Adamts4 Cas9-CKO Strategy

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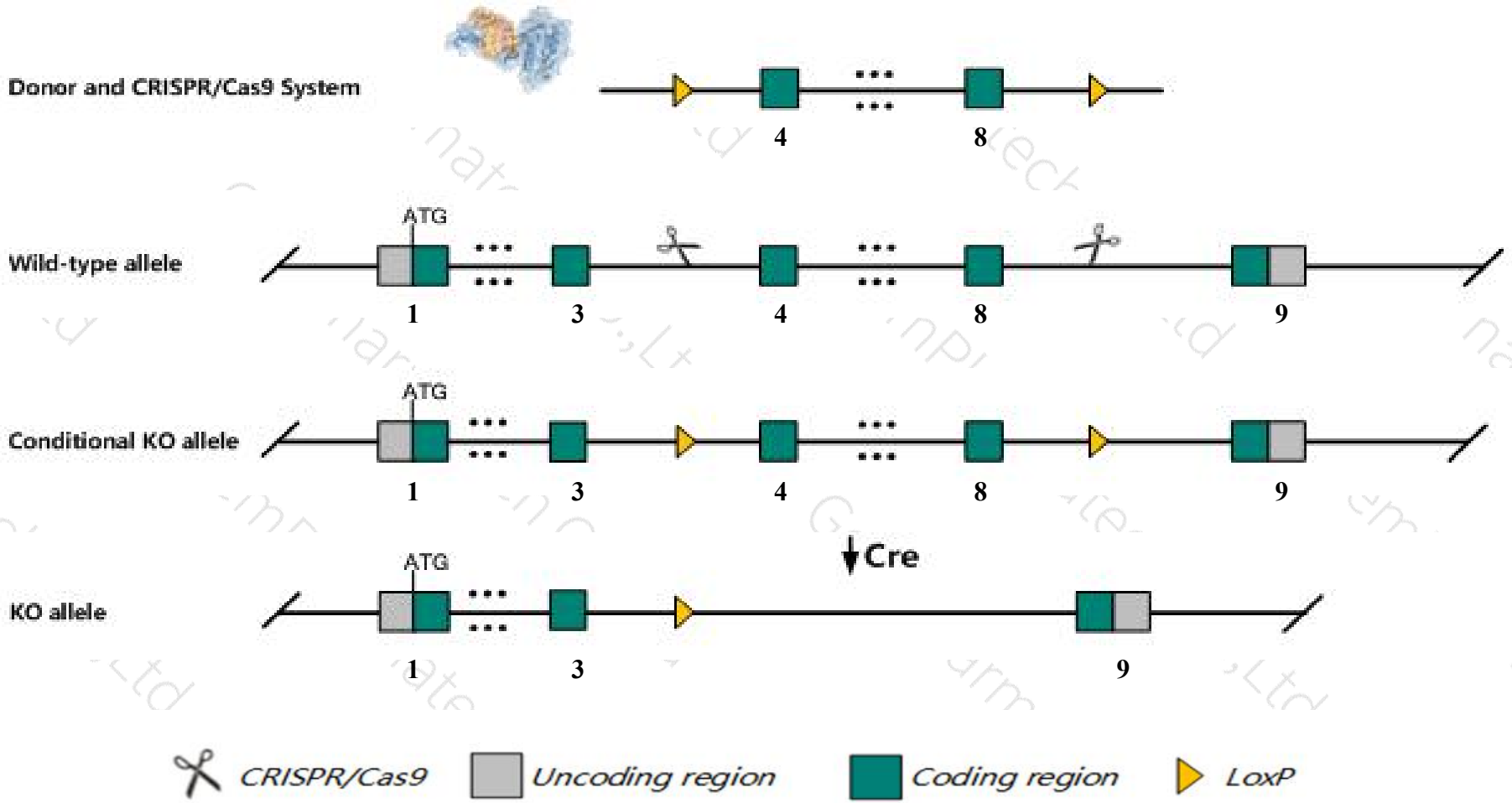
Project Overview

Project Name	***Adamts4***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adamts4* gene. The schematic diagram is as follows:



Technical routes

- The *Adamts4* gene has 3 transcripts. According to the structure of *Adamts4* gene, exon4-exon8 of *Adamts4-203* (ENSMUST00000219033.1) transcript is recommended as the knockout region.The region contains 997bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Adamts4* 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.

