Psma8 Cas9-KO Strategy

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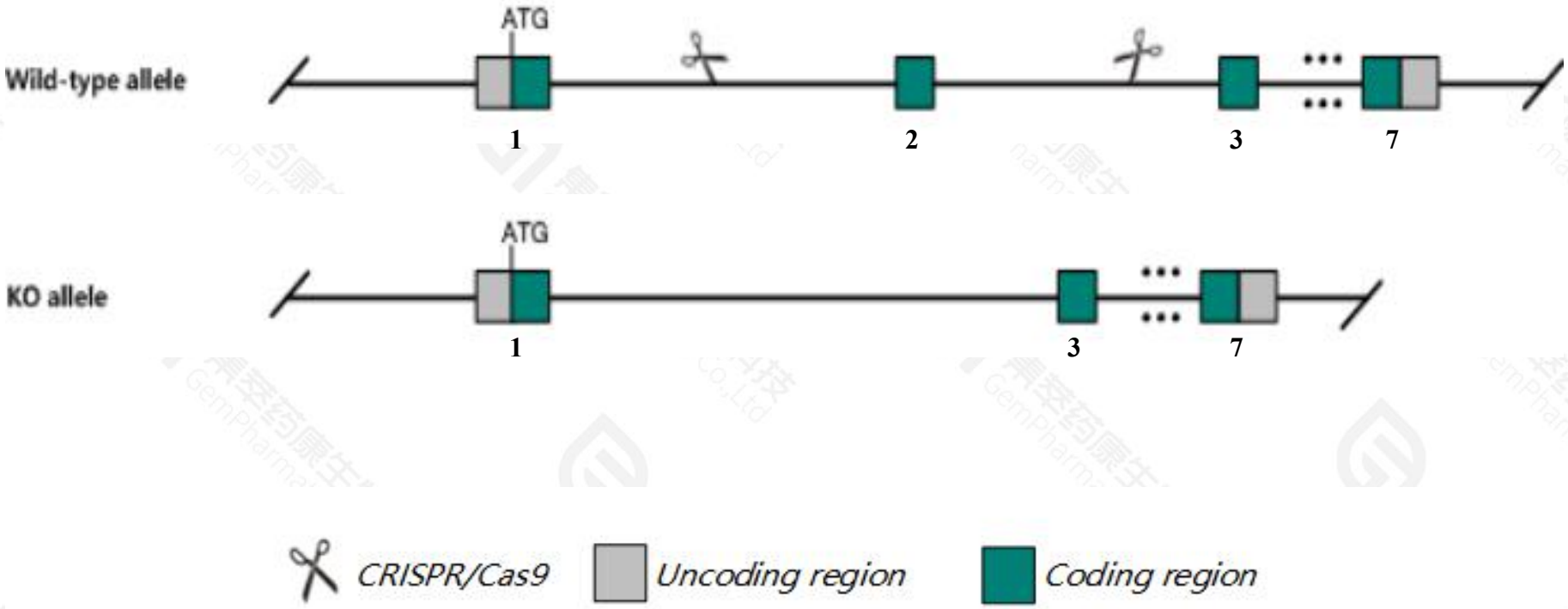
Project Overview

Project Name	***Psma8***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Psma8* gene. The schematic diagram is as follows:



Technical routes

➢ The *Psma8* gene has 7 transcripts. According to the structure of *Psma8* gene, exon2 of *Psma8-201*(ENSMUST00000040860.3) transcript is recommended as the knockout region.The region contains 127bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Psma8* 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,male mice homozygous for a null mutation are infertile with arrest of meiosis at M phase; however, females are fertile.

