Itga8 Cas9-KO Strategy

Designer: Yanhua Shen

Reviewer: Xueting Zhang

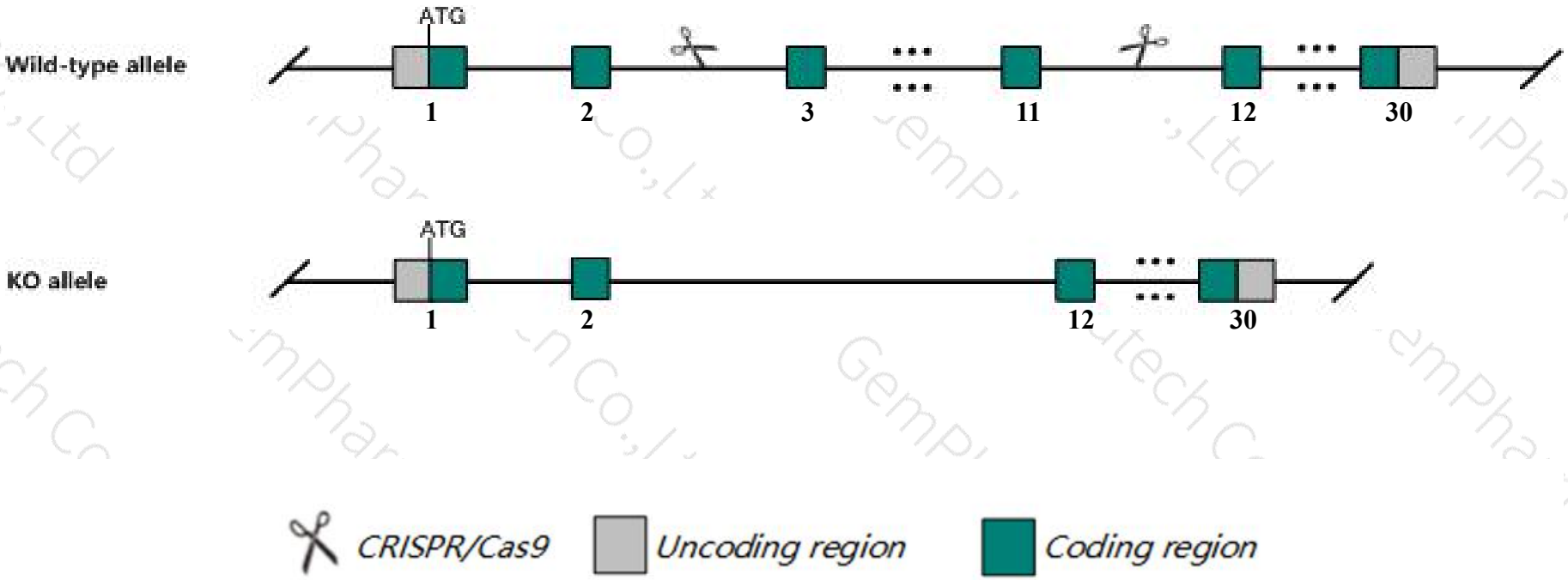
Design Date: 2020-01-21

Project Overview

Project Name	***Itga8***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Itga8* gene. The schematic diagram is as follows:



Technical routes

➢ The *Itga8* gene has 7 transcripts. According to the structure of *Itga8* gene, exon3-exon11 of *Itga8-201* (ENSMUST00000028106.10) transcript is recommended as the knockout region.The region contains 658bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Itga8* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for disruptions in this gene usually die by the end of the second day after birth. Those that do survive have reduced kidneys and abnormal steriocilia in the inner ear.
- Transcripts 202,203 may not be affected.
- The effect of transcript 205 is unknown.
- The *Itga8* gene is located on the Chr2. 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）

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Itga8 integrin alpha 8 [*Mus musculus* (house mouse)]

Gene ID: 241226, updated on 12-Aug-2019

Summary

Official Symbol	Itga8 provided by MGI
Official Full Name	integrin alpha 8 provided by MGI
Primary source	MGI:MGI:109442
See related	Ensembl:ENSMUSG00000026768
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	AI447669
Summary	This gene encodes a member of the integrin family of cell surface proteins that mediate cellular interactions with the extracellular matrix and other cells. The encoded protein undergoes proteolytic processing to generate the disulfide-linked heterodimeric alpha subunit which, in turn associates with a beta subunit to form the functional integrin receptor. Mice lacking the encoded protein mostly die after birth due to kidney defects, but some of animals that survive exhibit defects in the sensory hair cells of the inner ear. [provided by RefSeq, Aug 2016]
Expression	Biased expression in lung adult (RPKM 16.4), bladder adult (RPKM 4.7) and 14 other tissues See more
Orthologs	human all

Genomic context

Location: 2 A1; 2 9.12 cM

See Itga8 in Genome Data Viewer

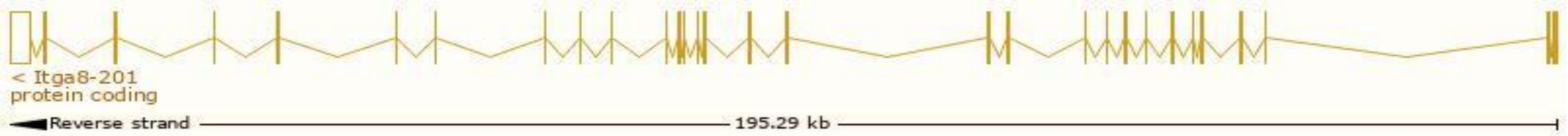
Exon count: 33

Transcript information（Ensembl）

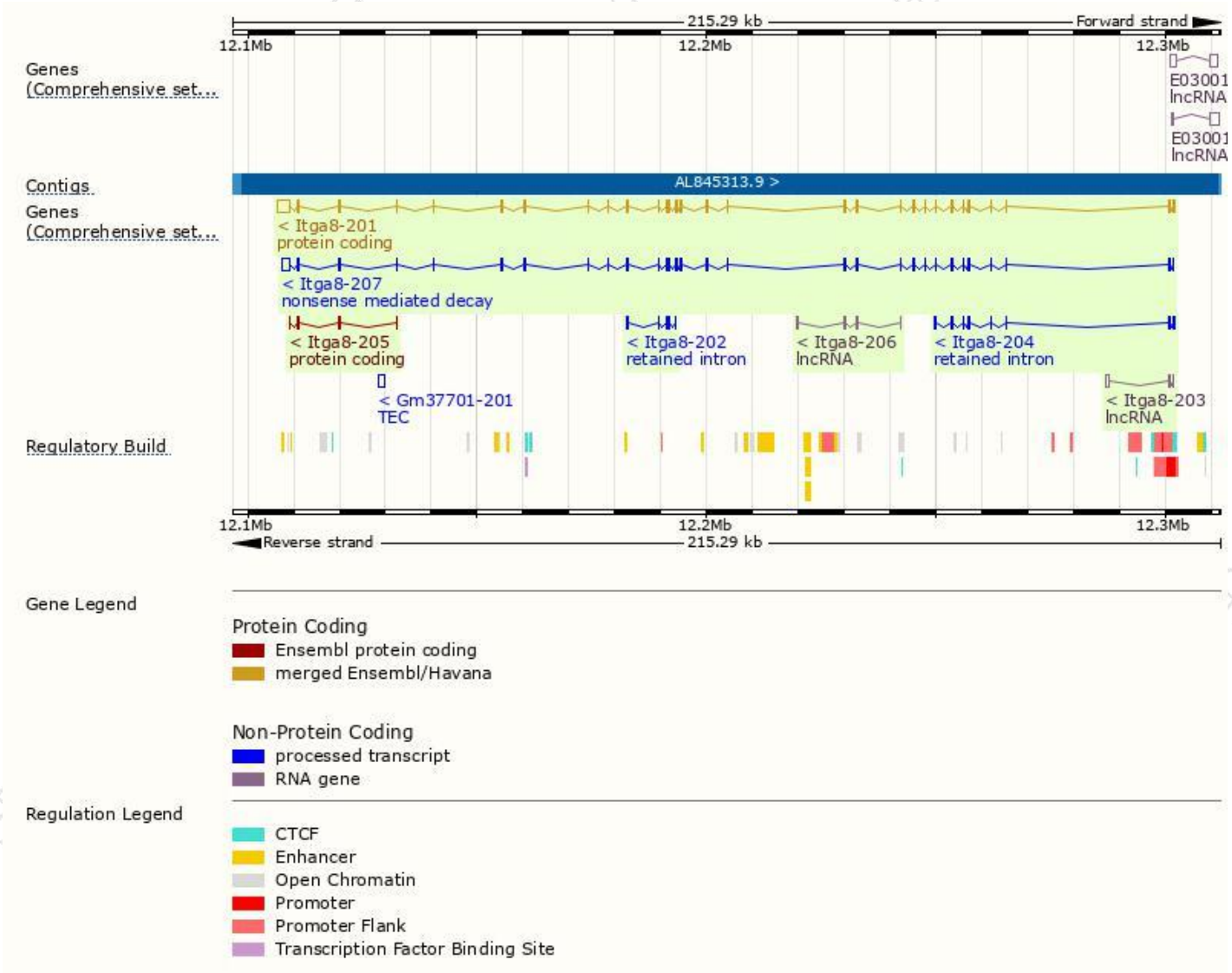
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Itga8-201	ENSMUST00000028106.10	5812	1062aa	Protein coding	CCDS15689	A2ARA8	TSL:1 GENCODE basic APPRIS P1
Itga8-205	ENSMUST00000148055.1	491	133aa	Protein coding	-	G3UYV5	CDS 5' incomplete TSL:5
Itga8-207	ENSMUST00000172791.7	4948	590aa	Nonsense mediated decay	-	G3UYN5	TSL:1
Itga8-204	ENSMUST00000141477.7	1265	No protein	Retained intron	-	-	TSL:1
Itga8-202	ENSMUST00000129370.1	488	No protein	Retained intron	-	-	TSL:3
Itga8-206	ENSMUST00000172716.2	924	No protein	lncRNA	-	-	TSL:3
Itga8-203	ENSMUST00000130548.2	885	No protein	lncRNA	-	-	TSL:5

