

# ***Dnm2 Cas9-KO Strategy***

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**Reviewer:**

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**Design Date:**

**2019-9-20**

# Project Overview

**Project Name**

***Dnm2***

**Project type**

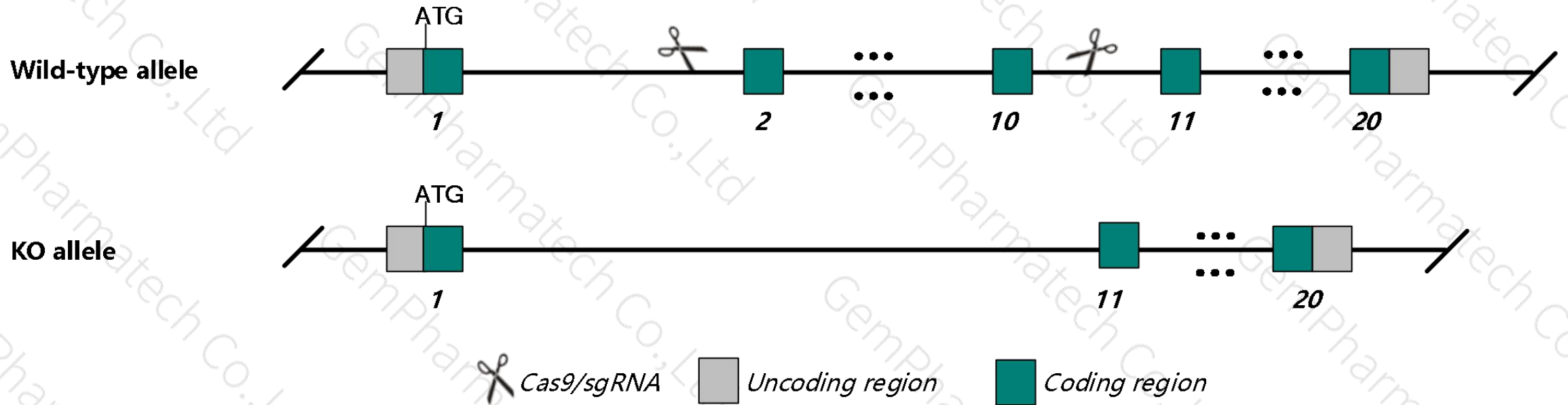
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dnm2* gene. The schematic diagram is as follows:



- The *Dnm2* gene has 14 transcripts. According to the structure of *Dnm2* gene, exon2-exon10 of *Dnm2-202* (ENSMUST00000091087.12) transcript is recommended as the knockout region. The region contains 1174bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dnm2* 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.

- According to the existing MGI data, Mice homozygous for a targeted allele die prior to E8-E12. Mice heterozygous for a knock-out allele exhibit muscle atrophy and weakness, intermyofibrillar disorganization, and centrally localized mitochondria and sarcoplasmic reticulum.
- The *Dnm2* gene is located on the Chr9. 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)

## Dnm2 dynamin 2 [ *Mus musculus* (house mouse) ]

Gene ID: 13430, updated on 14-Aug-2019

### Summary



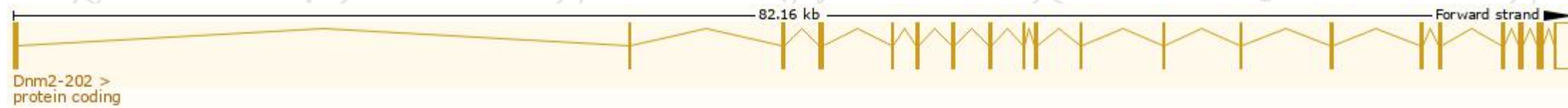
<b>Official Symbol</b>	Dnm2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	dynamin 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:109547</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000033335</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<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>	Dyn2; Udnm; b2b2159Clo
<b>Expression</b>	Ubiquitous expression in duodenum adult (RPKM 68.5), colon adult (RPKM 65.8) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

