Casq1 Cas9-CKO Strategy

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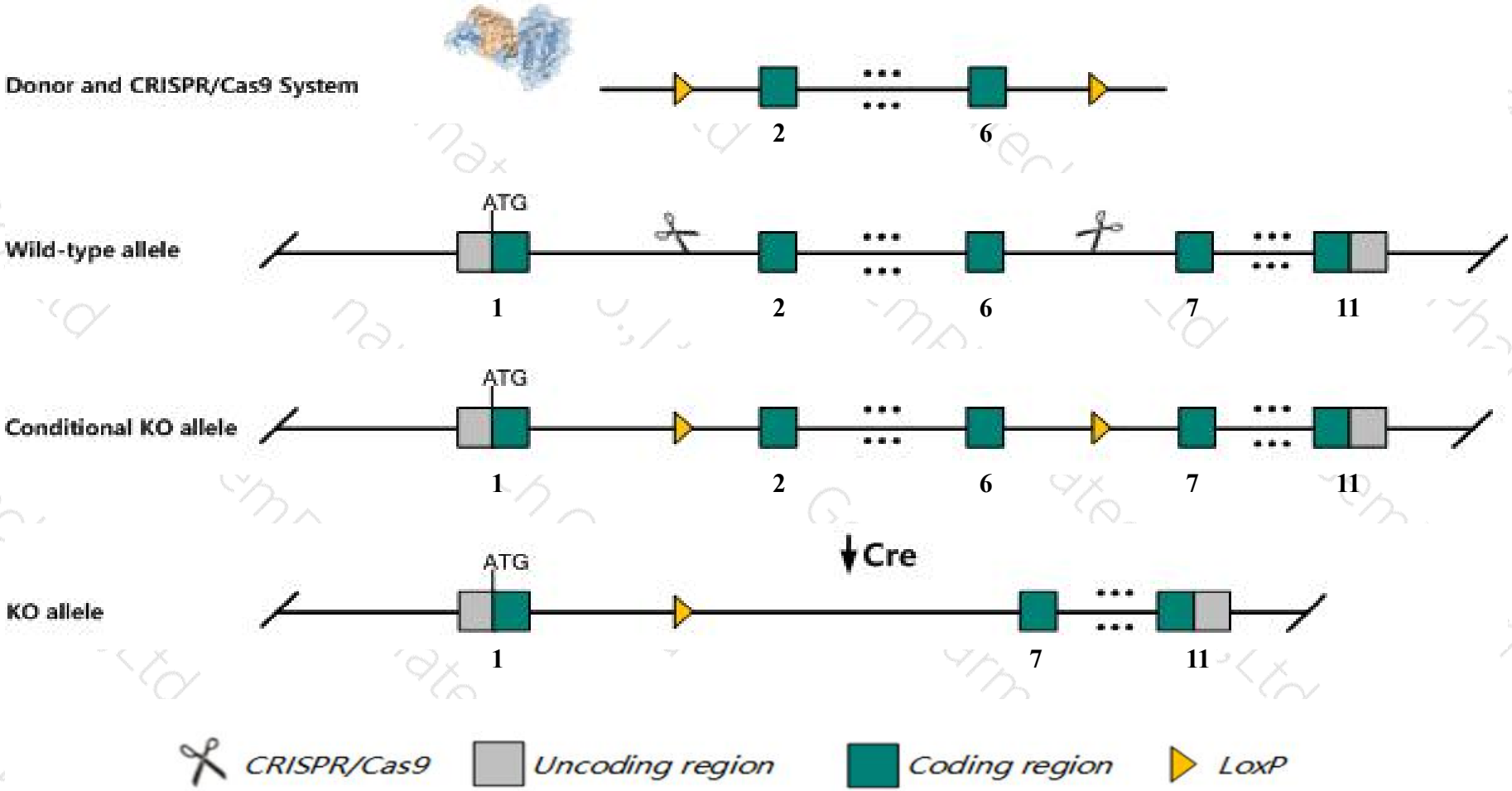
Project Overview

Project Name	***Casq1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Casq1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Casq1* gene has 3 transcripts. According to the structure of *Casq1* gene, exon2-exon6 of *Casq1-201*(ENSMUST00000003554.10) 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 *Casq1* 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,mice homozygous for an insertional mutation that inactivates the gene exhibit structural alterations of the Ca2+ release units, an increased frequency of mitochondria, and significantly impaired calcium handling in skeletal muscle.

