

# *Slc24a2* Cas9-CKO Strategy

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**Reviewer:**

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**Design Date:**

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# Project Overview

**Project Name**

*Slc24a2*

**Project type**

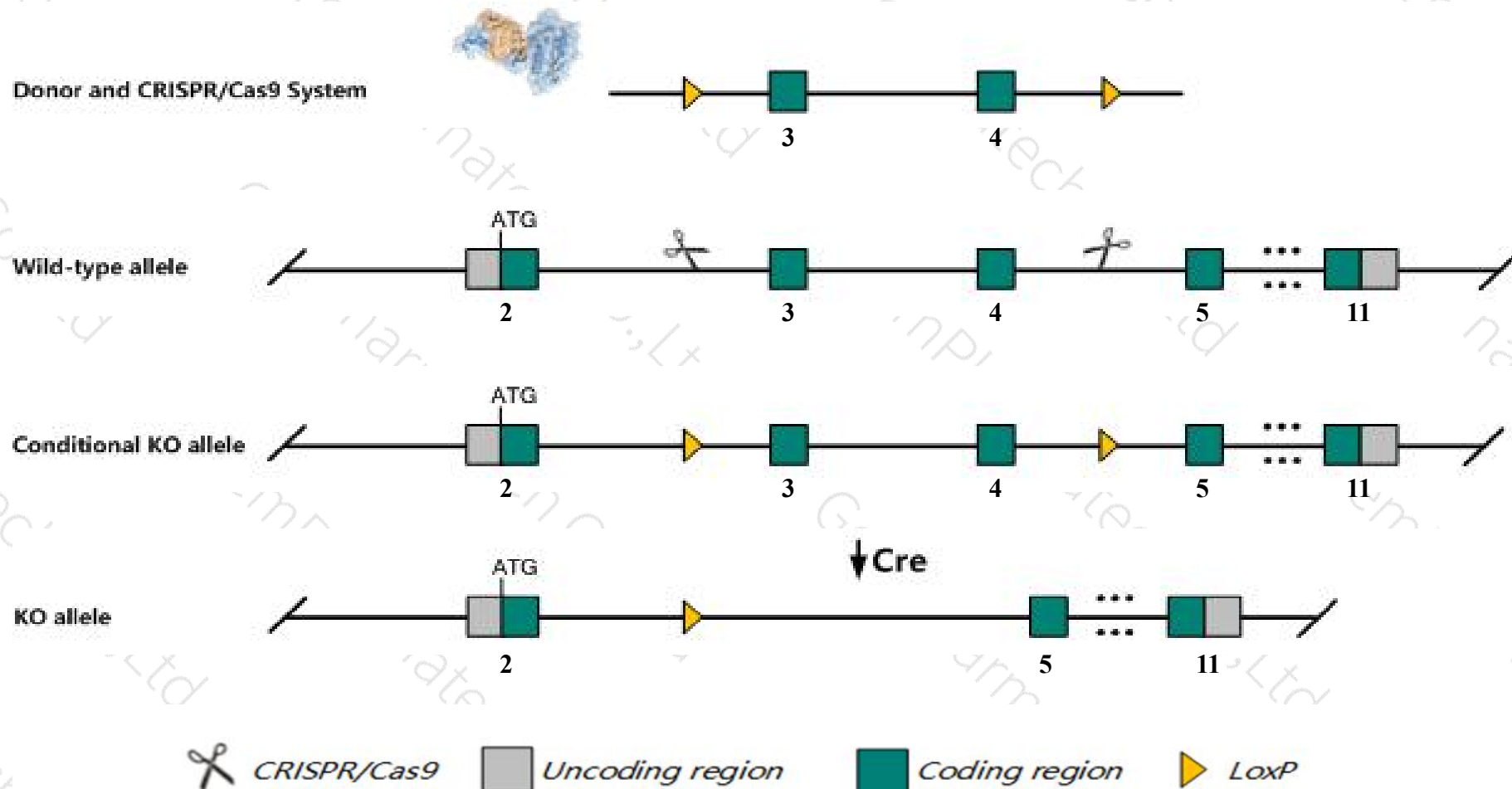
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slc24a2* gene. The schematic diagram is as follows:



# Technical routes

- The *Slc24a2* gene has 9 transcripts. According to the structure of *Slc24a2* gene, exon3-exon4 of *Slc24a2*-203 (ENSMUST00000107157.8) transcript is recommended as the knockout region. The region contains 148bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Slc24a2* 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, Homozygous mutation of this gene results in loss of long term potentiation and an increase in long term depression and deficits in motor learning and spatial working memory.
- Some amino acids will remain at the N-terminus and some functions may be retained.
- The *Slc24a2* 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.
- 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)

## Slc24a2 solute carrier family 24 (sodium/potassium/calcium exchanger), member 2 [Mus musculus (house mouse)]

Gene ID: 76376, updated on 5-Mar-2019

### Summary



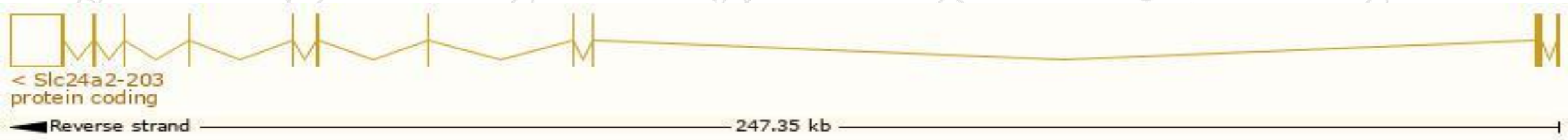
<b>Official Symbol</b>	Slc24a2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	solute carrier family 24 (sodium/potassium/calcium exchanger), member 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1923626</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG000000037996</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>	2810021B17Rik, 6330417K15Rik, AI847460, Nckx2
<b>Expression</b>	Biased expression in cortex adult (RPKM 27.0), cerebellum adult (RPKM 20.2) and 2 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

