

*Ywha*q Cas9-KO Strategy

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Reviewer:

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Project Overview

Project Name

Ywhaq

Project type

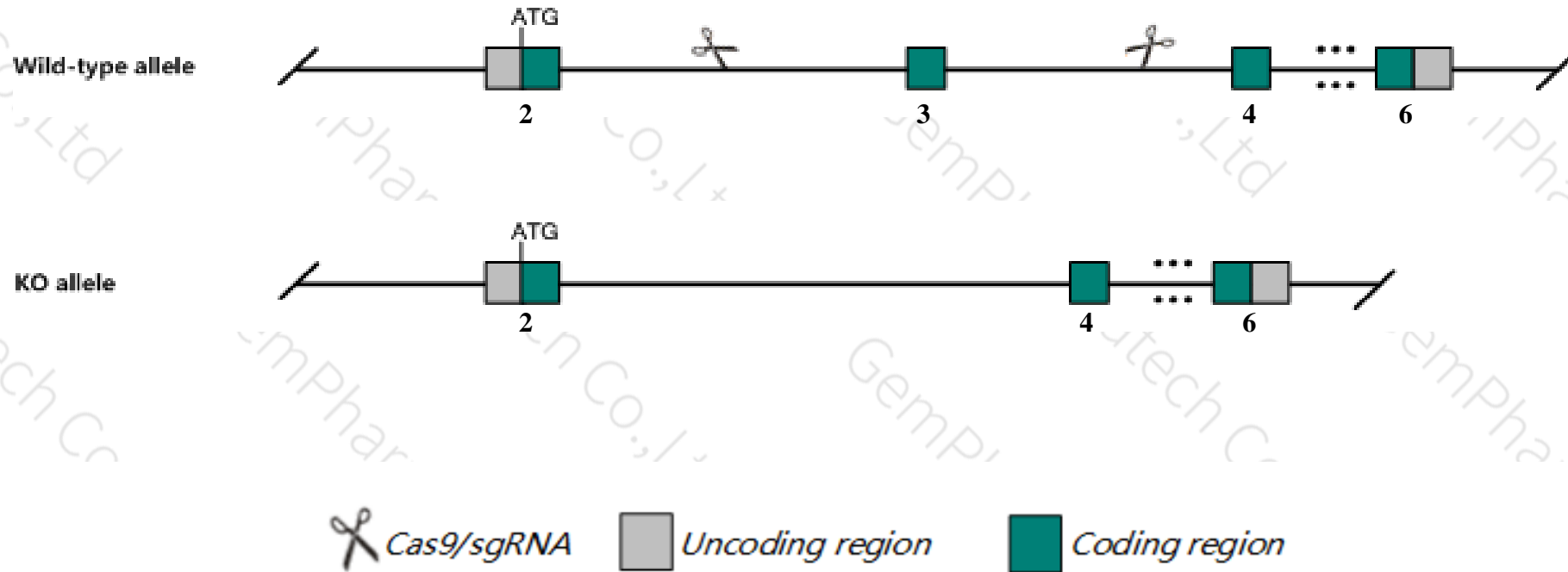
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Ywhaq* gene has 5 transcripts. According to the structure of *Ywhaq* gene, exon3 of *Ywhaq*-202 (ENSMUST00000135088.8) transcript is recommended as the knockout region. The region contains 124bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ywhaq* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Embryos homozygous for a gene trap allele are developmentally delayed and die by E14 with no specific cardiac defects; however, heterozygotes develop larger myocardial infarctions with increased post-infarction cardiac remodeling while cultured cardiomyocytes are sensitized to proapoptotic stimuli.
- The *Ywhaq* gene is located on the Chr12. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Ywhaq tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein theta [*Mus musculus* (house mouse)]

Gene ID: 22630, updated on 10-Oct-2019

Summary



Official Symbol Ywhaq provided by [MGI](#)

Official Full Name tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein theta provided by [MGI](#)

Primary source [MGI:MGI:891963](#)

See related [Ensembl:ENSMUSG00000076432](#)

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 R74690; AA409740; AU021156; 2700028P07Rik

