Il12b Cas9-KO Strategy

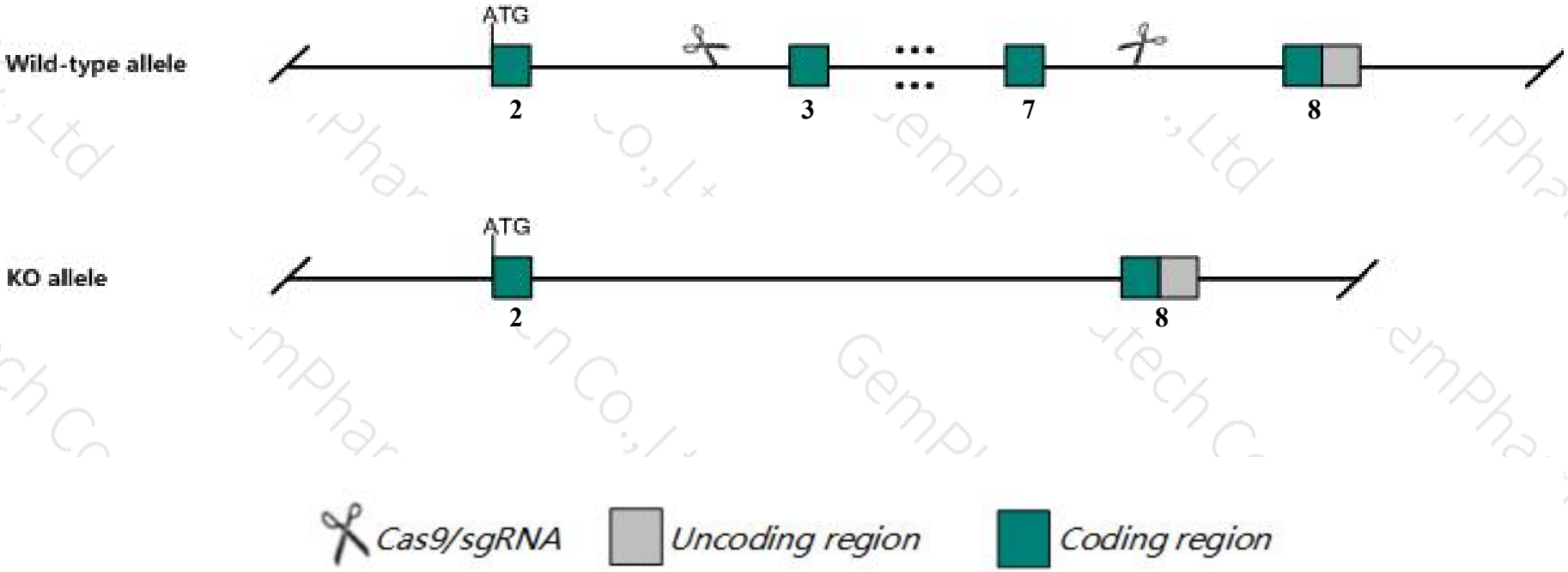
Designer: Xueting Zhang
Design Date: 2019-8-3

Project Overview

Project Name	***Il12b***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il12b* gene. The schematic diagram is as follows:



Technical routes

➢ The *Il12b* gene has 2 transcripts. According to the structure of *Il12b* gene, exon3-exon7 of *Il12b-201* (ENSMUST00000102796.9) transcript is recommended as the knockout region.The region contains 907bp coding sequence Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Il12b* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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.

Notice

- According to the existing MGI data,Mice homozygous for a null allele display impaired Th1 responses, defects in IFN gamma secretion and NK cell activity, increased susceptibility to bacterial and parasitic infection, alveolar bone loss, and resistance to chemically induced tumors and to delayed type hypersensitivity.

- The *Il12b* 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）

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Il12b interleukin 12b [Mus musculus (house mouse)]

Gene ID: 16160, updated on 12-Feb-2019

Summary

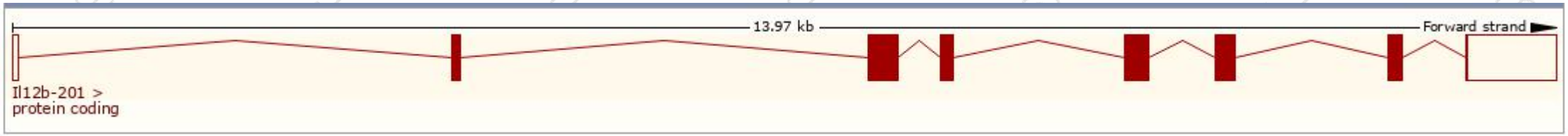
Official Symbol	Il12b provided by MGI
Official Full Name	interleukin 12b provided by MGI
Primary source	MGI:MGI:96540
See related	Ensembl:ENSMUSG00000004296
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Il-12b, Il-12p40, Il12p40, p40
Summary	This gene encodes the beta subunit p40 of the Interleukin 12 (IL-12) family of cytokines. Members of the IL-12 family form heterodimers consisting of heavy and light subunits linked by disulfide bonds. The product of this gene, p40, is a subunit of interleukins IL-12 and IL-23. [provided by RefSeq, Dec 2014]
Expression	Biased expression in thymus adult (RPKM 1.0), spleen adult (RPKM 0.3) and 4 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

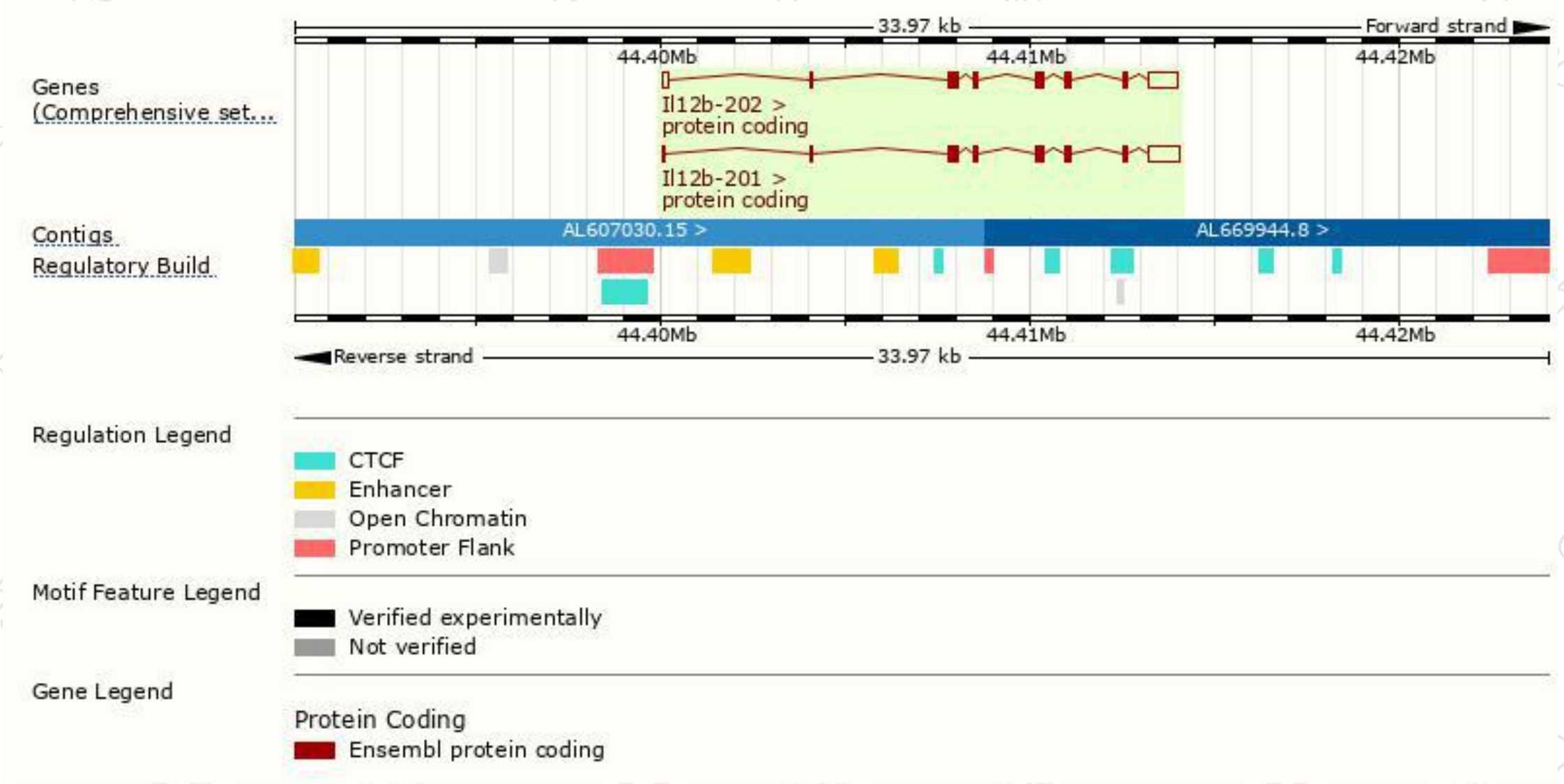
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Il12b-202	ENSMUST00000170513.2	1944	335aa	Protein coding	CCDS24563	P43432 Q3ZAX5	TSL:5 GENCODE basic APPRIS P1
Il12b-201	ENSMUST00000102796.9	1861	335aa	Protein coding	CCDS24563	P43432 Q3ZAX5	TSL:1 GENCODE basic APPRIS P1

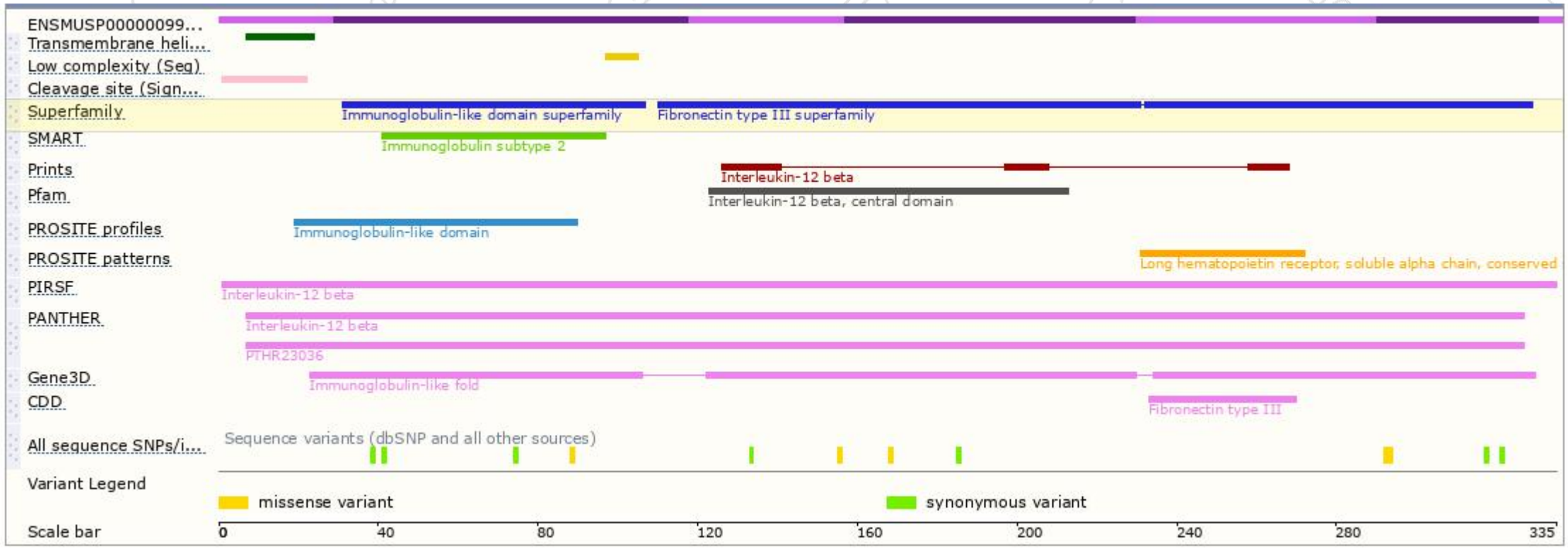
The strategy is based on the design of *Il12b-201* transcript,The transcription is shown below



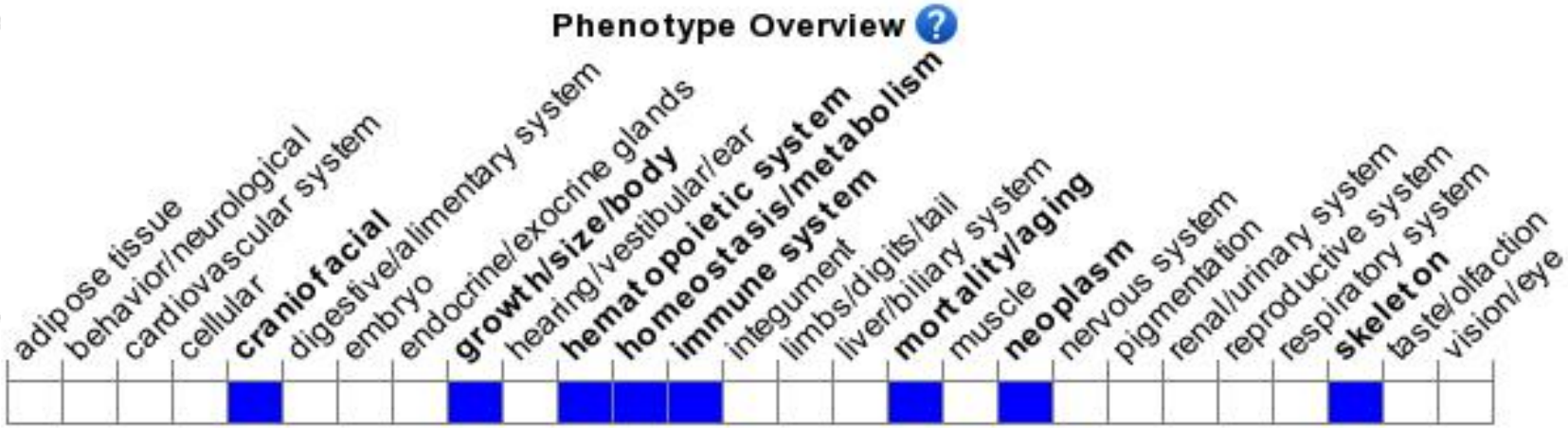
Genomic location distribution



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: 025-5864 1534

集萃药康生物科技
GemPharmatech Co.,Ltd