

# ***Dync1i2 Cas9-CKO Strategy***

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**Reviewer:**

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# Project Overview

**Project Name**

*Dync1i2*

**Project type**

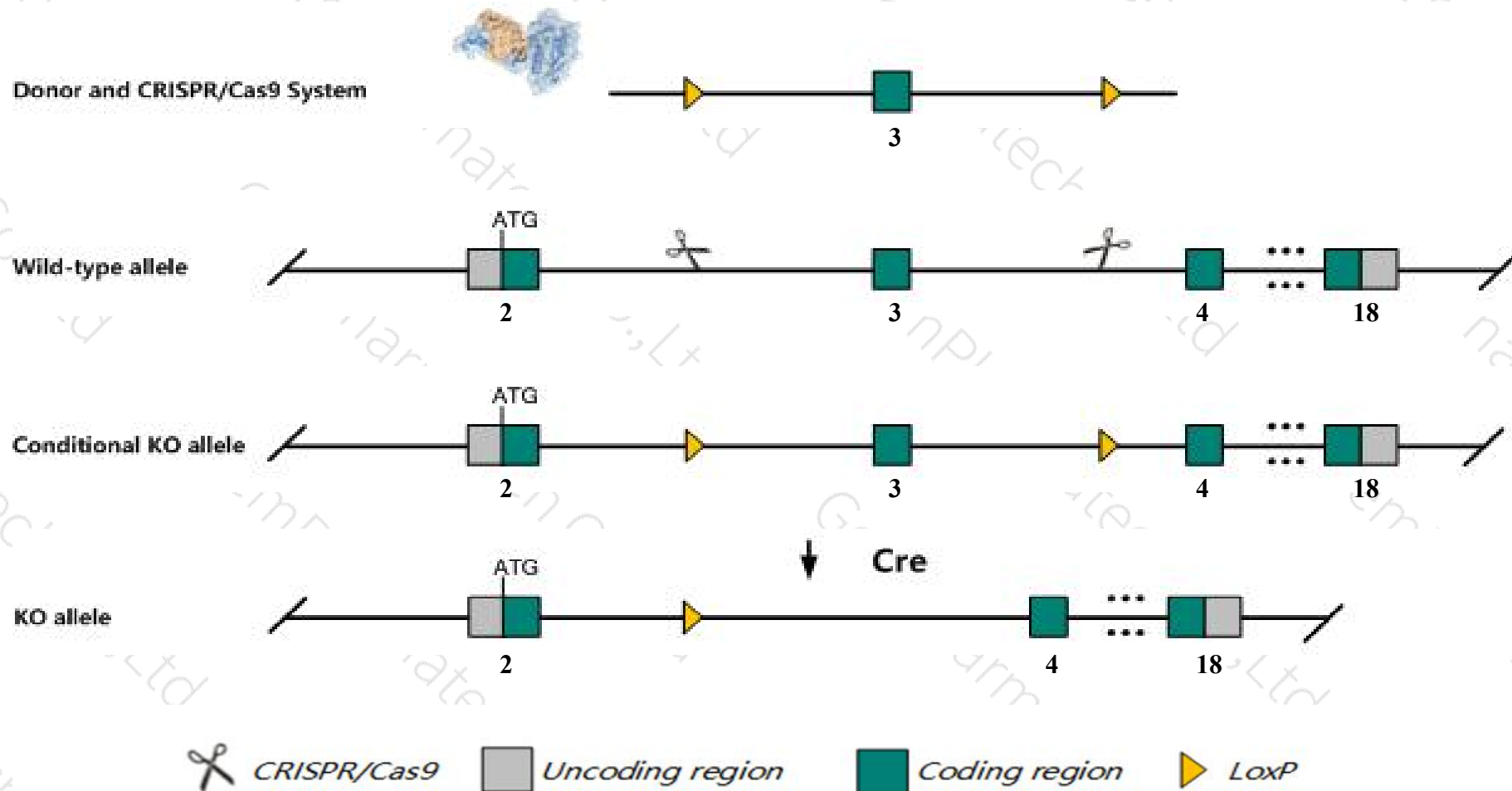
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dync1i2* gene. The schematic diagram is as follows:



- The *Dync1i2* gene has 12 transcripts. According to the structure of *Dync1i2* gene, exon3 of *Dync1i2-206* (ENSMUST00000112140.7) transcript is recommended as the knockout region. The region contains 118bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dync1i2* 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 an ENU-induced allele exhibit a trend towards slight locomotor deficit.
- The *Dync1i2* gene is located on the Chr2. 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)

## Dync1i2 dynein cytoplasmic 1 intermediate chain 2 [ *Mus musculus* (house mouse) ]

Gene ID: 13427, updated on 24-Dec-2019

### Summary

**Official Symbol** Dync1i2 provided by [MGI](#)  
**Official Full Name** dynein cytoplasmic 1 intermediate chain 2 provided by [MGI](#)  
**Primary source** [MGI:MGI:107750](#)  
**See related** [Ensembl:ENSMUSG00000027012](#)  
**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** Dncic2; AW554389; 3110079H08Rik  
**Expression** Broad expression in CNS E18 (RPKM 64.5), CNS E14 (RPKM 54.3) and 20 other tissues [See more](#)  
**Orthologs** [human](#) [all](#)

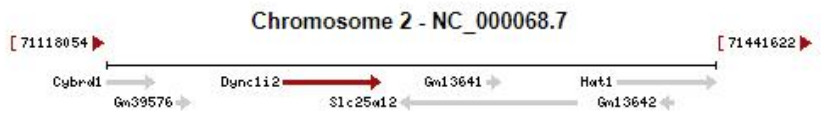
### Genomic context

Location: 2 C2; 2 42.38 cM

See Dync1i2 in [Genome Data Viewer](#)

Exon count: 20

Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	2	NC_000068.7 (71211676..71263303)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	2	NC_000068.6 (71050070..71101351)

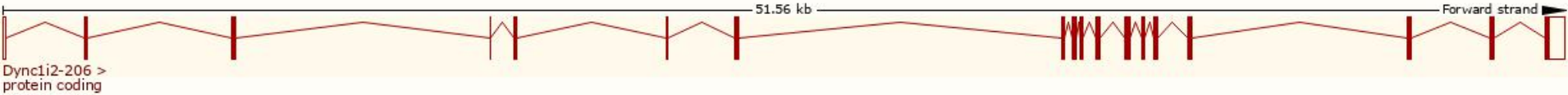


# Transcript information (Ensembl)

The gene has 12 transcripts,all transcripts are shown below:

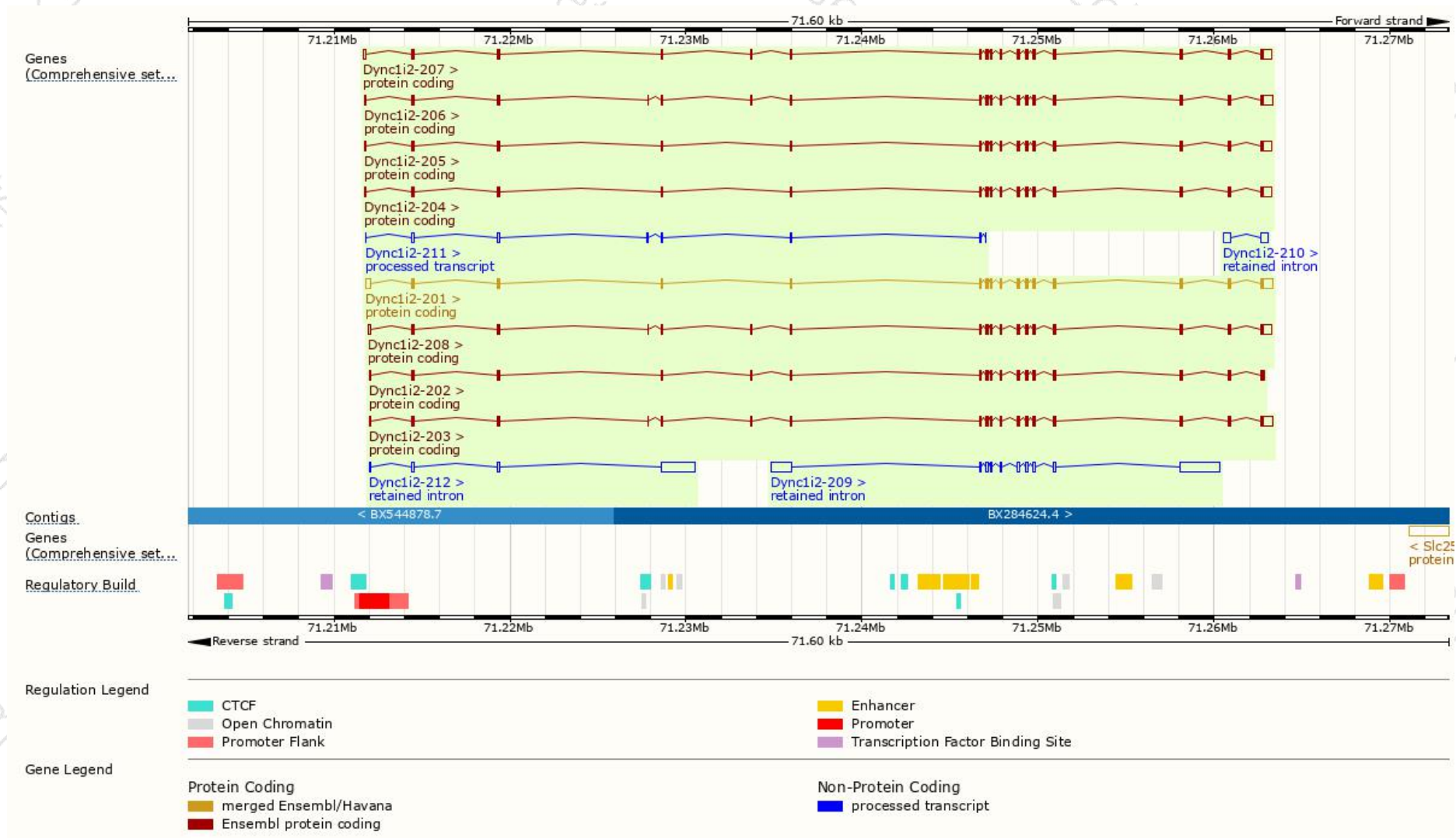
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dync1i2-201	<a href="#">ENSMUST00000081710.11</a>	2631	<a href="#">612aa</a>	Protein coding	<a href="#">CCDS16112</a>	<a href="#">A2BFF7</a> <a href="#">Q88487</a>	TSL:1 GENCODE basic APPRIS P3
Dync1i2-207	<a href="#">ENSMUST00000112142.7</a>	2585	<a href="#">632aa</a>	Protein coding	<a href="#">CCDS57175</a>	<a href="#">Q3TPJ8</a>	TSL:1 GENCODE basic APPRIS ALT1
Dync1i2-206	<a href="#">ENSMUST00000112140.7</a>	2573	<a href="#">638aa</a>	Protein coding	<a href="#">CCDS84536</a>	<a href="#">A2BFF9</a>	TSL:5 GENCODE basic APPRIS ALT1
Dync1i2-208	<a href="#">ENSMUST00000112144.8</a>	2565	<a href="#">638aa</a>	Protein coding	<a href="#">CCDS84536</a>	<a href="#">A2BFF9</a>	TSL:5 GENCODE basic APPRIS ALT1
Dync1i2-204	<a href="#">ENSMUST00000112138.7</a>	2466	<a href="#">612aa</a>	Protein coding	<a href="#">CCDS16112</a>	<a href="#">A2BFF7</a> <a href="#">Q88487</a>	TSL:1 GENCODE basic APPRIS P3
Dync1i2-202	<a href="#">ENSMUST00000100028.9</a>	2097	<a href="#">632aa</a>	Protein coding	<a href="#">CCDS57175</a>	<a href="#">Q3TPJ8</a>	TSL:5 GENCODE basic APPRIS ALT1
Dync1i2-203	<a href="#">ENSMUST00000112136.1</a>	2548	<a href="#">637aa</a>	Protein coding	-	<a href="#">A2BFF5</a>	TSL:5 GENCODE basic APPRIS ALT1
Dync1i2-205	<a href="#">ENSMUST00000112139.7</a>	2483	<a href="#">611aa</a>	Protein coding	-	<a href="#">A2BFF8</a>	TSL:5 GENCODE basic APPRIS ALT1
Dync1i2-211	<a href="#">ENSMUST00000141619.7</a>	679	No protein	Processed transcript	-	-	TSL:5
Dync1i2-209	<a href="#">ENSMUST00000137683.1</a>	4523	No protein	Retained intron	-	-	TSL:1
Dync1i2-212	<a href="#">ENSMUST00000149735.1</a>	2248	No protein	Retained intron	-	-	TSL:1
Dync1i2-210	<a href="#">ENSMUST00000138613.1</a>	812	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Dync1i2-206* transcript, the transcription is shown below:



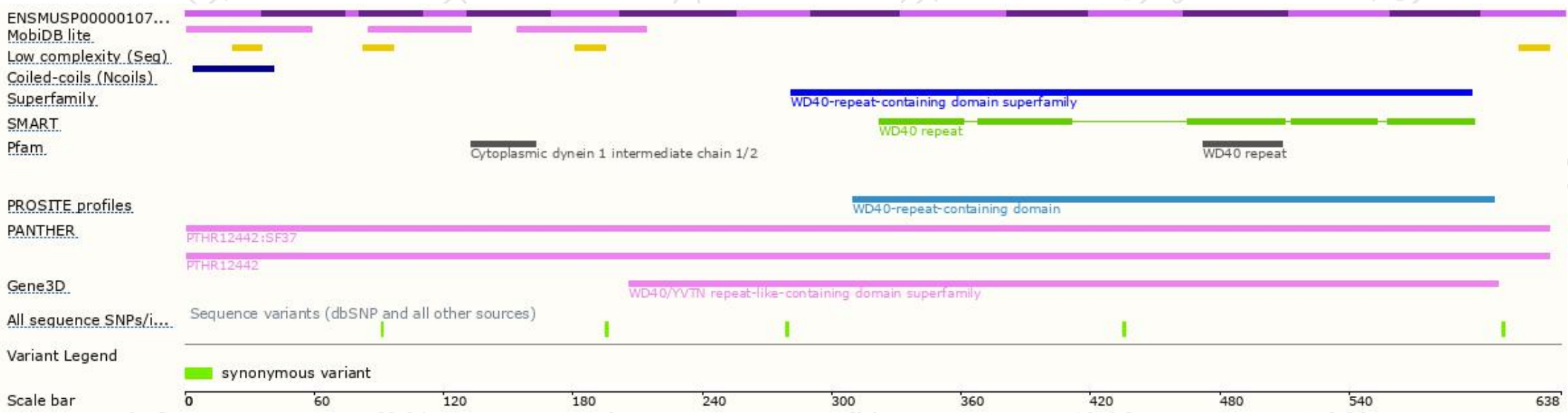


# Genomic location distribution

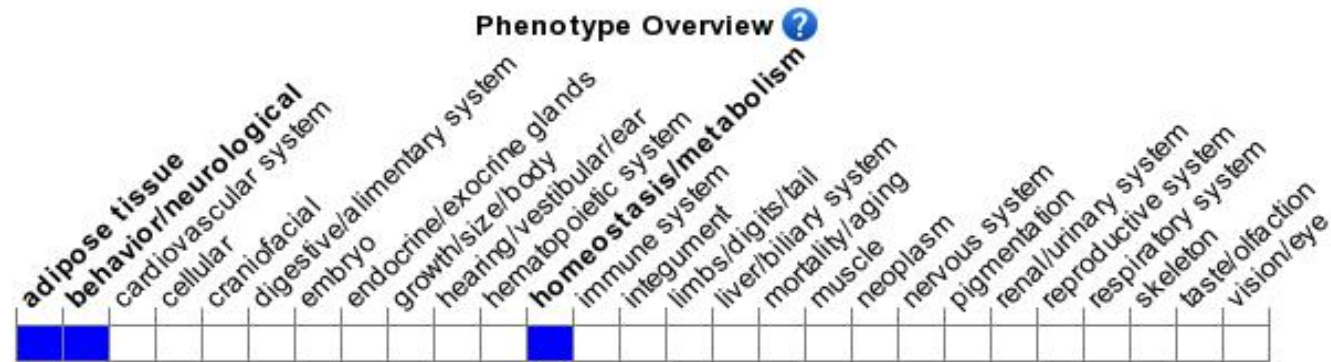




# Protein domain



# 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 an ENU-induced allele exhibit a trend towards slight locomotor deficit.

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

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