# *Cdh1* Cas9-CKO Strategy

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**Reviewer:** Huan Fan

**Design Date:** 2019-12-25

# Project Overview

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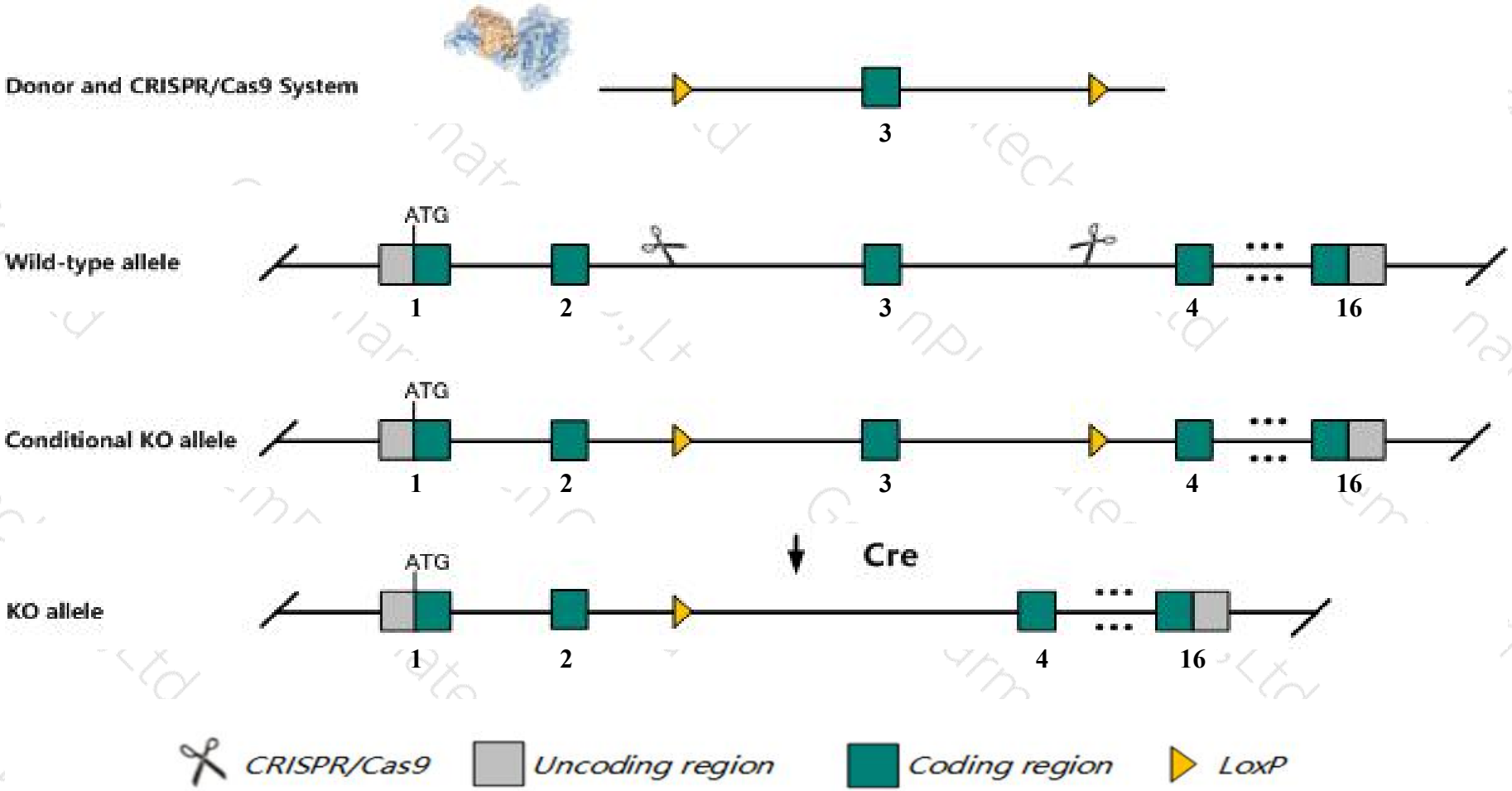
| **Project Name** | ***Cdh1*** |
| **Project type** | **Cas9-CKO** |
| **Strain background** | **C57BL/6JGpt** |

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdh1* gene. The schematic diagram is as follows:



# Technical routes

- The *Cdh1* gene has 3 transcripts. According to the structure of *Cdh1* gene, exon3 of *Cdh1-201* (ENSMUST00000000312.11) transcript is recommended as the knockout region.The region contains 224bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Cdh1* 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.

# Notice

- According to the existing MGI data,In mutant homozygotes, adhesive cells of the morula dissociate shortly after initial compaction, probably due to depletion of maternal protein. Mutant embryos fail to form a trophectodermal epithelium or blastocyst cavity, and die near implantation time.

- The *Cdh1* gene is located on the Chr8. 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）

集萃药康 GemPharmatech

## Cdh1 cadherin 1 [Mus musculus (house mouse)]

Gene ID: 12550, updated on 2-Apr-2019

### Summary

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|---|---|
| **Official Symbol** | Cdh1 provided by MGI |
| **Official Full Name** | cadherin 1 provided by MGI |
| **Primary source** | MGI:MGI:88354 |
| **See related** | Ensembl:ENSMUSG00000000303 |
| **Gene type** | protein coding |
| **RefSeq status** | REVIEWED |
| **Organism** | Mus musculus |
| **Lineage** | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| **Also known as** | AA960649, ARC-1, E-cad, Ecad, L-CAM, UVO, Um |
| **Summary** | This gene encodes E-cadherin, a calcium-dependent cell adhesion molecule that functions in the establishment and maintenance of epithelial cell morphology during embryongenesis and adulthood. The encoded preproprotein undergoes proteolytic processing to generate a mature protein. Targeted mutations disrupting binding of calcium to the encoded protein in mice cause death in utero due to failed blastocyst and trophectoderm formation. This gene is located adjacent to a related cadherin gene on chromosome 8. [provided by RefSeq, Oct 2015] |
| **Expression** | Broad expression in colon adult (RPKM 139.2), large intestine adult (RPKM 100.0) and 15 other tissuesSee more |
| **Orthologs** | human all |

