# *Plcb4* Cas9-KO Strategy


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**Reviewer:** Ruirui Zhang


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# Project Overview

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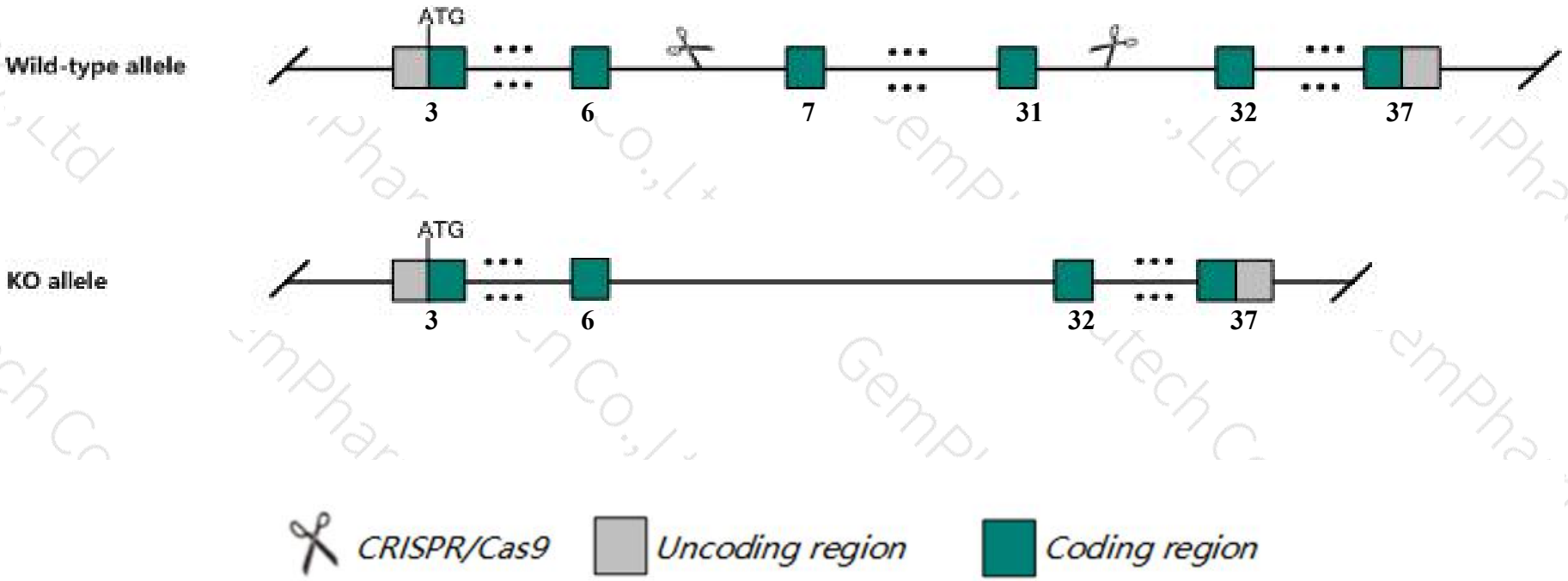
|---|---|
| **Project Name** | ***Plcb4*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Plcb4* gene. The schematic diagram is as follows:



# Technical routes

➢ The *Plcb4* gene has 15 transcripts. According to the structure of *Plcb4* gene, exon7-exon31 of *Plcb4-202* (ENSMUST00000110109.7) transcript is recommended as the knockout region.The region contains 2591bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Plcb4* gene. The brief process is as follows: CRISPR/Cas9 system

# Notice

- According to the existing MGI data,Homozygotes for targeted mutations may exhibit ataxia, impaired elimination of excess climbing fiber synapses in the developing cerebellum, abnormal cerebellar foliation, reduced visual processing ability and loss of circadian rhythm in constant darkness,mice survived in the absence of normal littermates, indicating a reduced ability to compete with normal littermates.

- The *Plcb4* gene is located on the Chr2. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information（NCBI）

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## Plcb4 phospholipase C, beta 4 [ *Mus musculus* (house mouse) ]

