Ranbp1 Cas9-CKO Strategy

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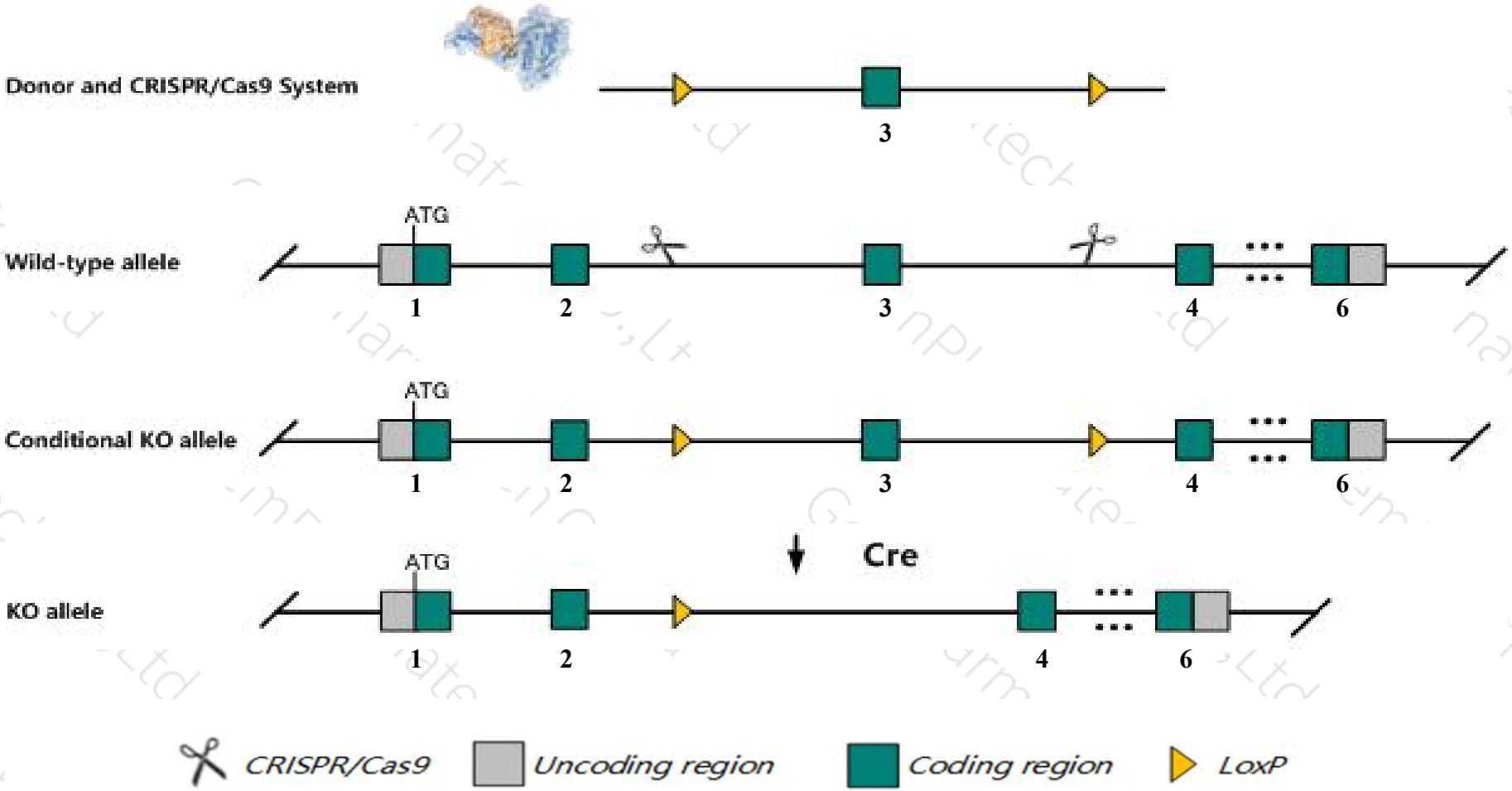
Project Overview

Project Name	***Ranbp1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ranbp1* gene. The schematic diagram is as follows:



Technical routes

- The *Ranbp1* gene has 4 transcripts. According to the structure of *Ranbp1* gene, exon3 of *Ranbp1-202* (ENSMUST00000115645.9) transcript is recommended as the knockout region.The region contains 158bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ranbp1* 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 knock-out allele exhibit postnatal growth retardation, decreased body weight, impaired spermatogenesis, and male infertility.

