Ccnd1 Cas9-CKO Strategy

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Project Overview

Project Name	***Ccnd1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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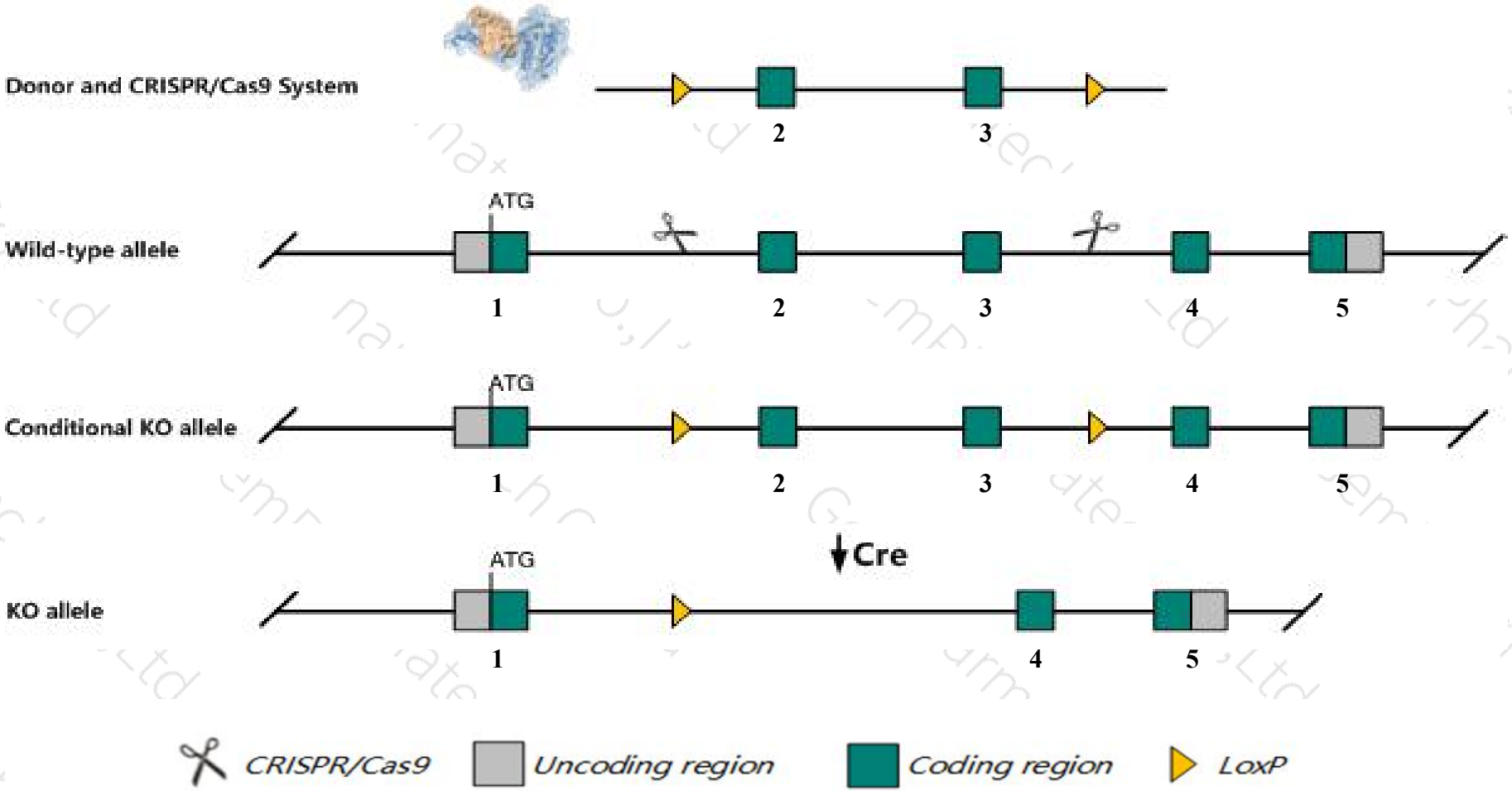
This model will use CRISPR/Cas9 technology to edit the *Ccnd1* gene. The schematic diagram is as follows:



