Hapln1 Cas9-KO Strategy

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Reviewer: Wenjing Li

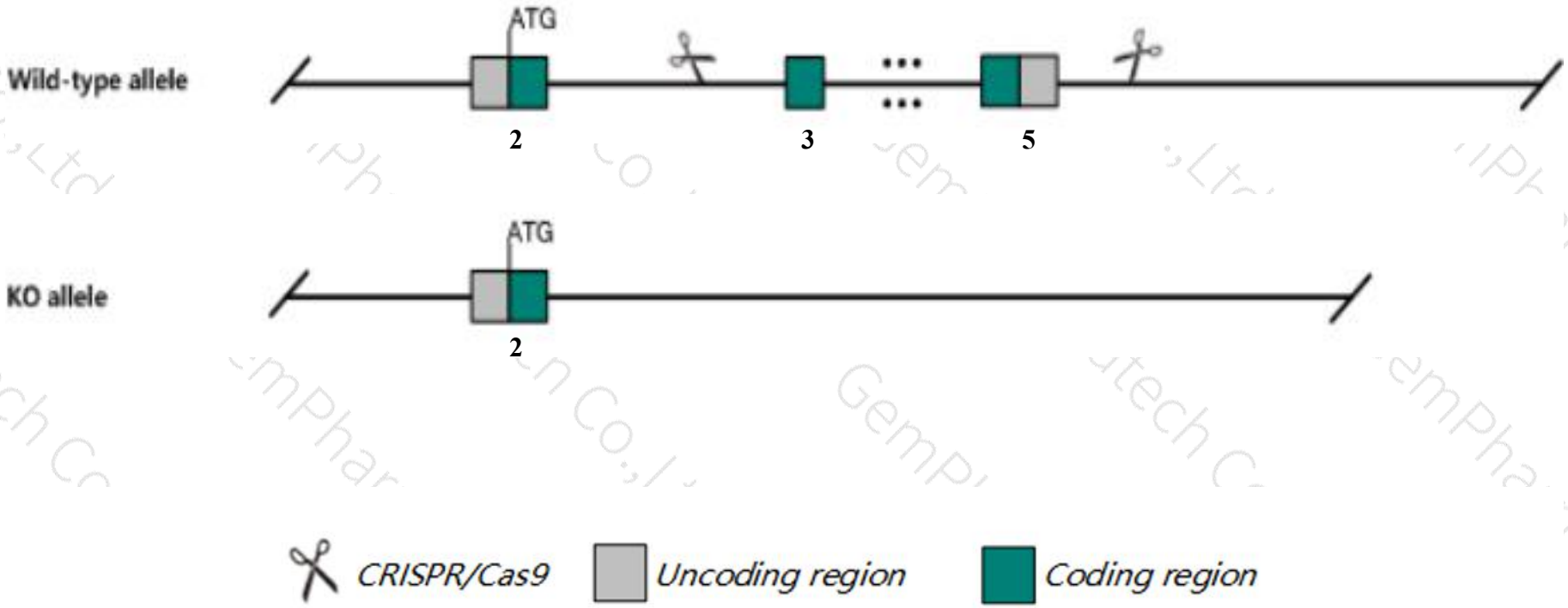
Design Date: 2018/10/31

Project Overview

Project Name	***Hapln1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hapln1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Hapln1* gene has 2 transcripts. According to the structure of *Hapln1* gene, exon3-exon5 of *Hapln1-201*(ENSMUST00000022108.8) transcript is recommended as the knockout region.The region contains 965bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Hapln1* gene. The brief process is as follows: CRISPR/Cas9 system were microinjected into the fertilized eggs of C57BL/6JGpt mice.Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

Notice

➢ According to the existing MGI data,homozygotes for a targeted null mutation exhibit defects in cartilage development and delayed bone formation with short limbs and craniofacial anomalies. Mutants usually die as neonates due to respiratory failure, but some survive and develop dwarfism.

