

Sema6c Cas9-CKO Strategy

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-02-07

Project Overview

Project Name

Sema6c

Project type

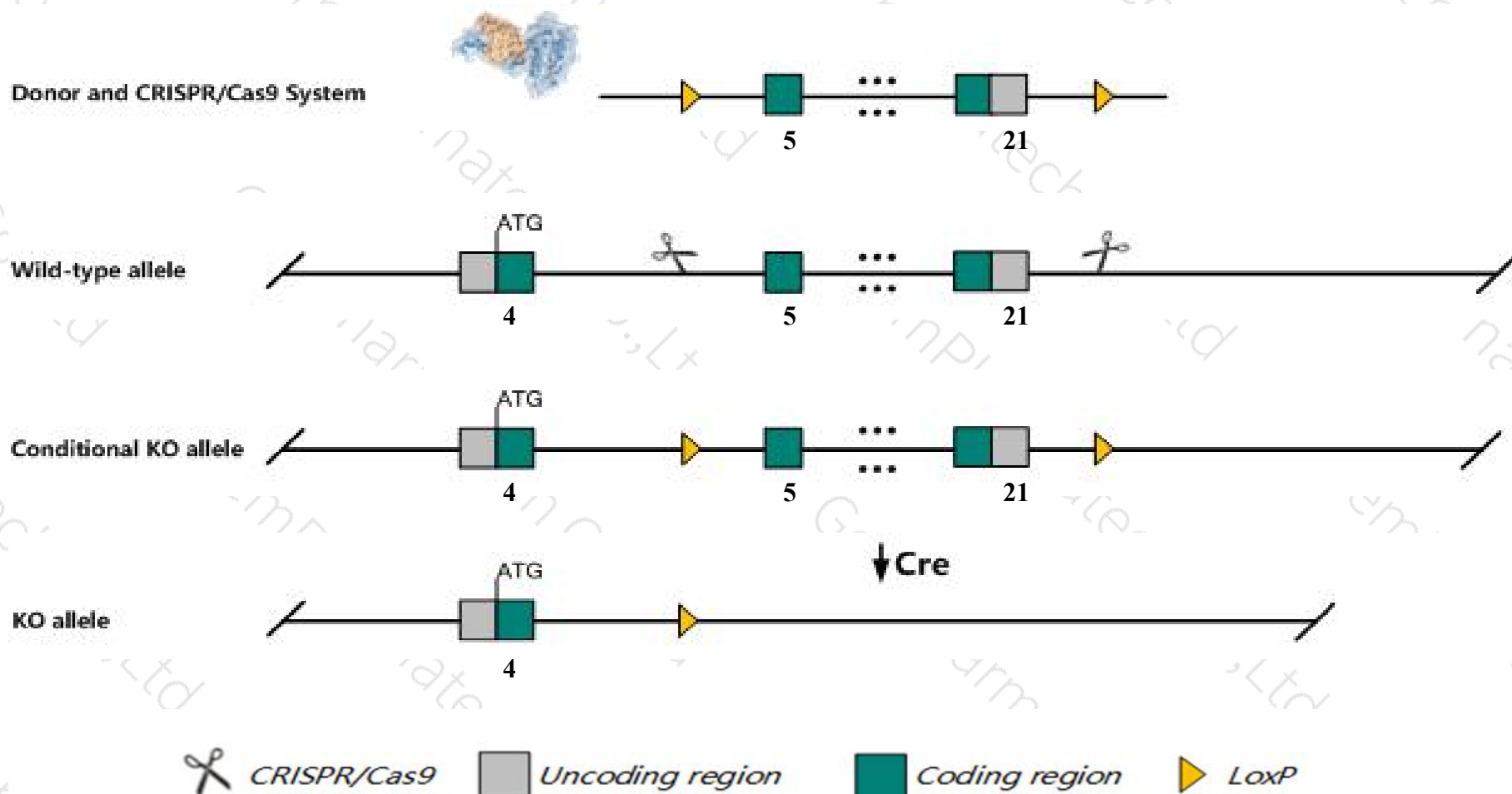
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sema6c* gene. The schematic diagram is as follows:



Technical routes

- The *Sema6c* gene has 15 transcripts. According to the structure of *Sema6c* gene, exon5-exon21 of *Sema6c*-202 (ENSMUST00000090823.7) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sema6c* 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, Mice homozygous for a targeted mutation display a decrease in pain threshold.
- Transcript *Sema6c*-206&211 may not be affected.
- The *Sema6c* gene is located on the Chr3. 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)



