Plxna1 Cas9-CKO Strategy

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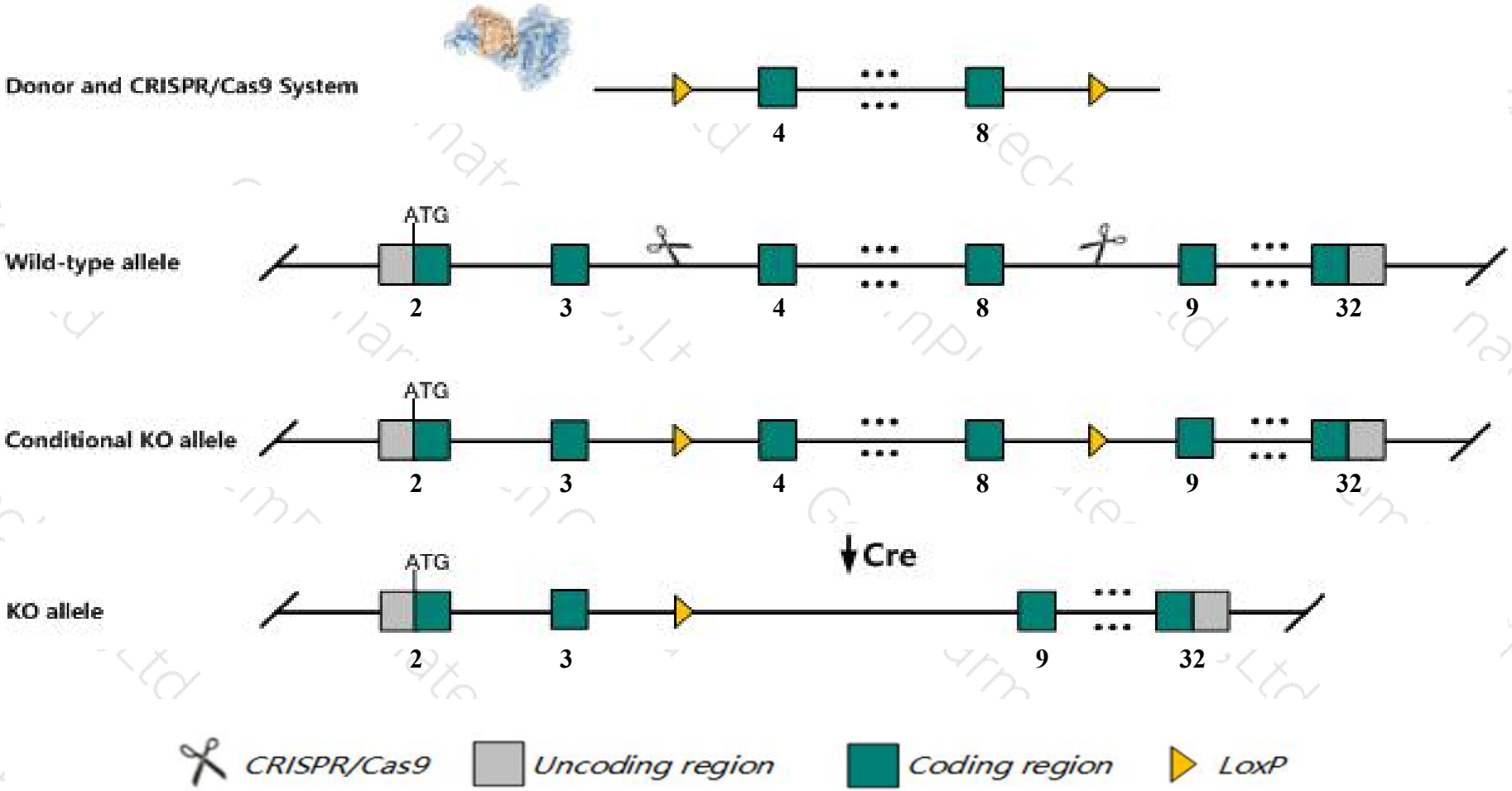
Project Overview

Project Name	***Plxna1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Plxna1* gene. The schematic diagram is as follows:



Technical routes

- The *Plxna1* gene has 6 transcripts. According to the structure of *Plxna1* gene, exon4-exon8 of *Plxna1-202* (ENSMUST00000163139.7) transcript is recommended as the knockout region.The region contains 620bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Plxna1* 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,Mice homozygous for a null allele exhibit bone cellularity abnormalities, altered dendritic cell physiology, abnormal proprioceptive and oligodendrocyte morphology, and increased lymphatic branching complexity and LEC numbers.