➢ The *Hapln1* gene is located on the Chr13. 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）

集萃药康 GemPharmatech

Hapln1 hyaluronan and proteoglycan link protein 1 [Mus musculus (house mouse)]

Gene ID: 12950, updated on 13-Mar-2020

Summary

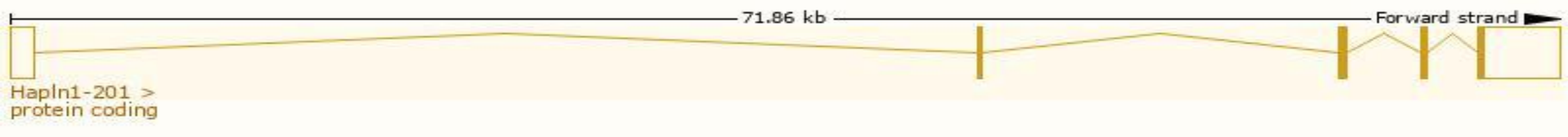
Official Symbol	Hapln1 provided by MGI
Official Full Name	hyaluronan and proteoglycan link protein 1 provided byMGI
Primary source	MGI:MGI:1337006
See related	Ensembl:ENSMUSG00000021613
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	BB099155, CLP, Crtl1, Crtl1l, LP, LP-1
Expression	Biased expression in limb E14.5 (RPKM 38.8), CNS E14 (RPKM 5.4) and 4 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

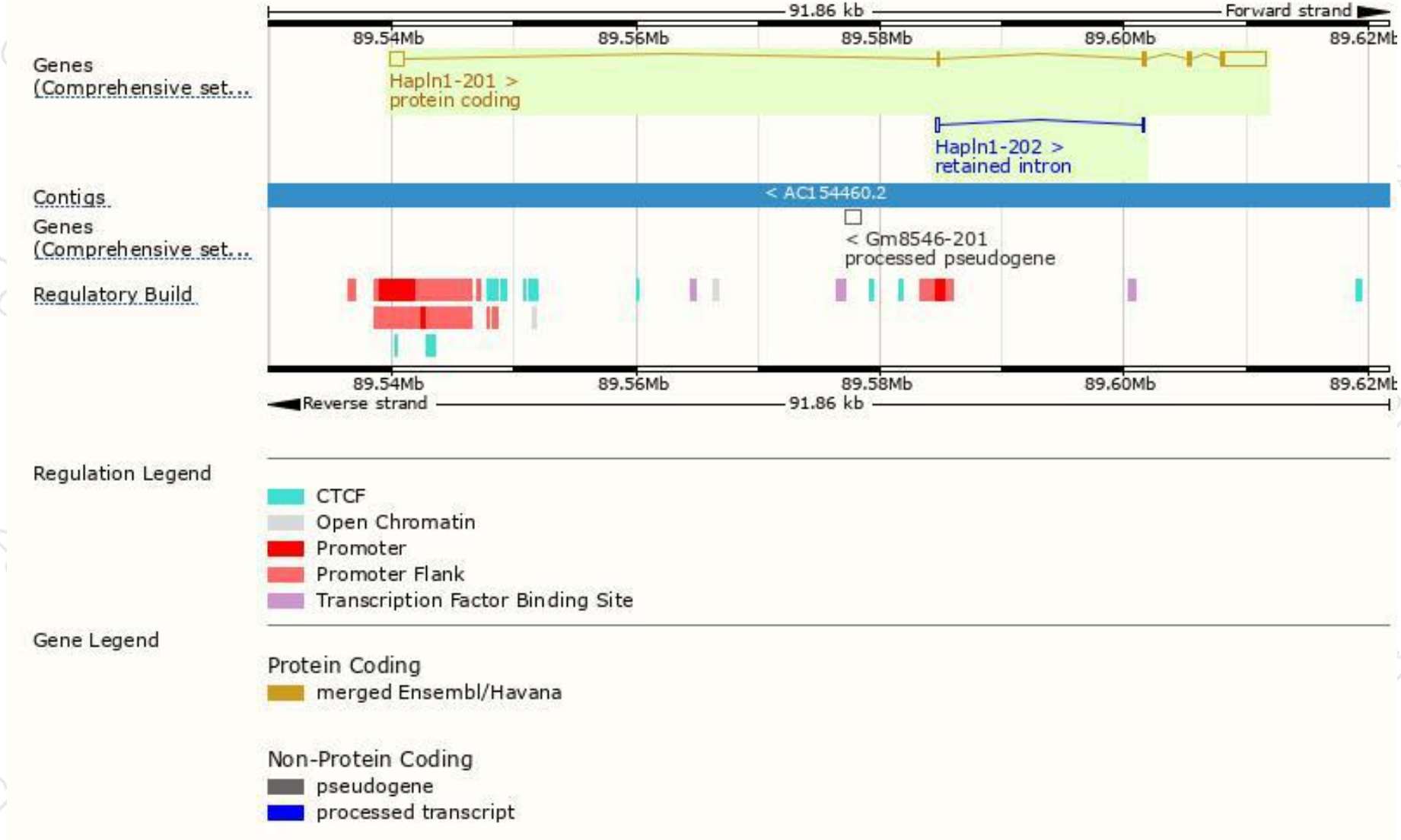
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hapln1-201	ENSMUST00000022108.8	5715	356aa	Protein coding	CCDS26671	Q9QUP5	TSL:1 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
Hapln1-202	ENSMUST00000225678.1	464	No protein	Retained intron	-	-	

