

Cd8a Cas9-KO Strategy

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Project Overview

Project Name

Cd8a

Project type

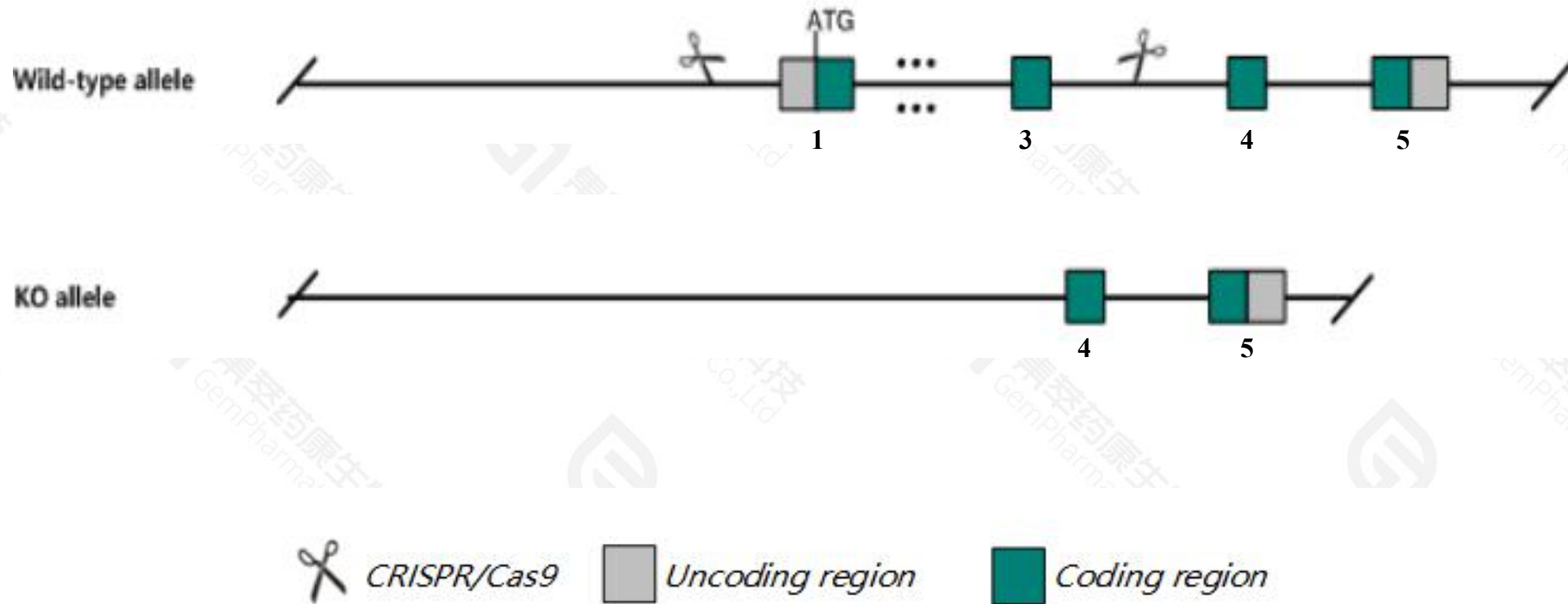
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cd8a* gene. The schematic diagram is as follows:



- The *Cd8a* gene has 3 transcripts. According to the structure of *Cd8a* gene, exon1-exon3 of *Cd8a-201*(ENSMUST00000066747.14) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cd8a* 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.

