

Abca5 Cas9-KO Strategy

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Project Overview

Project Name

Abca5

Project type

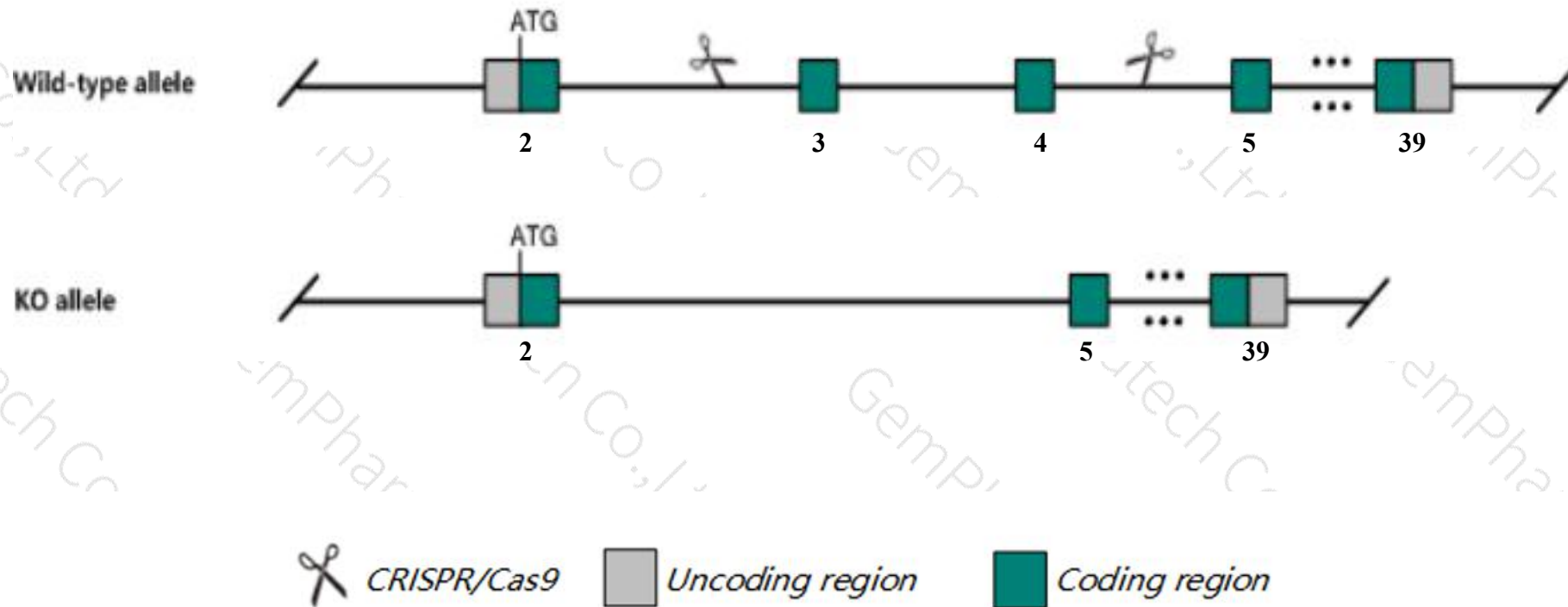
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Abca5* gene. The schematic diagram is as follows:



- The *Abca5* gene has 5 transcripts. According to the structure of *Abca5* gene, exon3-exon4 of *Abca5-201* (ENSMUST00000043961.11) transcript is recommended as the knockout region. The region contains 367bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Abca5* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit exophthalmos, tremors and collapse of the thyroid gland, and develop a dilated cardiomyopathy with large thrombi due to depression of the cardiac function. Severe edema, liver injury and premature death appear to be sensitive to genetic background.
- The *Abca5* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Abca5 ATP-binding cassette, sub-family A (ABC1), member 5 [*Mus musculus* (house mouse)]

