

Cav3 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Cav3

Project type

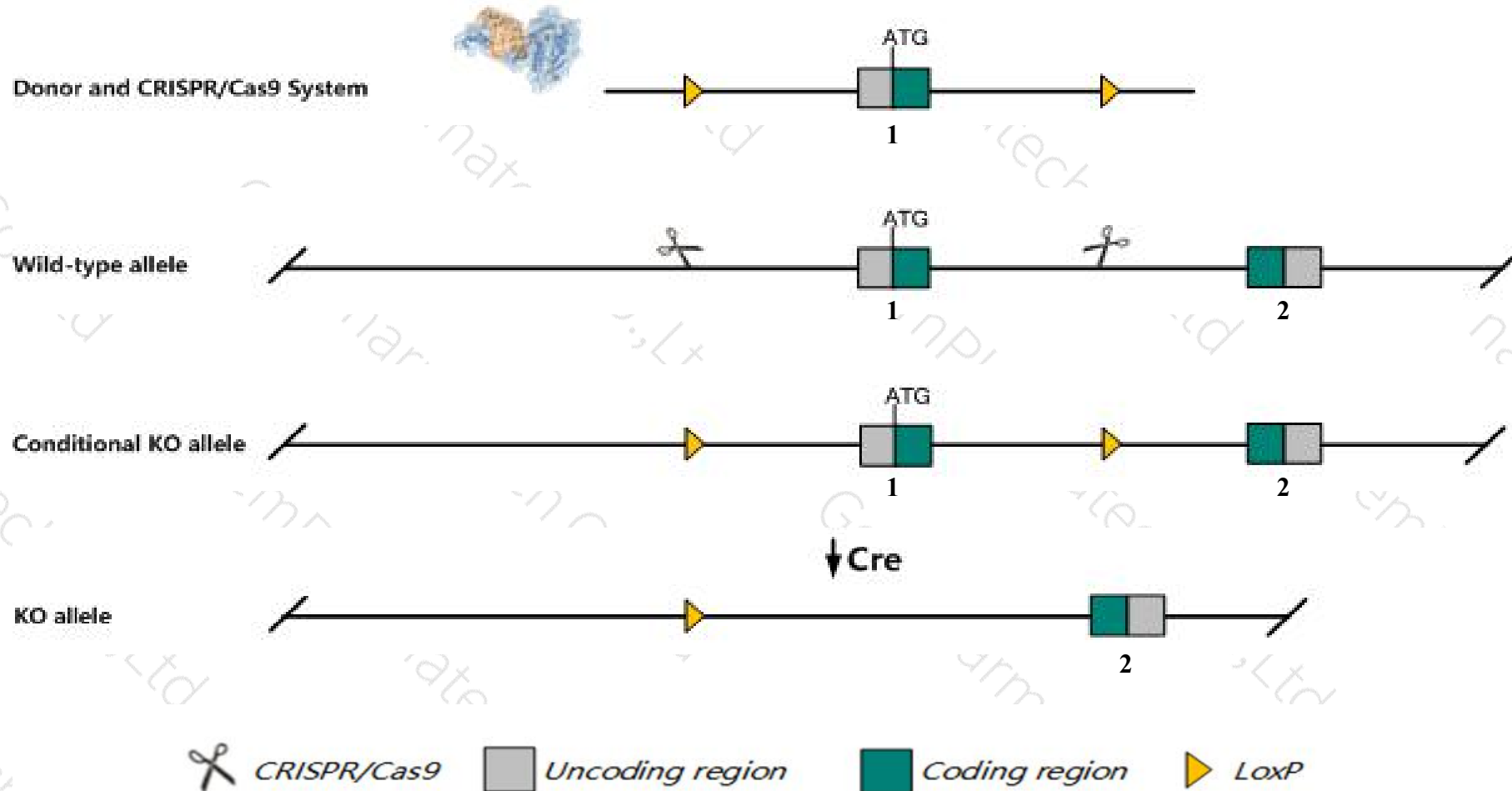
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cav3* gene. The schematic diagram is as follows:



Technical routes

- The *Cav3* gene has 1 transcript. According to the structure of *Cav3* gene, exon1 of *Cav3-201* (ENSMUST00000075477.7) 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 *Cav3* 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, Homozygous targeted mutant animals display mild myopathic changes in muscle.
- The *Cav3* gene is located on the Chr6. 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)

Cav3 caveolin 3 [Mus musculus (house mouse)]

Gene ID: 12391, updated on 9-Apr-2019

Summary



Official Symbol Cav3 provided by [MGI](#)

Official Full Name caveolin 3 provided by [MGI](#)

Primary source [MGI:MGI:107570](#)

See related [Ensembl:ENSMUSG00000062694](#)

Gene type protein coding

RefSeq status REVIEWED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as AI385751, Cav-3, M-cav

Summary This gene belongs to the caveolin family whose members encode the major protein components of caveolae, which are invaginations of plasma membrane. The encoded protein is muscle-specific and forms homooligomers in muscle cells. The protein binds and regulates phosphofructokinase M and neuronal nitric oxide synthase. It also associates with dystrophin in muscle cells. Mutations in this gene are associated with muscular dystrophy. [provided by RefSeq, Apr 2013]

