

Sema3d Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Sema3d

Project type

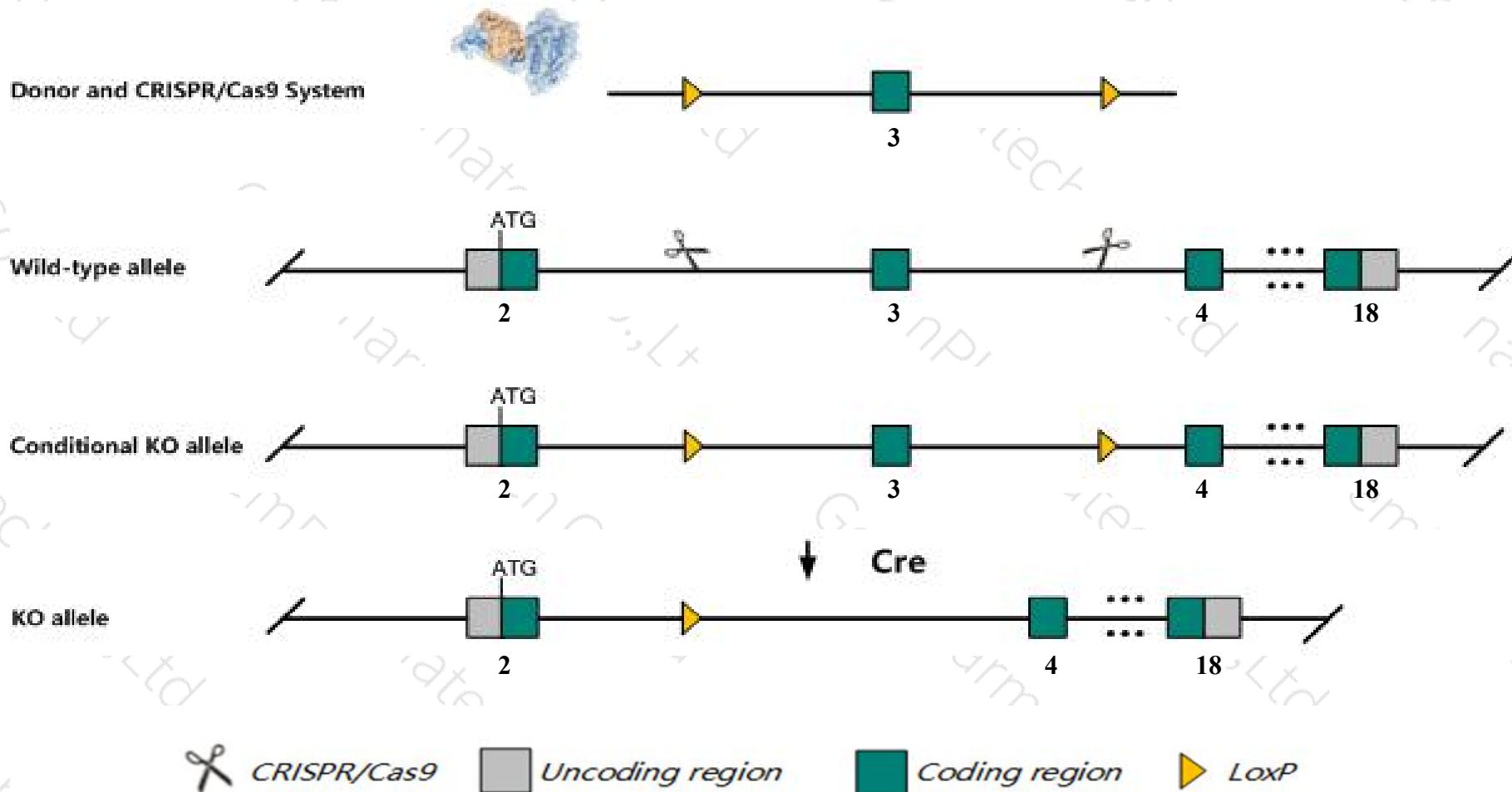
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sema3d* gene. The schematic diagram is as follows:



Technical routes

- The *Sema3d* gene has 5 transcripts. According to the structure of *Sema3d* gene, exon3 of *Sema3d-201* (ENSMUST00000030868.10) transcript is recommended as the knockout region. The region contains 161bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sema3d* 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 knock-out allele exhibit pulmonary vein connection to the right atrium and atrial septal defect.
- The *Sema3d* gene is located on the Chr5. 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)

Sema3d sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D [*Mus musculus* (house mouse)]

Gene ID: 108151, updated on 12-Aug-2019

Summary



Official Symbol Sema3d provided by [MGI](#)

Official Full Name sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3D provided by [MGI](#)

Primary source [MGI:MGI:1860118](#)

See related [Ensembl:ENSMUSG00000040254](#)

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 4631426B19Rik

Expression Broad expression in limb E14.5 (RPKM 4.3), bladder adult (RPKM 3.0) and 18 other tissues [See more](#)

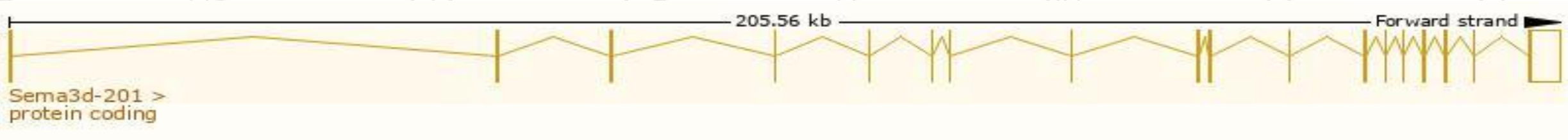
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

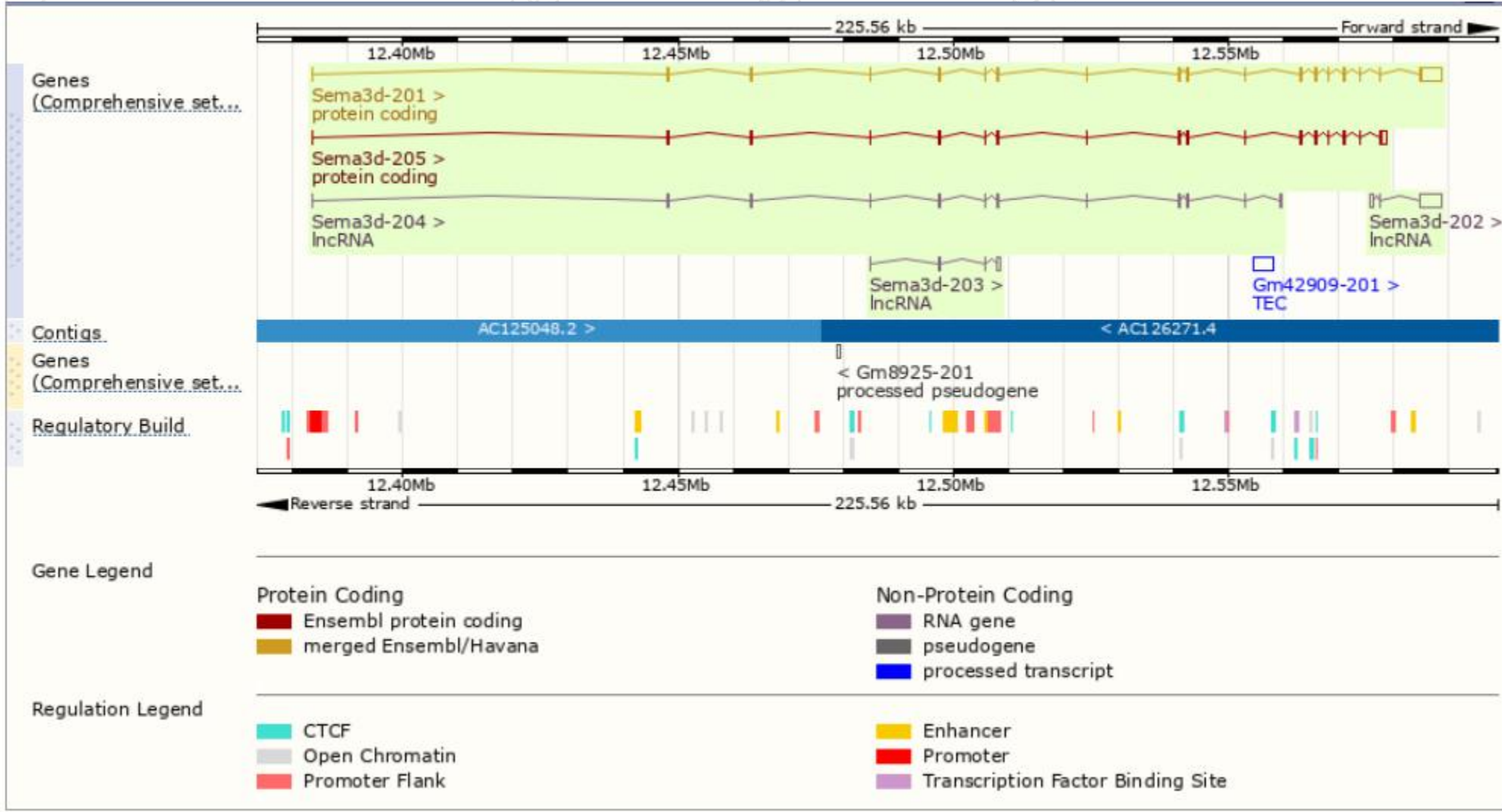
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sema3d-201	ENSMUST00000030868.10	6307	777aa	Protein coding	CCDS39013	Q8BH34	TSL:1 GENCODE basic APPRIS P1
Sema3d-205	ENSMUST00000197927.1	3207	660aa	Protein coding	-	A0A0G2JDP8	TSL:1 GENCODE basic
Sema3d-202	ENSMUST00000195923.1	4498	No protein	lncRNA	-	-	TSL:1
Sema3d-204	ENSMUST00000196618.4	1808	No protein	lncRNA	-	-	TSL:1
Sema3d-203	ENSMUST00000196093.1	708	No protein	lncRNA	-	-	TSL:5