Gene ID: 217265, updated on 12-Aug-2019

Summary

Official Symbol	Abca5 provided by MGI
Official Full Name	ATP-binding cassette, sub-family A (ABC1), member 5 provided by MGI
Primary source	MGI:MGI:2386607
See related	Ensembl:ENSMUSG00000018800
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	ABC13; mKIAA1888; B930033A02Rik
Expression	Broad expression in cerebellum adult (RPKM 4.0), cortex adult (RPKM 3.1) and 19 other tissues See more
Orthologs	human all

Genomic context

Location: 11; 11 E1

See Abca5 in [Genome Data Viewer](#)

Exon count: 39

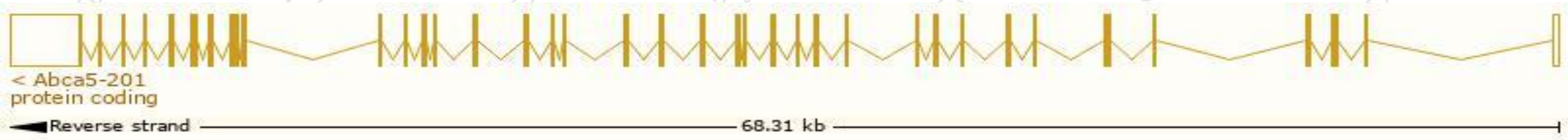
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	11	NC_000077.6 (110269369..110337723, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	11	NC_000077.5 (110130683..110199030, complement)

Transcript information (Ensembl)

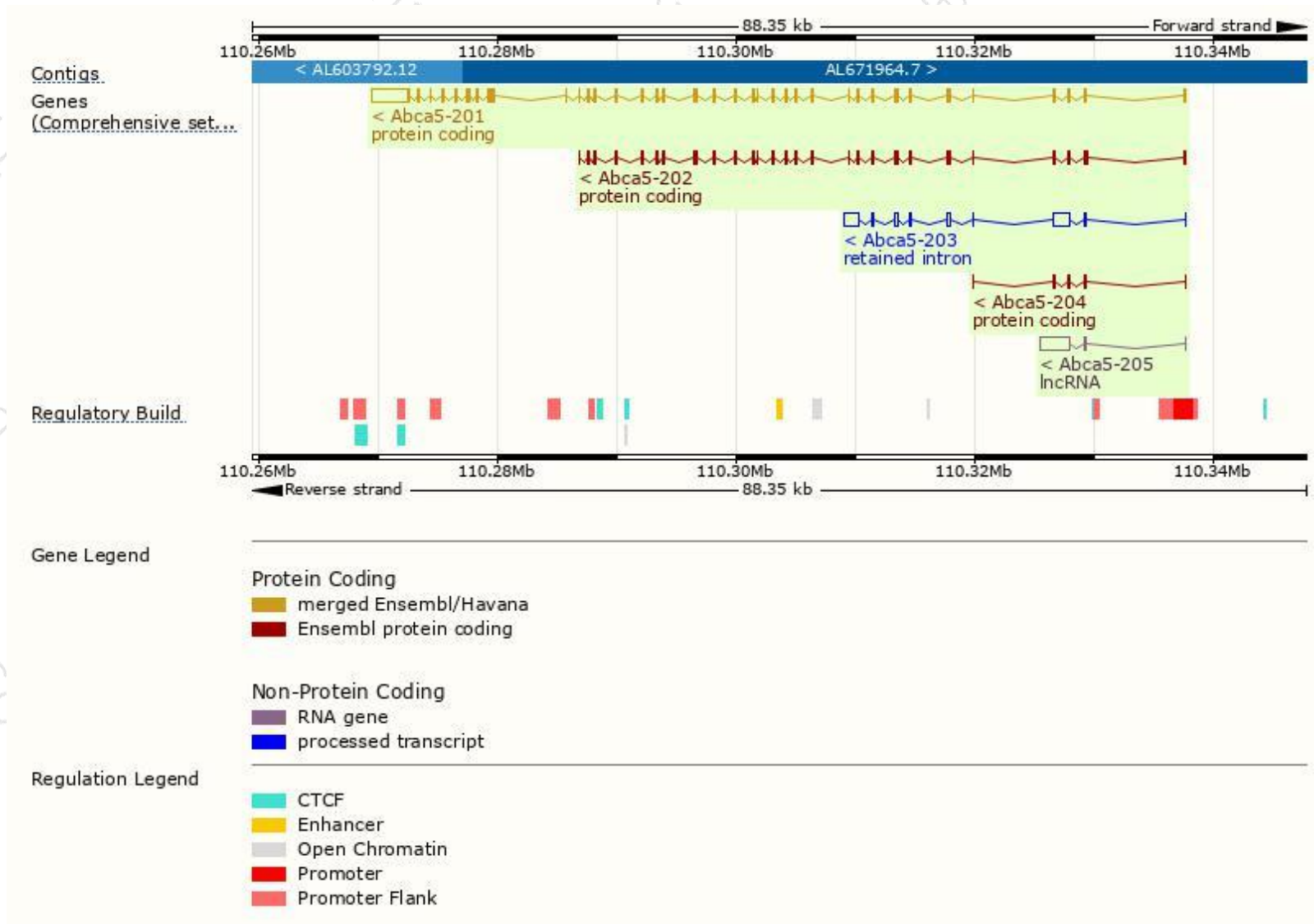
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Abca5-201	ENSMUST00000043961.11	8231	1642aa	Protein coding	CCDS25591	Q8K448	TSL:1 GENCODE basic APPRIS P1
Abca5-202	ENSMUST00000124714.7	3829	1194aa	Protein coding	-	A2AEP5	CDS 3' incomplete TSL:1
Abca5-204	ENSMUST00000134721.1	610	181aa	Protein coding	-	A2AEP6	CDS 3' incomplete TSL:5
Abca5-203	ENSMUST00000127318.7	3580	No protein	Retained intron	-	-	TSL:1
Abca5-205	ENSMUST00000148984.1	2684	No protein	lncRNA	-	-	TSL:1

