Capn15 Cas9-CKO Strategy

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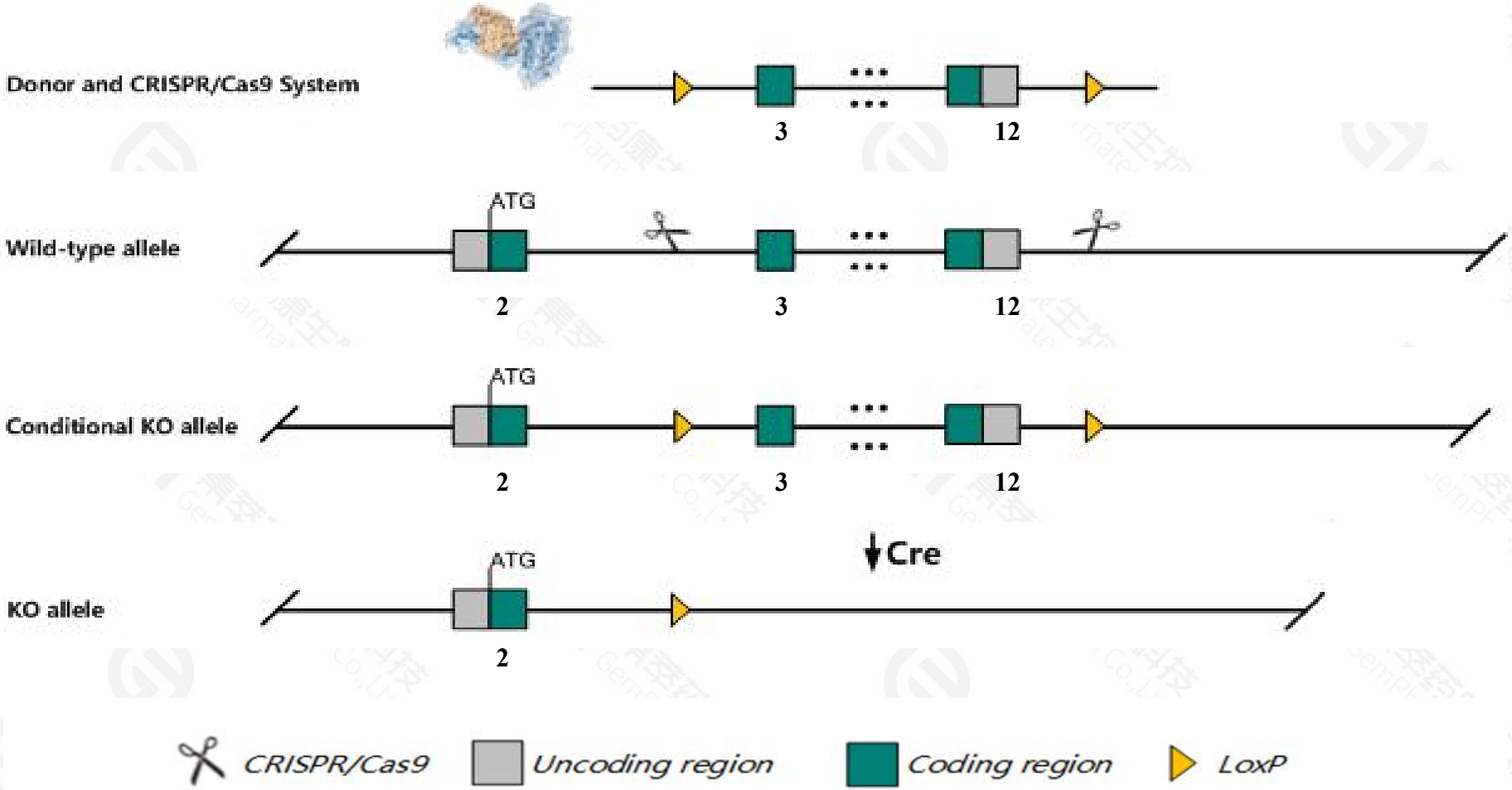
Project Overview

Project Name	***Capn15***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Capn15* gene. The schematic diagram is as follows:



Technical routes

➢ The *Capn15* gene has 8 transcripts. According to the structure of *Capn15* gene, exon3-exon12 of *Capn15-205*(ENSMUST00000212520.2) transcript is recommended as the knockout region.The region contains 3415bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Capn15* gene. The brief process is as follows:CRISPR/Cas9 system and Donor 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.

