Myh4 Cas9-CKO Strategy

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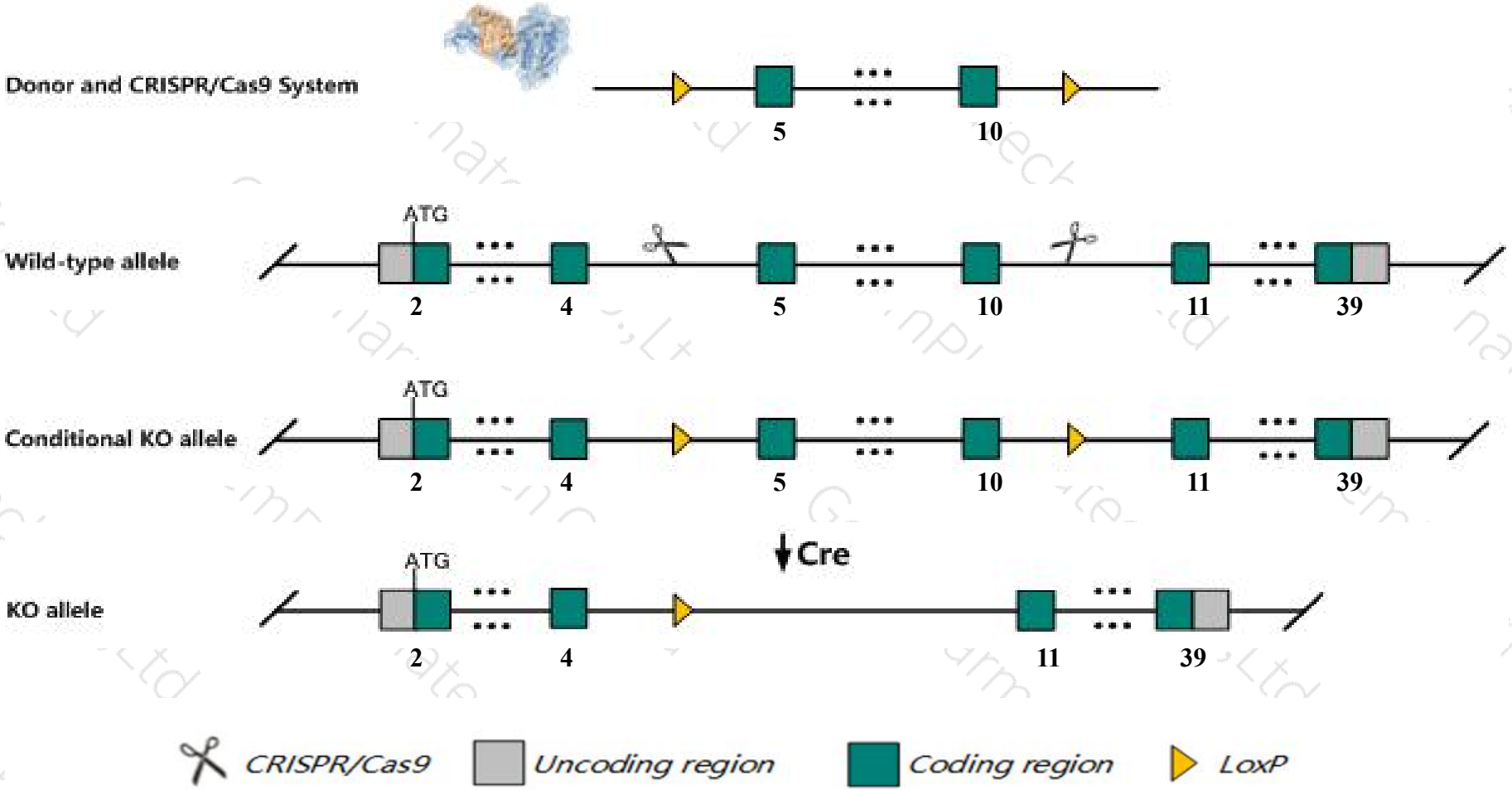
Project Overview

Project Name	***Myh4***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Myh4* gene. The schematic diagram is as follows:



Technical routes

- The *Myh4* gene has 2 transcripts. According to the structure of *Myh4* gene, exon5-exon10 of *Myh4-201* (ENSMUST00000018632.10) transcript is recommended as the knockout region.The region contains 503bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Myh4* 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.

