

# ***Drp2 Cas9-CKO Strategy***

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**Reviewer: Daohua Xu**

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# Project Overview

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**Project Name**

***Drp2***

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**Project type**

**Cas9-CKO**

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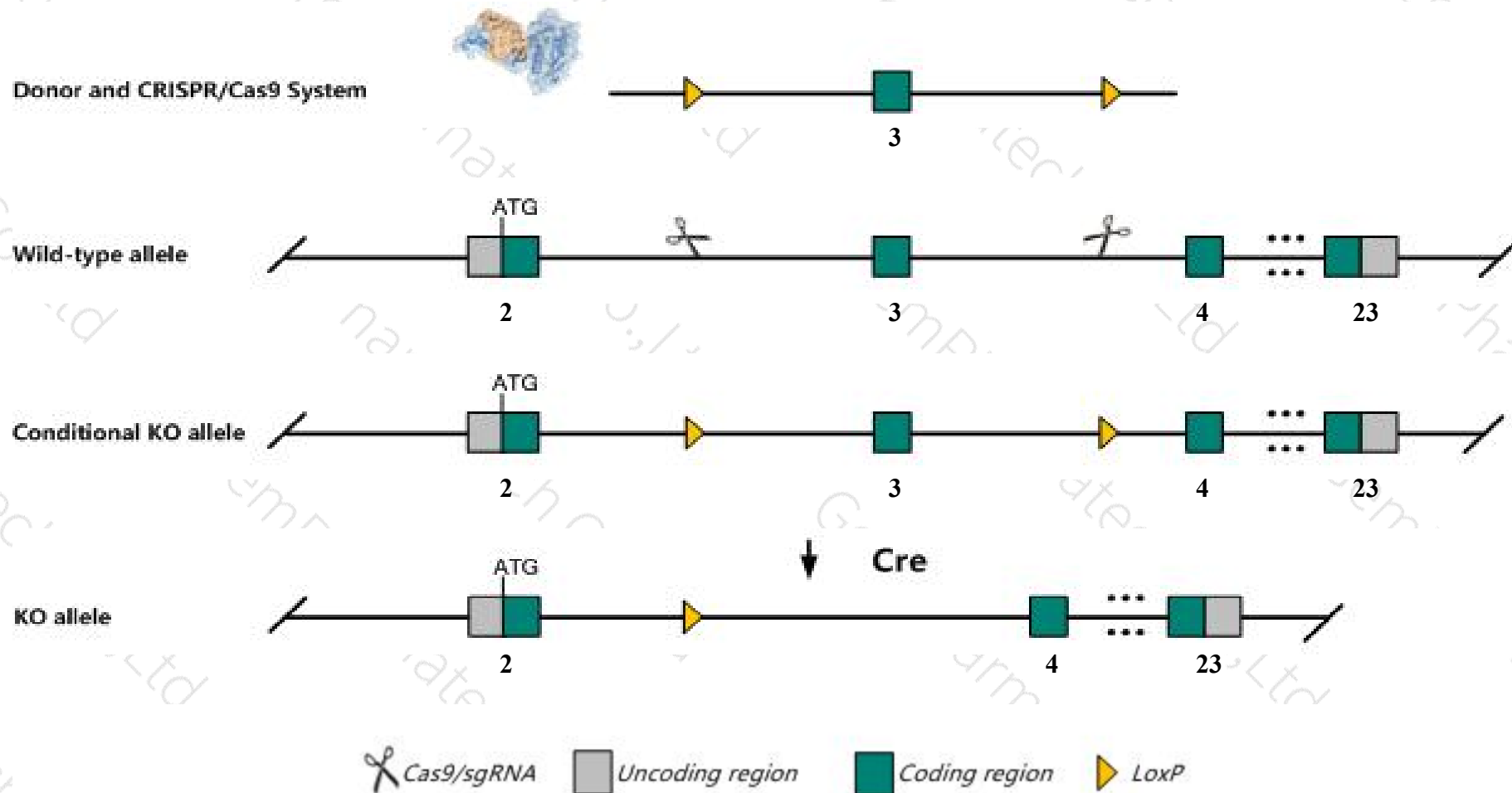
**Strain background**

**C57BL/6JGpt**

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# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Drp2* gene. The schematic diagram is as follows:



# Technical routes

- The *Drp2* gene has 6 transcripts. According to the structure of *Drp2* gene, exon3 of *Drp2-206*(ENSMUST00000153424.7) transcript is recommended as the knockout region. The region contains 164bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Drp2* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 was 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, mice homozygous for a conditional allele activated in peripheral nerves exhibit abnormal Schwann cell morphology, supernumerary Schwann cell, abnormal myelin sheath morphology and hypermyelination.
- The *Drp2* gene is located on the ChrX. 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)

## Drp2 dystrophin related protein 2 [Mus musculus (house mouse)]

Gene ID: 13497, updated on 13-Mar-2020

### Summary



**Official Symbol** Drp2 provided by [MGI](#)

**Official Full Name** dystrophin related protein 2 provided by [MGI](#)

**Primary source** [MGI:MGI:107432](#)

**See related** [Ensembl:ENSMUSG00000000223](#)

**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** AW495265, DRP-2

**Expression** Biased expression in frontal lobe adult (RPKM 10.1), cortex adult (RPKM 10.1) and 10 other tissues [See more](#)

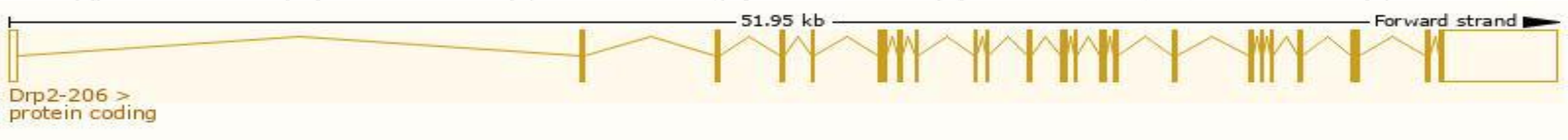
**Orthologs** [human](#) [all](#)

# Transcript information (Ensembl)

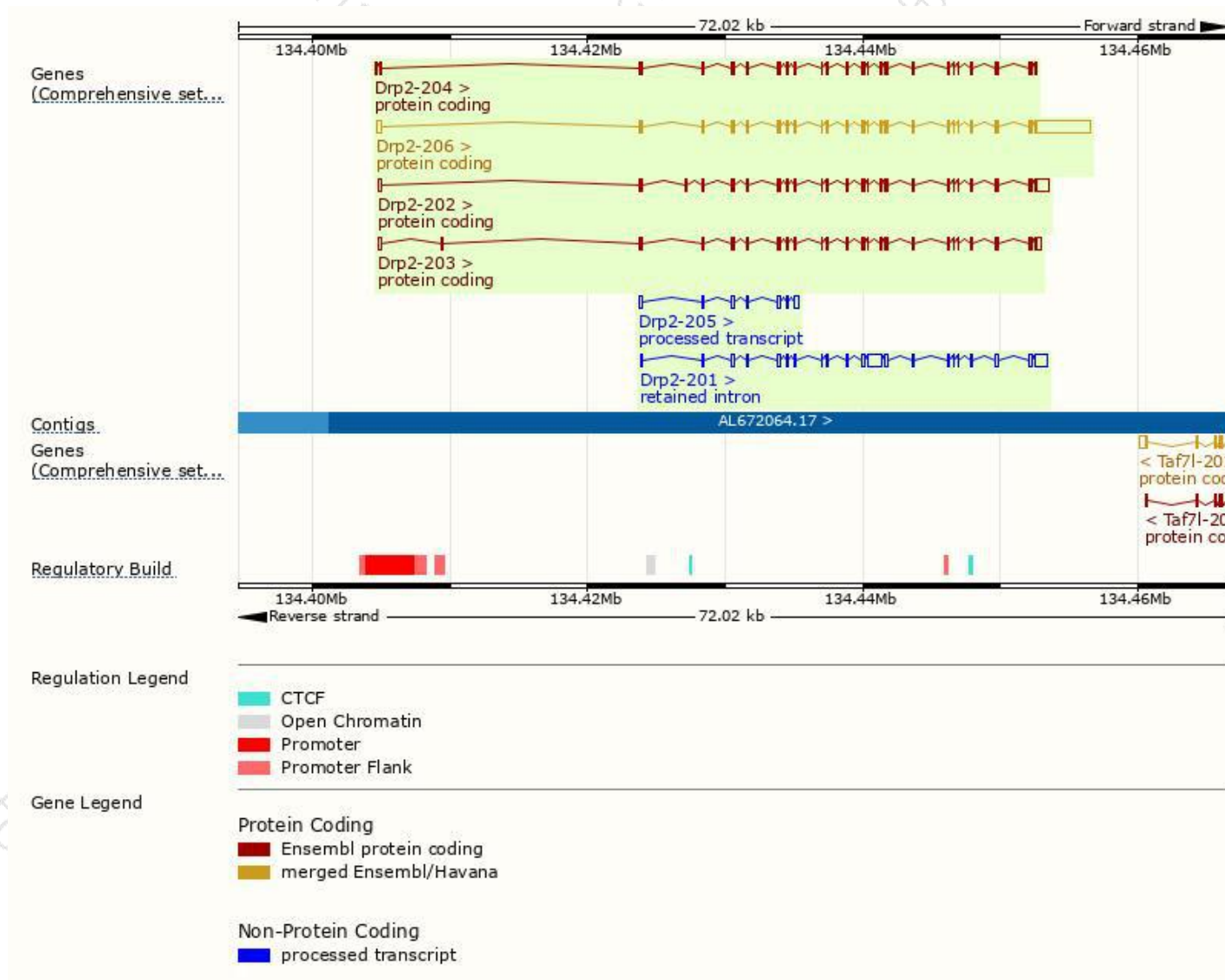
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Drp2-206	<a href="#">ENSMUST00000153424.7</a>	7135	<a href="#">957aa</a>	Protein coding	<a href="#">CCDS30394</a>	<a href="#">Q05AA6</a>	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 P1
Drp2-203	<a href="#">ENSMUST00000113226.1</a>	3499	<a href="#">957aa</a>	Protein coding	<a href="#">CCDS30394</a>	<a href="#">Q05AA6</a>	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 P1
Drp2-204	<a href="#">ENSMUST00000113228.7</a>	3141	<a href="#">957aa</a>	Protein coding	<a href="#">CCDS30394</a>	<a href="#">Q05AA6</a>	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 P1
Drp2-202	<a href="#">ENSMUST00000113224.8</a>	4147	<a href="#">981aa</a>	Protein coding	-	<a href="#">B1AV35</a>	TSL:5 GENCODE basic
Drp2-205	<a href="#">ENSMUST00000142146.7</a>	1423	No protein	Processed transcript	-	-	TSL:5
Drp2-201	<a href="#">ENSMUST00000000228.4</a>	4389	No protein	Retained intron	-	-	TSL:2