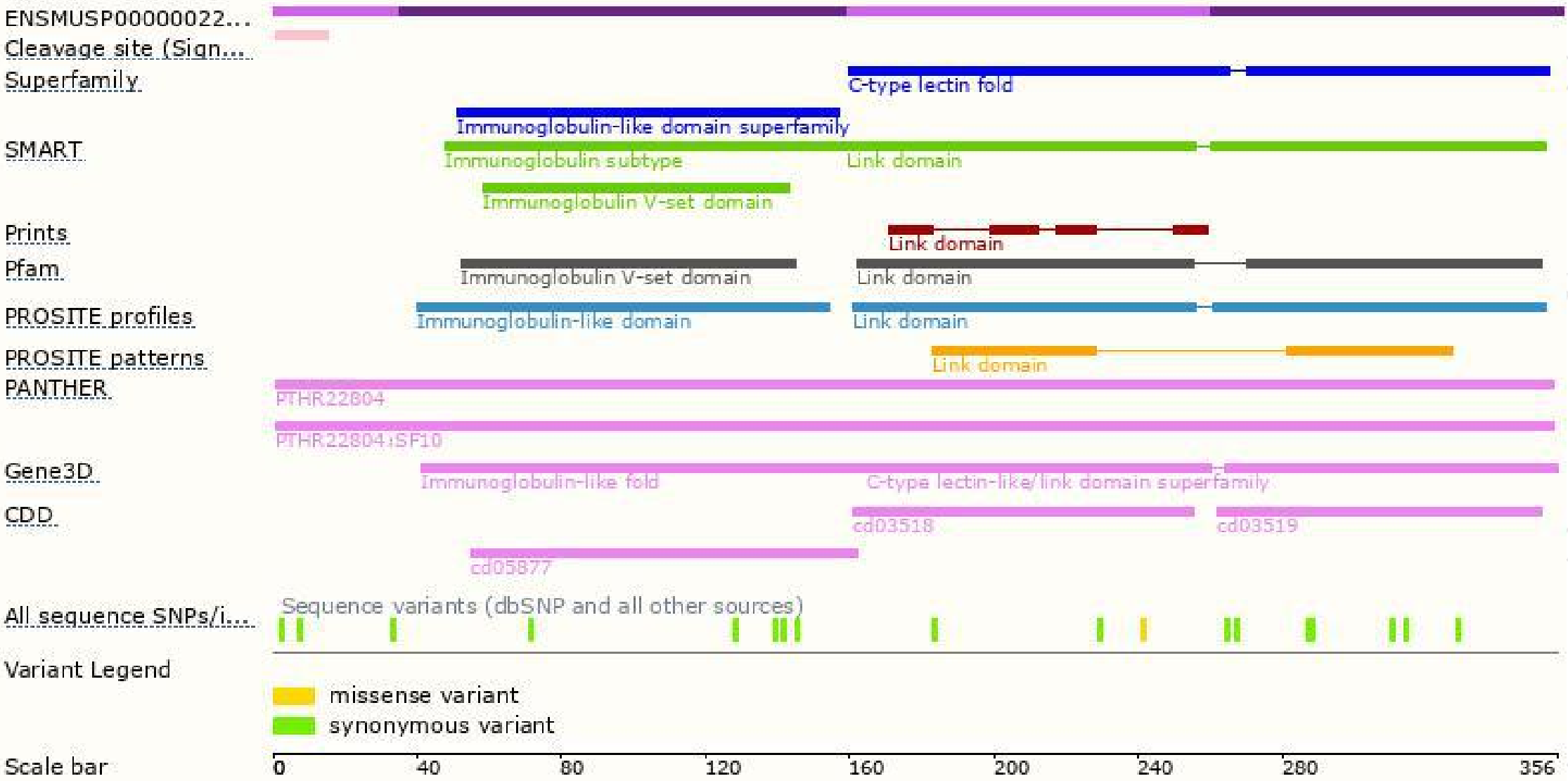
The strategy is based on the design of *Hapln1-201* transcript,the transcription is shown below:



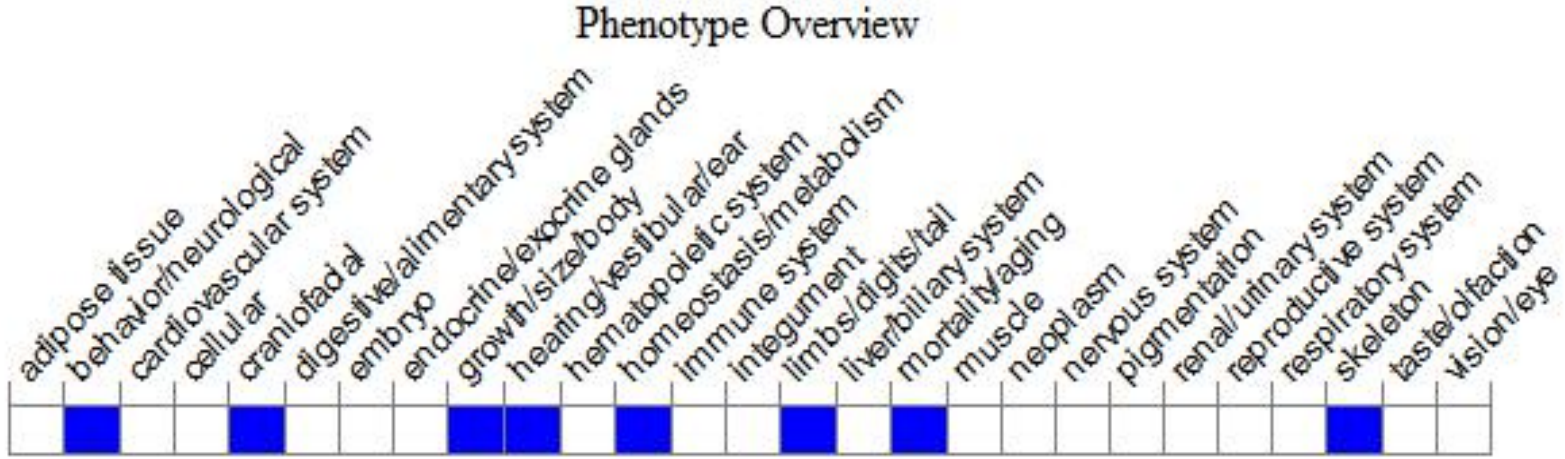
Genomic location distribution



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,homozygotes for a targeted null mutation exhibit defects in cartilage development and delayed bone formation with short limbs and craniofacial anomalies. Mutants usually die as neonates due to respiratory failure, but some survive and develop dwarfism.

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

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