

# *Hspa4* Cas9-KO Strategy

**Designer:**

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**Design Date:**

**2019-7-17**

# Project Overview

**Project Name**

*Hspa4*

**Project type**

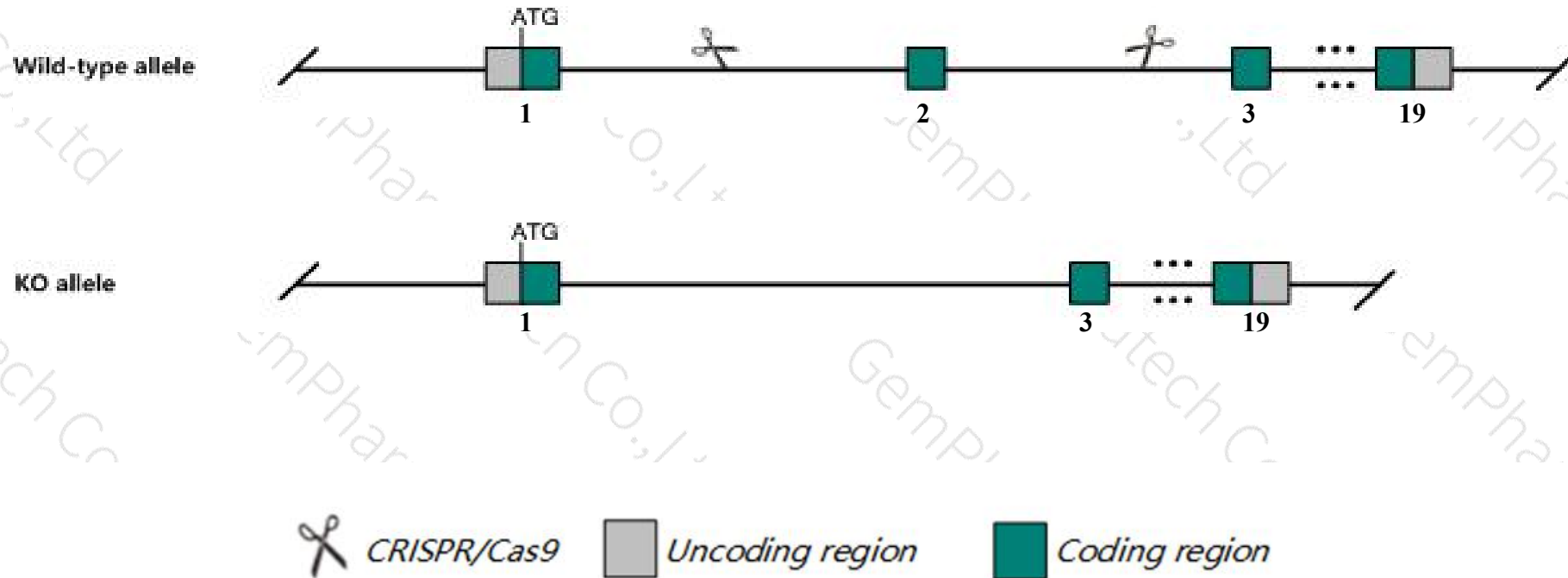
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hspa4* gene. The schematic diagram is as follows:



- The *Hspa4* gene has 3 transcripts. According to the structure of *Hspa4* gene, exon2 of *Hspa4-201* (ENSMUST00000020630.7) transcript is recommended as the knockout region. The region contains 58bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Hspa4* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit age-dependent neurofibrillary tangles and tau deposits, impaired contextual conditioning, and impaired bar grasping.
- The *Hspa4* gene is located on the Chr11. 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)