Expression Ubiquitous expression in CNS E18 (RPKM 170.8), CNS E14 (RPKM 138.7) and 28 other tissues [See more](#)

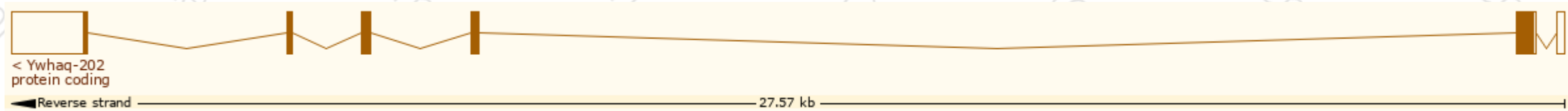
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

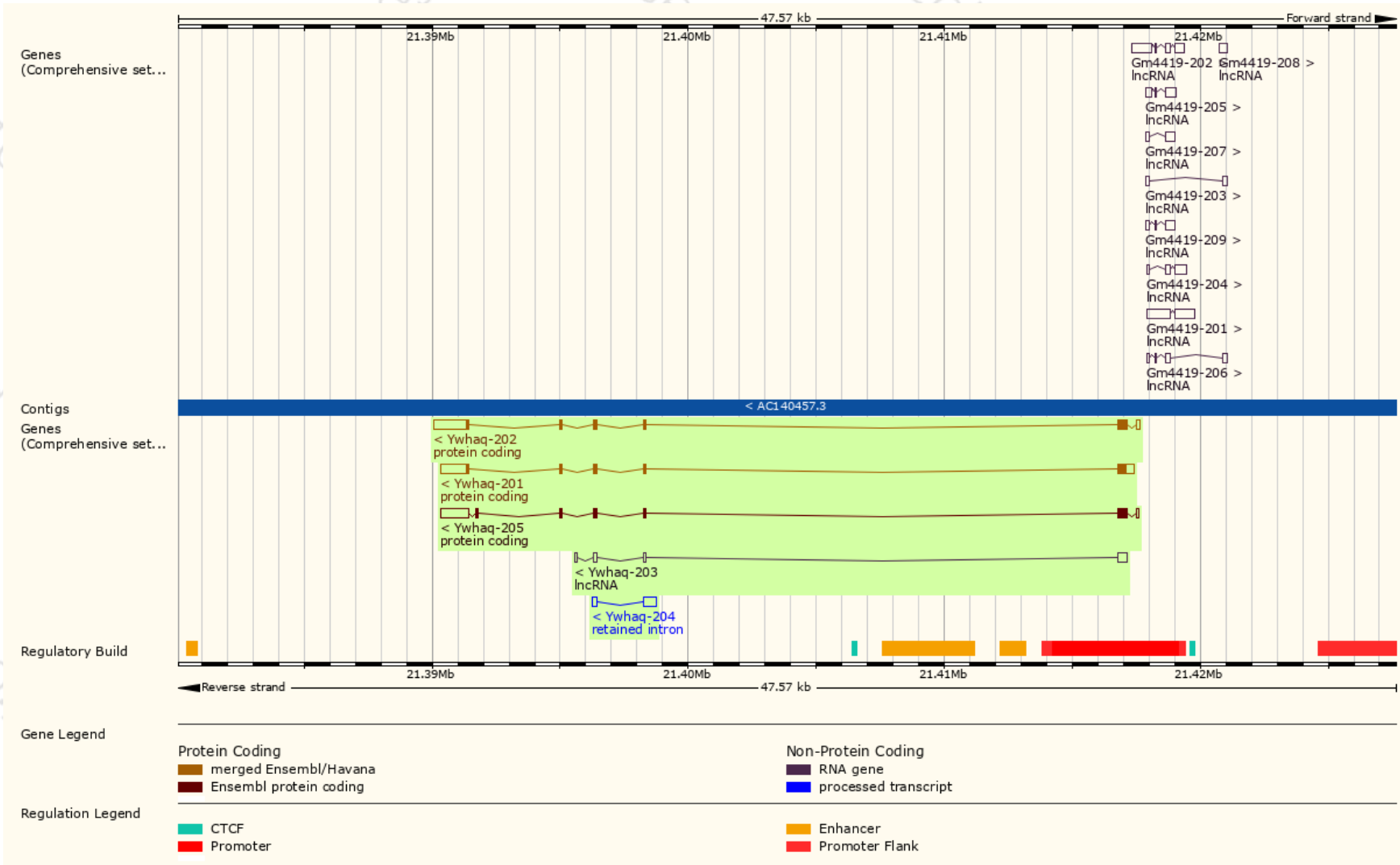
The gene has 5 transcripts,all transcripts are shown below:

