

Rb1cc1 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Rb1cc1

Project type

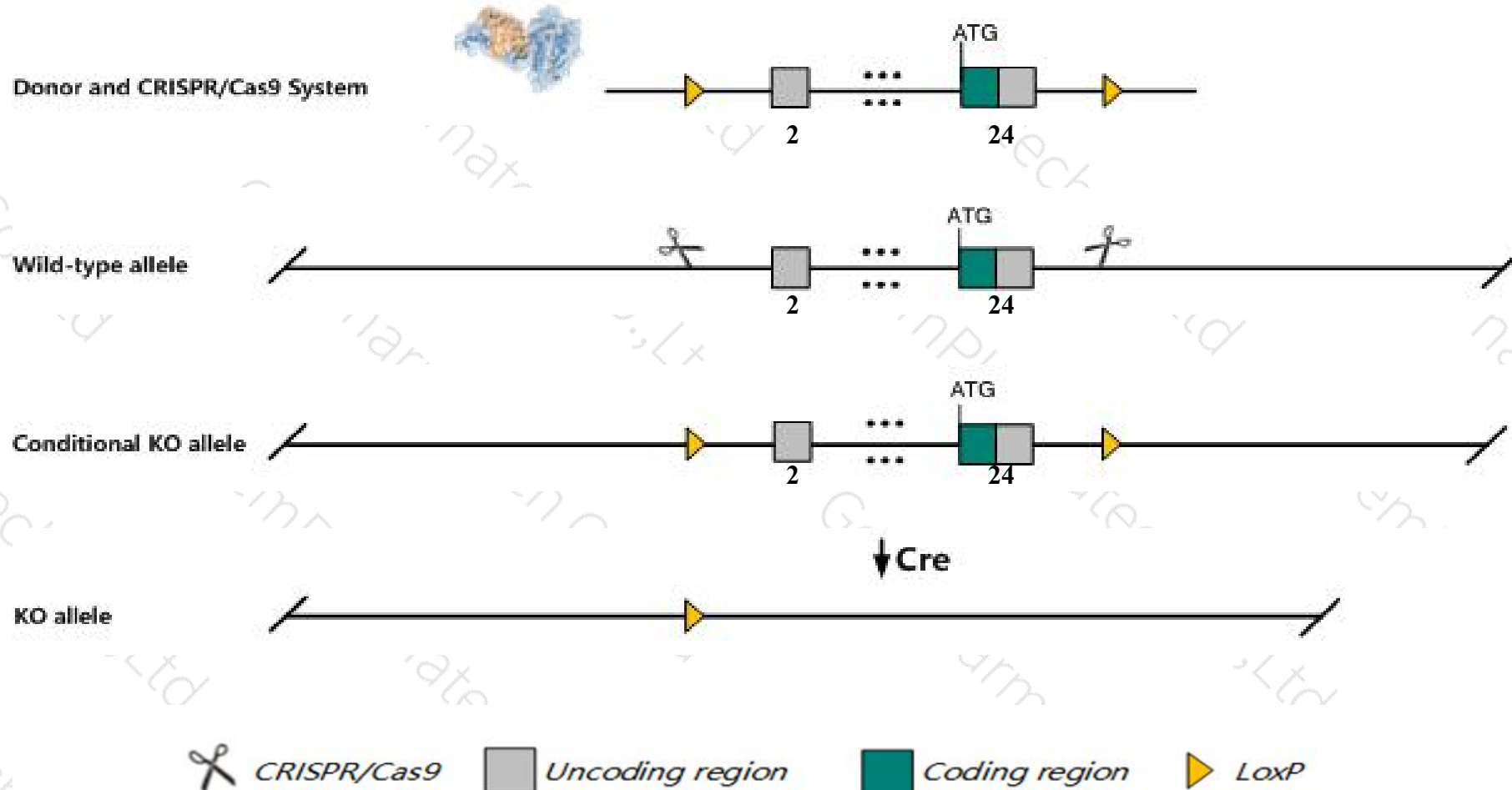
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rblcc1* gene. The schematic diagram is as follows:



- The *Rblcc1* gene has 16 transcripts. According to the structure of *Rblcc1* gene, exon2-exon24 of *Rblcc1-201* (ENSMUST00000027040.12) 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 *Rblcc1* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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, Homozygous mutation of this gene results in embryonic lethality at mid/late gestation associated with heart failure and liver degeneration.
- The *Rblcc1* gene is located on the Chr1. 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)