- According to the existing MGI data, animals homozygous for a mutation in this gene lack CD8⁺CD4⁻ cytotoxic T cells in the thymus and spleen and do not mount a cytotoxic response to alloantigens.
- *Gm44174-201* gene was also knocked out.
- The *Cd8a* gene is located on the Chr6. 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)

Cd8a CD8 antigen, alpha chain [Mus musculus (house mouse)]

Gene ID: 12525, updated on 13-Mar-2020

Summary

Official Symbol Cd8a provided by [MGI](#)

Official Full Name CD8 antigen, alpha chain provided by [MGI](#)

Primary source [MGI:MGI:88346](#)

See related [Ensembl:ENSMUSG00000053977](#)

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 BB154331, Ly-2, Ly-35, Ly-B, Lyt-2

Expression Restricted expression toward thymus adult (RPKM 213.1)[See more](#)

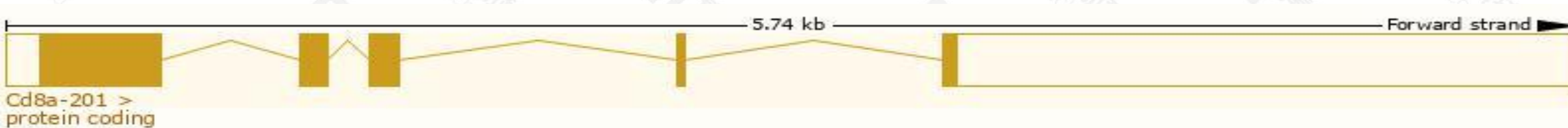
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

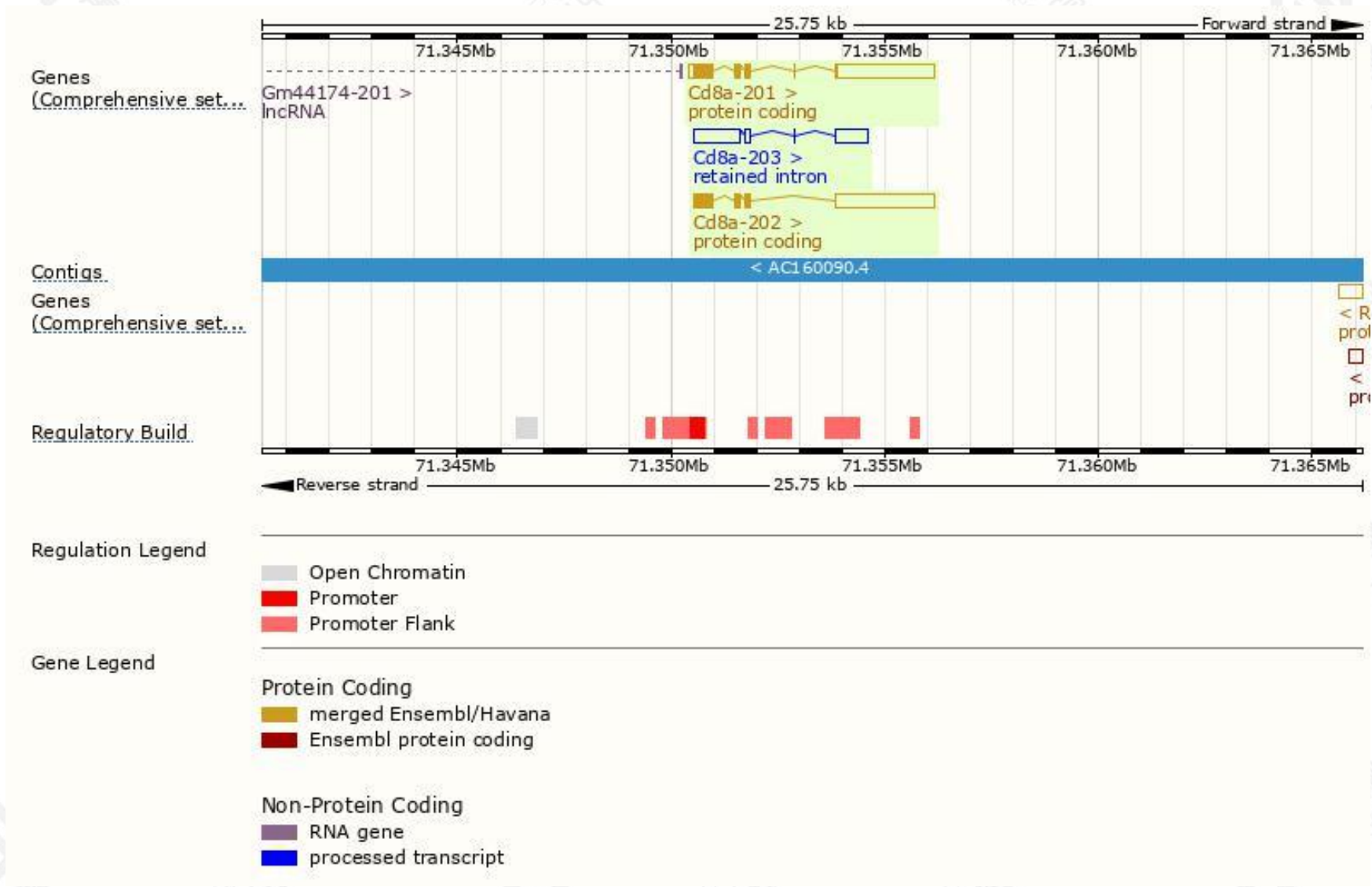
The gene has 3 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cd8a-201	ENSMUST00000066747.13	3128	247aa	Protein coding	CCDS39507	P01731	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P3
Cd8a-202	ENSMUST00000172321.2	2975	222aa	Protein coding	CCDS51806	Q8CAX3	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS ALT2
Cd8a-203	ENSMUST00000205054.1	1950	No protein	Retained intron	-	-	TSL:1