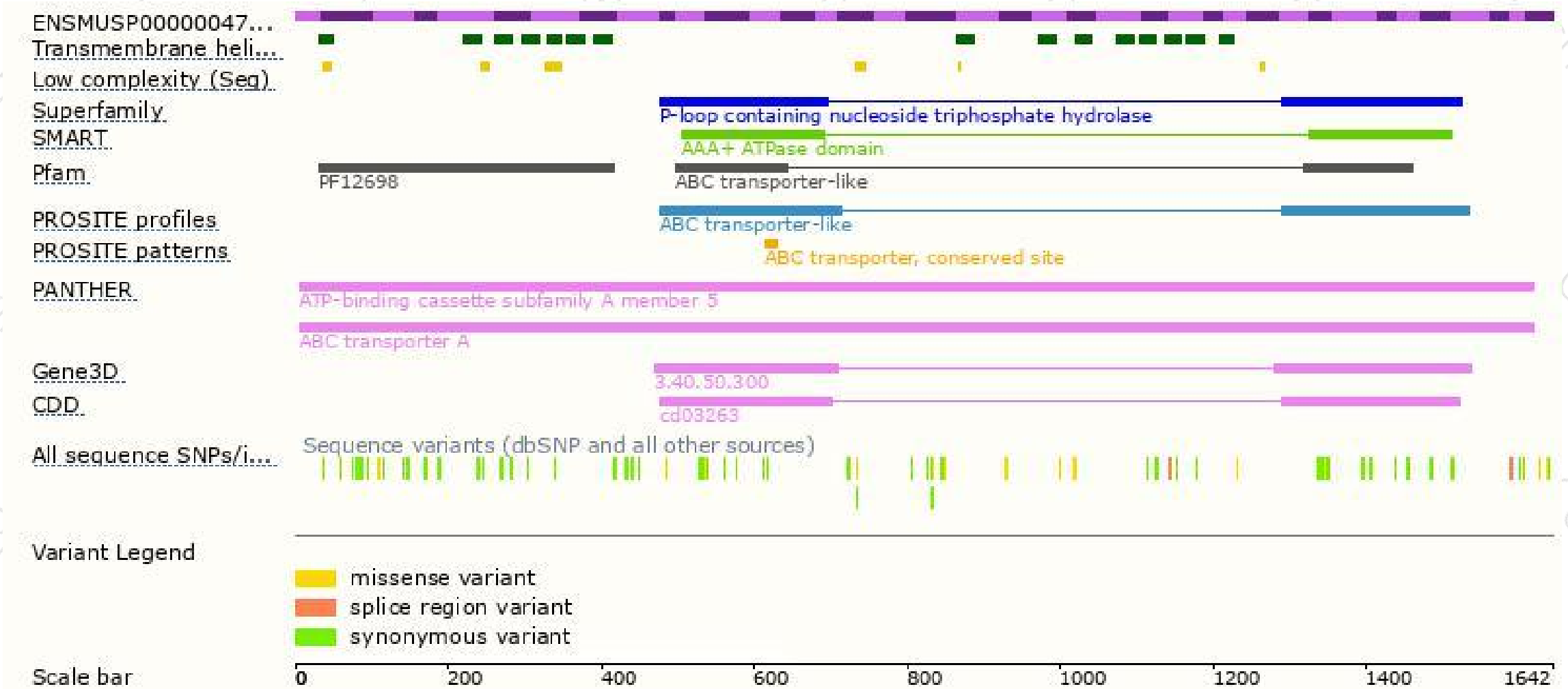
The strategy is based on the design of *Abca5-201* transcript,The transcription is shown below