Rb1cc1 RB1-inducible coiled-coil 1 [Mus musculus (house mouse)]

Gene ID: 12421, updated on 19-Mar-2019

Summary



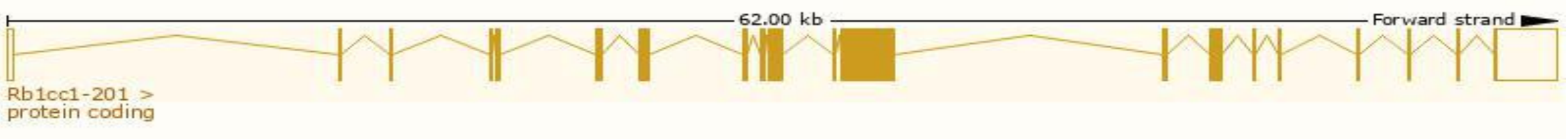
Official Symbol	Rb1cc1 provided by MGI
Official Full Name	RB1-inducible coiled-coil 1 provided by MGI
Primary source	MGI:MGI:1341850
See related	Ensembl:ENSMUSG00000025907
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2900055E04Rik, 5930404L04Rik, Cc1, FIP200, LaXp180
Expression	Ubiquitous expression in testis adult (RPKM 10.4), cerebellum adult (RPKM 5.1) and 27 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

