Cdc14b Cas9-CKO Strategy

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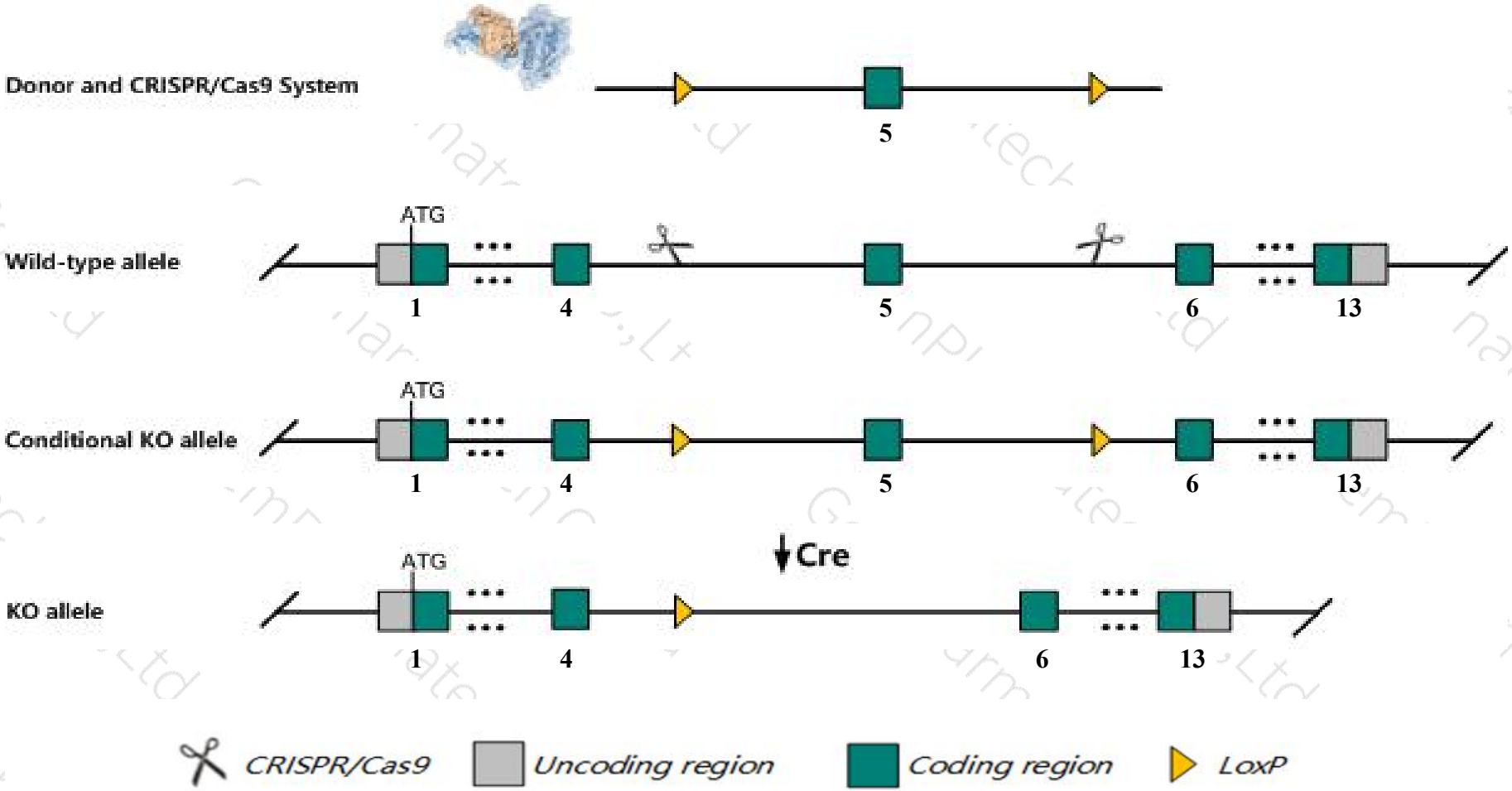
Project Overview

Project Name	***Cdc14b***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdc14b* gene. The schematic diagram is as follows:



Technical routes

- The *Cdc14b* gene has 11 transcripts. According to the structure of *Cdc14b* gene, exon5 of *Cdc14b-201* (ENSMUST00000039318.15) transcript is recommended as the knockout region.The region contains 77bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Cdc14b* 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 knock-out allele exhibit premature aging, including premature cataracts and kyphosis; reduced fertility, particularly in female mice; and impaired contextual conditioning.

