Scn3b Cas9-CKO Strategy

Designer:Xueting Zhang
Reviewer:Yanhua Shen
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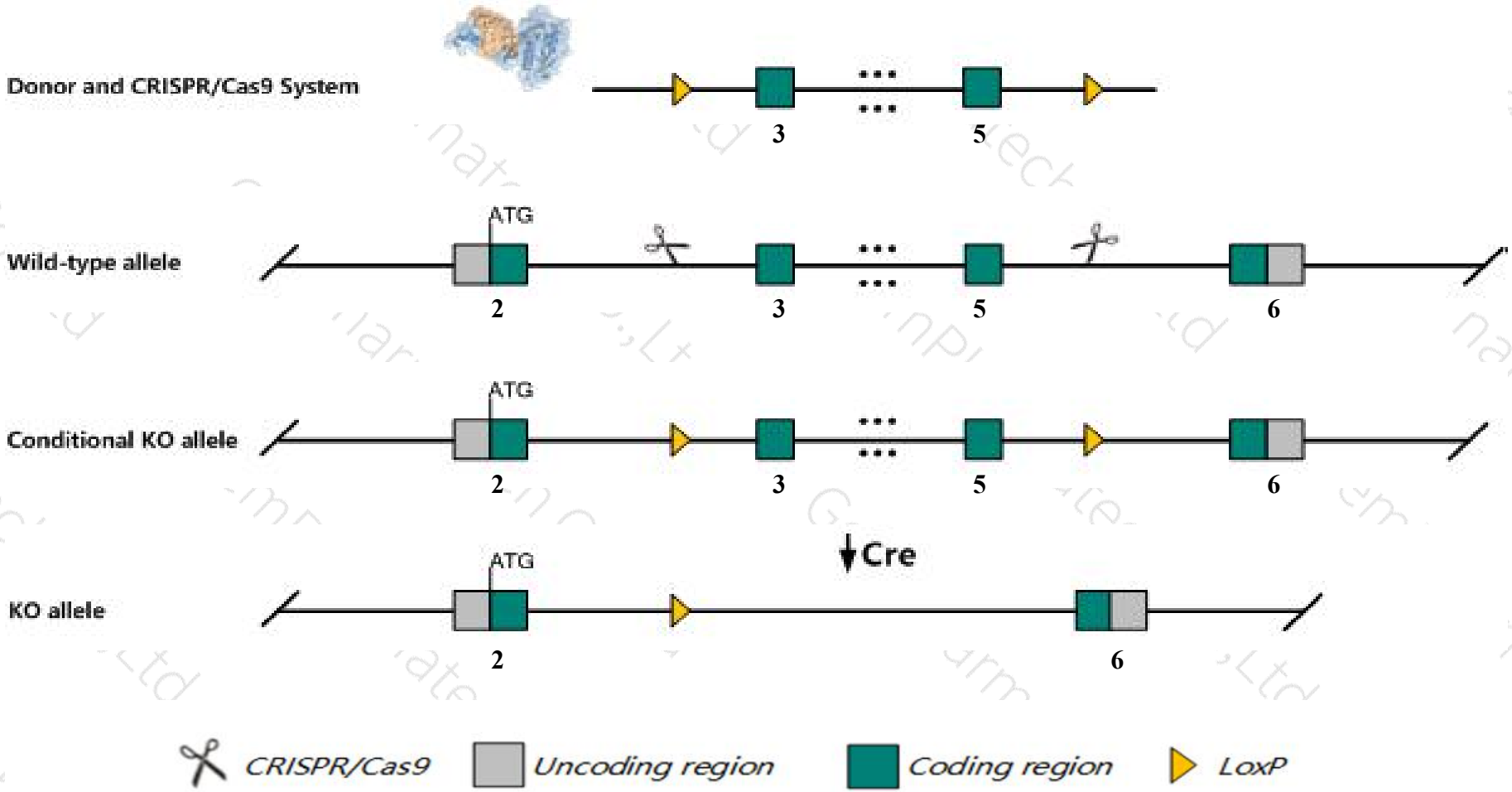
Project Overview

Project Name	***Scn3b***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Scn3b* gene. The schematic diagram is as follows:



Technical routes

- The *Scn3b* gene has 9 transcripts. According to the structure of *Scn3b* gene, exon3-exon5 of *Scn3b-201* (ENSMUST00000049941.11) transcript is recommended as the knockout region.The region contains 529bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Scn3b* 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 knock-out allele exhibit a ventricular arrhythmogenic phenotype with abnormal heart electrocardiography waveform features and sodium channel function.
- The floxed region is near to the N-terminal of *Gm47266* gene,this strategy may influence the regulatory function of the N-terminal of *Gm47266* gene.
- The effect on transcript *Scn3b*-207&209 is unknown.
- The *Scn3b* gene is located on the Chr9. 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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Scn3b sodium channel, voltage-gated, type III, beta [*Mus musculus* (house mouse)]

Gene ID: 235281, updated on 24-Oct-2019

Summary

Official Symbol	Scn3b provided by MGI
Official Full Name	sodium channel, voltage-gated, type III, beta provided by MGI
Primary source	MGI:MGI:1918882
See related	Ensembl:ENSMUSG00000049281
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	Scnb3; 1110001K16Rik; 4833414B02Rik
Expression	Biased expression in CNS E18 (RPKM 43.1), whole brain E14.5 (RPKM 26.9) and 7 other tissues See more
Orthologs	human all

Genomic context

Location: 9; 9 A5.1

See Scn3b in Genome Data Viewer

Exon count: 6

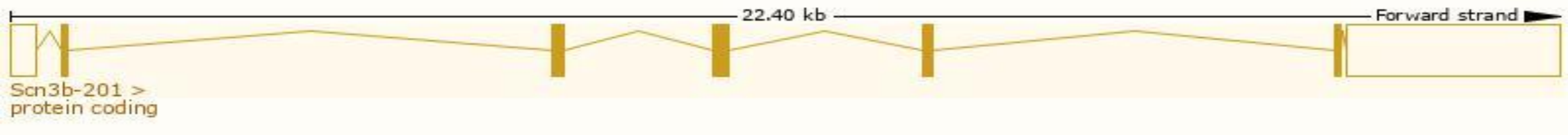
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	9	NC_000075.6 (40269216..40291618)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	9	NC_000075.5 (40076801..40099203)