Name ▲	Transcript ID ▲	bp ▲	Protein ▲	Biotype ▲	CCDS ▲	UniProt ▲	Flags ▲
Ywhaq-201	ENSMUST00000103002.7	2110	245aa	Protein coding	CCDS25837	A3KML3 P68254	TSL:1 Gencode basic APPRIS P1
Ywhaq-202	ENSMUST00000135088.8	2197	245aa	Protein coding	CCDS25837	A3KML3 F6VW30 P68254	TSL:1 Gencode basic APPRIS P1
Ywhaq-203	ENSMUST00000140710.1	703	No protein	lncRNA	-	-	TSL:3
Ywhaq-204	ENSMUST00000146206.1	682	No protein	Retained intron	-	-	TSL:2
Ywhaq-205	ENSMUST00000155480.8	1970	243aa	Protein coding	-	F6YY69 P68254	TSL:1 Gencode basic

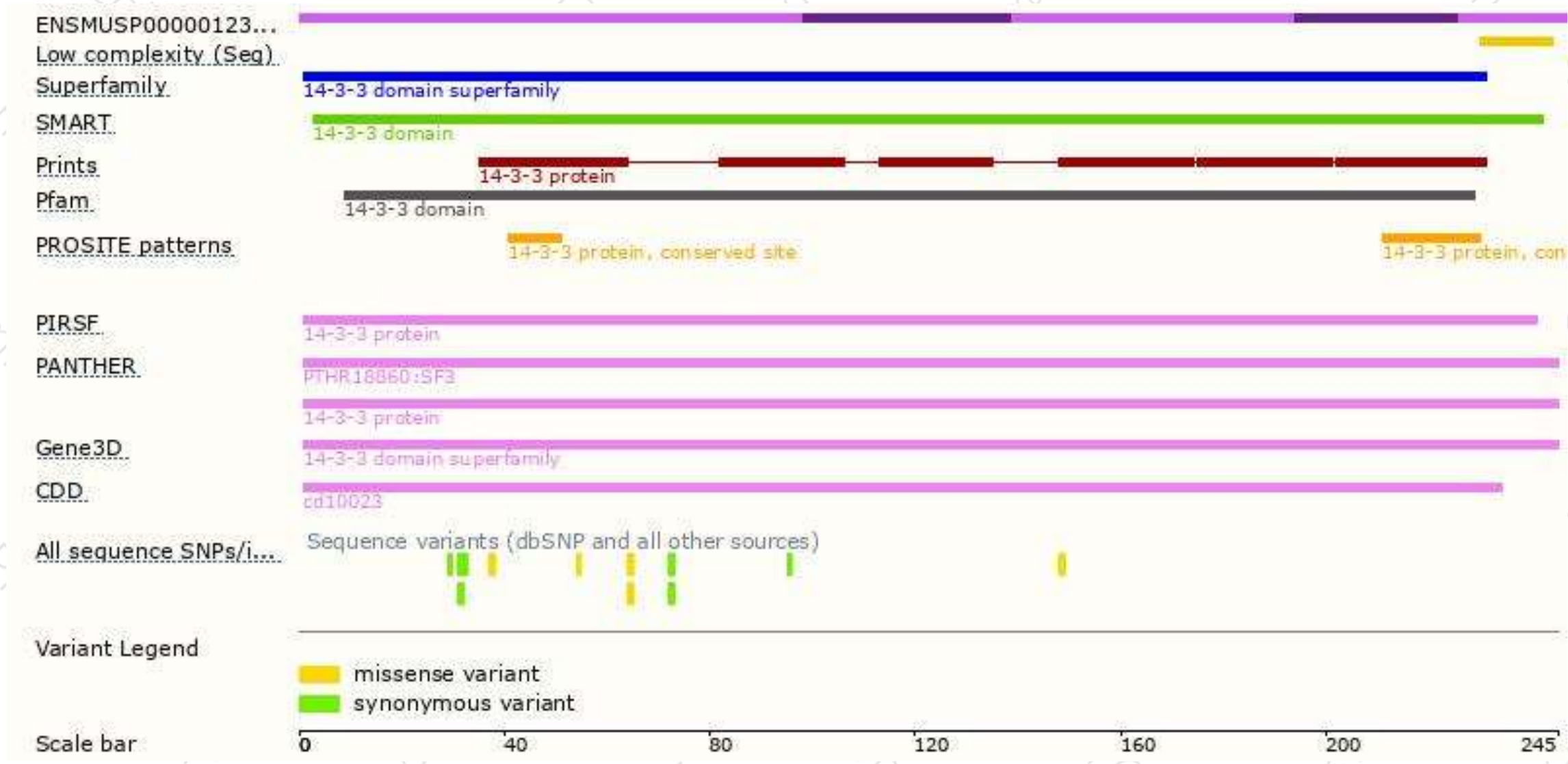
The strategy is based on the design of *Ywhaq-202* transcript,The transcription is shown below



