Samd7 Cas9-CKO Strategy

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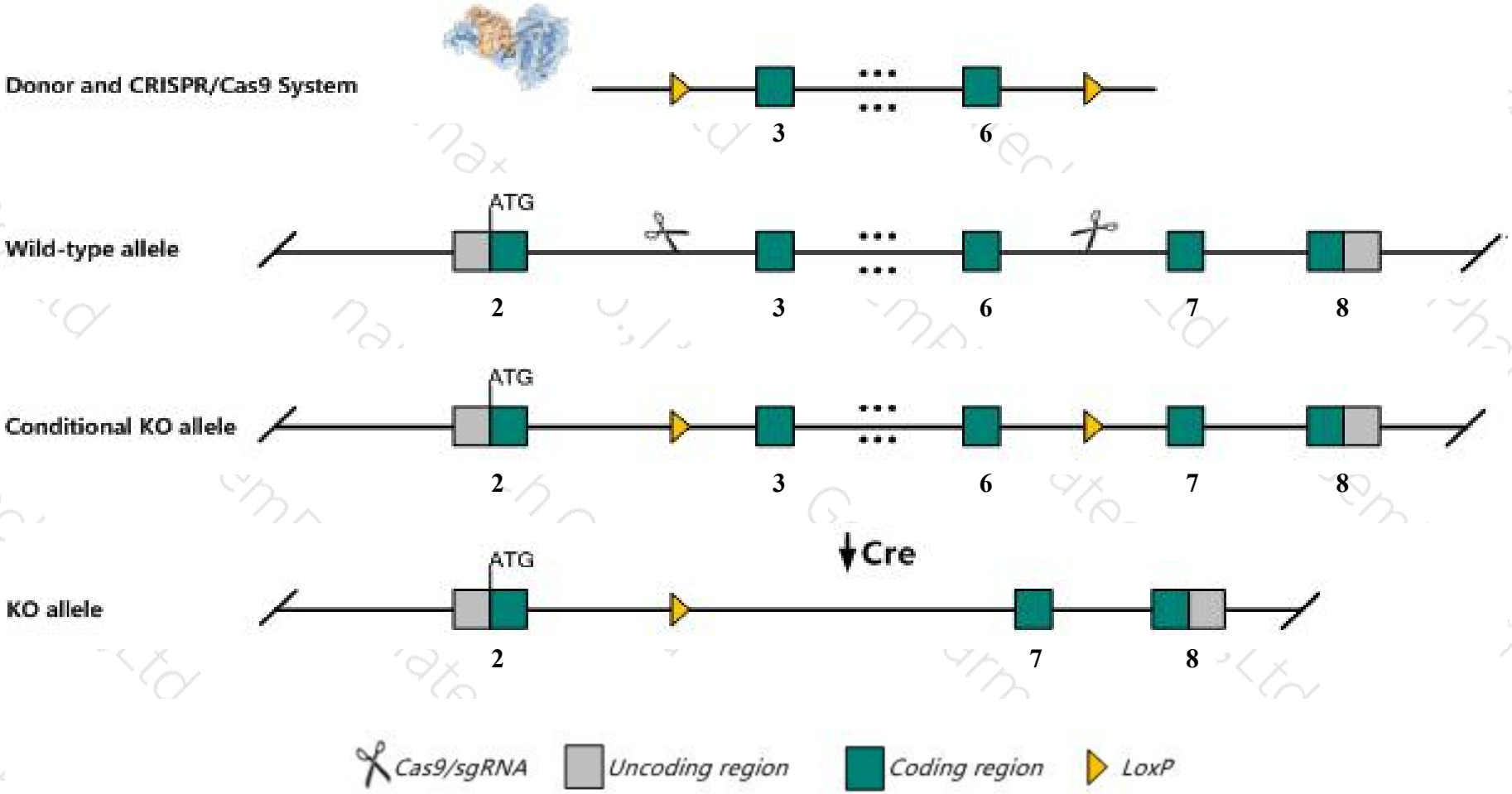
Project Overview

Project Name	***Samd7***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Samd7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Samd7* gene has 4 transcripts. According to the structure of *Samd7* gene, exon3-exon6 of *Samd7-201*(ENSMUST00000108262.9) transcript is recommended as the knockout region.The region contains 934bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Samd7* gene. The brief process is as follows:sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was 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,homozygous knockout reduces the sensitivity of the retinal rods to low-to-moderate flash luminescence.

