

Camk4 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Camk4

Project type

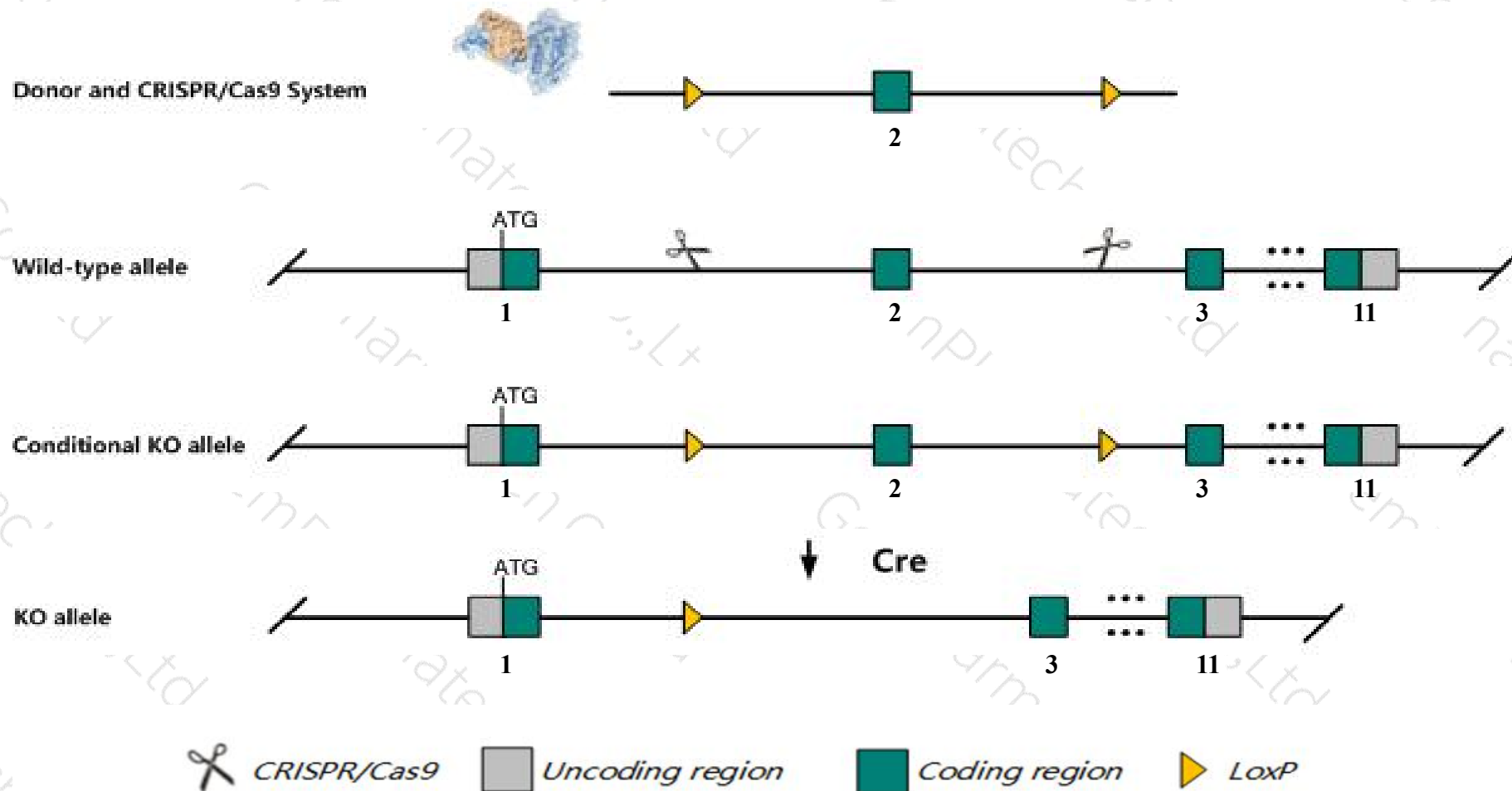
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Camk4* gene. The schematic diagram is as follows:



Technical routes

- The *Camk4* gene has 4 transcripts. According to the structure of *Camk4* gene, exon2 of *Camk4-201* (ENSMUST00000042868.5) transcript is recommended as the knockout region. The region contains 79bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Camk4* 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.

