Kel Cas9-CKO Strategy

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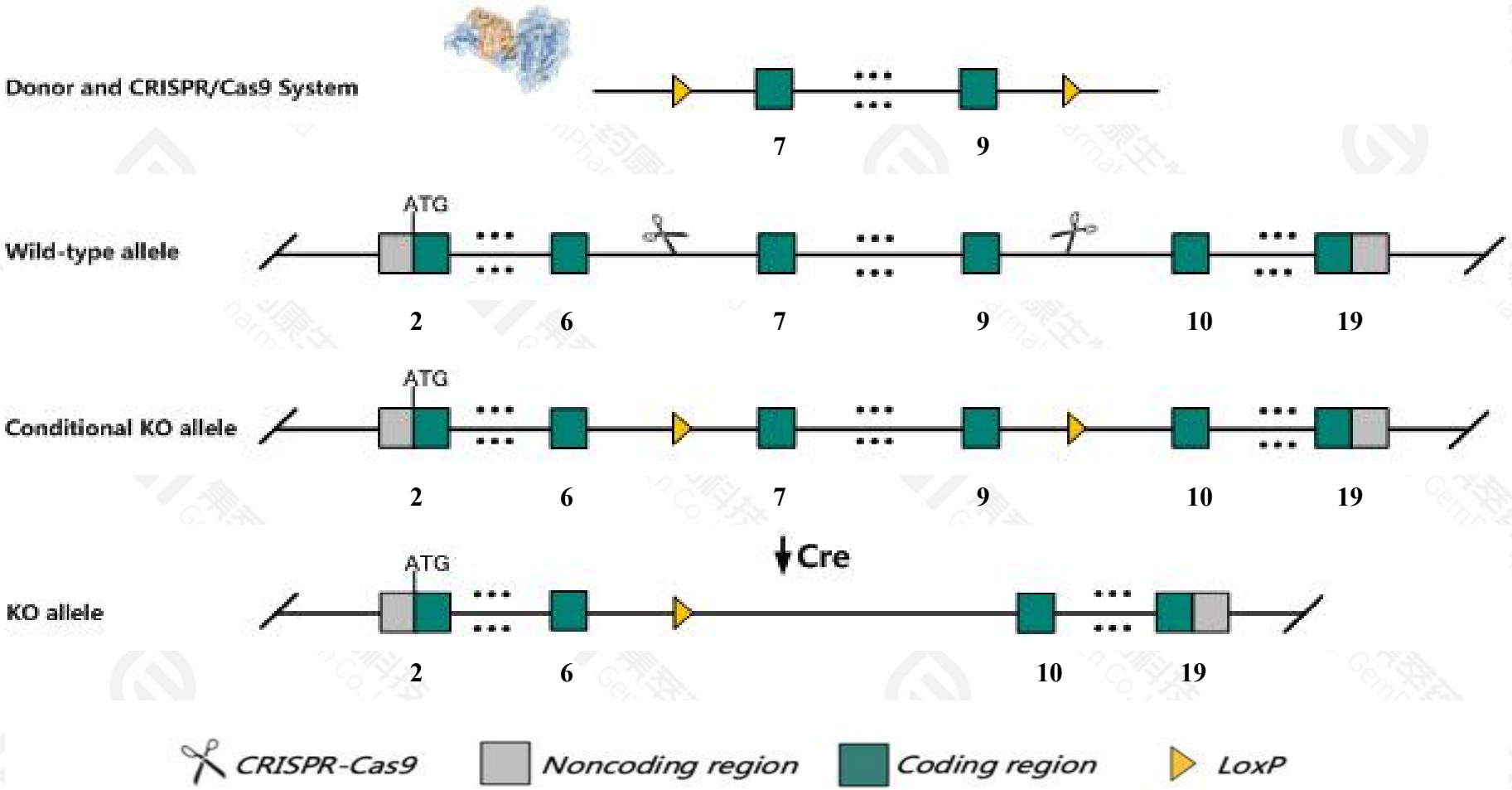
Project Overview

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

Conditional Knockout strategy

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



Technical routes

➢ The *Kel* gene has 5 transcripts. According to the structure of *Kel* gene, exon7-exon9 of *Kel-201*(ENSMUST00000031899.14) transcript is recommended as the knockout region.The region contains 401bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR-Cas9 technology to modify *Kel* 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,mice homozygous for a null allele exhibit decreased heart rate, altered hematological parameters and ECG waveform features, decreased erythrocyte Mg2+ and K+ ion content, mild motor deficits, and giant axon changes with varying degrees of paranodal demyelination in the spinal cord and sciatic nerve.

