

Dusp8 Cas9-CKO Strategy

Designer:

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Design Date:

2019-9-29

Project Overview

Project Name

Dusp8

Project type

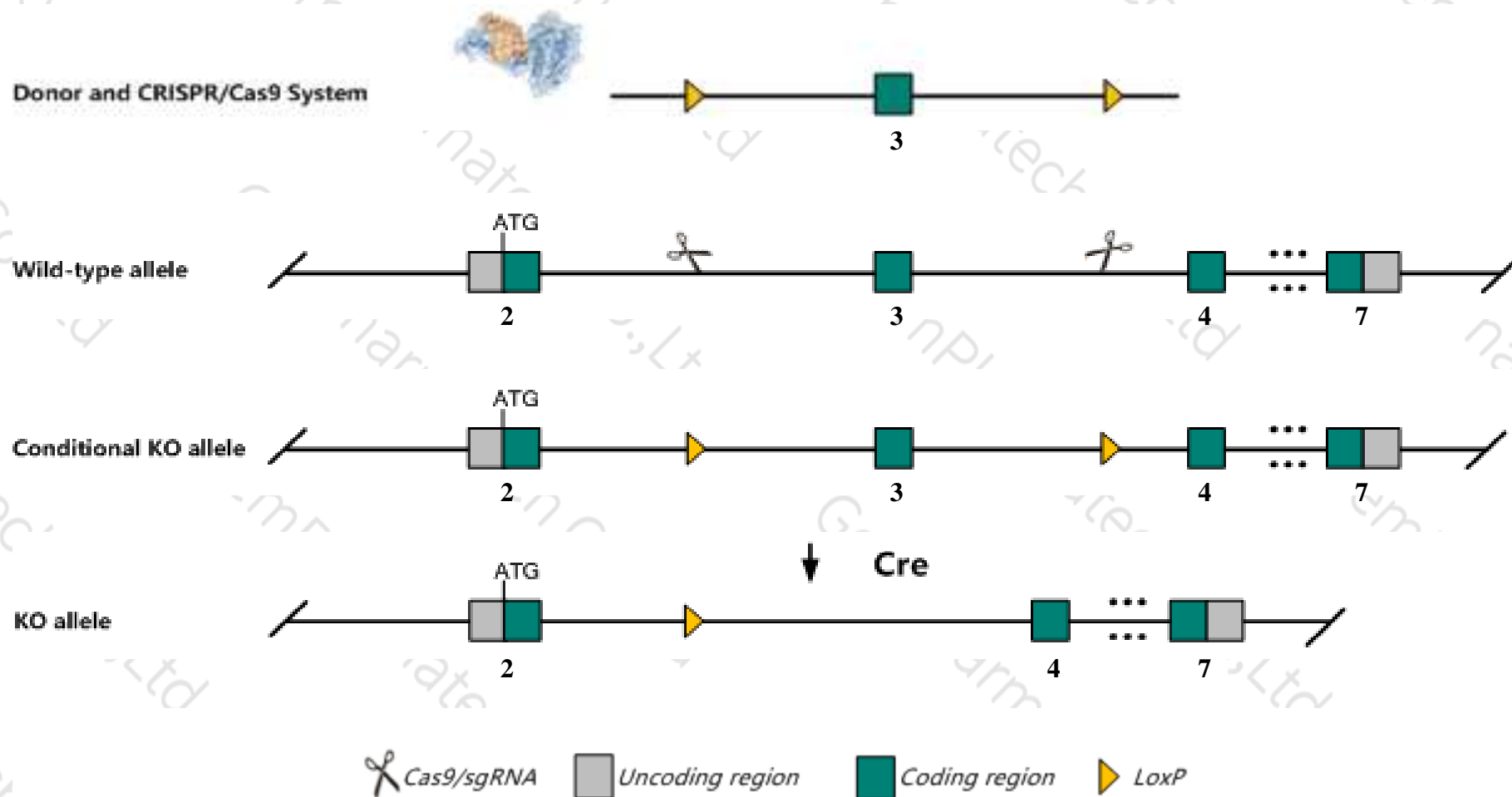
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dusp8* gene. The schematic diagram is as follows:



- The *Dusp8* gene has 2 transcripts. According to the structure of *Dusp8* gene, exon3 of *Dusp8-201* (ENSMUST00000039926.9) transcript is recommended as the knockout region. The region contains 139bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dusp8* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was 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 altered myocardial fiber morphology, mildly increased cardiac muscle contractility at baseline, and decreased response of heart to induced stress.
- The *Dusp8* gene is located on the Chr7. 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)

Dusp8 dual specificity phosphatase 8 [*Mus musculus* (house mouse)]

Gene ID: 18218, updated on 12-Aug-2019

Summary

Official Symbol Dusp8 provided by [MGI](#)
Official Full Name dual specificity phosphatase 8 provided by [MGI](#)
Primary source [MGI:MGI:106626](#)
See related [Ensembl:ENSMUSG00000037887](#)
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 Nt1p1; AI593498; 5530400B01Rik
Expression Broad expression in whole brain E14.5 (RPKM 20.5), CNS E18 (RPKM 19.5) and 22 other tissues [See more](#)
Orthologs [human](#) [all](#)

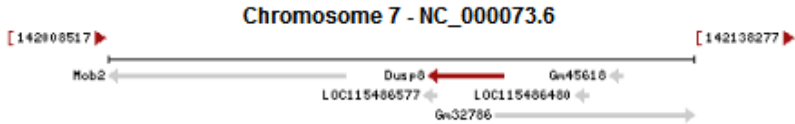
Genomic context

Location: 7 F5; 7 87.59 cM

See Dusp8 in [Genome Data Viewer](#)



Exon count: 8

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	7	NC_000073.6 (142079487..142095907, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	7	NC_000073.5 (149267401..149276175, complement)

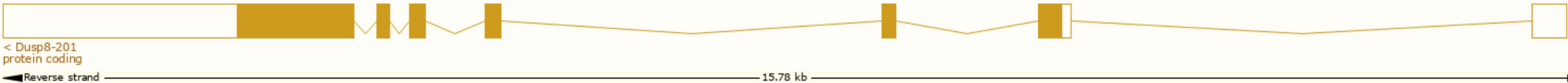


Transcript information (Ensembl)

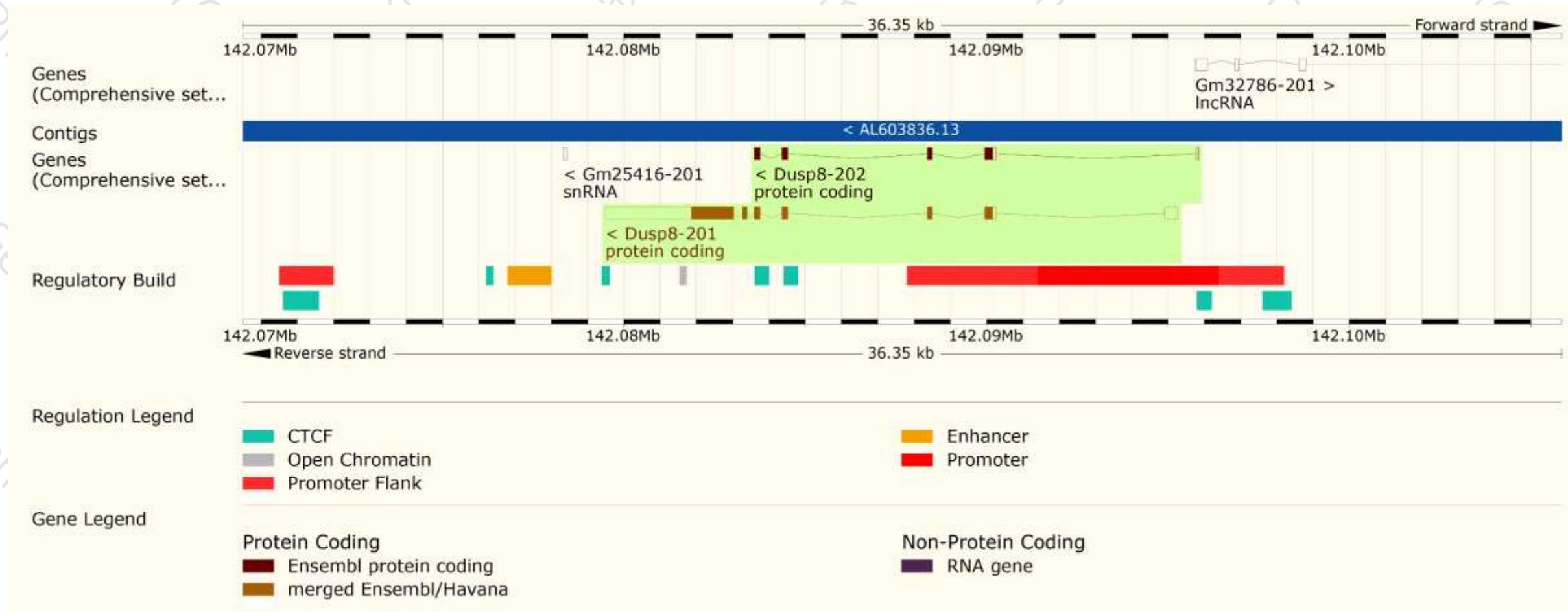
The gene has 2 transcripts, and all transcripts are shown below:

Show/hide columns (1 hidden)							Filter	
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags	
Dusp8-201	ENSMUST00000039926.9	4804	663aa	 Protein coding	CCDS22024	O09112	TSL:1	GENCODE basic APPRIS P1
Dusp8-202	ENSMUST00000143661.1	853	231aa	 Protein coding	-	B7ZC52	CDS 3' incomplete	TSL:3

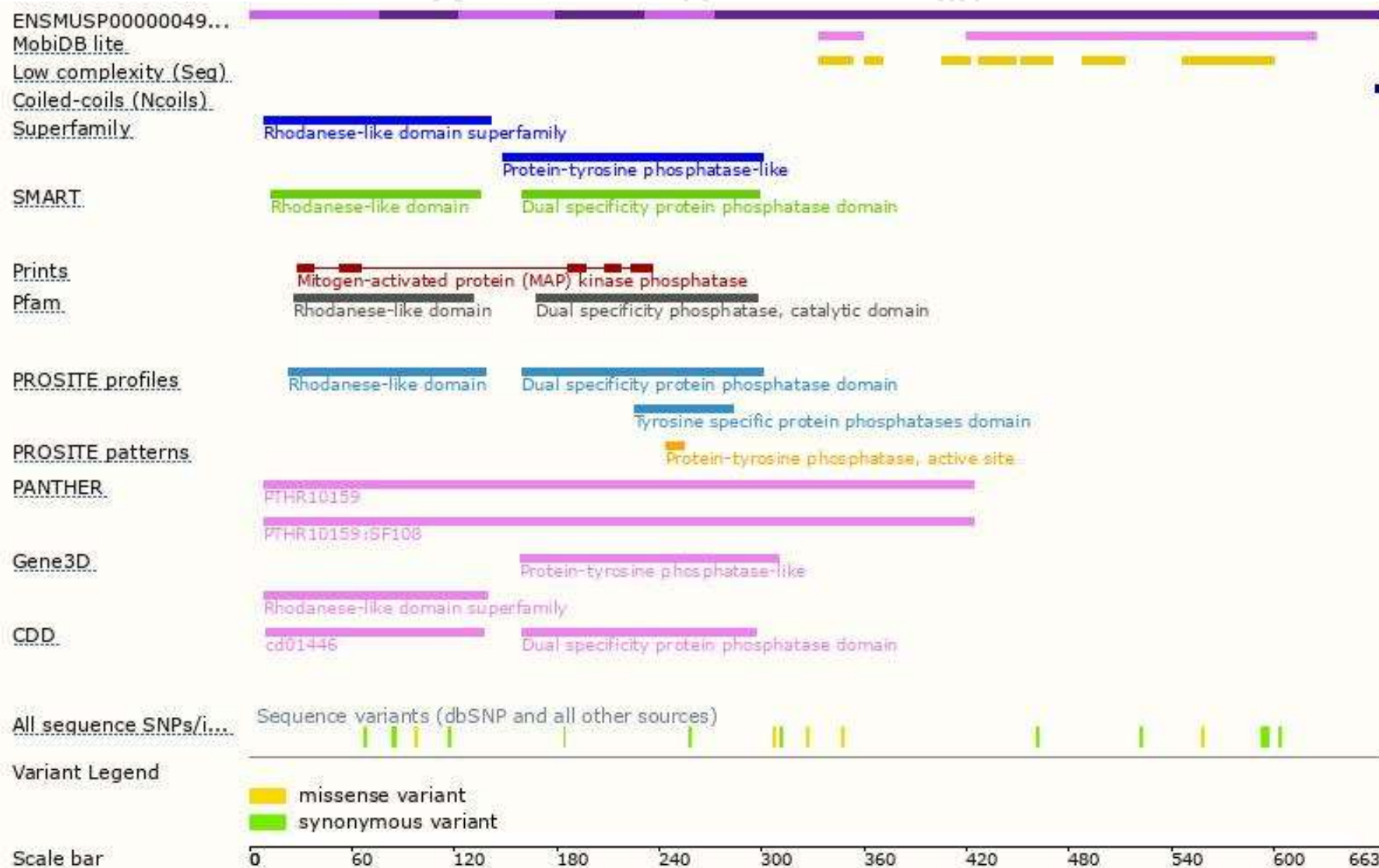
The strategy is based on the design of *Dusp8* -201 transcript,The transcription is shown below