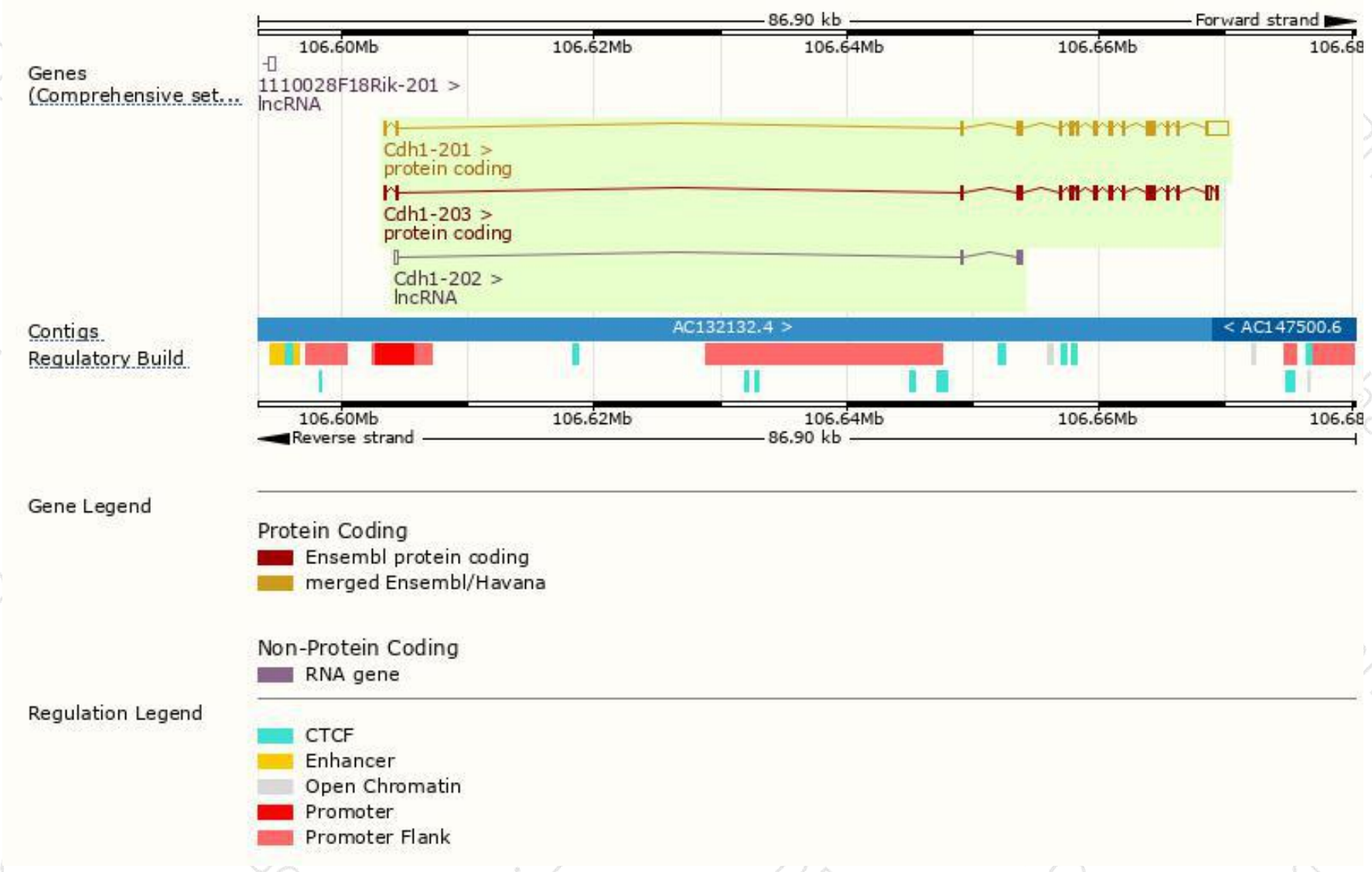
# Transcript information（Ensembl）

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

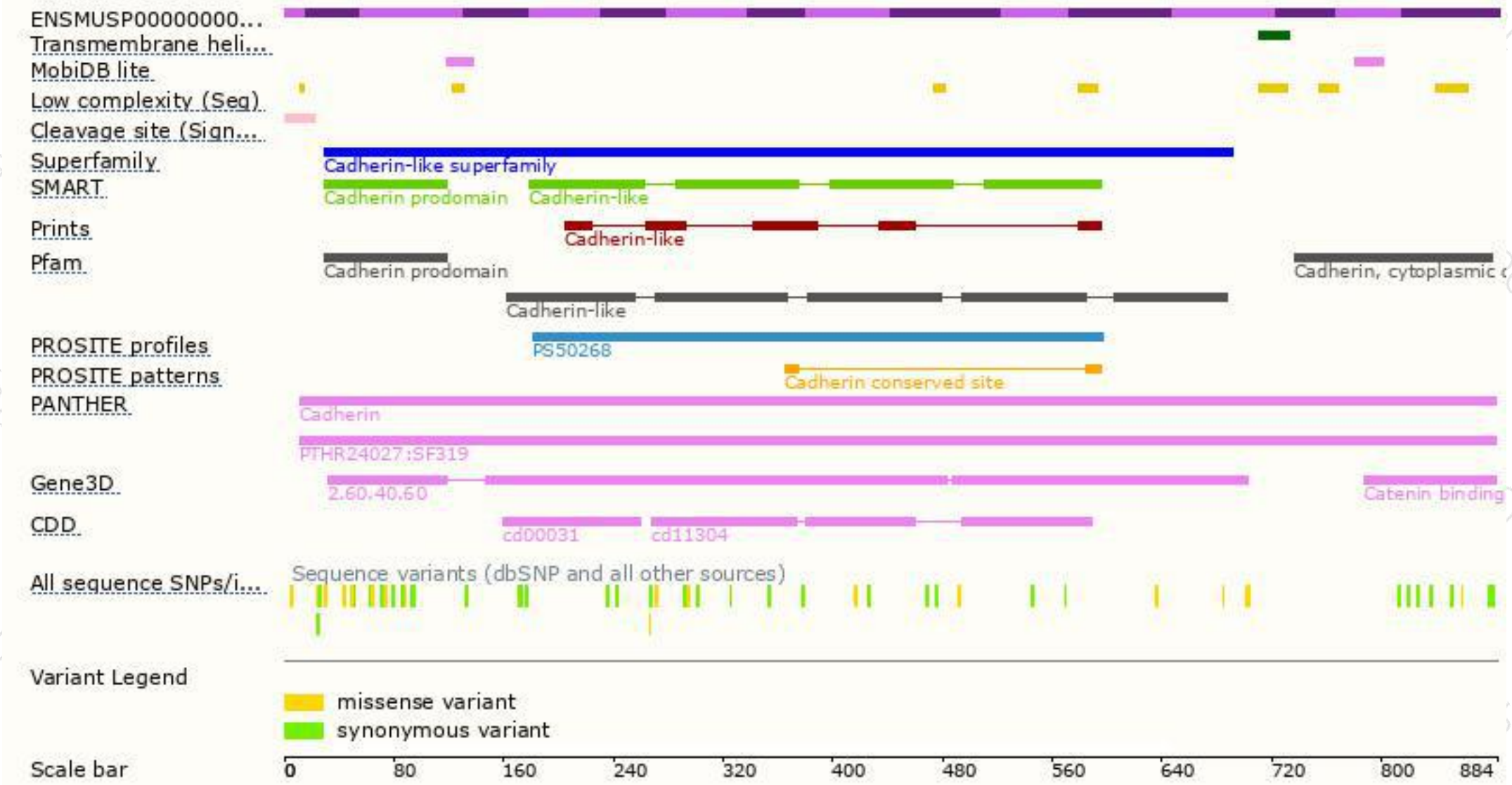
| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| Cdh1-201 | ENSMUST00000000312.11 | 4430 | 884aa | Protein coding | CCDS22638 | A0A0R4IZW5 | TSL:1 GENCODE basic APPRIS P1 |
| Cdh1-203 | ENSMUST00000167688.1 | 3203 | 884aa | Protein coding | CCDS22638 | A0A0R4IZW5 | TSL:5 GENCODE basic APPRIS P1 |
| Cdh1-202 | ENSMUST00000136580.1 | 789 | No protein | lncRNA | - | - | TSL:2 |

The strategy is based on the design of *Cdh1-201* transcript,The transcription is shown below

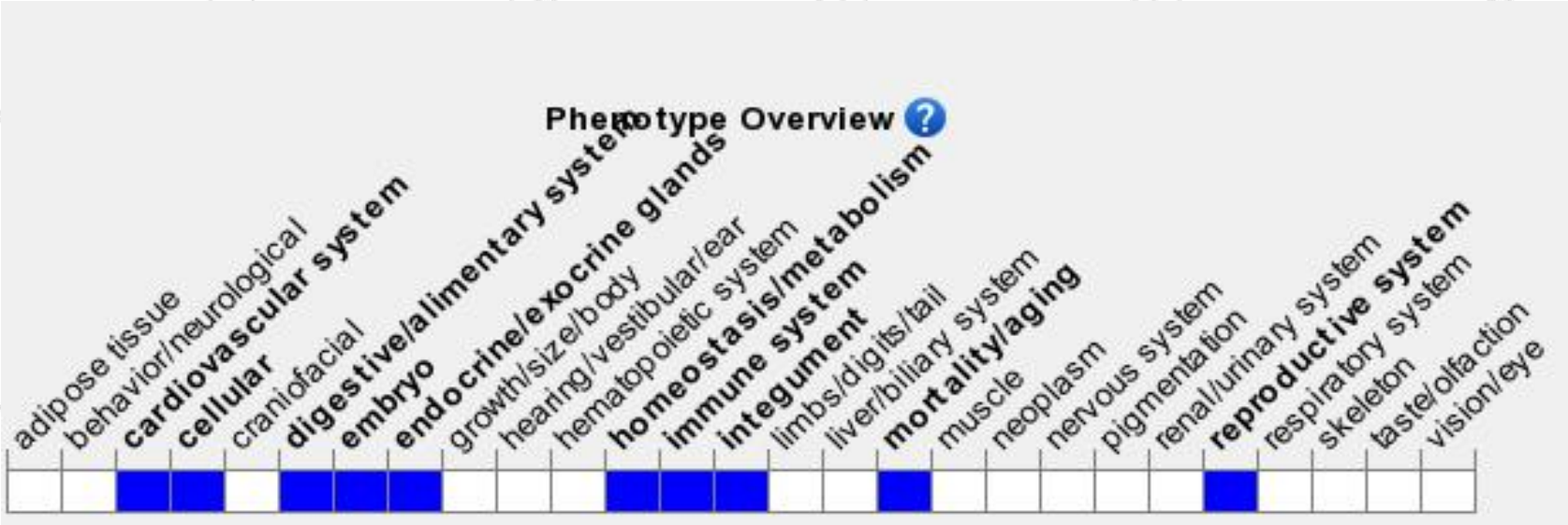
# Genomic location distribution



# 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/).*

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

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