Technical routes

- The *Ccnd1* gene has 3 transcripts. According to the structure of *Ccnd1* gene, exon2-exon3 of *Ccnd1-201* (ENSMUST00000093962.4) transcript is recommended as the knockout region.The region contains 376bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ccnd1* 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,homozygotes for targeted mutations may exhibit reduced body size and viability, impaired retinal development, pregnancy-insensitive mammary glands, and modified development of mammary cancer induced by neu and ras oncogenes, depending on the specific allele or genetic background.
- The *Ccnd1* gene is located on the Chr7. 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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Ccnd1 cyclin D1 [Mus musculus (house mouse)]

Gene ID: 12443, updated on 13-Mar-2020

Summary

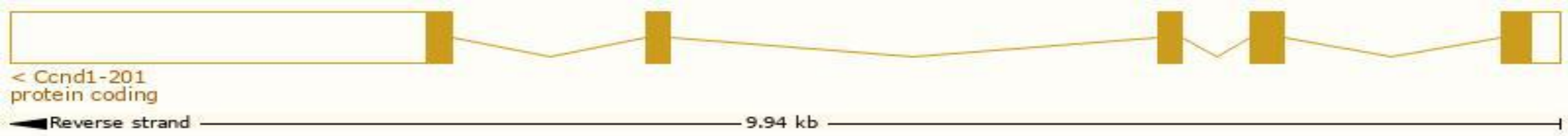
Official Symbol	Ccnd1 provided by MGI
Official Full Name	cyclin D1 provided by MGI
Primary source	MGI:MGI:88313
See related	Ensembl:ENSMUSG00000070348
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI327039, CycD1, Cyl-1, PRAD1, bcl-1, cD1
Expression	Ubiquitous expression in CNS E11.5 (RPKM 58.4), adrenal adult (RPKM 54.1) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

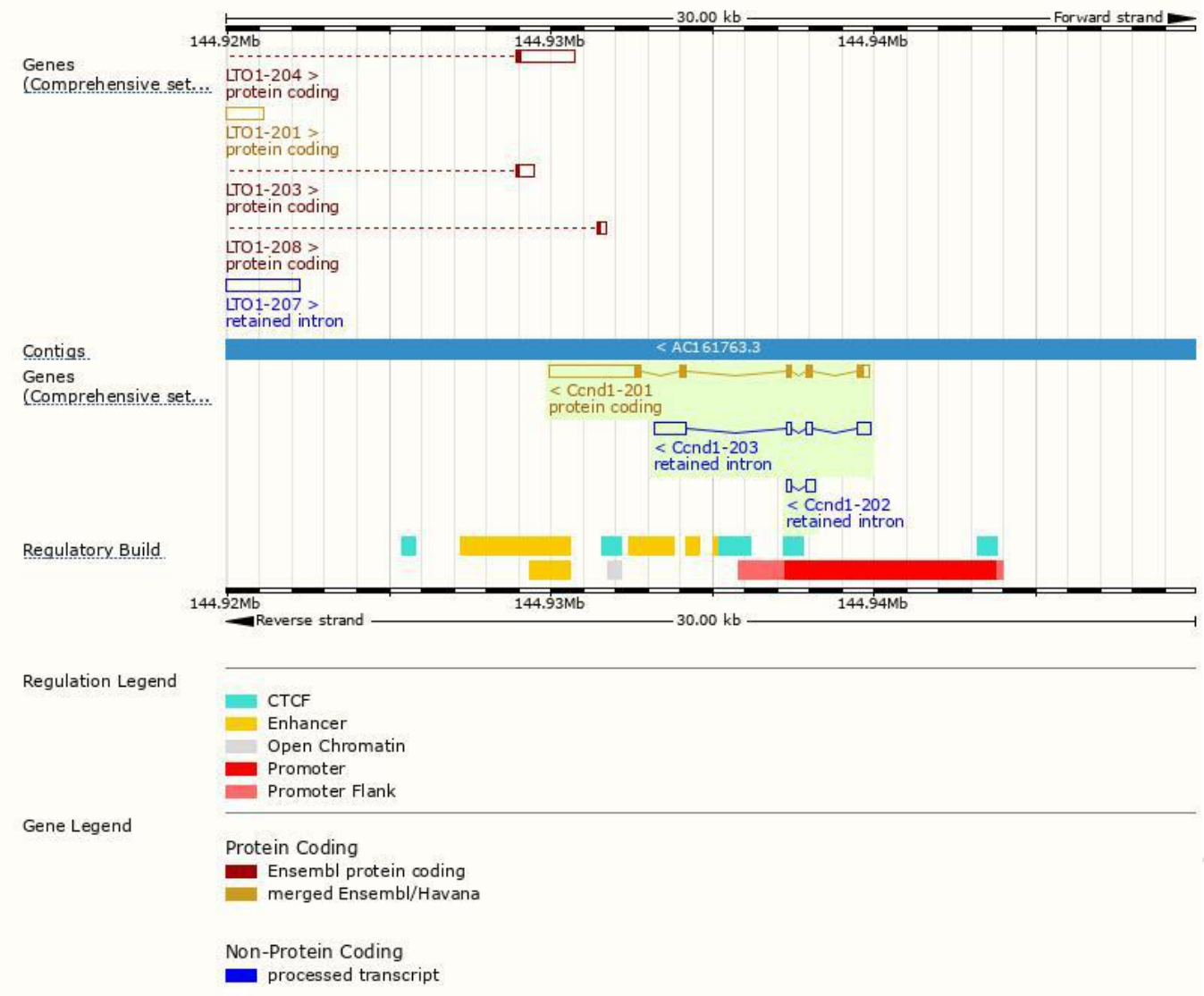
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ccnd1-201	ENSMUST00000093962.4	3740	295aa	Protein coding	CCDS22055	P25322 Q790L7	TSL:1 GENCODE basic APPRIS P1
Ccnd1-203	ENSMUST00000208193.1	1773	No protein	Retained intron	-	-	TSL:1
Ccnd1-202	ENSMUST00000135985.1	470	No protein	Retained intron	-	-	TSL:2