- According to the existing MGI data, Homozygotes for different targeted mutations show variable phenotypes, including reduced viability, male and/or female sterility, and mild to severe neurological and spatial memory disorders.
- The *Camk4* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Camk4 calcium/calmodulin-dependent protein kinase IV [Mus musculus (house mouse)]

Gene ID: 12326, updated on 5-Mar-2019

Summary



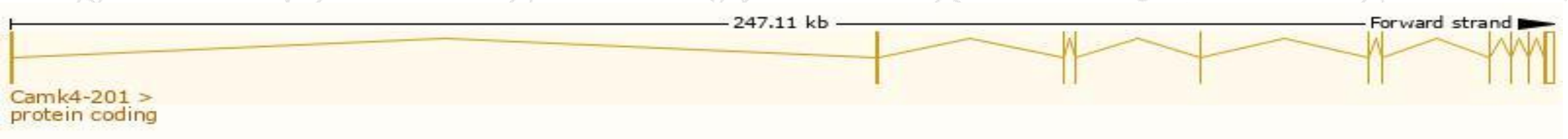
Official Symbol	Camk4 provided by MGI
Official Full Name	calcium/calmodulin-dependent protein kinase IV provided by MGI
Primary source	MGI:MGI:88258
See related	Ensembl:ENSMUSG00000038128
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	A430110E23Rik, AI666733, CaMKIV, CaMKIV/Gr, D18Bwg0362e
Expression	Biased expression in cerebellum adult (RPKM 21.8), cortex adult (RPKM 9.3) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

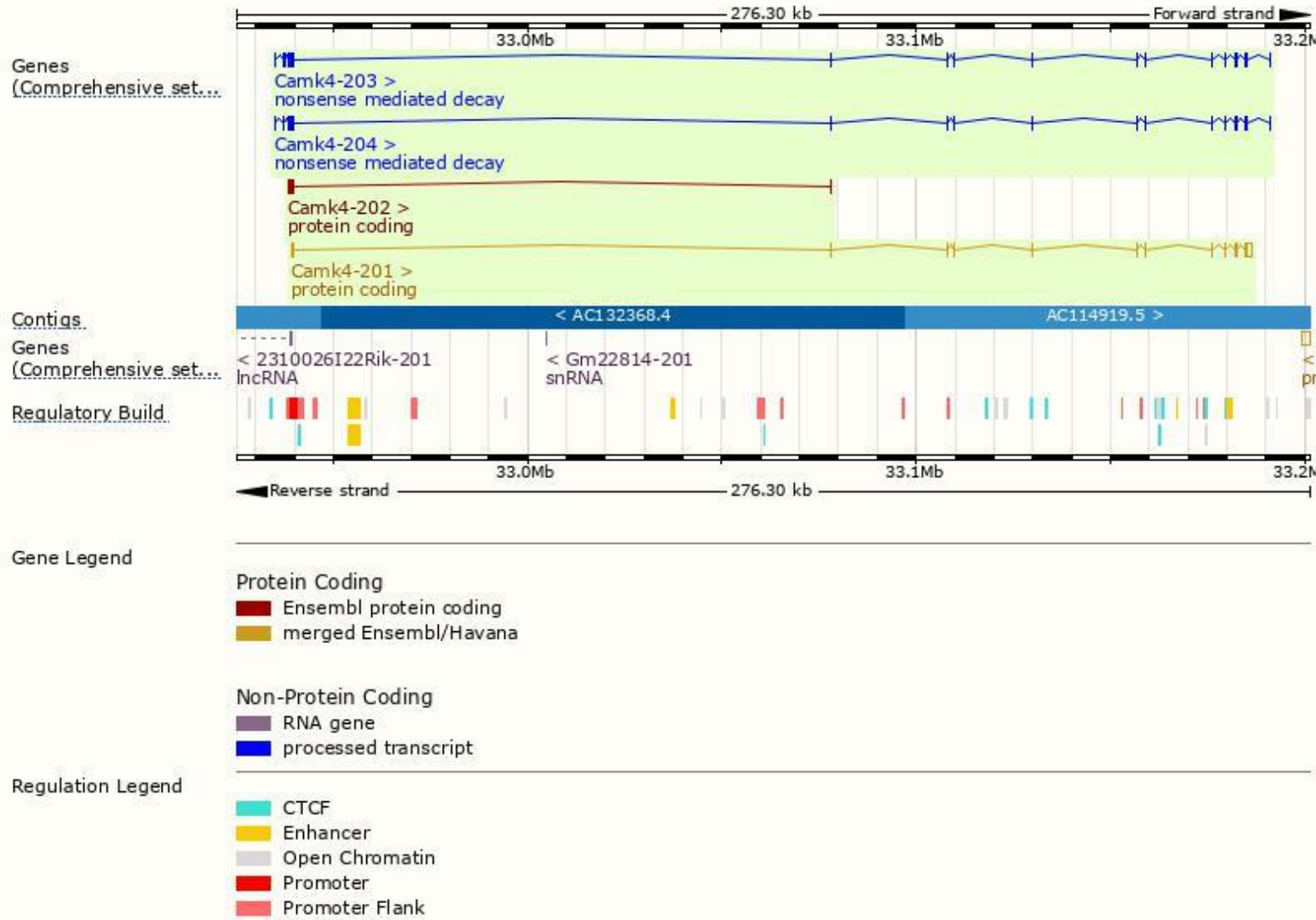
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Camk4-201	ENSMUST00000042868.5	2717	469aa	Protein coding	CCDS29122	Q8BGR3	TSL:1 GENCODE basic APPRIS P1
Camk4-202	ENSMUST00000234001.1	526	67aa	Protein coding	-	-	CDS 3' incomplete
Camk4-203	ENSMUST00000234205.1	1868	469aa	Nonsense mediated decay	CCDS29122	-	
Camk4-204	ENSMUST00000234654.1	1829	469aa	Nonsense mediated decay	CCDS29122	-	