➢ The *Psma8* gene is located on the Chr18. 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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Psma8 proteasome subunit alpha 8 [Mus musculus (house mouse)]

Gene ID: 73677, updated on 13-Dec-2020

Summary

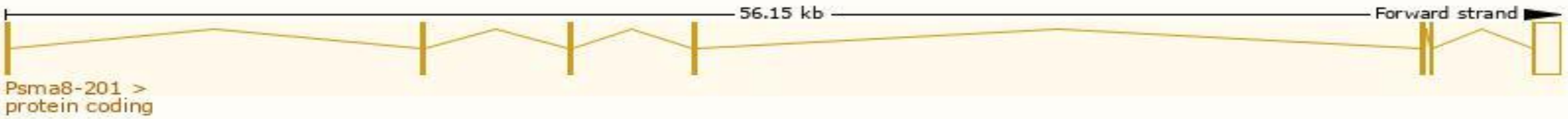
Official Symbol	Psma8 provided by MGI
Official Full Name	proteasome subunit alpha 8 provided byMGI
Primary source	MGI:MGI:1920927
See related	Ensembl:ENSMUSG00000036743
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410072D24Rik
Expression	Biased expression in testis adult (RPKM 11.2) and liver E14 (RPKM 0.4)See more
Orthologs	human all

Transcript information（Ensembl）

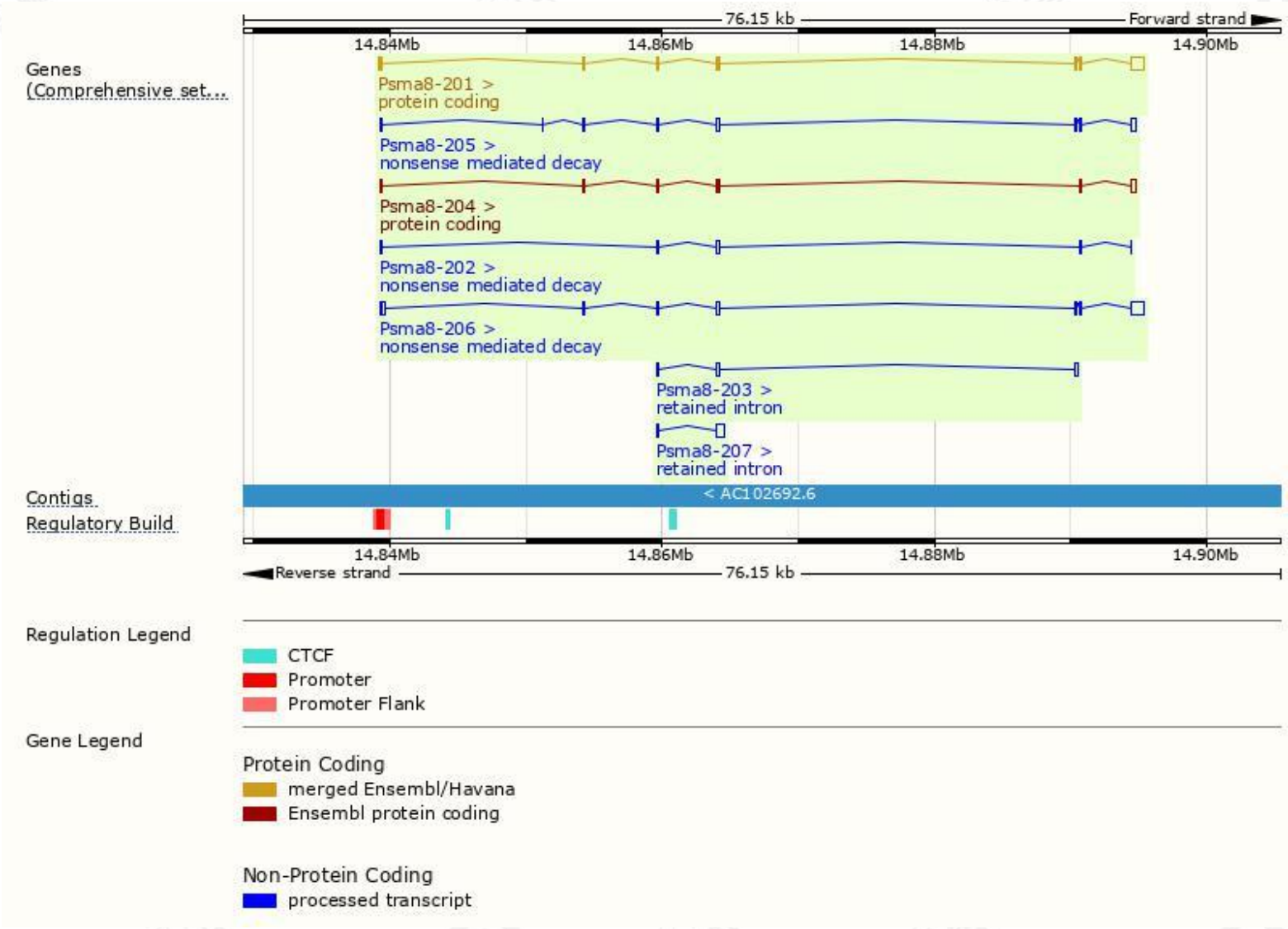
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Psma8-201	ENSMUST00000040860.3	1692	250aa	Protein coding	CCDS50226		TSL:1 , GENCODE basic , APPRIS P1 ,
Psma8-204	ENSMUST00000234680.2	1023	210aa	Protein coding	-		GENCODE basic ,
Psma8-206	ENSMUST00000234922.2	1918	63aa	Nonsense mediated decay	-		
Psma8-205	ENSMUST00000234869.2	1214	53aa	Nonsense mediated decay	-		
Psma8-202	ENSMUST00000234177.2	493	35aa	Nonsense mediated decay	-		
Psma8-207	ENSMUST00000235037.2	576	No protein	Retained intron	-		
Psma8-203	ENSMUST00000234318.2	432	No protein	Retained intron	-		

