Atoh7 Cas9-CKO Strategy

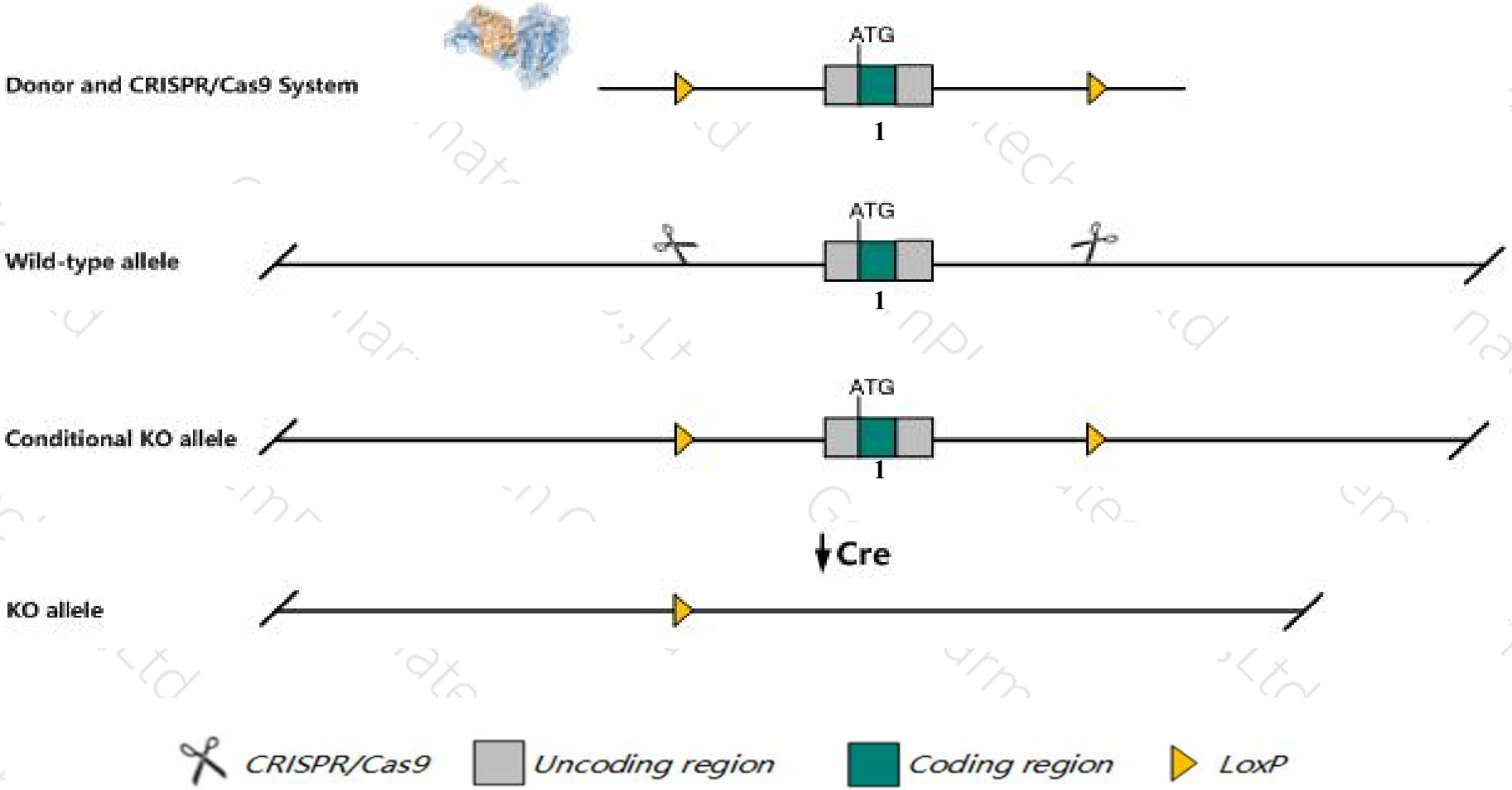
Designer:Xueting Zhang
Reviewer:Yanhua Shen
Date:2019-11-18