- The distance between *Gm44207* and exon4 of *Plxna1* is about 1kb, so the 5-terminal regulation of *Gm44207* may be affected.

- The *Plxna1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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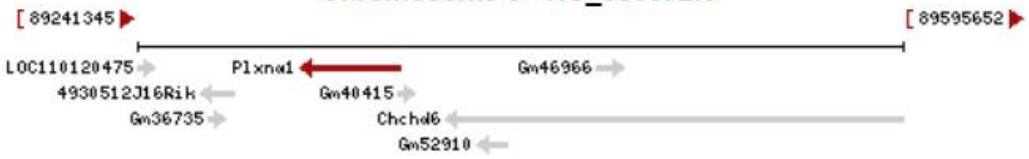
Plxna1 plexin A1 [*Mus musculus* (house mouse)]

Gene ID: 18844, updated on 29-Oct-2019

Summary

Official Symbol	Plxna1 provided by MGI
Official Full Name	plexin A1 provided by MGI
Primary source	MGI:MGI:107685
See related	Ensembl:ENSMUSG00000030084
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	NOV; Plxn1; PlexA1; mKIAA4053; 2600013D04Rik
Expression	Broad expression in lung adult (RPKM 77.1), ovary adult (RPKM 54.3) and 24 other tissues See more
Orthologs	human all