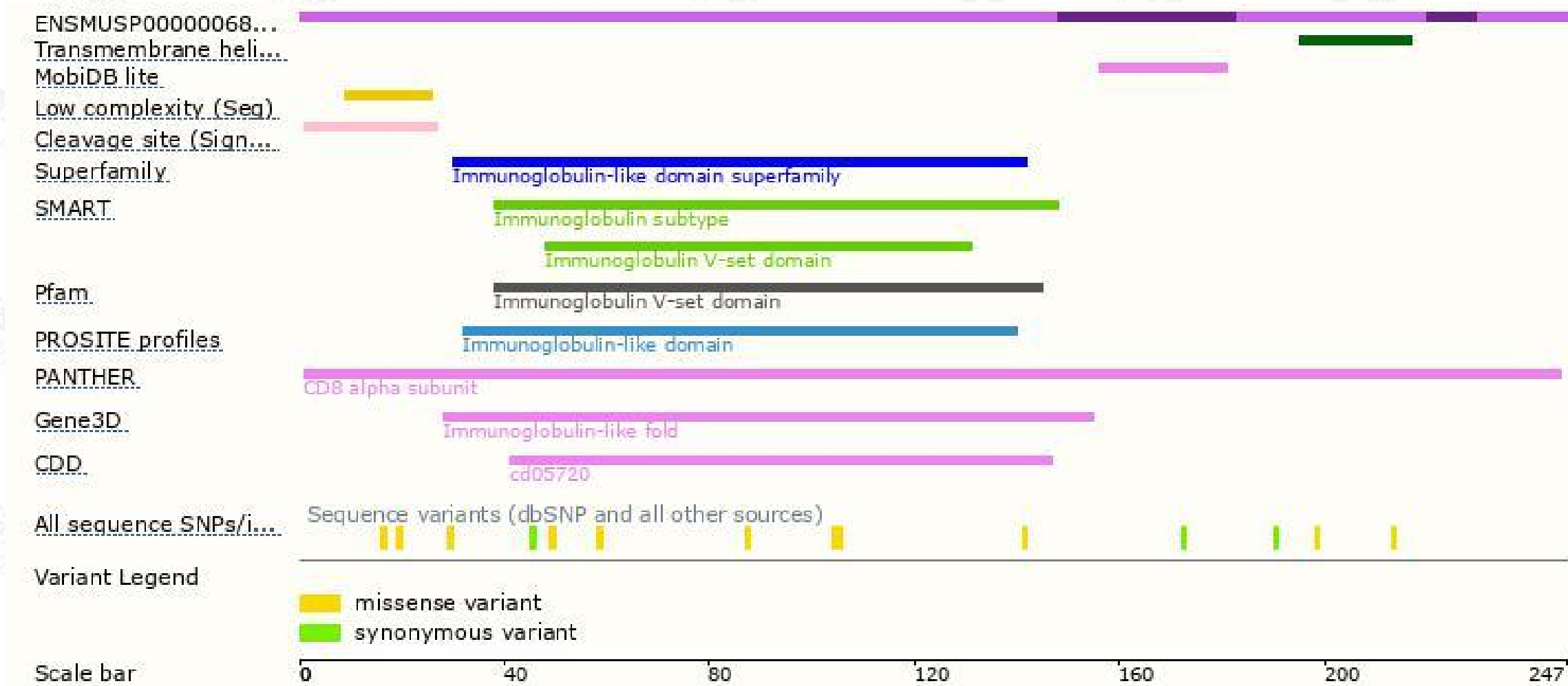
The strategy is based on the design of *Cd8a-201* transcript, the transcription is shown below:



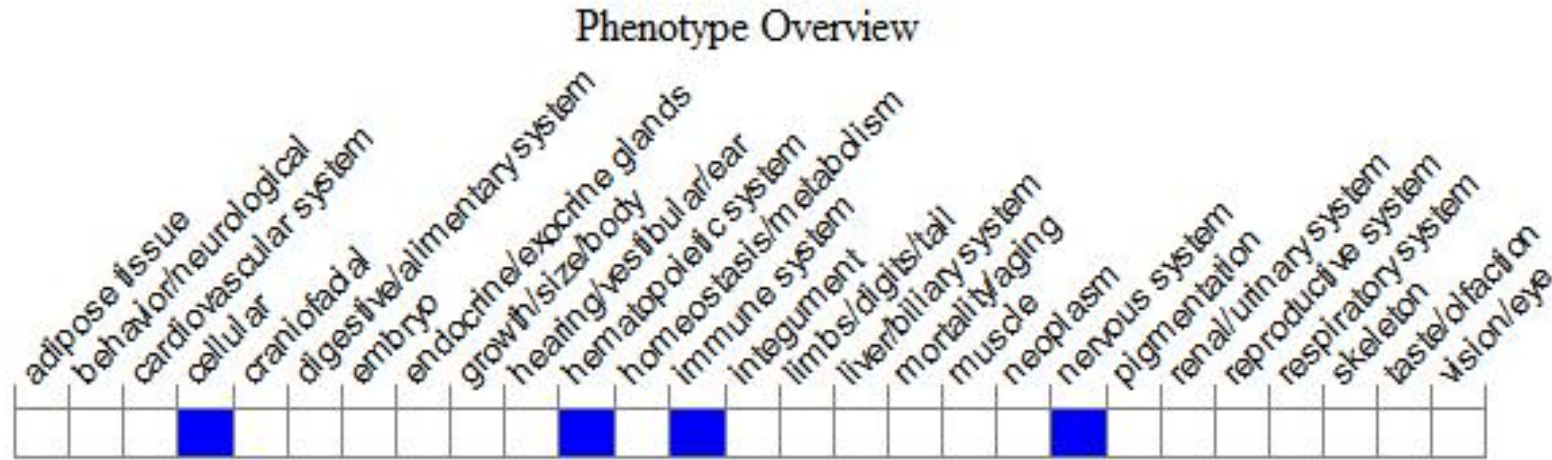
Genomic location distribution



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, animals homozygous for a mutation in this gene lack CD8⁺CD4⁻ cytotoxic T cells in the thymus and spleen and do not mount a cytotoxic response to alloantigens.

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

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