

Adra1b Cas9-CKO Strategy

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Project Overview

Project Name

Adra1b

Project type

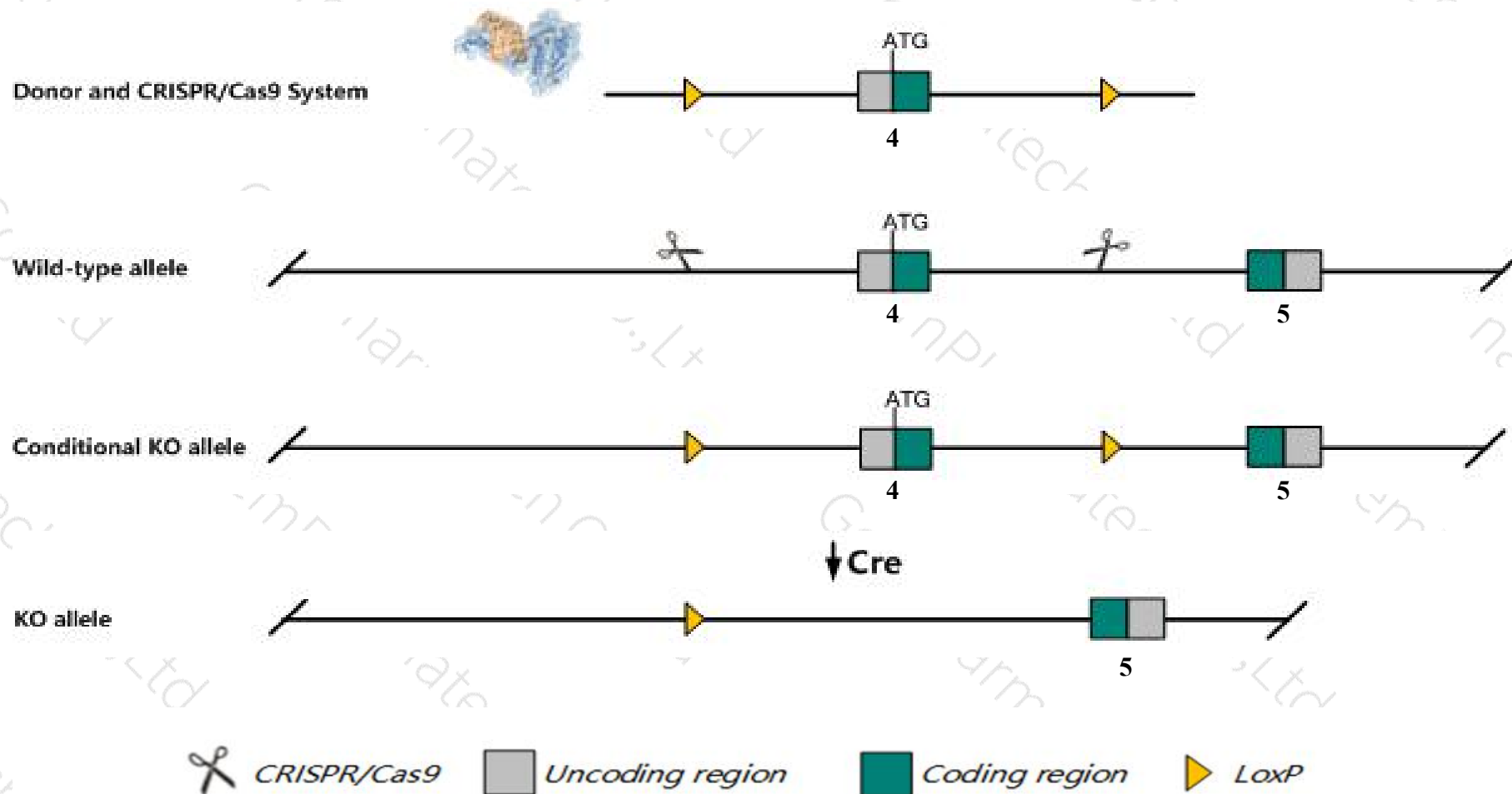
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adra1b* gene. The schematic diagram is as follows:



- The *Adralb* gene has 4 transcripts. According to the structure of *Adralb* gene, exon4 of *Adralb-201* (ENSMUST00000067258.8) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Adralb* 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, Targeted mutations that inactivate the gene affect atrial contractility and left ventricle function, suggesting their use in modeling chronic heart failure in humans.
- Since intron 3-4 is only 511bp, the insertion of 5 'loxP may affect the normal splicing of exons.
- The insertion of 5 'loxP into introns upstream of the initial codon may affect potential cis-acting elements and transcription factor binding sites. This strategy removes the original ATG of the gene and may lead to the formation of new unknown proteins.
- The Adra1b gene is located on the Chr11. 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)

Adra1b adrenergic receptor, alpha 1b [Mus musculus (house mouse)]

Gene ID: 11548, updated on 31-Jan-2019

Summary



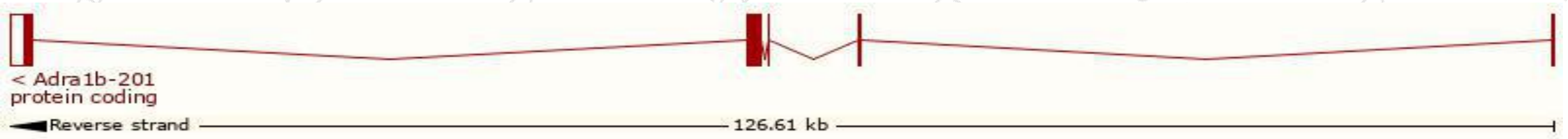
Official Symbol	Adra1b provided by MGI
Official Full Name	adrenergic receptor, alpha 1b provided by MGI
Primary source	MGI:MGI:104774
See related	Ensembl:ENSMUSG00000050541
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	[a]1b
Expression	Biased expression in liver adult (RPKM 44.6), heart adult (RPKM 12.4) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

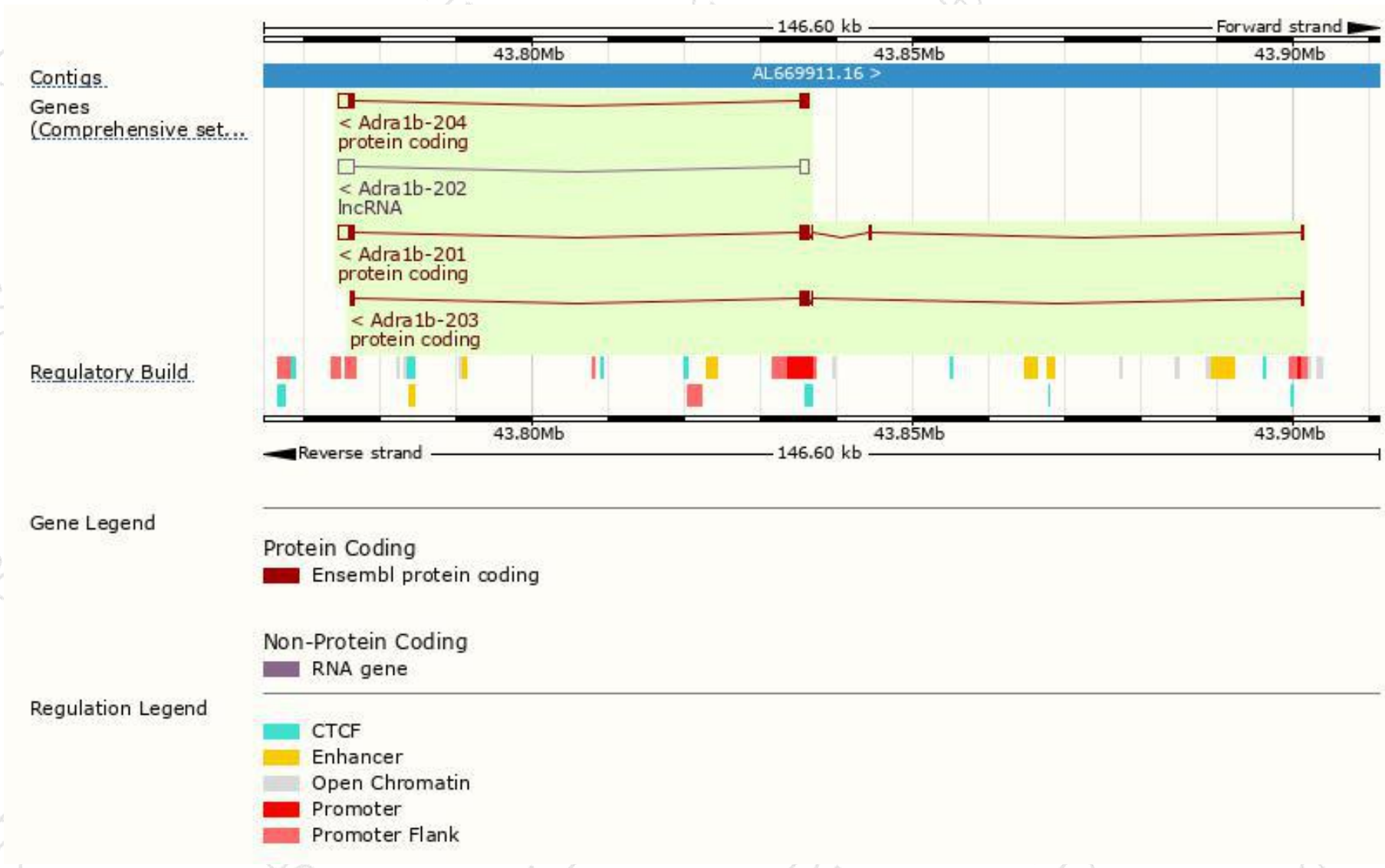
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adra1b-201	ENSMUST00000067258.8	3331	515aa	Protein coding	CCDS24562	Q9DBL0	TSL:1 GENCODE basic APPRIS P1
Adra1b-204	ENSMUST00000167574.1	3047	515aa	Protein coding	CCDS24562	Q9DBL0	TSL:1 GENCODE basic APPRIS P1
Adra1b-203	ENSMUST00000139906.1	1764	462aa	Protein coding	-	B1AU41	CDS 3' incomplete TSL:1
Adra1b-202	ENSMUST00000124306.1	3047	No protein	Processed transcript	-	-	TSL:1