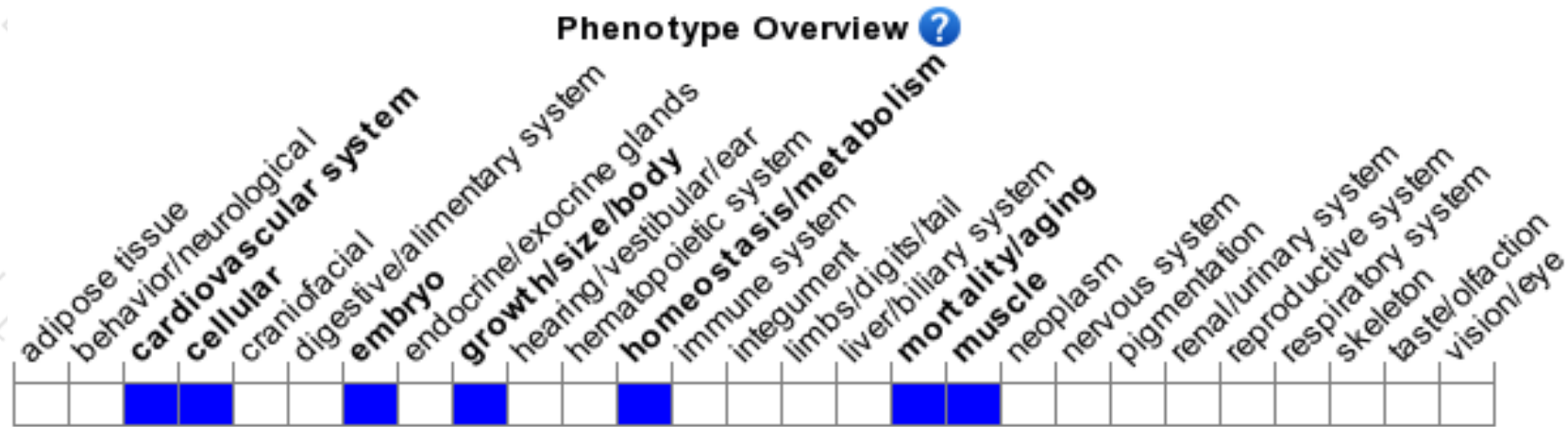
Genomic location distribution



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, embryos homozygous for a gene trap allele are developmentally delayed and die by E14 with no specific cardiac defects; however, heterozygotes develop larger myocardial infarctions with increased post-infarction cardiac remodeling while cultured cardiomyocytes are sensitized to proapoptotic stimuli.

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

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