

# *Nrl* Cas9-CKO Strategy

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# Project Overview

**Project Name**

*Nrl*

**Project type**

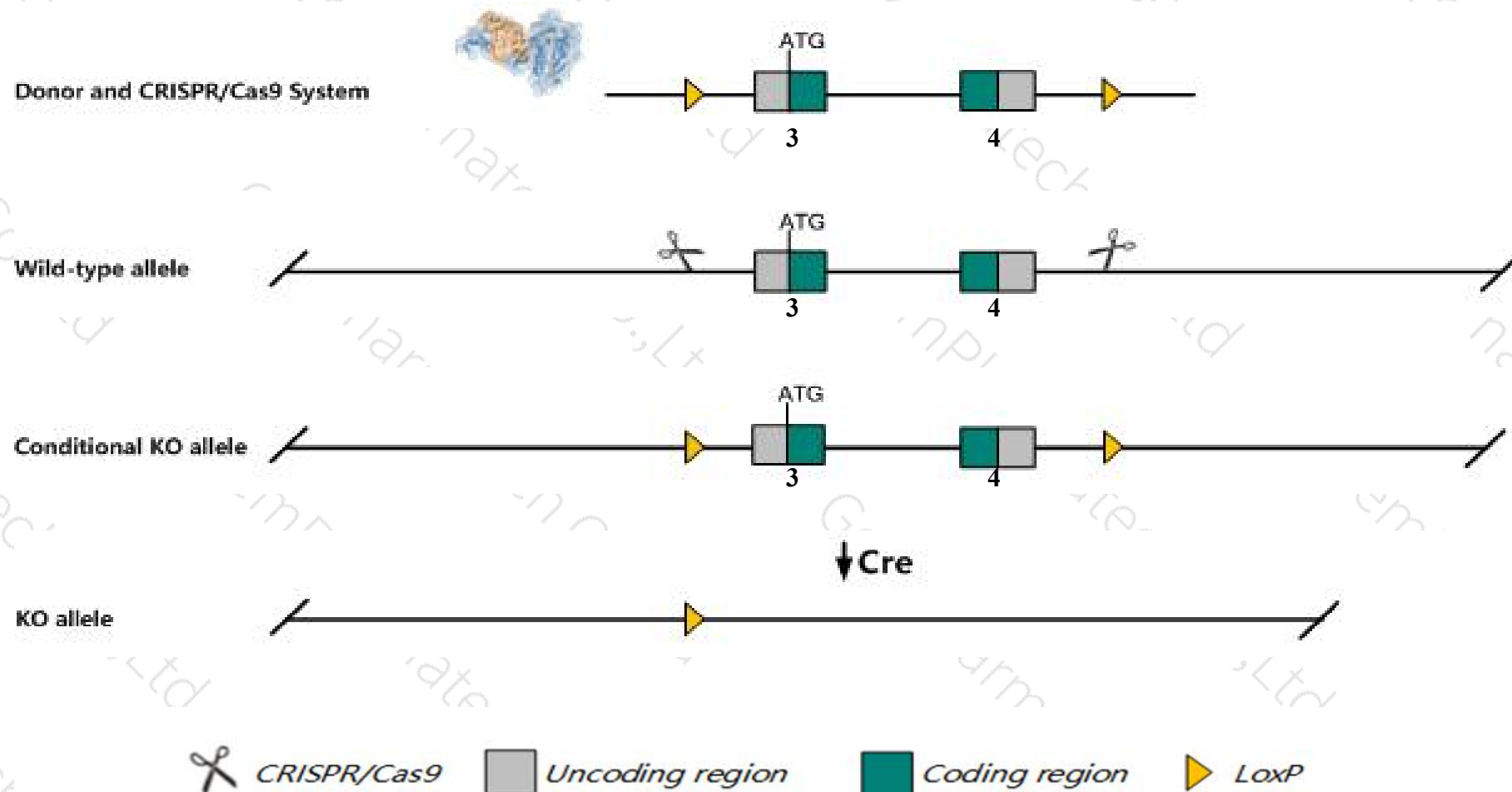
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

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



- The *Nrl* gene has 7 transcripts. According to the structure of *Nrl* gene, exon3-exon4 of *Nrl-201* (ENSMUST00000062232.14) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nrl* 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.

- According to the existing MGI data, Homozygotes for a targeted null mutation exhibit a retinal defect causing loss of rod function, exaggerated cone function, short, sparse outer segments, and abnormal disks.
- The *Nrl* gene is located on the Chr14. 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)

## Nrl neural retina leucine zipper gene [Mus musculus (house mouse)]

Gene ID: 18185, updated on 30-Mar-2019

### Summary



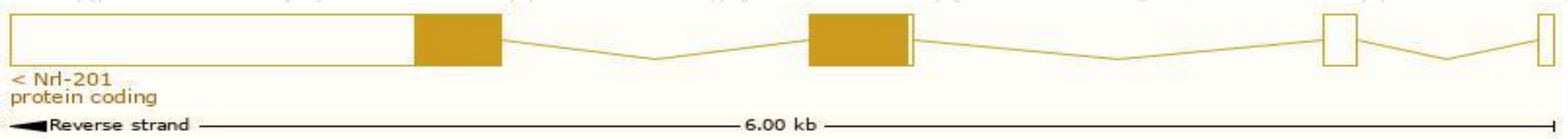
<b>Official Symbol</b>	Nrl provided by <a href="#">MGI</a>
<b>Official Full Name</b>	neural retina leucine zipper gene provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:102567</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000040632</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	REVIEWED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	D14H14S46E
<b>Summary</b>	This gene encodes a member of the basic leucine zipper domain family of transcription factors. The encoded protein is preferentially expressed in the retina and is necessary for rod photoreceptor development. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Dec 2012]
<b>Expression</b>	Low expression observed in reference dataset <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

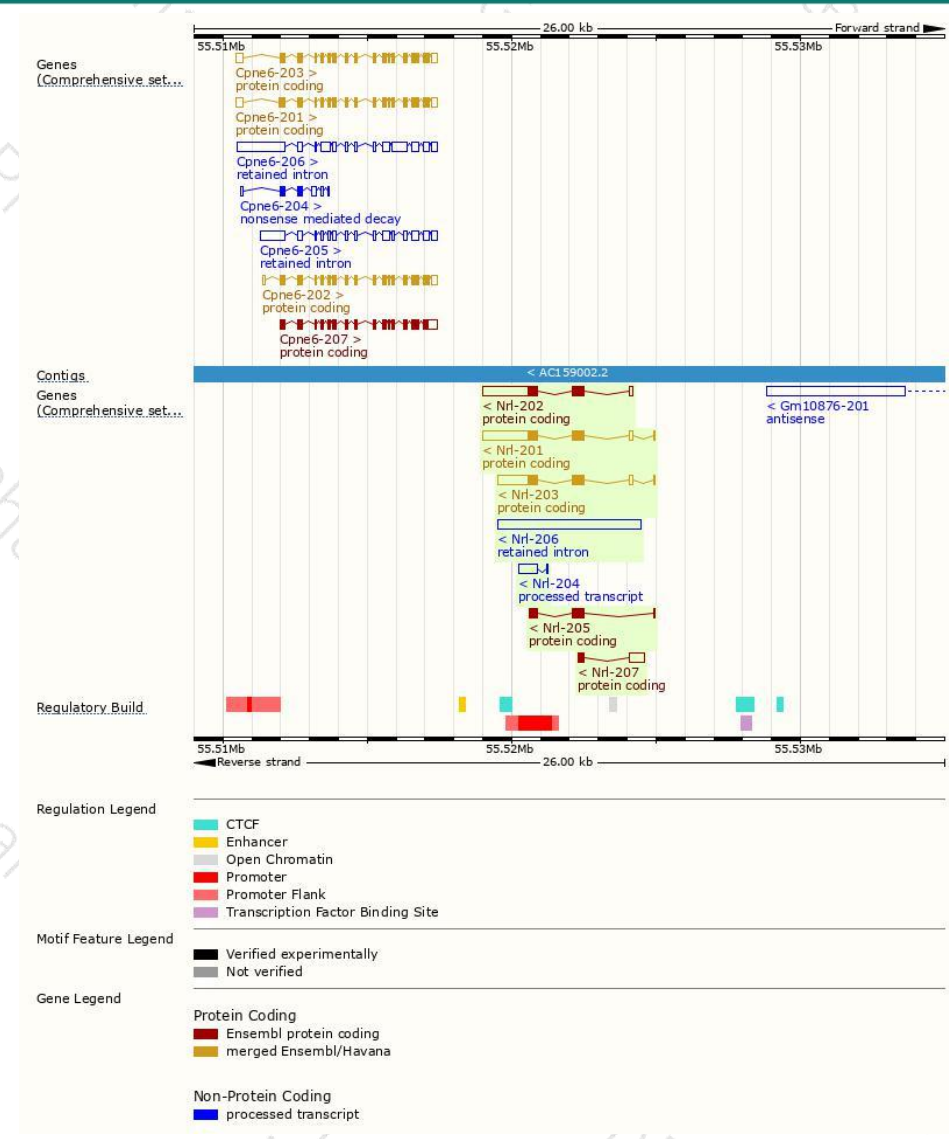
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nrl-201	<a href="#">ENSMUST00000062232.14</a>	2504	<a href="#">237aa</a>	Protein coding	<a href="#">CCDS27113</a>	<a href="#">P54846 Q543Y0</a>	TSL:1 GENCODE basic APPRIS P1
Nrl-202	<a href="#">ENSMUST00000111404.7</a>	2422	<a href="#">237aa</a>	Protein coding	<a href="#">CCDS27113</a>	<a href="#">P54846 Q543Y0</a>	TSL:1 GENCODE basic APPRIS P1
Nrl-203	<a href="#">ENSMUST00000178694.2</a>	1928	<a href="#">237aa</a>	Protein coding	<a href="#">CCDS27113</a>	<a href="#">P54846 Q543Y0</a>	TSL:1 GENCODE basic APPRIS P1
Nrl-205	<a href="#">ENSMUST00000228287.1</a>	742	<a href="#">226aa</a>	Protein coding	-	<a href="#">A0A2I3BPV3</a>	CDS 3' incomplete
Nrl-207	<a href="#">ENSMUST00000228902.1</a>	733	<a href="#">62aa</a>	Protein coding	-	<a href="#">A0A2I3BQU2</a>	CDS 3' incomplete
Nrl-204	<a href="#">ENSMUST00000226858.1</a>	731	No protein	Processed transcript	-	-	
Nrl-206	<a href="#">ENSMUST00000228351.1</a>	4973	No protein	Retained intron	-	-	

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

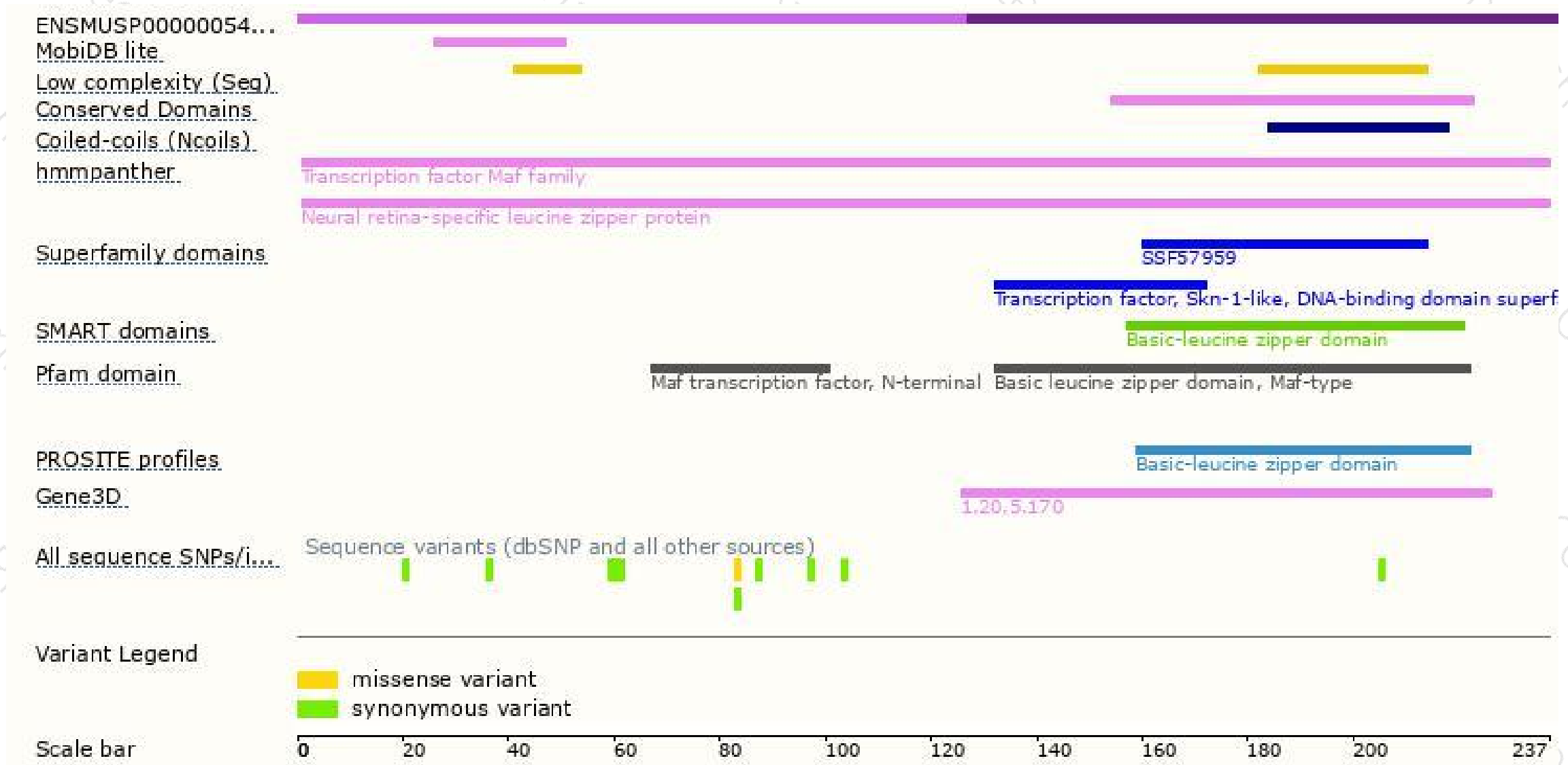


# Genomic location distribution

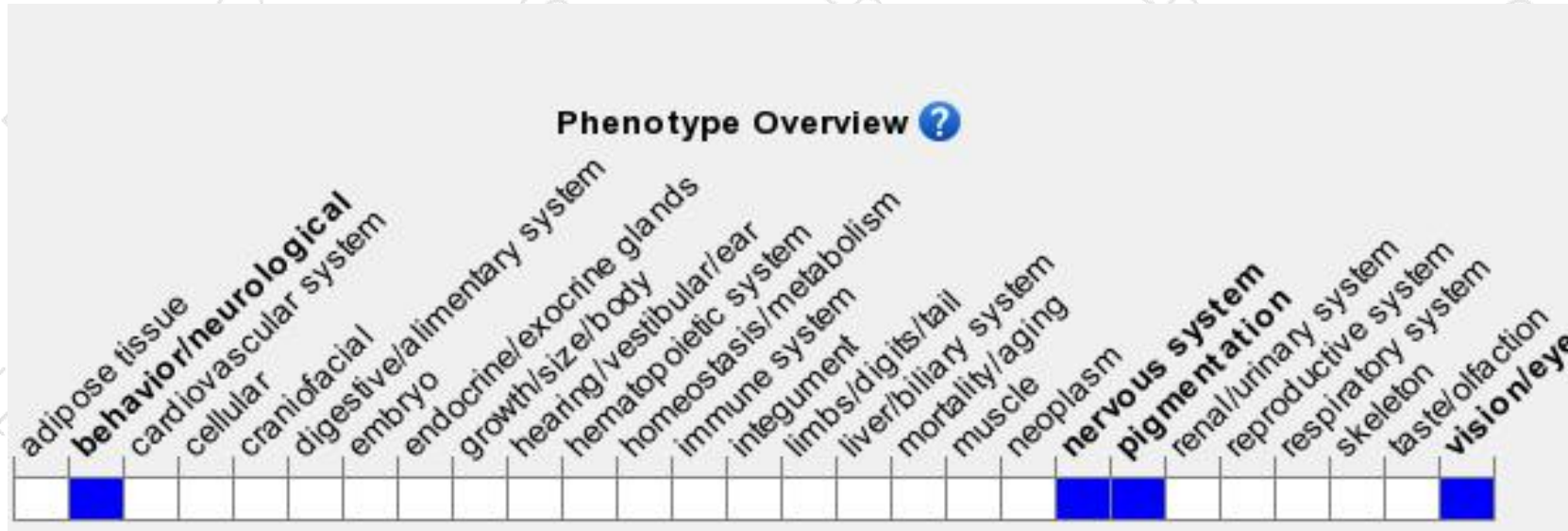




# Protein domain



# 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, Homozygotes for a targeted null mutation exhibit a retinal defect causing loss of rod function, exaggerated cone function, short, sparse outer segments, and abnormal disks.

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

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