➢ The *Kel* gene is located on the Chr6. 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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Kel Kell blood group [Mus musculus (house mouse)]

Gene ID: 23925, updated on 17-Dec-2020

Summary

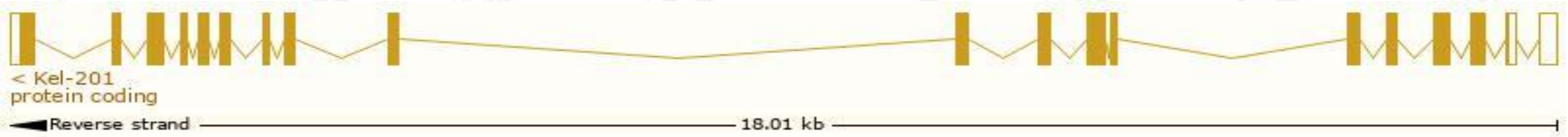
Official Symbol	Kel provided by MGI
Official Full Name	Kell blood group provided byMGI
Primary source	MGI:MGI:1346053
See related	Ensembl:ENSMUSG00000029866
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CD238, Ece3
Expression	Biased expression in liver E14.5 (RPKM 142.2), liver E14 (RPKM 123.9) and 3 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

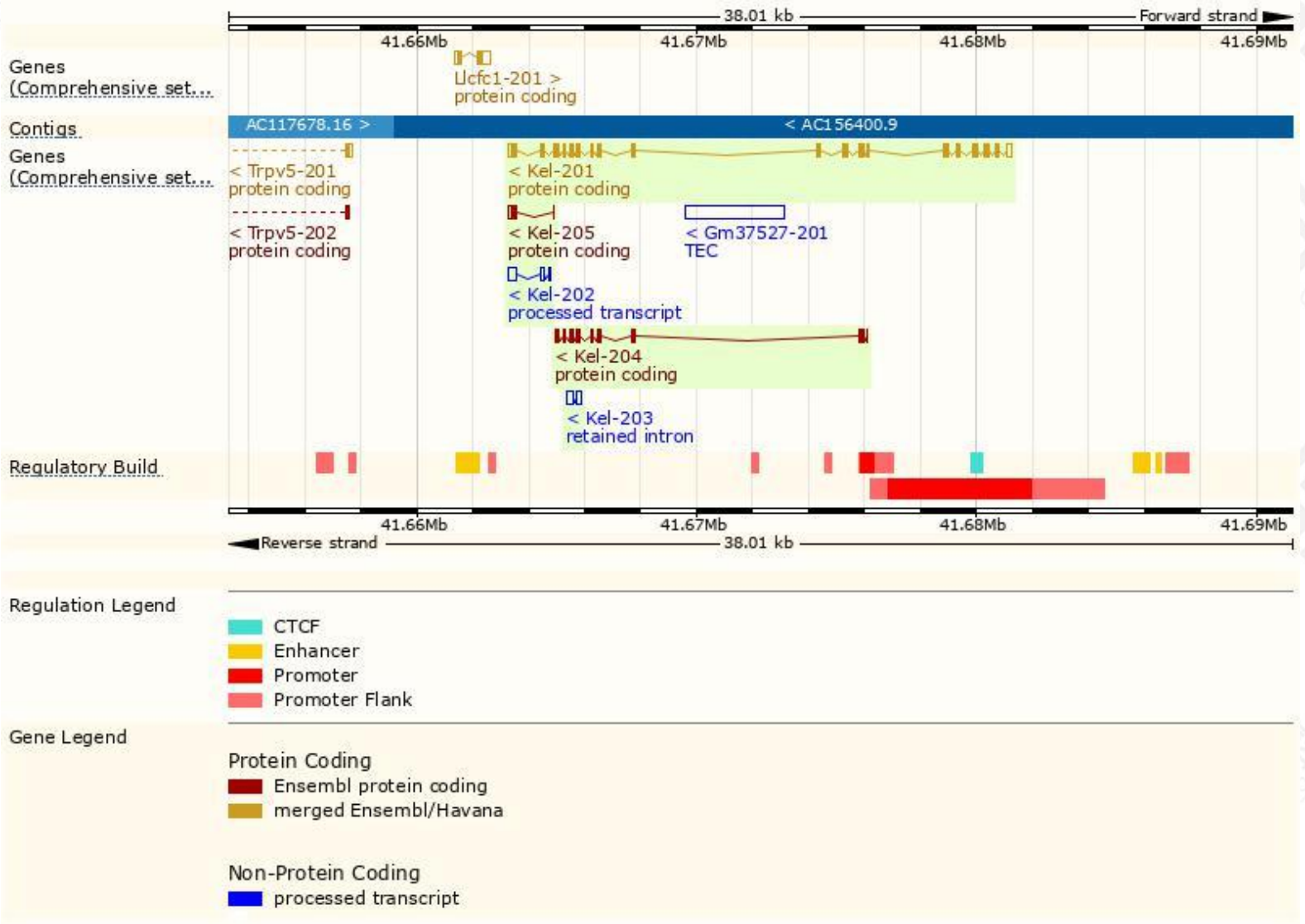
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kel-201	ENSMUST00000031899.14	2530	713aa	Protein coding	CCDS20055		TSL:1 , GENCODE basic , APPRIS P1 ,
Kel-204	ENSMUST00000192118.2	858	286aa	Protein coding	-		CDS 5' and 3' incomplete , TSL:5 ,
Kel-205	ENSMUST00000194597.2	322	69aa	Protein coding	-		CDS 5' incomplete , TSL:3 ,
Kel-202	ENSMUST00000141502.2	422	No protein	Processed transcript	-		TSL:2 ,
Kel-203	ENSMUST00000153760.2	384	No protein	Retained intron	-		TSL:3 ,