Chromosome 6 - NC_000072.6

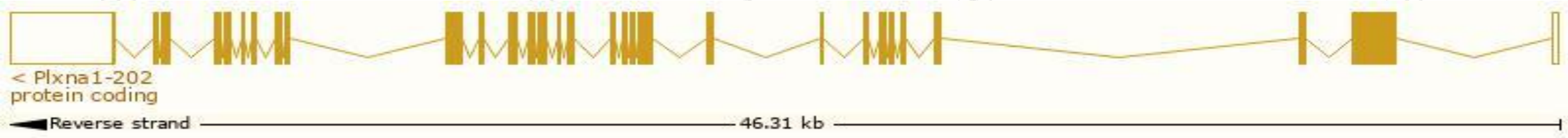


Transcript information（Ensembl）

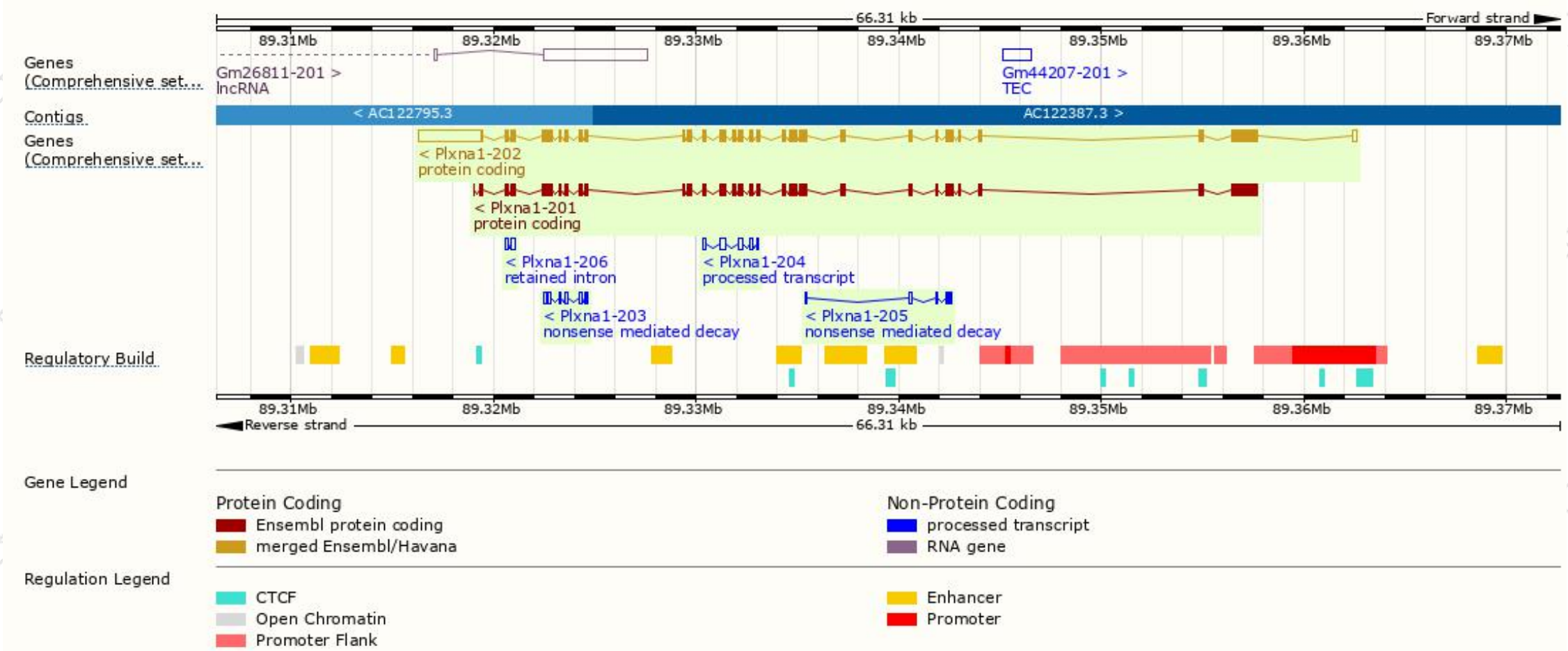
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Plxna1-202	ENSMUST00000163139.7	9034	1894aa	ENSMUSP00000131840.1	Protein coding	CCDS20344	P70206	TSL:1 GENCODE basic APPRIS P1
Plxna1-201	ENSMUST00000049845.5	5810	1894aa	ENSMUSP00000063066.5	Protein coding	CCDS20344	P70206	TSL:1 GENCODE basic APPRIS P1
Plxna1-203	ENSMUST00000204468.1	678	16aa	ENSMUSP00000144822.1	Nonsense mediated decay	-	A0A0N4SUU1	CDS 5' incomplete TSL:3
Plxna1-205	ENSMUST00000205121.1	459	59aa	ENSMUSP00000145403.1	Nonsense mediated decay	-	A0A0N4SW74	CDS 5' incomplete TSL:5
Plxna1-206	ENSMUST00000205230.1	372	No protein	-	Retained intron	-	-	TSL:3
Plxna1-204	ENSMUST00000204997.1	735	No protein	-	lncRNA	-	-	TSL:3

