Adam7 Cas9-KO Strategy

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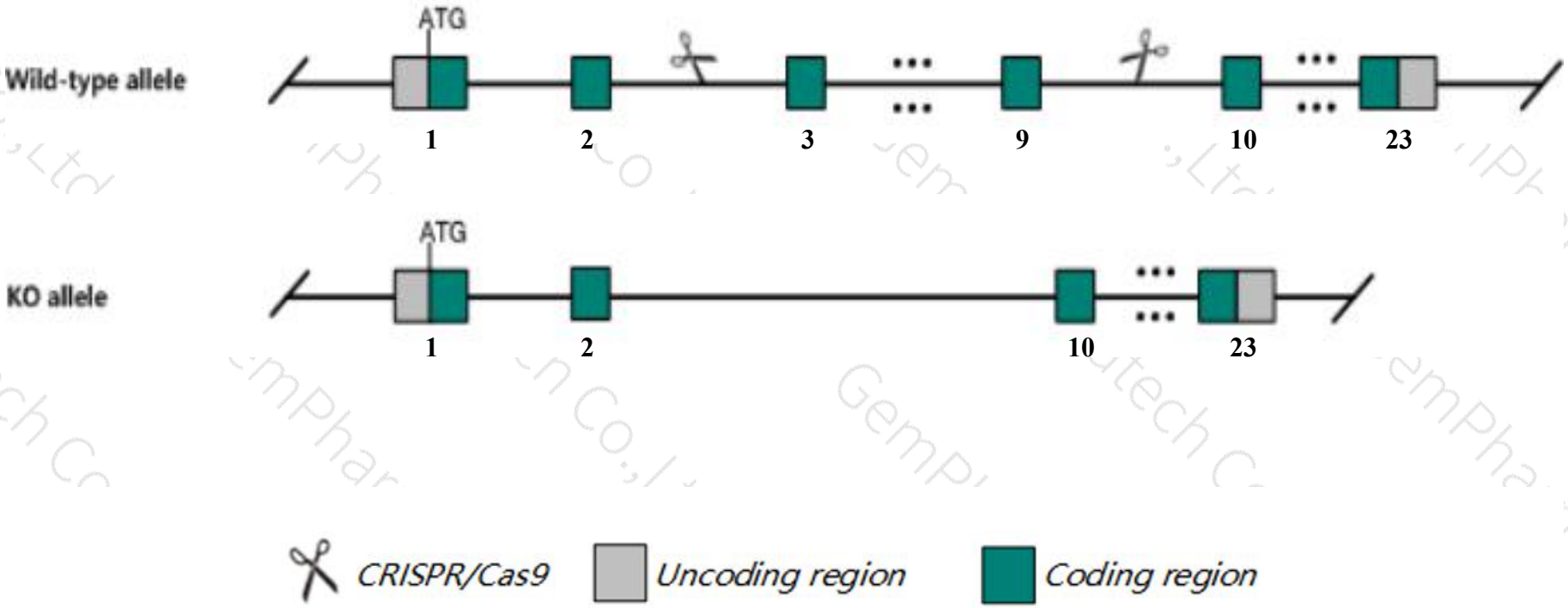
Design Date: 2020-8-3

Project Overview

Project Name	***Adam7***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adam7* gene. The schematic diagram is as follows:



Technical routes

➢ The *Adam7* gene has 3 transcripts. According to the structure of *Adam7* gene, exon3-exon9 of *Adam7-201*(ENSMUST00000022640.7) transcript is recommended as the knockout region.The region contains 719bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Adam7* 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,mice homozygous for a knock-out allele exhibit reduced male fertility with decreased cell height in caput epididymis, spermatic granuloma, kinked sperm flagellum and reduced sperm motility.