➢ The *Casq1* gene is located on the Chr1. 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）

集萃药康 GemPharmatech

Casq1 calsequestrin 1 [Mus musculus (house mouse)]

Gene ID: 12372, updated on 13-Mar-2020

Summary

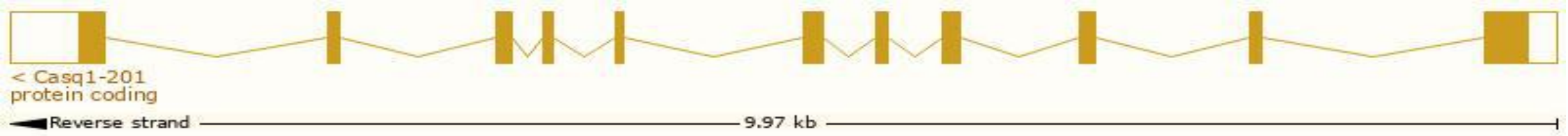
Official Symbol	Casq1 provided by MGI
Official Full Name	calsequestrin 1 provided by MGI
Primary source	MGI:MGI:1309468
See related	Ensembl:ENSMUSG00000007122
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CSQ, CSQ-1, CSQ1, sCSQ
Expression	Biased expression in mammary gland adult (RPKM 118.1), heart adult (RPKM 12.4) and 1 other tissue See more
Orthologs	human all

Transcript information（Ensembl）

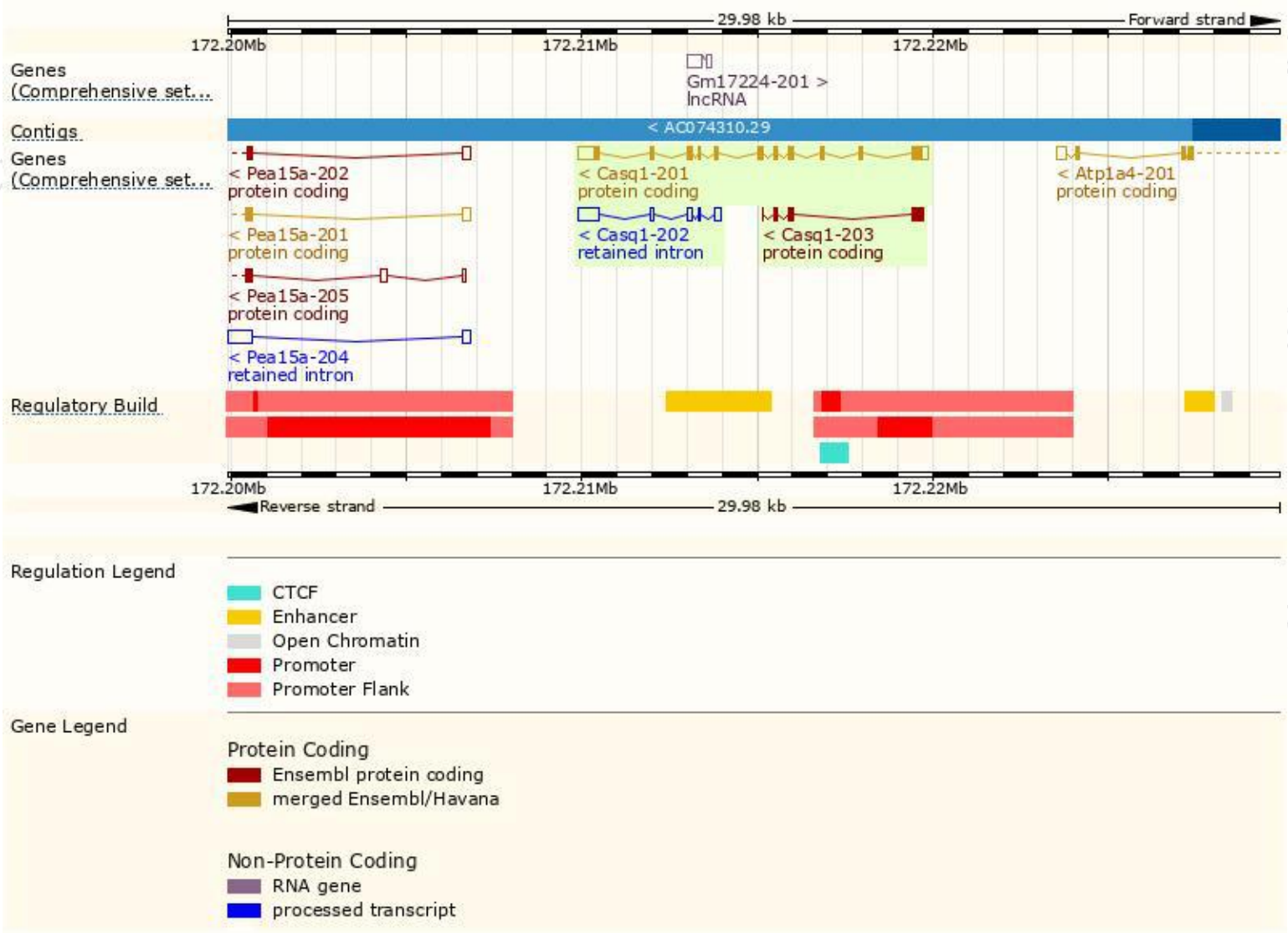
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Casq1-201	ENSMUST00000003554.10	1847	405aa	Protein coding	CCDS35781	O09165	TSL:1 GENCODE basic APPRIS P1
Casq1-203	ENSMUST00000170700.1	493	156aa	Protein coding	-	E9Q489	CDS 3' incomplete TSL:5
Casq1-202	ENSMUST00000170638.1	990	No protein	Retained intron	-	-	TSL:1