## Hspa4 heat shock protein 4 [Mus musculus (house mouse)]

Gene ID: 15525, updated on 7-Apr-2019

### Summary



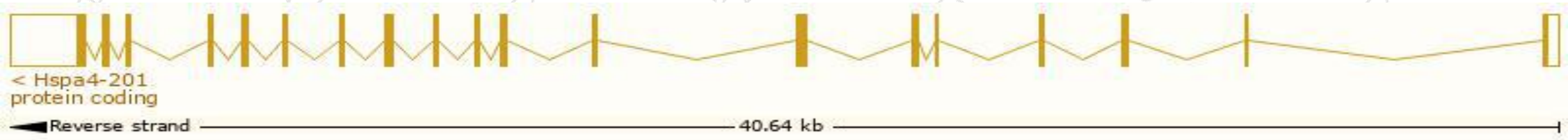
<b>Official Symbol</b>	Hspa4 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	heat shock protein 4 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1342292</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000020361</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</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>	70kDa, A1317151, APG-2, Hsp110, Hsp70RY, mKIAA4025
<b>Expression</b>	Ubiquitous expression in CNS E11.5 (RPKM 44.3), adrenal adult (RPKM 30.6) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

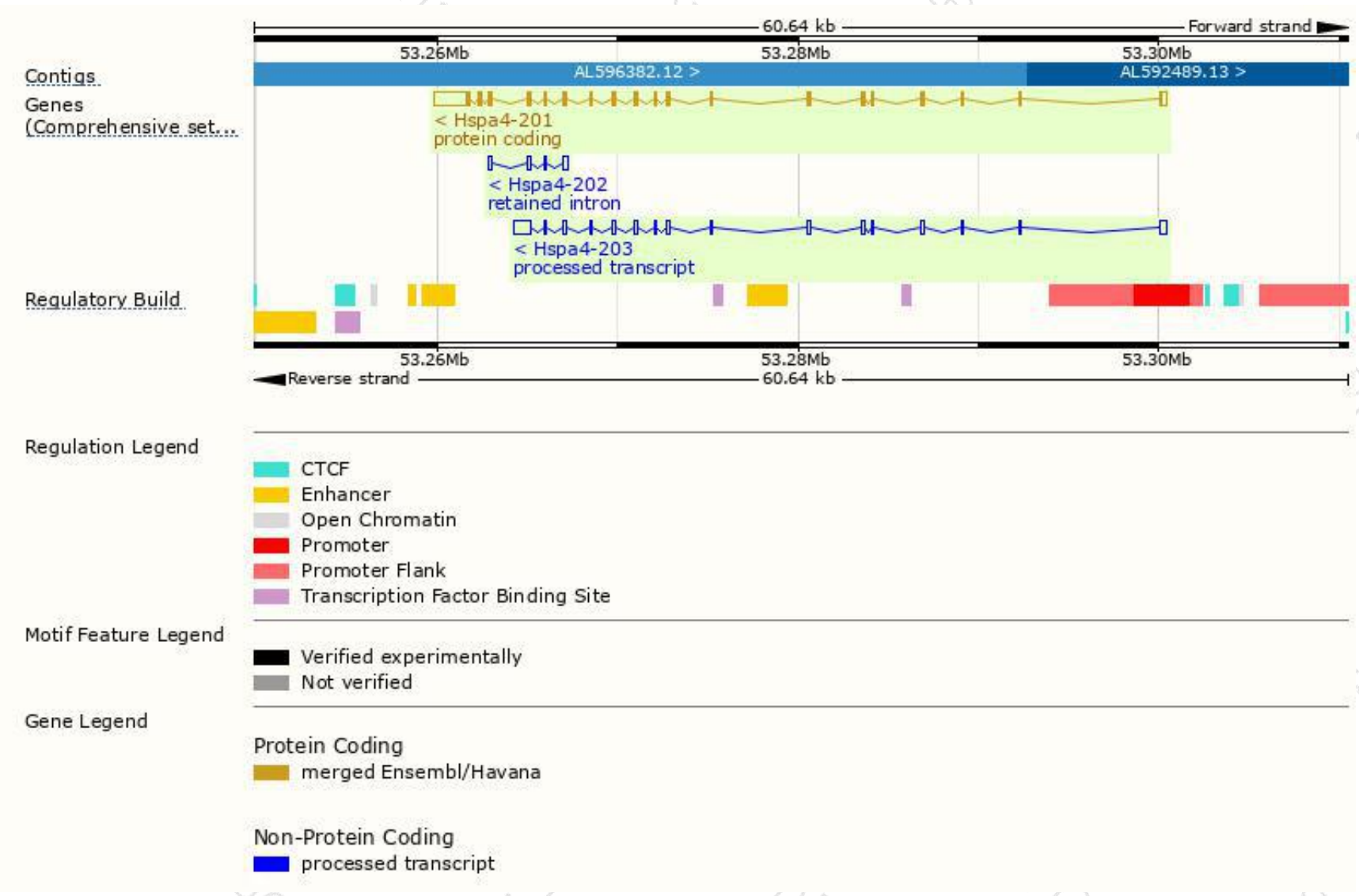
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hspa4-201	<a href="#">ENSMUST00000020630.7</a>	4618	<a href="#">842aa</a>	Protein coding	<a href="#">CCDS24674</a>	<a href="#">Q3U2G2</a>	TSL:1 GENCODE basic APPRIS P1
Hspa4-203	<a href="#">ENSMUST00000151854.1</a>	3075	No protein	Processed transcript	-	-	TSL:5
Hspa4-202	<a href="#">ENSMUST00000139322.7</a>	630	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Hspa4-201* transcript,The transcription is shown below

