MOUSE STRAIN DATASHEET - 003342

STOCK
Hba
Hbb
Tg ( HBA - HBBs ) 41Paz / tm1Paz tm1Tow

Stock No: 003342 | Berkeley model

Available

PLACE ORDER

Live mice available in varying quantities. Ask Customer Service for details.
Overview

Also Known As: sickle cell anemia, Berkeley model
Mice homozygous for the alpha-globin null allele, homozygous for the beta-globin null allele and carrying the sickle transgene (Hba\(^{00}\) Hbb\(^{00}\) Tg(Hu-miniLCR\(\alpha1^G V\delta^S\)\(\gamma^S\)) are called sickle cell mice (Berkeley model). These mice display the major genetic, hematologic and histopathologic features observed in humans with sickle cell anemia and may be useful in studying sickle cell disease.

Donating Investigator
Dr. Chris Paszty, Amgen, Inc.

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1F7G34</td>
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<tr>
<td></td>
<td>(2018-04-02 00:00:00)</td>
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</tbody>
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Tg(HBA-HBBs)41Paz

| Transgenic (Inserted expressed sequence, Humanized sequence) |

Hbb\(^{tm1Tow}\)

<table>
<thead>
<tr>
<th>Targeted (Null/Knockout)</th>
<th>Gene Symbol</th>
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<td>Hbb</td>
<td>hemoglobin beta chain complex</td>
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Hba\(^{tm1Paz}\)

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RESEARCH APPLICATIONS

Hematological Research
Mouse/Human Gene Homologs

BASE PRICE
Starting at:
Details

Detailed Description

These mice harbor

1) the $Hba^{tm1Paz}$ null mutation (also called $Hba^0$; designed with both of the adult hemoglobin genes [$\alpha_1$ and $\alpha_2$] deleted),

2) the $Hbb^{tm1Tow}$ null mutation (also called $Hbb^0$; designed with deletion of the entire hemoglobin beta-β1 [major] and the 5’ portion of the hemoglobin beta-β2 [minor]).

3) the Tg(HBA-HBBs)41Paz transgene (also called Tg(Hu-miniLCR$\alpha_1^G\gamma_\delta_\beta^S$); designed with the human sequences encoding the hemoglobin subunits
   - alpha 1 ($HBA1$),
   - gamma 2 ($HBG2$),
   - gamma ($HBG1$),
   - delta ($HBD$),
   and the beta sickle allele ($HBB^S$),
   and the locus control region (LCR).

Mice homozygous for the alpha-globin null allele, homozygous for the beta-globin null allele and carrying the sickle transgene ($Hba^{00}$ $Hbb^{00}$ Tg(Hu-miniLCR$\alpha_1^G\gamma_\delta_\beta^S$) are called sickle cell mice (Berkeley model). They exclusively express human sickle hemoglobin, and do not express mouse $Hba$ or $Hbb$. Although chronically anemic, most of these mice survive for 2 to 9 months and are fertile. A significant percentage of sickle cell mice do not survive to adulthood. These mice display the major genetic, hematologic and histopathologic features observed in humans with sickle cell anemia; including irreversibly sickled red blood cells, anemia and multiorgan pathology. Typically, ~20% of sickling mutant mice die between weaning and 14 weeks of age.

This strain does not carry the retinal degeneration allele $Pde6b^{rd1}$.
Genotyping Protocols
Separated PCR:Hbb<sup>tm1Tow</sup>
Standard PCR:Hba<sup>tm1Paz</sup>
Standard PCR:Tg(HBA-HBBs)41Paz
QPCR:Tg(HBA-HBBs)41Paz
Probe:Hba<sup>tm1Paz</sup> Probe
Probe:Pde6b<sup>rd1</sup>

Genotyping resources and troubleshooting

Dietary Information
LabDiet® 5K52 formulation (6% fat)

Breeding Considerations
The breeding strategy utilized by The Jackson Laboratory follows a general scheme of mating non-sickling females with sickling males:

Type 1:
homozygous for Hba<sup>tm1Paz</sup>, heterozygous for Hbb<sup>tm1Tow</sup>, hemizygous for Tg(HBA-HBBs)41Paz (-/-, +/-, Tg/0, non-sickling)

Type 2:
homozygous for Hba<sup>tm1Paz</sup>, homozygous for Hbb<sup>tm1Tow</sup>, homozygous for Tg(HBA-HBBs)41Paz (-/-, +/-, Tg/Tg, sickling)

Currently, trio matings are being used to maximize colony breeding. Sickling females are not suitable for breeding. Approximately 50% of progeny are homozygous for both Hba and Hbb targeted alleles and are hemizygous or homozygous for the transgene (sickling mutant mice). Of these sickling mutant mice, ~81% will be hemizygous for the transgene and the other ~19% will be homozygous. Only ~40% of the sickling mutants will be male. Typically, ~20% of sickling mutant mice die between weaning and 14 weeks of age.

Breeding units supplied to the customer will consist of one non-sickling female (Type 1 [-/-, +/-, Tg/0]) and one sickling male (homozygous for Hba<sup>tm1Paz</sup>, homozygous for Hbb<sup>tm1Tow</sup>, hemizygous for Tg(HBA-HBBs)41Paz [-/-, +/-, Tg/0]).

The Jackson Laboratory does not offer triple homozygous males or females because they do not survive shipping. Mating mice that are both homozygous for the transgene results in undersized litters and a small percentage of sickling pups. Additional Breeding and Husbandry Support
Mating System
HOM HET HEMI X HOM HOM HOM (NO RECIP)

Appearance
Expected coat color from matings is black and agouti.

Citation
When using the Berkeley model mouse strain in a publication, please cite the originating article(s) and include JAX stock #003342 in your Materials and Methods section.

Animal Health Reports
AX11 (Maximum)

Pricing & Availability

Live mice available in varying quantities. Ask Customer Service for details.

Available

Domestic

Pricing effective for USA, Canada and Mexico shipping destinations

**Live Mouse**

<table>
<thead>
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<th>AGE</th>
<th>SEX</th>
<th>GENOTYPE</th>
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**Breeder Pair**

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

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All

By Allele

By Gene

By Collection

All Related Strains
MOUSE PHENOME DATABASE

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TOMORROW'S CURES

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