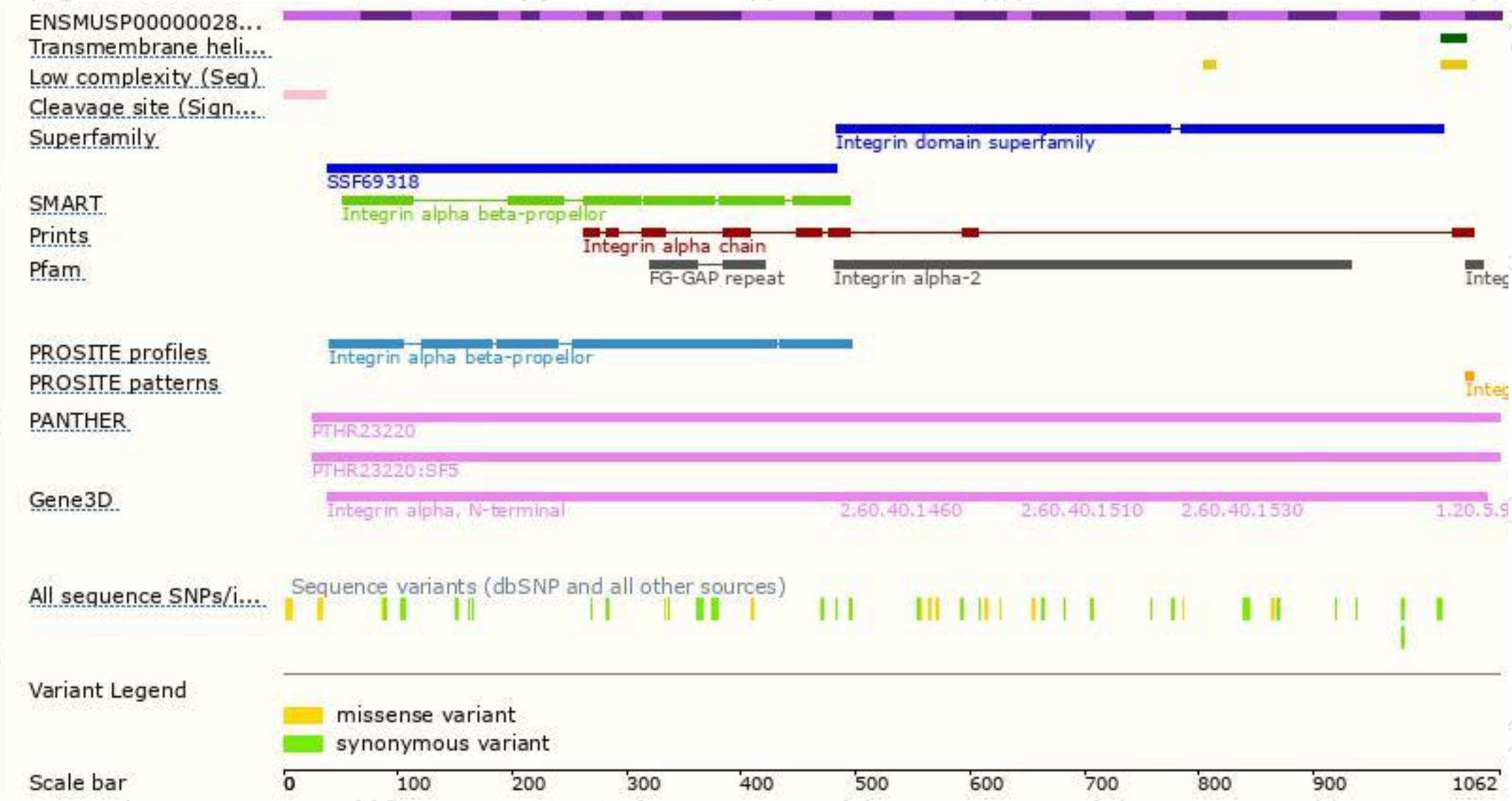
The strategy is based on the design of *Itga8-201* transcript,The transcription is shown below