Sema6c sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6C [*Mus musculus* (house mouse)]

Gene ID: 20360, updated on 10-Oct-2019

Summary

- Official Symbol** Sema6c provided by MGI
- Official Full Name** sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6C provided by MGI
- Primary source** MGI:MGI:1338032
- See related** Ensembl:ENSMUSG00000038777
- 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** Semay; mKIAA1869
- Expression** Broad expression in whole brain E14.5 (RPKM 28.2), CNS E14 (RPKM 23.1) and 18 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 3; 3 F2.1 See Sema6c in [Genome Data Viewer](#)

Exon count: 22

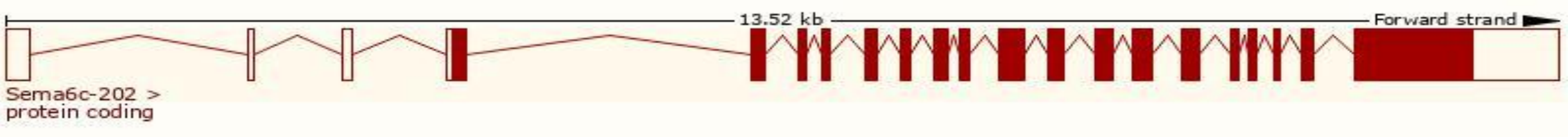
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	3	NC_000069.6 (95160420..95174050)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	3	NC_000069.5 (94968296..94977238)

Transcript information (Ensembl)

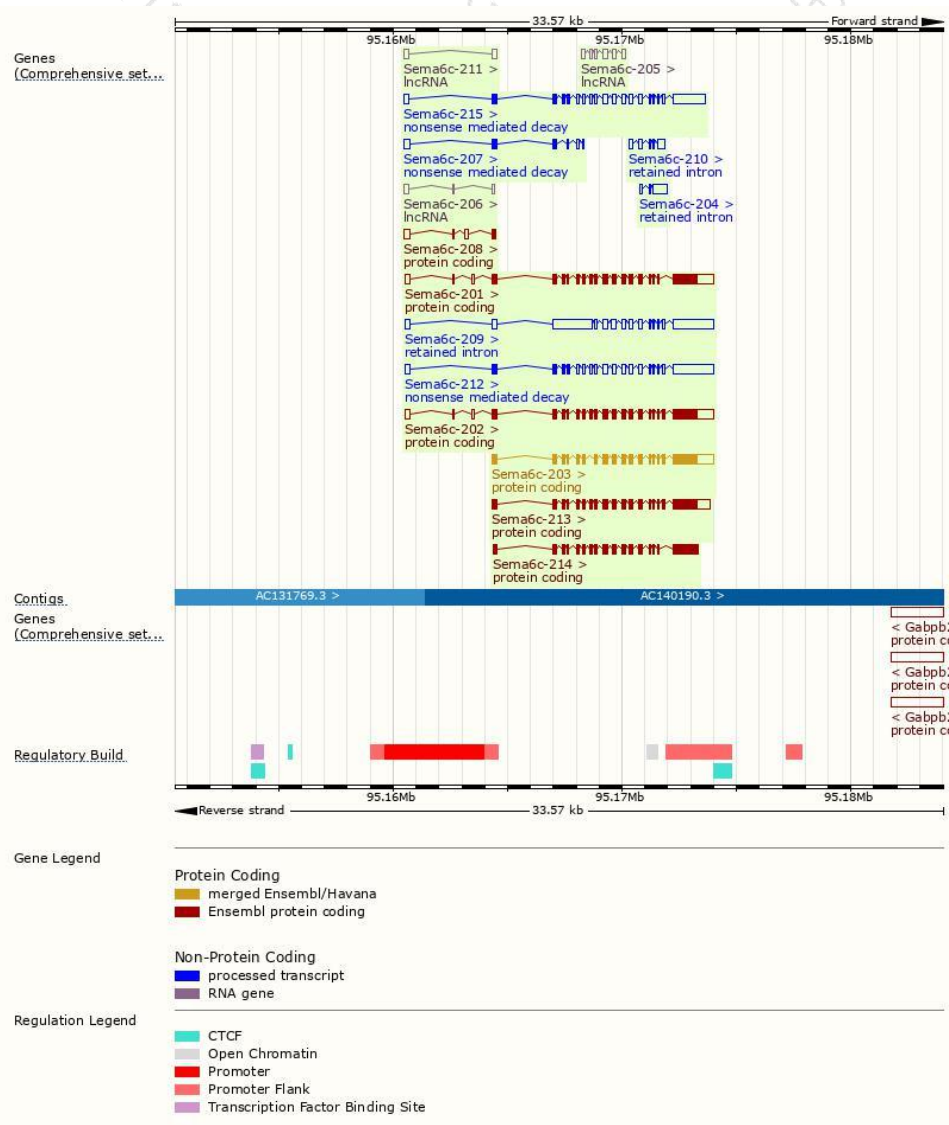
The gene has 15 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sema6c-202	ENSMUST00000090823.7	4029	963aa	Protein coding	CCDS71289	E9Q613	TSL:1 GENCODE basic APPRIS ALT2
Sema6c-201	ENSMUST00000090821.9	3933	931aa	Protein coding	CCDS17604	Q9WTM3	TSL:5 GENCODE basic APPRIS P3
Sema6c-213	ENSMUST00000168321.7	3553	963aa	Protein coding	CCDS71289	E9Q613	TSL:1 GENCODE basic APPRIS ALT2
Sema6c-214	ENSMUST00000202315.2	2843	931aa	Protein coding	CCDS17604	Q9WTM3	TSL:1 GENCODE basic APPRIS P3
Sema6c-203	ENSMUST00000107217.5	3595	923aa	Protein coding	-	G5E8N4	TSL:1 GENCODE basic
Sema6c-208	ENSMUST00000131742.7	549	29aa	Protein coding	-	A0A0G2JDV7	CDS 3' incomplete TSL:2
Sema6c-212	ENSMUST00000142449.8	3936	124aa	Nonsense mediated decay	-	E9Q4N1	TSL:1
Sema6c-215	ENSMUST00000204709.2	3562	124aa	Nonsense mediated decay	-	E9Q4N1	TSL:1
Sema6c-207	ENSMUST00000131620.7	716	80aa	Nonsense mediated decay	-	S4R1B4	TSL:5
Sema6c-209	ENSMUST00000134125.7	5095	No protein	Retained intron	-	-	TSL:2
Sema6c-204	ENSMUST00000126597.1	814	No protein	Retained intron	-	-	TSL:3
Sema6c-210	ENSMUST00000141607.7	788	No protein	Retained intron	-	-	TSL:3
Sema6c-205	ENSMUST00000130662.1	890	No protein	lncRNA	-	-	TSL:2
Sema6c-211	ENSMUST00000142306.1	450	No protein	lncRNA	-	-	TSL:2
Sema6c-206	ENSMUST00000130814.7	347	No protein	lncRNA	-	-	TSL:2

