

# *Pygm* Cas9-CKO Strategy

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# Project Overview

**Project Name**

*Pygm*

**Project type**

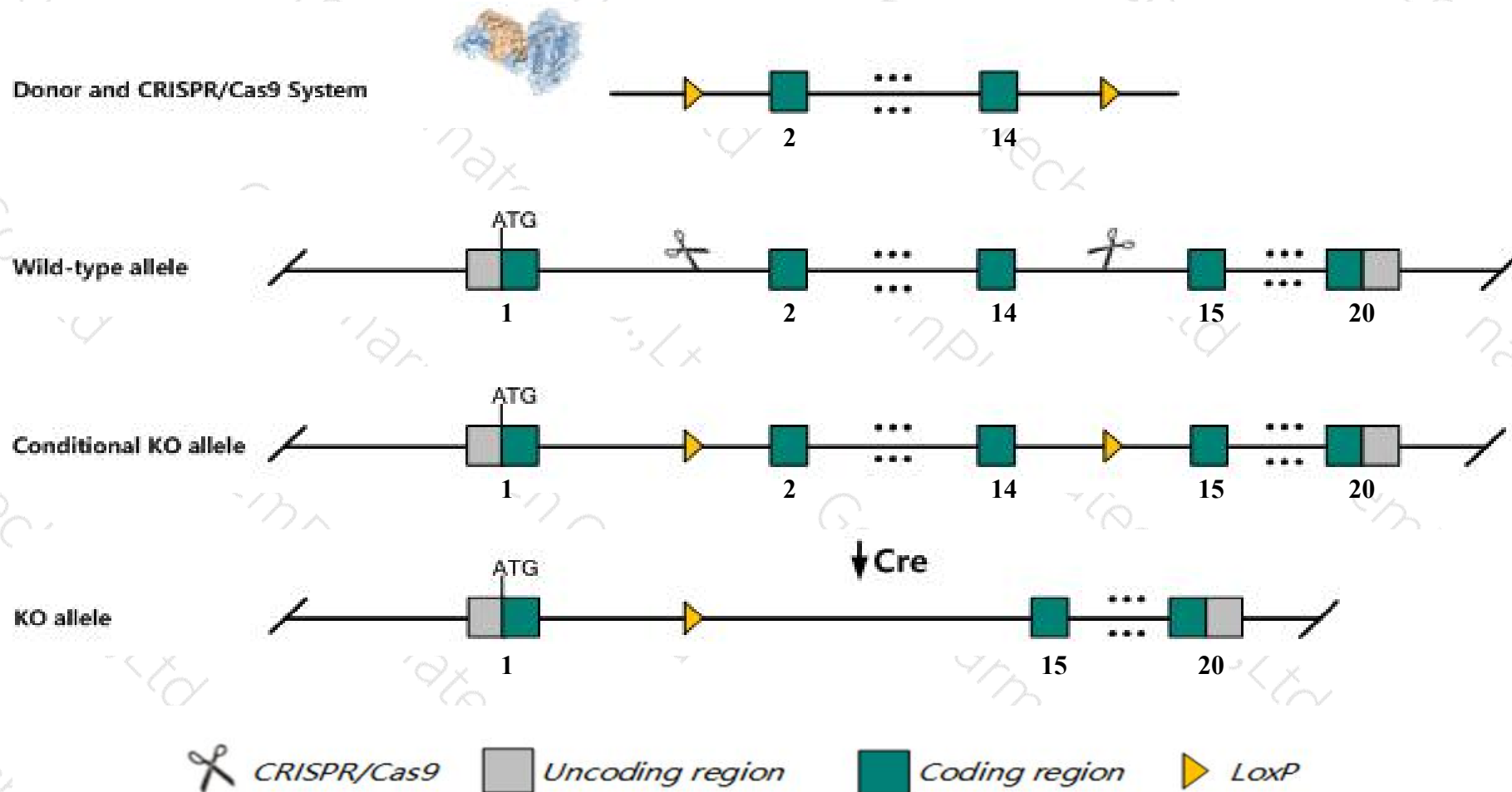
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

