Overview

Also Known As: Rai1-Tag (Rai1<sup>tm1Luo</sup>)

The Rai1<sup>tm1Luo</sup> knock-in allele expresses a FLAG/myc-tagged RAI1 (Rai1-Tag) before Cre recombinase exposure. Cre-mediated deletion of the floxed FLAG-myc-STOP sequence results in expression of RAI1/EGFP fusion protein (Rai1<sup>EGFP</sup>). These Rai1<sup>Tag</sup> may be useful for studying Rai1 DNA binding, circuit assembly and neuronal communication in human disorders such as Smith-Magenis syndrome (SMS).

Donating Investigator

Liqun Luo, Stanford University

Genetic Overview

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rai1&lt;sup&gt;tm1Luo&lt;/sup&gt;</td>
<td></td>
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<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
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<tbody>
<tr>
<td>Targeted (Conditional ready (e.g. floxed), Reporter)</td>
<td>Rai1</td>
<td>retinoic acid induced 1</td>
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</tbody>
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Research Applications

- Research Tools
- Neurobiology Research
- Diabetes and Obesity Research
- Cancer Research
- Cell Biology Research

Check out the NEW Design
Haploinsufficiency of retinoic acid induced 1 (RAI1) in humans causes Smith-Magenis syndrome (SMS), which is associated with diverse neurodevelopmental and behavioral symptoms as well as obesity. RAI1 encodes a nuclear protein with emerging functions in the expression of genes involved in circuit assembly and neuronal communication.

The Rai1\textsuperscript{Tag} knock-in allele has a \textit{loxp}-flanked FLAG-myc-STOP cassette upstream of an EGFP sequence, all inserted in-frame into the endogenous stop codon of the retinoic acid induced 1 gene. Prior to Cre recombinase exposure, expression of FLAG/myc-tagged RAI1 (Rai1-Tag) is observed in a pattern consistent with the endogenous gene, and no EGFP expression is reported. Rai1-Tag is expressed in many cell types in the brain, with an onset that parallels the neuronal differentiation process and remains broadly expressed throughout the adult mouse brain - including olfactory bulb, cortex, hippocampus, striatum, thalamus, hypothalamus, cerebellum and brainstem.

When bred to mice that express Cre recombinase, offspring will have the floxed region (FLAG-myc-STOP) deleted in cre-expressing tissues; resulting in expression of an RAI1/EGFP fusion protein (Rai1\textsuperscript{EGFP}) instead of Rai1-Tag. For example, when bred to mice with Cre-expression in subcortical excitatory neurons (Vglut2-ires-cre ; Stock No. 016963), the resulting Vglut2\textsuperscript{Cre}:Rai1\textsuperscript{Tag} mice have Cre-positive thalamic neurons expressing RAI1/EGFP but not Tag. Any Cre-negative neurons in those mice express Rai1-Tag but not EGFP.

Mice homozygous for the Rai1\textsuperscript{Tag} knock-in allele are viable and fertile with no reported gross physical or behavioral abnormalities. The Tag peptide on the RAI1 C-terminus does not adversely affect Rai1-Tag expression, and allows for immunoprecipitation (via anti-FLAG antibodies). Expression of the RAI1/EGFP fusion protein is detectable by antibody staining. However, the donating investigator reports that detection of the fusion protein by direct fluorescence has not been successful to date (December 2016).
Mice homozygous for the Rai1\textsuperscript{Tag} allele are viable and fertile with no reported gross physical or behavioral abnormalities.

When maintaining a live colony, heterozygous mice may be bred together, to wildtype mice from the colony or to C57BL/6J inbred mice (Stock No. 000664). Alternatively, homozygous mice may be bred together.

**Additional Breeding and Husbandry Support**

**Citation**

When using the Rai1-Tag (Rai1\textsuperscript{Tag}) mouse strain in a publication, please cite the originating article(s) and include JAX stock #029101 in your Materials and Methods section.

**Animal Health Reports**

*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.

CRYORECOVERY - DOMESTIC PRICING

<table>
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<tr>
<th>SERVICE/PRODUCT</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
</tr>
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<tbody>
<tr>
<td>Cryo Recovery &gt;</td>
<td>Heterozygous for Rai1&lt;tm1Luo&gt;</td>
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</table>

Domestic

Pricing effective for USA, Canada and Mexico shipping destinations

RELATED PRODUCTS AND SERVICES

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<thead>
<tr>
<th>SERVICE/PRODUCT</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frozen Mouse Embryo</td>
<td>STOCK Rai1&lt;tm1Luo&gt;/J</td>
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PAYMENT TERMS AND CONDITIONS

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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. We do not guarantee breeding performance and therefore suggest that investigators order more than one breeding pair to avoid delays in their research.

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TERMS OF USE
ADDITIONAL USE RESTRICTIONS APPLY

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LICENSING INFORMATION

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

Related Strains

- All
- By Allele
- By Gene
- By Collection