Gene ID: 18798, updated on 14-Jan-2020

### Summary

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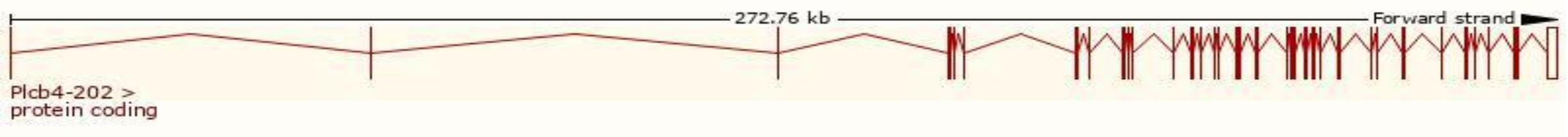
|---|---|
| **Official Symbol** | Plcb4 provided by MGI |
| **Official Full Name** | phospholipase C, beta 4 provided by MGI |
| **Primary source** | MGI:MGI:107464 |
| **See related** | Ensembl:ENSMUSG00000039943 |
| **Gene type** | protein coding |
| **RefSeq status** | VALIDATED |
| **Organism** | Mus musculus |
| **Lineage** | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| **Also known as** | AI854601; A930039J07Rik; C230058B11Rik |
| **Expression** | Biased expression in bladder adult (RPKM 32.1), cerebellum adult (RPKM 16.4) and 11 other tissues See more |
| **Orthologs** | human all |

# Transcript information（Ensembl）

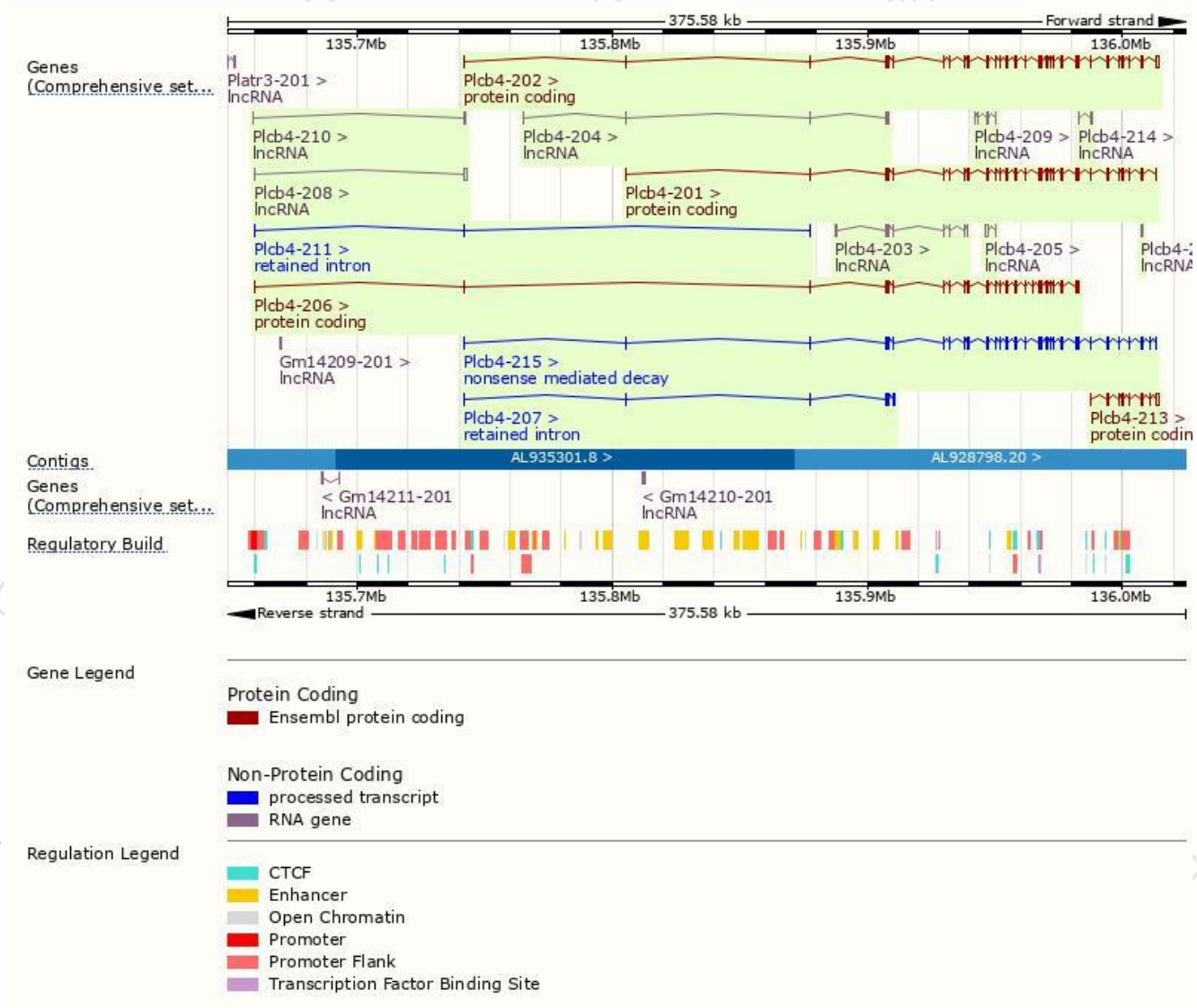
The gene has 15 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| Plcb4-202 | ENSMUST00000110109.7 | 5217 | 1175aa | Protein coding | CCDS16788 | Q91UZ1 | TSL:1 GENCODE basic APPRIS P1 |
| Plcb4-201 | ENSMUST00000035646.10 | 3635 | 1175aa | Protein coding | CCDS16788 | Q91UZ1 | TSL:5 GENCODE basic APPRIS P1 |
| Plcb4-206 | ENSMUST00000134310.7 | 2744 | 883aa | Protein coding | - | A2AT91 | CDS 3' incomplete TSL:1 |
| Plcb4-213 | ENSMUST00000147744.1 | 2307 | 255aa | Protein coding | - | A2AT93 | CDS 5' incomplete TSL:1 |
| Plcb4-215 | ENSMUST00000184371.7 | 3754 | 1022aa | Nonsense mediated decay | - | V9GXQ9 | TSL:5 |
| Plcb4-207 | ENSMUST00000137969.7 | 739 | No protein | Retained intron | - | - | TSL:5 |
| Plcb4-211 | ENSMUST00000146018.7 | 613 | No protein | Retained intron | - | - | TSL:5 |
| Plcb4-210 | ENSMUST00000144931.1 | 1366 | No protein | lncRNA | - | - | TSL:1 |
| Plcb4-208 | ENSMUST00000139480.1 | 1186 | No protein | lncRNA | - | - | TSL:1 |
| Plcb4-205 | ENSMUST00000132686.1 | 779 | No protein | lncRNA | - | - | TSL:2 |
| Plcb4-203 | ENSMUST00000127044.1 | 669 | No protein | lncRNA | - | - | TSL:3 |
| Plcb4-214 | ENSMUST00000150072.1 | 508 | No protein | lncRNA | - | - | TSL:2 |
| Plcb4-209 | ENSMUST00000141025.1 | 449 | No protein | lncRNA | - | - | TSL:5 |
| Plcb4-204 | ENSMUST00000127729.7 | 441 | No protein | lncRNA | - | - | TSL:5 |
| Plcb4-212 | ENSMUST00000147122.1 | 389 | No protein | lncRNA | - | - | TSL:3 |

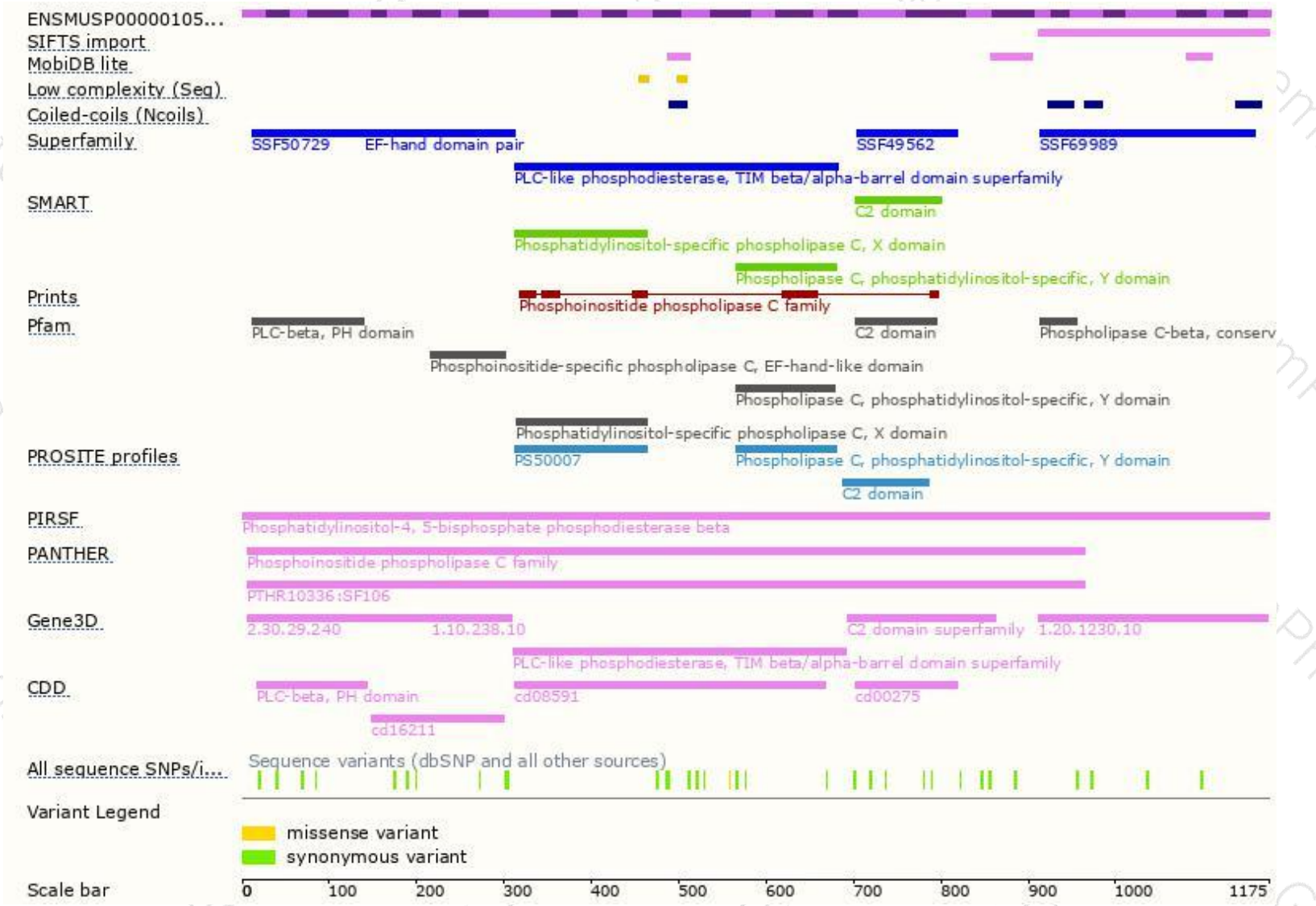
The strategy is based on the design of *Plcb4-202* transcript,The transcription is shown below



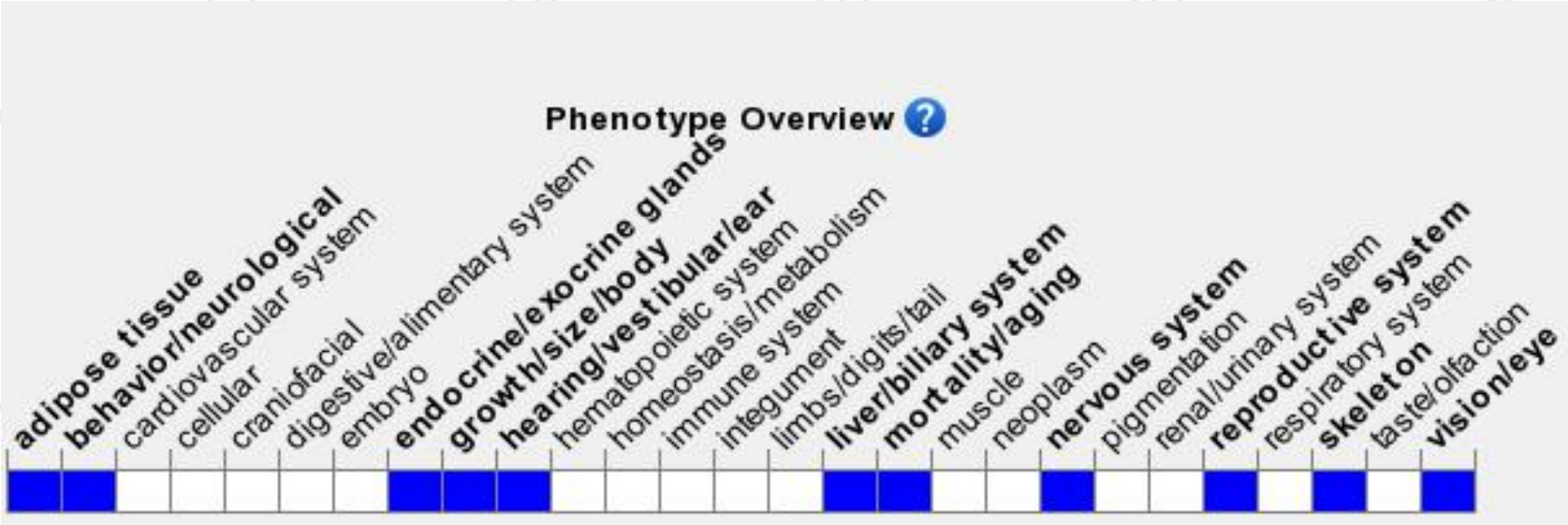
# Genomic location distribution



# 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,Homozygotes for targeted mutations may exhibit ataxia, impaired elimination of excess climbing fiber synapses in the developing cerebellum, abnormal cerebellar foliation, reduced visual processing ability and loss of circadian rhythm in constant darkness, mice survived in the absence of normal littermates, indicating a reduced ability to compete with normal littermates.

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

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