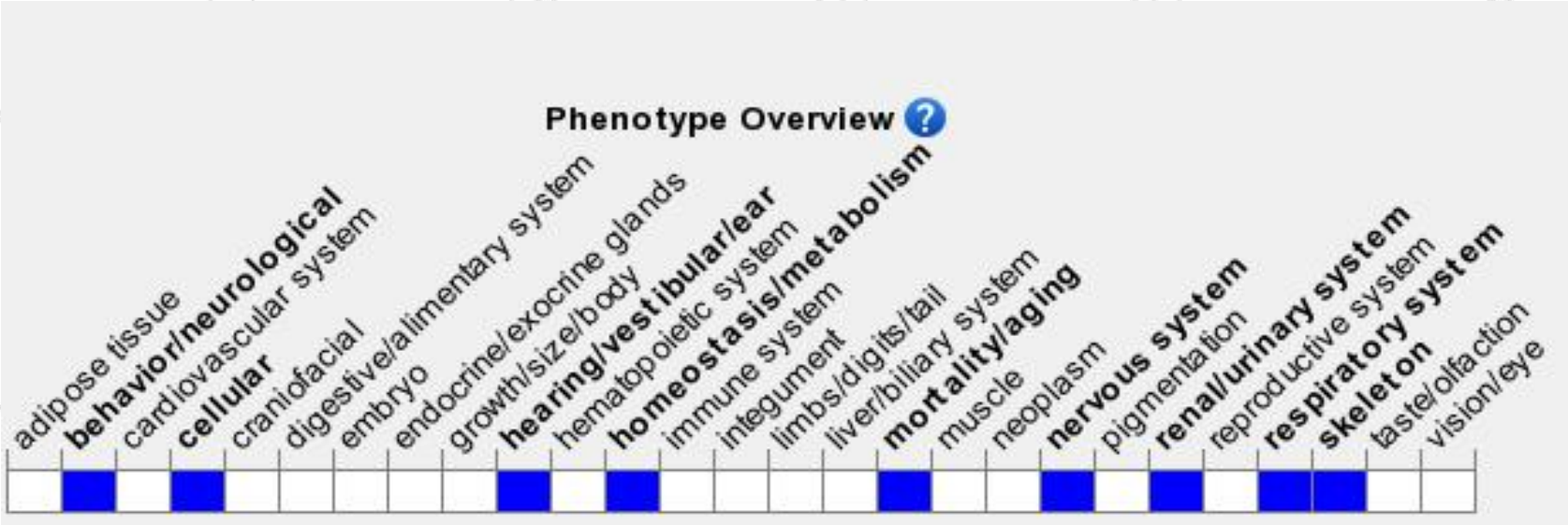
Genomic location distribution



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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GemPharmatech

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

Tel: 400-9660890

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GemPharmatech Co.,Ltd