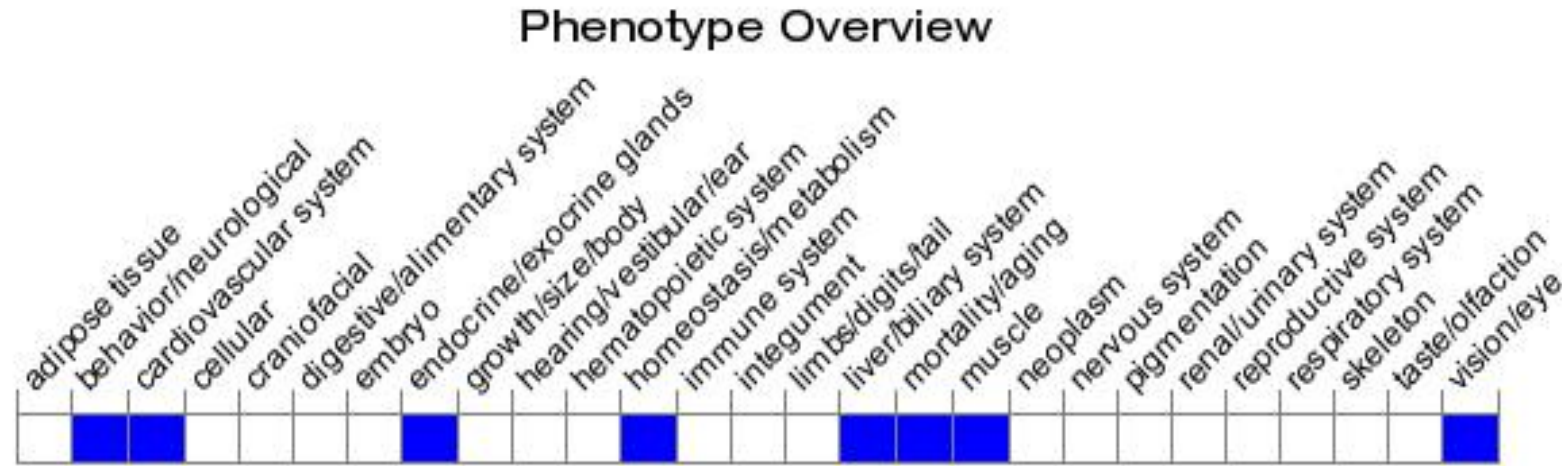
Genomic location distribution



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 a knock-out allele exhibit exophthalmos, tremors and collapse of the thyroid gland, and develop a dilated cardiomyopathy with large thrombi due to depression of the cardiac function. Severe edema, liver injury and premature death appear to be sensitive to genetic background.

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

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