B6; 129S-Gt(ROSA)26Sor<sup>tm32(CAG-COP4*H134R/EYFP)Hze</sup> <i>/J</i>
Stock No: 012569 | Ai32 or Ai32(RCL-ChR2(H134R)/EYFP)

Gene Trap, Targeted Mutation

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

**Overview**

Also Known As: Ai32 or Ai32(RCL-ChR2(H134R)/EYFP)

These mice express an improved channelrhodopsin-2/EYFP fusion protein following exposure to Cre recombinase. These mice can be used in optogenetic studies for rapid in vivo activation of excitable cells by illumination with blue light (450-490 nm).

A C57BL/6J congenic version of this strain is available as Stock No. 024109.

**Donating Investigator**

Hongkui Zeng, Allen Institute for Brain Science

**GENETIC OVERVIEW**

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tbody>
<tr>
<td>Gt(ROSA)26Sor&lt;sup&gt;tm32(CAG-COP4*H134R/EYFP)Hze&lt;/sup&gt;</td>
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</tbody>
</table>

**Allele Type**

- Targeted (Reporter)

**Gene Symbol**

- Gt(ROSA)26Sor

**Gene Name**

- gene trap ROSA 26, Philippe Soriano

**RESEARCH APPLICATIONS**

Neurobiology Research

Research Tools
Ai32 mice homozygous for the Rosa-CAG-LSL-Chr2(H134R)-EYFP-WPRE conditional allele are viable and fertile. A $\text{loxP}$-flanked STOP cassette prevents transcription of the downstream Chr2(H134R)-EYFP fusion gene. Because this CAG promoter driven reporter construct was targeted for insertion into the $\text{Gt(ROSA)26Sor}$ locus, Chr2(H134R)-EYFP expression is determined by which tissue(s) express Cre recombinase.

When bred to mice that express Cre recombinase, the resulting offspring will have the STOP cassette deleted in the cre-expressing tissues; resulting in expression of the Chr2(H134R)-EYFP fusion protein. Chr2(H134R)-EYFP expression following exposure to cre can be detected by EYFP fluorescence (and presumably by mRNA [in situ hybridization] and antibody staining [immunohistochemistry]; although this was not tested by the donating investigator).

The donating investigator reports Ai32 mice have no significant expression of Chr2(H134R)-EYFP prior to introduction of Cre recombinase. Importantly, very low levels of Chr2(H134R)-EYFP expression may be present before Cre recombination - but the Chr2(H134R)-EYFP expression levels after Cre recombination are significantly greater than those baseline levels. As such, it is recommended that researchers include Cre-negative Ai32 controls to establish the baseline Chr2(H134R)-EYFP levels in their experiments.

For characterization information, see images at the Allen Institute for Brain Science website (Ai32 images).

Of note, the $\text{FRT}$ sites flanking the mutation allow for additional targeted replacement of the reporter sequences through $\text{Fli}$-mediated recombination if so desired. Similarly, the $\text{attB}/\text{attP}$-flanked selection cassette may be removed by introduction of the site-specific bacteriophage PhiC31 integrase if so desired.

The Chr2(H134R)-EYFP fusion protein is composed of a $\text{Chlamydomonas reinhardtii}$-derived channelrhodopsin-2 that harbors a gain-of-function H134R substitution fused in-frame with an enhanced yellow fluorescent protein. The Chr2(H134R) is designed to cause larger stationary photocurrents compared to Chr2.

The bacterial opsins are retinal-binding proteins that combine a light-sensitive domain with an ion channel or pump; providing light-dependent ion transport, membrane potential alteration, and sensory functions to bacteria. This Chr2(H134R) functions as a blue light-driven cation channel that depolarizes the cell and causes action potentials. As such, illuminating Chr2(H134R)-expressing cells with blue light (450-490 nm) leads to rapid and reversible photostimulation of action potential firing activity in these cells.
Genetics

Gt(ROSA)26Sor^{tm32(CAG-COP4*H134R/EYFP)Hze}

Disease/Phenotype

Disease Terms

Research Areas By Phenotype

Mammalian Phenotype Terms by Genotype

References

Technical Support

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
Standard PCR: Gt(ROSA)26Sor(COP4-EGFP)
Genotyping resources and troubleshooting

Breeding Considerations

When maintaining a live colony, homozygous mice may be bred together.

Additional Breeding and Husbandry Support

Mating System
Homozygote x Homozygote

Citation

When using the Ai32 or Ai32(RCL-ChR2(H134R)/EYFP) mouse strain in a publication, please cite the originating article(s) and include JAX stock #012569 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

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

Cryo Recovery

Cryorecovery - Domestic Not-For-Profit & Academic Pricing

<table>
<thead>
<tr>
<th>SERVICE/PRODUCT</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
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<tbody>
<tr>
<td>Cryo Recovery</td>
<td>Heterozygous or wildtype for Gt(ROSA)26Sor&lt;tm32.1(CAG-COP4*H134R/EYFP)Hze&gt;</td>
<td>$2,854.50</td>
</tr>
</tbody>
</table>

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Terms Of Use

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