Pax2 Cas9-CKO Strategy

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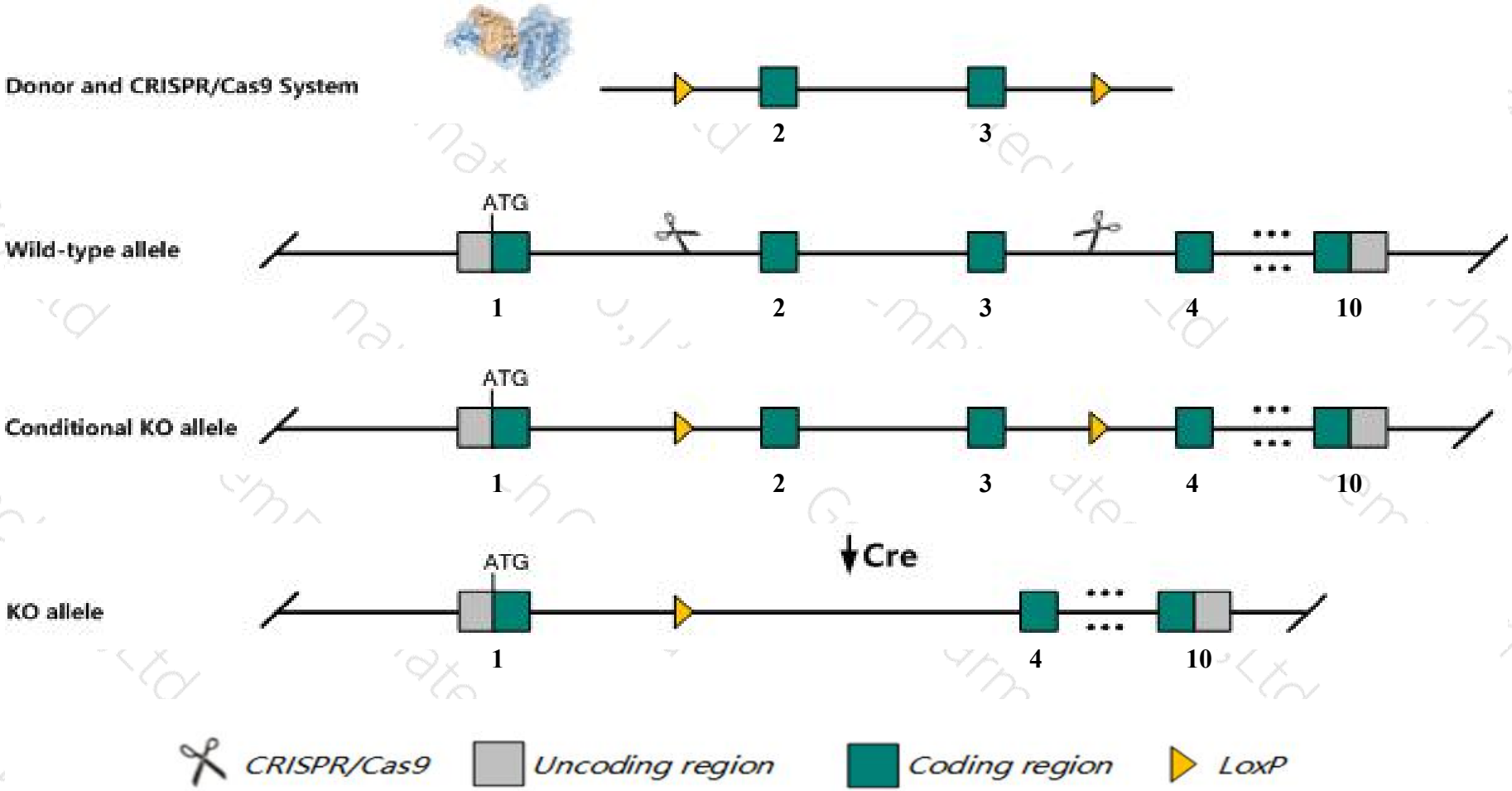
Project Overview

