B6(SJL)-ApoE^tm1(APOE*4)Adiu/Tm1Adiu/J

Stock No: 028709 | APOE4/Trem2^R47H

PLACE ORDER

3-6 week lead time for most orders depending on quantity and age range requested
**Overview**

Also Known As: APOE4/Trem2*R47H, APOE*4/Trem2*R47H

This double mutant strain carries a humanized ApoE knock-in mutation (sequence coding for isoform E4) 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

---

### GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genetic Background</td>
<td>Generation</td>
</tr>
<tr>
<td>?+pN1F3</td>
<td>(2019-03-01 00:00:00)</td>
</tr>
</tbody>
</table>

**Trem2^em1Adju**

<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endonuclease-mediated (Humanized sequence)</td>
<td>Trem2</td>
<td>triggering receptor expressed on myeloid cells 2</td>
</tr>
</tbody>
</table>

**Apoem1.1(APOE*4)Adju**

<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted (Inserted expressed sequence, Humanized sequence)</td>
<td>Apoe</td>
<td>apolipoprotein E</td>
</tr>
</tbody>
</table>

---

### RESEARCH APPLICATIONS

Neurobiology Research
Research Tools
Details

Detailed Description

This double 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), and a knock-in point mutation in the mouse Trem2, gene consisting of an R47H point mutation, along with 2 other silent mutations. The targeted apolipoprotein E gene is important in lipoprotein metabolism and cardiovascular disease as well as Alzheimer's disease, immunoregulation and cognition. 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 both alleles are viable and fertile. 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\textsuperscript{em1Adij}\ 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\textsuperscript{em1Adij}

Apo\textsuperscript{em1.1ApoE\textsuperscript{-/Adij}}

Disease/Phenotype

Disease Terms
Genotyping Protocols
End Point Analysis: Trem2\textsuperscript{em1(R47H)Msasn}\_EP
End Point Analysis: Trem2\textsuperscript{tm1.1(APOE*4)Msasn}\_EP
Sanger sequencing: Apoe\textsuperscript{tm1.1(APOE*4)Msasn}\_E4/E3/E2-Alternate 1
High Resolution Melting: Apoe\textsuperscript{tm1.1(APOE*4)Msasn}

Genotyping resources and troubleshooting

Breeding Considerations
When maintaining a live colony, these mice can be bred as homozygotes for both alleles.

Additional Breeding and Husbandry Support

Mating System
Homozygous Apoe, homozygous Trem2 x Homozygous Apoe, homozygous Trem2

Citation
When using this APOE4/Trem2\textsuperscript{R47H} mouse strain in a publication, please cite the originating article(s) and include JAX stock #028709 in your Materials and Methods section.

Facility Barrier Level Descriptions

3–6 week lead time for most orders depending on quantity and age range requested

Pricing & Availability

<table>
<thead>
<tr>
<th>AGE</th>
<th>SEX</th>
<th>GENOTYPE</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approx 4-8 weeks</td>
<td>Female</td>
<td>Homozygous for Apoe\textsuperscript{tm1.1(APOE*4)Adju}</td>
<td>$255.00</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>Homozygous for Apoe\textsuperscript{tm1.1(APOE*4)Adju}</td>
<td>$255.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Homozygous for Trem2\textsuperscript{em1Adju}</td>
<td>$255.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Homozygous for Trem2\textsuperscript{em1Adju}</td>
<td>$255.00</td>
</tr>
</tbody>
</table>

Payment Terms and Conditions
Terms are granted by individual review and stated on the customer invoice(s) and account statement. These transactions are payable in U.S. currency within the granted terms. Payment for services, products, shipping containers, and shipping costs that are rendered are expected within the payment terms indicated on the invoice or stated by contract. Invoices and account balances in arrears of stated terms may result in The Jackson Laboratory pursuing collection activities including but not limited to outside agencies and court filings.

**The Jackson Laboratory’s Genotype Promise**
The Jackson Laboratory has rigorous genetic quality control and mutant gene genotyping programs to ensure the genetic background of JAX® Mice strains as well as the genotypes of strains with identified molecular mutations. JAX® Mice strains are only made available to researchers after meeting our standards. However, the phenotype of each strain may not be fully characterized and/or captured in the strain data sheets. Therefore, we cannot guarantee a strain’s phenotype will meet all expectations. To ensure that JAX® Mice will meet the needs of individual research projects or when requesting a strain that is new to your research, we suggest ordering and performing tests on a small number of mice to determine suitability for your particular project.

