

Mfn2 Cas9-CKO Strategy

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Project Overview

Project Name

Mfn2

Project type

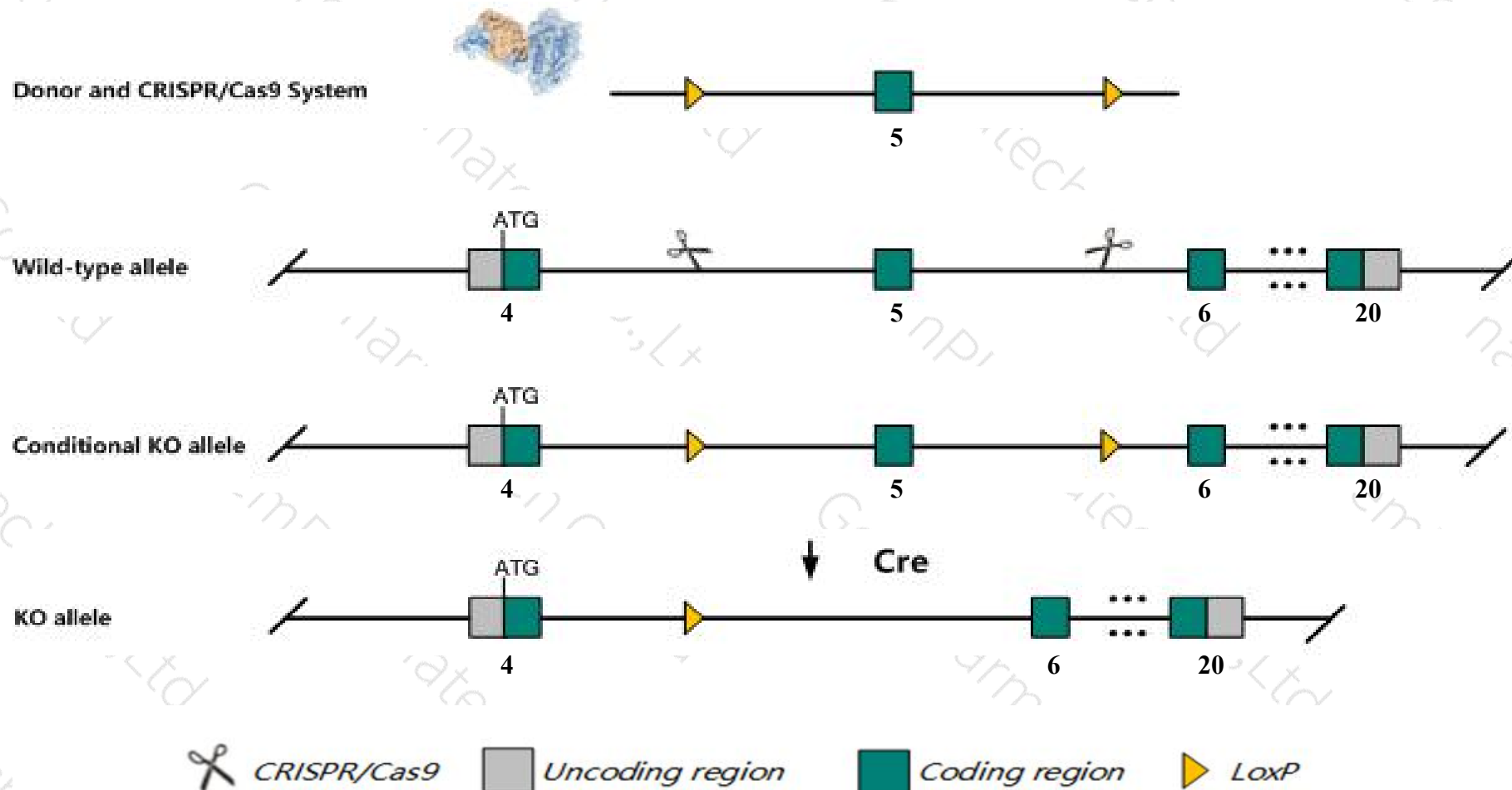
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mfn2* gene. The schematic diagram is as follows:



Technical routes

- The *Mfn2* gene has 7 transcripts. According to the structure of *Mfn2* gene, exon5 of *Mfn2-201* (ENSMUST00000030884.9) transcript is recommended as the knockout region. The region contains 136bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mfn2* 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 disruptions in this gene die in mid-gestation. Structural and functional abnormalities of mitochondria are reported.
- The *Mfn2* gene is located on the Chr4. 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)