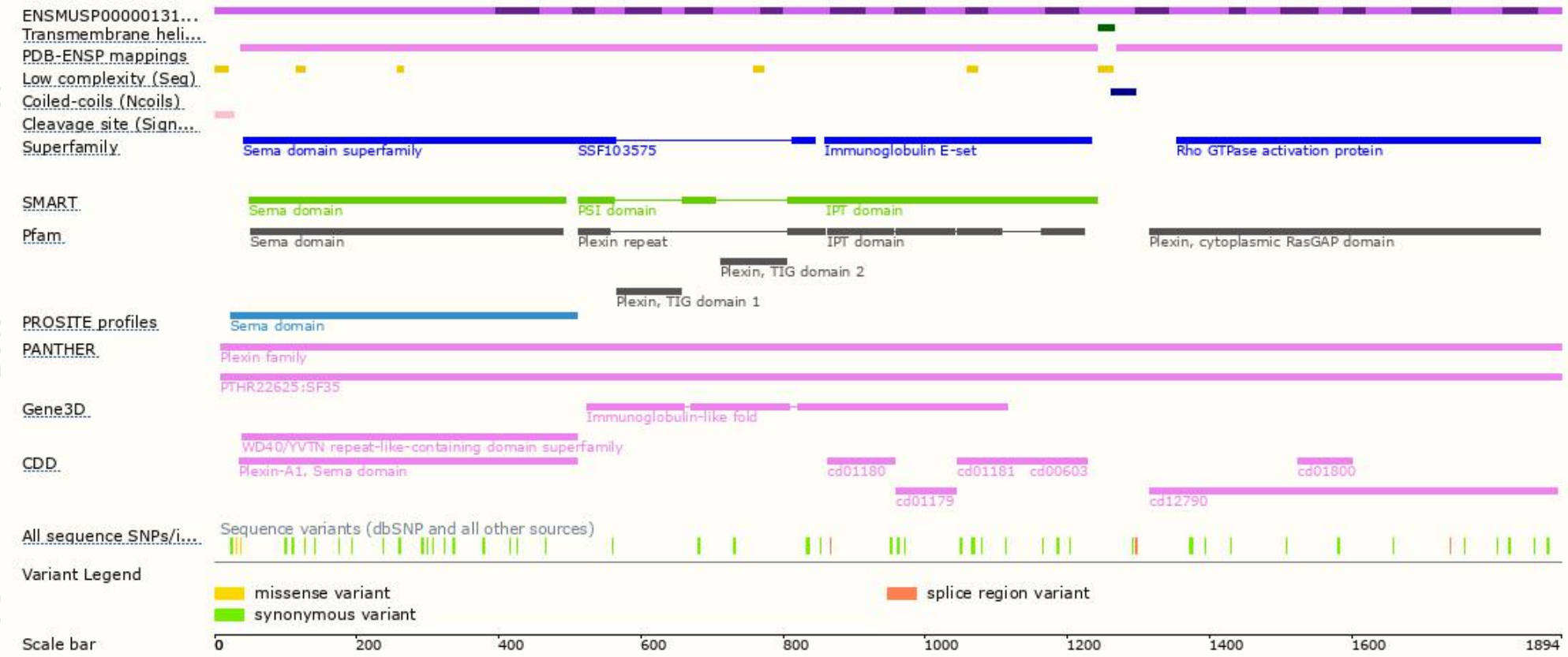
The strategy is based on the design of *Plxna1-202* transcript,The transcription is shown below



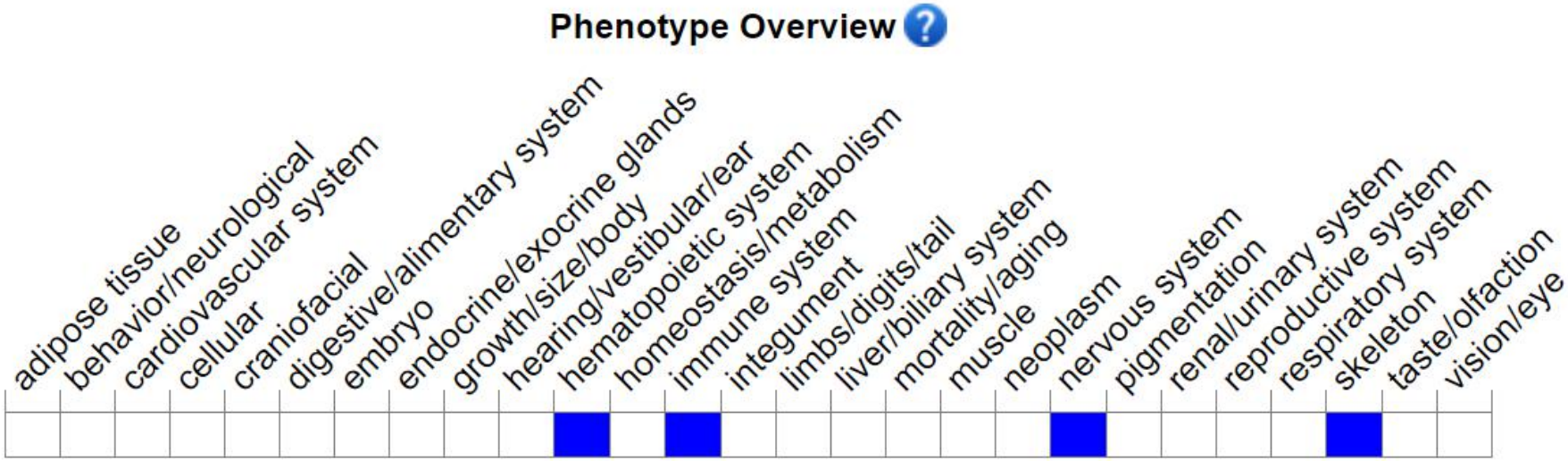
Genomic location distribution



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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