Notice

- According to the existing MGI data,Homozygotes for a targeted null mutation exhibit decreased growth and muscle defects including reduced muscle mass, muscle fiber loss, compensatory fiber hypertrophy, and impaired strength.

- The *Myh4* 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）

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Myh4 myosin, heavy polypeptide 4, skeletal muscle [*Mus musculus* (house mouse)]

Gene ID: 17884, updated on 1-Oct-2019

Summary

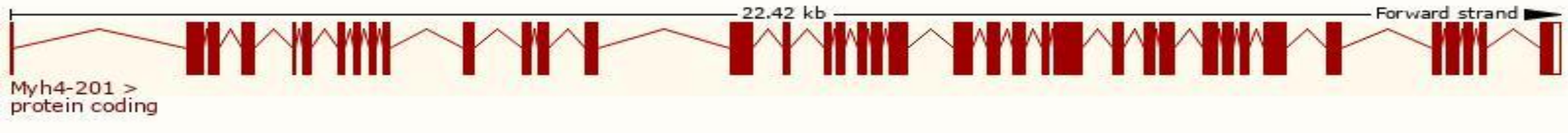
Official Symbol	Myh4 provided by MGI
Official Full Name	myosin, heavy polypeptide 4, skeletal muscle provided by MGI
Primary source	MGI:MGI:1339713
See related	Ensembl:ENSMUSG00000057003
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	MM; MHC2B; Myhsf; MYH-2B; Minmus; Minimsc; AI506973; MyHC-IIb
Expression	Restricted expression toward mammary gland adult (RPKM 118.7) See more
Orthologs	human all

Transcript information（Ensembl）

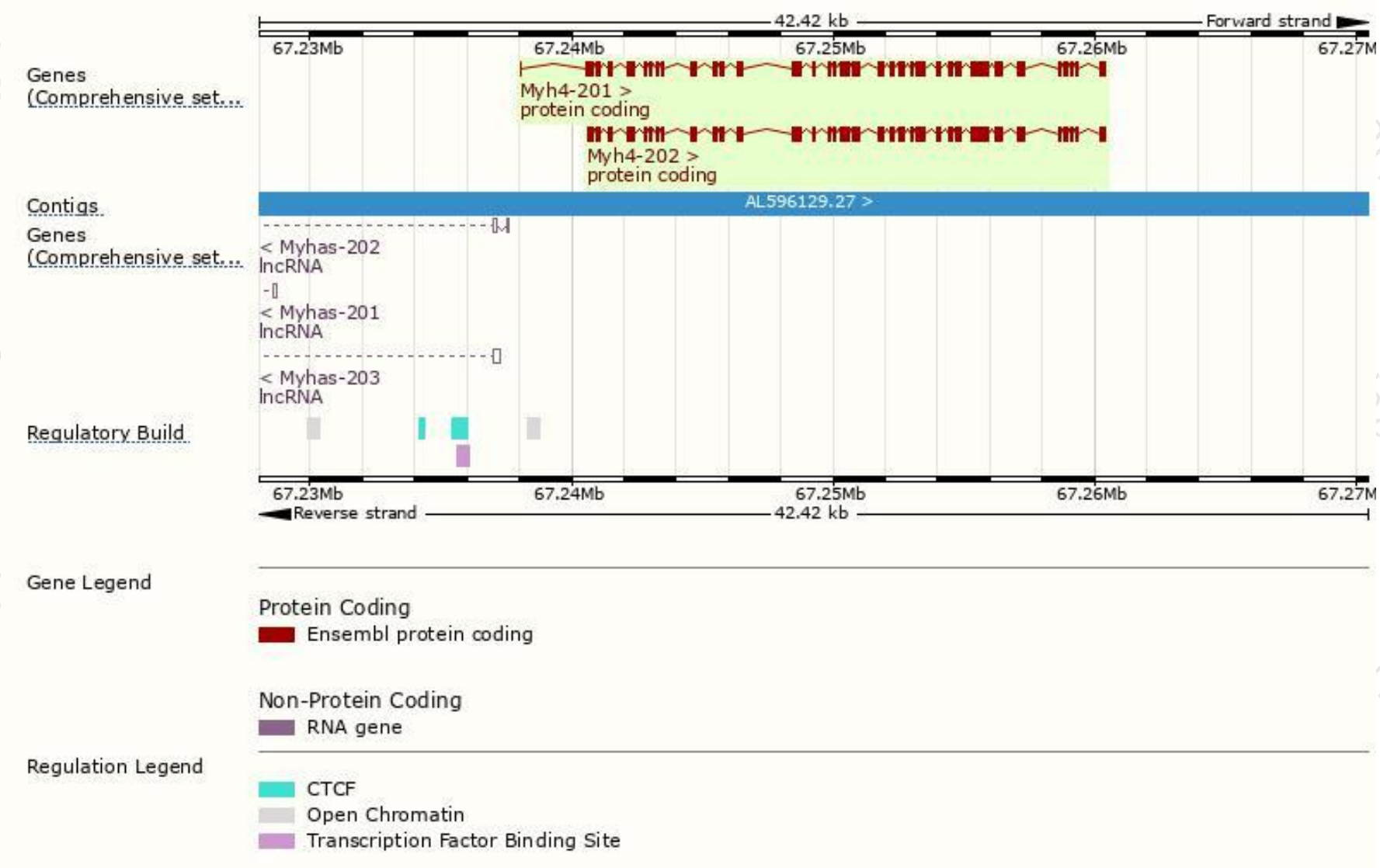
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Myh4-201	ENSMUST00000018632.10	6016	1939aa	Protein coding	CCDS24856	Q5SX39	TSL:5 GENCODE basic APPRIS P1
Myh4-202	ENSMUST00000170942.1	5912	1939aa	Protein coding	CCDS24856	Q5SX39	TSL:1 GENCODE basic APPRIS P1

