

# ***Mdn1*** Cas9-KO Strategy

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# Project Overview

**Project Name**

*Mdn1*

**Project type**

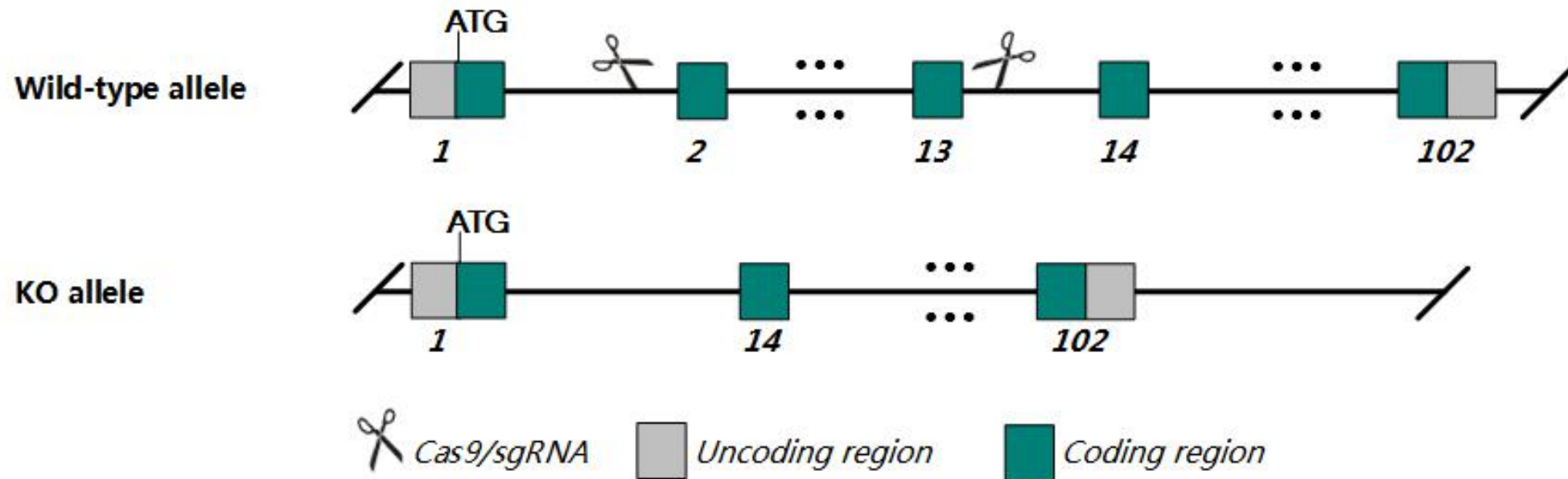
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mdn1* gene. The schematic diagram is as follows:



- The *Mdn1* gene has 11 transcripts. According to the structure of *Mdn1* gene, exon2-exon13 of *Mdn1-211* (ENSMUST00000178134.1) transcript is recommended as the knockout region. The region contains 1823bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mdn1* gene. The brief process is as follows: gRNA was transcribed in vitro. Cas9 and gRNA 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 *Mdn1* gene is located on the Chr4. 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.
- Transcript *Mdn1*-202&203&204&206&207&208&209 may not be affected.
- 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)

## Mdn1 midasin AAA ATPase 1 [ *Mus musculus* (house mouse) ]

Gene ID: 100019, updated on 31-Jan-2019

### Summary

**Official Symbol** Mdn1 provided by [MGI](#)  
**Official Full Name** midasin AAA ATPase 1 provided by [MGI](#)  
**Primary source** [MGI:MGI:1926159](#)  
**See related** [Ensembl:ENSMUSG00000058006](#)  
**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** Gm135; D4Abb1e; AA958993; A130070M06; 4833432B22Rik  
**Expression** Ubiquitous expression in CNS E18 (RPKM 4.6), testis adult (RPKM 4.3) and 28 other tissues [See more](#)  
**Orthologs** [human](#) [all](#)

### Genomic context

Location: 4 A5; 4 14.3 cM

[See Mdn1 in Genome Data Viewer](#)