➢ The *Adam7* gene is located on the Chr14. 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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Adam7 a disintegrin and metallopeptidase domain 7 [Mus musculus (house mouse)]

Gene ID: 11500, updated on 13-Mar-2020

Summary

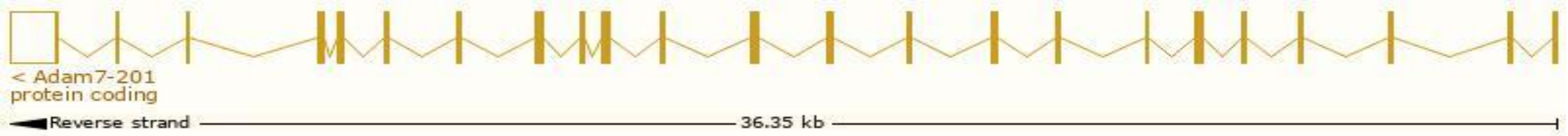
Official Symbol	Adam7 provided by MGI
Official Full Name	a disintegrin and metallopeptidase domain 7 provided byMGI
Primary source	MGI:MGI:107247
See related	Ensembl:ENSMUSG00000022056
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	ADAM 7, EAP1, EAPI
Summary	This gene encodes a member of a disintegrin and metalloprotease (ADAM) family of endoproteases that play important roles in various biological processes including cell signaling, adhesion and migration. This gene is specifically expressed in epididymis where the encoded protein is transferred to the sperm surface during epididymal transit. This gene is located adjacent to a related gene from the ADAM family of proteins on chromosome 14. [provided by RefSeq, Oct 2015]
Expression	Restricted expression toward genital fat pad adult (RPKM 292.3)See more
Orthologs	human all

Transcript information（Ensembl）

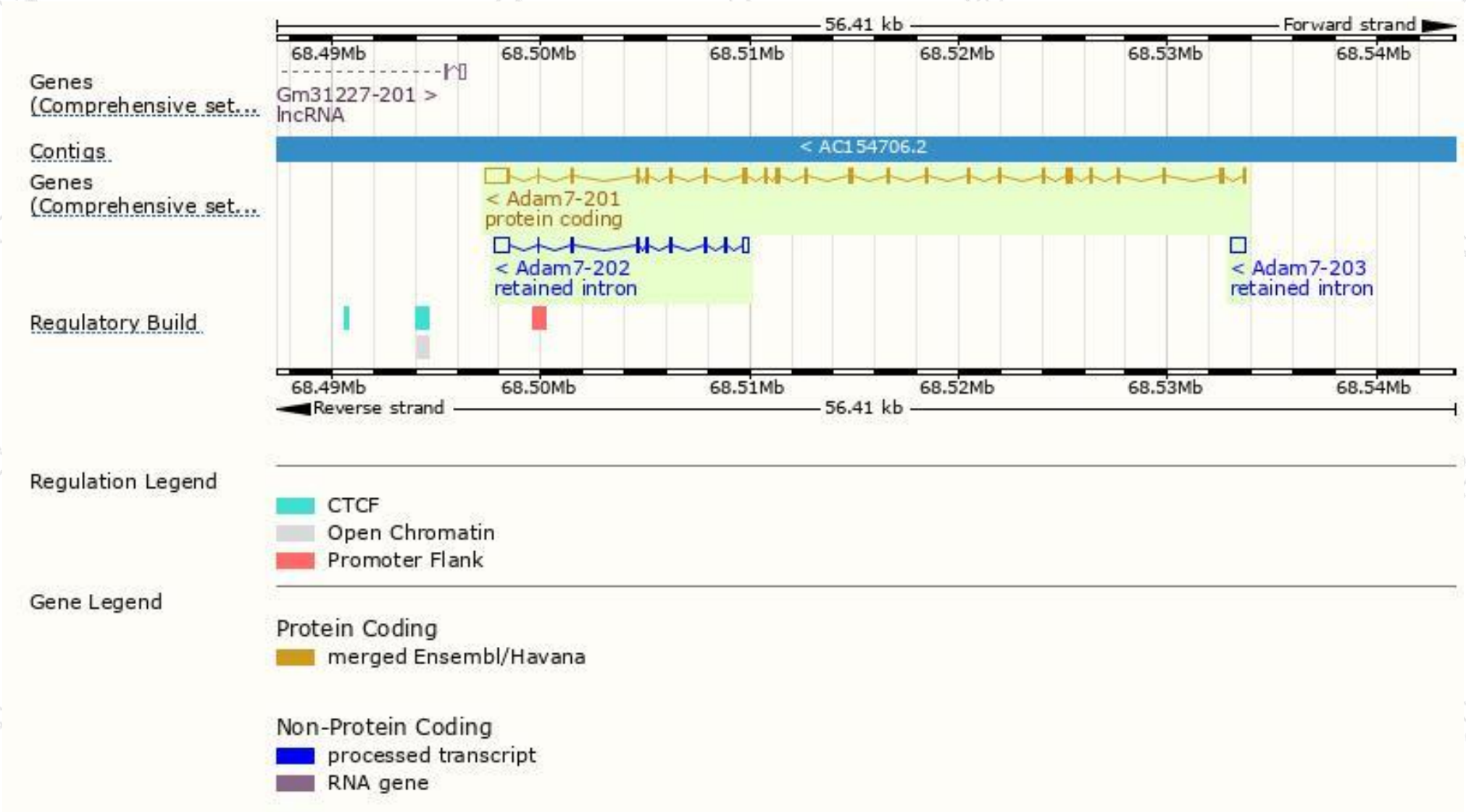
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adam7-201	ENSMUST00000022640.7	3469	789aa	Protein coding	CCDS27234	O35227	TSL:1 GENCODE basic APPRIS P1
Adam7-202	ENSMUST00000128069.1	1497	No protein	Retained intron	-	-	TSL:1
Adam7-203	ENSMUST00000225673.1	741	No protein	Retained intron	-	-	