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



- The *Pygm* gene has 4 transcripts. According to the structure of *Pygm* gene, exon2-exon14 of *Pygm-201* (ENSMUST00000035269.14) transcript is recommended as the knockout region. The region contains 1525bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Pygm* 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, Mice homozygous for a null mutation exhibit massive muscle glycogen accumulation, elevated creatine kinase levels in blood, and very poor exercise performance.
- The *Pygm* gene is located on the Chr19. 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)

## Pygm muscle glycogen phosphorylase [Mus musculus (house mouse)]

Gene ID: 19309, updated on 31-Jan-2019

### Summary



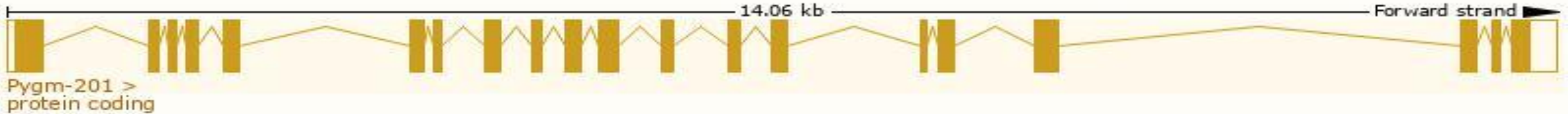
<b>Official Symbol</b>	Pygm provided by <a href="#">MGI</a>
<b>Official Full Name</b>	muscle glycogen phosphorylase provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:97830</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000032648</a>
<b>Gene type</b>	protein coding
<b>RefSeq 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>	AI115133, PG
<b>Summary</b>	This gene encodes a glycolysis enzyme found in muscle. Highly similar enzymes encoded by different genes are found in liver and brain. The encoded protein is involved in regulating the breakdown of glycogen to glucose-1-phosphate, which is necessary for ATP generation. [provided by RefSeq, Dec 2015]
<b>Expression</b>	Biased expression in heart adult (RPKM 318.9), mammary gland adult (RPKM 190.6) and 3 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

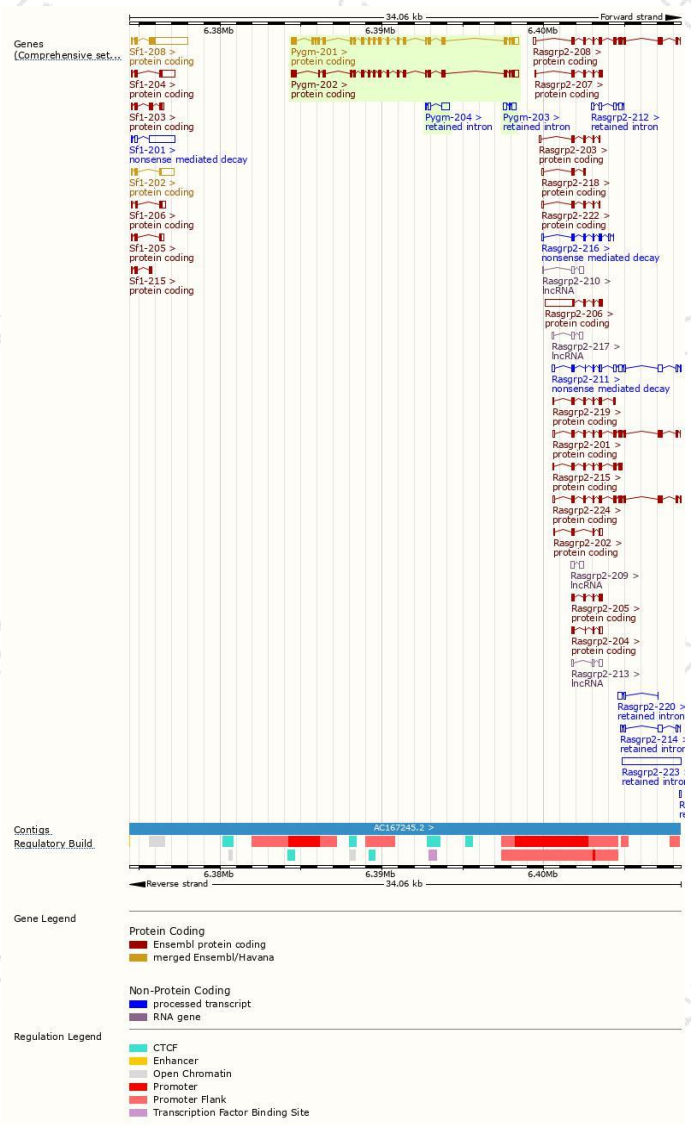
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pygm-201	<a href="#">ENSMUST00000035269.14</a>	2874	<a href="#">842aa</a>	Protein coding	<a href="#">CCDS29504</a>	<a href="#">Q9WUB3</a>	TSL:1 GENCODE basic APPRIS P1
Pygm-202	<a href="#">ENSMUST00000113483.1</a>	2583	<a href="#">754aa</a>	Protein coding	-	<a href="#">E9PUM3</a>	TSL:5 GENCODE basic
Pygm-204	<a href="#">ENSMUST00000142755.1</a>	638	No protein	Retained intron	-	-	TSL:3
Pygm-203	<a href="#">ENSMUST00000139775.1</a>	532	No protein	Retained intron	-	-	TSL:1

