Ptk7 Cas9-CKO Strategy

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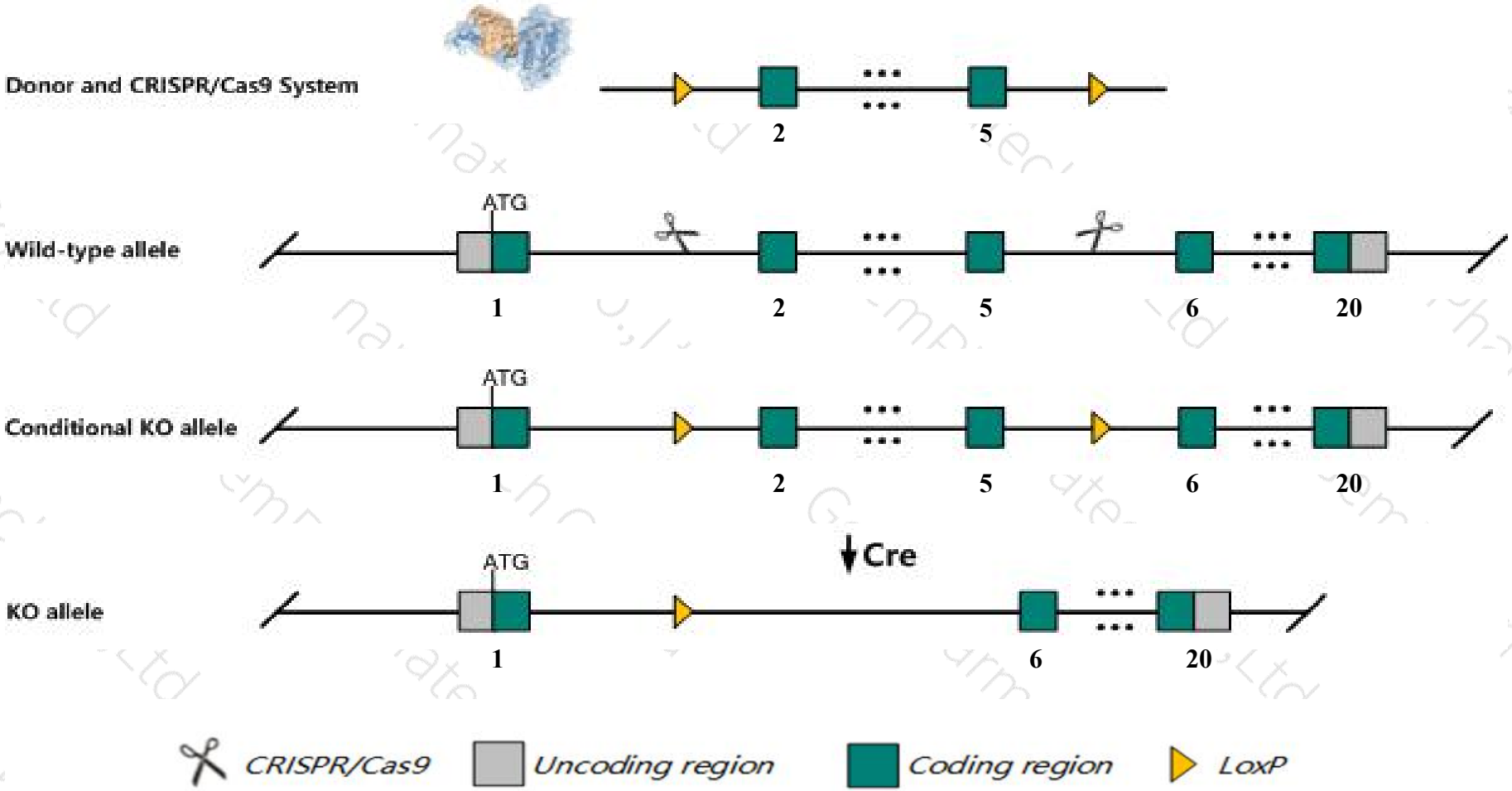
Design Date: 2020-4-24

Project Overview

Project Name	***Ptk7***
Project type	**Cas9-CKO**
Strain background	**C57BL/6J**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ptk7* gene. The schematic diagram is as follows:



Technical routes

- The *Ptk7* gene has 2 transcripts. According to the structure of *Ptk7* gene, exon2-exon5 of *Ptk7-201* (ENSMUST00000044442.9) transcript is recommended as the knockout region.The region contains 733bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ptk7* gene. The brief process is as follows:CRISPR/Cas9 system and Donor were microinjected into the fertilized eggs of C57BL/6J 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/6J 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 gene trapped allele die perinatally with defects in neural tube closure and planar cell polarity in the ear. enu-induced mutant mice show omphalocele, impaired neural tube, heart and lung development, rib defects, polydactyly, failed eyelid closure and altered cell polarity.
- The *Ptk7* gene is located on the Chr17. 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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Ptk7 PTK7 protein tyrosine kinase 7 [Mus musculus (house mouse)]

Gene ID: 71461, updated on 13-Mar-2020

Summary

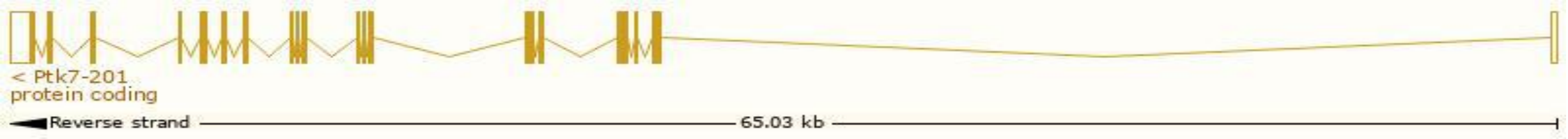
Official Symbol	Ptk7 provided by MGI
Official Full Name	PTK7 protein tyrosine kinase 7 provided by MGI
Primary source	MGI:MGI:1918711
See related	Ensembl:ENSMUSG00000023972
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	8430404F20Rik, chz, mPTK7/CCK4
Expression	Broad expression in limb E14.5 (RPKM 30.4), ovary adult (RPKM 29.7) and 22 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

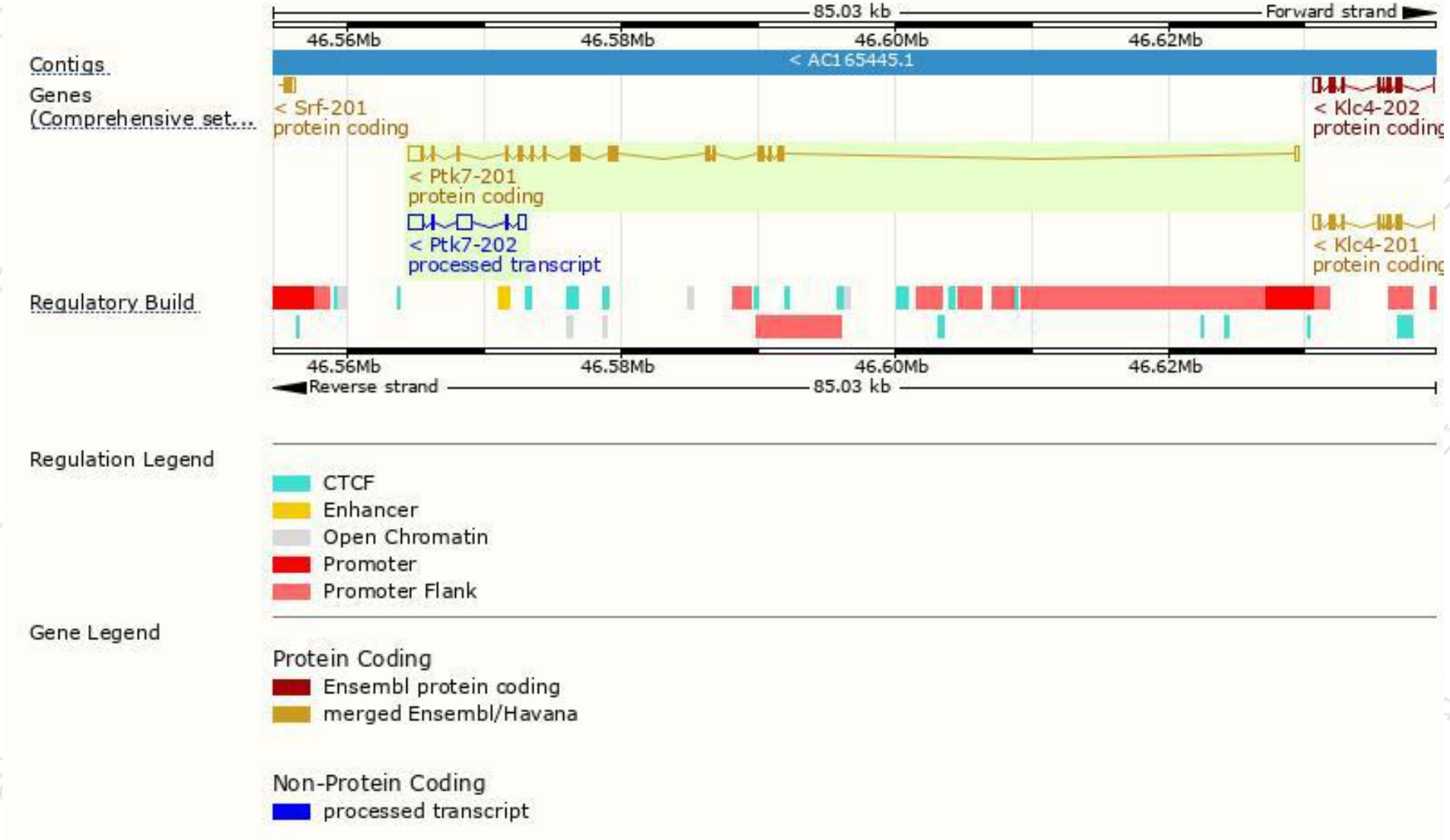
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptk7-201	ENSMUST00000044442.9	4235	1062aa	Protein coding	CCDS37637	Q8BKG3	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Ptk7-202	ENSMUST00000232855.1	2819	No protein	Processed transcript	-	-	

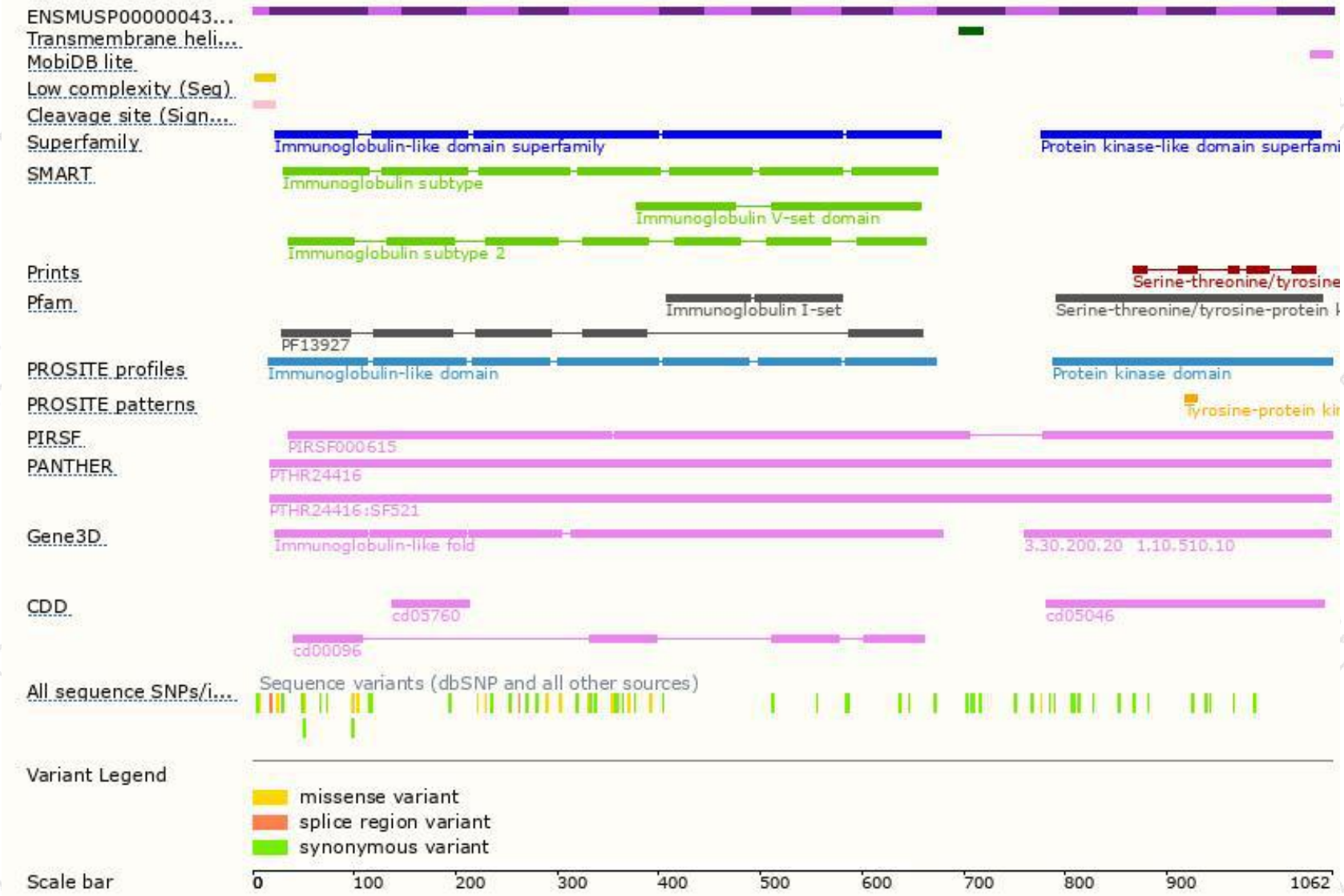
The strategy is based on the design of *Ptk7-201* transcript,the transcription is shown below:



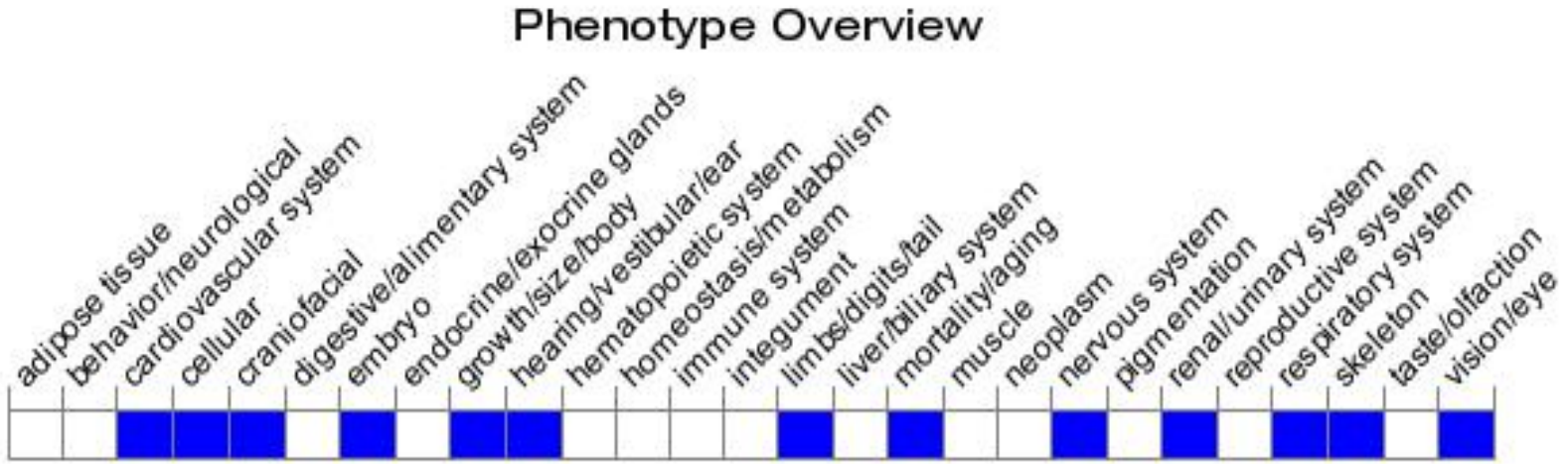
Genomic location distribution



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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