Project Overview

Project Name	***Atoh7***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atoh7* gene. The schematic diagram is as follows:



Technical routes

- The *Atoh7* gene has 2 transcripts. According to the structure of *Atoh7* gene, exon1 of *Atoh7-201* (ENSMUST00000044059.4) transcript is recommended as the knockout region.The region contains all 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 *Atoh7* 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,Homozygous mutation of this gene results in impaired differentiation of retinal ganglion cells resulting in an increase of amacrine cells. Mice show impaired optic nerve formation and one allele shows loss of circadian photoentrainment.
- *Gm38063* gene will be deleted together in this strategy.
- The *Atoh7* gene is located on the Chr10. 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

Atoh7 atonal bHLH transcription factor 7 [*Mus musculus* (house mouse)]

Gene ID: 53404, updated on 5-Nov-2019

Summary

Official Symbol	Atoh7 provided by MGI
Official Full Name	atonal bHLH transcription factor 7 provided by MGI
Primary source	MGI:MGI:1355553
See related	Ensembl:ENSMUSG00000036816
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	Math5; bHLHa13
Expression	Biased expression in cerebellum adult (RPKM 1.7), cortex adult (RPKM 0.3) and 4 other tissues See more
Orthologs	human all

Genomic context

Location: 10 B4; 10 32.54 cM

See Atoh7 in Genome Data Viewer

Exon count: 1

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	10	NC_000076.6 (63099785..63101280)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	10	NC_000076.5 (62562904..62563353)