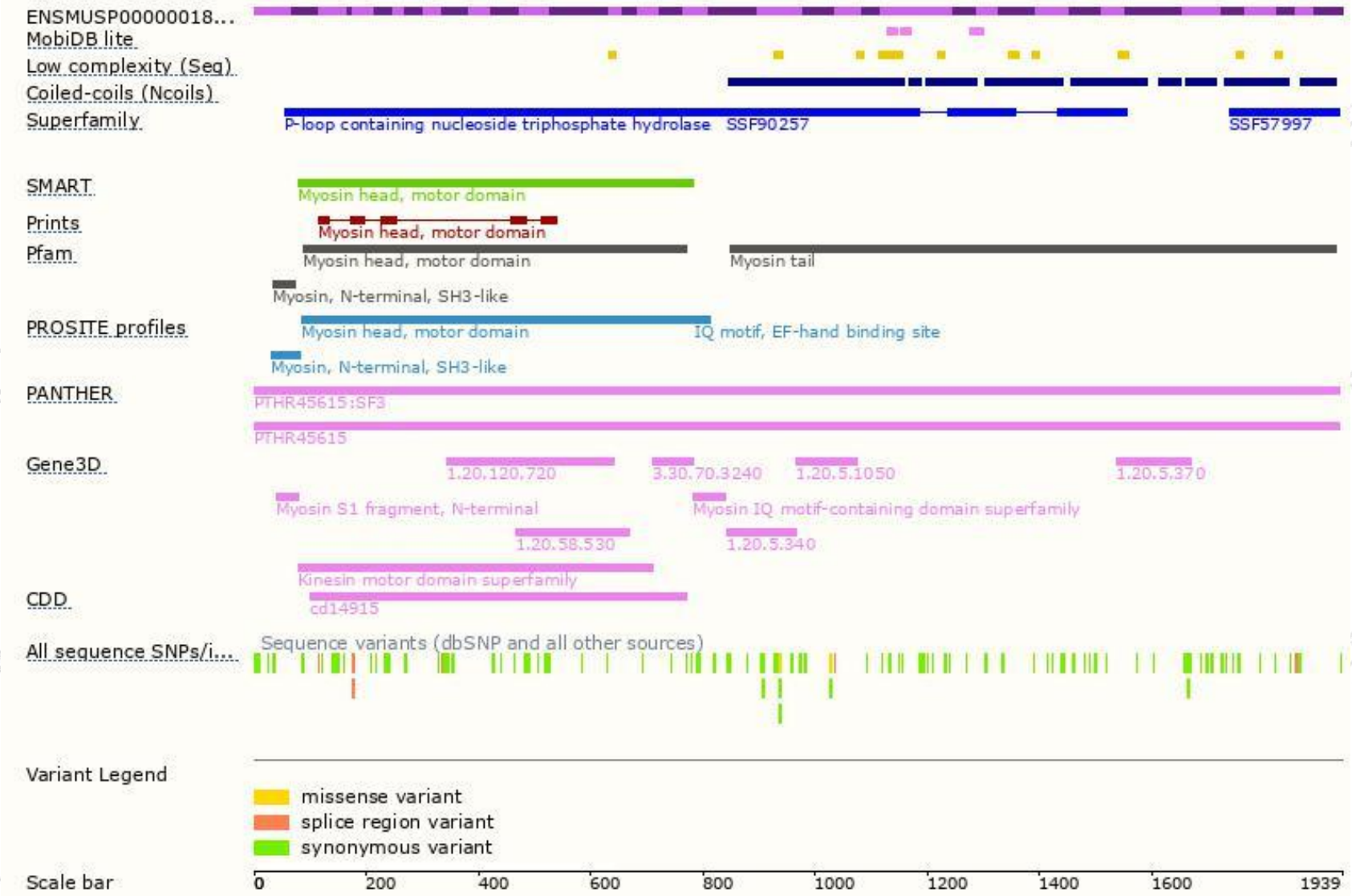
The strategy is based on the design of *Myh4-201* transcript,The transcription is shown below