Project Name	***Pax2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pax2* gene. The schematic diagram is as follows:



Technical routes

- The *Pax2* gene has 3 transcripts. According to the structure of *Pax2* gene, exon2-exon3 of *Pax2-203* (ENSMUST00000174490.8) transcript is recommended as the knockout region.The region contains 367bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Pax2* 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 targeted and spontaneous null mutants show impaired to absent development of optic nerve, retina, kidney, ureters, genital tracts, inner ear and midhindbrain. heterozygotes show milder defects of the optic nerve, retina and kidney.
- The *Pax2* gene is located on the Chr19. 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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Pax2 paired box 2 [Mus musculus (house mouse)]

Gene ID: 18504, updated on 13-Mar-2020

Summary

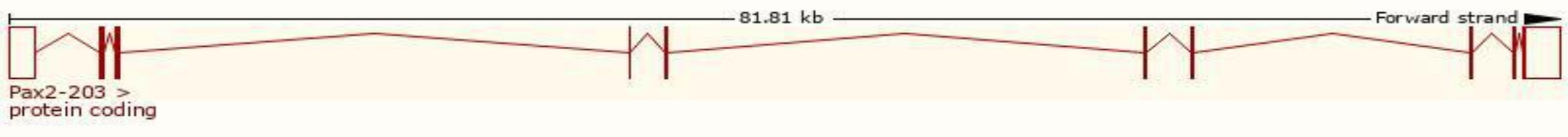
Official Symbol	Pax2 provided by MGI
Official Full Name	paired box 2 provided by MGI
Primary source	MGI:MGI:97486
See related	Ensembl:ENSMUSG00000004231
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Opdc, Pax-2
Expression	Biased expression in kidney adult (RPKM 7.7), genital fat pad adult (RPKM 5.8) and 7 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

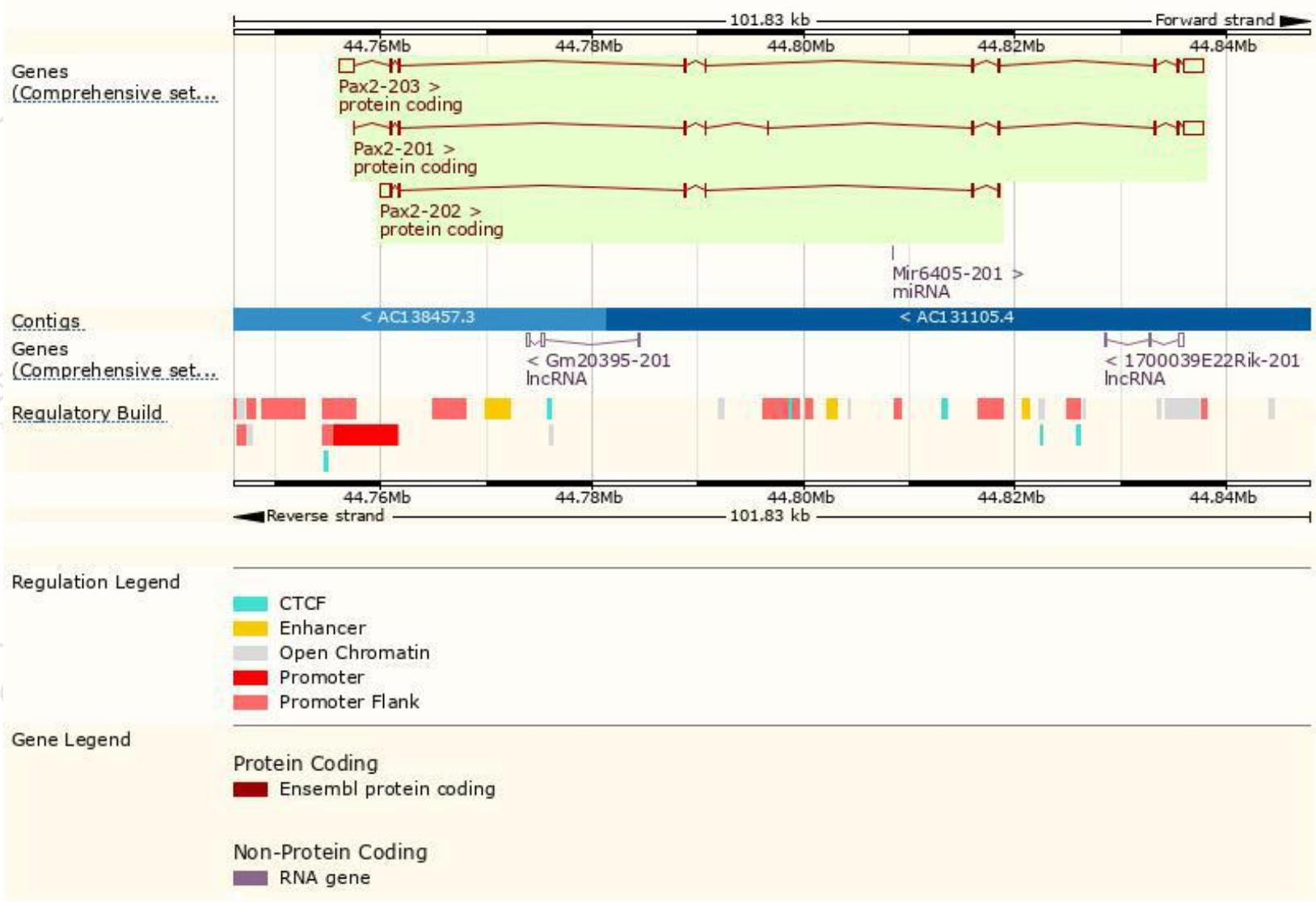
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pax2-203	ENSMUST00000174490.8	4358	394aa	Protein coding	CCDS37998	A0A0R4J267	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 P2
Pax2-201	ENSMUST00000004340.10	3095	416aa	Protein coding	-	G3X8Q7	TSL:5 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 ALT2
Pax2-202	ENSMUST00000173346.3	1814	303aa	Protein coding	-	G3UZ20	CDS 3' incomplete TSL:5