- The *Cdc14b* gene is located on the Chr13. 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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Cdc14b CDC14 cell division cycle 14B [Mus musculus (house mouse)]

Gene ID: 218294, updated on 31-Jan-2019

Summary

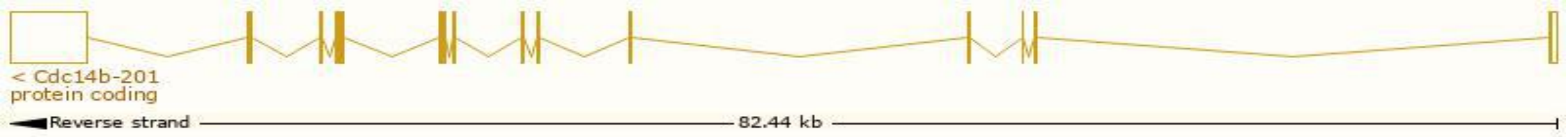
Official Symbol	Cdc14b provided by MGI
Official Full Name	CDC14 cell division cycle 14B provided byMGI
Primary source	MGI:MGI:2441808
See related	Ensembl:ENSMUSG00000033102
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2810432N10Rik, A530086E13Rik, AA472821, CDC14B3, Cdc14B1
Expression	Ubiquitous expression in testis adult (RPKM 6.1), placenta adult (RPKM 2.9) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

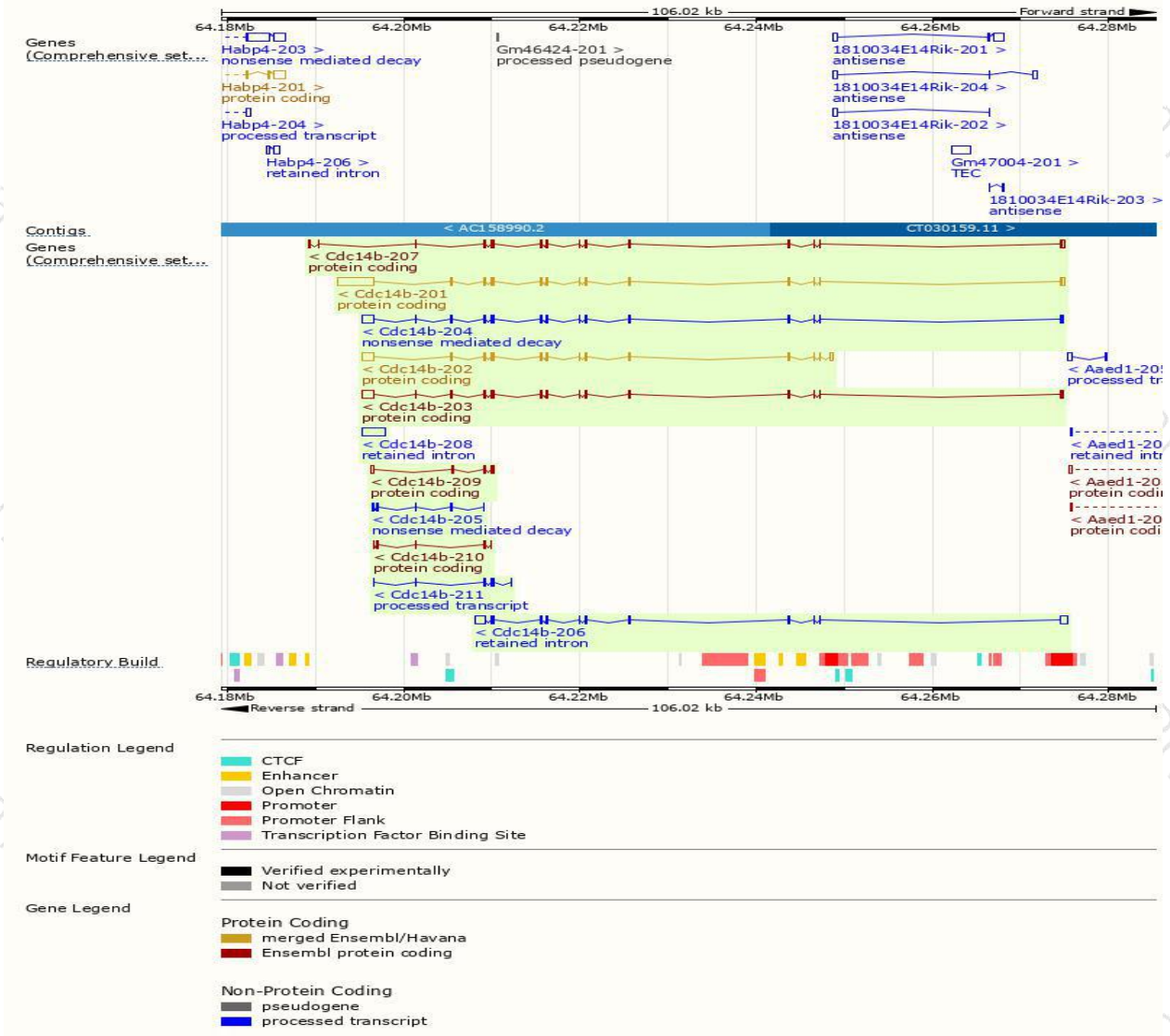
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdc14b-201	ENSMUST00000039318.15	5859	485aa	Protein coding	CCDS26598	Q6PFY9	TSL:1 GENCODE basic APPRIS P3
Cdc14b-203	ENSMUST00000109770.1	3052	485aa	Protein coding	CCDS26598	Q6PFY9	TSL:1 GENCODE basic APPRIS P3
Cdc14b-202	ENSMUST00000109769.9	2886	448aa	Protein coding	CCDS49292	Q6PFY9	TSL:1 GENCODE basic APPRIS ALT2
Cdc14b-207	ENSMUST00000221634.1	1953	492aa	Protein coding	-	A0A1Y7VJB9	TSL:1 GENCODE basic
Cdc14b-209	ENSMUST00000222713.1	790	153aa	Protein coding	-	A0A1Y7VJ26	CDS 5' incomplete TSL:3
Cdc14b-210	ENSMUST00000222766.1	474	124aa	Protein coding	-	A0A1Y7VKG2	CDS 5' incomplete TSL:3
Cdc14b-204	ENSMUST00000221139.1	3075	485aa	Nonsense mediated decay	-	Q6PFY9	TSL:1
Cdc14b-205	ENSMUST00000221217.1	628	63aa	Nonsense mediated decay	-	A0A1Y7VK12	CDS 5' incomplete TSL:3
Cdc14b-211	ENSMUST00000223116.1	752	No protein	Processed transcript	-	-	TSL:5
Cdc14b-206	ENSMUST00000221437.1	2841	No protein	Retained intron	-	-	TSL:1
Cdc14b-208	ENSMUST00000221788.1	2565	No protein	Retained intron	-	-	TSL:NA