Notice

- According to the existing MGI data,Homozygous mutant mice do not exhibit any morphological abnormalities. However, they do display impaired coordination and an increased susceptibility to pharmacologically induced seizures.
- The floxed region is near to the N-terminal of *Ndufs2* gene,this strategy may influence the regulatory function of the N-terminal of *Ndufs2* gene.
- The N-terminal of *Adamts4* gene will remain 371aa,it may remain the partial function of *Adamts4* gene.
- The *Adamts4* gene is located on the Chr1. 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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Adamts4 a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 4 [*Mus musculus* (house mouse)]

Gene ID: 240913, updated on 26-Nov-2019

Summary

Official Symbol	Adamts4 provided by MGI
Official Full Name	a disintegrin-like and metallopeptidase (reprolysin type) with thrombospondin type 1 motif, 4 provided by MGI
Primary source	MGI:MGI:1339949
See related	Ensembl:ENSMUSG00000006403
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	ADMP-1; ADAM-TS4; ADAMTS-2
Summary	This gene encodes a member of "a disintegrin and metalloproteinase with thrombospondin motifs" (ADAMTS) family of multi-domain matrix-associated metalloendopeptidases that have diverse roles in tissue morphogenesis and pathophysiological remodeling, in inflammation and in vascular biology. The encoded preproprotein undergoes proteolytic processing to generate an active zinc-dependent aggrecanase enzyme that degrades cartilage. [provided by RefSeq, Jul 2016]
Expression	Broad expression in ovary adult (RPKM 13.3), cerebellum adult (RPKM 7.1) and 18 other tissues See more
Orthologs	human all