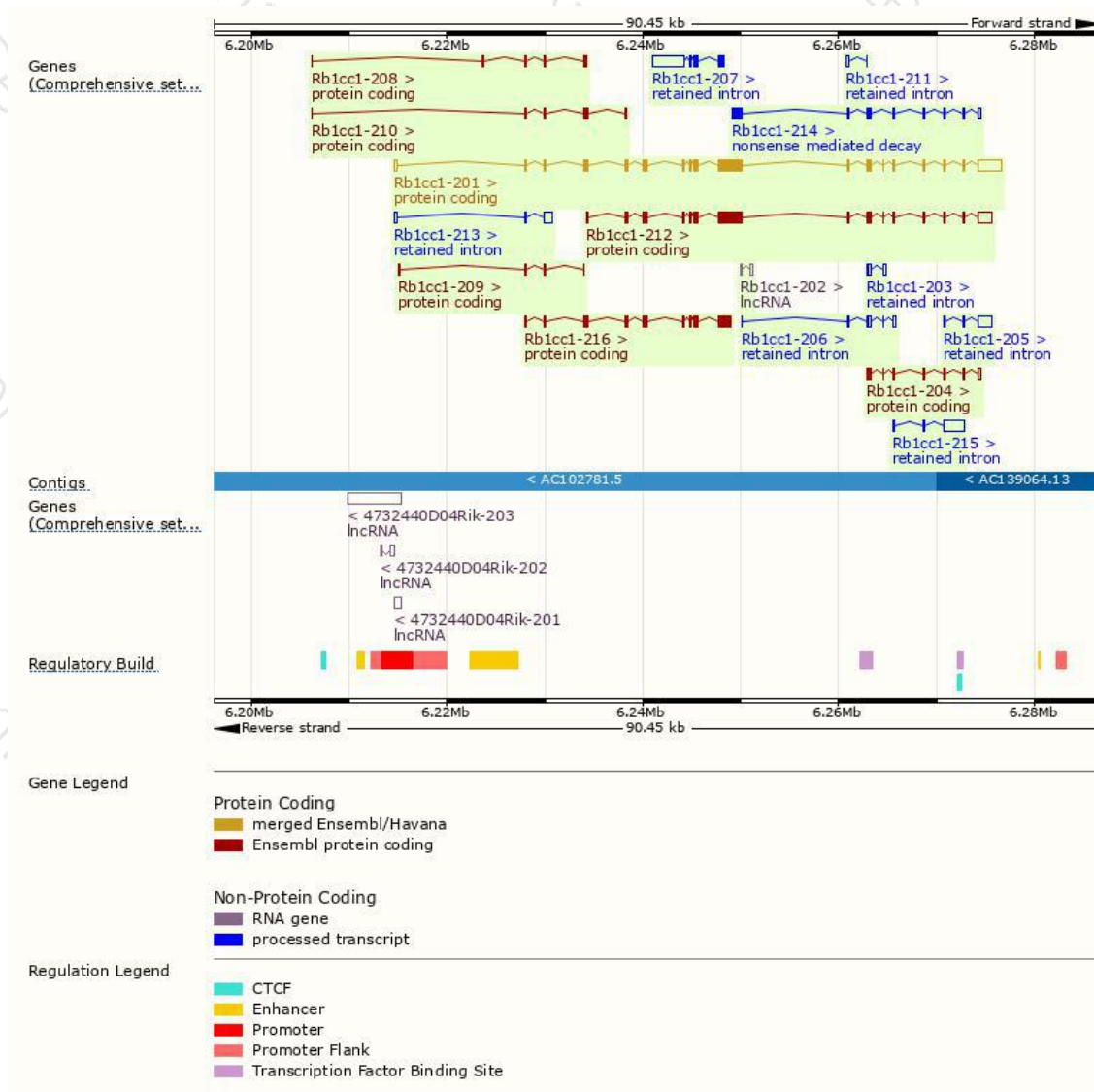
The gene has 16 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rb1cc1-201	ENSMUST00000027040.12	7607	1588aa	Protein coding	CCDS35507	Q9ESK9	TSL:1 GENCODE basic APPRIS P1
Rb1cc1-212	ENSMUST000000161327.7	5707	1468aa	Protein coding	-	F7CC56	CDS 5' incomplete TSL:1
Rb1cc1-216	ENSMUST000000162795.7	2712	873aa	Protein coding	-	E9PX56	CDS 3' incomplete TSL:5
Rb1cc1-204	ENSMUST000000159530.1	898	227aa	Protein coding	-	F6TLJ4	CDS 5' incomplete TSL:1
Rb1cc1-210	ENSMUST000000160871.7	690	164aa	Protein coding	-	E0CYY6	CDS 3' incomplete TSL:2
Rb1cc1-208	ENSMUST000000159906.7	656	93aa	Protein coding	-	E0CZG6	CDS 3' incomplete TSL:2
Rb1cc1-209	ENSMUST000000160062.7	520	40aa	Protein coding	-	E0CYU7	CDS 3' incomplete TSL:3
Rb1cc1-214	ENSMUST000000162257.7	2204	536aa	Nonsense mediated decay	-	F7CCJ3	CDS 5' incomplete TSL:5
Rb1cc1-207	ENSMUST000000159802.1	4136	No protein	Retained intron	-	-	TSL:1
Rb1cc1-215	ENSMUST000000162418.1	2150	No protein	Retained intron	-	-	TSL:1
Rb1cc1-205	ENSMUST000000159656.1	1599	No protein	Retained intron	-	-	TSL:1
Rb1cc1-213	ENSMUST000000162210.7	1151	No protein	Retained intron	-	-	TSL:1
Rb1cc1-206	ENSMUST000000159661.7	875	No protein	Retained intron	-	-	TSL:5
Rb1cc1-203	ENSMUST000000159349.1	633	No protein	Retained intron	-	-	TSL:2
Rb1cc1-211	ENSMUST000000161183.1	332	No protein	Retained intron	-	-	TSL:5
Rb1cc1-202	ENSMUST000000159206.1	519	No protein	lncRNA	-	-	TSL:3