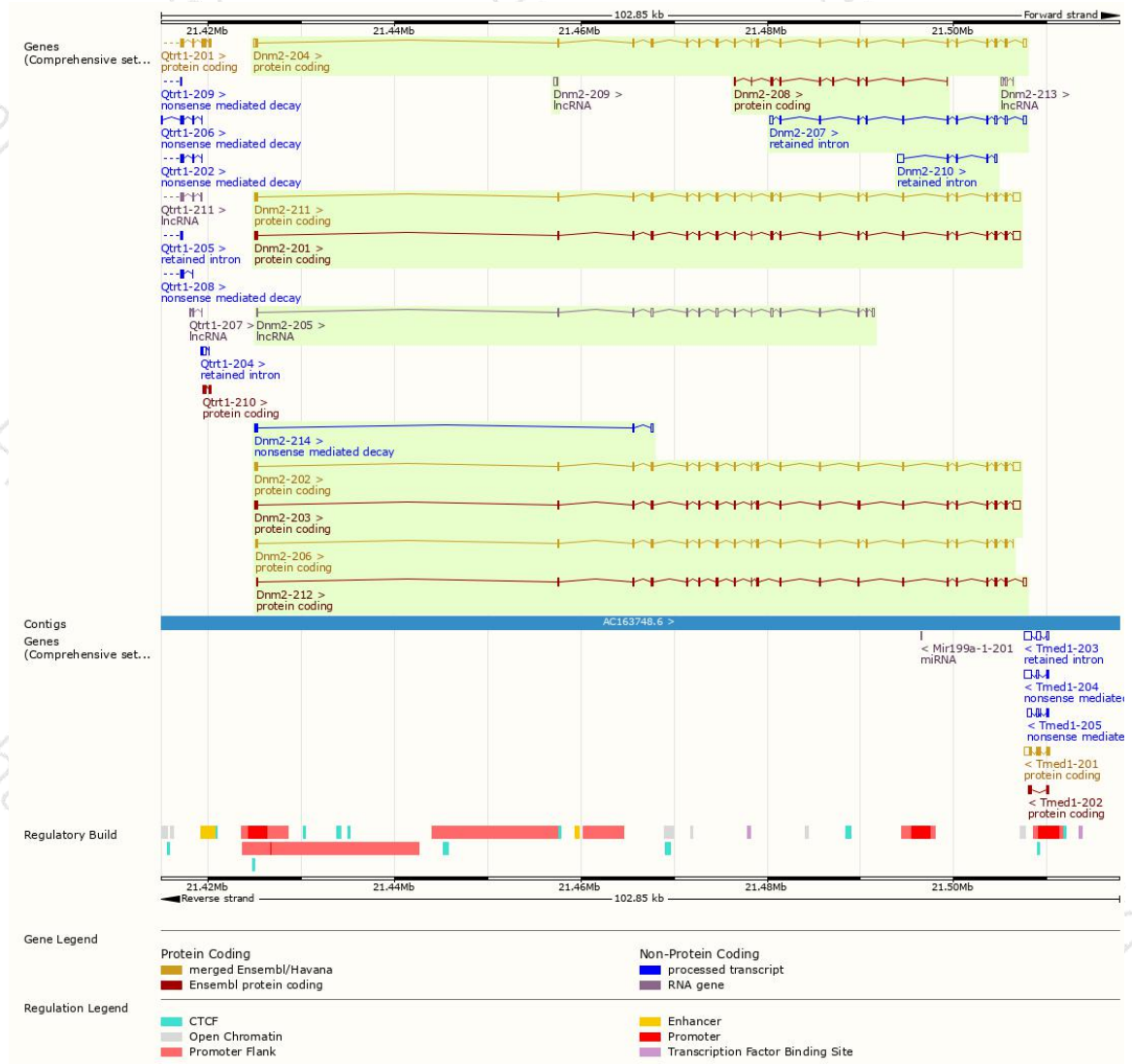
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dnm2-211	<a href="#">ENSMUST00000173397.7</a>	3510	<a href="#">869aa</a>	Protein coding	<a href="#">CCDS57660</a>	<a href="#">Q3TCR7</a>	TSL:1 GENCODE basic APPRIS ALT1
Dnm2-202	<a href="#">ENSMUST00000091087.12</a>	3450	<a href="#">866aa</a>	Protein coding	<a href="#">CCDS57659</a>	<a href="#">P39054</a>	TSL:1 GENCODE basic APPRIS ALT1
Dnm2-204	<a href="#">ENSMUST00000165766.8</a>	3063	<a href="#">860aa</a>	Protein coding	<a href="#">CCDS57658</a>	<a href="#">Q3T9X3</a>	TSL:1 GENCODE basic
Dnm2-206	<a href="#">ENSMUST00000172482.7</a>	2613	<a href="#">870aa</a>	Protein coding	<a href="#">CCDS57657</a>	<a href="#">P39054</a>	TSL:5 GENCODE basic APPRIS P4
Dnm2-201	<a href="#">ENSMUST00000072362.13</a>	3502	<a href="#">870aa</a>	Protein coding	-	<a href="#">G3X9G4</a>	TSL:1 GENCODE basic APPRIS ALT1
Dnm2-203	<a href="#">ENSMUST00000115404.10</a>	3455	<a href="#">870aa</a>	Protein coding	-	<a href="#">F8WIV5</a>	TSL:5 GENCODE basic APPRIS ALT1
Dnm2-212	<a href="#">ENSMUST00000174050.7</a>	2715	<a href="#">807aa</a>	Protein coding	-	<a href="#">G3UZZ3</a>	CDS 5' incomplete TSL:5
Dnm2-208	<a href="#">ENSMUST00000172833.1</a>	744	<a href="#">248aa</a>	Protein coding	-	<a href="#">G3UXX2</a>	CDS 5' and 3' incomplete TSL:3
Dnm2-214	<a href="#">ENSMUST00000174828.1</a>	608	<a href="#">69aa</a>	Nonsense mediated decay	-	<a href="#">G3UY64</a>	TSL:5
Dnm2-207	<a href="#">ENSMUST00000172763.7</a>	1772	No protein	Retained intron	-	-	TSL:1
Dnm2-210	<a href="#">ENSMUST00000173299.1</a>	1255	No protein	Retained intron	-	-	TSL:5
Dnm2-205	<a href="#">ENSMUST00000169194.8</a>	1591	No protein	lncRNA	-	-	TSL:1
Dnm2-213	<a href="#">ENSMUST00000174243.1</a>	454	No protein	lncRNA	-	-	TSL:3
Dnm2-209	<a href="#">ENSMUST00000172873.1</a>	373	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Dnm2-202* transcript,The transcription is shown below