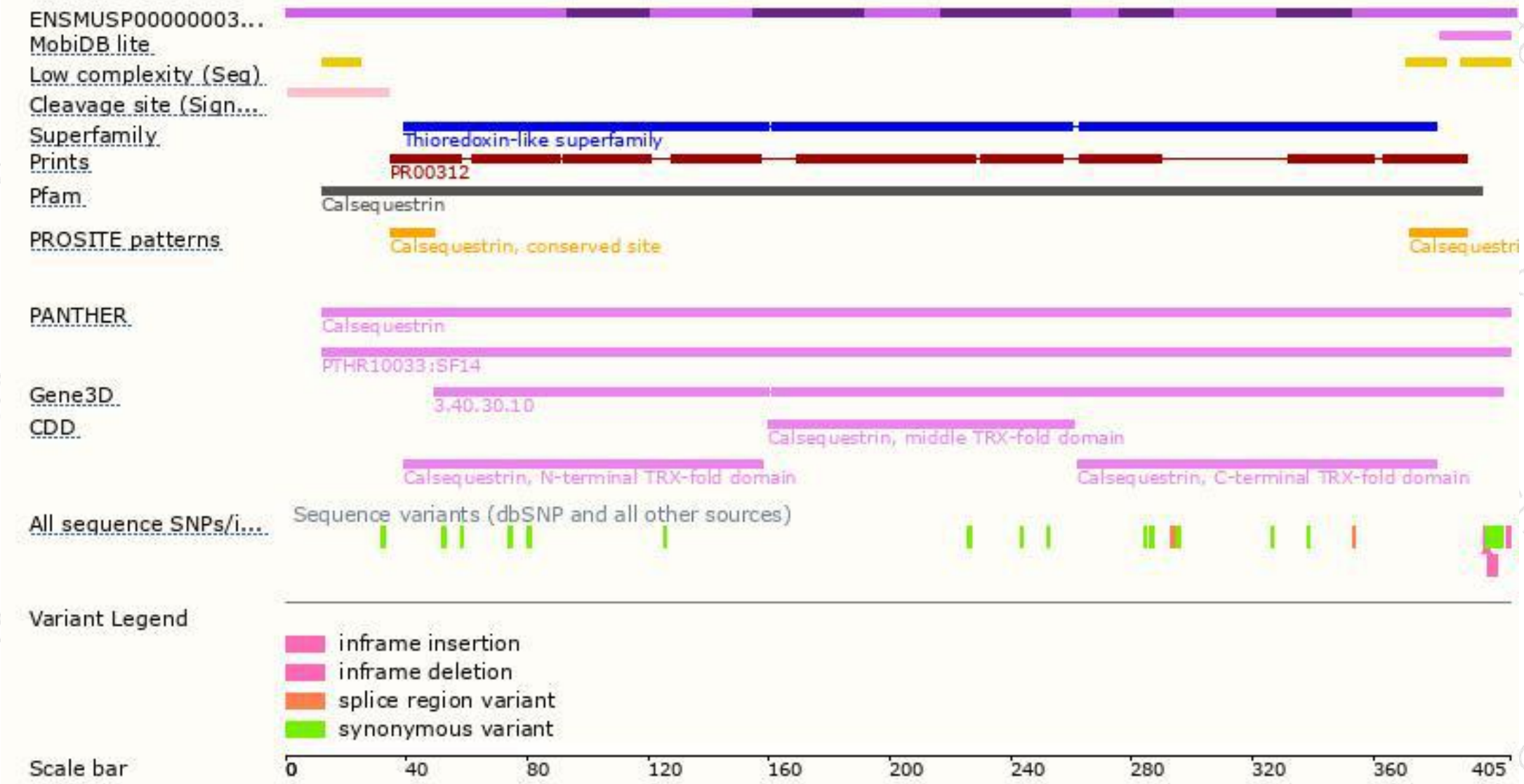
The strategy is based on the design of *Casq1-201* transcript,the transcription is shown below:



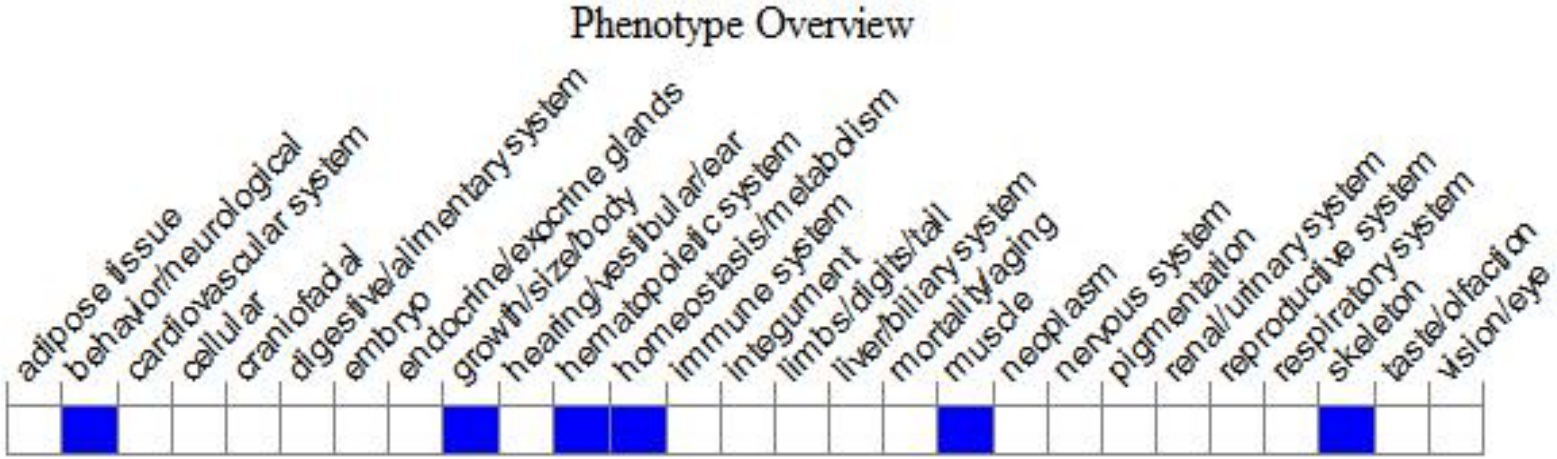
Genomic location distribution



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 an insertional mutation that inactivates the gene exhibit structural alterations of the Ca2+ release units, an increased frequency of mitochondria, and significantly impaired calcium handling in skeletal muscle.

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

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