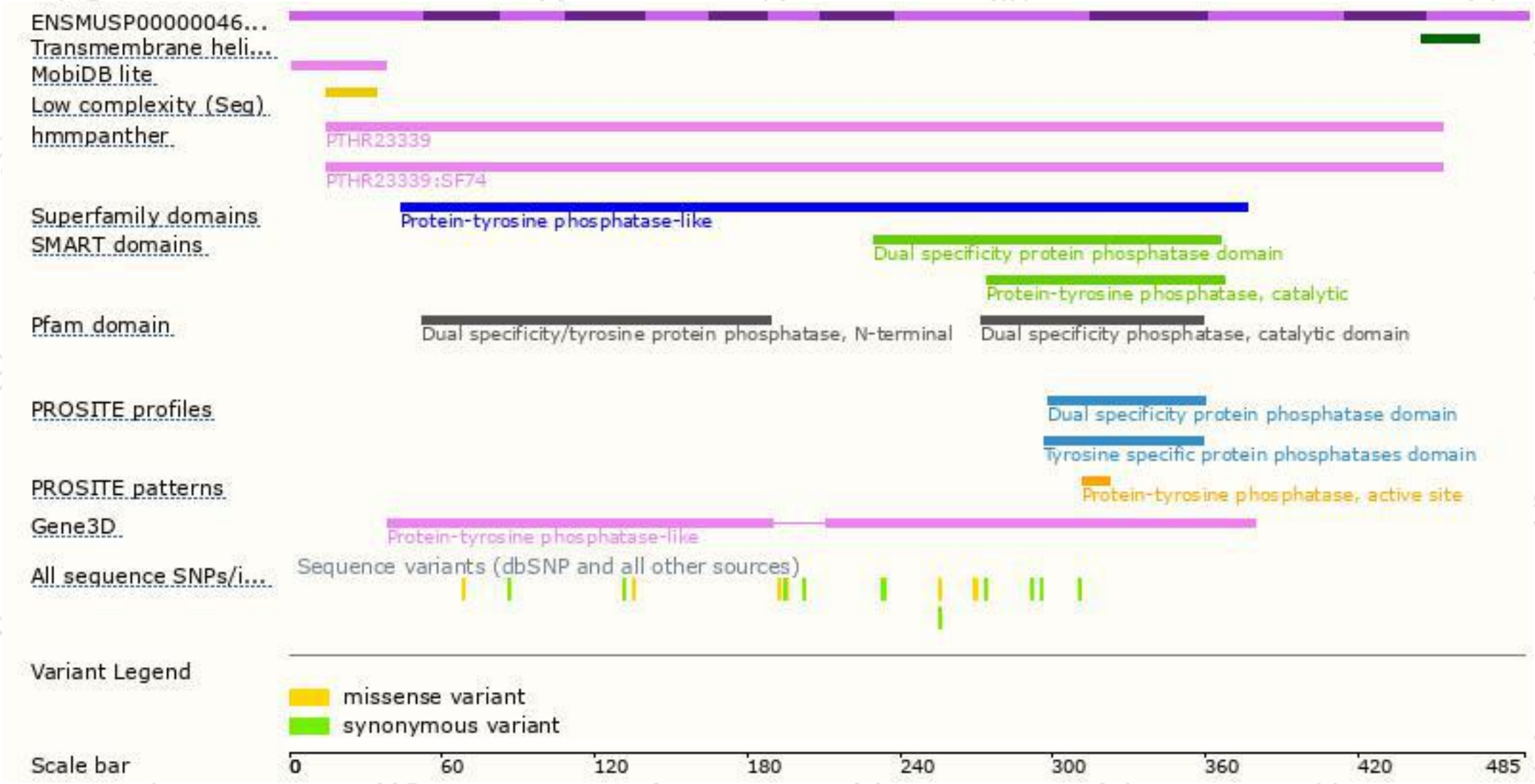
The strategy is based on the design of *Cdc14b-201* transcript,The transcription is shown below