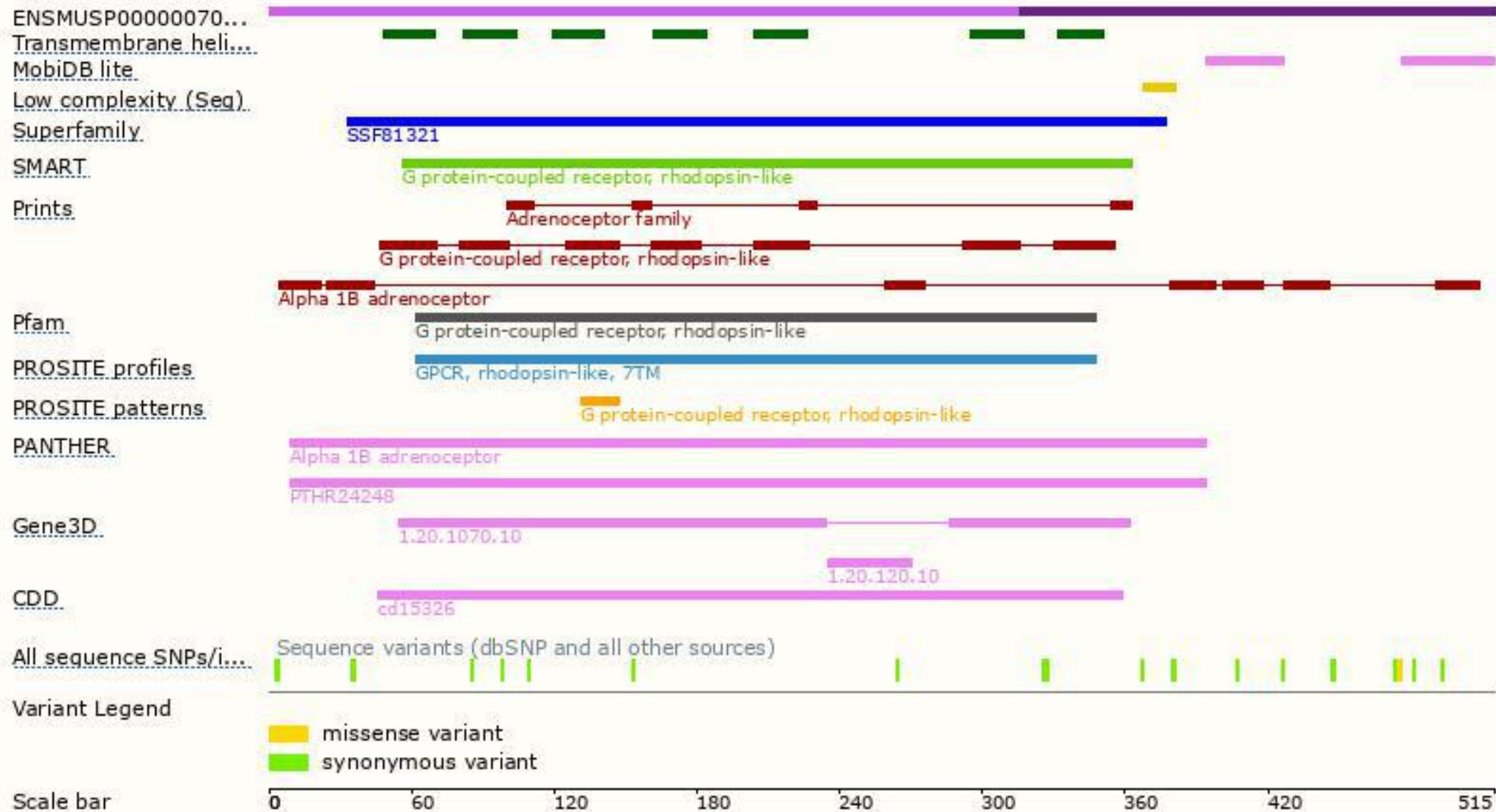
The strategy is based on the design of *Adra1b-201* transcript,The transcription is shown below



