

Plcg1 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Plcg1

Project type

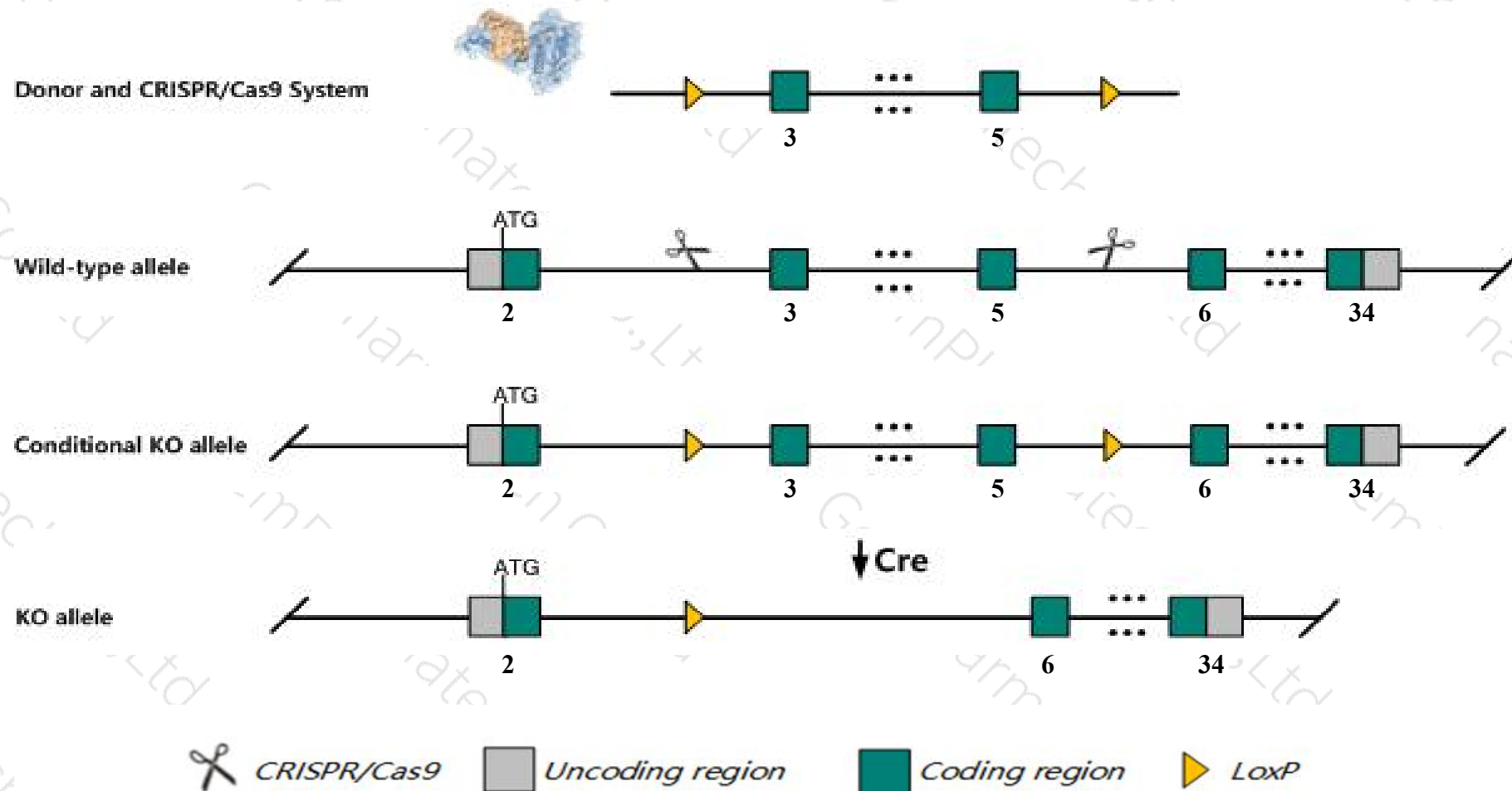
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Plcg1* gene. The schematic diagram is as follows:



Technical routes

- The *Plcg1* gene has 12 transcripts. According to the structure of *Plcg1* gene, exon3-exon5 of *Plcg1*-202 (ENSMUST00000103115.7) transcript is recommended as the knockout region. The region contains 295bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Plcg1* 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 early embryonic lethality associated with arrested growth and/or abnormal hematopoiesis.
- *Gm27206* is overlapped with *Plcg1*, so *Gm27206* will be knockout together.
- The *Plcg1* gene is located on the Chr2. 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)

Plcg1 phospholipase C, gamma 1 [*Mus musculus* (house mouse)]