➢ The *Samd7* gene is located on the Chr3. 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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Samd7 sterile alpha motif domain containing 7 [*Mus musculus* (house mouse)]

Gene ID: 75953, updated on 25-Sep-2020

Summary

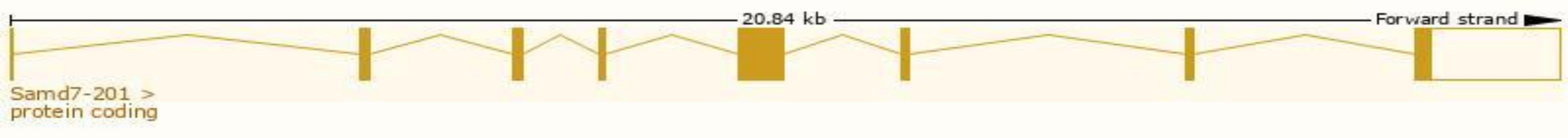
Official Symbol	Samd7 provided by MGI
Official Full Name	sterile alpha motif domain containing 7 provided by MGI
Primary source	MGI:MGI:1923203
See related	Ensembl:ENSMUSG00000051860
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	4930597A01Rik
Expression	Biased expression in testis adult (RPKM 1.3) and CNS E18 (RPKM 0.1) See more
Orthologs	human all

Transcript information（Ensembl）

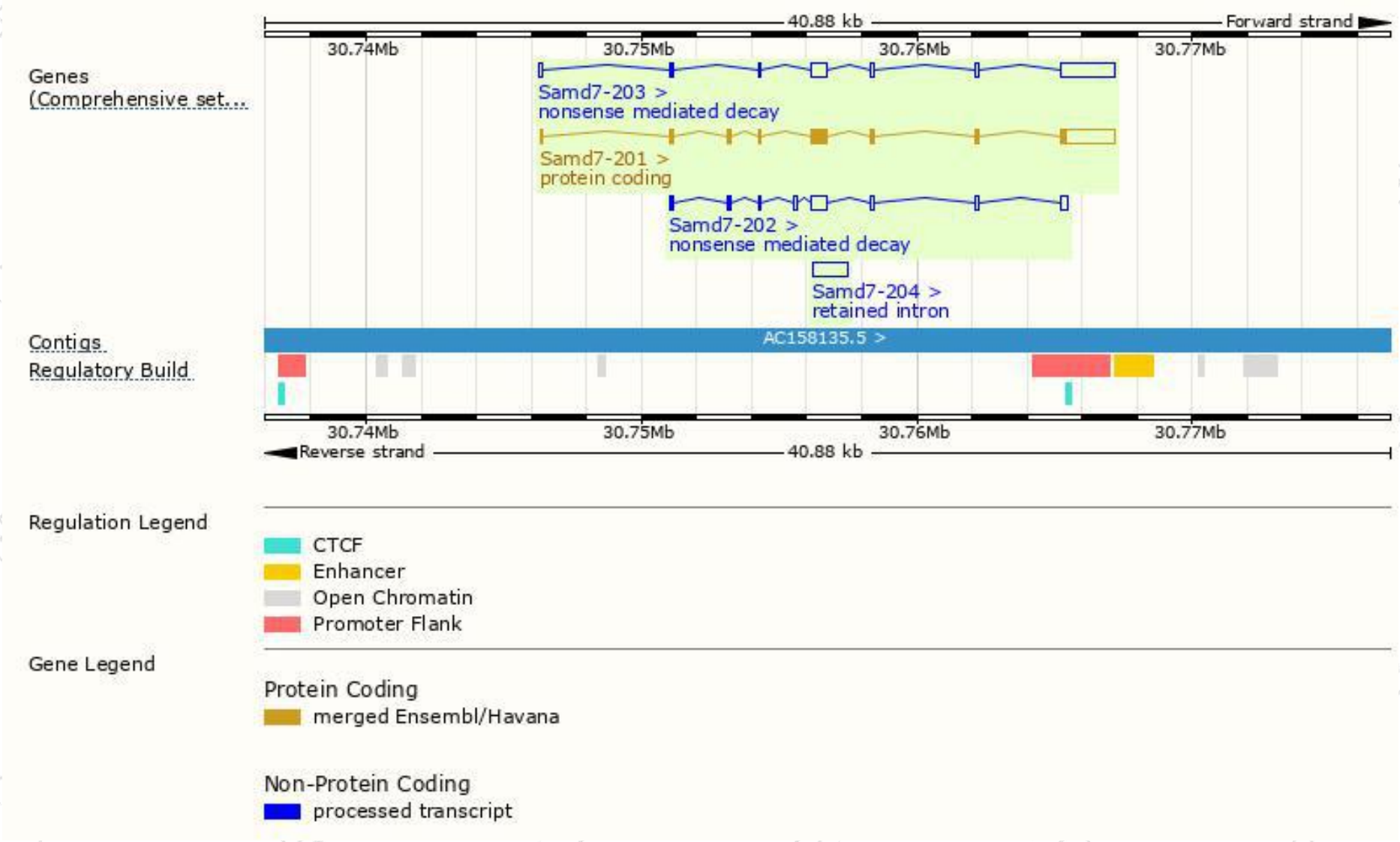
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Samd7-201	ENSMUST00000108262.9	3144	445aa	Protein coding	CCDS17285	Q8C8Y5	TSL:5 GENCODE basic APPRIS P1
Samd7-203	ENSMUST00000174395.7	3058	39aa	Nonsense mediated decay	-	Q8C8Y5	TSL:2
Samd7-202	ENSMUST00000172593.1	1511	102aa	Nonsense mediated decay	-	G3UWL1	TSL:5
Samd7-204	ENSMUST00000192872.1	1241	No protein	Retained intron	-	-	TSL:NA