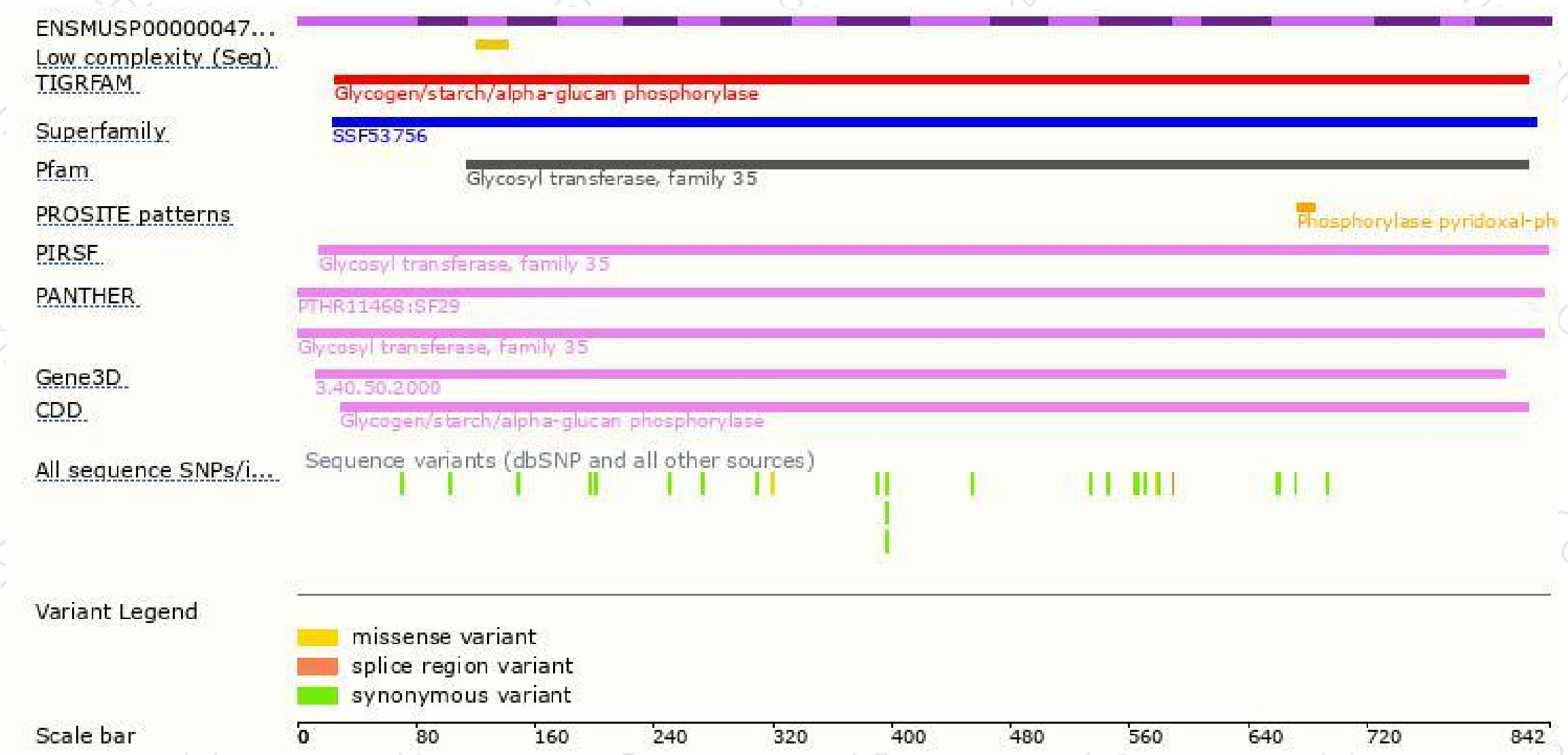
The strategy is based on the design of *Pygm-201* transcript,The transcription is shown below