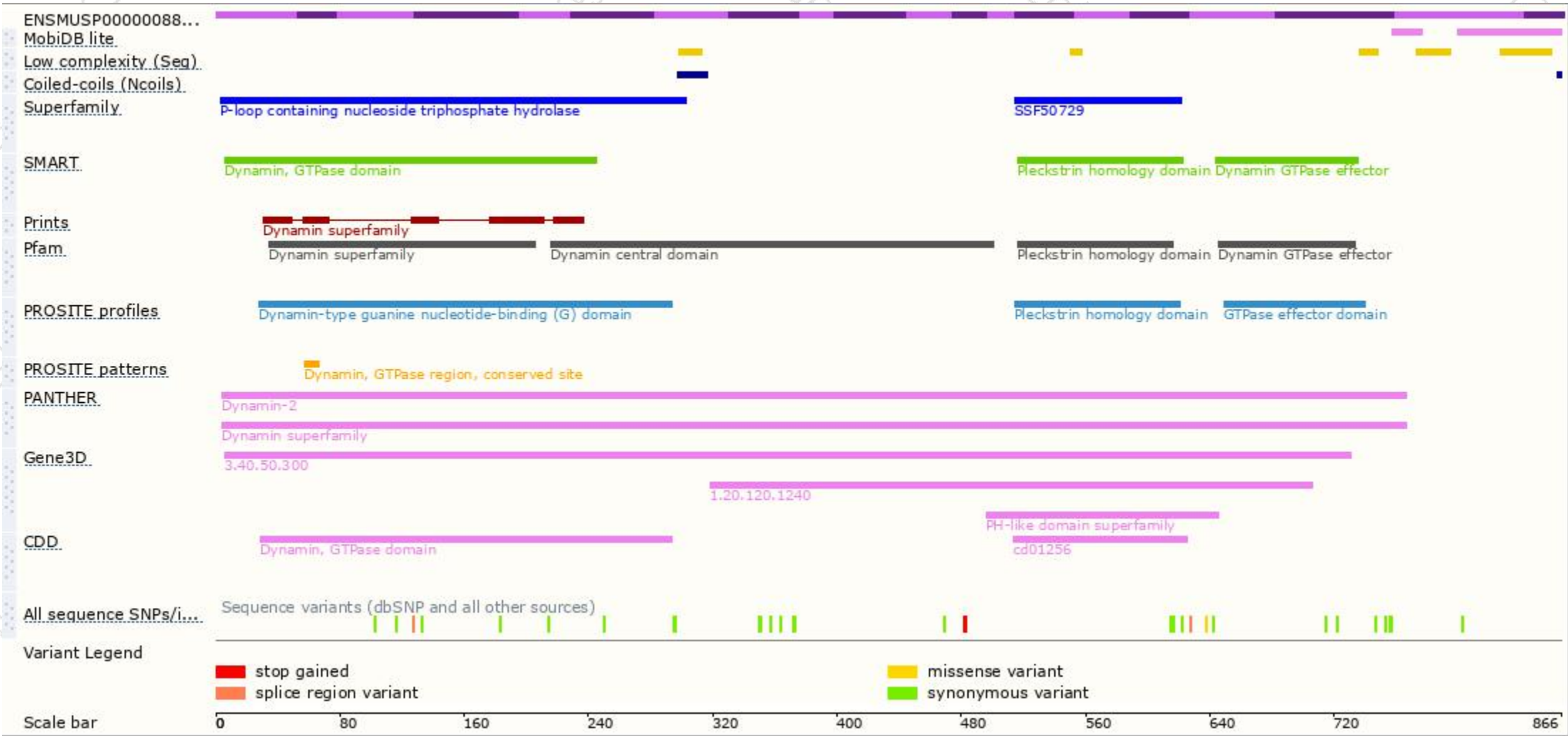


# Genomic location distribution

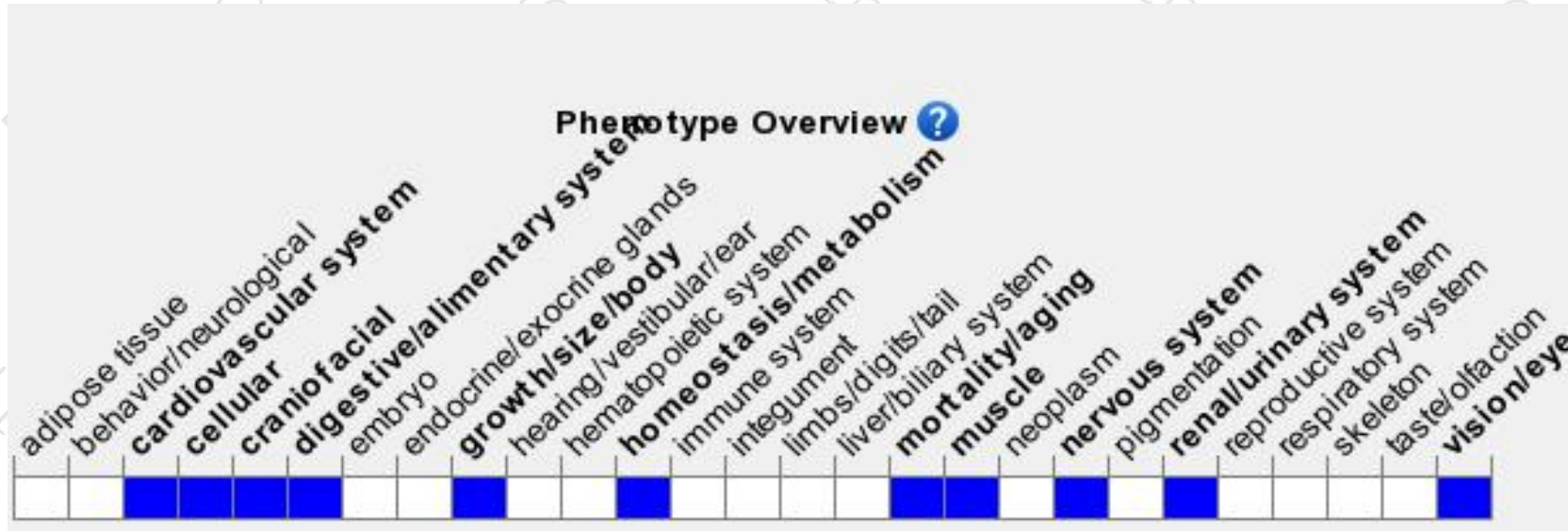




# Protein domain



# 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, Mice homozygous for a targeted allele die prior to E8-E12. Mice heterozygous for a knock-out allele exhibit muscle atrophy and weakness, intermyofibrillar disorganization, and centrally localized mitochondria and sarcoplasmic reticulum.

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

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