Lmnb2 Cas9-KO Strategy

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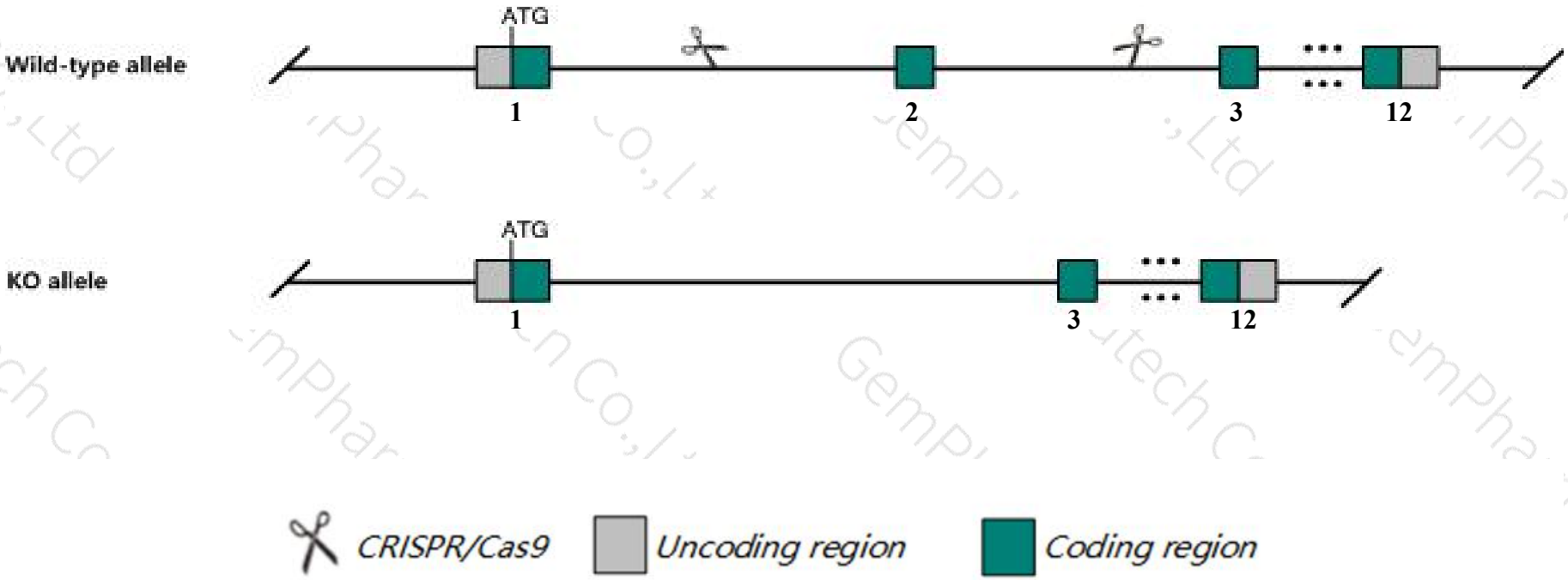
Project Overview

Project Name	***Lmnb2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lmnb2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Lmnb2* gene has 4 transcripts. According to the structure of *Lmnb2* gene, exon2 of *Lmnb2-204* (ENSMUST00000179022.7) transcript is recommended as the knockout region.The region contains 137bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Lmnb2* gene. The brief process is as follows: CRISPR/Cas9 systen

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele exhibit neonatal death with abnormal brain development.

- The *Lmnb2* gene is located on the Chr10. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.

- This Strategy is designed based on genetic information in existing databases.Due to the complexity of biological processes, all risk of the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Lmnb2 lamin B2 [Mus musculus (house mouse)]