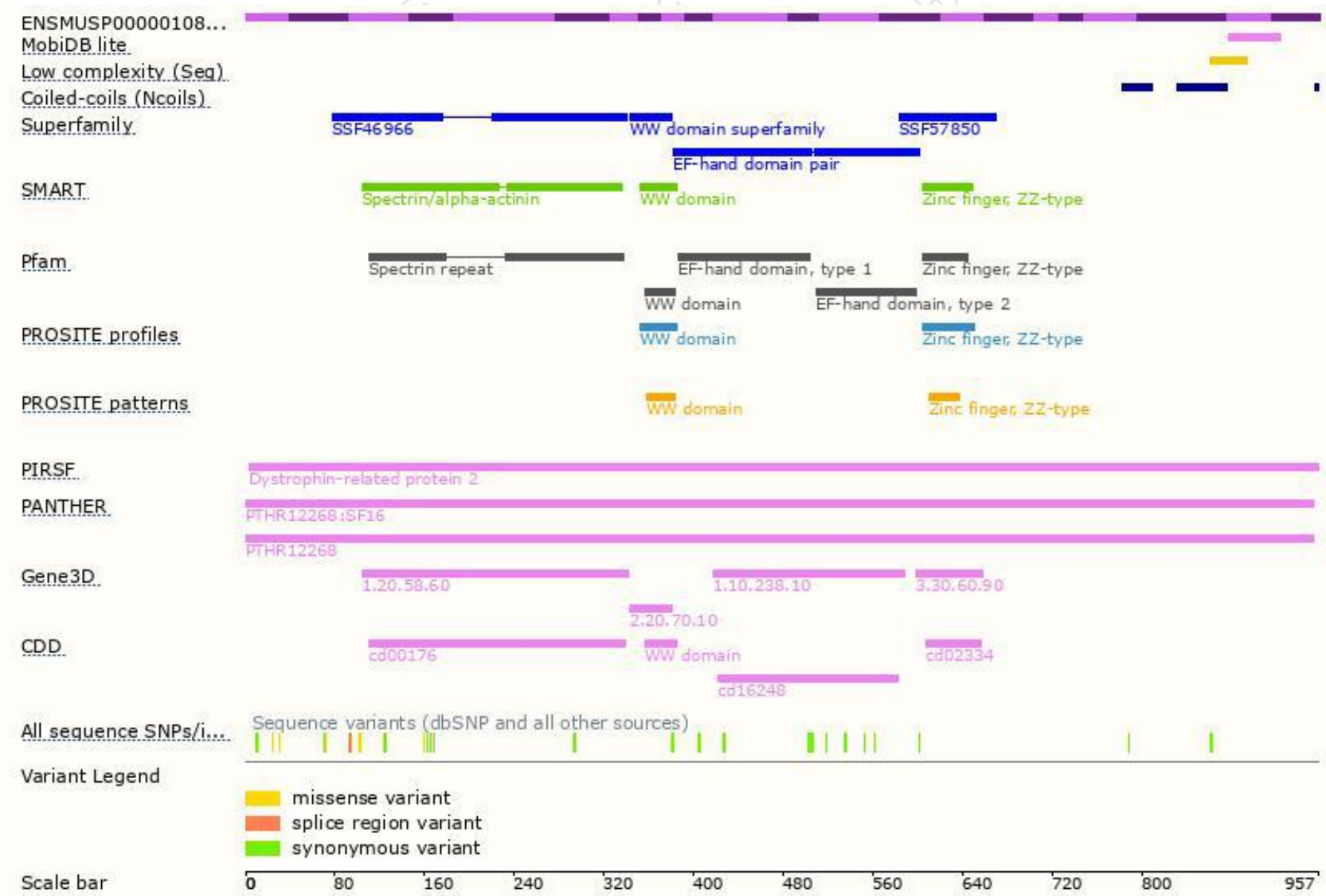
The strategy is based on the design of *Drp2-206* transcript,the transcription is shown below:



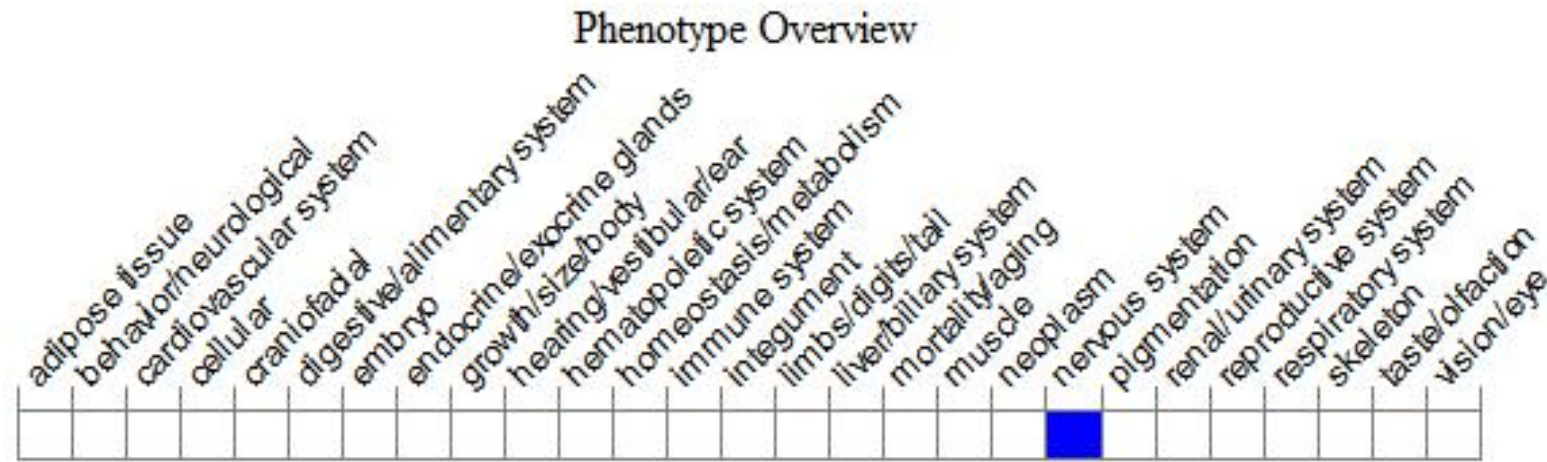
# Genomic location distribution



# 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 conditional allele activated in peripheral nerves exhibit abnormal Schwann cell morphology, supernumerary Schwann cell, abnormal myelin sheath morphology and hypermyelination.

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

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