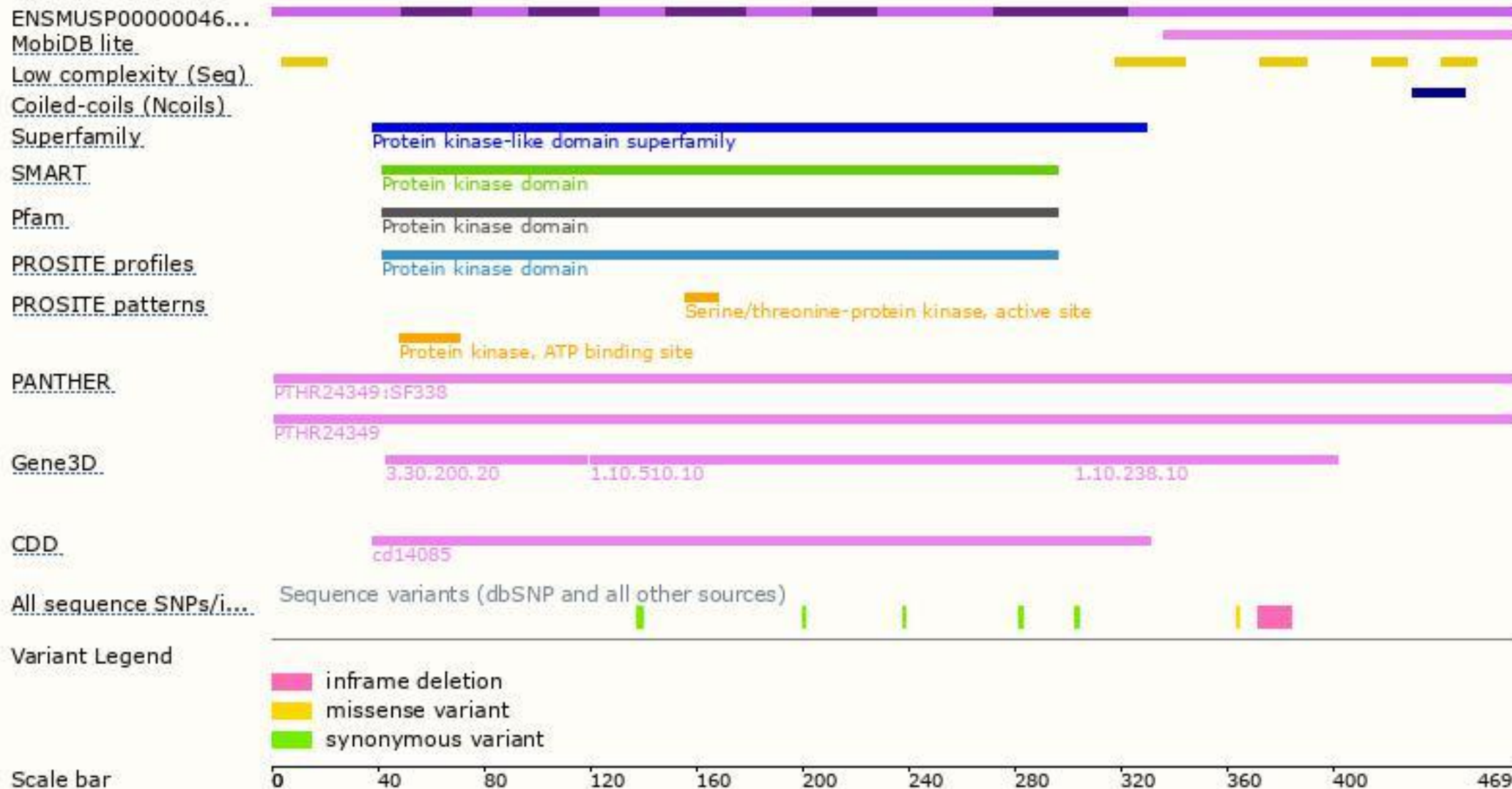
The strategy is based on the design of *Camk4-201* transcript,The transcription is shown below



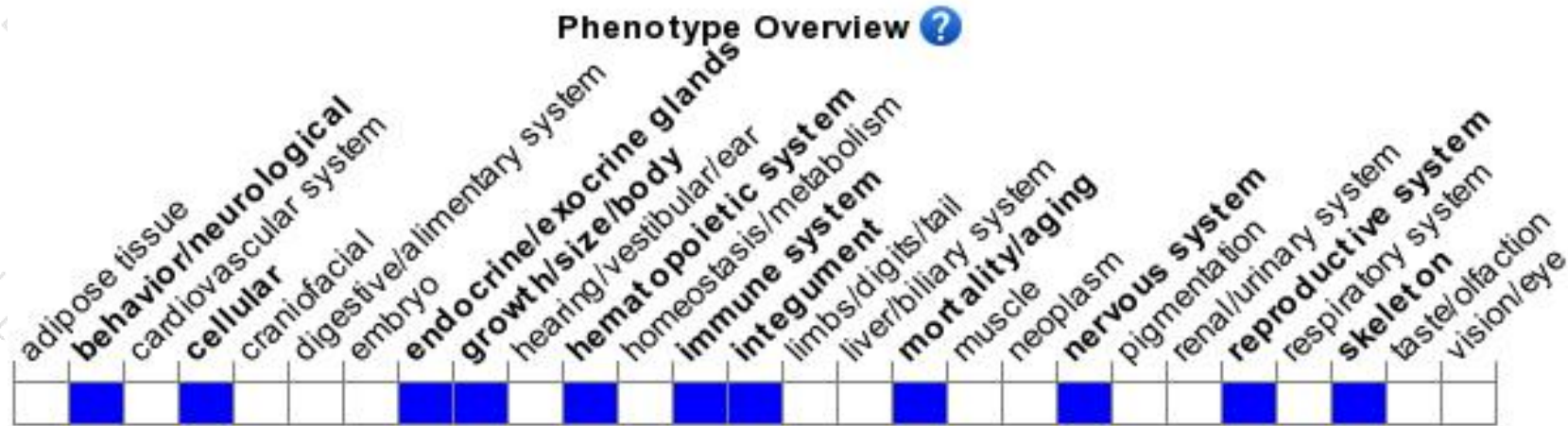
Genomic location distribution



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, Homozygotes for different targeted mutations show variable phenotypes, including reduced viability, male and/or female sterility, and mild to severe neurological and spatial memory disorders.

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

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