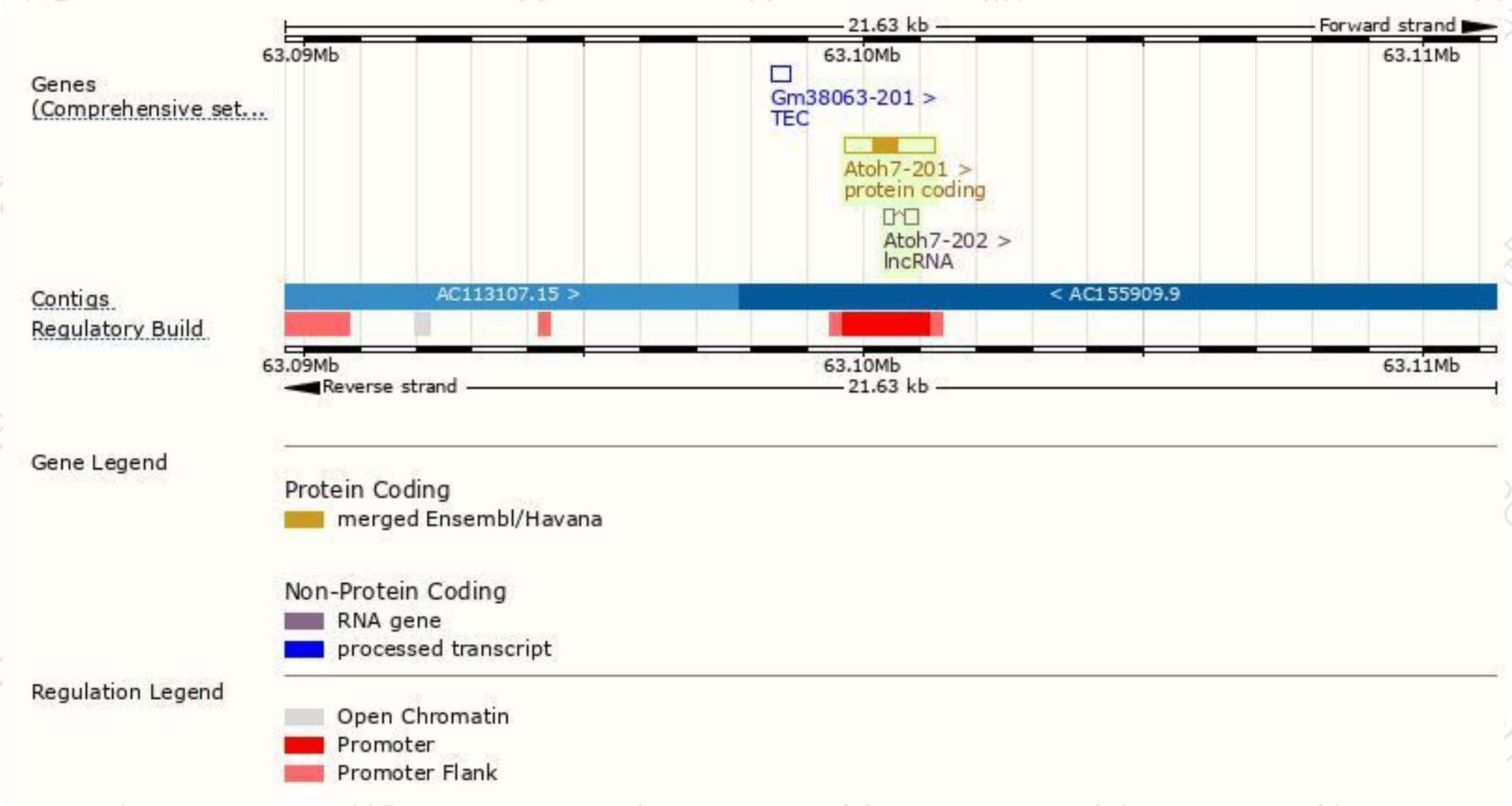
Transcript information（Ensembl）

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

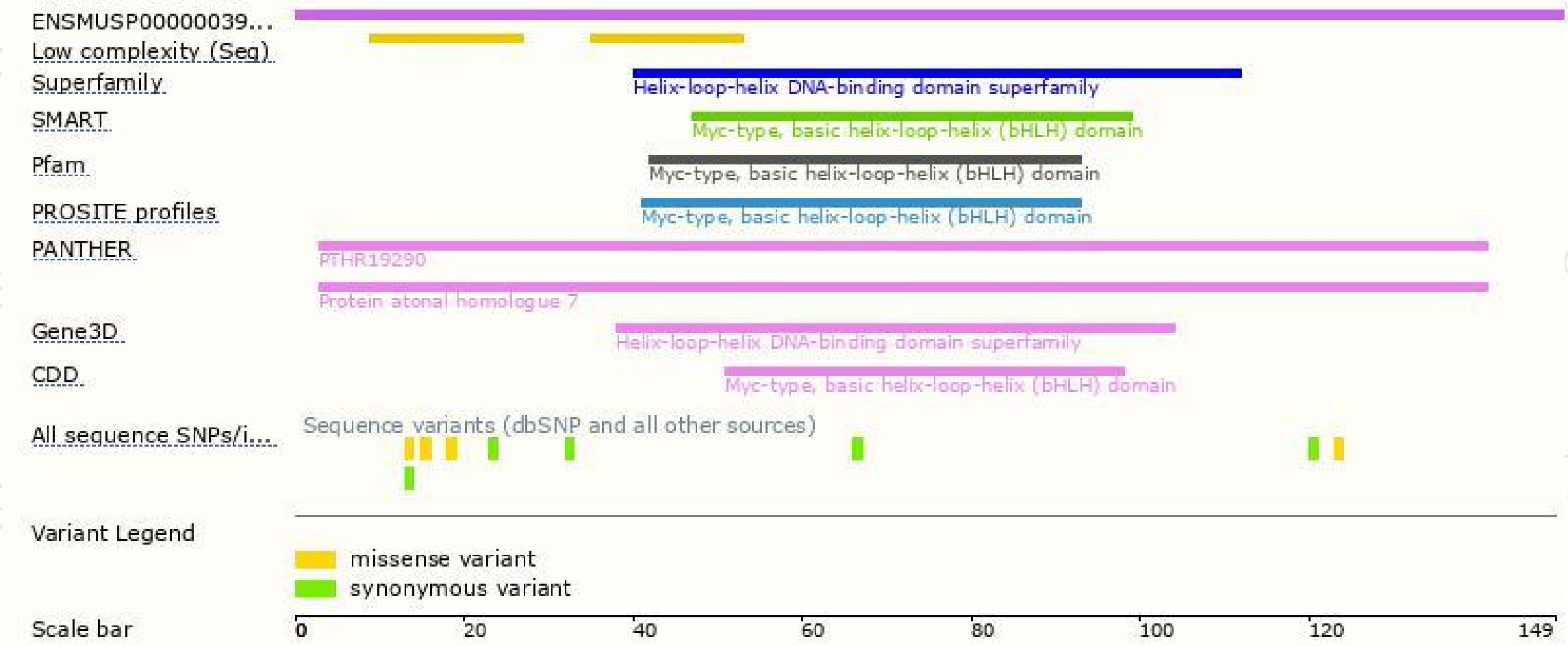
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atoh7-201	ENSMUST00000044059.4	1629	149aa	Protein coding	CCDS23896	Q9Z2E5	TSL:NA GENCODE basic APPRIS P1
Atoh7-202	ENSMUST00000219964.1	416	No protein	lncRNA	-	-	TSL:1

