Zmpste24 Cas9-CKO Strategy

Designer: Daohua Xu
Reviewer: Huimin Su

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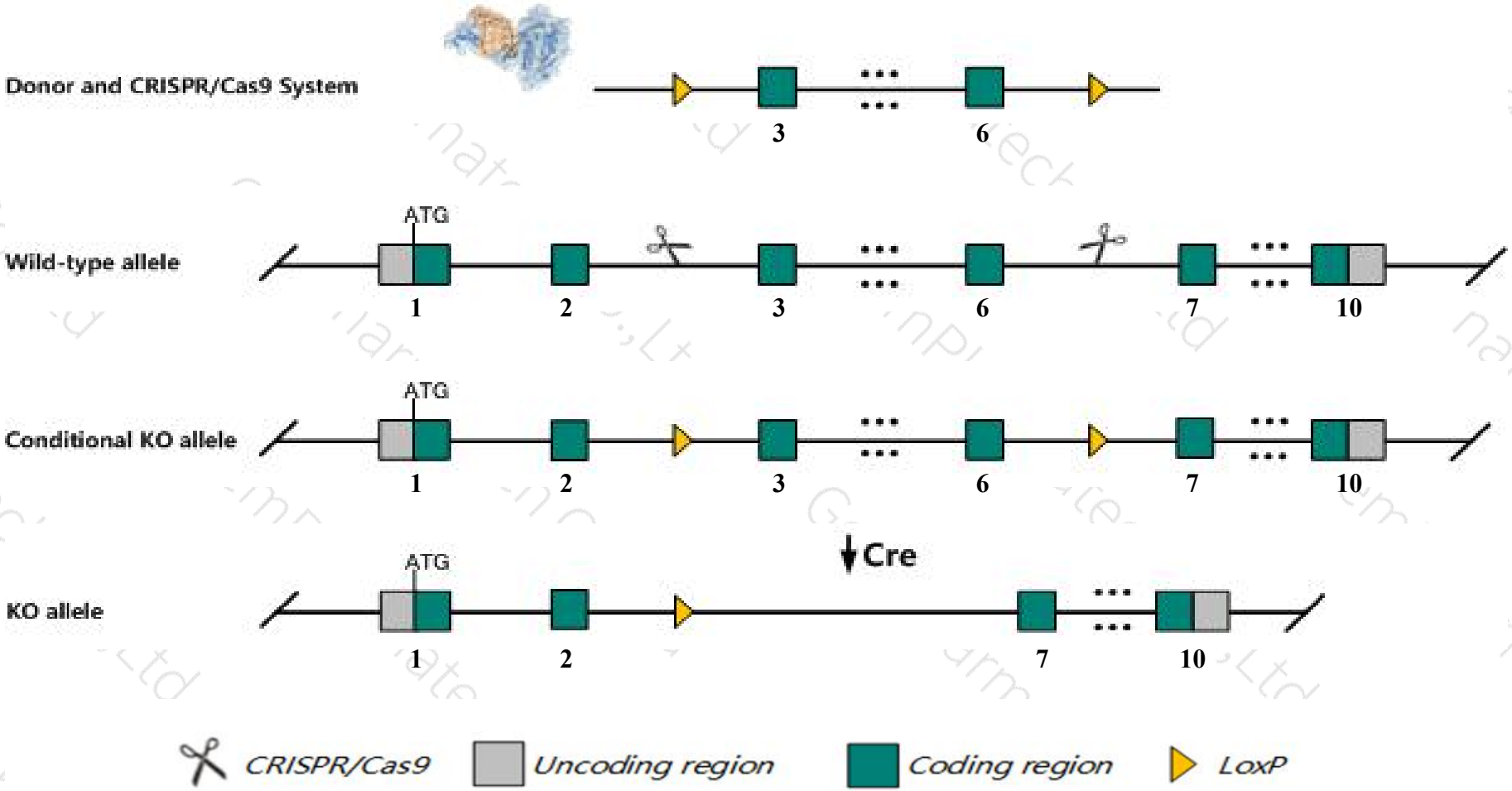
Project Overview

Project Name	***Zmpste24***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Zmpste24* gene. The schematic diagram is as follows:



Technical routes

- The *Zmpste24* gene has 3 transcripts. According to the structure of *Zmpste24* gene, exon3-exon6 of *Zmpste24-201* (ENSMUST00000058754.8) transcript is recommended as the knockout region.The region contains 499bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Zmpste24* 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,Mutants are deficient in proteolytic processing of prelamin A and display many abnormalities including retarded growth, bone fragility, hair loss, cardiomyopathy, muscular dystrophy and lipodystrophy. Most die prematurely, but some survive and reproduce.

➢ The *Zmpste24* gene is located on the Chr4. 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）

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Zmpste24 zinc metallopeptidase, STE24 [Mus musculus (house mouse)]

Gene ID: 230709, updated on 5-Mar-2019

Summary

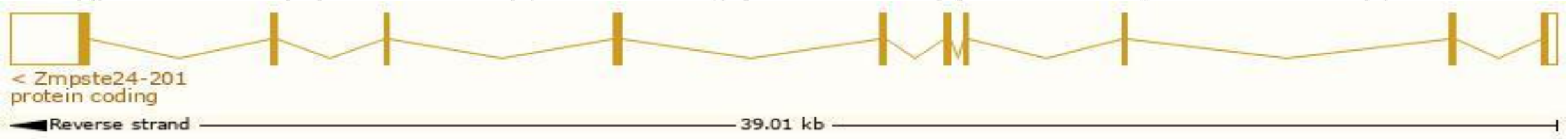
Official Symbol	Zmpste24 provided by MGI
Official Full Name	zinc metallopeptidase, STE24 provided by MGI
Primary source	MGI:MGI:1890508
See related	Ensembl:ENSMUSG00000043207
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	A530043O15Rik, D030046F19, FACE1, Face-1, MADB, STE24, Ste24p
Expression	Ubiquitous expression in kidney adult (RPKM 16.8), placenta adult (RPKM 12.9) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

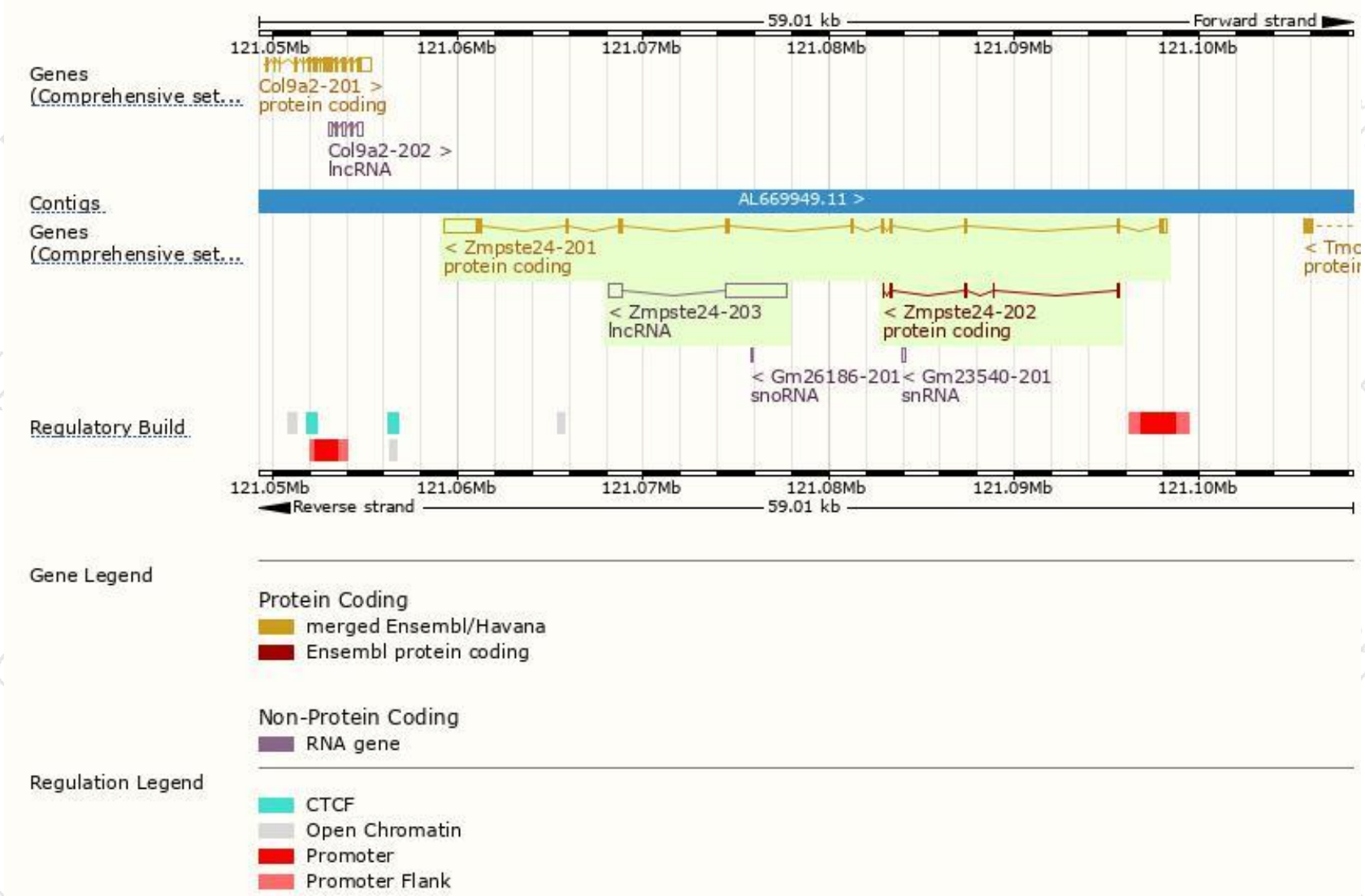
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Zmpste24-201	ENSMUST00000058754.8	3429	475aa	Protein coding	CCDS18600	B9EHY2 Q80W54	TSL:1 GENCODE basic APPRIS P1
Zmpste24-202	ENSMUST00000135788.1	439	146aa	Protein coding	-	I7HIP5	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Zmpste24-203	ENSMUST00000143768.1	3949	No protein	Processed transcript	-	-	TSL:1

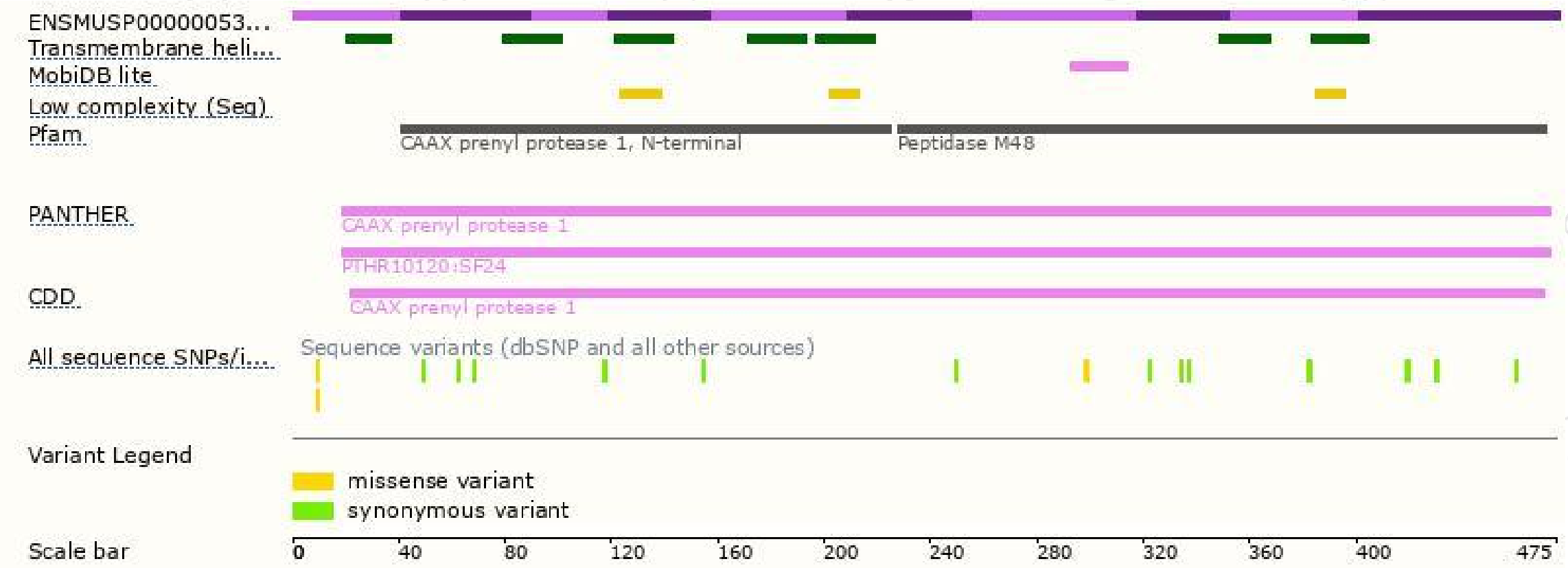
The strategy is based on the design of *Zmpste24-201* transcript,The transcription is shown below



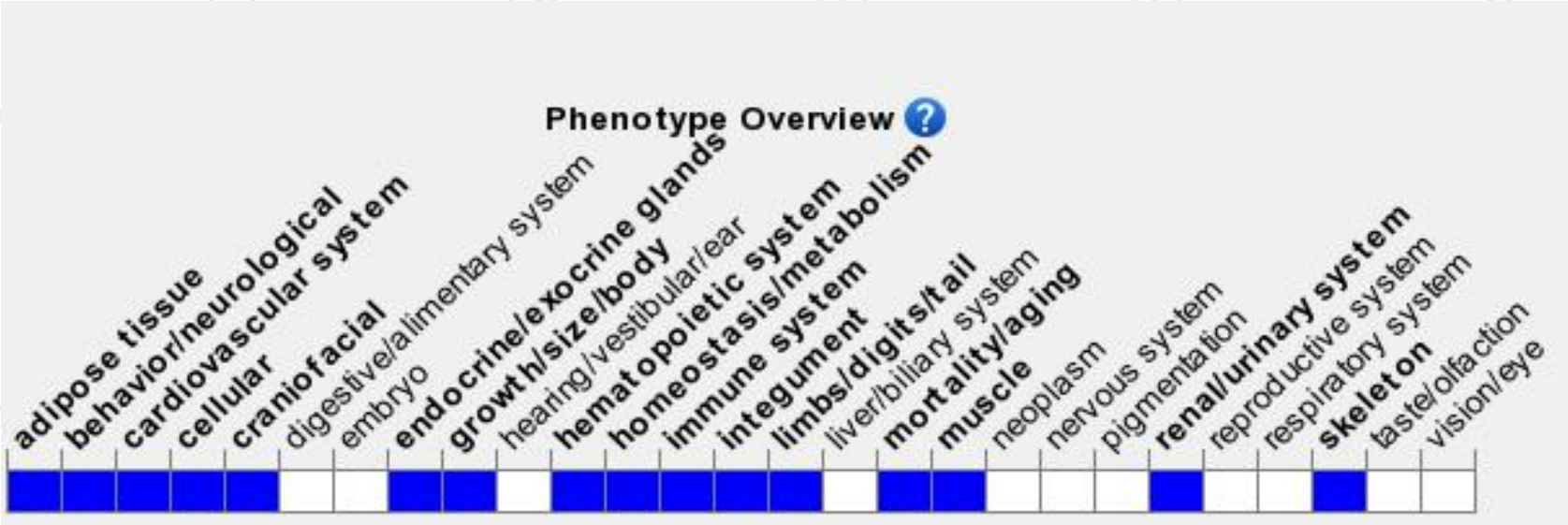
Genomic location distribution



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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集萃药康
GemPharmatech

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

Tel: 400-9660890

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GemPharmatech Co.,Ltd