Gene ID: 18803, updated on 17-Dec-2019

Summary

Official Symbol

Plcg1 provided by [MGI](#)

Official Full Name

phospholipase C, gamma 1 provided by [MGI](#)

Primary source

[MGI: MGI:97615](#)

See related

[Ensembl: ENSMUSG00000016933](#)

Gene type

protein coding

RefSeq status

PROVISIONAL

Organism

[Mus musculus](#)

Lineage

Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as

Cded; Plc-1; Plcg-1; AI894140; Plc-gamma1

Expression

Ubiquitous expression in thymus adult (RPKM 43.6), CNS E14 (RPKM 34.2) and 27 other tissues [See more](#)

Orthologs

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

Genomic context

Location:

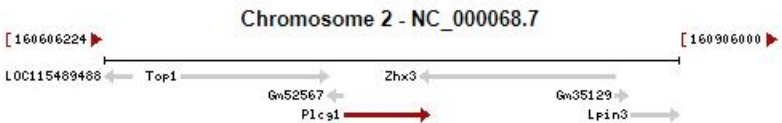
2 H2; 2 80.97 cM

See Plcg1 in [Genome Data Viewer](#)

Exon count:

34

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	2	NC_000068.7 (160731310..160775760)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	2	NC_000068.6 (160557046..160601496)

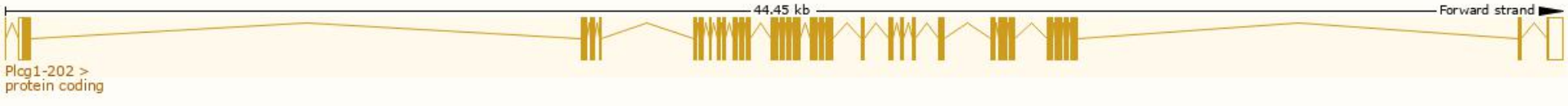


Transcript information (Ensembl)