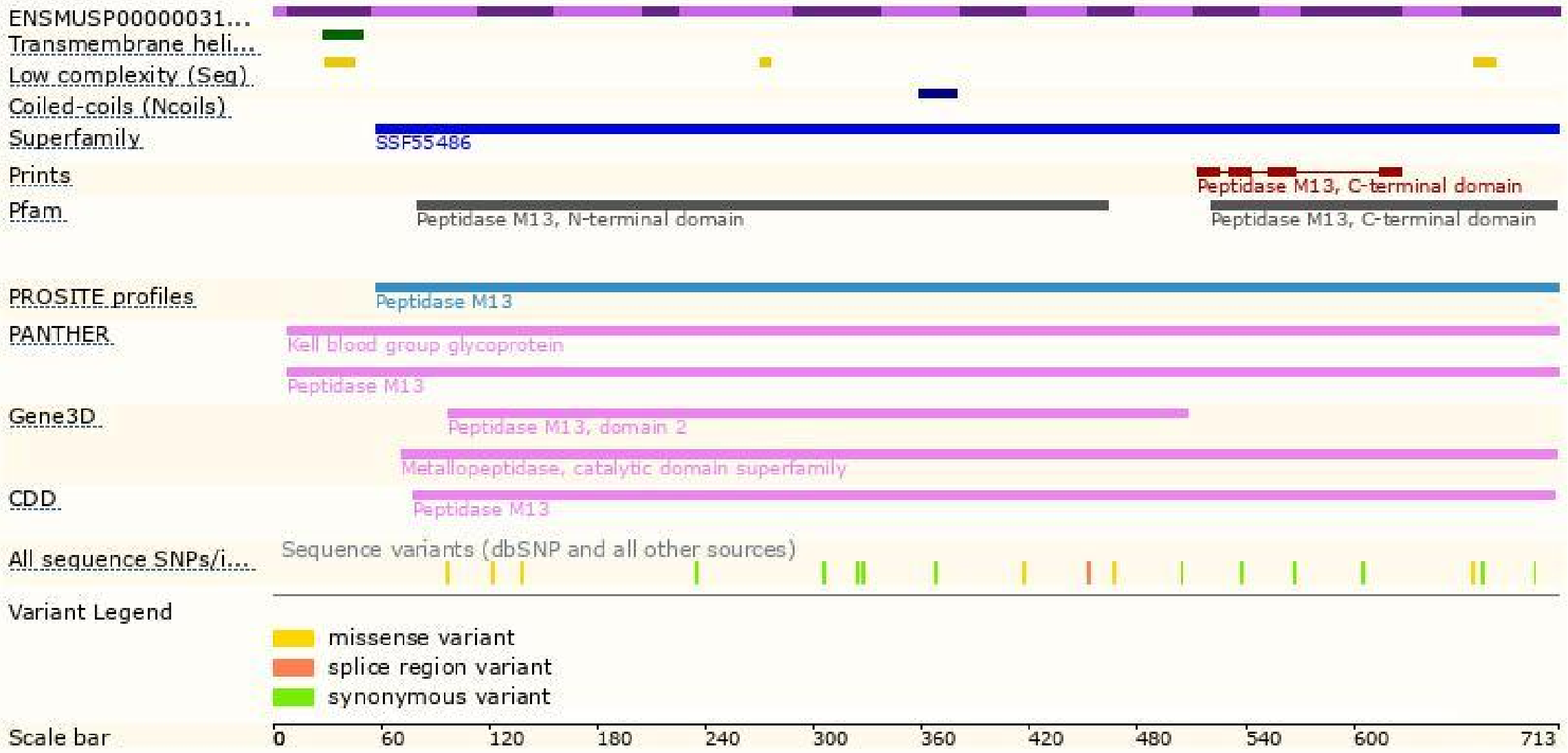
The strategy is based on the design of *Kel-201* transcript,the transcription is shown below:



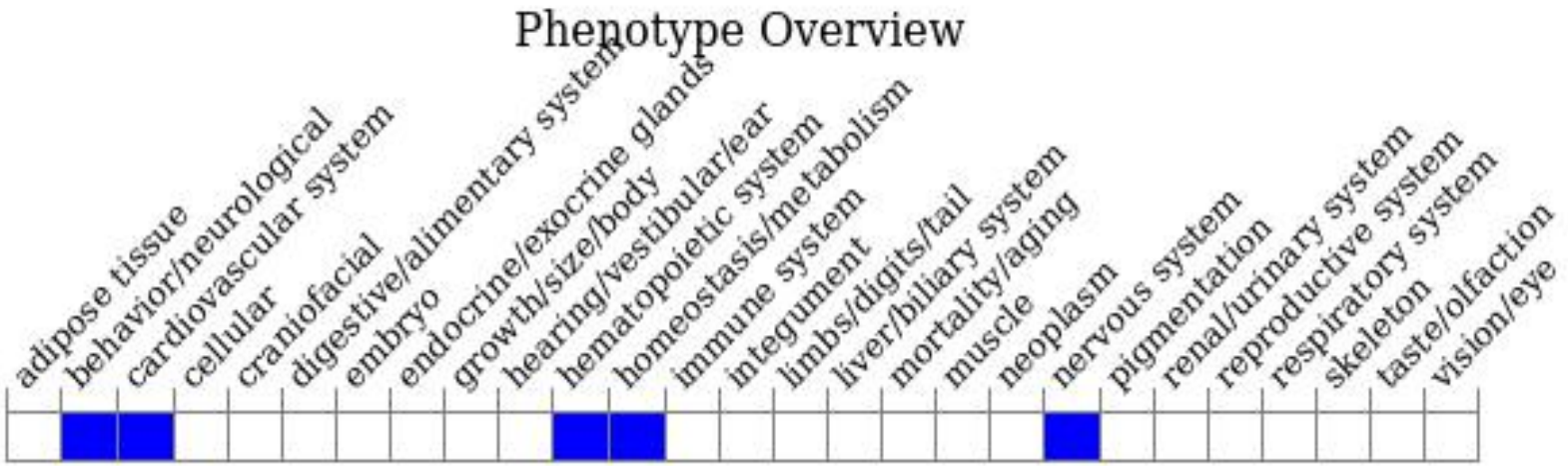
Genomic location distribution



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