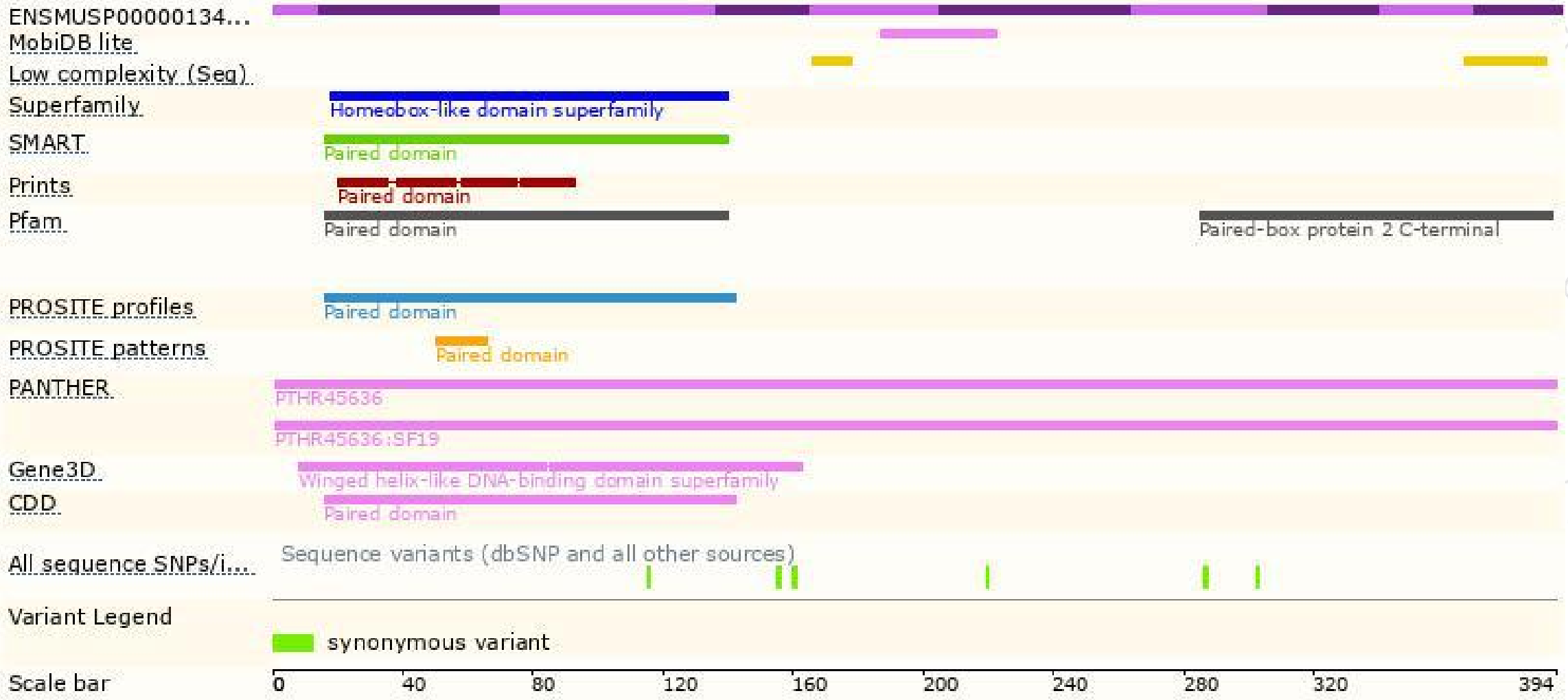
The strategy is based on the design of *Pax2-203* transcript,the transcription is shown below:



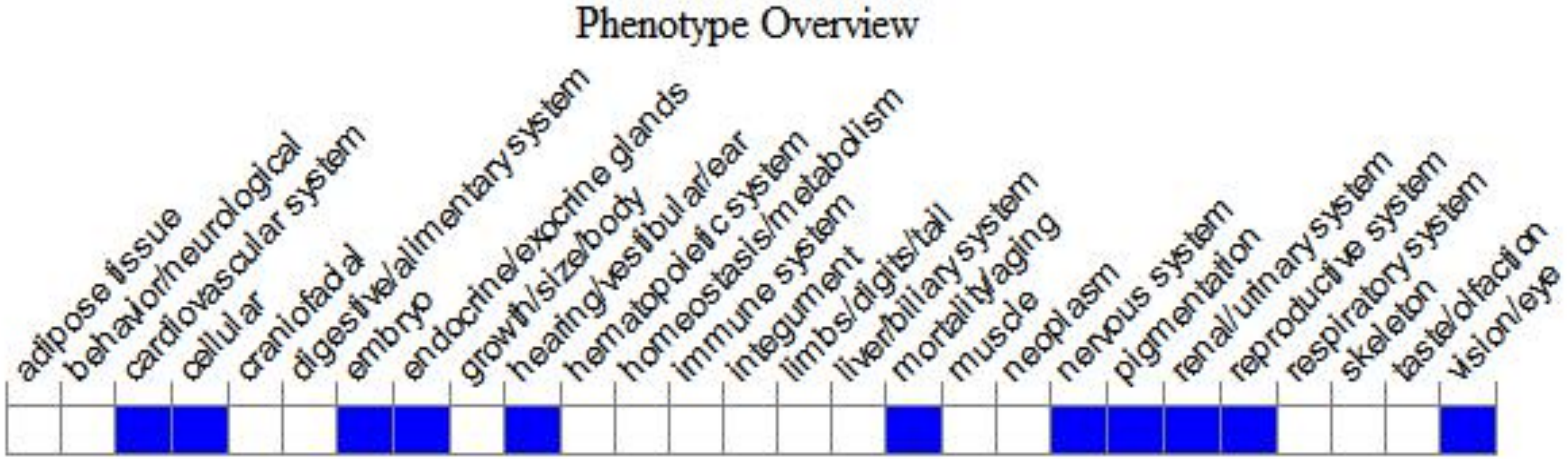
Genomic location distribution



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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