Expression Biased expression in heart adult (RPKM 48.7), limb E14.5 (RPKM 10.8) and 6 other tissues [See more](#)

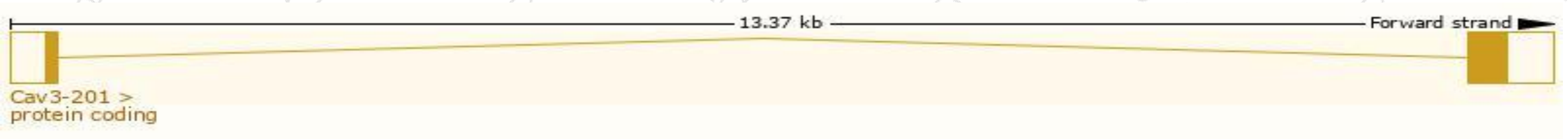
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

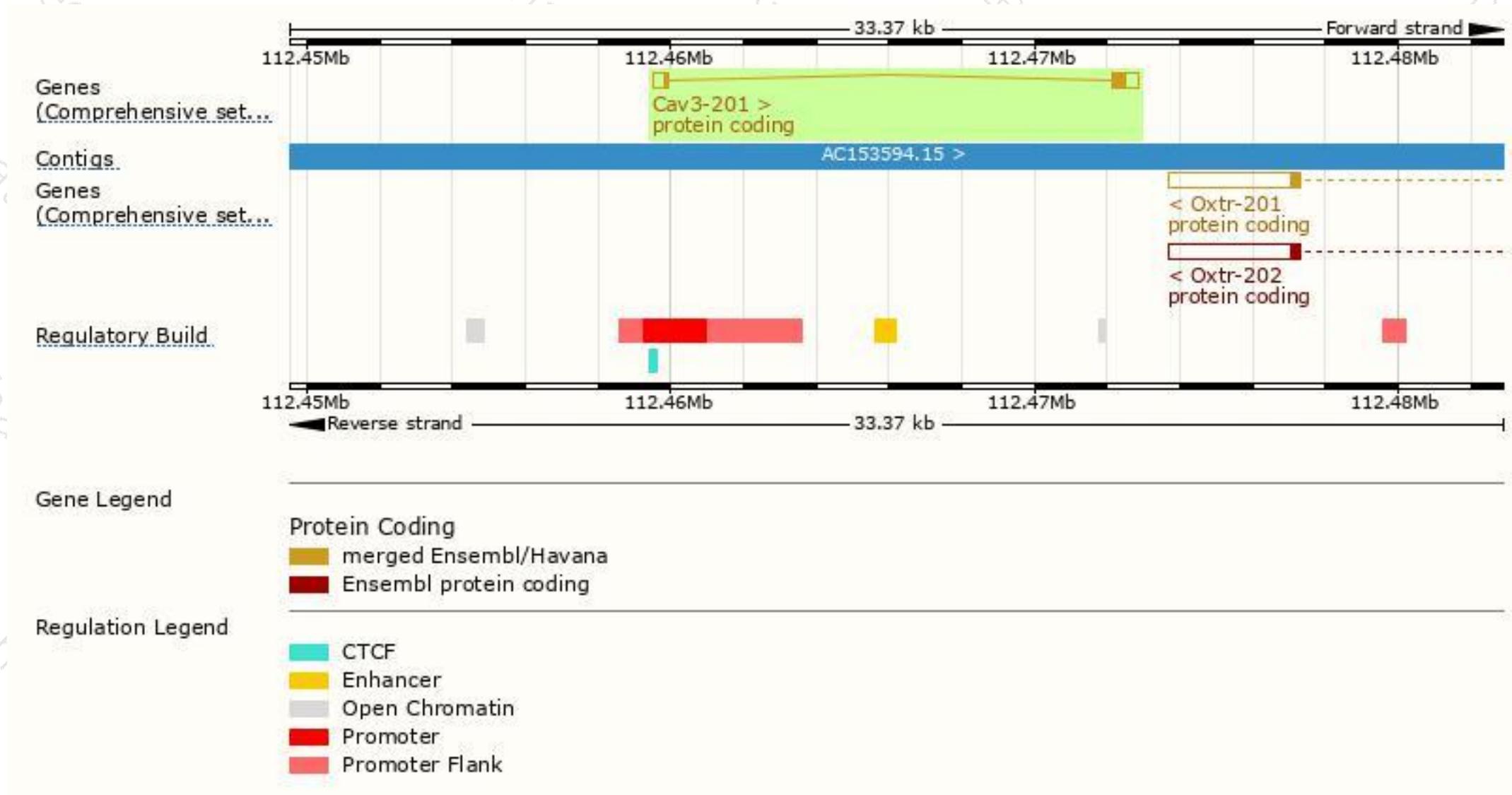
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cav3-201	ENSMUST00000075477.7	1157	151aa	Protein coding	CCDS20406	P51637	TSL:1 GENCODE basic APPRIS P1

