

Cldn5 Cas9-KO Strategy

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Project Overview

Project Name

Cldn5

Project type

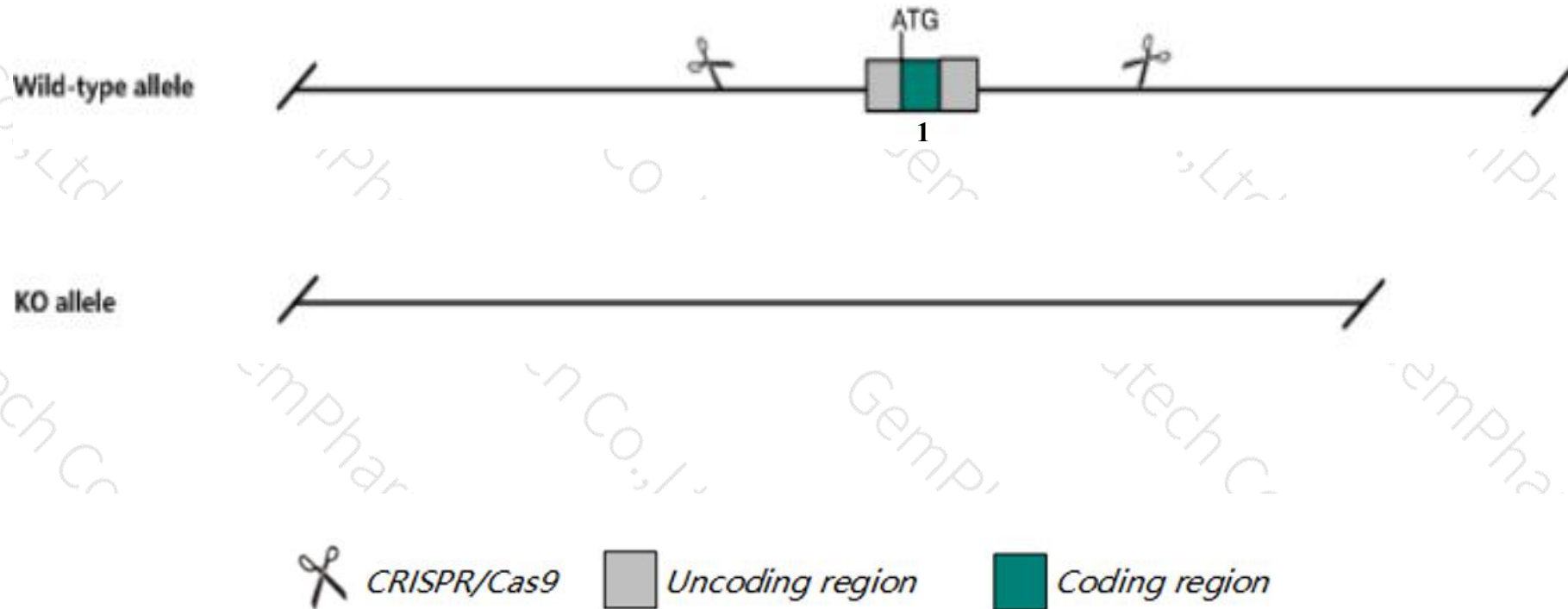
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cldn5* gene. The schematic diagram is as follows:



- The *Cldn5* gene has 1 transcript. According to the structure of *Cldn5* gene, exon1 of *Cldn5-201* (ENSMUST00000043577.2) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cldn5* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, homozygous mutation of this gene results in size-selective loosening of the blood-brain barrier. homozygous mutant neonates gradually cease movement and die within 10 hours after birth.
- The *Cldn5* gene is located on the Chr16. 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)

Cldn5 claudin 5 [Mus musculus (house mouse)]

Gene ID: 12741, updated on 13-Mar-2020

Summary

Official Symbol Cldn5 provided by MGI

Official Full Name claudin 5 provided by MGI

Primary source MGI:MGI:1276112

See related [Ensembl:ENSMUSG000000041378](#)

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

Also known as AI854493, MBEC1, Tmvcf

Summary This gene encodes a member of the claudin family. Claudins are integral membrane proteins and components of tight junction strands. Tight junction strands serve as a physical barrier to prevent solutes and water from passing freely through the paracellular space between epithelial or endothelial cell sheets, and also play critical roles in maintaining cell polarity and signal transductions. The protein encoded by this gene is a critical component of endothelial tight junctions that control pericellular permeability. The knockout mice lacking this gene died within 10 h of birth and the blood-brain barrier in these mice against small molecules was selectively affected. This gene is expressed strongly in endothelium of normal lung and plays a regulation role during acrolein-induced acute lung injury. [provided by RefSeq, Aug 2010]

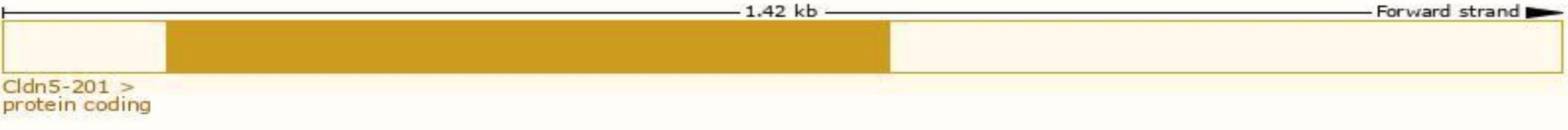
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

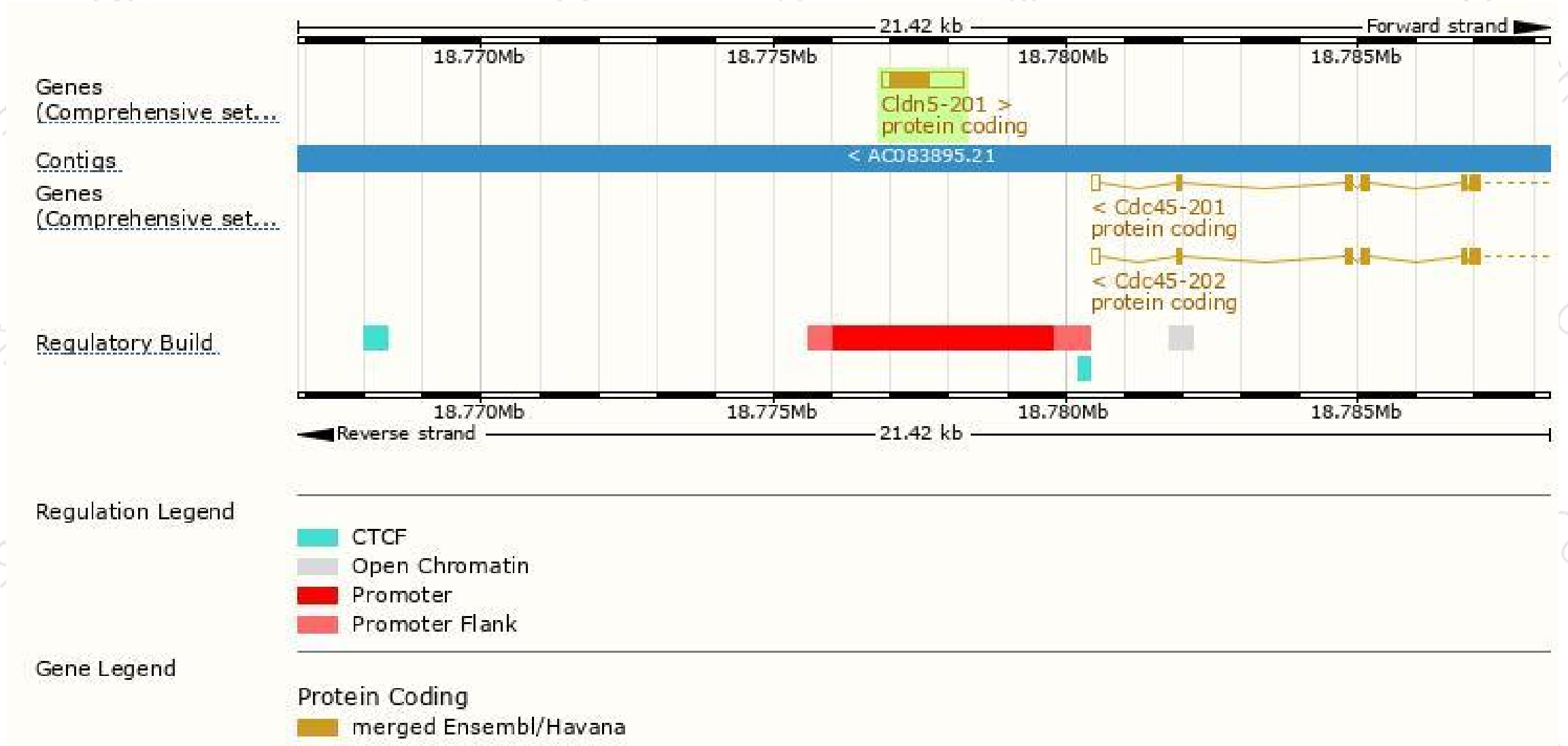
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cldn5-201	ENSMUST00000043577.2	1416	218aa	Protein coding	CCDS28026	Q54942	TSL:NA GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1

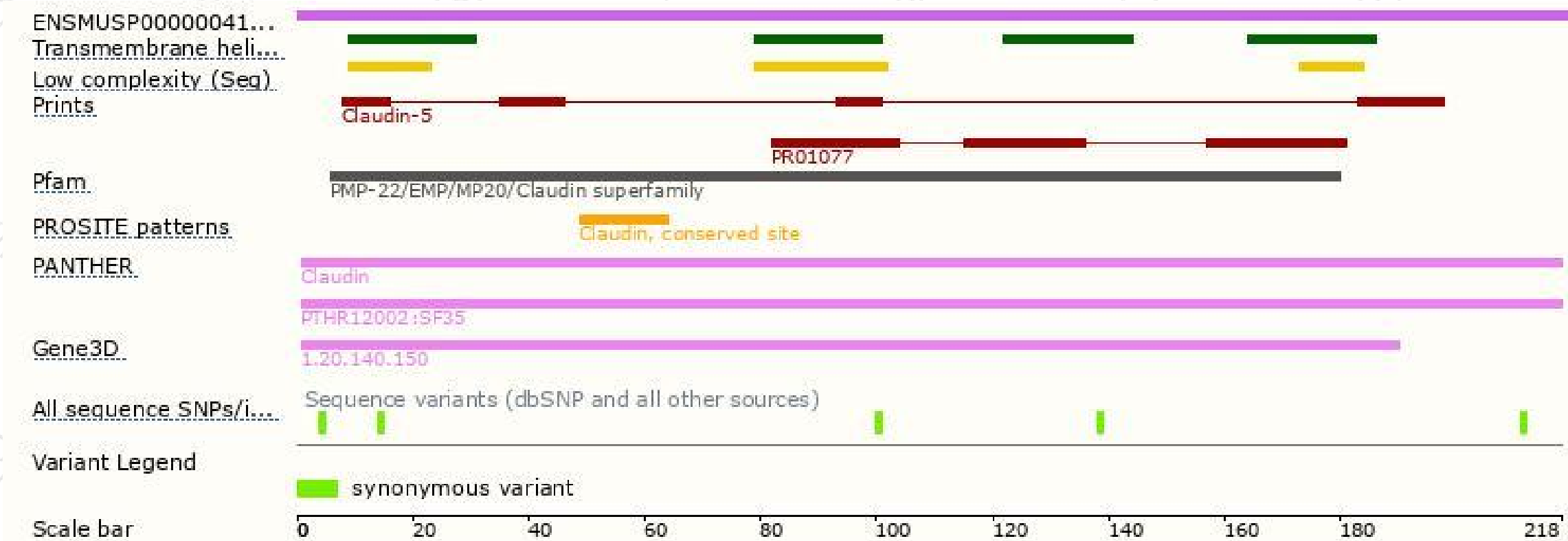
The strategy is based on the design of *Cldn5-201* transcript, the transcription is shown below:



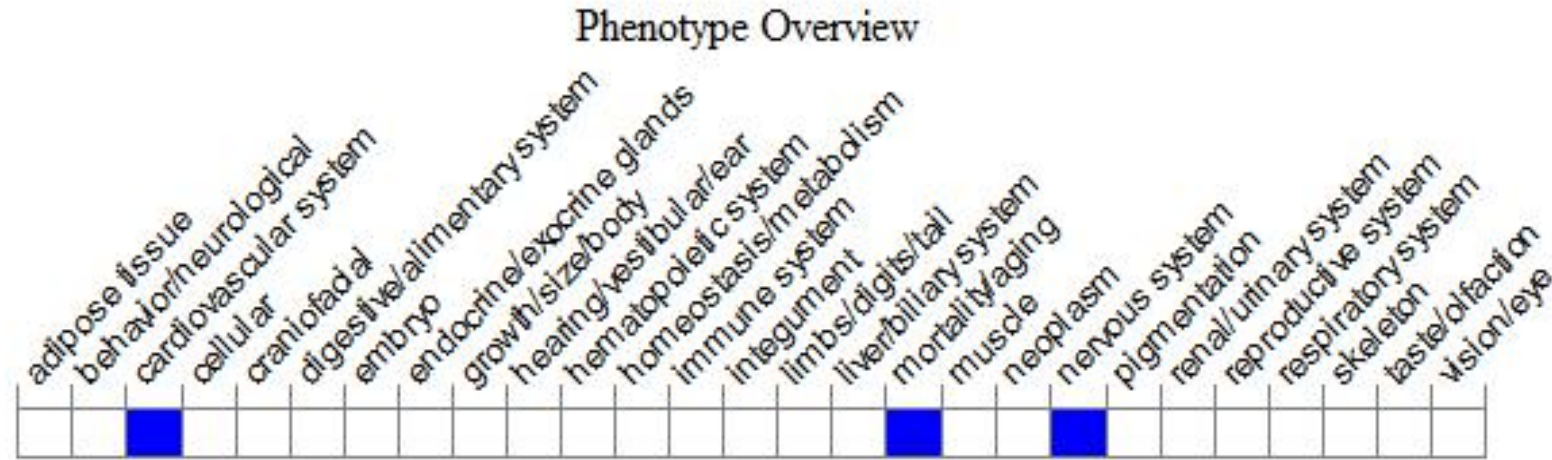
Genomic location distribution



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, homozygous mutation of this gene results in size-selective loosening of the blood-brain barrier. Homozygous mutant neonates gradually cease movement and die within 10 hours after birth.

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

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