Gene ID: 16907, updated on 19-Mar-2019

Summary

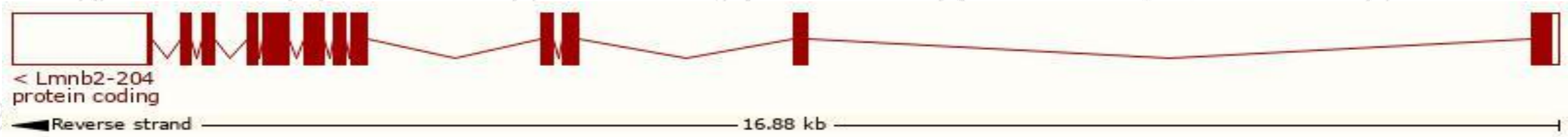
Official Symbol	Lmnb2 provided by MGI
Official Full Name	lamin B2 provided byMGI
Primary source	MGI:MGI:96796
See related	Ensembl:ENSMUSG00000062075
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Summary	This gene encodes a protein component of the nuclear lamina, which provides a structural framework for the nuclear envelope. Defects in this gene were found to cause abnormalities in the shape of neurons. This locus represents one of two B-type lamin genes that may be partially, but not entirely, functionally redundant in neuronal development. Loss of both B-type lamin genes in keratinocytes results in ichthyosis and a skin barrier defect leading to dehydration. Alternative transcriptional initiation and splicing results in multiple transcript variants and protein isoforms, including an isoform with a shorter N-terminal rod domain that may function in nuclear envelope remodeling during spermatogenesis. A related pseudogene is found on chromosome 5. [provided by RefSeq, Sep 2017]
Expression	Ubiquitous expression in testis adult (RPKM 34.2), CNS E11.5 (RPKM 26.4) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

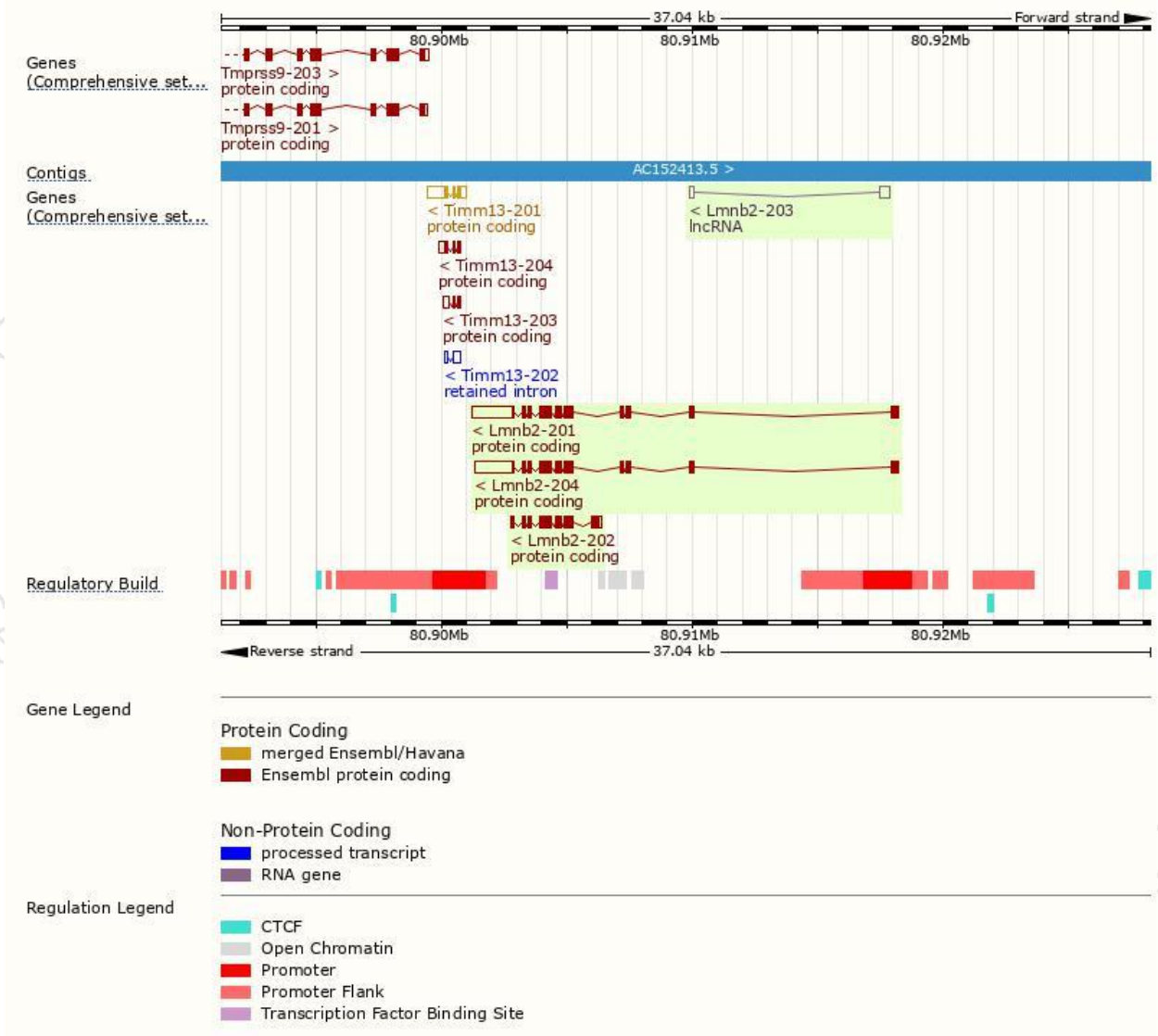
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lmnb2-204	ENSMUST00000179022.7	3370	596aa	Protein coding	CCDS24037	P21619	TSL:1 GENCODE basic APPRIS P2
Lmnb2-202	ENSMUST00000105332.2	1643	474aa	Protein coding	CCDS83733	P21619 Q3V159	TSL:1 GENCODE basic
Lmnb2-201	ENSMUST00000057623.13	3531	615aa	Protein coding	-	A0A0R4J0Q5	TSL:1 GENCODE basic APPRIS ALT2
Lmnb2-203	ENSMUST00000159094.1	469	No protein	lncRNA	-	-	TSL:3