---

**Terms Of Use**

**General Terms and Conditions**

---

**Additional Use Restrictions Apply**
The use of this mouse model is subject to the terms and conditions of the Limited Label Use License from Caribou Biosciences, Inc.
The use of this mouse model is subject to the terms and conditions of the Limited License from The Broad Institute.

**Licensing Information**
Phone: 207-288-6470
Email: TechTran@jax.org

**JAX® Mice, Products & Services Conditions of Use**

“MICE” means mouse strains, their progeny derived by inbreeding or crossbreeding, unmodified derivatives from mouse strains or their progeny supplied by The Jackson Laboratory (“JACKSON”). “PRODUCT(S)” means biological materials supplied by JACKSON, and their derivatives. “SERVICES” means projects conducted by JACKSON for other parties that may include but are not limited to the use of MICE or PRODUCTS. “RECIPIENT” means each recipient of MICE, PRODUCTS, or SERVICES provided by JACKSON including each institution, its employees and other researchers under its control. MICE or PRODUCTS shall not be: (i) used for any purpose other than internal research, (ii) sold or otherwise provided to any third party for any use, or (iii) provided to any agent or other third party to provide breeding or other services. Acceptance of MICE, PRODUCTS or SERVICES from JACKSON shall be deemed as agreement by RECIPIENT to these conditions, and departure from these conditions requires JACKSON’s prior written authorization.

---

**No Warranty**

MICE, PRODUCTS AND SERVICES ARE PROVIDED “AS IS”. JACKSON EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO MICE, PRODUCTS OR SERVICES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY OF NON-INFRINGEMENT OF ANY PATENT, TRADEMARK, OR OTHER INTELLECTUAL PROPERTY RIGHTS.

---

**Credit for PRODUCTS or SERVICES**

In case of dissatisfaction for a valid reason and claimed in writing by a purchaser within ninety (90) days of receipt of, PRODUCTS or SERVICES, JACKSON will, at its option, provide credit or replacement for the PRODUCT received or the SERVICES provided. JACKSON makes no other representations and this shall be the exclusive remedy of the purchaser. Please note specific policy for live mice.

---

**Animal Care and Use for SERVICES**

Consistent with the requirement for a written understanding regarding animal care and use, the JACKSON Animal Care and Use Committee will review the animal care and use protocol(s) associated with any SERVICES to be performed at JACKSON, and JACKSON shall have ultimate responsibility and authority for the care of animals while on site or in JACKSON custody.
No Liability

In no event shall JACKSON, its trustees, directors, officers, employees, and affiliates be liable for any causes of action or damages, including any direct, indirect, special, or consequential damages, arising out of the provision of MICE, PRODUCTS, or SERVICES, including economic damage or injury to property and lost profits, and including any damage arising from acts or negligence on the part of JACKSON, its agents or employees. Unless prohibited by law, in purchasing or receiving MICE, PRODUCTS, or SERVICES from JACKSON, purchaser or recipient, or any party claiming by or through them, expressly releases and discharges JACKSON from all such causes of action or damages, and further agrees to defend and indemnify JACKSON from any costs or damages arising out of any third party claims.

MICE, PRODUCTS or SERVICES are to be used in a safe manner and in accordance with all applicable governmental rules and regulations.

The foregoing represents the General Terms and Conditions applicable to JACKSON’s MICE, PRODUCTS or SERVICES. In addition, special terms and conditions of sale of certain MICE, PRODUCTS, or SERVICES may be set forth separately in JACKSON web pages, catalogs, price lists, contracts, and/or other documents, and these special terms and conditions shall also govern the sale of these MICE, PRODUCTS and SERVICES by JACKSON, and by its licensees and distributors.

Acceptance of delivery of MICE, PRODUCTS or SERVICES shall be deemed agreement to these terms and conditions. No purchase order or other document transmitted by purchaser or recipient that may modify the terms and conditions hereof, shall be in any way binding on JACKSON, and instead the terms and conditions set forth herein, including any special terms and conditions set forth separately, shall govern the sale of MICE, PRODUCTS or SERVICES by JACKSON.

Related Strains

<table>
<thead>
<tr>
<th>Related Strains</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
</tr>
<tr>
<td>By Allele</td>
</tr>
<tr>
<td>By Gene</td>
</tr>
<tr>
<td>By Collection</td>
</tr>
</tbody>
</table>

All Related Strains
ELLSWORTH FACILITY OFFICIALLY OPEN AND OPERATIONAL
Shipments have begun at our new facility, allowing increased access to JAX mouse models.