

# Vps39 Cas9-CKO Strategy

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# Overview

## Target Gene Name

- Vps39

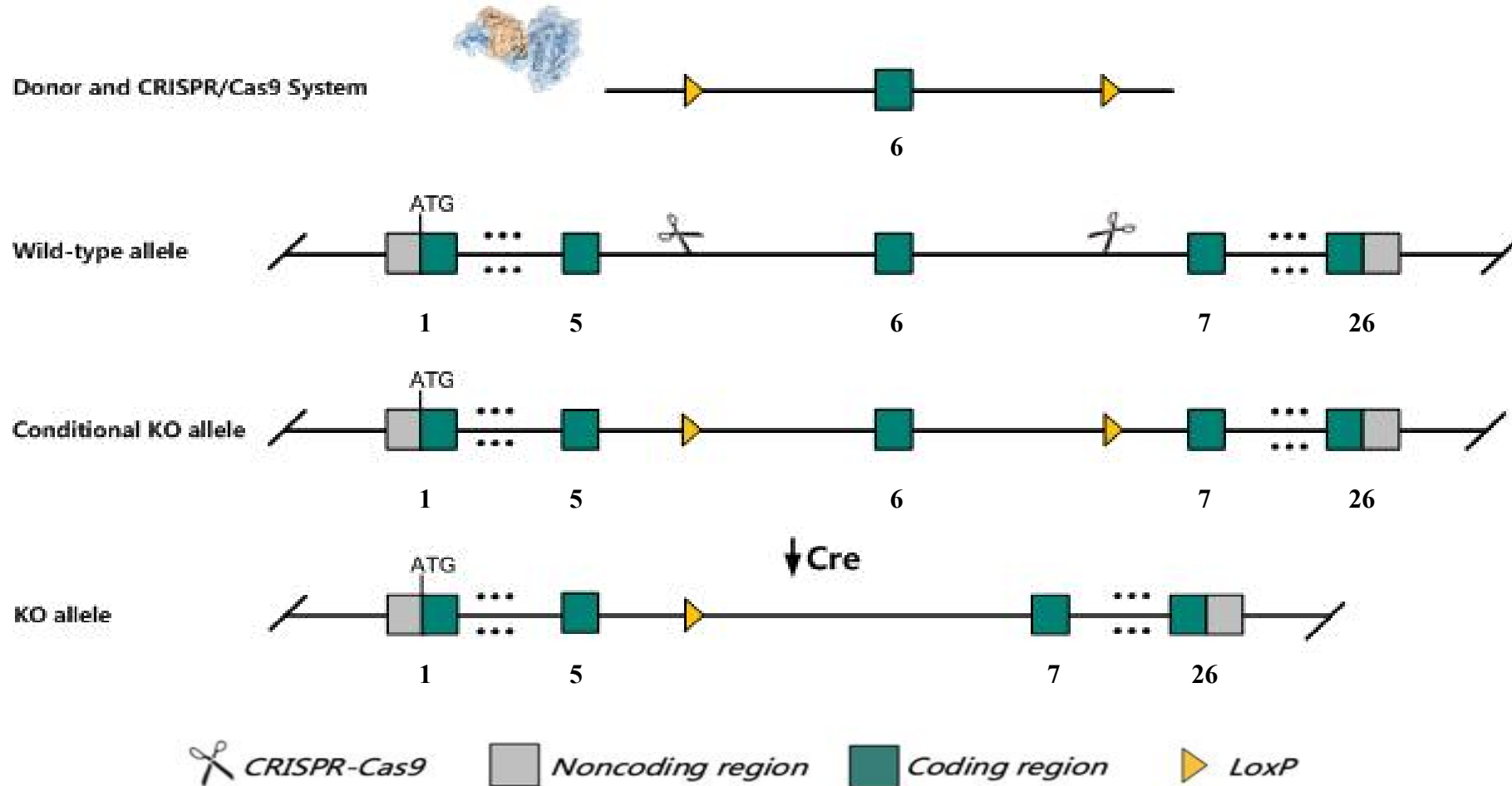
## Project Type

- Cas9-CKO

## Genetic Background

- C57BL/6JGpt

# Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Vps39* gene.

# Technical Information

- The *Vps39* gene has 10 transcripts. According to the structure of *Vps39* gene, exon6 of *Vps39*-202 (ENSMUST00000102501.10) transcript is recommended as the knockout region. The region contains 95bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Vps39* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.