- The distance between the 5-terminal of *Trmt2a* gene and *Ranbp1* gene exon3 is about 3.5kb, this strategy may affect the regulatory function of the 5-terminal of *Trmt2a* gene.

- The *Ranbp1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Ranbp1 RAN binding protein 1 [*Mus musculus* (house mouse)]

Gene ID: 19385, updated on 3-Nov-2019

Summary

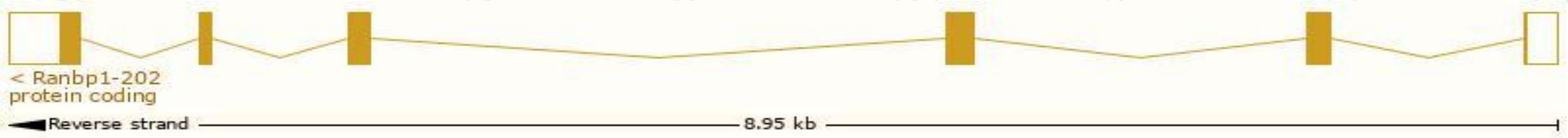
Official Symbol	Ranbp1 provided by MGI
Official Full Name	RAN binding protein 1 provided by MGI
Primary source	MGI:MGI:96269
See related	Ensembl:ENSMUSG00000005732
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Htf9a
Expression	Ubiquitous expression in CNS E11.5 (RPKM 250.8), liver E14 (RPKM 112.5) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