Genomic context

Location: 1 H3; 1 79.28 cM

See Adamts4 in Genome Data Viewer

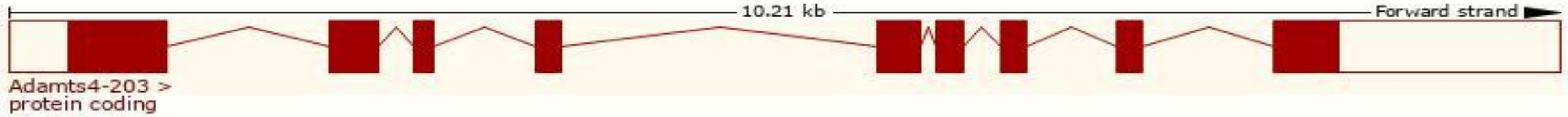
Exon count: 9

Transcript information（Ensembl）

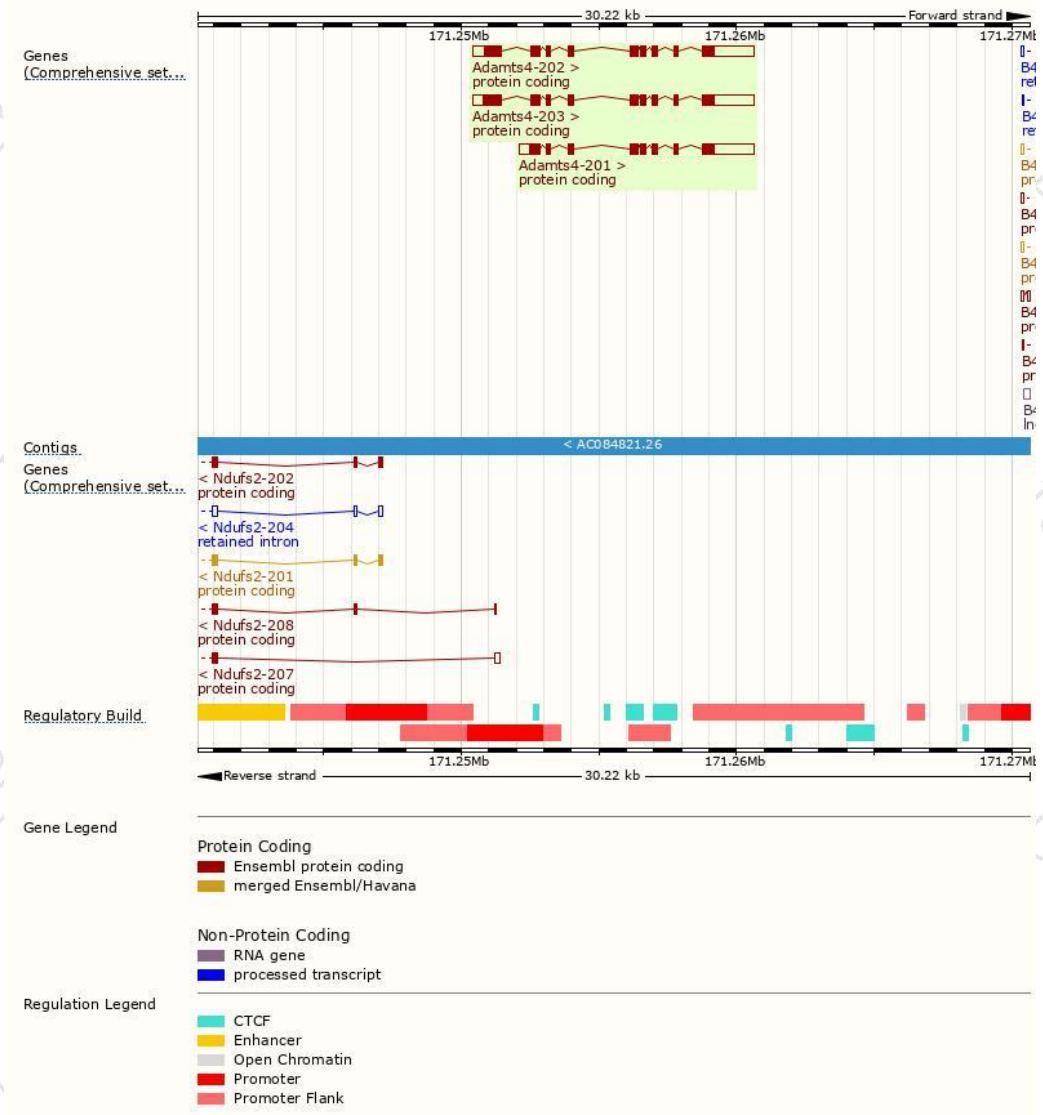
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adamts4-203	ENSMUST00000219033.1	4386	845aa	Protein coding	CCDS15485	Q3TNX8	TSL:1 GENCODE basic APPRIS P2
Adamts4-202	ENSMUST00000111315.8	4389	833aa	Protein coding	-	A0A0B4J1L2 Q8BNJ2	TSL:1 GENCODE basic APPRIS ALT2
Adamts4-201	ENSMUST00000111314.1	3761	648aa	Protein coding	-	E9PV91	TSL:1 GENCODE basic APPRIS ALT2

