# B6.CAg-Apoe$^{tm1.1(APOE*4)Adiuj}$ App$^{em2Adiuj}$ Trem2$^{em1Adiuj}$/J

**Stock No:** 031722 | **App KO/APOE4/Trem2*R47H**

Congenic,Targeted Mutation,Endonuclease-Mediated Mutation

CRYO RECOVERY

PLACE ORDER

**Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.**

## Overview

MODEL-AD

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

### Also Known As: App KO/APOE4/Trem2*R47H

This triple mutant strain carries a humanized ApoE knock-in mutation (sequence coding for isoform E4), a CRISPR/cas9-generated 94bp deletion in exon 14 of the *App* 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 |
| --- | --- |
| *Trem2*$^{em1Adiuj}$ | |

| Allele Type | Gene Symbol | Gene Name |
|---|---|---|
| Endonuclease-mediated (Humanized sequence) | *Trem2* | triggering receptor expressed on myeloid cells 2 |

### *App*$^{em2Adiuj}$

| Allele Type | Gene Symbol | Gene Name |
|---|---|---|
| Endonuclease-mediated (Not Specified) | *App* | amyloid beta (A4) precursor protein |

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

| Allele Type | Gene Symbol | Gene Name |
|---|---|---|
| Targeted (Inserted expressed sequence, Humanized sequence) | *Apoe* | apolipoprotein E |

VIEW GENETICS

## RESEARCH APPLICATIONS

Cardiovascular Research
Research Tools
Neurobiology Research
Metabolism Research

VIEW ALL RESEARCH APPLICATIONS

## BASE PRICE

Starting at:

$2,854.50 Domestic price Cryo Recovery

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 allele of the *App* gene containing a 94bp deletion in exon 14; 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 *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 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*$^{em1Adiuj}$ $^{em2Adiuj}$

alleles, and heterozygous for the *App*$^{em2Adiuj}$ allele are viable and fertile. Homozygous viability/fertility has not been tested for the *App*$^{em2Adiuj}$ 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).
***Important note about App isoforms and exon numbering:*** The App-201 isoform (695 aa protein) is encoded by 16 exons, of which the Abeta sequence is encoded by exon 14. The App-206 isoform (770 aa protein) is encoded by 18 exons, of which the Abeta sequence is encoded by exon 16.

## Development

## Expression Data

## Control Suggestions

# Genetics

## *Trem2*$^{em1Adiuj}$

## *App*$^{em2Adiuj}$

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

# Disease/Phenotype

## Disease Terms

## Research Areas By Genotype

## Mammalian Phenotype Terms by Genotype

## References

# Technical Support

CHAT OFFLINE

CONTACT TECHNICAL SUPPORT

## Genotyping Protocols

End Point Analysis:Trem2$^{em1Adiuj}$-EP
Standard PCR:Apoe$^{tm1.1(APOE*4)Adiuj}$
Probe:App$^{em2Adiuj}$ (91bp del)
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 *App*$^{em2Adiuj}$ allele may be bred.

Homozygous viability/fertility has not been tested for the *App*$^{em2Adiuj}$ 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 *Apoe*$^{tm1.1(APOE*4)Adiuj}$, homozygous *Trem2*$^{em1Adiuj}$, heterozygous *App*$^{em2Adiuj}$ x homozygous *Apoe*$^{tm1.1(APOE*4)Adiuj}$, homozygous *Trem2*$^{em1Adiuj}$, Wildtype *App*$^{em2Adiuj}$ and reciproca

## Citation

When using the App KO/APOE4/Trem2*R47H mouse strain in a publication, please cite the originating article(s) and include JAX stock #031722 in your Materials and Methods section.

## Animal Health Reports

Facility Barrier Level Descriptions

*Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, G200*

# Pricing & Availability

Cryo Recovery

Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.

Domestic | Internatior

Pricing effective for USA, Canada and Mexico shipping destinations

### Cryorecovery - Domestic Pricing

| SERVICE | GENOTYPE | PRICE |
|---|---|---|
| Cryo Recovery | Homozygous for Apoe<tm1.1(APOE*4)Adiuj> and Trem2<em1Adiuj>Heterozygous or wildtype for App<em2Adiuj> | $2,854.50 |

We will fulfill your order by providing at least two carriers for each strain ordered. The total number, sex, and genotypes provided will vary, although typically 8 or more animals are provided. Please check genotypes which will be recovered. While the genotypes of all animals produced will be communicated to you prior to scheduling shipment, the genotypes of animals provided may not reflect the mating scheme and genotypes described in the strain description. Animals are typically ready to ship in 11-14 weeks. If a second recovery is required to produce the minimum number of animals, then delivery time would increase to approximately 25 weeks. If we fail to produce animals of the correct genotype, you will not be charged. We cannot guarantee the reproductive success of mice shipped to your facility. If the mice are lost after the first three days (post-arrival) or do not produce progeny at your facility, a new order and fee will be necessary.

Cryorecovery to establish a Dedicated Supply for greater quantities of mice. Mice recovered can be used to establish a dedicated colony to contractually supply you mice according to your requirements. Price by quotation.

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suggest ordering and performing tests on a small number of mice to determine suitability for your particular project.

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### Terms of Use

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