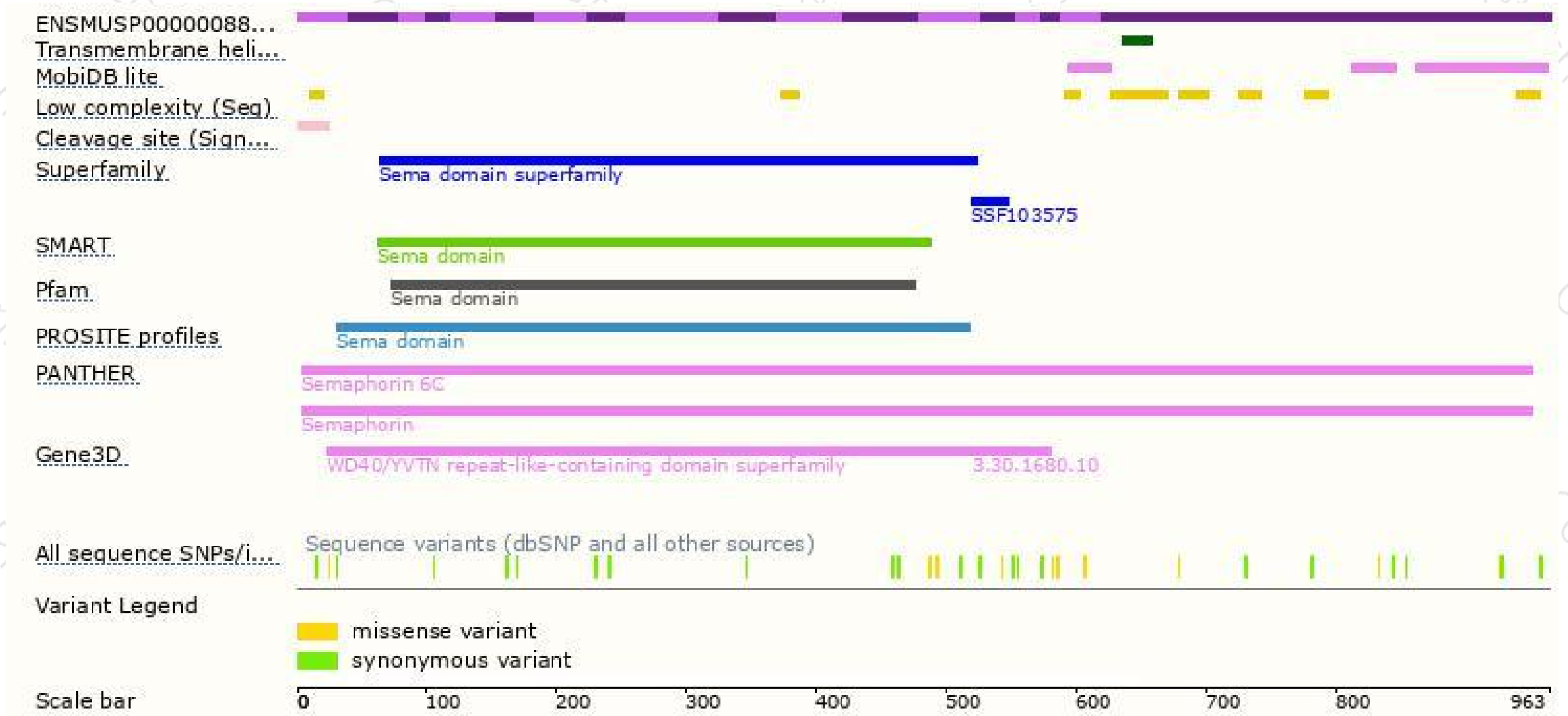
The strategy is based on the design of *Sema6c-202* transcript,The transcription is shown below