Exon count: 102

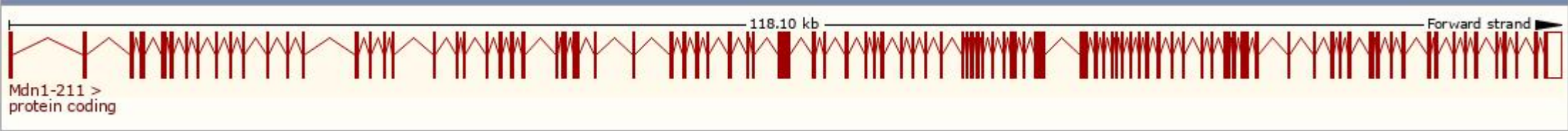
Annotation release	Status	Assembly	Chr	Location
<a href="#">106</a>	current	GRCm38.p4 ( <a href="#">GCF_000001635.24</a> )	4	NC_000070.6 (32657112..32775217)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	4	NC_000070.5 (32744094..32862192)

# Transcript information (Ensembl)

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

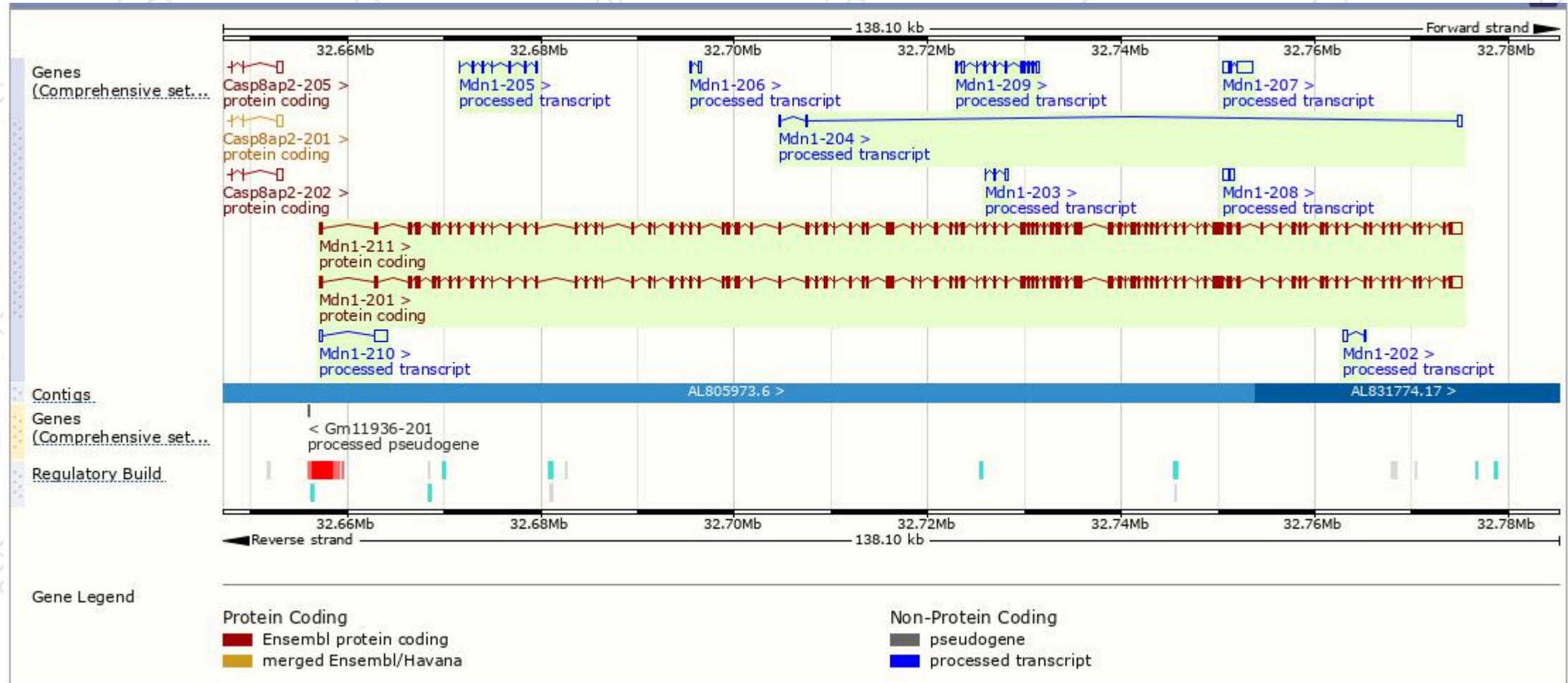
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mdn1-201	<a href="#">ENSMUST00000071642.10</a>	17970	<a href="#">5589aa</a>	Protein coding	-	<a href="#">A2ANY6</a>	TSL:5 GENCODE basic APPRIS ALT2
Mdn1-202	<a href="#">ENSMUST000000124361.1</a>	597	No protein	Processed transcript	-	-	TSL:3
Mdn1-203	<a href="#">ENSMUST000000124657.1</a>	396	No protein	Processed transcript	-	-	TSL:5
Mdn1-204	<a href="#">ENSMUST000000125323.1</a>	546	No protein	Processed transcript	-	-	TSL:5
Mdn1-205	<a href="#">ENSMUST000000133403.1</a>	679	No protein	Processed transcript	-	-	TSL:5
Mdn1-206	<a href="#">ENSMUST000000136608.1</a>	431	No protein	Processed transcript	-	-	TSL:3
Mdn1-207	<a href="#">ENSMUST000000138577.1</a>	2265	No protein	Processed transcript	-	-	TSL:1
Mdn1-208	<a href="#">ENSMUST000000149941.7</a>	943	No protein	Processed transcript	-	-	TSL:2
Mdn1-209	<a href="#">ENSMUST000000150934.7</a>	1875	No protein	Processed transcript	-	-	TSL:1
Mdn1-210	<a href="#">ENSMUST000000151626.1</a>	1508	No protein	Processed transcript	-	-	TSL:1
Mdn1-211	<a href="#">ENSMUST000000178134.1</a>	17959	<a href="#">5582aa</a>	Protein coding	<a href="#">CCDS57264</a>	<a href="#">J3QMC5</a>	TSL:5 GENCODE basic APPRIS P2

The strategy is based on the design of *Mdn1-201* transcript,The transcription is shown below



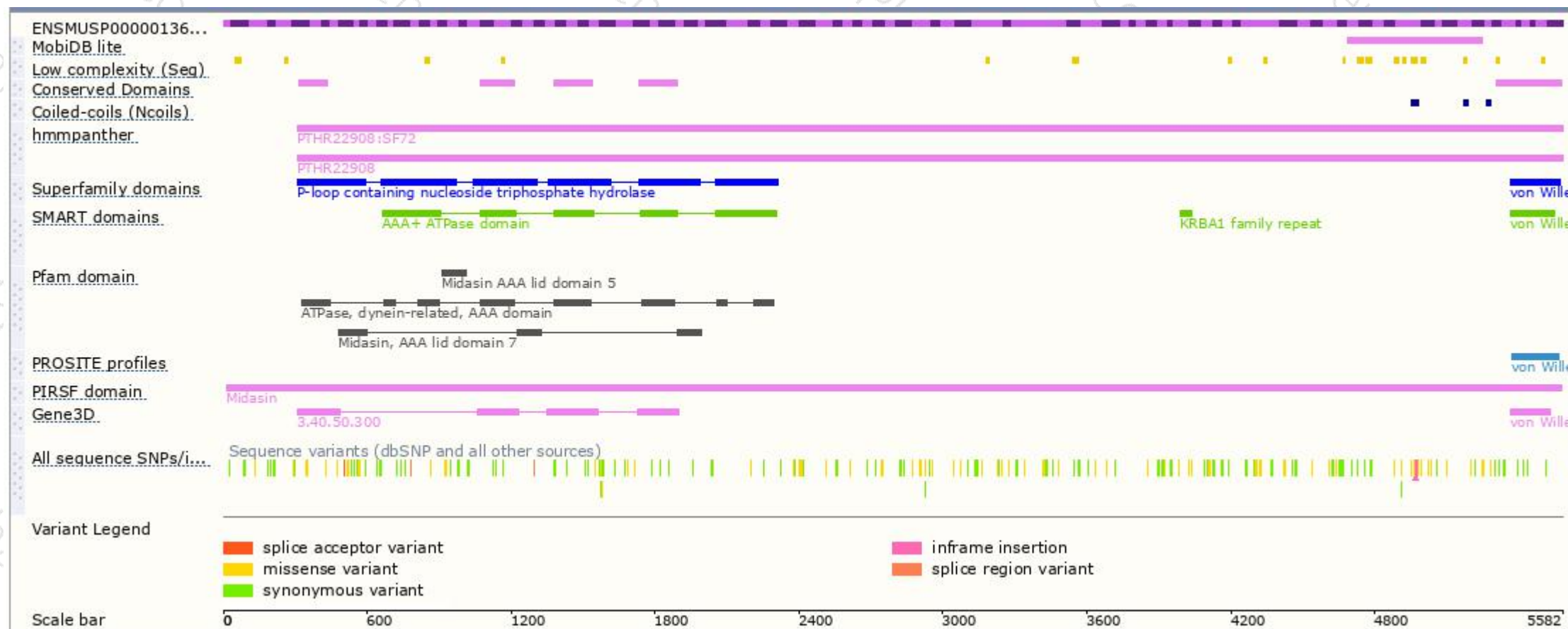


# Genomic location distribution

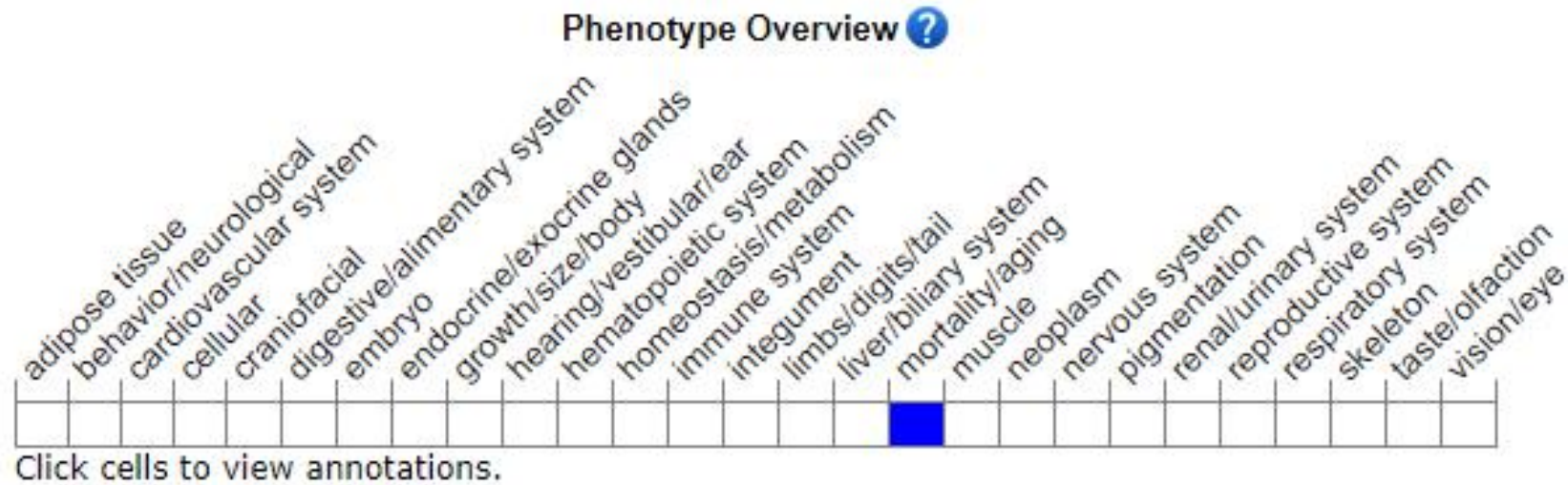




# Protein domain



# Mouse phenotype description(MGI)



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

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

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