rs73223431.

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

Ptk2b^{em1A}diuj

Allele Type	Gene Symbol	Gene Name
Endonuclease-mediated (Not Specified)	<i>Ptk2b</i>	PTK2 protein tyrosine kinase 2 beta

[VIEW GENETICS](#)

RESEARCH APPLICATIONS

Research Tools
Cell Biology Research
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Neurobiology Research
Mouse/Human Gene Homologs
Cardiovascular Research

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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 *Ptk2b* intron 5 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 *Ptk2b* gene with a C-to-A point mutation in the promoter flanking region (modeling human SNP rs73223431), a mutant allele of the *App* gene containing G601R, F606Y and R609H point mutations 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 *Ptk2b* gene encodes a cytoplasmic protein tyrosine kinase involved in the map kinase signaling pathway. Variants of the *PTK2B* gene are implicated in late onset Alzheimer's disease risk. 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 *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)Adiuj} (APOE4), *Ptk2b*^{em1Adiuj} (Ptk2b intron 5 SNP), *App*^{em1Adiuj} (hAbeta) and *Trem2*^{em1Adiuj} (Trem2*R47H) are viable and fertile [March 2020]. If additional characterization of these Ptk2b intron 5 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*^{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}

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

+ *App*^{em1Adiuj}

+ *Ptk2b*^{em1Adiuj}

- 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: [Ptk2b_rs73223431-alt1](#)

[Genotyping resources and troubleshooting](#)

Breeding Considerations

When maintaining a live colony, mice homozygous for *Apoe*^{tm1.1(APOE*4)Adiuj} (APOE4), *Ptk2b*^{em1Adiuj} (Ptk2b intron 5 SNP), *App*^{em1Adiuj} (hAbeta) 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 *Apoe*^{tm1.1(APOE*4)Adiuj}
 Homozygous for *Trem2*^{em1Adiuj} X Homozygous for *Trem2*^{em1Adiuj}
 Homozygous for *App*^{em1Adiuj} X Homozygous for *App*^{em1Adiuj}
 Homozygous for *Ptk2b*^{em1Adiuj} X Homozygous for *Ptk2b*^{em1Adiuj}

Appearance

BLACK

Citation

When using the *Ptk2b* intron 5 SNP/hAbeta/APOE4/*Trem2**R47H mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #033913 in your Materials and Methods section.

Pricing & Availability



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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} Homozygous for <i>App</i> ^{em1Adiuj}	Heterozygous for <i>Ptk2b</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj}	\$255.00
	Male	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} Homozygous for <i>App</i> ^{em1Adiuj}	Heterozygous for <i>Ptk2b</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj}	\$255.00
Approx 4-8 weeks	Female	Homozygous for <i>Apoe</i> ^{tm1.1(APOE*4)Adiuj} for <i>App</i> ^{em1Adiuj}	Homozygous for <i>Ptk2b</i> ^{em1Adiuj} Homozygous for <i>Trem2</i> ^{em1Adiuj}	\$255.00

Male	SEX	Homozygous for Apoe ^{tm1.1(APOE⁴)Adiuj}	Homozygous for Ptk2b ^{em1Adiuj}	Homozygous for App ^{em1Adiuj}	Homozygous for Trem2	\$255.00
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BREEDER PAIR						
SEX	GENOTYPE					PRICE
Female	Homozygous for Apoe ^{tm1.1(APOE⁴)Adiuj}	Heterozygous for Ptk2b ^{em1Adiuj}	Homozygous for App ^{em1Adiuj}	Homozygous for Trem2		\$510.00
Male	Homozygous for Apoe ^{tm1.1(APOE⁴)Adiuj}	Heterozygous for Ptk2b ^{em1Adiuj}	Homozygous for App ^{em1Adiuj}	Homozygous for Trem2		

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