Transcript information（Ensembl）

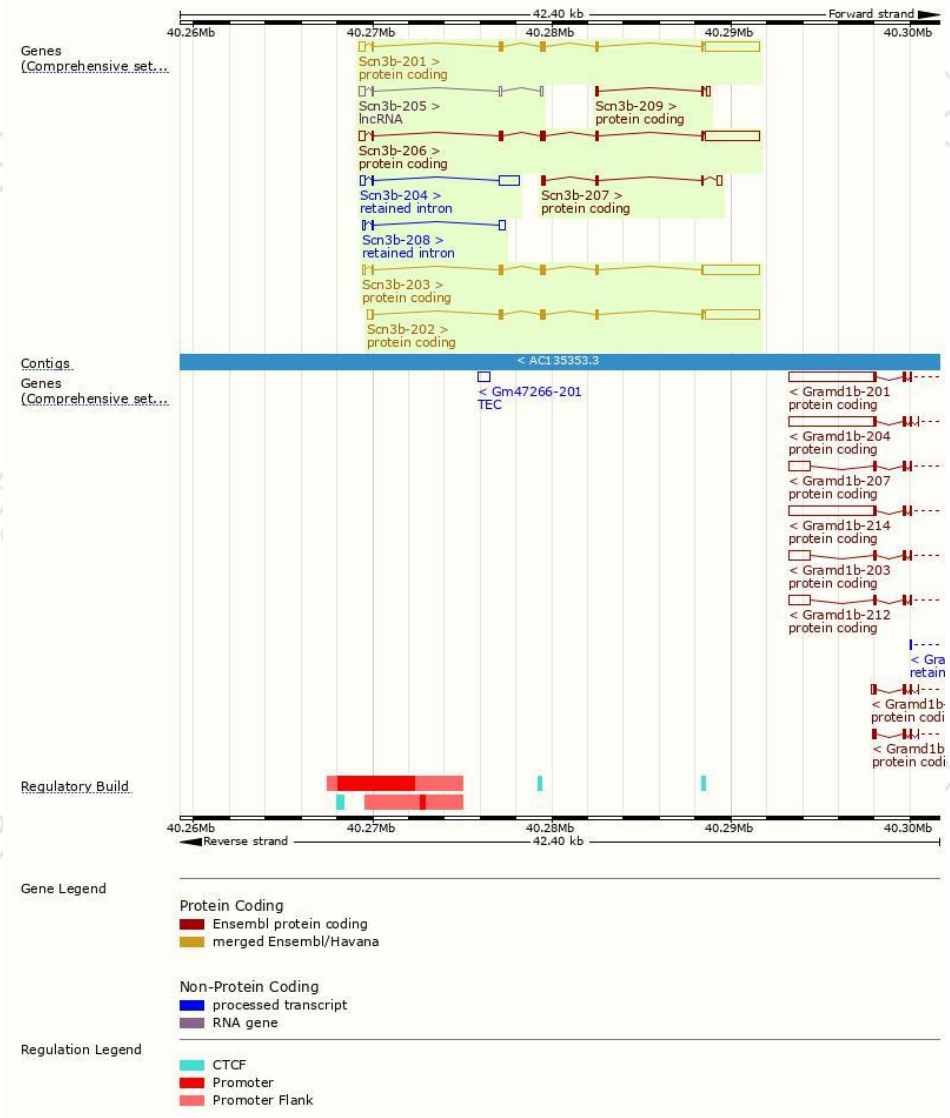
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Scn3b-201	ENSMUST00000049941.11	4150	215aa	Protein coding	CCDS23080	Q0P666 Q8BHK2	TSL:1 GENCODE basic APPRIS P1
Scn3b-206	ENSMUST00000176185.7	4090	175aa	Protein coding	CCDS72214	H3BJR6	TSL:1 GENCODE basic
Scn3b-202	ENSMUST00000114956.10	4045	215aa	Protein coding	CCDS23080	Q0P666 Q8BHK2	TSL:1 GENCODE basic APPRIS P1
Scn3b-203	ENSMUST00000171835.8	4024	215aa	Protein coding	CCDS23080	Q0P666 Q8BHK2	TSL:1 GENCODE basic APPRIS P1
Scn3b-207	ENSMUST00000176547.1	672	120aa	Protein coding	-	H3BKP5	CDS 5' incomplete TSL:3
Scn3b-209	ENSMUST00000216398.1	385	57aa	Protein coding	-	A0A1L1SRT9	CDS 5' incomplete TSL:2
Scn3b-204	ENSMUST00000175873.7	1507	No protein	Retained intron	-	-	TSL:1
Scn3b-208	ENSMUST00000176634.1	600	No protein	Retained intron	-	-	TSL:2
Scn3b-205	ENSMUST00000176169.7	704	No protein	lncRNA	-	-	TSL:3

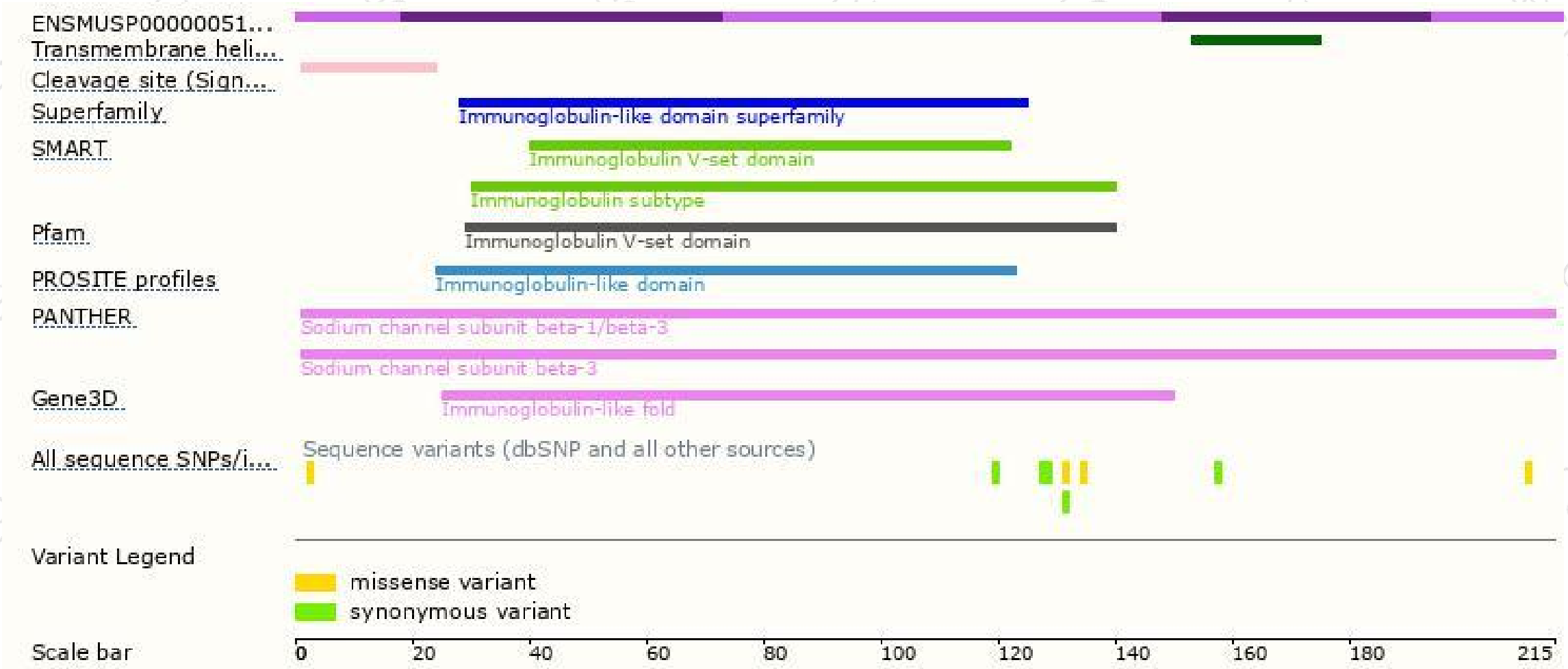
The strategy is based on the design of *Scn3b-201* transcript,The transcription is shown below