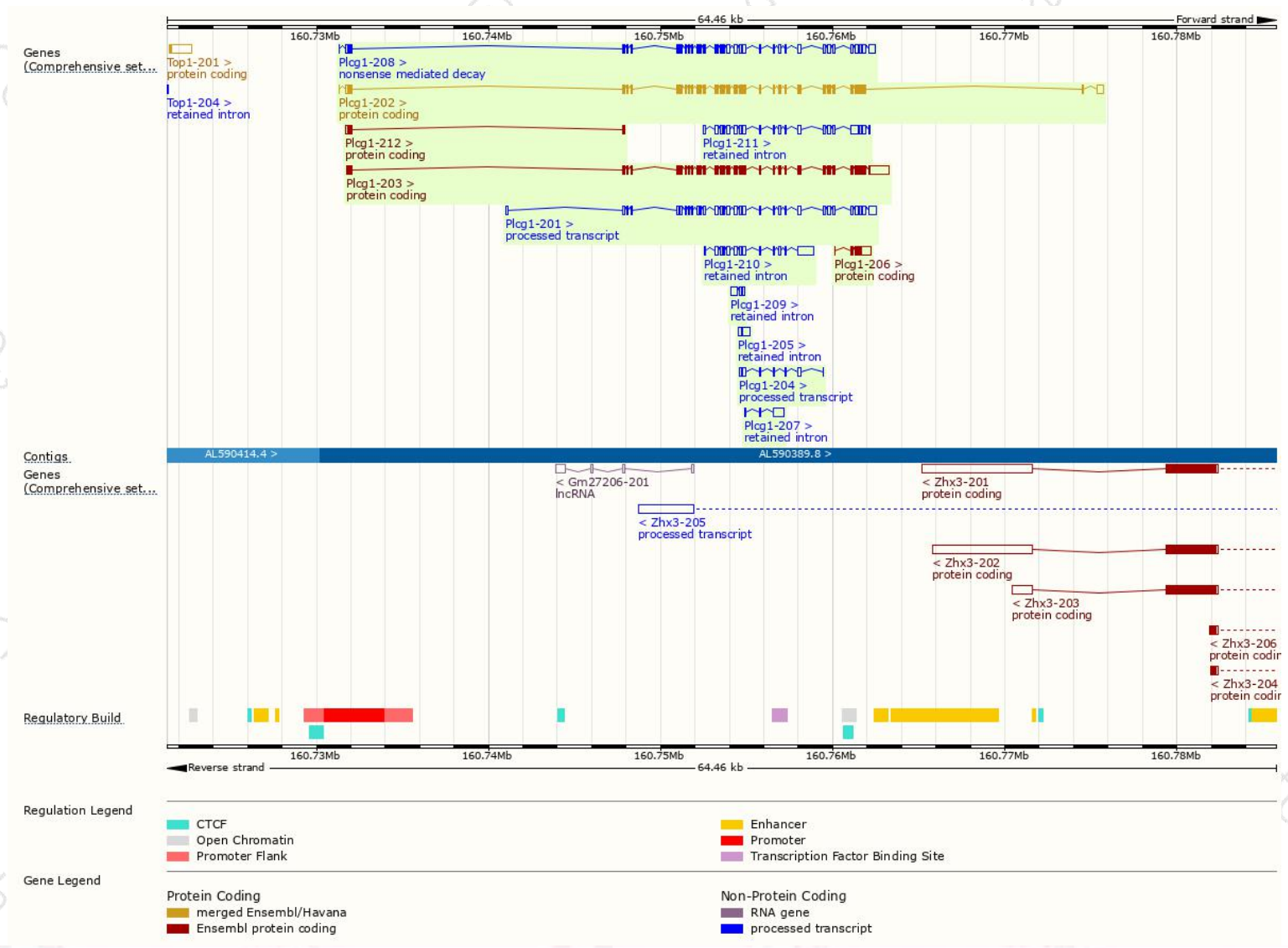
The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Plcg1-202	ENSMUST00000103115.7	4435	1302aa	Protein coding	CCDS16996	Q62077	TSL:1 Gencode basic
Plcg1-203	ENSMUST00000109462.7	5107	1290aa	Protein coding	-	A2A4A6	TSL:5 Gencode basic APPRIS P1
Plcg1-206	ENSMUST00000143997.1	949	132aa	Protein coding	-	F6SLL0	CDS 5' incomplete TSL:3
Plcg1-212	ENSMUST00000174885.1	449	110aa	Protein coding	-	G3V016	CDS 3' incomplete TSL:2
Plcg1-208	ENSMUST00000151590.7	4388	513aa	Nonsense mediated decay	-	G3UXP4	TSL:1
Plcg1-201	ENSMUST00000017077.13	4180	No protein	Processed transcript	-	-	TSL:1
Plcg1-204	ENSMUST00000124652.7	727	No protein	Processed transcript	-	-	TSL:5
Plcg1-211	ENSMUST00000173791.7	2876	No protein	Retained intron	-	-	TSL:5
Plcg1-210	ENSMUST00000173335.7	2392	No protein	Retained intron	-	-	TSL:1
Plcg1-207	ENSMUST00000147254.1	721	No protein	Retained intron	-	-	TSL:5
Plcg1-209	ENSMUST00000173061.1	643	No protein	Retained intron	-	-	TSL:2
Plcg1-205	ENSMUST00000129568.1	545	No protein	Retained intron	-	-	TSL:3