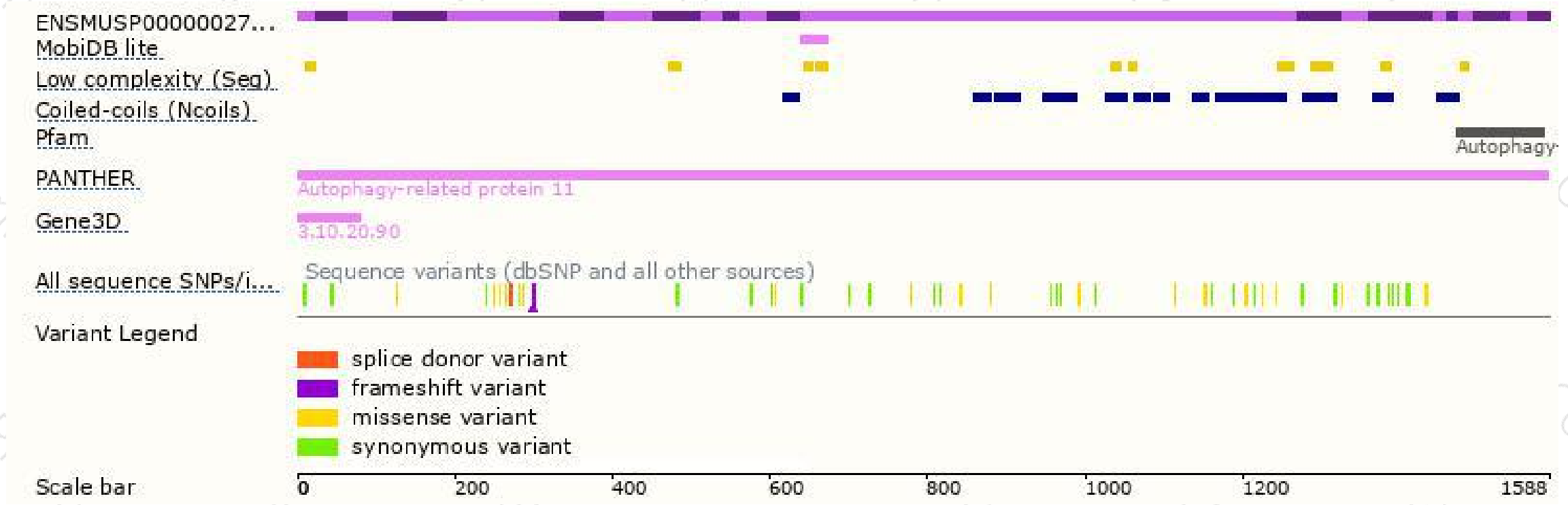
The strategy is based on the design of *Rb1cc1-201* transcript,The transcription is shown below



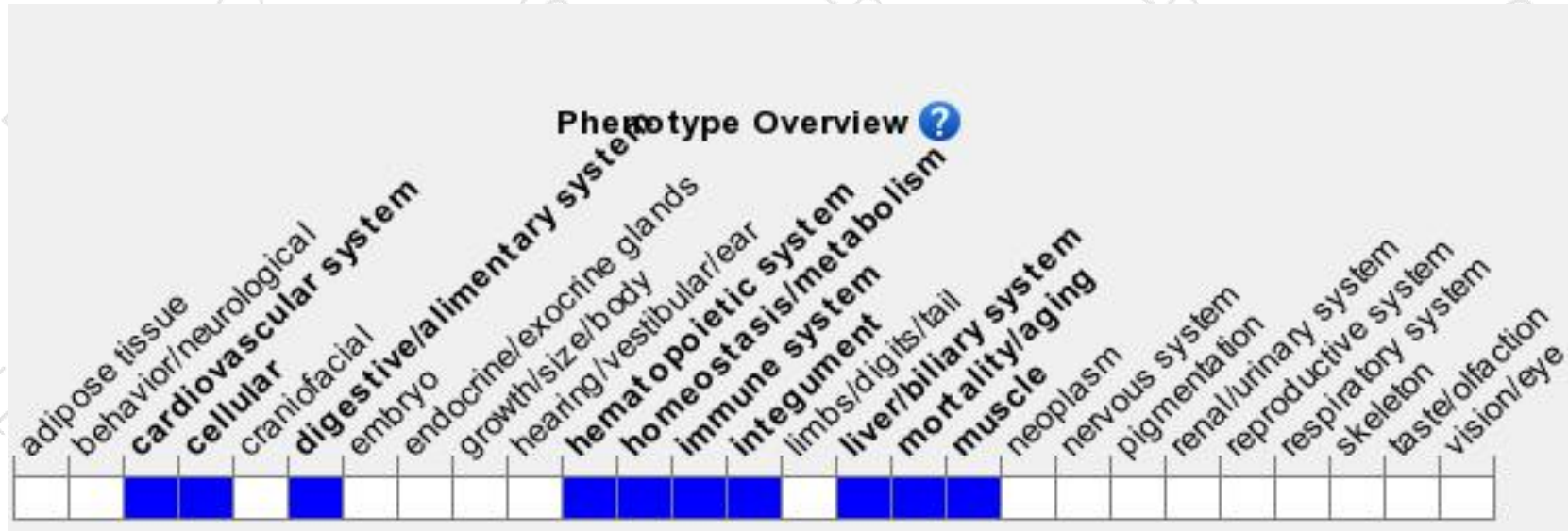
Genomic location distribution



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, Homozygous mutation of this gene results in embryonic lethality at mid/late gestation associated with heart failure and liver degeneration.

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

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