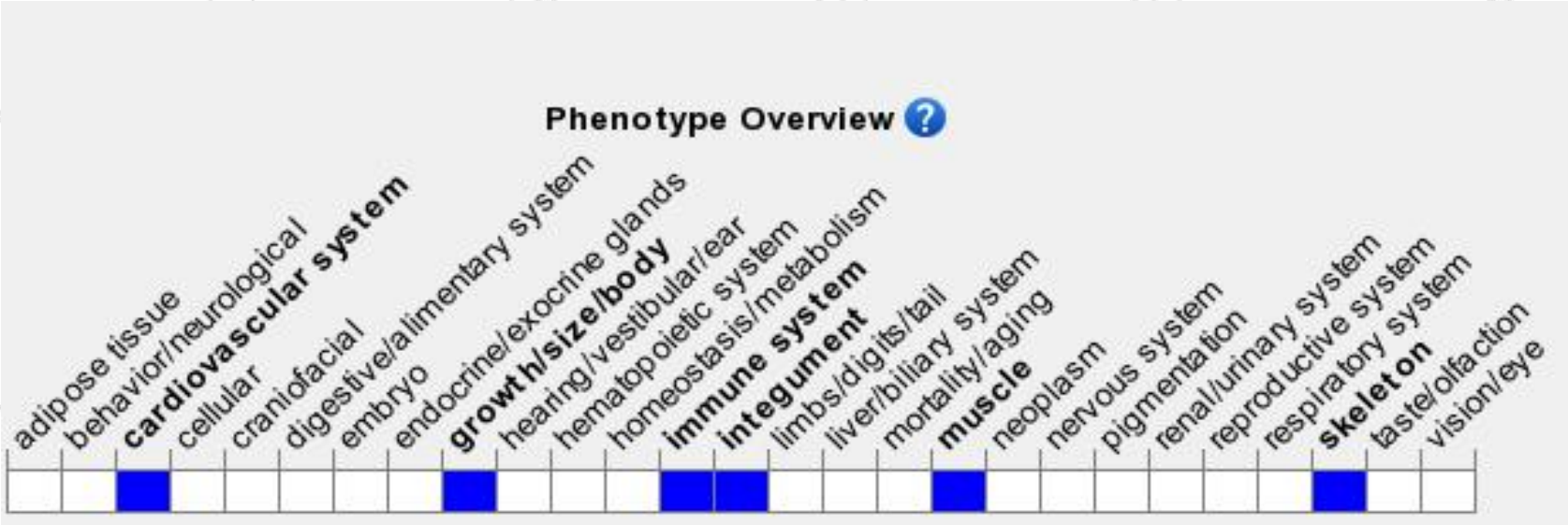
Genomic location distribution



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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集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd