

# *Vcam1* Cas9-CKO Strategy

**Designer:**

**Huan Fan**

**Reviewer:**

**Huan Wang**

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# Project Overview

**Project Name**

*Vcam1*

**Project type**

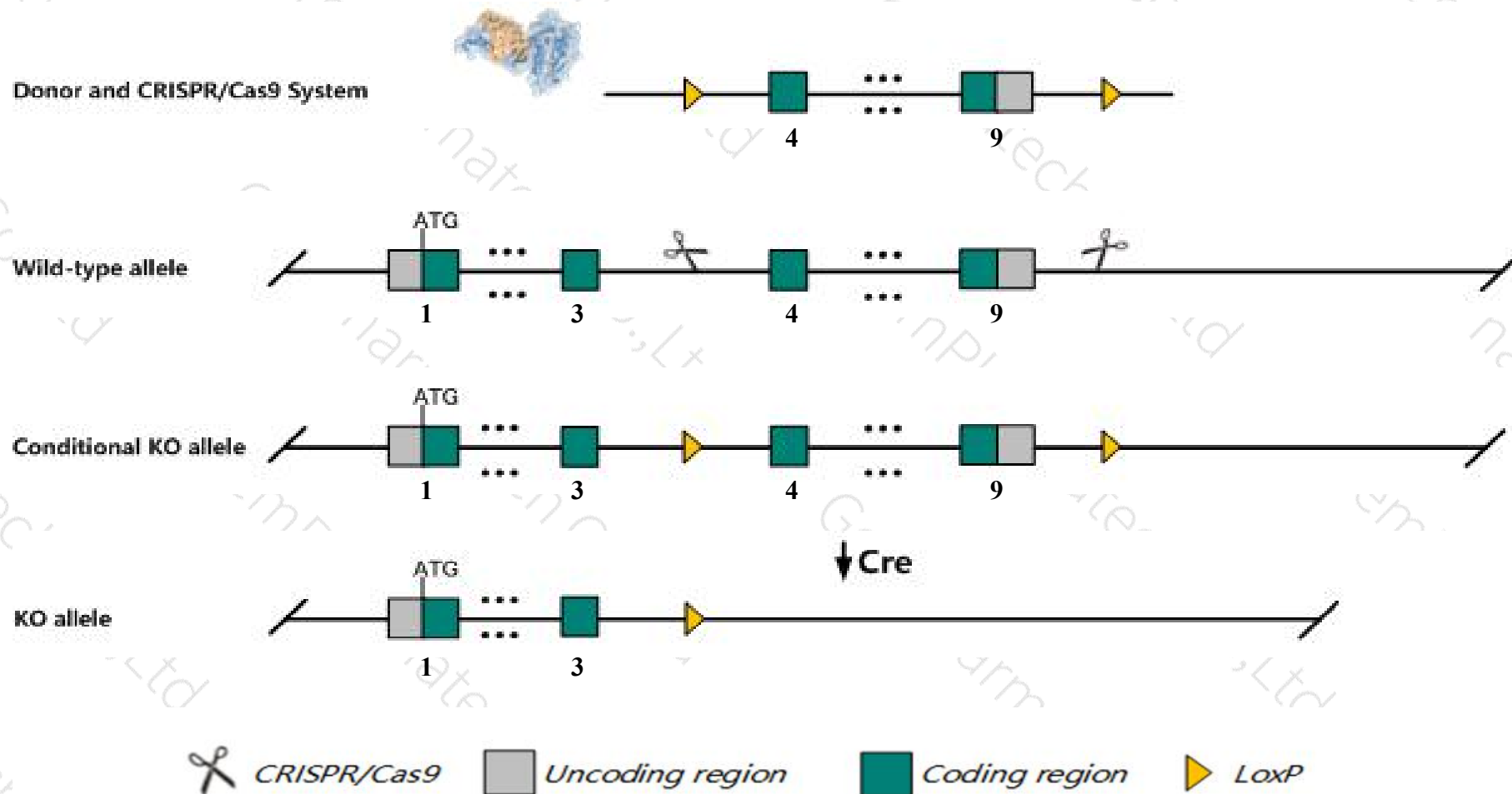
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Vcam1* gene. The schematic diagram is as follows:



# Technical routes

- The *Vcam1* gene has 4 transcripts. According to the structure of *Vcam1* gene, exon4-exon9 of *Vcam1*-201 (ENSMUST00000029574.12) transcript is recommended as the knockout region. The region contains 1559bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Vcam1* 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, Most homozygous null mutants die by embryonic day 12.5 due to defective placenta and failure of chorion/allantois fusion, and heart developmental anomalies. Survivors are generally normal, but have high numbers of circulating blood mononuclear leukocytes.
- The *Vcam1* gene is located on the Chr3. 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)

## Vcam1 vascular cell adhesion molecule 1 [Mus musculus (house mouse)]

Gene ID: 22329, updated on 2-Apr-2019

### Summary



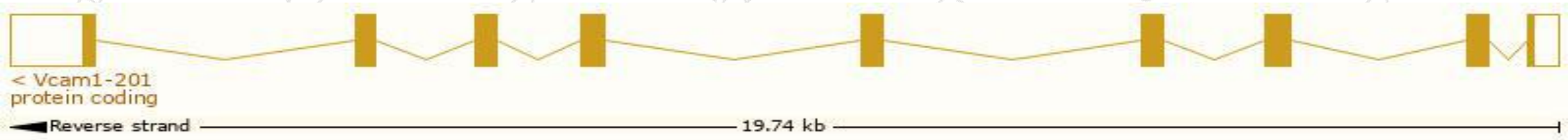
<b>Official Symbol</b>	Vcam1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	vascular cell adhesion molecule 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:98926</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000027962</a>
<b>Gene type</b>	protein coding
<b>RefSeq 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>	CD106, Vcam-1
<b>Expression</b>	Broad expression in liver E18 (RPKM 27.1), limb E14.5 (RPKM 20.2) and 18 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

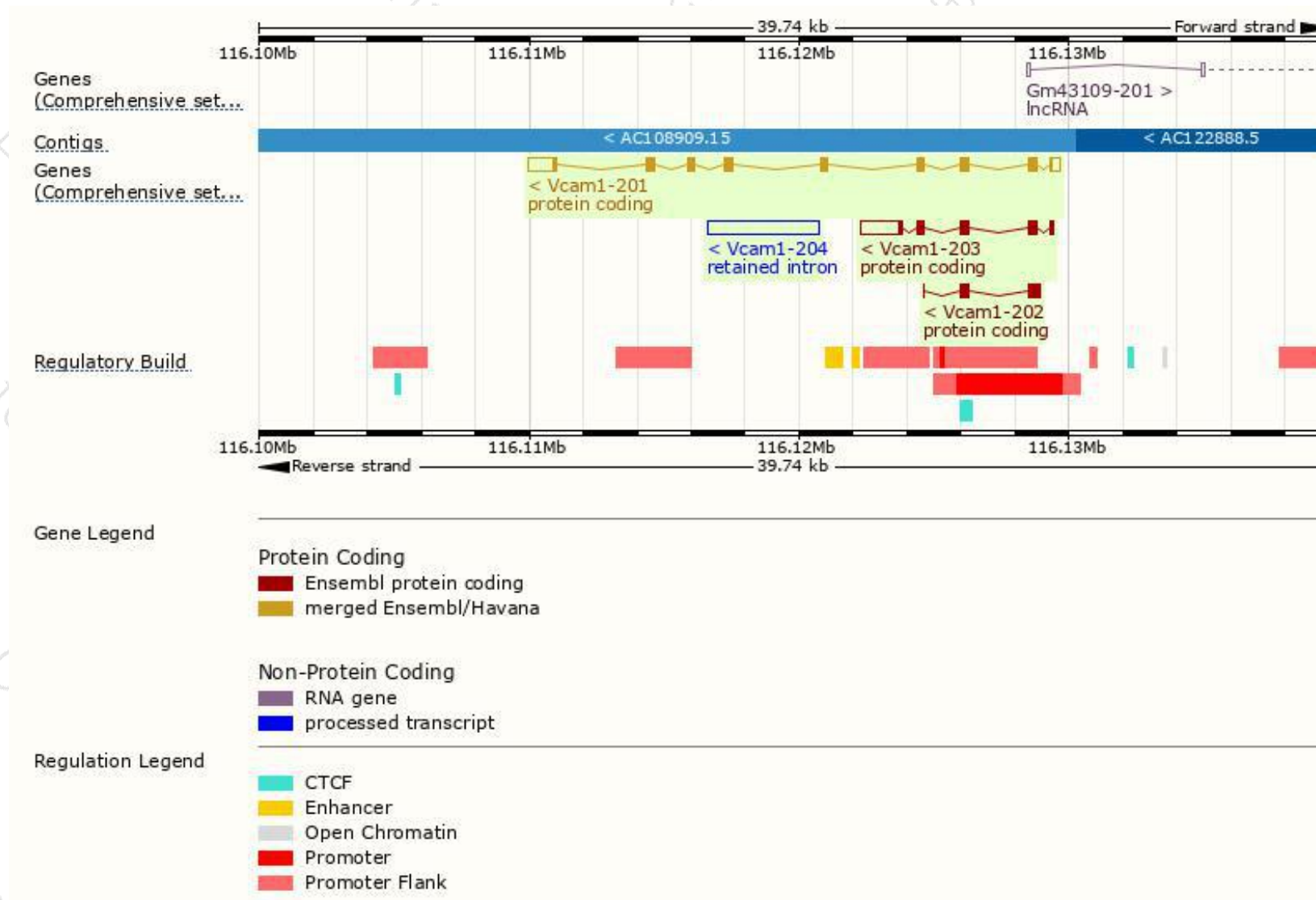
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Vcam1-201	<a href="#">ENSMUST00000029574.12</a>	3469	<a href="#">739aa</a>	Protein coding	<a href="#">CCDS17785</a>	<a href="#">Q3UPN1</a>	TSL:1 GENCODE basic APPRIS P1
Vcam1-203	<a href="#">ENSMUST00000196449.4</a>	2532	<a href="#">345aa</a>	Protein coding	-	<a href="#">P29533 Q544V4</a>	TSL:1 GENCODE basic
Vcam1-202	<a href="#">ENSMUST00000196309.1</a>	749	<a href="#">237aa</a>	Protein coding	-	<a href="#">A0A0G2JFP9</a>	CDS 3' incomplete TSL:3
Vcam1-204	<a href="#">ENSMUST00000197031.1</a>	4088	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Vcam1-201* transcript,The transcription is shown below

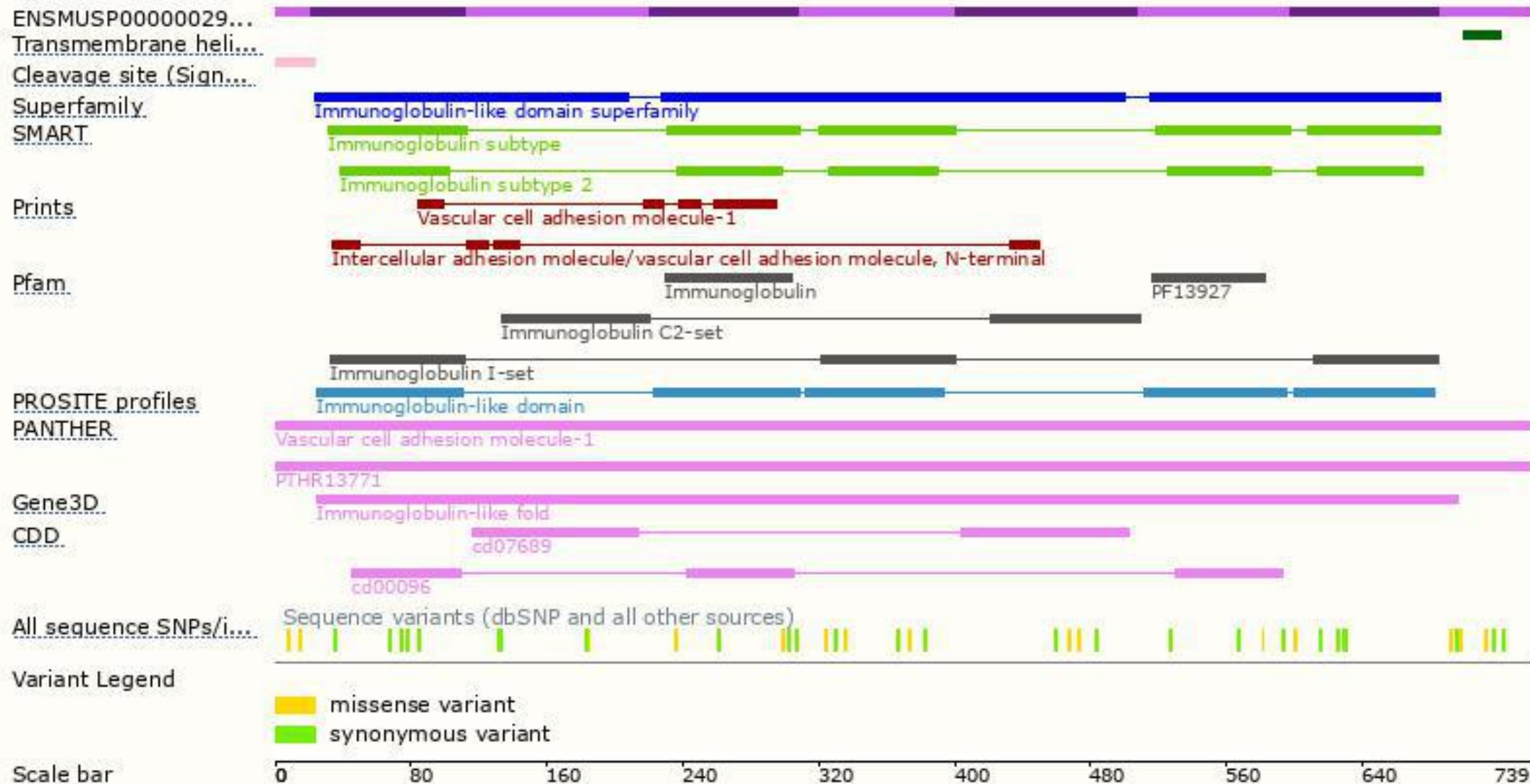


# Genomic location distribution

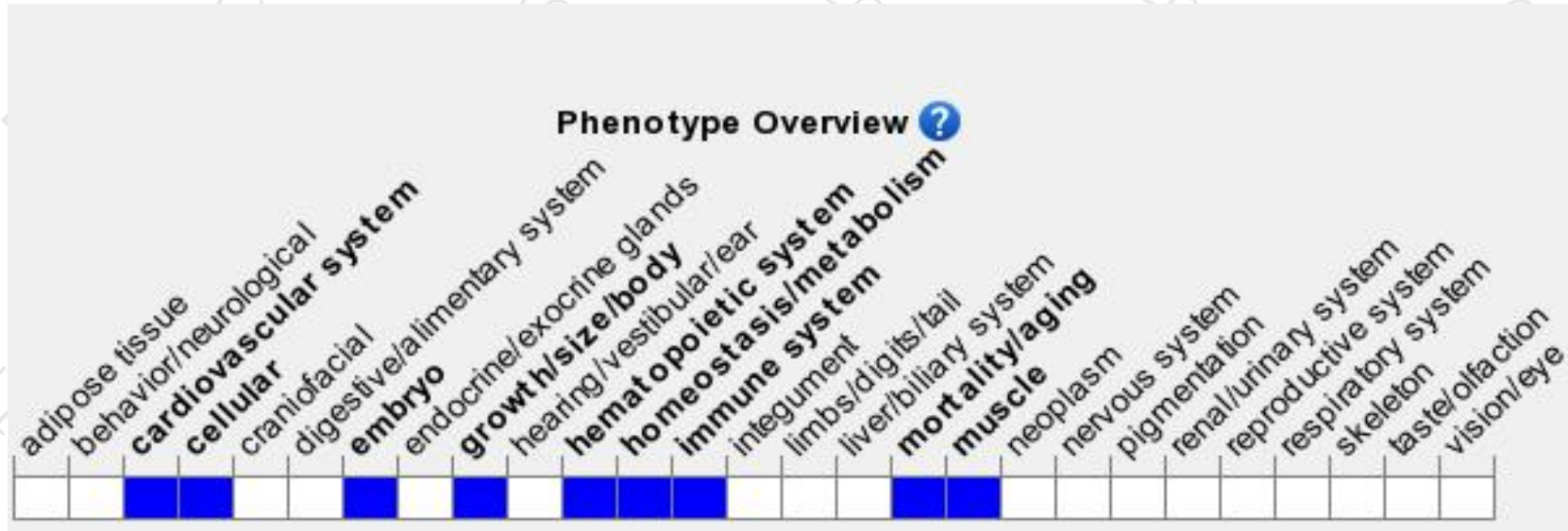




# Protein domain



# 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, Most homozygous null mutants die by embryonic day 12.5 due to defective placenta and failure of chorion/allantois fusion, and heart developmental anomalies. Survivors are generally normal, but have high numbers of circulating blood mononuclear leukocytes.

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

Tel: 400-9660890