Mfn2 mitofusin 2 [Mus musculus (house mouse)]

Gene ID: 170731, updated on 3-Feb-2019

Summary



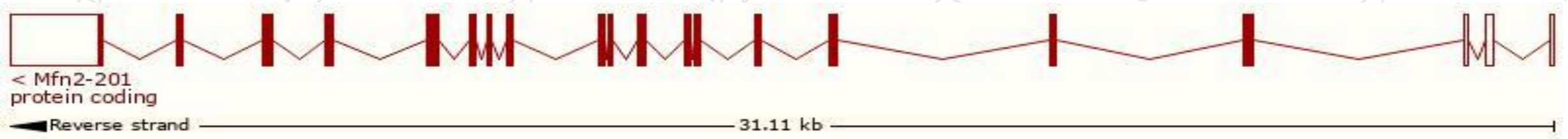
Official Symbol	Mfn2 provided by MGI
Official Full Name	mitofusin 2 provided by MGI
Primary source	MGI:MGI:2442230
See related	Ensembl:ENSMUSG00000029020
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	D630023P19Rik, Fzo
Expression	Ubiquitous expression in heart adult (RPKM 132.4), testis adult (RPKM 47.3) and 24 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

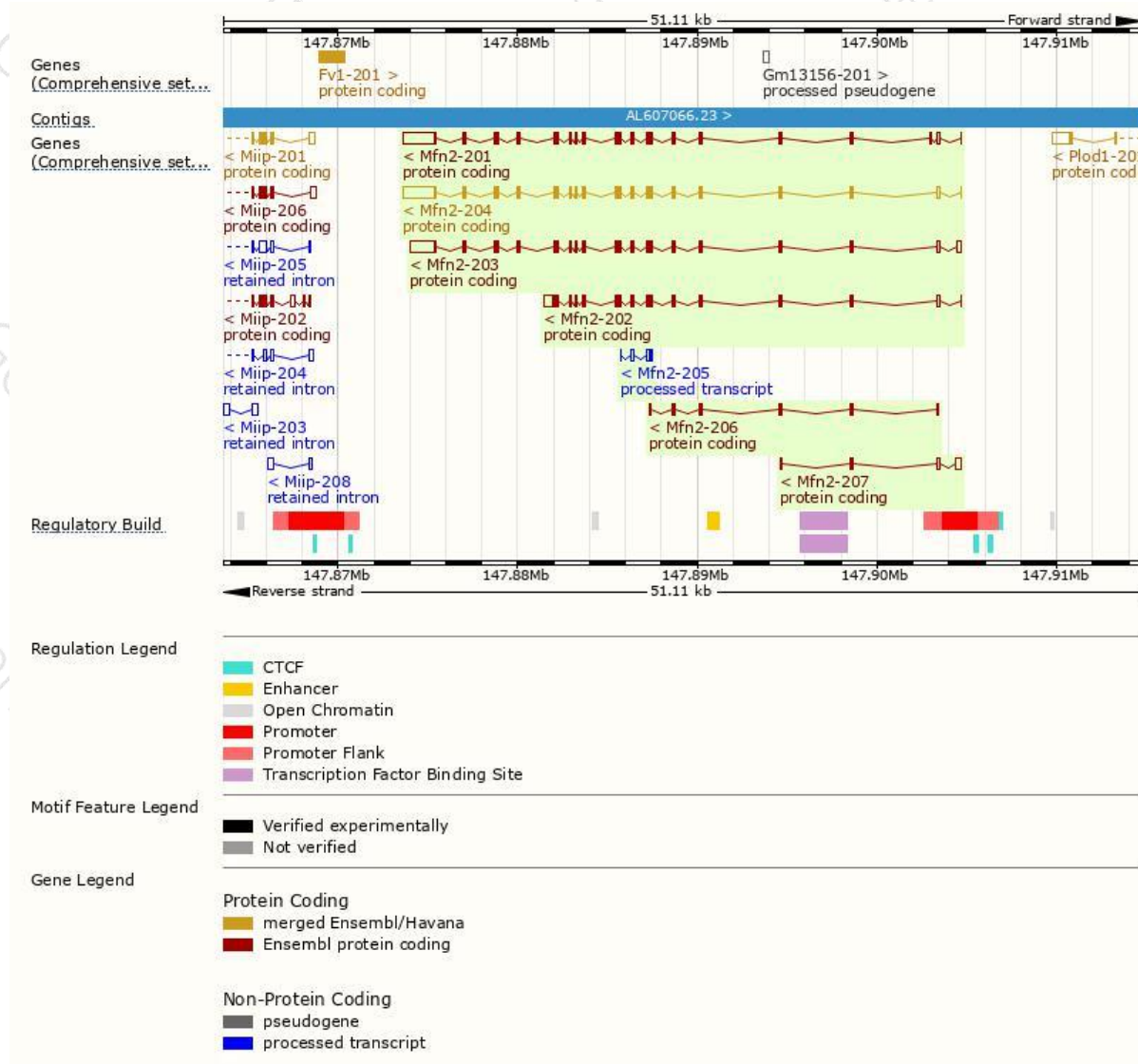
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mfn2-201	ENSMUST00000030884.9	4341	757aa	Protein coding	CCDS38965	Q80U63	TSL:1 GENCODE basic APPRIS P1
Mfn2-204	ENSMUST00000105716.8	4241	757aa	Protein coding	CCDS38965	Q80U63	TSL:1 GENCODE basic APPRIS P1
Mfn2-203	ENSMUST00000105715.7	4043	757aa	Protein coding	CCDS38965	Q80U63	TSL:1 GENCODE basic APPRIS P1
Mfn2-202	ENSMUST00000105714.7	2427	605aa	Protein coding	-	Q80U63	TSL:1 GENCODE basic
Mfn2-207	ENSMUST00000150881.1	708	97aa	Protein coding	-	A2A7Y8	CDS 3' incomplete TSL:3
Mfn2-206	ENSMUST00000134172.7	685	213aa	Protein coding	-	A8Y5E5	CDS 3' incomplete TSL:3
Mfn2-205	ENSMUST00000124646.1	447	No protein	Processed transcript	-	-	TSL:3