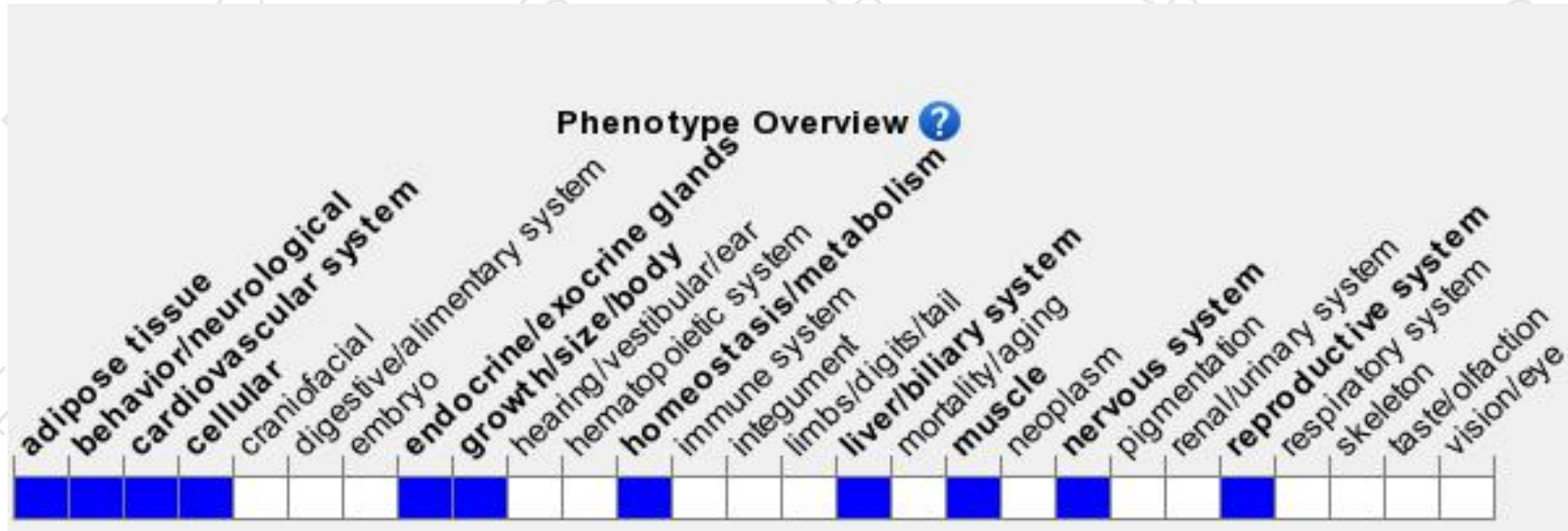
Genomic location distribution



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, Targeted mutations that inactivate the gene affect atrial contractility and left ventricle function, suggesting their use in modeling chronic heart failure in humans.

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

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