➢ The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

➢ According to the existing MGI data,mice homozygous for a null allele exhibit partial preweaning lethality, reduced body weight, and eye defects.

➢ The KO region contains functional region of the Capn15 gene.Knockout the region may affect the function of D630044L22Rik gene.

➢ The *Capn15* gene is located on the Chr17. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information（NCBI）

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Capn15 calpain 15 [Mus musculus (house mouse)]

Gene ID: 50817, updated on 17-Feb-2021

Summary

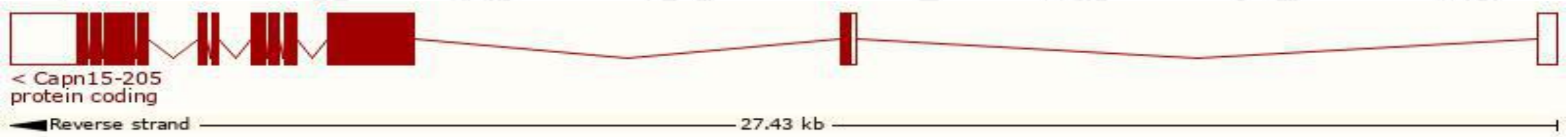
Official Symbol	Capn15 provided by MGI
Official Full Name	calpain 15 provided byMGI
Primary source	MGI:MGI:1355075
See related	Ensembl:ENSMUSG00000037326
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	S, Solh
Expression	Ubiquitous expression in duodenum adult (RPKM 32.7), ovary adult (RPKM 26.8) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

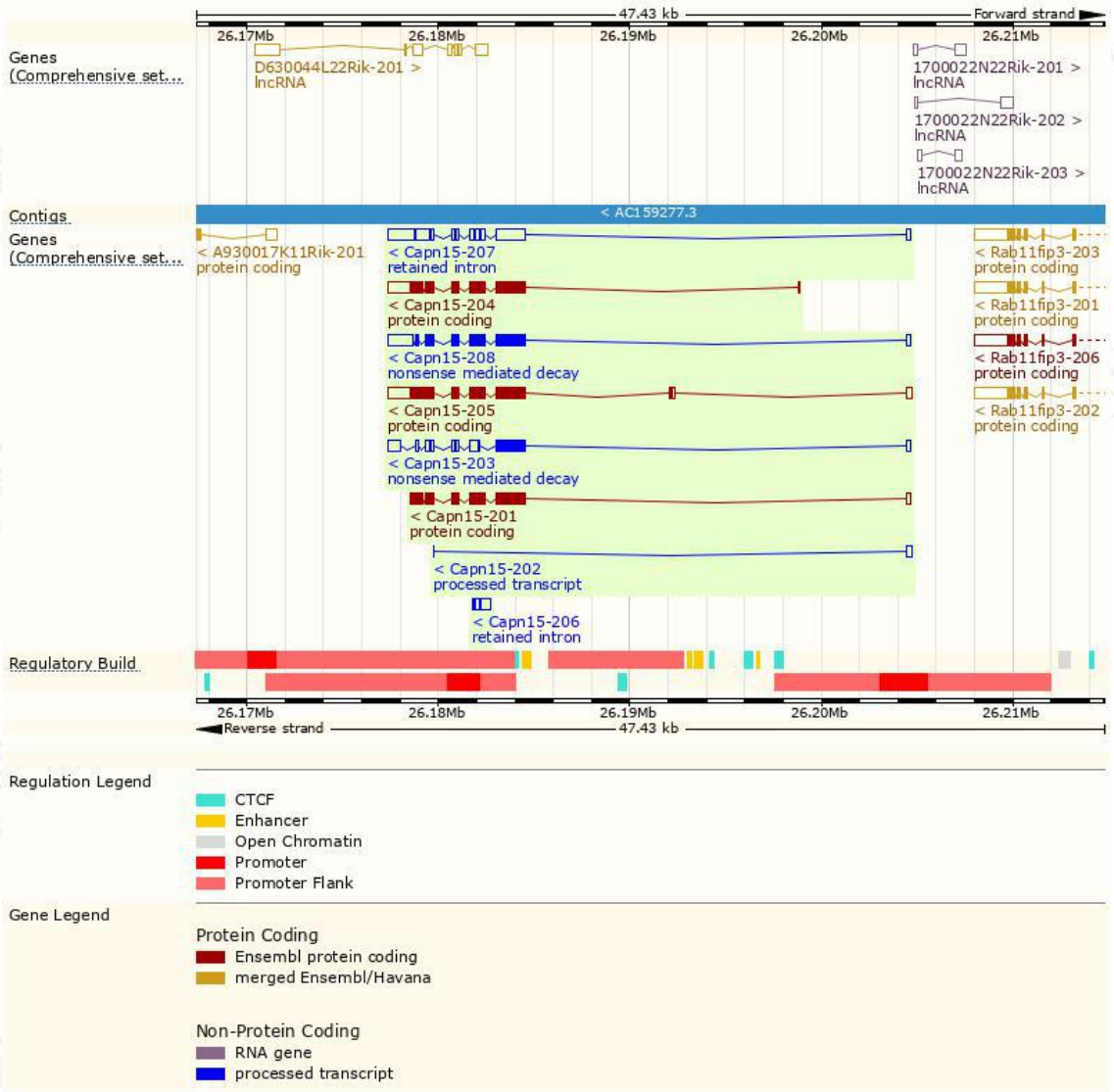
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Capn15-205	ENSMUST00000212520.2	5216	1196aa	Protein coding	CCDS84286		TSL:1 , GENCODE basic , APPRIS ALT2 ,
Capn15-204	ENSMUST00000212149.2	4555	1095aa	Protein coding	CCDS28540		TSL:5 , GENCODE basic , APPRIS P3 ,
Capn15-201	ENSMUST00000041641.9	3520	1095aa	Protein coding	CCDS28540		TSL:5 , GENCODE basic , APPRIS P3 ,
Capn15-208	ENSMUST00000212789.2	4536	955aa	Nonsense mediated decay	-		TSL:1 ,
Capn15-203	ENSMUST00000212099.2	3687	502aa	Nonsense mediated decay	-		TSL:1 ,
Capn15-202	ENSMUST00000211917.2	355	No protein	Processed transcript	-		TSL:3 ,
Capn15-207	ENSMUST00000212735.2	4922	No protein	Retained intron	-		TSL:1 ,
Capn15-206	ENSMUST00000212702.2	772	No protein	Retained intron	-		TSL:2 ,

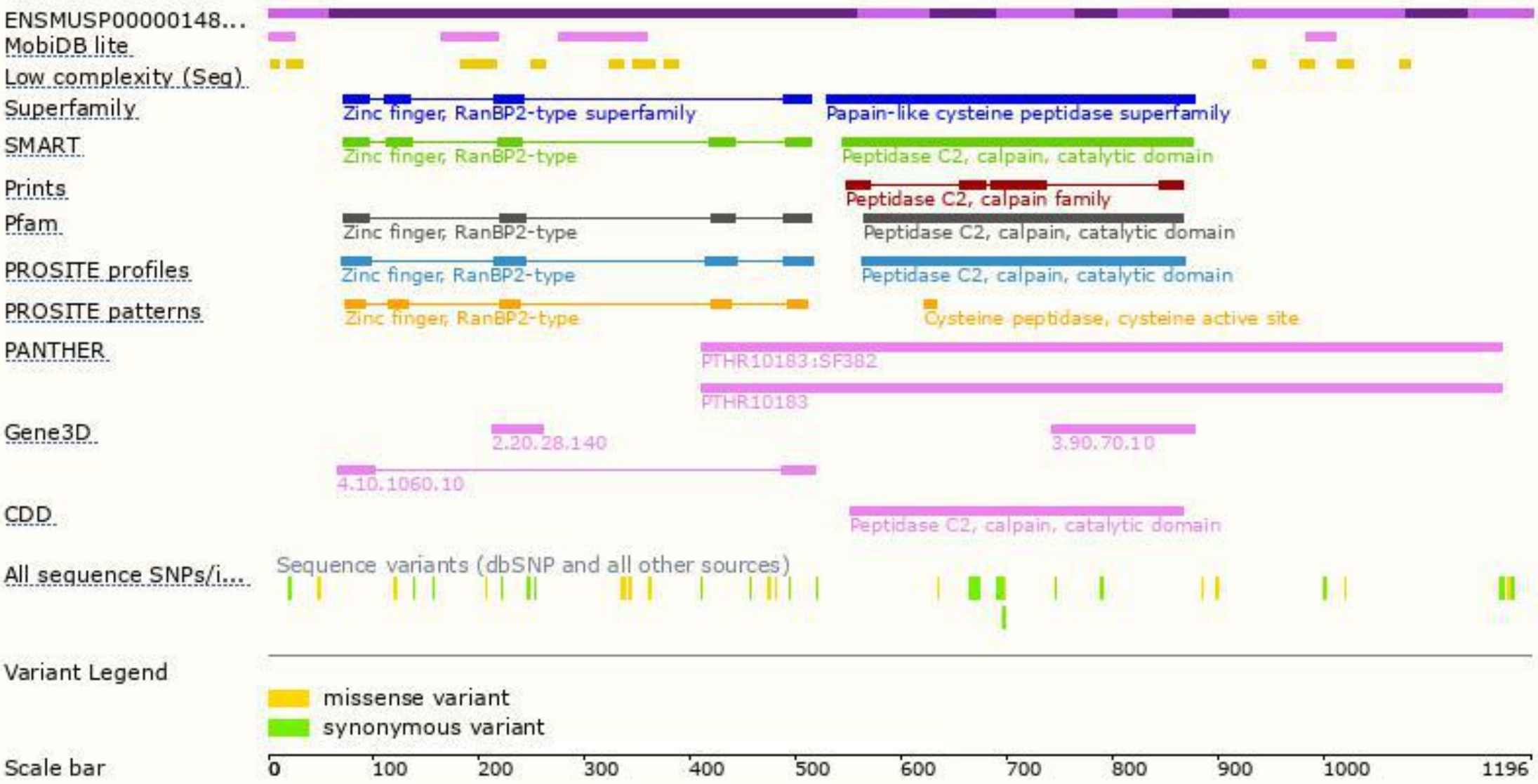
The strategy is based on the design of *Capn15-205* transcript,the transcription is shown below:



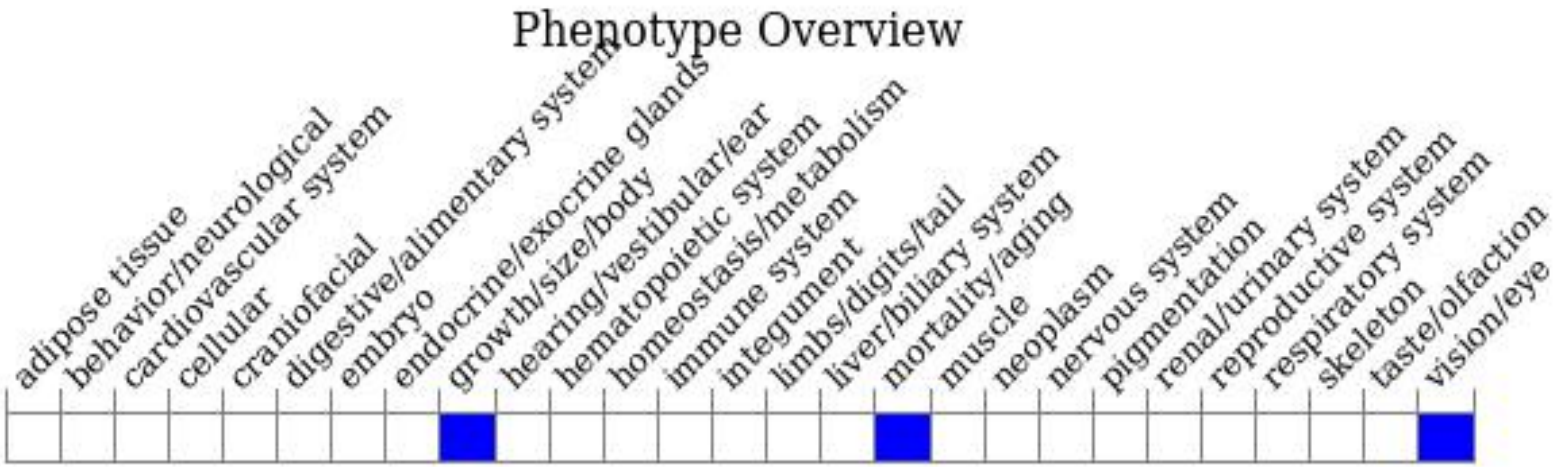
Genomic location distribution



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 null allele exhibit partial preweaning lethality, reduced body weight, and eye defects.

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