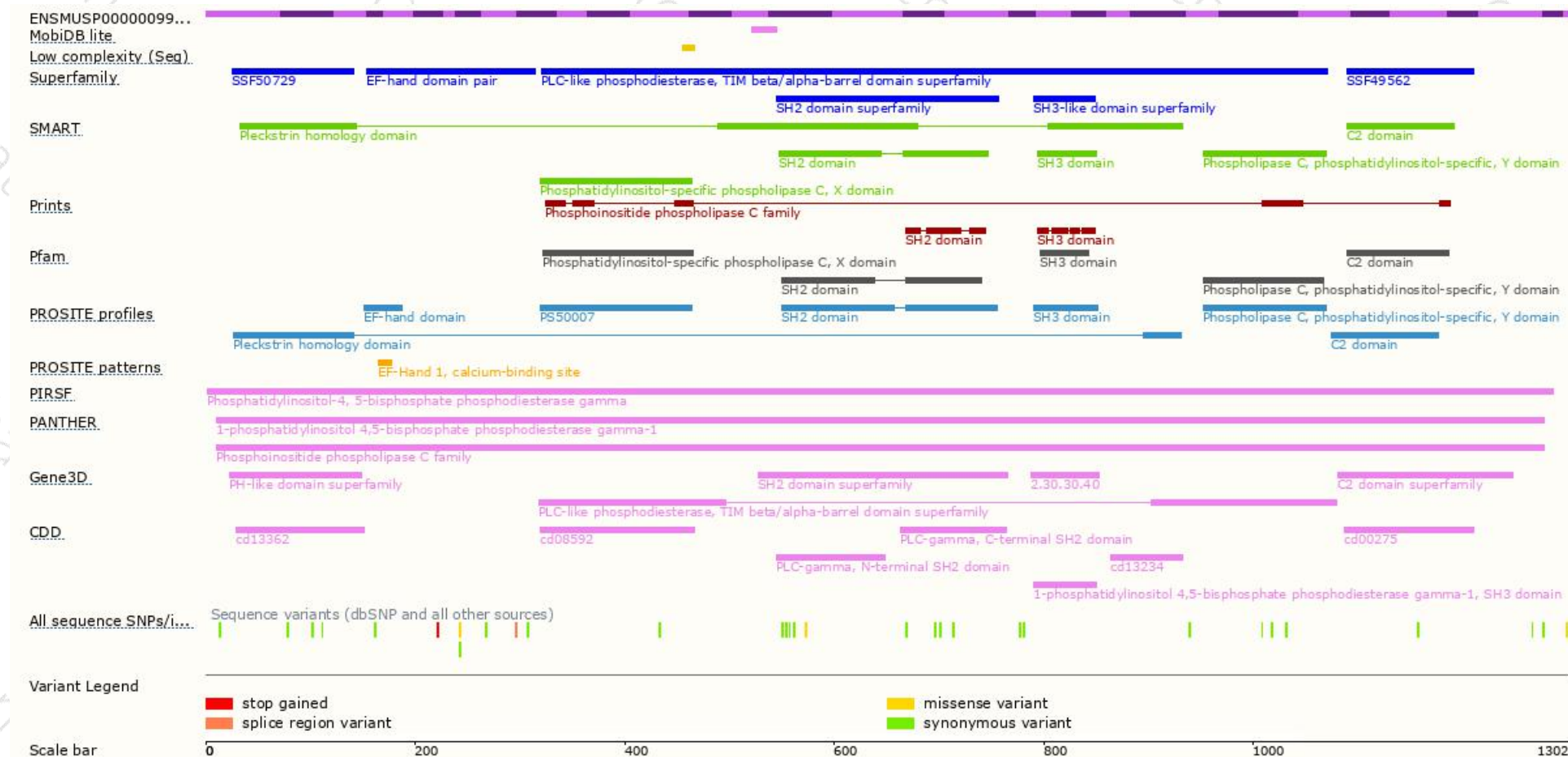
The strategy is based on the design of *Plcg1-202* transcript,The transcription is shown below



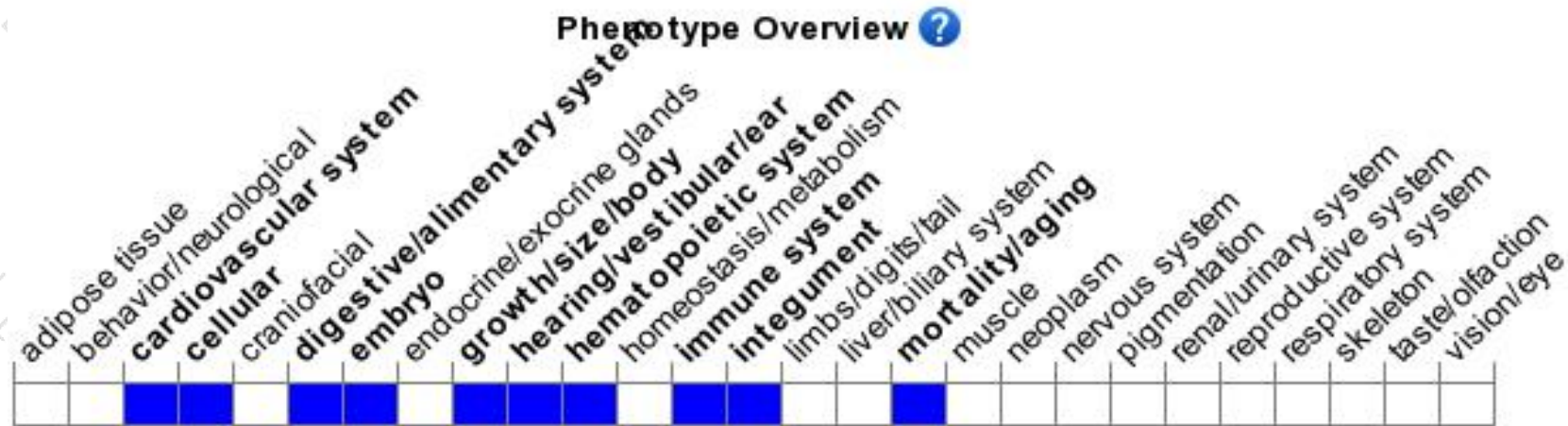
Genomic location distribution



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 knock-out allele exhibit early embryonic lethality associated with arrested growth and/or abnormal hematopoiesis.

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

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