B6.129-Ucp1^{tm1Kz}\textsuperscript{J}

Stock No: 003124 | Ucp1\textsuperscript{−}

Congenic, Targeted Mutation

REPOSITORY LIVE

PLACE ORDER

3–6 week average lead time depending on quantity and age requests are not accepted

Also Known As: Ucp1\textsuperscript{−}

These Ucp knock-out mice are sensitive to cold temperatures, exhibit altered metabolism and are resistant to diet induced obesity when maintained at 20°C. This mutant mouse strain may be useful in studies of obesity, metabolic homeostasis, and adaptive thermogenesis.

Donating Investigator

Leslie P. Kozak, Polish Academy of Sciences

READ MORE +

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tr>
<td>00664 C57BL/6J</td>
<td>?×N3F10</td>
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<td>(2018-07-22 00:00:00)</td>
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<table>
<thead>
<tr>
<th>Ucp1^{tm1Kz}</th>
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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 (Null/Knockout)</td>
<td>Ucp1</td>
<td>uncoupling protein 1 (mitochondrial, proton carrier)</td>
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</table>

VIEW GENETICS

RESEARCH APPLICATIONS

Internal/Organ Research
Cardiovascular Research
Diabetes and Obesity Research
Metabolism Research
Research Tools
Endocrine Deficiency Research

VIEW ALL RESEARCH APPLICATIONS
Details

Detailed Description

Mice that are homozygous for this knockout allele are viable and fertile, but exhibit sensitivity to cold temperatures. The Donating Investigator notes that homozygous offspring have increased survival rates to weaning age when maintained at 25°C to 28°C. No gene product (mRNA or protein) is detected by Northern or Western blot analysis of brown adipose tissue from homozygotes. When maintained at 20°C, homozygotes are resistant to diet induced obesity with reduced white fat depot weights, exhibit a 0.1–0.3°C higher body temperature, and a slightly lowered respiratory quotient compared to controls. Notably, when maintained at 27°C, homozygous mutant mice are no longer resistant to diet induced obesity and gain weight at a rate similar to wildtype controls. An increase in the number of brown adipocytes in the inguinal fat depots is observed in mutant mice maintained at 20°C, on either diet. Homozygotes have reduced levels of plasma fatty acids, circulating triglyceride levels, and T4 levels. Spleen cell numbers are reduced by approximately 3-fold, CD8 single positive cells are reduced to approximately half and CD4/CD8 double positive cells in both the spleen and thymus are increased in homozygous animals. Homozygotes have no heat production from brown adipose tissue. Mitochondria isolated from the muscles of cold-acclimated homozygotes display an increased total ATP production capacity, a metabolic shift for increased lipid oxidation and reduced carbohydrate catabolism capacity with a corresponding increased serum level of beta-hydroxybuterate, and decreased sensitivity to fatty acids as uncoupling agents. Mitochondria isolated from brown adipose tissue from homozygotes exhibit increased rate of reactive oxygen species (ROS) production when compared to wildtype controls. The Donating Investigator reports that mice carrying this allele are less cold sensitive on the C57BL/6 genetic background compared to the 129 genetic background.

Development

Control Suggestions

Selected References

Genetics

Ucp1Im1Kz

Disease/Phenotype

Disease Terms

Research Areas By Genotype
Genotyping Protocols
MELT: Ucp1^{tm1Kz} Alternate4
QPCR: Generic Neo Quantitative PCR-QPCR-1.2
Genotyping resources and troubleshooting

Breeding Considerations
When maintaining a live colony, heterozygous mice may be bred with wildtype mice from the colony or with C57BL/6J inbred mice. Although homozygotes are viable and fertile, they exhibit increased sensitivity to cold temperatures. The Donating Investigator notes that there is better survival of homozygous to weaning age when mice are maintained at 25°C to 28°C.

Additional Breeding and Husbandry Support

Mating System
See "Breeding Considerations"

Citation
When using this Ucp1^{tm1Kz} mouse strain in a publication, please cite the originating article(s) and include JAX stock #003124 in your

Animal Health Reports
Materials and Methods section.
Facility Barrier Level Descriptions

Pricing & Availability
3–6 week average lead time depending on quantity and age requests are not accepted

Repository Live

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<tr>
<th></th>
<th>AGE</th>
<th>SEX</th>
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<td>Female</td>
<td>Heterozygous for Ucp1^{tm1Kz}</td>
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<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Heterozygous for Ucp1^{tm1Kz}</td>
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Breeder Pair

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<tr>
<td>Female</td>
<td>Heterozygous for Ucp1&lt;sup&gt;tm1Kz&lt;/sup&gt;</td>
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Related Products and Services

| Frozen Mouse Embryo | $2,595.00 per straw or vial |

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Email: TechTran@jax.org

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Related Strains

- All
- By Allele
- By Gene
- By Collection

All Related Strains