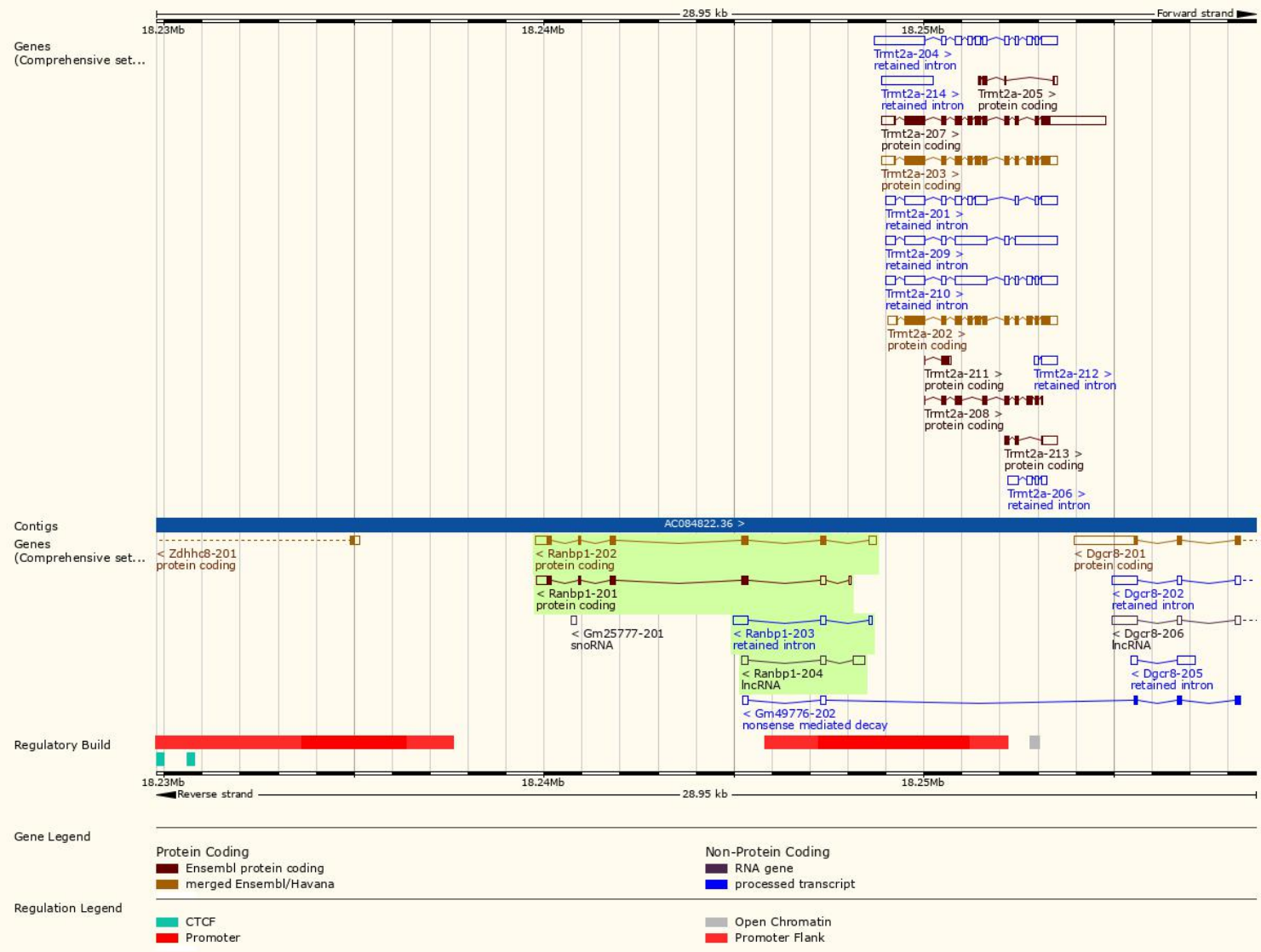
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ranbp1-202	ENSMUST00000115645.9	1085	203aa	Protein coding	CCDS37280	P34022	TSL:1 GENCODE basic APPRIS P1
Ranbp1-201	ENSMUST00000052325.6	923	153aa	Protein coding	-	H7BX22	TSL:3 GENCODE basic
Ranbp1-203	ENSMUST00000123073.7	626	No protein	Retained intron	-	-	TSL:2
Ranbp1-204	ENSMUST00000134035.1	599	No protein	lncRNA	-	-	TSL:3

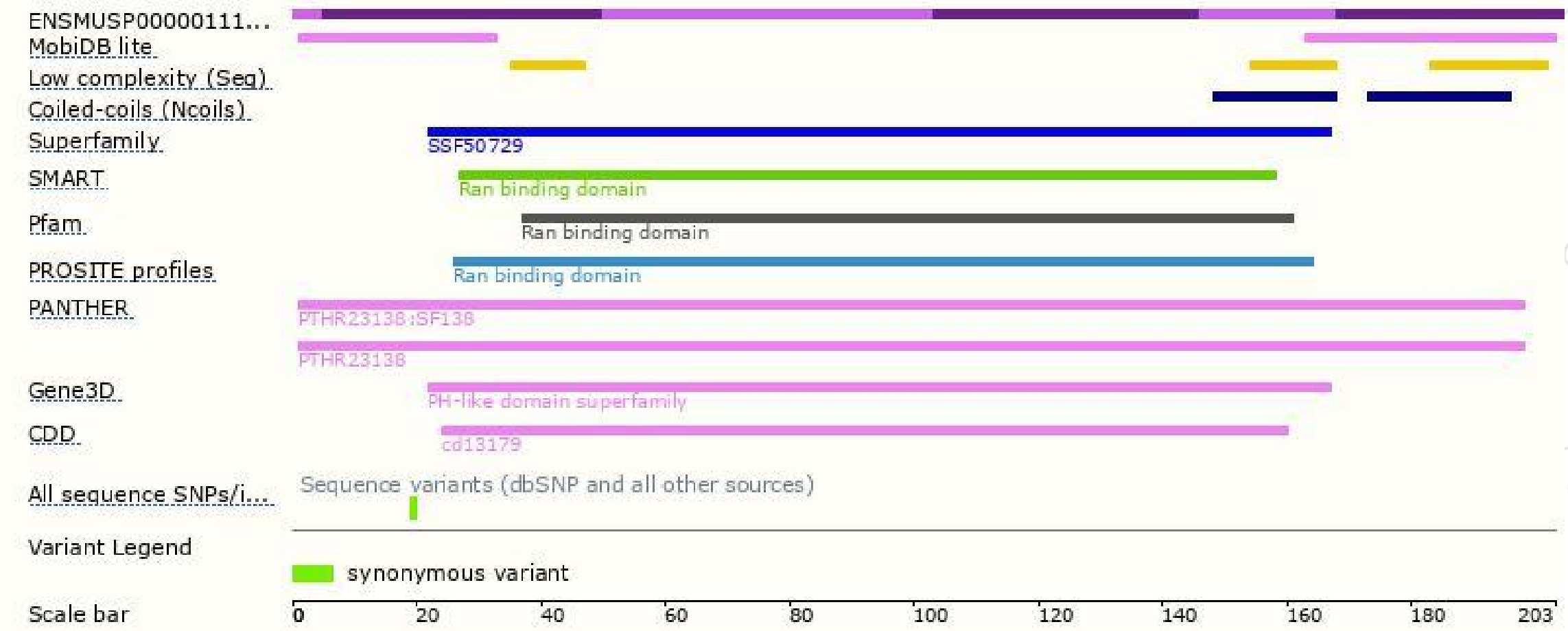
The strategy is based on the design of *Ranbp1-202* transcript, the transcription is shown below:



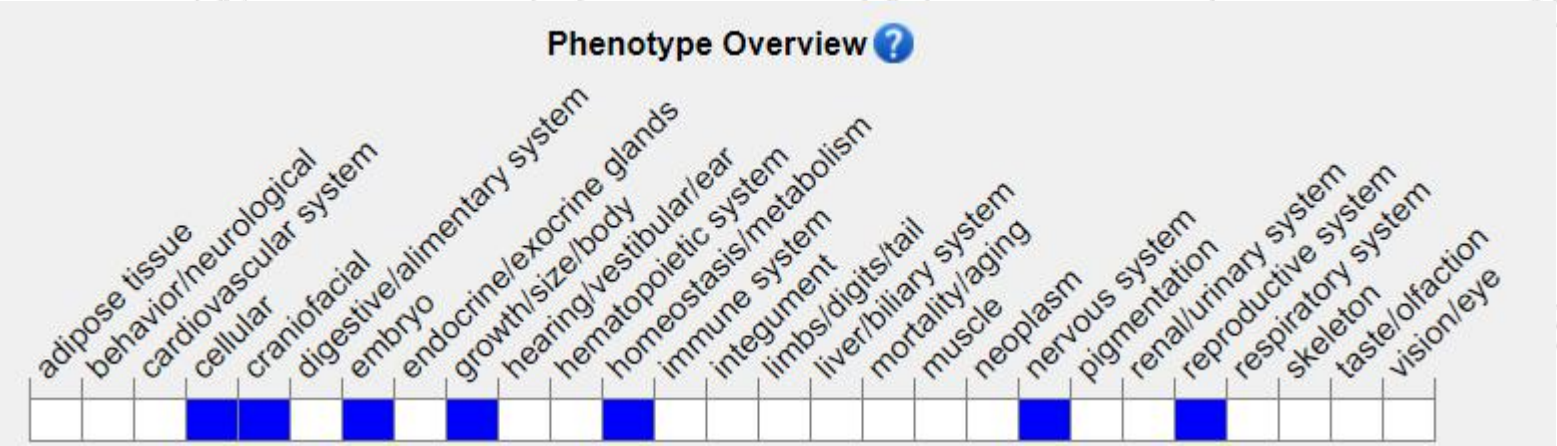
Genomic location distribution



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/).

According to the existing MGI data,Mice homozygous for a knock-out allele exhibit postnatal growth retardation, decreased body weight, impaired spermatogenesis, and male infertility.

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

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