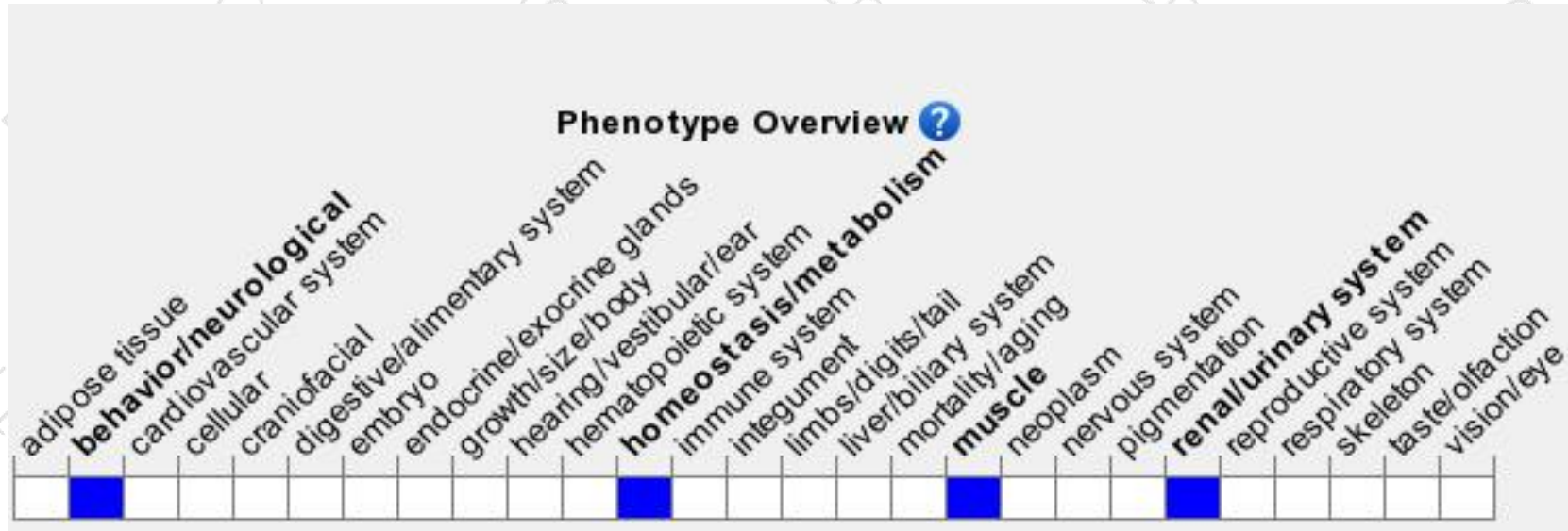
# Genomic location distribution



# 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, Mice homozygous for a null mutation exhibit massive muscle glycogen accumulation, elevated creatine kinase levels in blood, and very poor exercise performance.

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

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