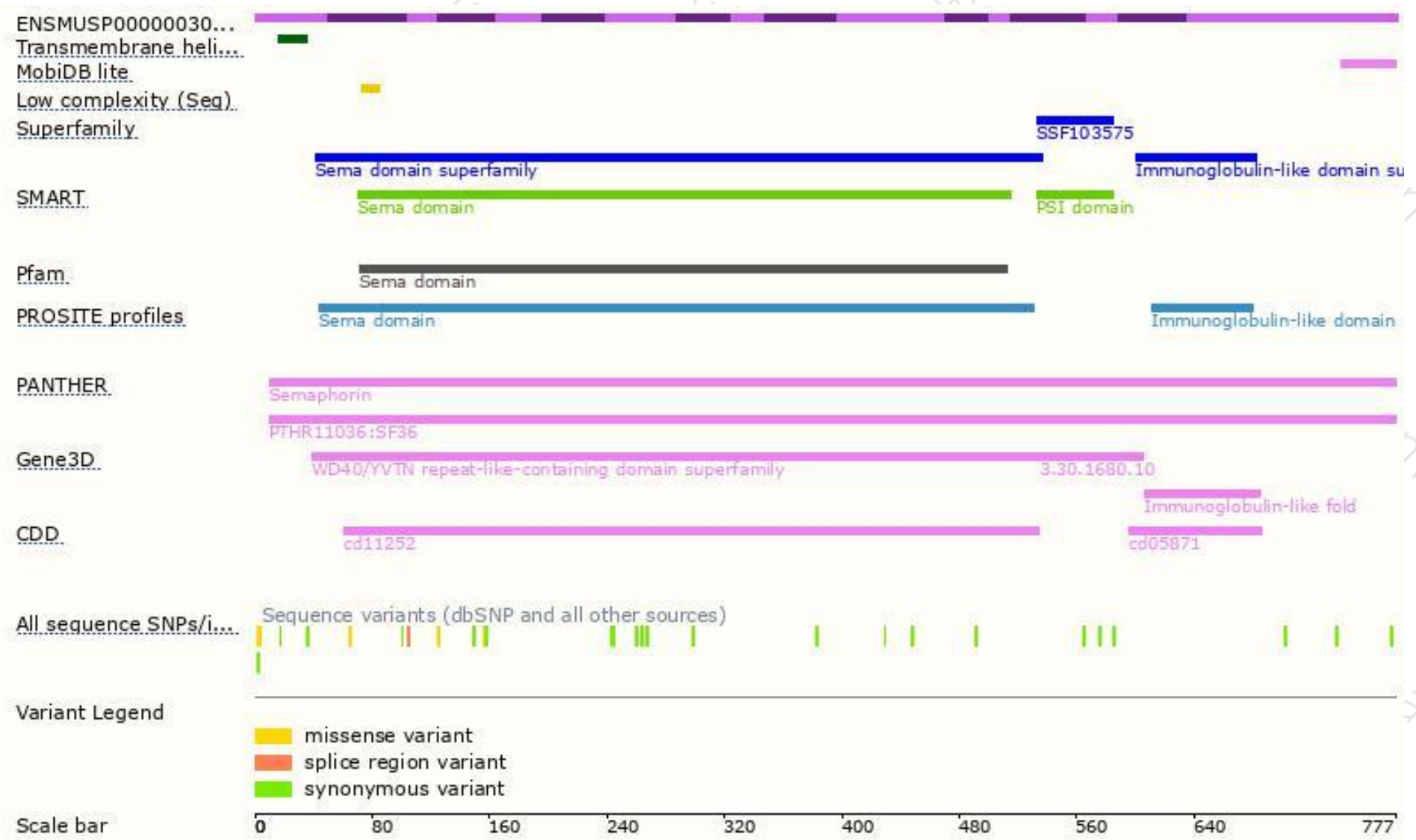
The strategy is based on the design of *Sema3d-201* transcript,The transcription is shown below