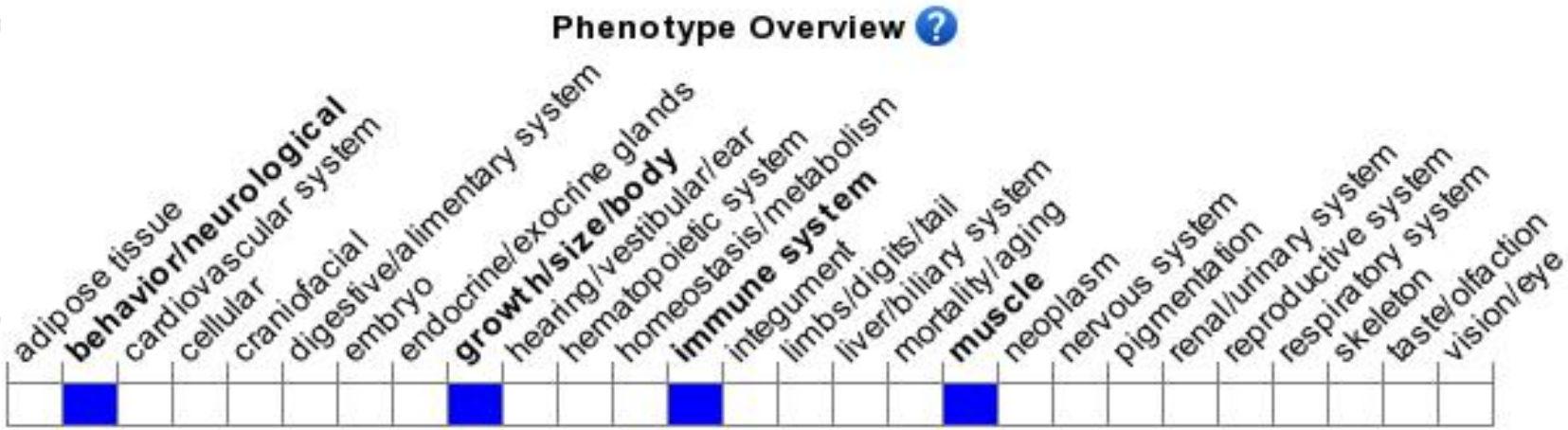
Genomic location distribution



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,Homozygotes for a targeted null mutation exhibit decreased growth and muscle defects including reduced muscle mass, muscle fiber loss, compensatory fiber hypertrophy, and impaired strength.

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

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