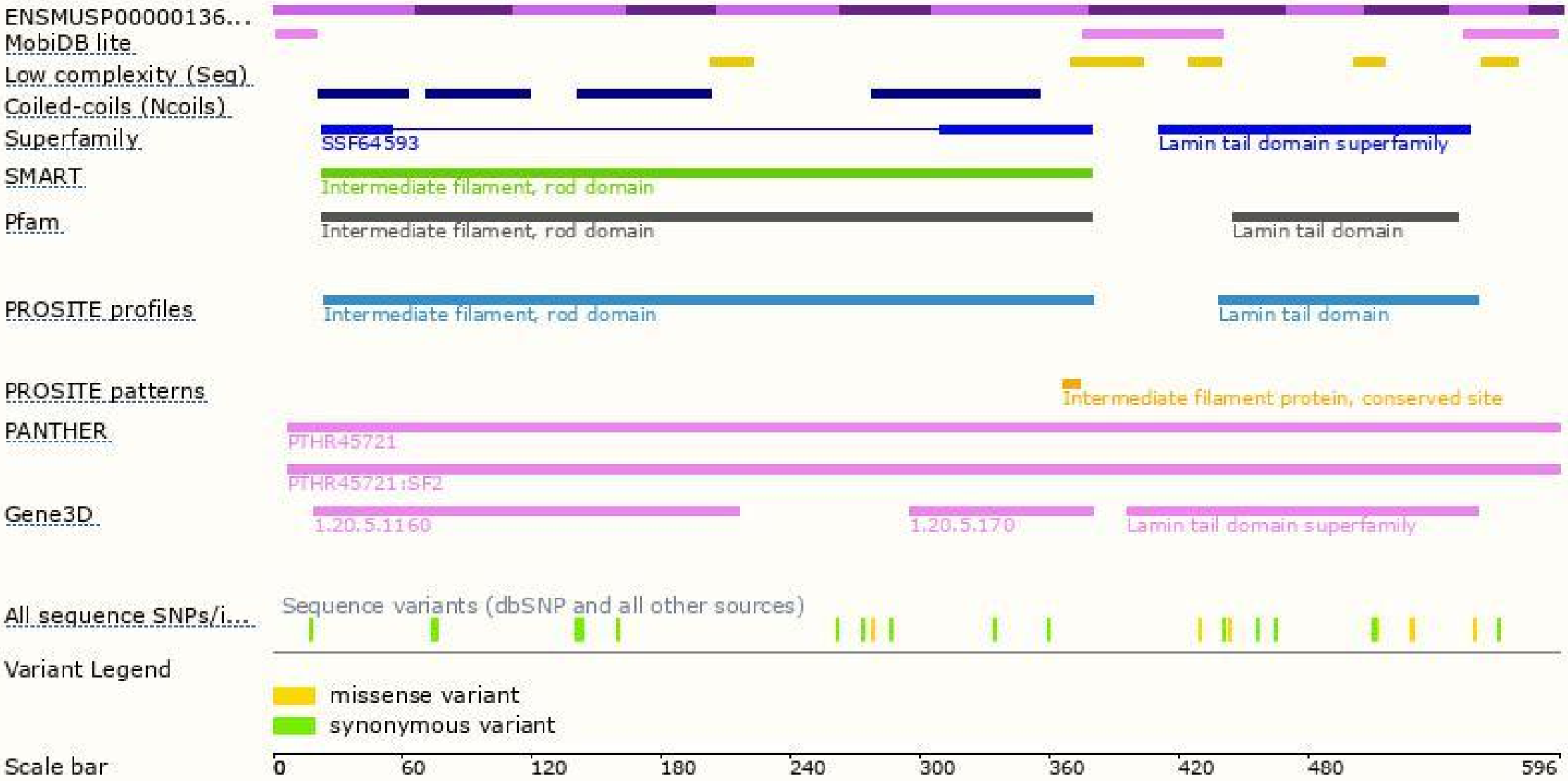
The strategy is based on the design of *Lmnb2-204* transcript,The transcription is shown below



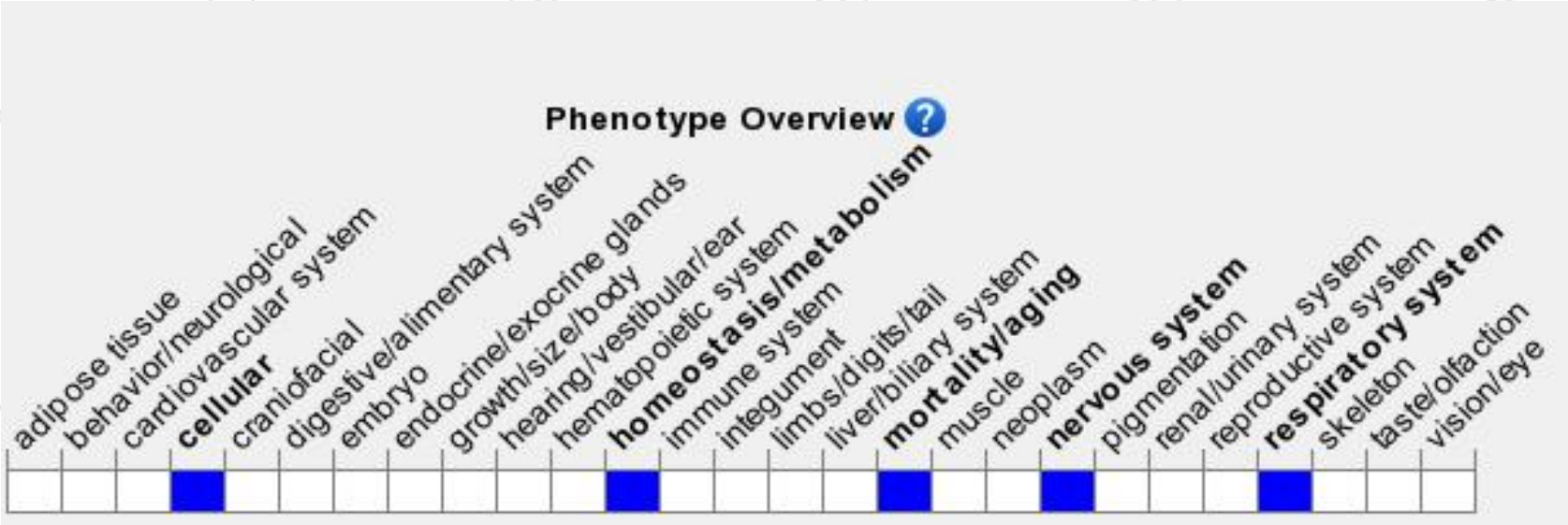
Genomic location distribution



Protein domain



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue.Data quoted from MGI database(http://www.informatics.jax.org/).

According to the existing MGI data,Mice homozygous for a knock-out allele exhibit neonatal death with abnormal brain development.

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If you have any questions, you are welcome to inquire.

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