Prdm1 Cas9-KO Strategy

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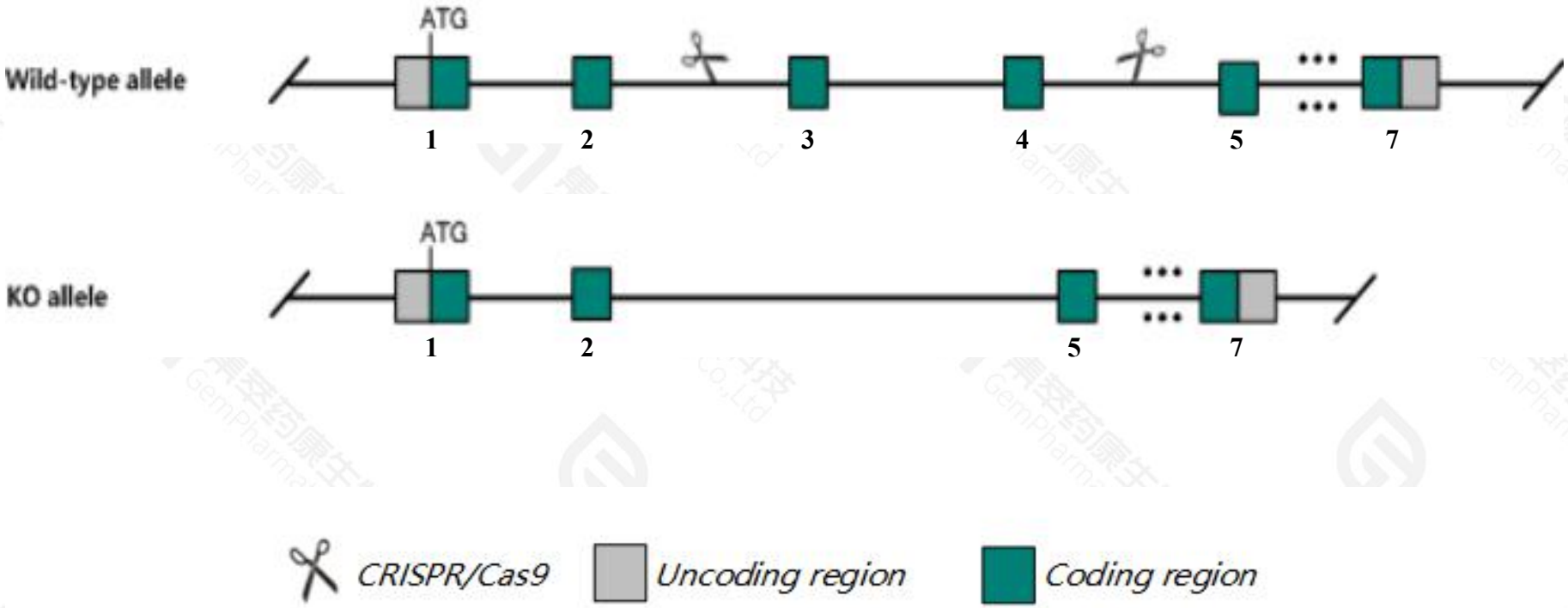
Project Overview

Project Name	***Prdm1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prdm1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Prdm1* gene has 4 transcripts. According to the structure of *Prdm1* gene, exon3-exon4 of *Prdm1-202*(ENSMUST00000105490.3) transcript is recommended as the knockout region.The region contains 373bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Prdm1* 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,homozygous null mice display embryonic lethality and impaired primordial germ cell development, while heterozygotes display a decreased numbers of primordial germ cells but normal migration. Conditional mutants display impaired plasma cell and pre-plasmamemory B cell development.

➢ The *Prdm1* 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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Prdm1 PR domain containing 1, with ZNF domain [Mus musculus (house mouse)]

Gene ID: 12142, updated on 21-Feb-2021

Summary

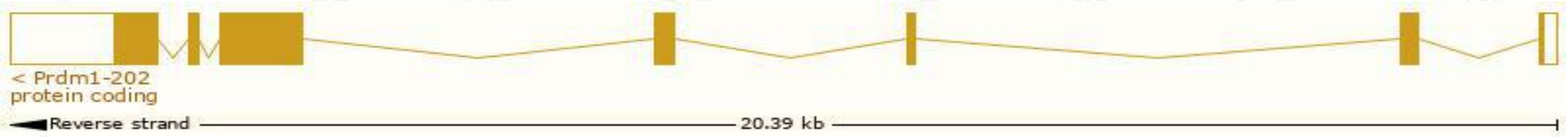
Official Symbol	Prdm1 provided by MGI
Official Full Name	PR domain containing 1, with ZNF domain provided byMGI
Primary source	MGI:MGI:99655
See related	Ensembl:ENSMUSG00000038151
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Bli, Blim, Blimp-1, Blimp1, PRDI-, PRDI-BF1, ZNFPR1A1, b2b1765C, b2b1765Clo
Expression	Broad expression in placenta adult (RPKM 3.0), subcutaneous fat pad adult (RPKM 1.7) and 20 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

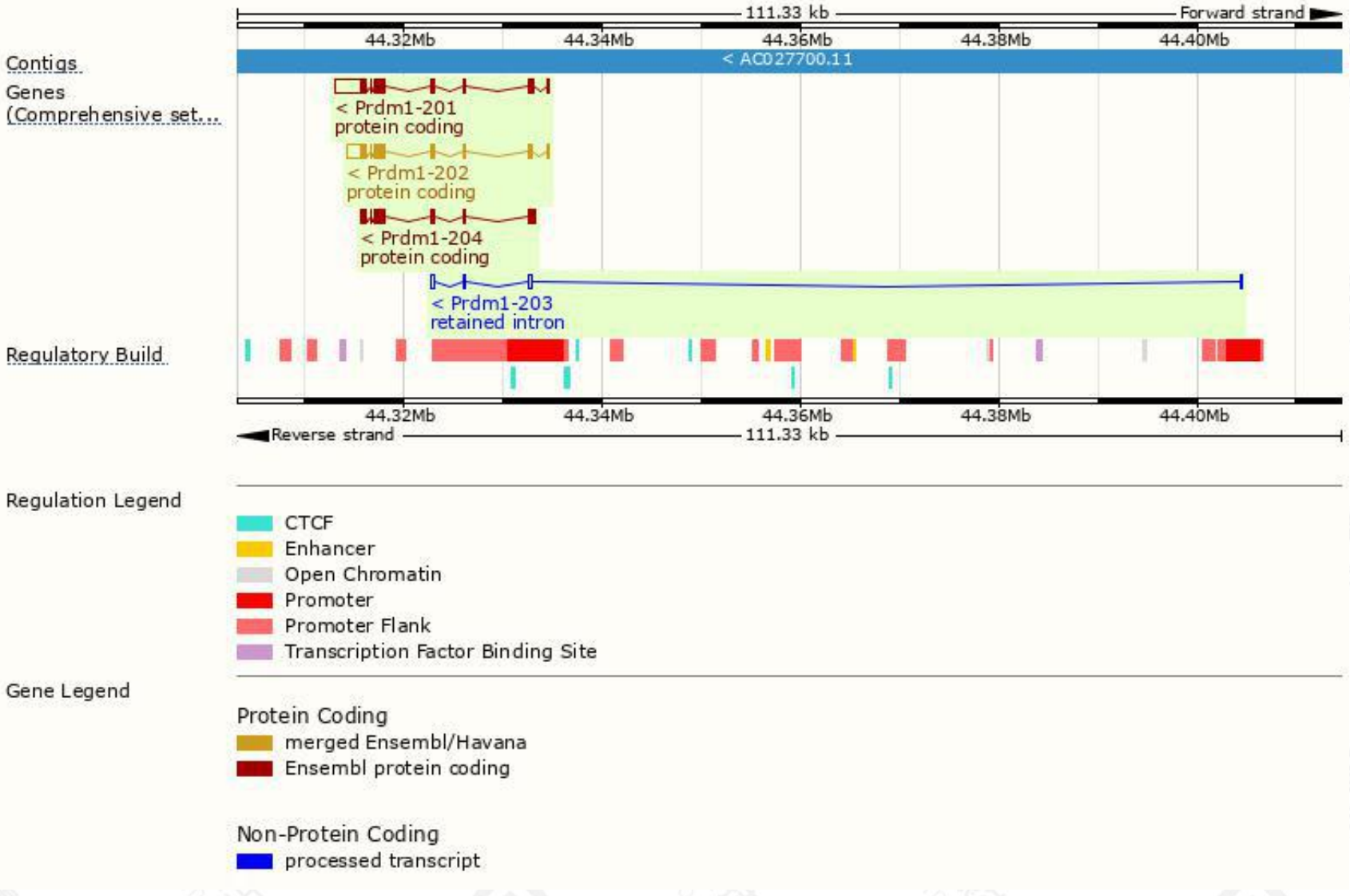
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prdm1-202	ENSMUST00000105490.3	4025	823aa	Protein coding	CCDS23825		TSL:1 , GENCODE basic , APPRIS P2 ,
Prdm1-201	ENSMUST00000039174.11	5281	856aa	Protein coding	-		TSL:2 , GENCODE basic , APPRIS ALT2 ,
Prdm1-204	ENSMUST00000218369.2	2517	838aa	Protein coding	-		TSL:5 , GENCODE basic , APPRIS ALT2 ,
Prdm1-203	ENSMUST00000167340.2	830	No protein	Retained intron	-		TSL:1 ,

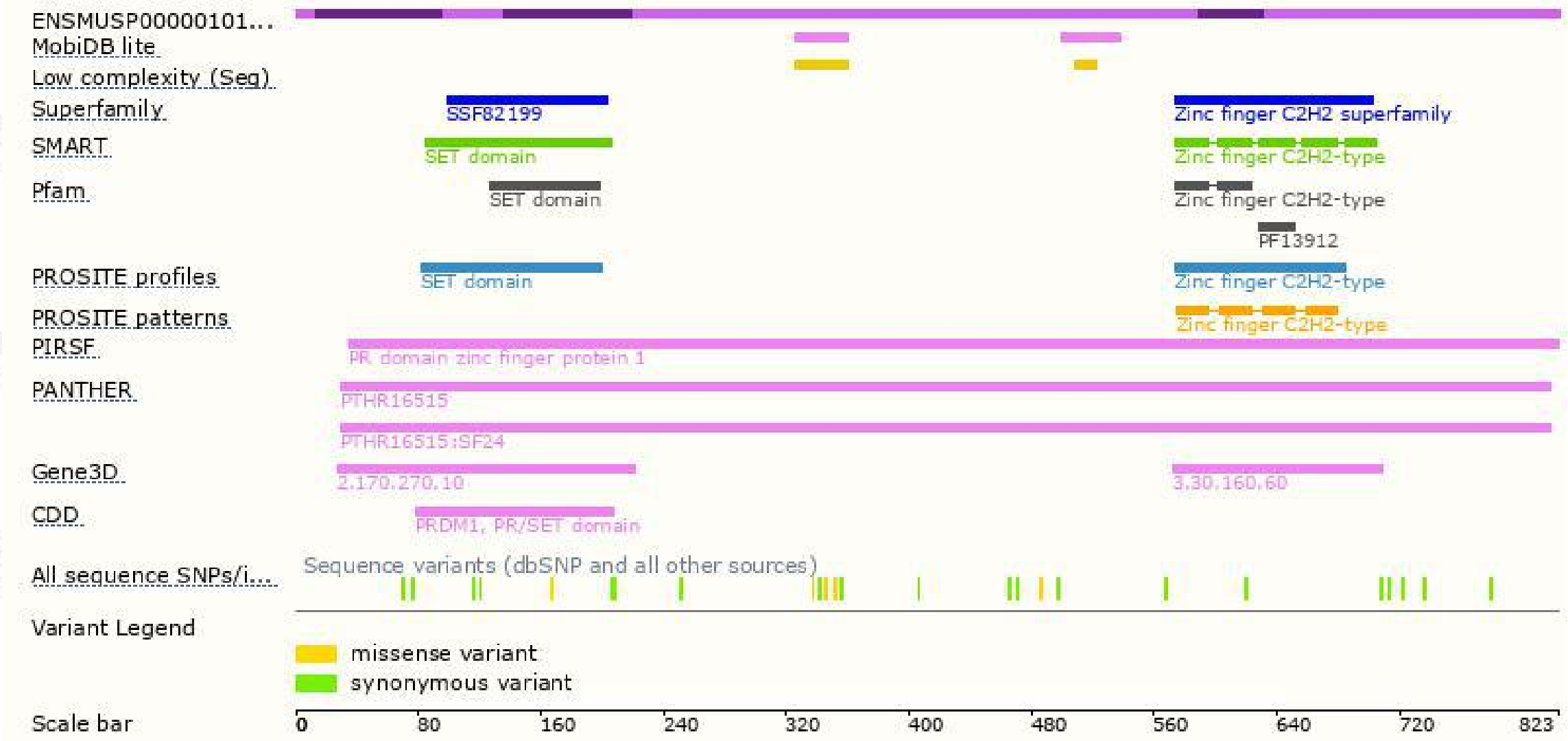
The strategy is based on the design of *Prdm1-202* transcript,the transcription is shown below:



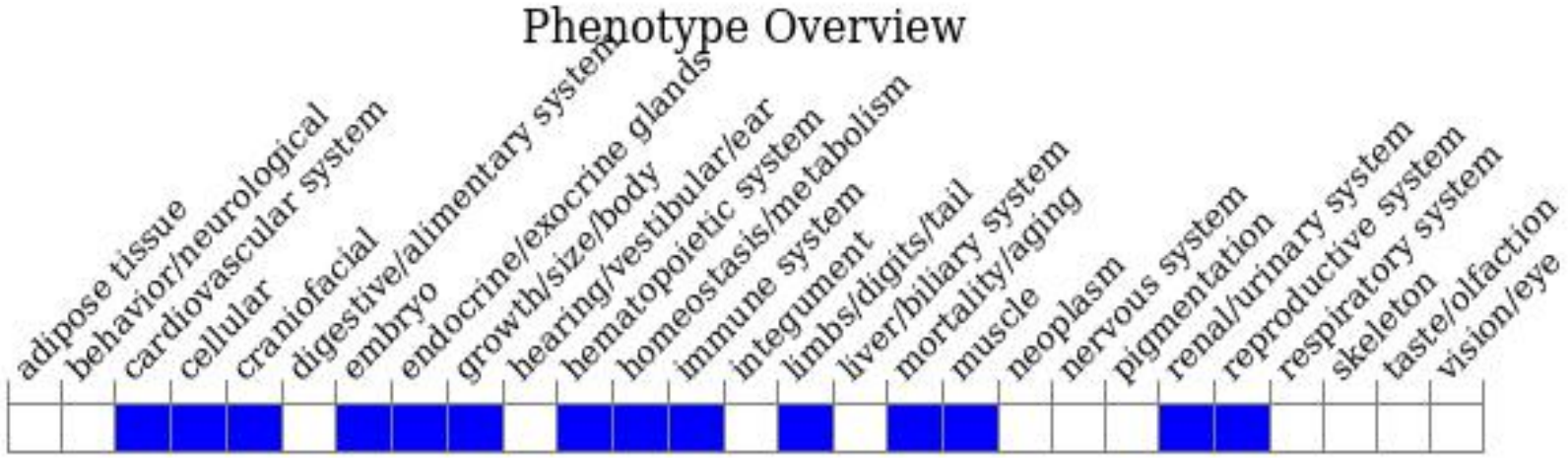
Genomic location distribution



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/).

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