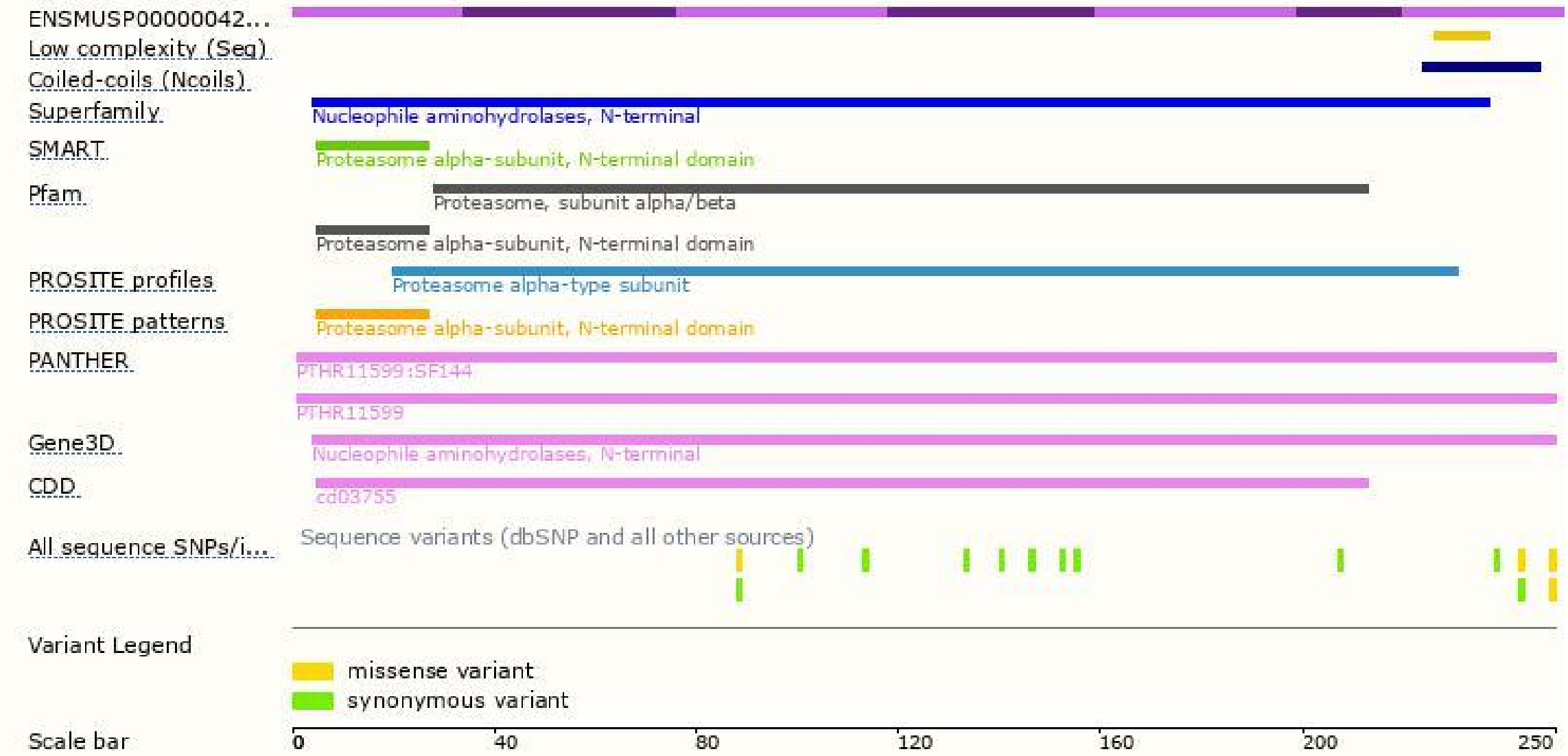
The strategy is based on the design of *Psma8-201* transcript,the transcription is shown below:



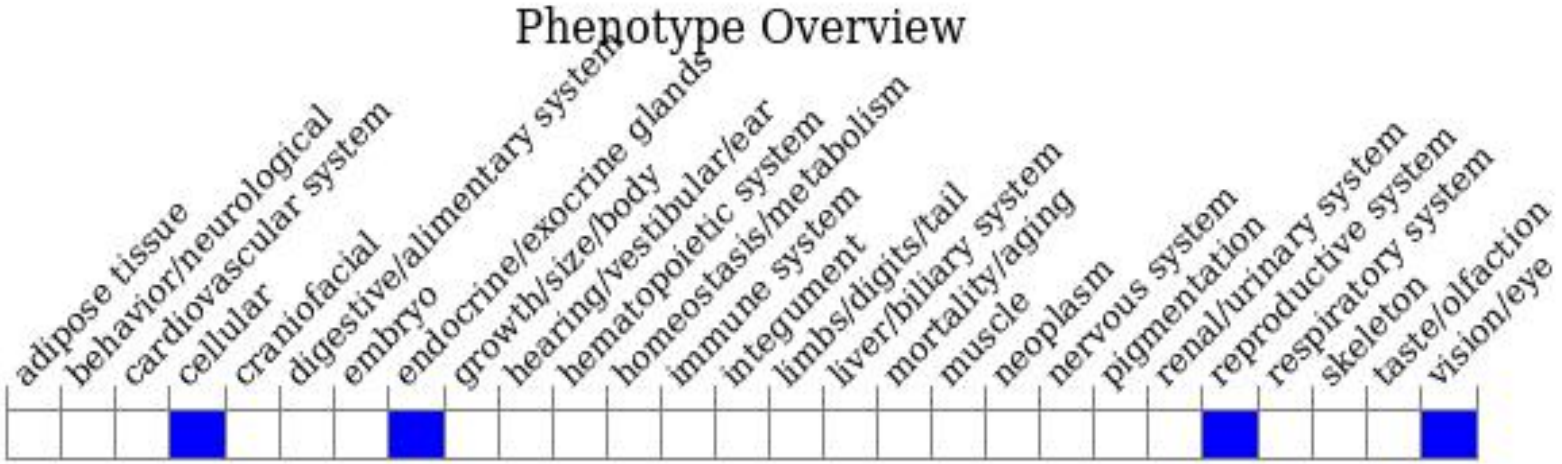
Genomic location distribution



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,male mice homozygous for a null mutation are infertile with arrest of meiosis at M phase; however, females are fertile.

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