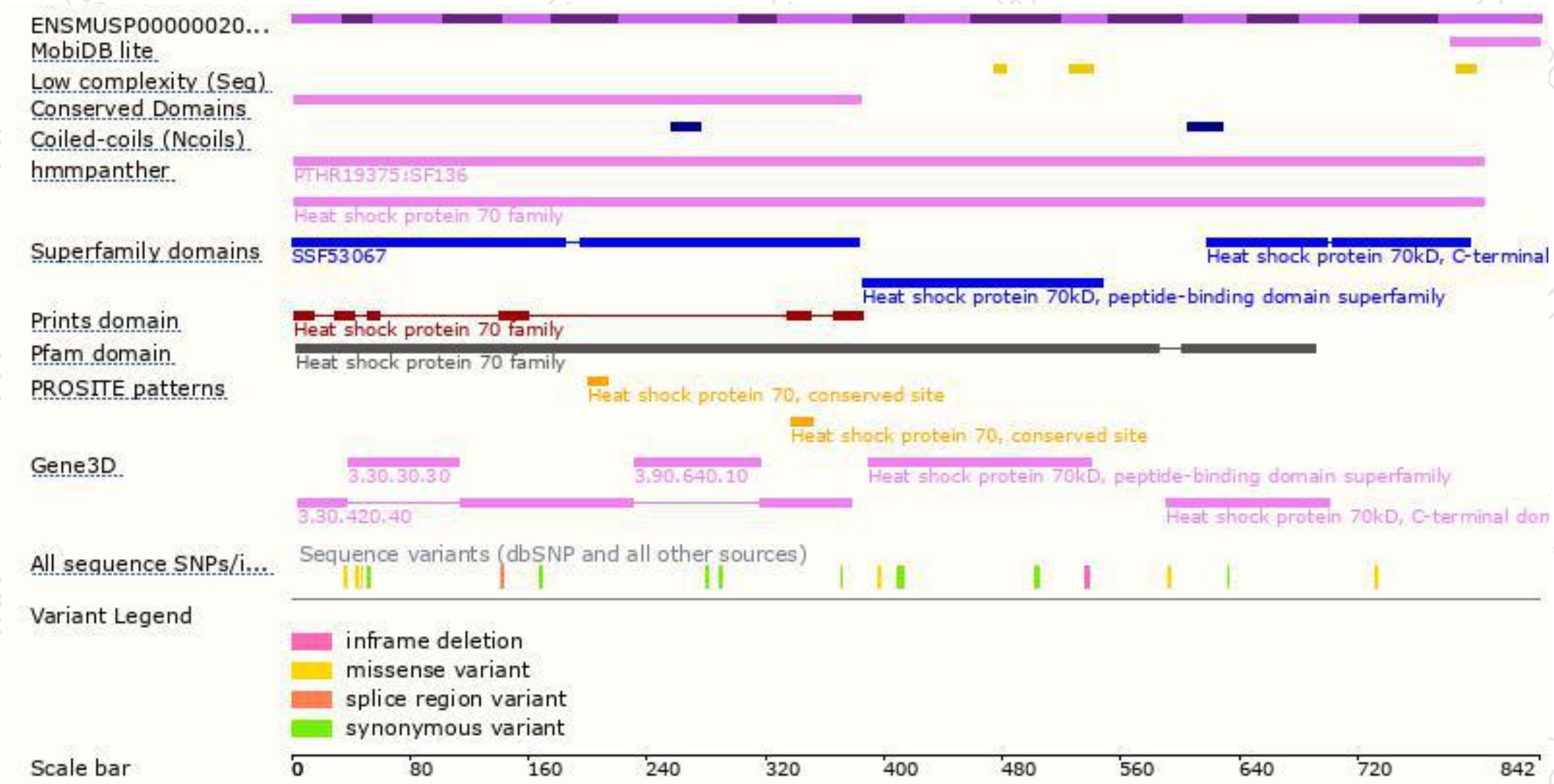


# Genomic location distribution

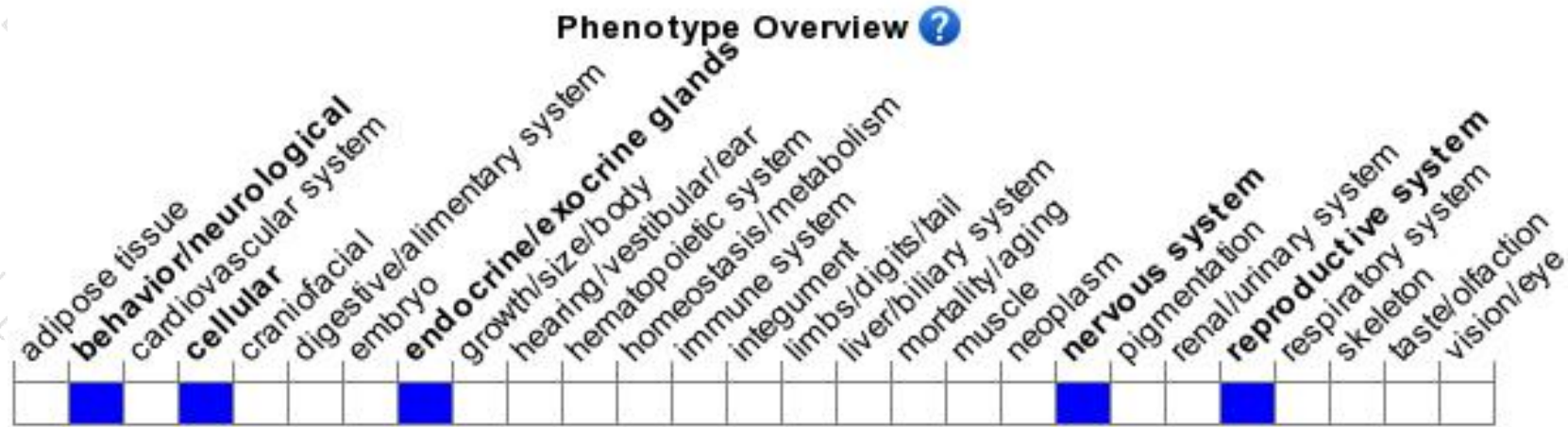




# Protein domain



# 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 knock-out allele exhibit age-dependent neurofibrillary tangles and tau deposits, impaired contextual conditioning, and impaired bar grasping.

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

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