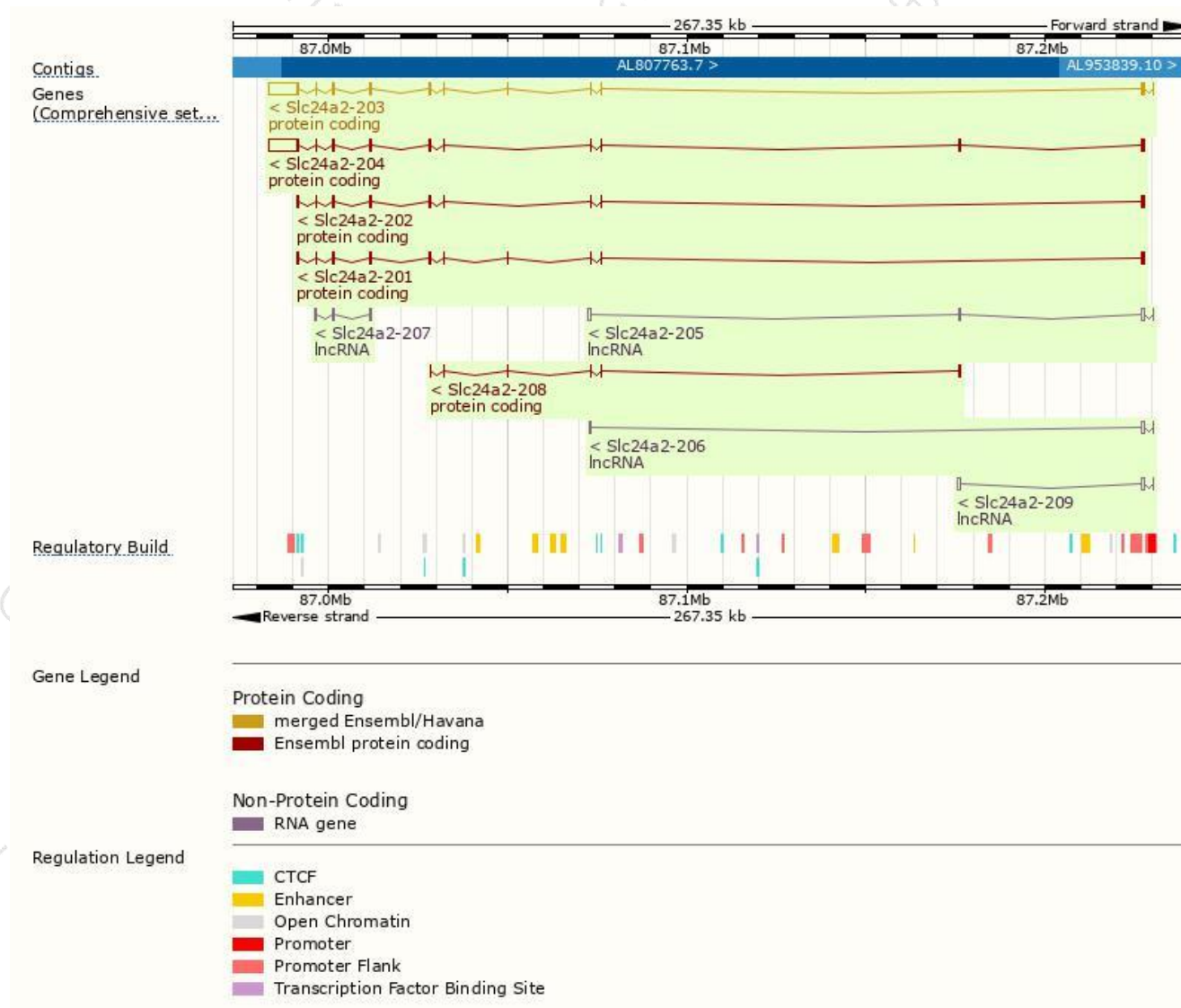
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Slc24a2-203	<a href="#">ENSMUST00000107157.8</a>	10531	<a href="#">666aa</a>	Protein coding	<a href="#">CCDS18312</a>	<a href="#">Q8BUN9</a>	TSL:1 GENCODE basic APPRIS P2
Slc24a2-204	<a href="#">ENSMUST00000107158.8</a>	10499	<a href="#">711aa</a>	Protein coding	<a href="#">CCDS51220</a>	<a href="#">Q14BI1</a>	TSL:1 GENCODE basic
Slc24a2-201	<a href="#">ENSMUST00000044990.10</a>	2218	<a href="#">662aa</a>	Protein coding	-	<a href="#">B1AXF2</a>	TSL:5 GENCODE basic APPRIS ALT 1
Slc24a2-202	<a href="#">ENSMUST00000107155.7</a>	2171	<a href="#">645aa</a>	Protein coding	-	<a href="#">B1AXF3</a>	TSL:5 GENCODE basic APPRIS ALT 1
Slc24a2-208	<a href="#">ENSMUST00000146815.1</a>	504	<a href="#">168aa</a>	Protein coding	-	<a href="#">F6RT95</a>	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:3
Slc24a2-205	<a href="#">ENSMUST00000134248.7</a>	2230	No protein	lncRNA	-	-	TSL:2
Slc24a2-209	<a href="#">ENSMUST00000155361.1</a>	1796	No protein	lncRNA	-	-	TSL:2
Slc24a2-206	<a href="#">ENSMUST00000134643.7</a>	1655	No protein	lncRNA	-	-	TSL:2
Slc24a2-207	<a href="#">ENSMUST00000140780.1</a>	679	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Slc24a2-203* transcript,The transcription is shown below

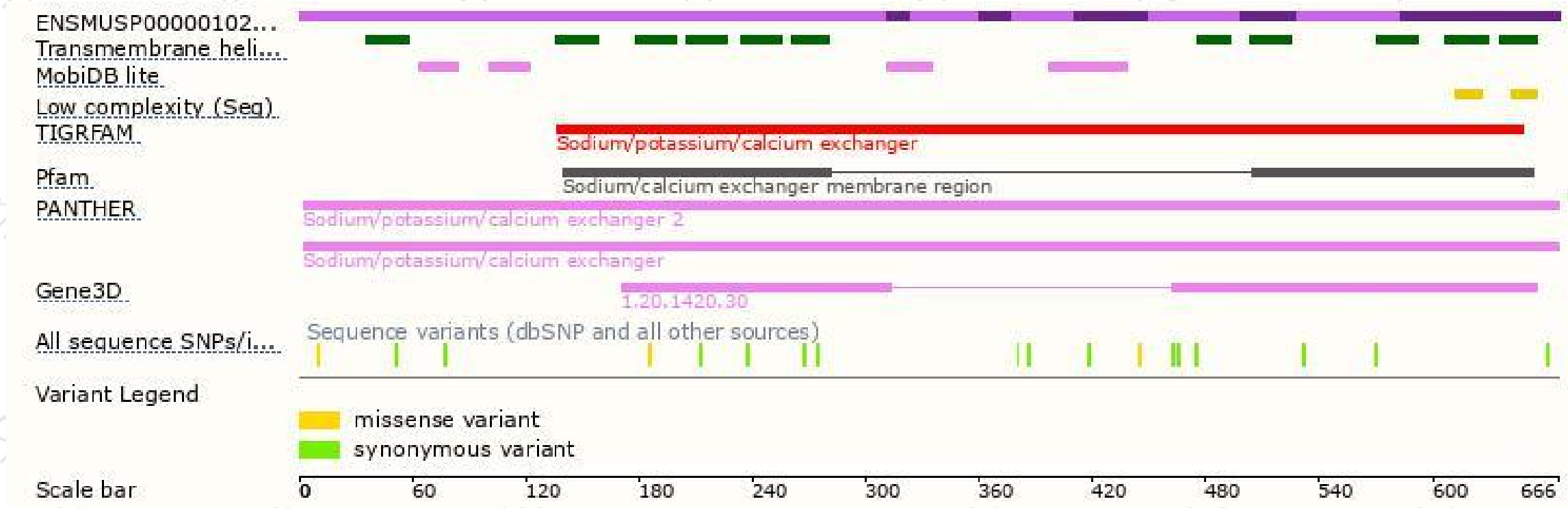


# Genomic location distribution

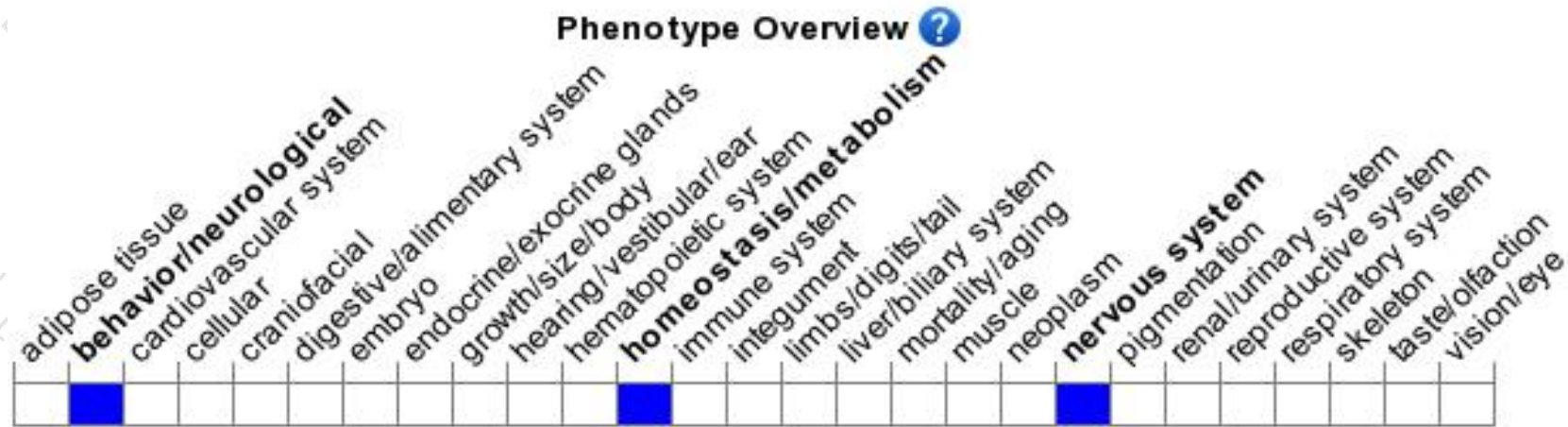




# Protein domain



# 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, Homozygous mutation of this gene results in loss of long term potentiation and an increase in long term depression and deficits in motor learning and spatial working memory.

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

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