

# *Adams3* Cas9-KO Strategy

Designer: Xiaojing Li

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# Overview

## Target Gene Name

- Adamts3

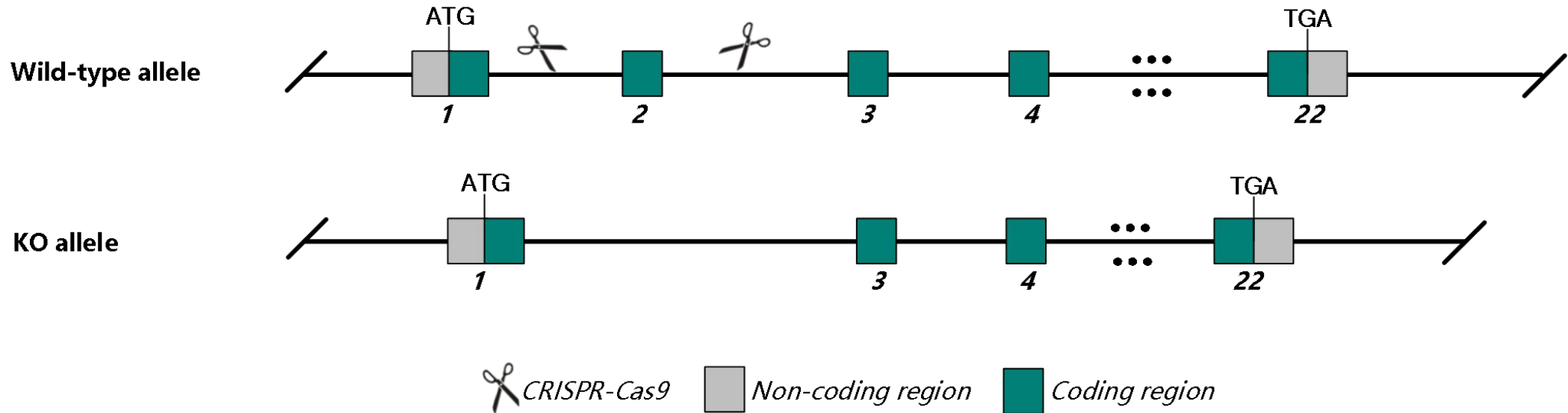
## Project Type

- Cas9-KO

## Genetic Background

- C57BL/6JGpt

# Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Adamts3* gene.

# Technical Information

- The *Adamts3* gene has 4 transcripts. According to the structure of *Adamts3* gene, exon 2 of *Adamts3-202* (ENSMUST00000163159.8) transcript is recommended as the knockout region. The region contains 28 bp of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Adamts3* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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.

# Gene Information

**Adamts3** ADAM metallopeptidase with thrombospondin type 1 motif 3 [ *Mus musculus* (house mouse) ]

[Download Datasets](#)

Gene ID: 330119, updated on 23-Nov-2023

## Summary

Official Symbol	Adamts3 provided by <a href="#">MGI</a>
Official Full Name	ADAM metallopeptidase with thrombospondin type 1 motif 3 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:3045353</a>
See related	<a href="#">Ensembl:ENSMUSG00000043635</a> <a href="#">AllianceGenome:MGI:3045353</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1100001H14Rik; 6330442E02Rik
Summary	Enables peptidase activity. Acts upstream of or within in utero embryonic development and protein processing. Predicted to be located in extracellular space. Predicted to be active in extracellular matrix. Is expressed in embryo; footplate apical ectodermal ridge; and handplate apical ectodermal ridge. Human ortholog(s) of this gene implicated in Hennekam syndrome. Orthologous to human ADAMTS3 (ADAM metallopeptidase with thrombospondin type 1 motif 3). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in limb E14.5 (RPKM 3.5), CNS E18 (RPKM 3.3) and 18 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>
<b>NEW</b>	Try the new <a href="#">Gene table</a> Try the new <a href="#">Transcript table</a>

## Genomic context

Location: 5 E1; 5 44.32 cM

See Adamts3 in [Genome Data Viewer](#)