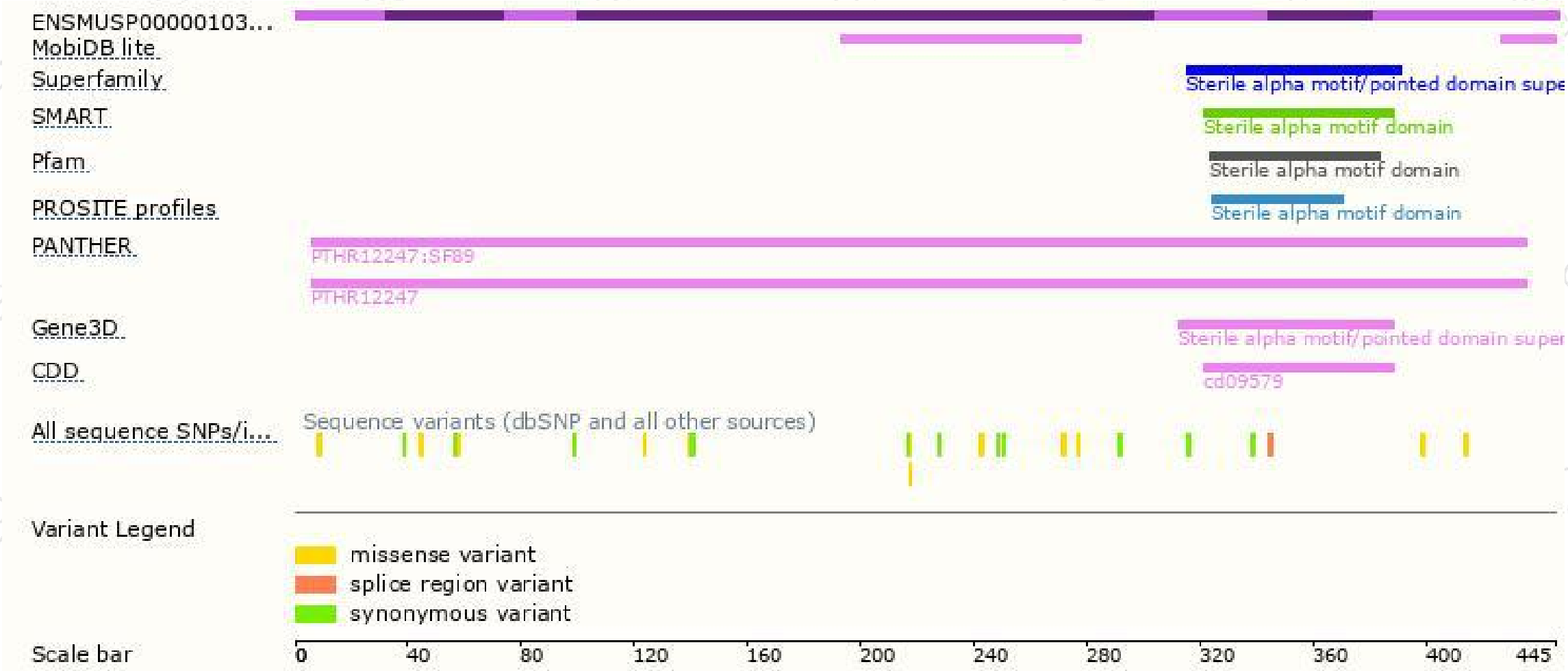
The strategy is based on the design of *Samd7-201* transcript,the transcription is shown below:



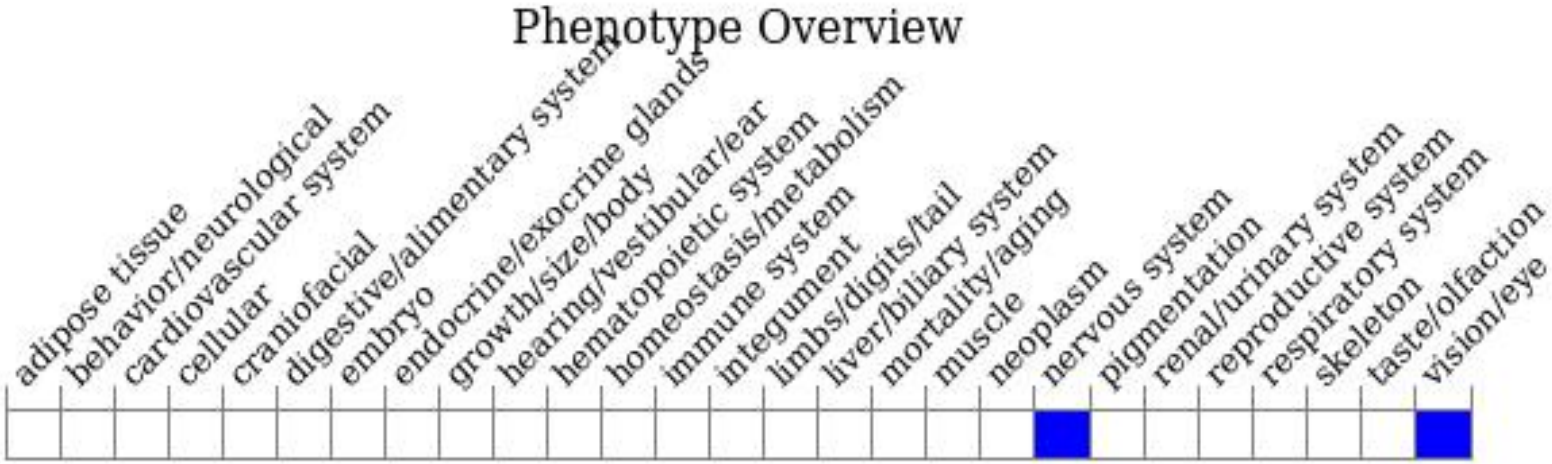
Genomic location distribution



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 knockout reduces the sensitivity of the retinal rods to low-to-moderate flash luminescence.

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

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