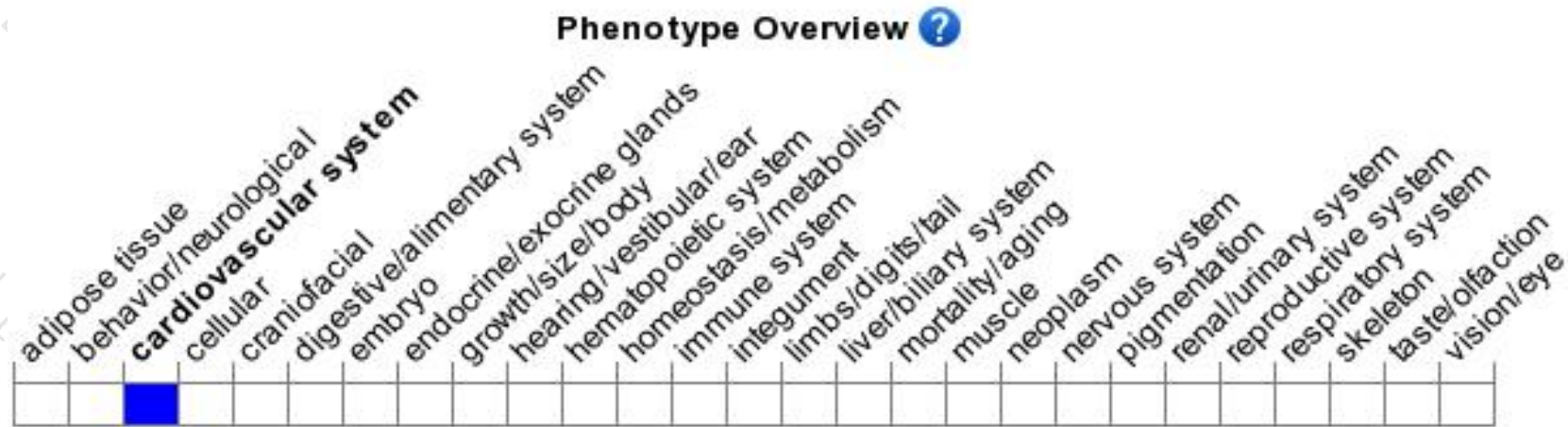
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit pulmonary vein connection to the right atrium and atrial septal defect.

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

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