Exon count: 23

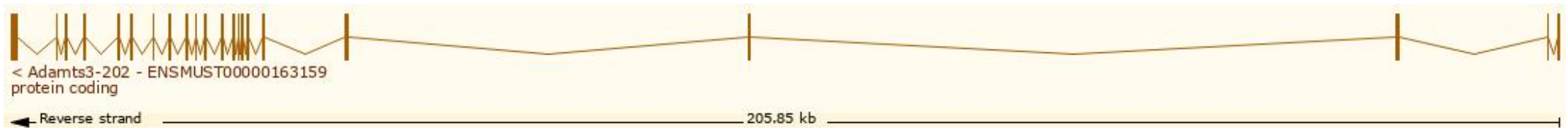
Source: <https://www.ncbi.nlm.nih.gov/>

# Transcript Information

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

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
<a href="#">ENSMUST00000061427.10</a>	Adamts3-201	3934	<a href="#">1203aa</a>	Protein coding	<a href="#">CCDS39140</a>	<a href="#">G3X9D2</a>	GENCODE basic APPRIS P1 TSL:1
<a href="#">ENSMUST00000163159.8</a>	Adamts3-202	3937	<a href="#">1204aa</a>	Protein coding	<a href="#">CCDS51542</a>	<a href="#">E9Q287</a>	Ensembl Canonical GENCODE basic TSL:1
<a href="#">ENSMUST00000196507.2</a>	Adamts3-203	563	No protein	Protein coding CDS not defined		-	TSL:3
<a href="#">ENSMUST00000198151.2</a>	Adamts3-204	1833	<a href="#">228aa</a>	Protein coding		<a href="#">Q8BIB2</a>	GENCODE basic TSL:1

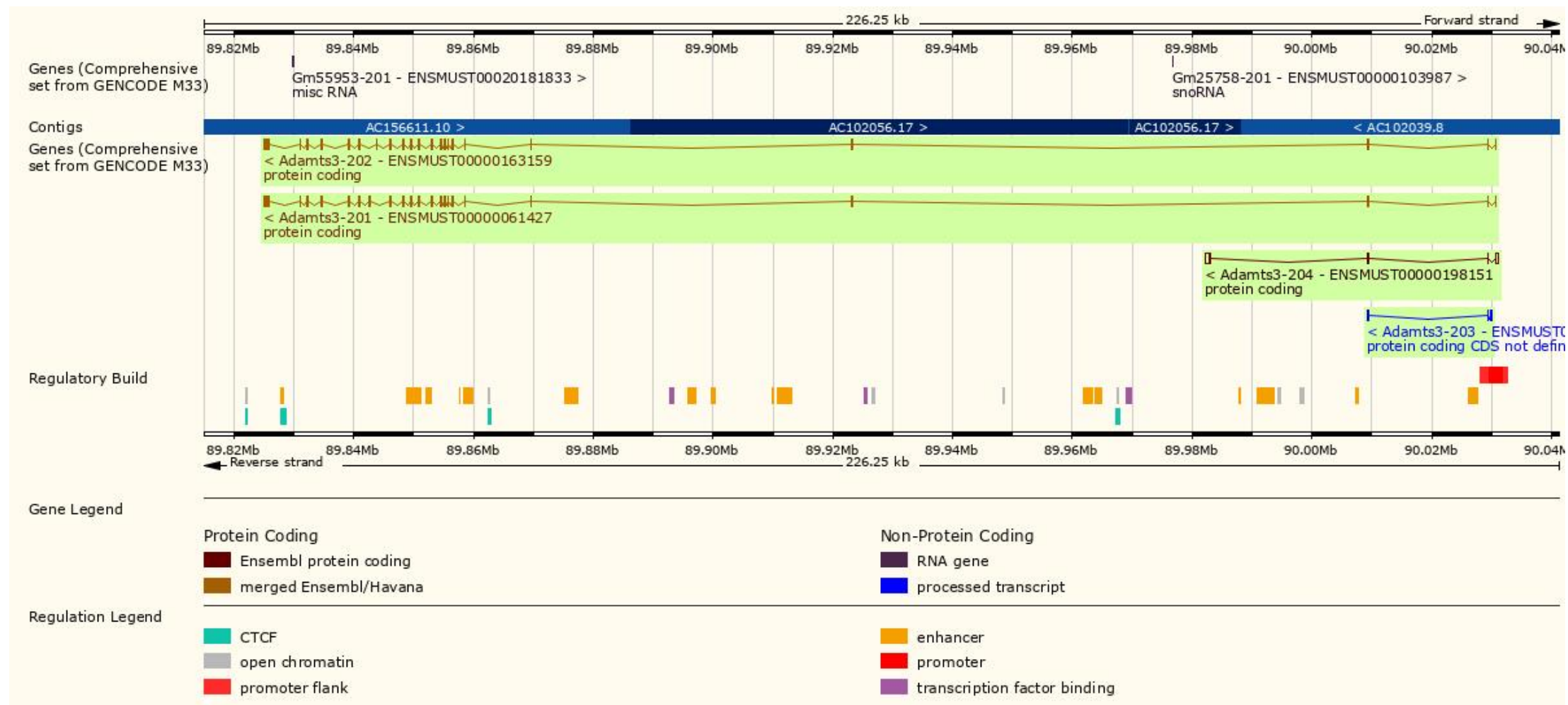
The strategy is based on the design of *Adamts3-202* transcript, the transcription is shown below:



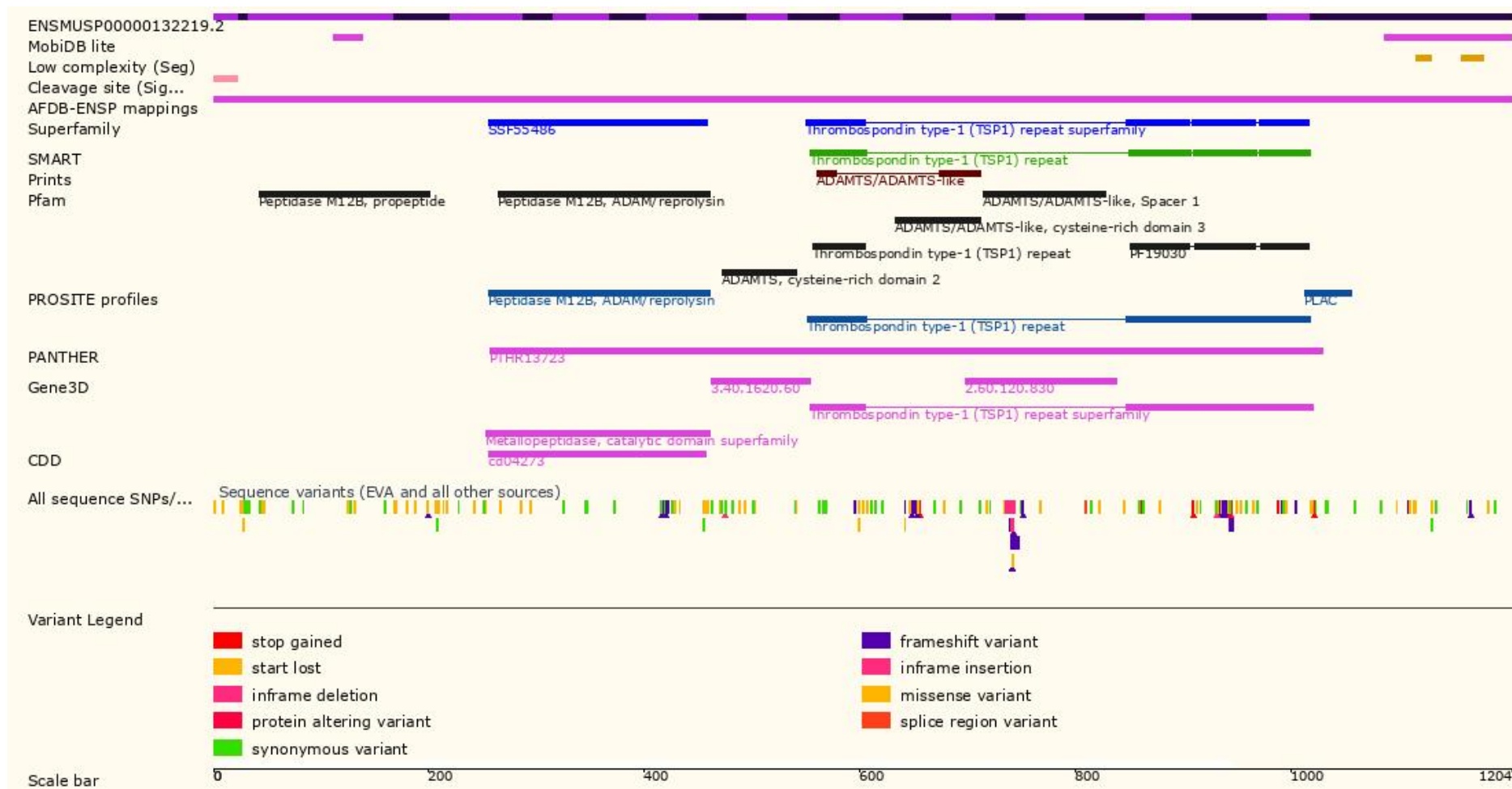
Source: <https://www.ensembl.org>



# Genomic Information

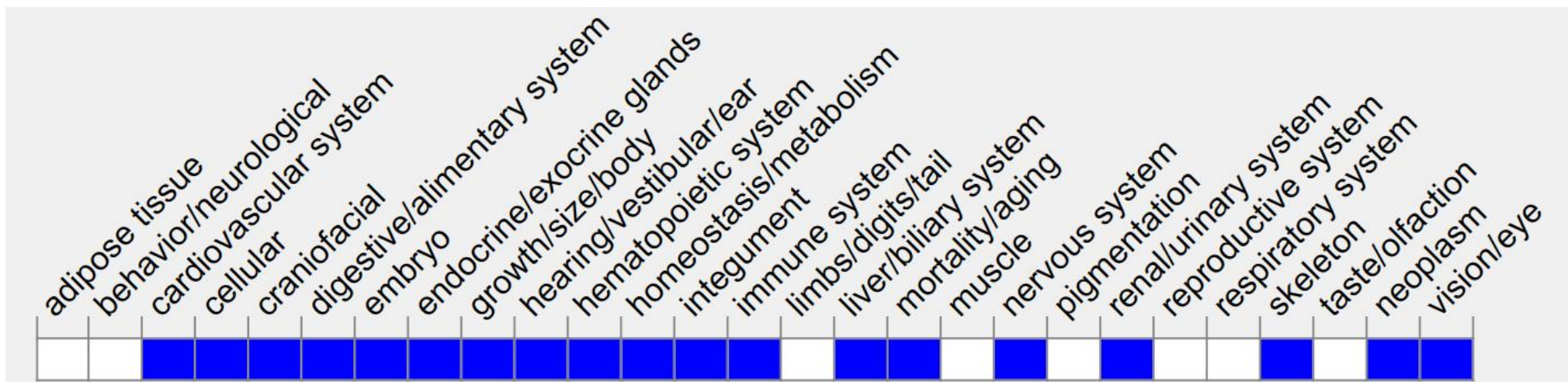


# Protein Information





# Mouse Phenotype Information (MGI)



Mice homozygous for a knockout allele exhibit lethality after E15, edema, absent lymphatic vessels, liver degeneration, and abnormal placenta labyrinth morphology.

# Important Information

- Mice homozygous for a knockout allele exhibit lethality after E15, edema, absent lymphatic vessels, liver degeneration, and abnormal placenta labyrinth morphology.
- *Adamts3* is located on Chr 5. 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 risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.