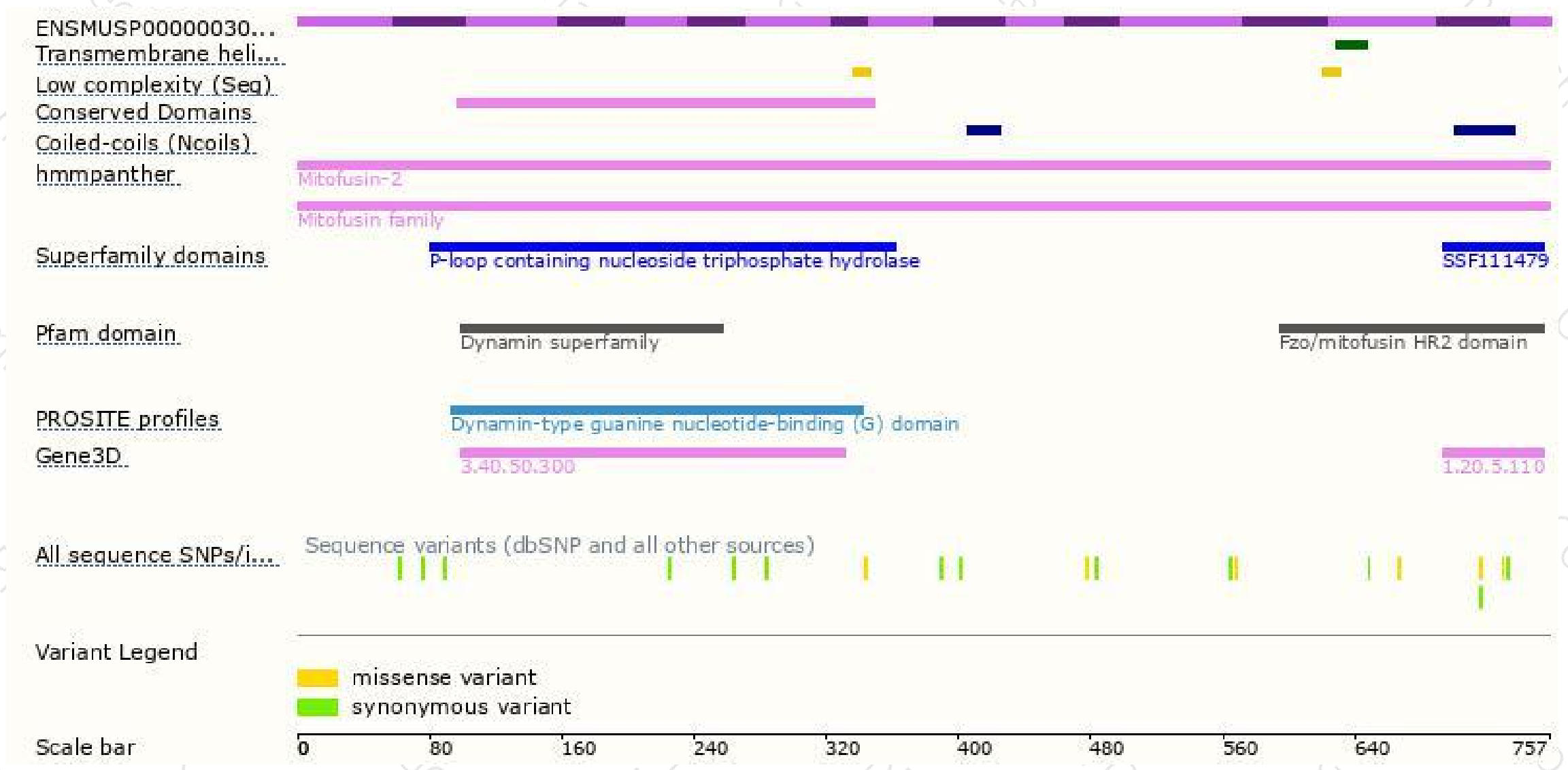
The strategy is based on the design of *Mfn2-201* transcript,The transcription is shown below