The strategy is based on the design of *Atoh7-201* transcript,The transcription is shown below

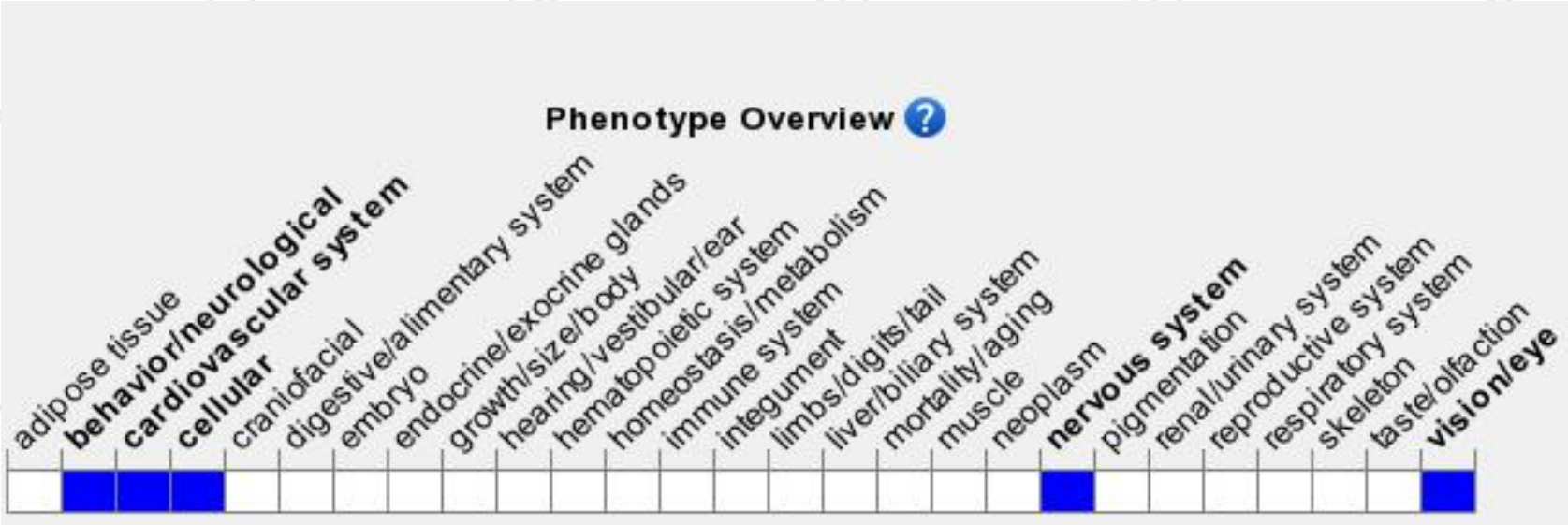
Genomic location distribution



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 mutation of this gene results in impaired differentiation of retinal ganglion cells resulting in an increase of amacrine cells. Mice show impaired optic nerve formation and one allele shows loss of circadian photoentrainment.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd