The Jackson Laboratory

FVB.129S4(B6)-*Hif1a* ^{tm1Jhu} /CkaMmjax

MMRRC Stock No: **37489-JAX** | Hif1a

Congenic, Targeted Mutation

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HIF1 is a master regulator of homeostatic response to hypoxia. The *Hif1a* (hypoxia inducible factor 1, alpha subunit) knockout allele results in embryonic lethality by E11; embryos exhibit neural tube defects and cardiovascular malformations. On the diabetes-inducible FVB/N background, mice provide a tool for examining the role of hypoxia in diabetes.

Donating Investigator

Claudia Kappen, Pennington Biomedical Research Center

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GENETIC OVERVIEW

Genetic Background	Generation

Hif1a^{tm1Jhu}

Allele Type	Gene Symbol	Gene Name
Targeted (Null/Knockout)	*Hif1a*	hypoxia inducible factor 1, alpha subunit

VIEW GENETICS

RESEARCH APPLICATIONS

Cardiovascular Research
Developmental Biology Research
Neurobiology Research

VIEW ALL RESEARCH APPLICATIO

Details

Detailed Description

Hif1a (hypoxia inducible factor 1, alpha subunit) encodes the alpha subunit of a heterodimer that functions as a master regulator of homeostatic response to hypoxia. HIF1 is essential to embryonic vascularization, tumor angiogenesis and ischemic disease.

Loss of HIF1A results in embryonic lethality by E11. Beginning at E8.5, some *Hif1a* null embryos appear abnormal, however, by E9 all null embryos are morphologically abnormal. Abnormal embryos are characterized by mesenchymal cell death resulting in failure of neural tube closure with cystic degeneration and prolapse of neural folds, hyperplasia of the presumptive myocardium, anomalous vascular structures in the cephalic mesenchyme, absent or hypoplastic branchial arch vessels, and abnormal dorsal aortae. *Hif1a*^{tm1Jhu} embryonic stem cells have reduced mRNA levels of glucose transporters, glycolytic enzymes, and vascular endothelial growth factor as well as impaired cellular proliferation.

On the FVB/N background streptozotocin (STZ) administration induces diabetes in *Hif1a* null mice providing a resource for examining the role of hypoxia in diabetes.

In an attempt to offer alleles on well-characterized or multiple genetic backgrounds, alleles are frequently moved to a genetic background different from that on which an allele was first characterized. It should be noted that the phenotype could vary from that originally described. We will modify the strain description if necessary as published results become available.

Development

Control Suggestions

Selected References

Genetics

Hif1a^{tm1Jhu}

Disease/Phenotype

Disease Terms

Research Areas By Phenotype

Mammalian Phenotype Terms by Genotype

References

Technical Support

CONTACT TECHNICAL SUPPORT

Genotyping Protocols

Standard PCR:Hif1aAlternate2
Genotyping resources and troubleshooting

Breeding Considerations

While maintaining a live colony, these mice are bred as heterozygotes. Mice homozygous for the mutation are not viable.

Additional Breeding and Husbandry Support

Citation

When using the Hif1a^{-} mouse strain in a publication, please cite the originating article(s) and include MMRRC stock #37489 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

THE JACKSON LABORATORY'S GENOTYPE PROMISE

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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