Also Known As: UCP2 KO

These Ucp2 knock-out mice exhibit lower blood glucose levels, greater serum insulin, and aberrations in mitochondrial function. They may be useful in studies of diabetes and neurodegenerative diseases.

Donating Investigator
Bradford B. Lowell, Beth Israel Deaconess Med Cntr (Harvard)

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
</tr>
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<tbody>
<tr>
<td>Ucp2&lt;sup&gt;tm1Lowl&lt;/sup&gt;</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted (Null/Knockout)</td>
<td>Ucp2</td>
<td>uncoupling protein 2 (mitochondrial, proton carrier)</td>
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</tbody>
</table>

VIEW GENETICS

RESEARCH APPLICATIONS

Diabetes and Obesity Research  
Neurobiology Research  
Metabolism Research  
Research Tools

VIEW ALL RESEARCH APPLICATIONS
Details

Detailed Description

Homozygous mice are viable and fertile and do not express full length mRNA in heart, kidney, spleen, white adipose tissue, and pancreatic islets. In splenic mitochondria, endogenous protein was undetectable. When grown under high glucose conditions, cultured pancreatic islet cells from homozygous mice have increased insulin secretion and ATP levels compared to wildtype. Homozygous mice have 18% lower blood glucose levels. Whether fasting or fed, homozygotes have approximately 3-fold greater serum insulin due to increased insulin secretion. Similarly, glucose-stimulated insulin secretion is significantly increased. High fat diet-fed mice or palmitate-treated islets maintain pancreatic glucose responsiveness in vivo and in vitro compared to wildtype. Mitochondria isolated from the dopaminergic mesencephalic nigral cells of homozygous mice have increased reactive oxygen species but lesser mitochondria number and increased sensitivity to MPTP, mimicking Parkinson's disease.

In a recent study (Endocrinology, 2009, Epub Feb 26) it was found that homozygous mutant mice exhibit increased oxidative stress as well as impaired glucose-stimulated insulin secretion, a finding that contrasts from the initial phenotype description. In the publication, it was suggested that the difference could be attributed to the earlier studies being performed on mice with a mixed B6;129S4 genetic background. These later studies, mice on a congenic B6.129S4 genetic background were used.

This mouse may be useful in studies of diabetes, glucose-dependent metabolism-secretion coupling, aerobic respiration, Parkinson's disease, epilepsy, stroke, and other neurodegenerative diseases.

Development

Control Suggestions

Selected References

Genetics

Ucp2^{tm1Low}

Disease/Phenotype
Genotyping Protocols
Standard PCR: Ucp2
Genotyping resources and troubleshooting

Breeding Considerations
When maintaining a live colony, these mice are bred as homozygotes.

Additional Breeding and Husbandry Support

Citation
When using the UCP2 KO mouse strain in a publication, please cite the originating article(s) and include JAX stock #005934 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.
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Email: TechTran@jax.org

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🔗 Related Strains

- **All**
- **By Allele**
- **By Gene**
- **By Collection**