Tie1 Cas9-CKO Strategy

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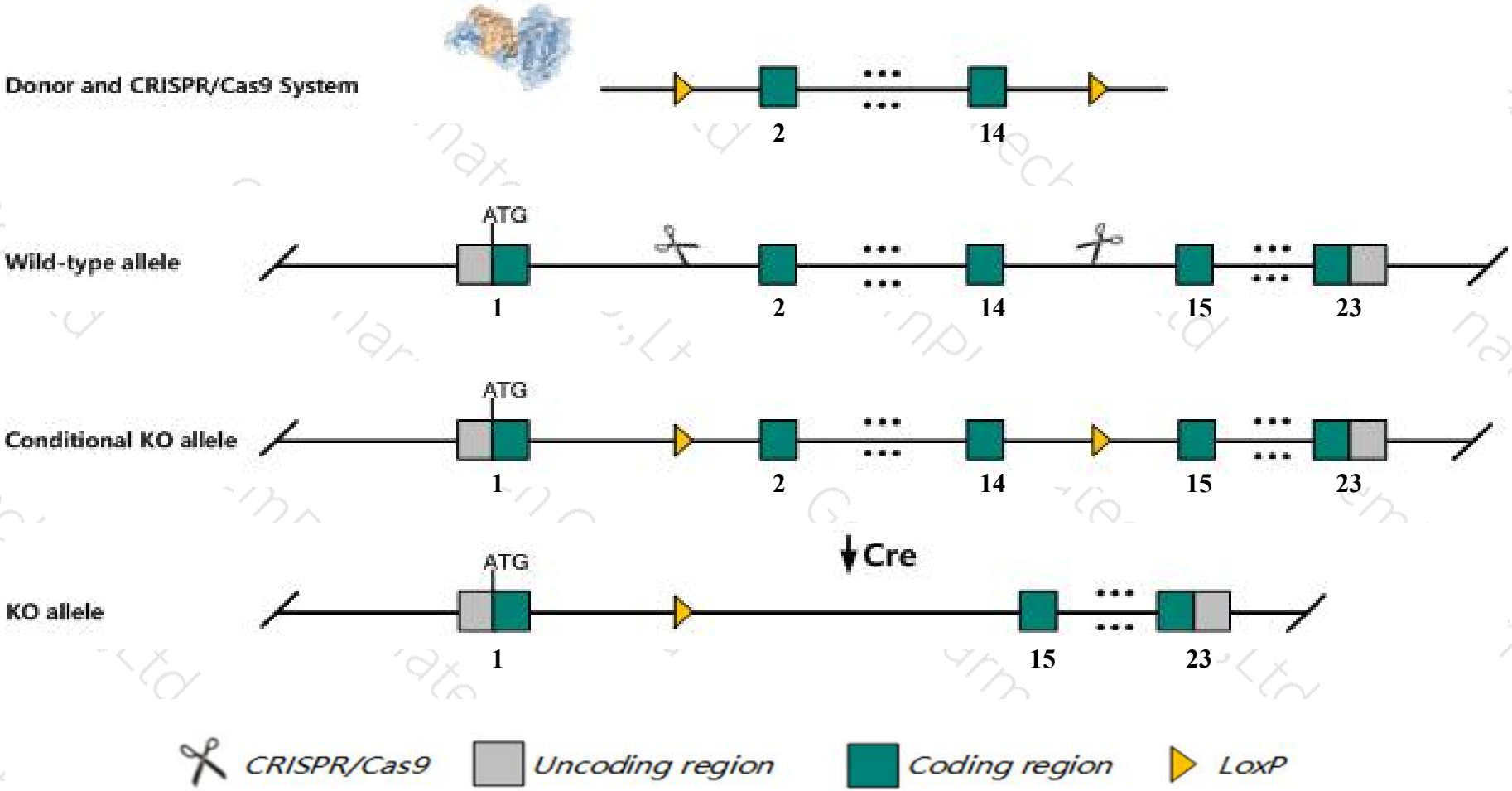
Project Overview

Project Name	***Tie1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tie1* gene. The schematic diagram is as follows:



Technical routes

- The *Tie1* gene has 3 transcripts. According to the structure of *Tie1* gene, exon2-exon14 of *Tie1-201* (ENSMUST00000047421.5) transcript is recommended as the knockout region.The region contains 2339bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Tie1* 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 embryonic or neonatal lethality, hemorrhages, edema, increased vascular branching, and abnormal vascular endothelial cell development. Mice homozygous for a hypomorphic allele exhibit dilated and disorganized lymphatic vessel, edema, and hemorrhage.

- The *Tie1* 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）

集萃药康 GemPharmatech

Tie1 tyrosine kinase with immunoglobulin-like and EGF-like domains 1 [Mus musculus (house mouse)]

Gene ID: 21846, updated on 12-Mar-2019

Summary

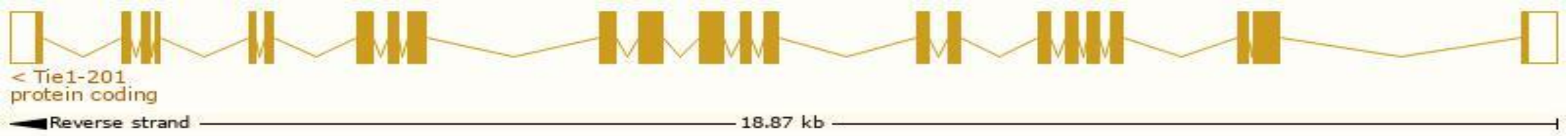
Official Symbol	Tie1 provided by MGI
Official Full Name	tyrosine kinase with immunoglobulin-like and EGF-like domains 1 provided by MGI
Primary source	MGI:MGI:99906
See related	Ensembl:ENSMUSG00000033191
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	D430008P04Rik, TIE, tie-1
Expression	Biased expression in lung adult (RPKM 126.3), adrenal adult (RPKM 37.3) and 14 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

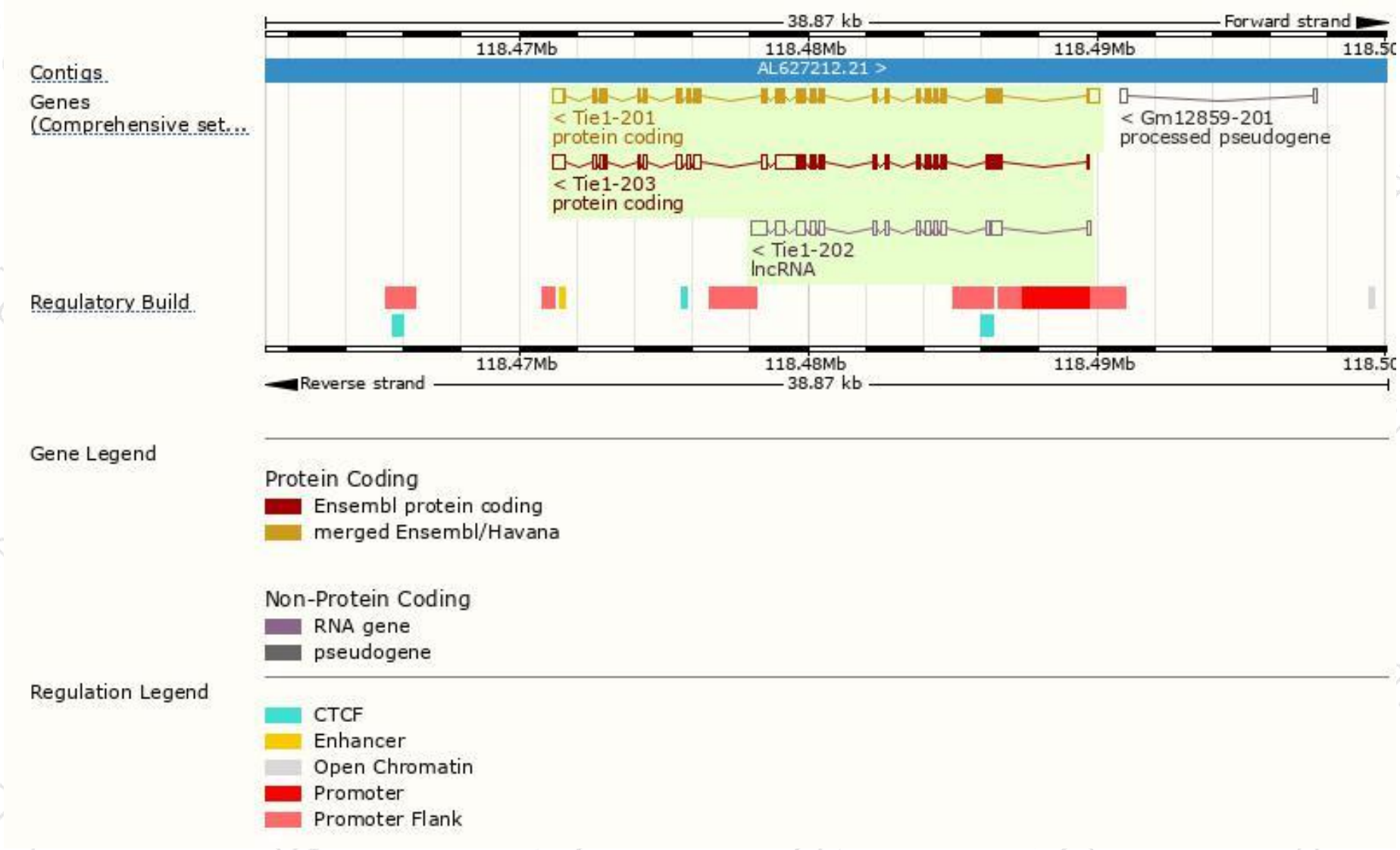
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tie1-201	ENSMUST00000047421.5	4091	1134aa	Protein coding	CCDS18553	Q06806	TSL:1 GENCODE basic APPRIS P1
Tie1-203	ENSMUST00000184261.7	4234	647aa	Protein coding	-	Q6PAP2	TSL:2 GENCODE basic
Tie1-202	ENSMUST00000153286.1	2851	No protein	lncRNA	-	-	TSL:1

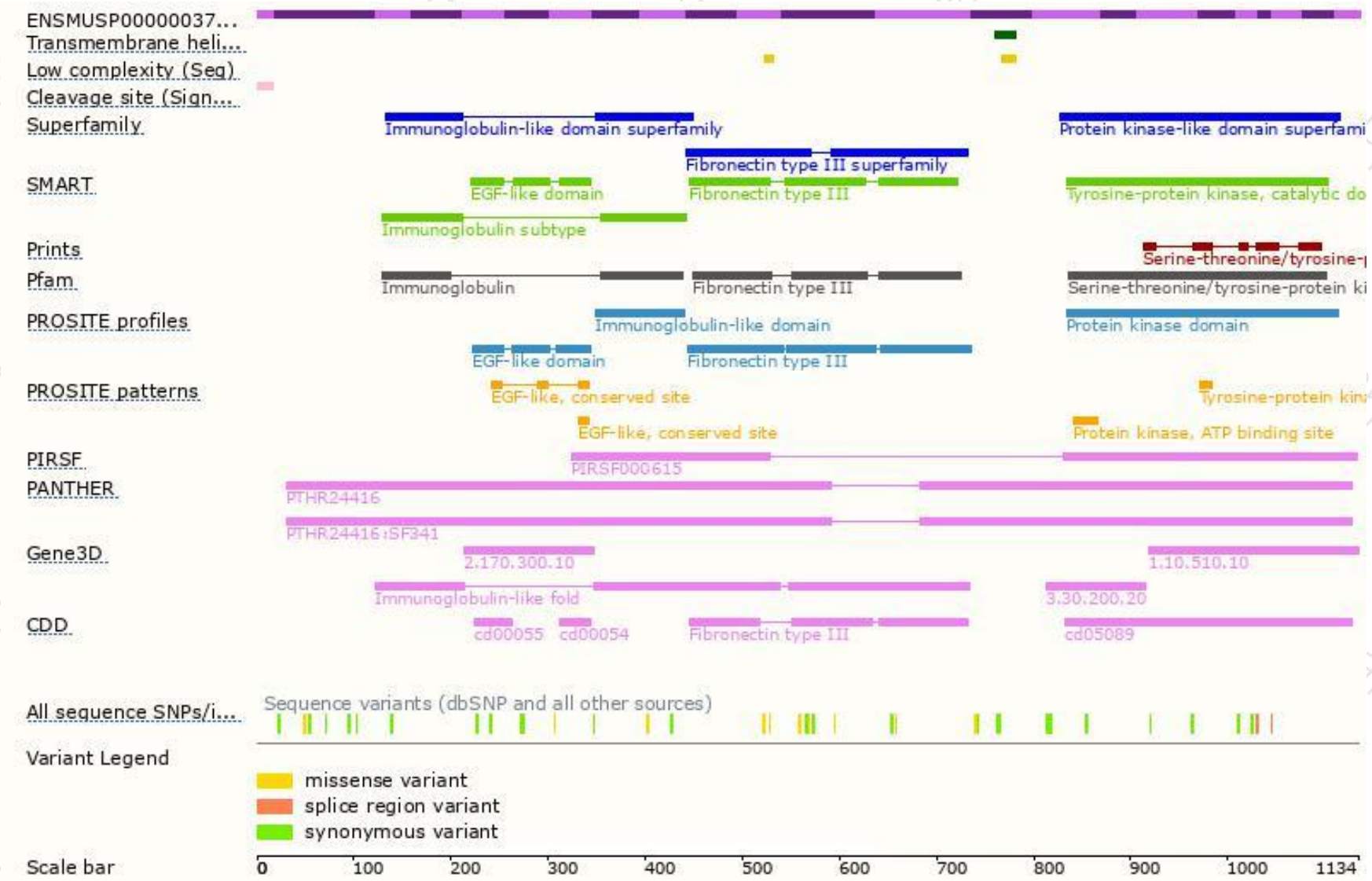
The strategy is based on the design of *Tie1-201* transcript,The transcription is shown below



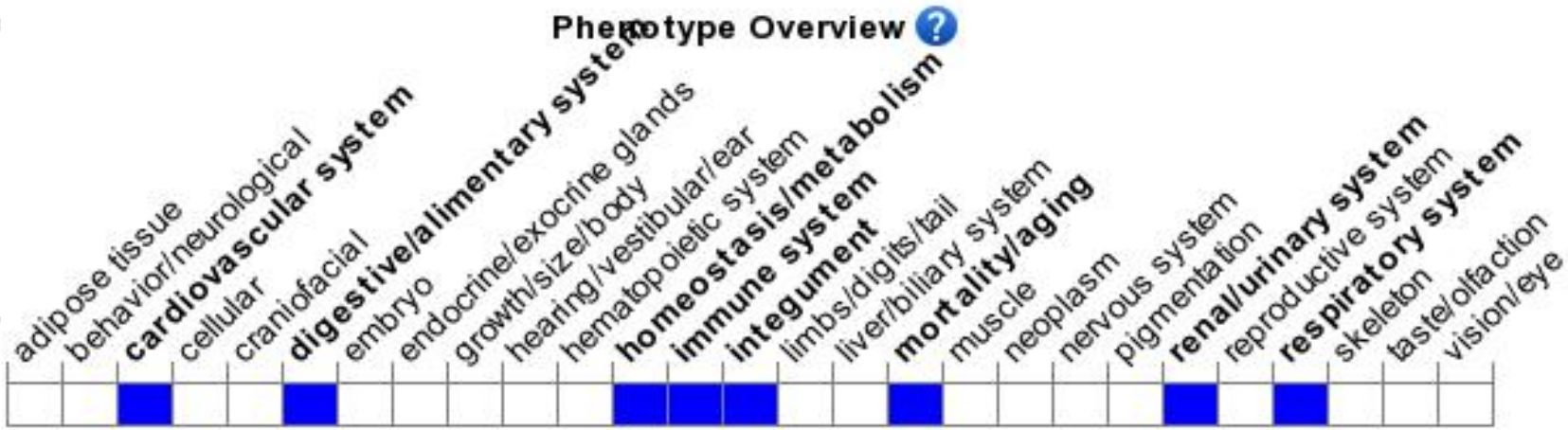
Genomic location distribution



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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