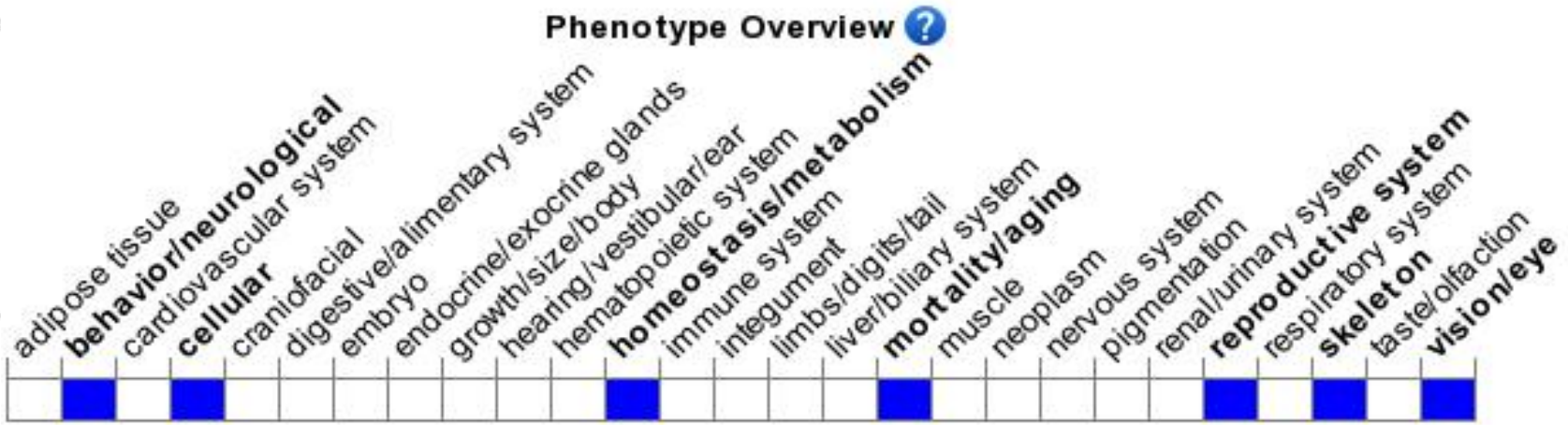
Genomic location distribution



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/).

According to the existing MGI data,Mice homozygous for a knock-out allele exhibit premature aging, including premature cataracts and kyphosis; reduced fertility, particularly in female mice; and impaired contextual conditioning.

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

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