# Gene Information

## Vps39 VPS39 HOPS complex subunit [Mus musculus (house mouse)]

Gene ID: 269338, updated on 31-May-2023

### Summary

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Official Symbol</b>    | Vps39 provided by <a href="#">MGI</a>                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Official Full Name</b> | VPS39 HOPS complex subunit provided by <a href="#">MGI</a>                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Primary source</b>     | <a href="#">MGI:MGI:2443189</a>                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>See related</b>        | <a href="#">Ensembl:ENSMUSG00000027291</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>      | A230065P22Rik, Vam6, Vam6P, mVam6                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Summary</b>            | Predicted to be involved in endocytic recycling; lysosomal transport; and vesicle fusion. Predicted to act upstream of or within protein transport. Part of AP-3 adaptor complex. Is expressed in several structures, including brain; genitourinary system; gut; quadriceps femoris muscle; and trigeminal nerve. Orthologous to human VPS39 (VPS39 subunit of HOPS complex). [provided by Alliance of Genome Resources, Apr 2022] |
| <b>Expression</b>         | Ubiquitous expression in CNS E18 (RPKM 15.5), whole brain E14.5 (RPKM 15.5) and 28 other tissues <a href="#">See more</a>                                                                                                                                                                                                                                                                                                           |
| <b>Orthologs</b>          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                                                                                                                                                                                                                                                                           |

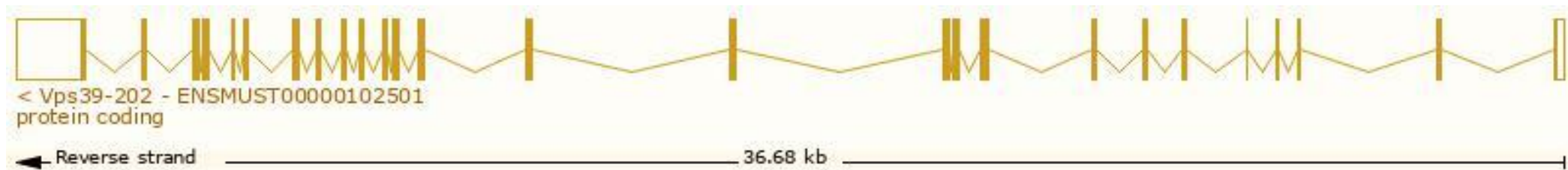
Source: <https://www.ncbi.nlm.nih.gov/>

# Transcript Information

The gene has 10 transcripts, all transcripts are shown below:

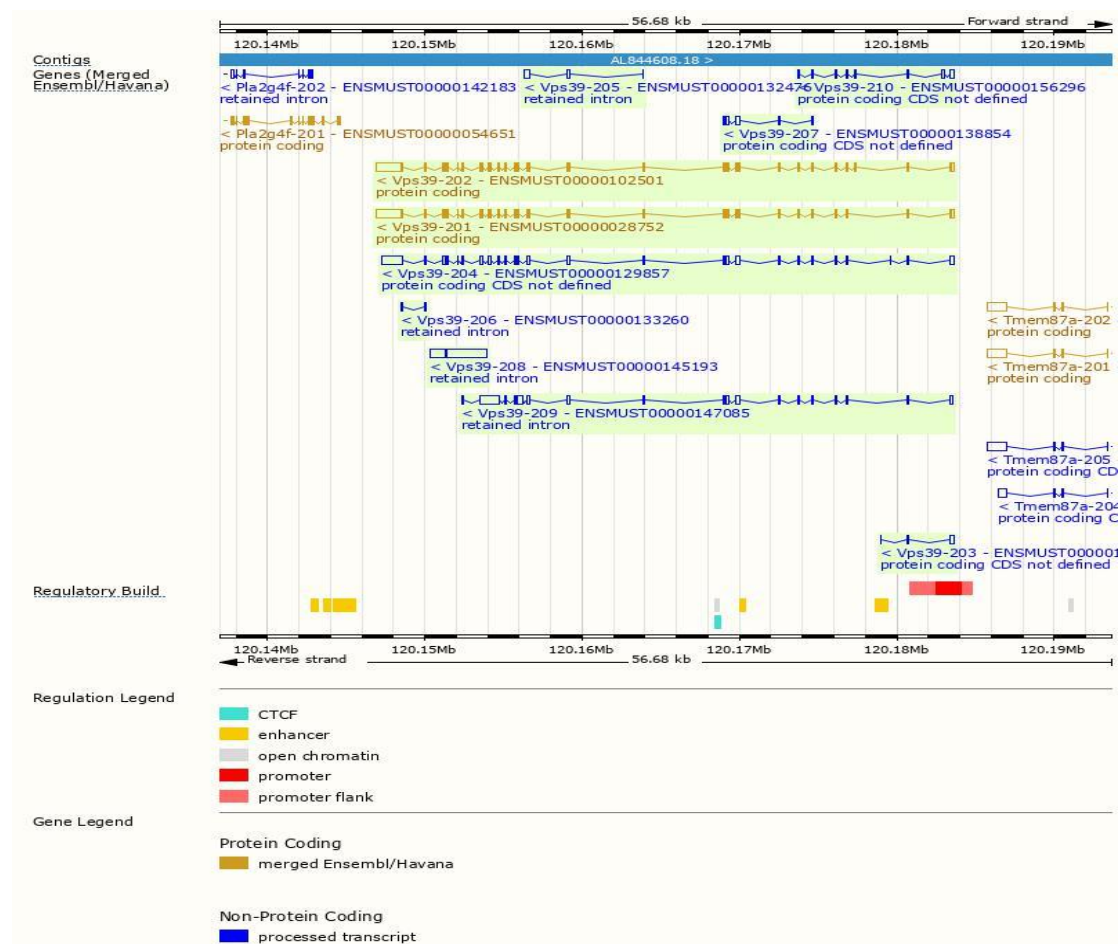
| Transcript ID                         | Name      | bp   | Protein               | Biotype                        | CCDS                      | UniProt Match            | Flags                                             |
|---------------------------------------|-----------|------|-----------------------|--------------------------------|---------------------------|--------------------------|---------------------------------------------------|
| <a href="#">ENSMUST00000102501.10</a> | Vps39-202 | 4384 | <a href="#">886aa</a> | Protein coding                 | <a href="#">CCDS38210</a> | <a href="#">Q8R5L3-1</a> | Ensembl Canonical Gencode basic APPRIS ALT1 TSL:1 |
| <a href="#">ENSMUST00000028752.8</a>  | Vps39-201 | 4339 | <a href="#">875aa</a> | Protein coding                 | <a href="#">CCDS16619</a> | <a href="#">Q8R5L3-2</a> | Gencode basic APPRIS P4 TSL:1                     |
| <a href="#">ENSMUST00000129857.8</a>  | Vps39-204 | 4055 | No protein            | Protein coding CDS not defined |                           | -                        | TSL:1                                             |
| <a href="#">ENSMUST00000156296.8</a>  | Vps39-210 | 691  | No protein            | Protein coding CDS not defined |                           | -                        | TSL:3                                             |
| <a href="#">ENSMUST00000138854.2</a>  | Vps39-207 | 602  | No protein            | Protein coding CDS not defined |                           | -                        | TSL:5                                             |
| <a href="#">ENSMUST00000126526.2</a>  | Vps39-203 | 343  | No protein            | Protein coding CDS not defined |                           | -                        | TSL:3                                             |
| <a href="#">ENSMUST00000145193.2</a>  | Vps39-208 | 3545 | No protein            | Retained intron                |                           | -                        | TSL:1                                             |
| <a href="#">ENSMUST00000147085.8</a>  | Vps39-209 | 3379 | No protein            | Retained intron                |                           | -                        | TSL:5                                             |
| <a href="#">ENSMUST00000132476.2</a>  | Vps39-205 | 469  | No protein            | Retained intron                |                           | -                        | TSL:3                                             |
| <a href="#">ENSMUST00000133260.2</a>  | Vps39-206 | 200  | No protein            | Retained intron                |                           | -                        | TSL:3                                             |

The strategy is based on the design of *Vps39-202* transcript, the transcription is shown below:

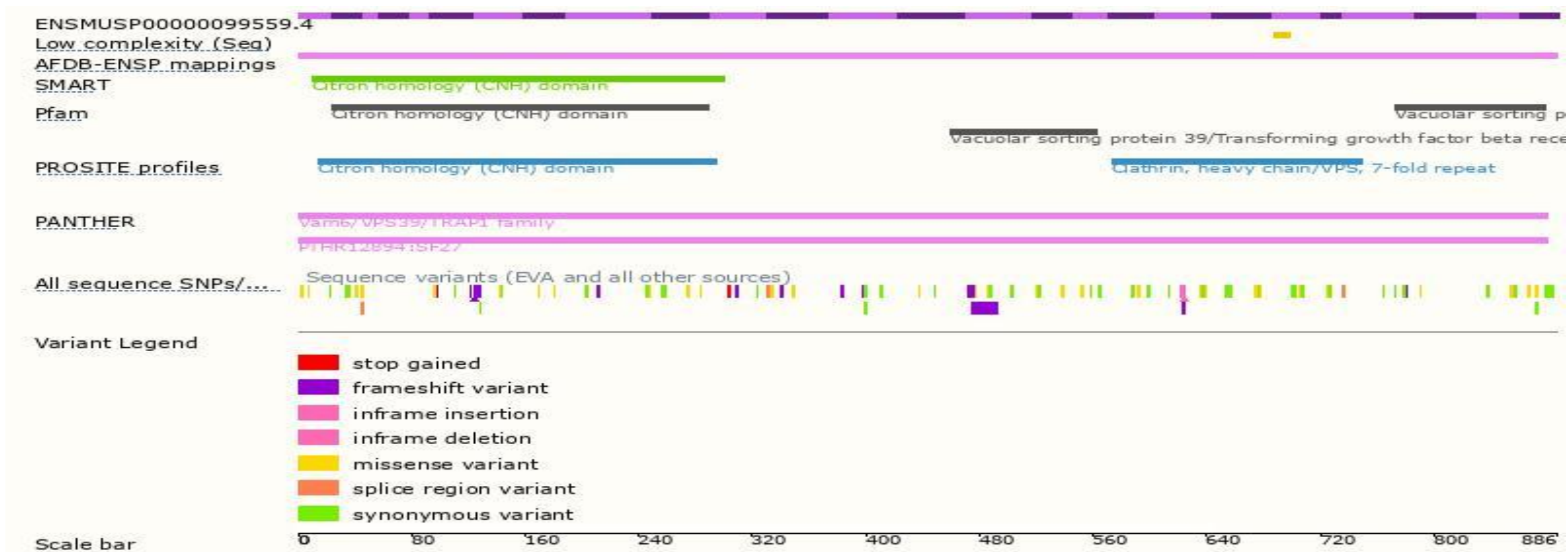


Source: <https://www.ensembl.org>

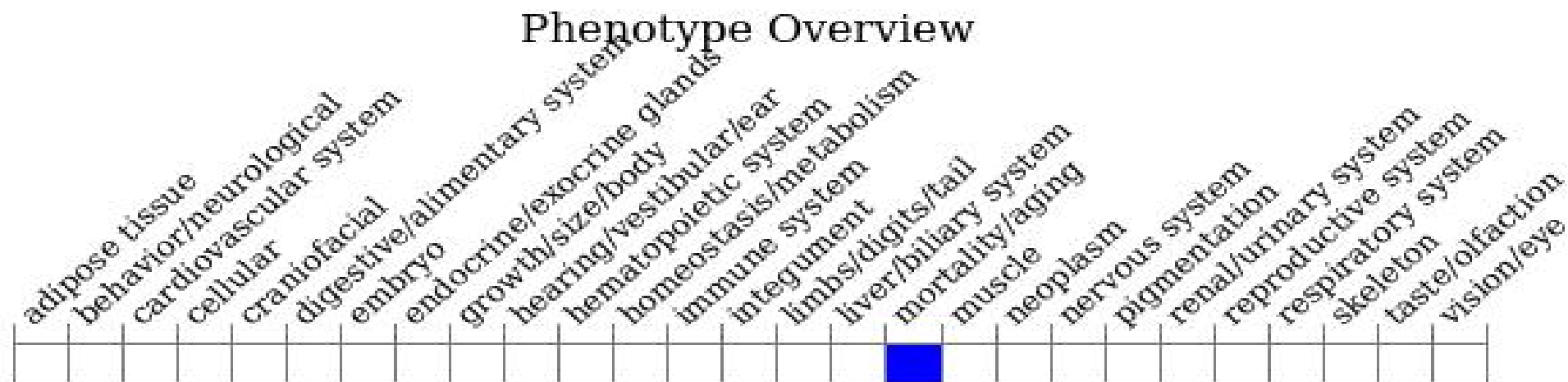
# Genomic Information



# Protein Information



# Mouse Phenotype Information (MGI)



- Mice exhibit embryonic lethality between E2.5 and E7.5.

# Important Information

- According to the existing MGI data, mice exhibit embryonic lethality between E2.5 and E7.5.
- The some amino acids of N-terminal of *Vps39* will be remained, and the effect is unknown.
- *Vps39* is located on Chr2. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 the existing technology level.

# Reference

<https://www.mousephenotype.org/data/genes/MGI:2443189>

Vps39<sup>tm1a(EUCOMM)Hmgu</sup>

KO first allele (reporter-tagged insertion with conditional potential)

Mice, Targeting vectors, ES Cells

12

123456789101112

1

2

3

4

5

6

7

8

9

10

11

12

FRT

SA

lacZ

neo

FRT

loxP

6

loxP

7

9

10

12

SA

pA

Mice (1)

ES Cells (19)

Targeting Vectors (2)

Tissues (0)

| Colony Name    | Genetic Background | Production Centre | QC Data | ES Cell/Parent Mouse Colony} | Order / Contact              |
|----------------|--------------------|-------------------|---------|------------------------------|------------------------------|
| HEPD0537_1_E10 | C57BL/6NTac        | RIKEN BRC         | QC data | HEPD0537_1_E10               | <div>Contact RIKEN BRC</div> |