

***Bcar1* Cas9-CKO Strategy**

Designer: Huan Wang

Reviewer: Yumeng Wang

Design Date: 2021-9-27

Project Overview

Project Name

Bcar1

Project type

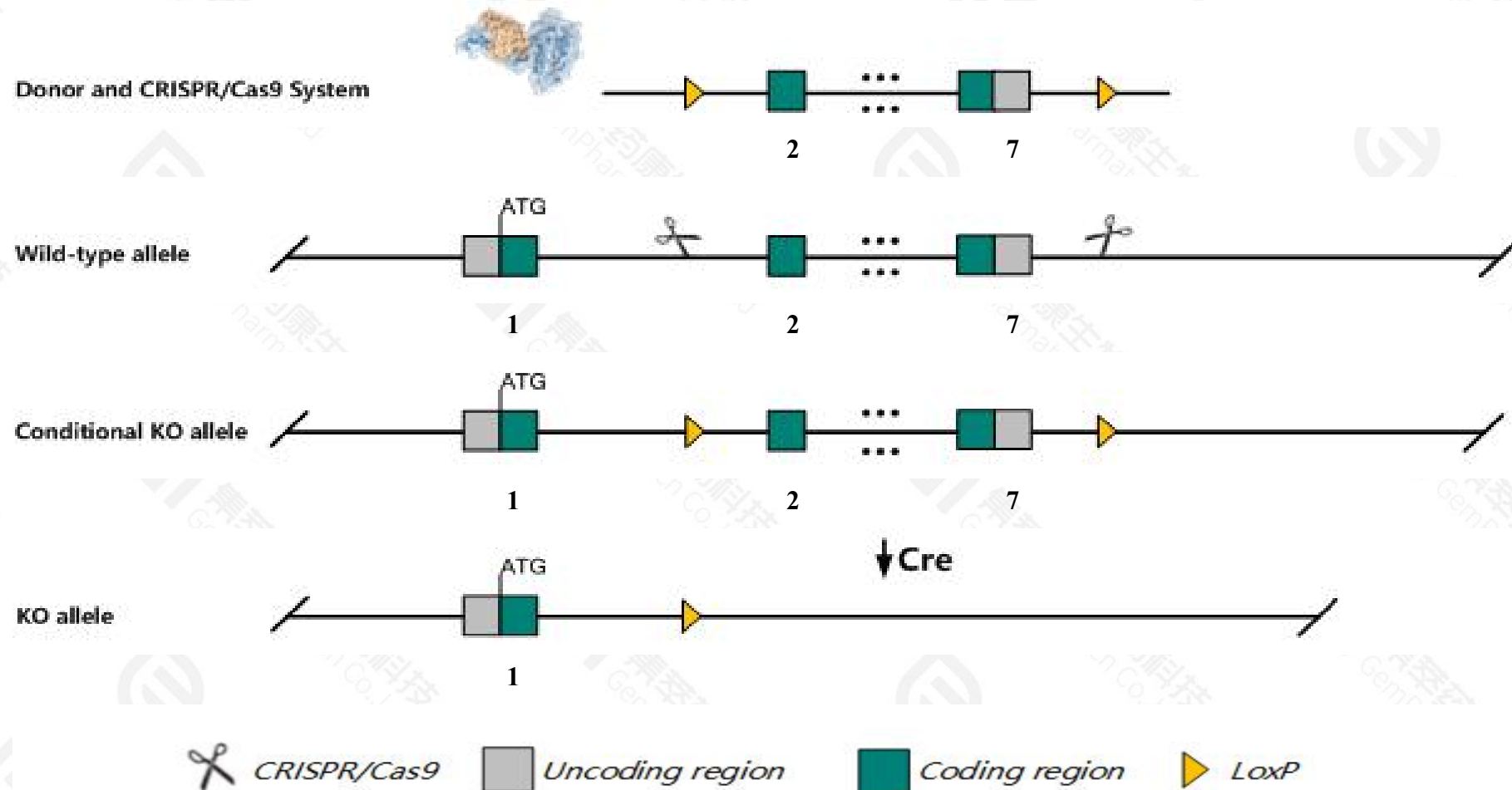
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bcar1* gene. The schematic diagram is as follows:



- The *Bcar1* gene has 3 transcripts. According to the structure of *Bcar1* gene, exon2-exon7 of *Bcar1-201*(ENSMUST00000166232.4) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Bcar1* 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 null embryos exhibit growth retardation and embryonic lethality, following disruption of cardiac myofibrils, increased vasodilation, and systemic congestion.
- The *Bcar1* gene is located on the Chr8. 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)

Bcar1 breast cancer anti-estrogen resistance 1 [Mus musculus (house mouse)]

Gene ID: 12927, updated on 21-Mar-2020

Summary

Official Symbol Bcar1 provided by [MGI](#)

Official Full Name breast cancer anti-estrogen resistance 1 provided by [MGI](#)

Primary source [MGI:MGI:108091](#)

See related [Ensembl:ENSMUSG000000031955](#)

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 AI385681, Cas, Crkas

Expression Ubiquitous expression in adrenal adult (RPKM 90.6), small intestine adult (RPKM 67.5) and 25 other tissues [See more](#)

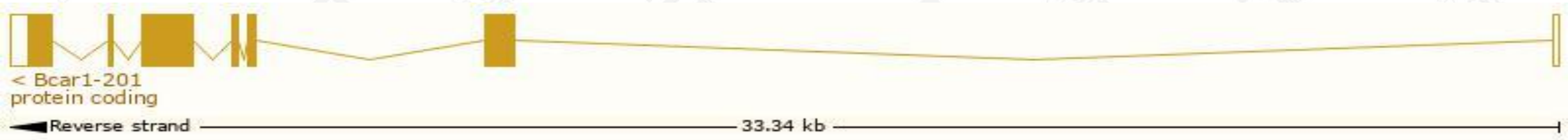
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

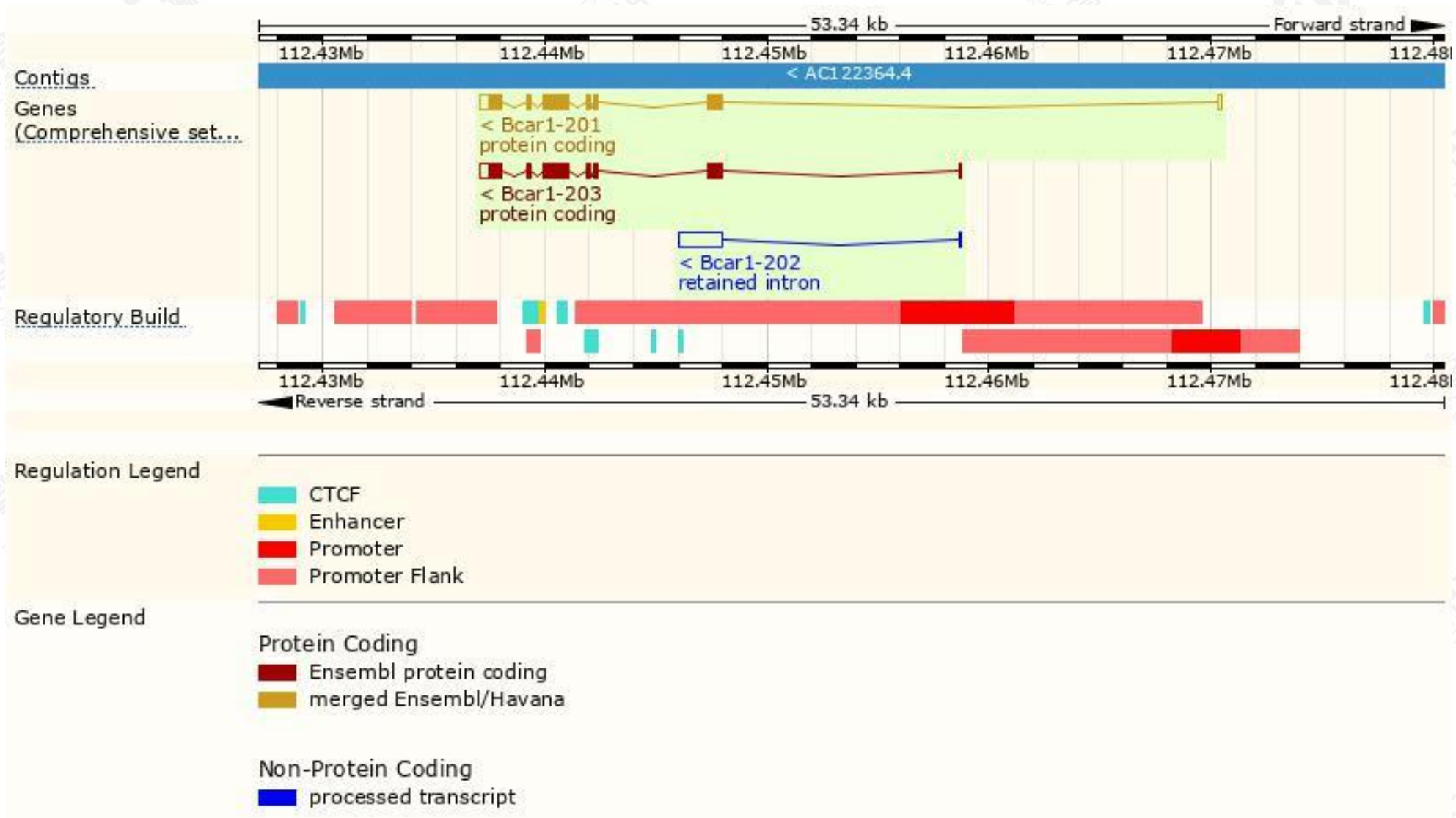
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bcar1-201	ENSMUST00000166232.3	3142	874aa	Protein coding	CCDS52675	Q61140	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P3
Bcar1-203	ENSMUST00000212349.1	3116	874aa	Protein coding	CCDS85616	Q61140	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS ALT2
Bcar1-202	ENSMUST00000212147.1	2007	No protein	Retained intron	-	-	TSL:1