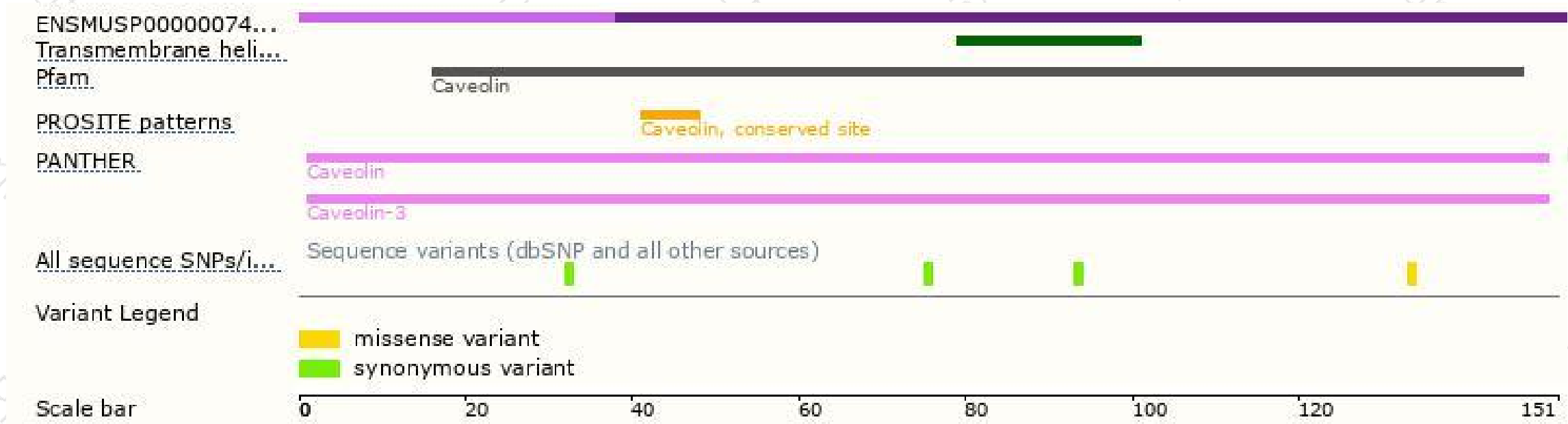
The strategy is based on the design of *Cav3-201* transcript, The transcription is shown below



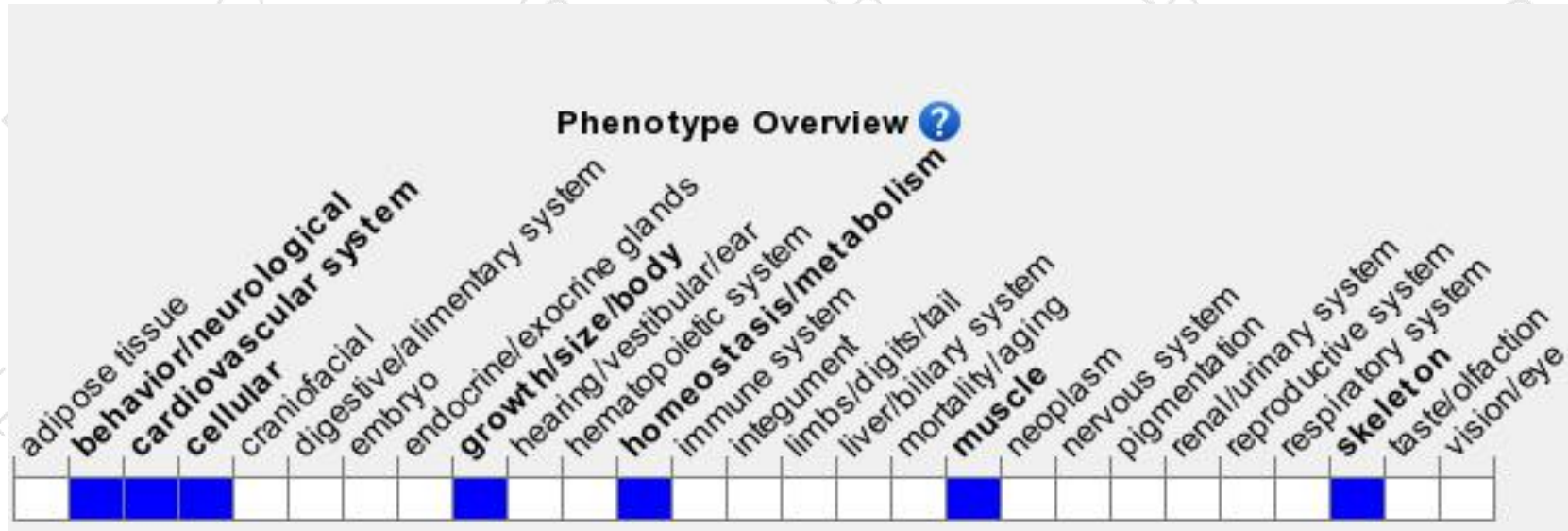
Genomic location distribution



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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