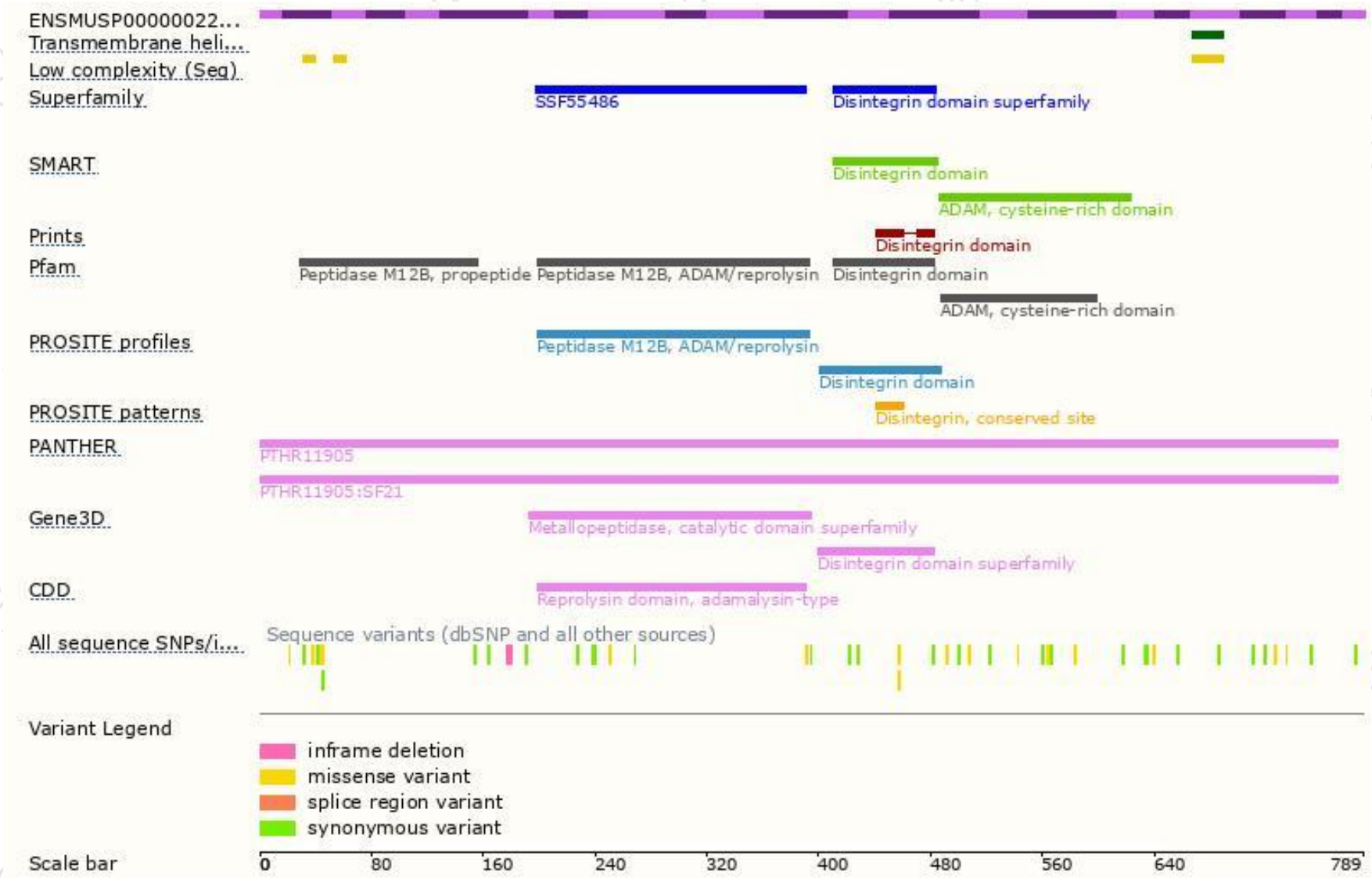
The strategy is based on the design of *Adam7-201* transcript,the transcription is shown below:



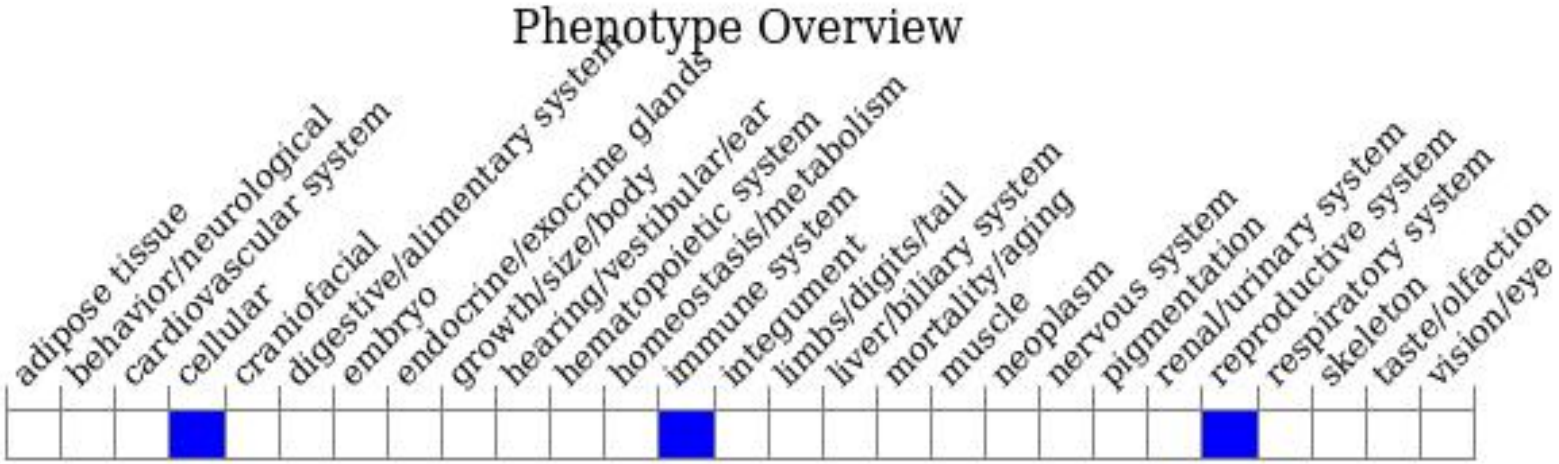
Genomic location distribution



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/).

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

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