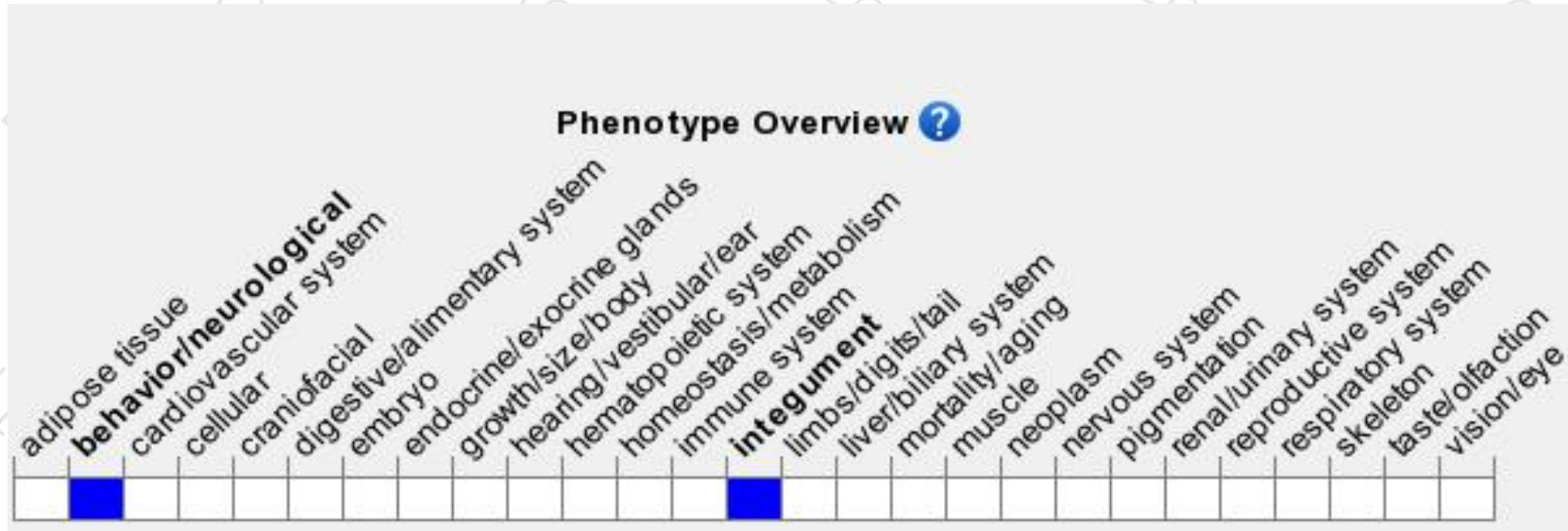
Genomic location distribution



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/>).

According to the existing MGI data, Mice homozygous for a targeted mutation display a decrease in pain threshold.

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

Tel: 400-9660890

