This knock-in mutation (also referred to as a tafazzin knock-down or TAZKD) strain is a tetracycline inducible shRNA-mediated TAZ knock-down mouse model of Barth syndrome, and may also be useful in studies of lipid metabolism, and myocardial and mitochondrial physiology.

Donating Investigator
Zaza Khuchua, Children's Hospital Medical Center

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tbody>
<tr>
<td>Gt(ROSA)26Sor</td>
<td>N6+N1F8</td>
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Allele Type: Targeted (Inducible, Knockdown)
Gene Symbol: Gt(ROSA)26Sor
Gene Name: gene trap ROSA 26, Philippe Soriano

RESEARCH APPLICATIONS

Research Tools
Cardiovascular Research
Metabolism Research
These mutant mice have a tetracycline inducible \textit{Taz} specific short hairpin RNA (shRNA) driven by the endogenous mouse \textit{Gt(ROSA)26Sor} promoter. Expression of the shRNA is controlled by the transcription of the H1 RNA polymerase III promoter, which is coupled to a tet-operator (tetO) sequence. Expression of the shRNA is blocked by codon-optimized version of the tet repressor itetR, which is part of the allelic construct found in this mouse. Doxycycline (dox—a tetracycline analog) treatment decreases the affinity of itetR for the tetO sequence, allowing transcription of the shRNA.

Dox-induced \textit{Taz} gene silencing is detected in heart (to ~3.7% of wildtype), skeletal muscle (to ~11.2%), liver (to ~8.9%) and brain (to ~3.4%) by RT-PCR analysis. Gene product (mRNA) in transgenic mice without dox induction is reduced by 35% of wildtype control levels. Withdrawal of dox at 4 weeks partially reverses the reduction of \textit{Taz} expression. Protein product is reduced in cardiac (by 97%) and in skeletal muscles (by 86%) as detected by Western Blot analysis. Dox treated mutants, at 8 months of age, weigh 17% less than controls and exhibit left ventricular cardiac dilation and mass reduction. In dox-treated 2 month old mutants, levels of tetralinoleoyl cardiolipin in cardiac and skeletal muscles are reduced, with a shift to more saturated cardiolipins and an accumulation of monolysocardiolipin (MLCL) resulting in an increase in the monolysocardiolipin/cardiolipin ratio. Ultrastructural mitochondrial and sarcomeric abnormalities are observed in dox-treated 8 month old mutants, including mitochondrial aggregations, mitochondrial vacuoles, disorganized myofibrils and endoplasmic-reticular membranes in skeletal muscle and swollen mitochondria and reduced myofiber density in cardiac tissue. Skeletal muscle contraction is impaired. Mice that are heterozygous for the targeted mutation are viable, fertile, normal in size and do not display any gross physical or behavioral abnormalities in the absence of tetracycline or any similar analog. The Donating Investigator reports that although homozygotes are viable, in the absence of dox do not live long.
Genotyping Protocols
Standard PCR: Gr(ROSA)26Sor(H1/tetO-RNAi)
Genotyping resources and troubleshooting

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

Breeding Considerations
When maintaining a live colony, these mice can be bred as heterozygotes. The Donating Investigator reports that although homozygotes are viable they do not live long.

Additional Breeding and Husbandry Support
Mating System
Heterozygote x +/+ sibling

Citation
When using the TAZKD mouse strain in a publication, please cite the originating article(s) and include JAX stock #014648 in your Materials and Methods section.

Animal Health Reports
Facility Barrier Level Descriptions

FGB29 (Standard)
Live mice available in varying quantities. Ask Customer Service for details.

### Related Products and Services

**Frozen Mouse Embryo**

B6.Cg-Gt(Rosa)26Sor<tm37(H1/tetO-RNAi:Taz)Arte>/ZkuhJ Frozen  

$2595.00

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