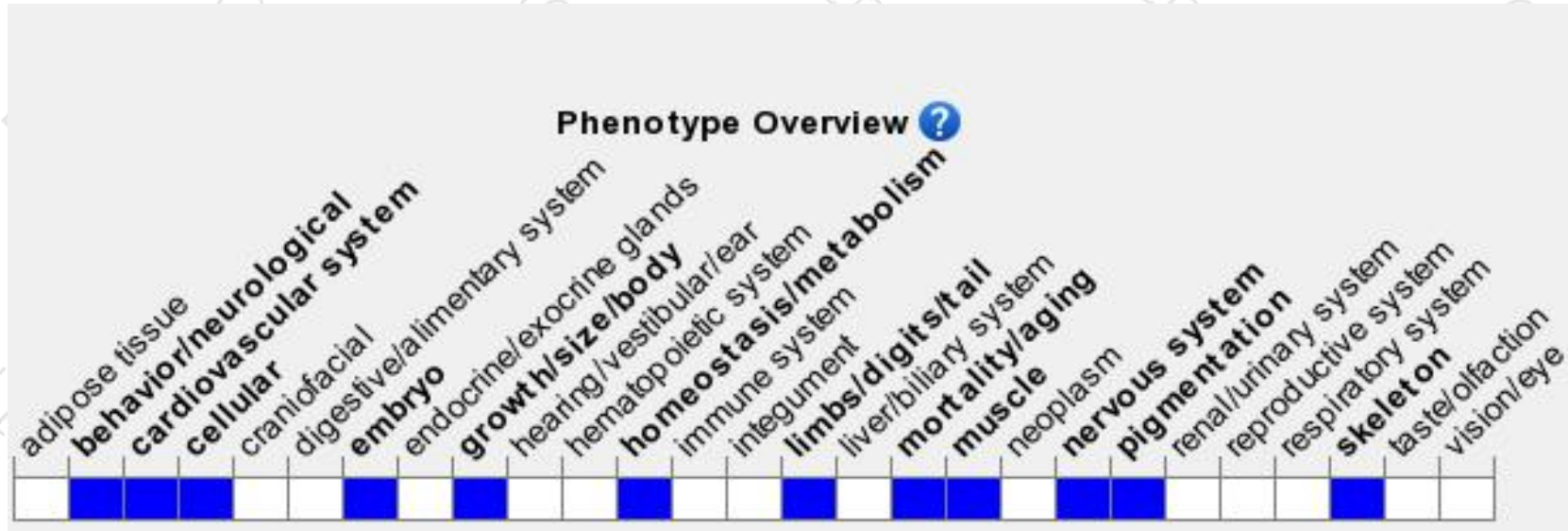
Genomic location distribution



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/>).

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

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