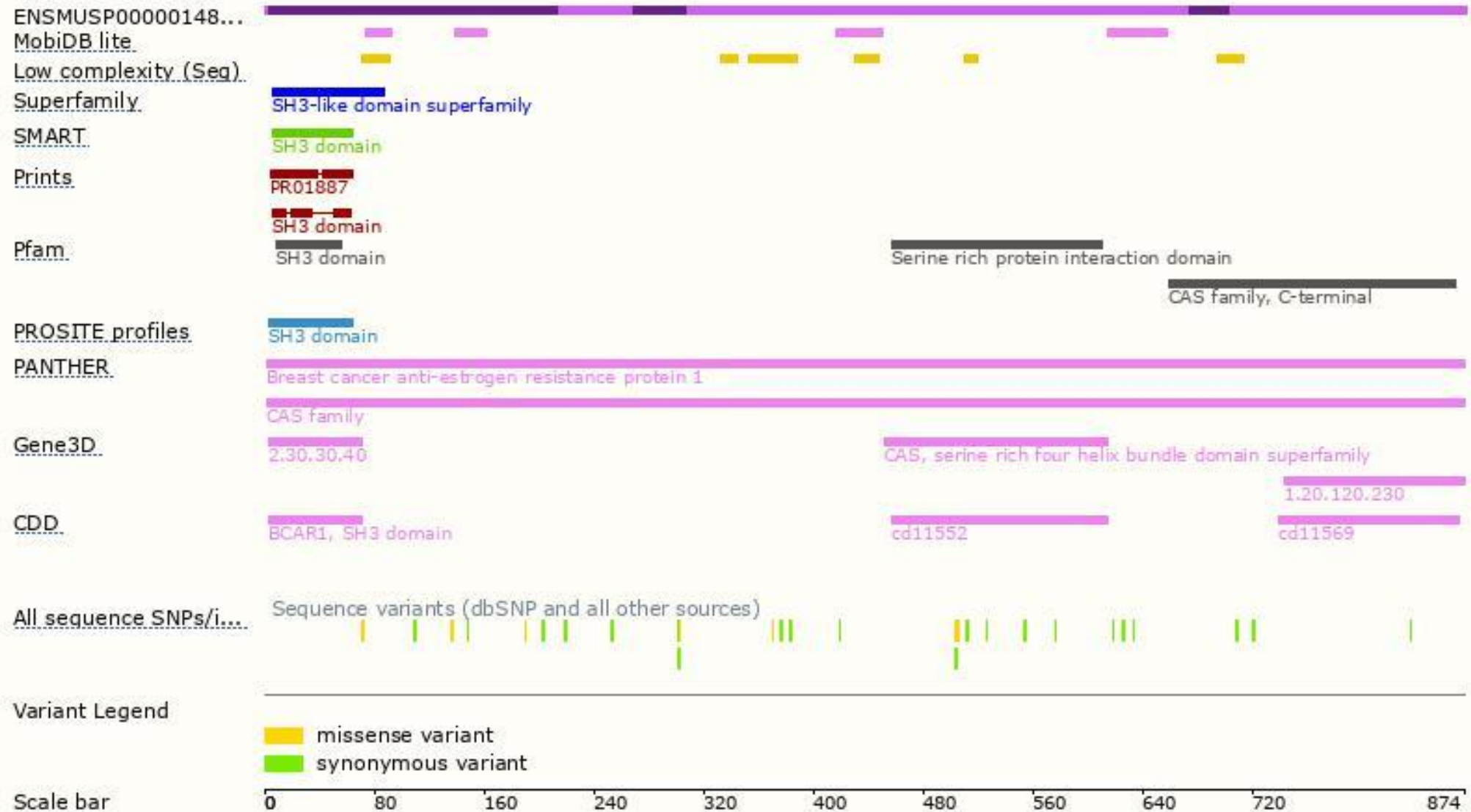
The strategy is based on the design of *Bcar1-201* transcript,the transcription is shown below:



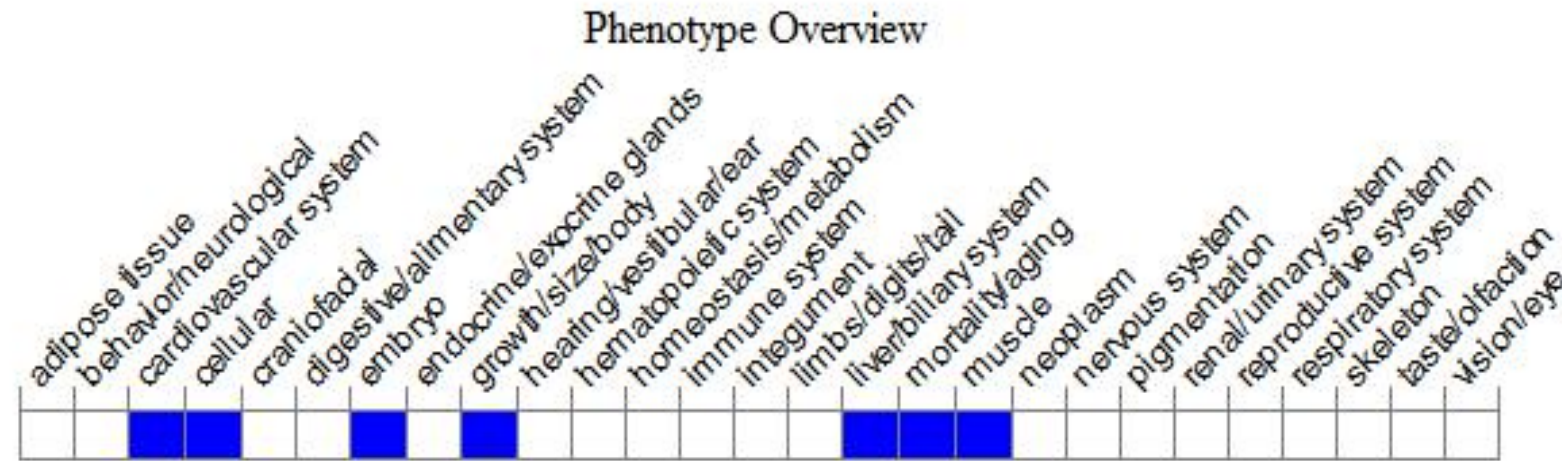
Genomic location distribution



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, homozygous null embryos exhibit growth retardation and embryonic lethality, following disruption of cardiac myofibrils, increased vasodilation, and systemic congestion.

If you have any questions, you are welcome to inquire.
Tel: 400-9660890