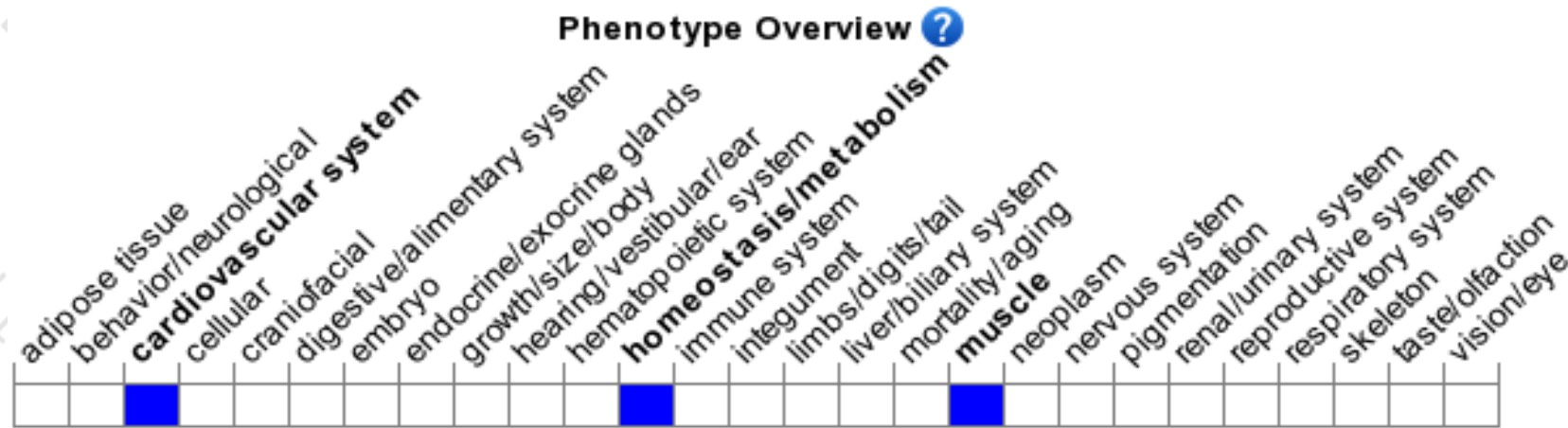
Genomic location distribution



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 altered myocardial fiber morphology, mildly increased cardiac muscle contractility at baseline, and decreased response of heart to induced stress.

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