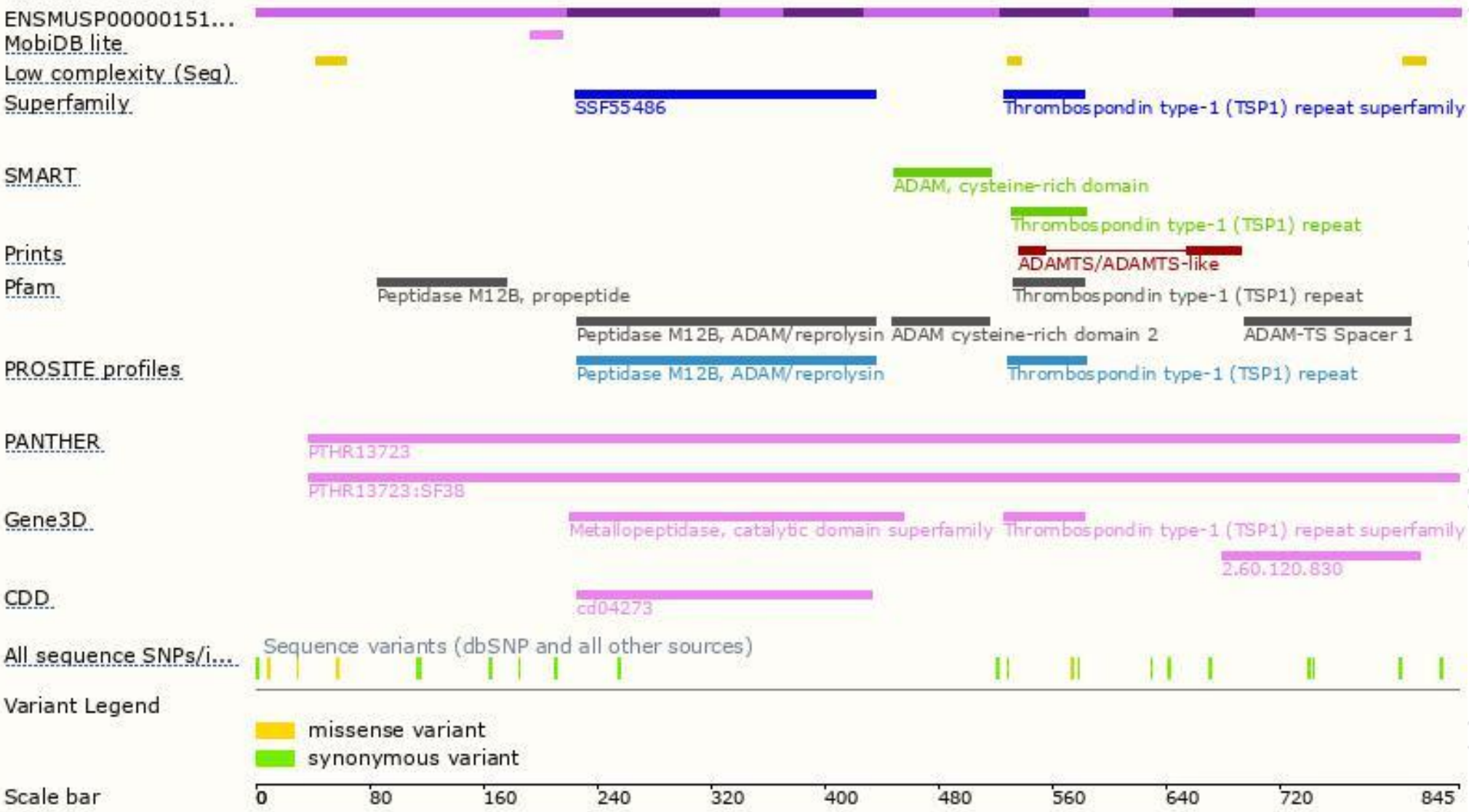
The strategy is based on the design of *Adamts4-203* transcript,The transcription is shown below



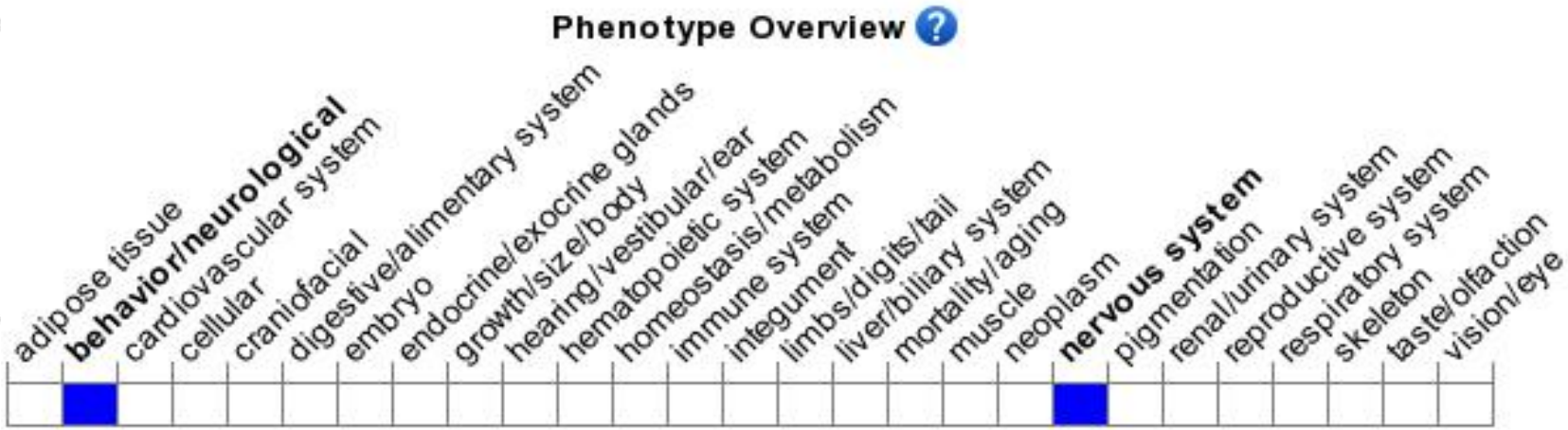
Genomic location distribution



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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