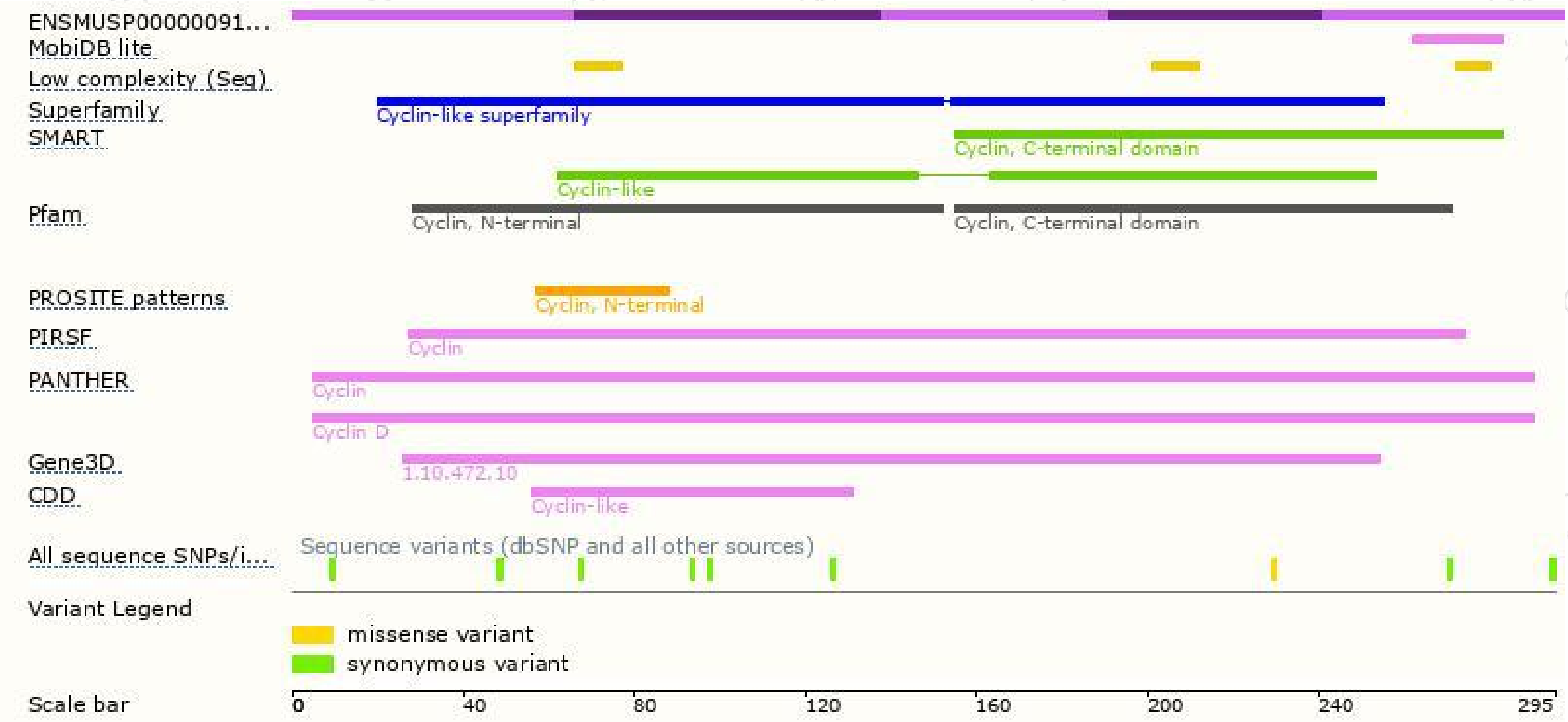
The strategy is based on the design of *Ccnd1-201* transcript,the transcription is shown below:



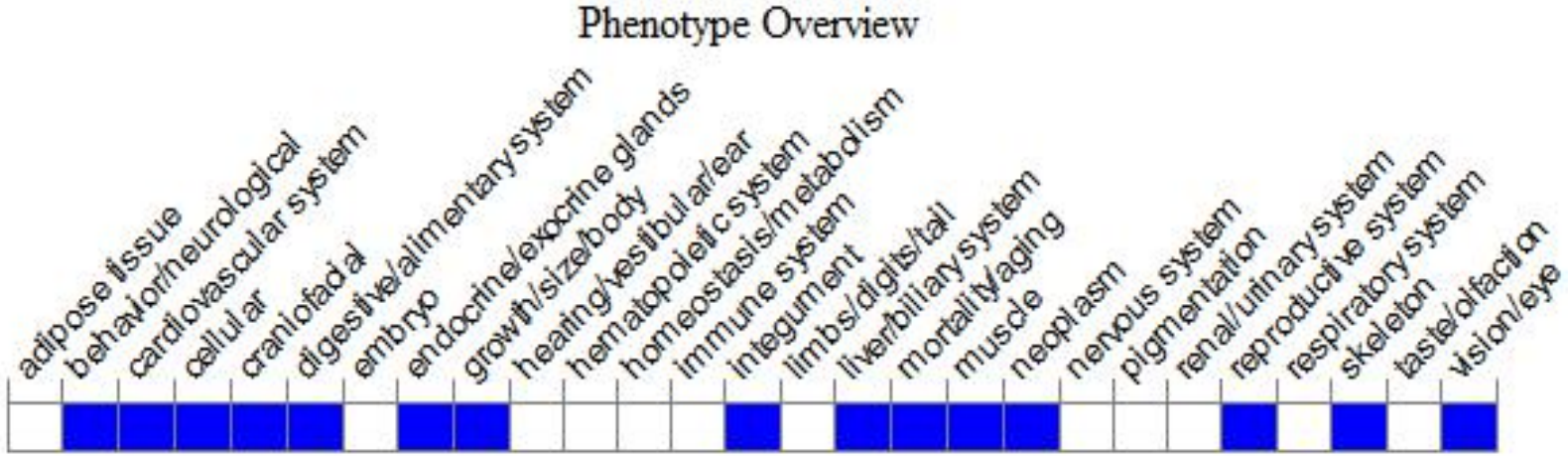
Genomic location distribution



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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