# *Bmp10* Cas9-KO Strategy


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# Project Overview

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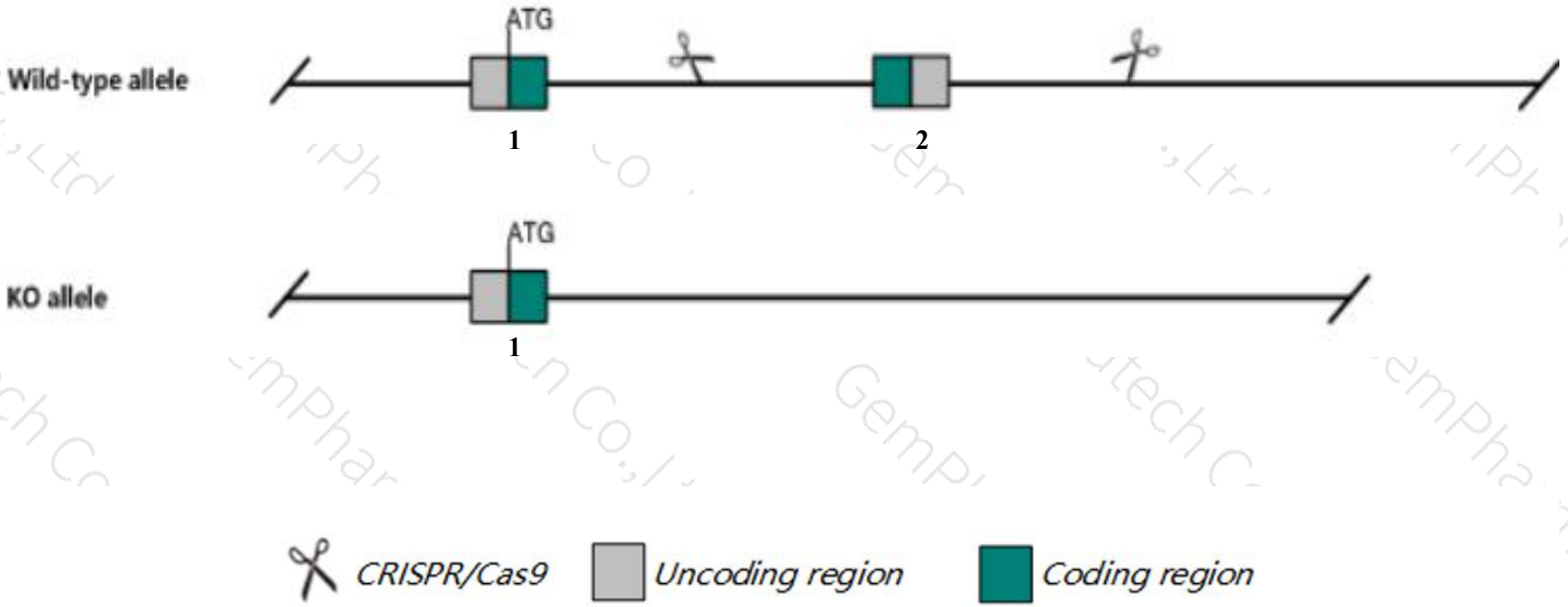
| **Project Name** | ***Bmp10*** |
| **Project type** | **Cas9-KO** |
| **Strain background** | **C57BL/6JGpt** |

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bmp10* gene. The schematic diagram is as follows:



# Technical routes

➢ The *Bmp10* gene has 1 transcript. According to the structure of *Bmp10* gene, exon2 of *Bmp10-201* (ENSMUST00000032125.6) transcript is recommended as the knockout region.The region contains 932bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Bmp10* gene. The brief process is as follows: CRISPR/Cas9 systen

# Notice

- According to the existing MGI data,Homozygous null mice display decreased embryo size, cardiac dysgenesis, defects in early embryonic vascular development, enlarged pericardium, arteriovenous malformations, and embryonic lethality.
- The *Bmp10* gene is located on the Chr6. 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）

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## Bmp10 bone morphogenetic protein 10 [Mus musculus (house mouse)]

Gene ID: 12154, updated on 13-Mar-2020

### Summary

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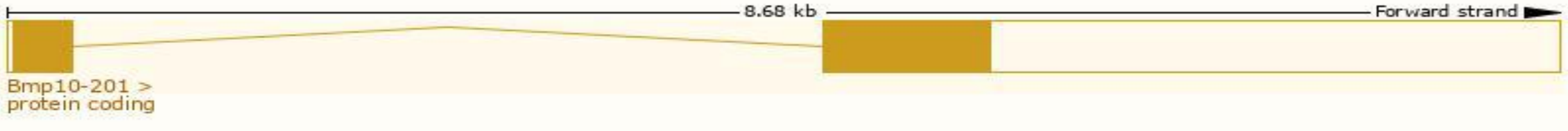
|---|---|
| **Official Symbol** | Bmp10 provided by MGI |
| **Official Full Name** | bone morphogenetic protein 10 provided by MGI |
| **Primary source** | MGI:MGI:1338820 |
| **See related** | Ensembl:ENSMUSG00000030046 |
| **Gene type** | protein coding |
| **RefSeq status** | REVIEWED |
| **Organism** | Mus musculus |
| **Lineage** | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| **Also known as** | b2b2711Clo |
| **Summary** | This gene encodes a secreted ligand of the TGF-beta (transforming growth factor-beta) superfamily of proteins. Ligands of this family bind various TGF-beta receptors leading to recruitment and activation of SMAD family transcription factors that regulate gene expression. The encoded preproprotein is proteolytically processed to generate the mature protein, which binds to the activin receptor-like kinase 1 (ALK1) and plays important roles in cardiovascular development including cardiomyocyte proliferation and regulation of heart size, closure of the ductus arteriosus, angiogenesis and ventricular trabeculation. Homozygous knockout mice for this gene exhibit impaired heart development and embryonic lethality. [provided by RefSeq, Aug 2016] |
| **Expression** | Biased expression in heart adult (RPKM 23.3) and liver E18 (RPKM 1.3)See more |
| **Orthologs** | human all |

# Transcript information（Ensembl）

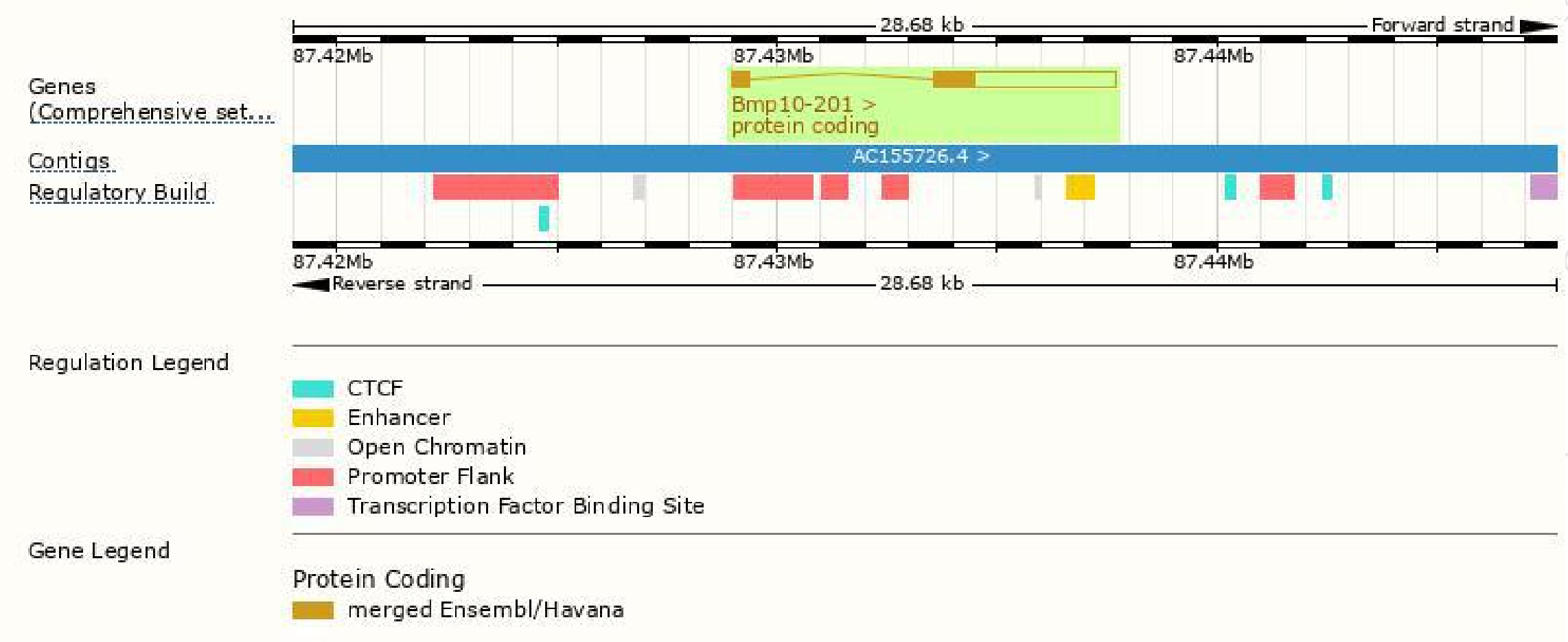
The gene has 1 transcript,and the transcript is shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|---|---|---|---|---|---|---|---|
| Bmp10-201 | ENSMUST00000032125.6 | 4490 | 421aa | Protein coding | CCDS51838 | Q9R229 | TSL:1 GENCODE basic APPRIS P1 |

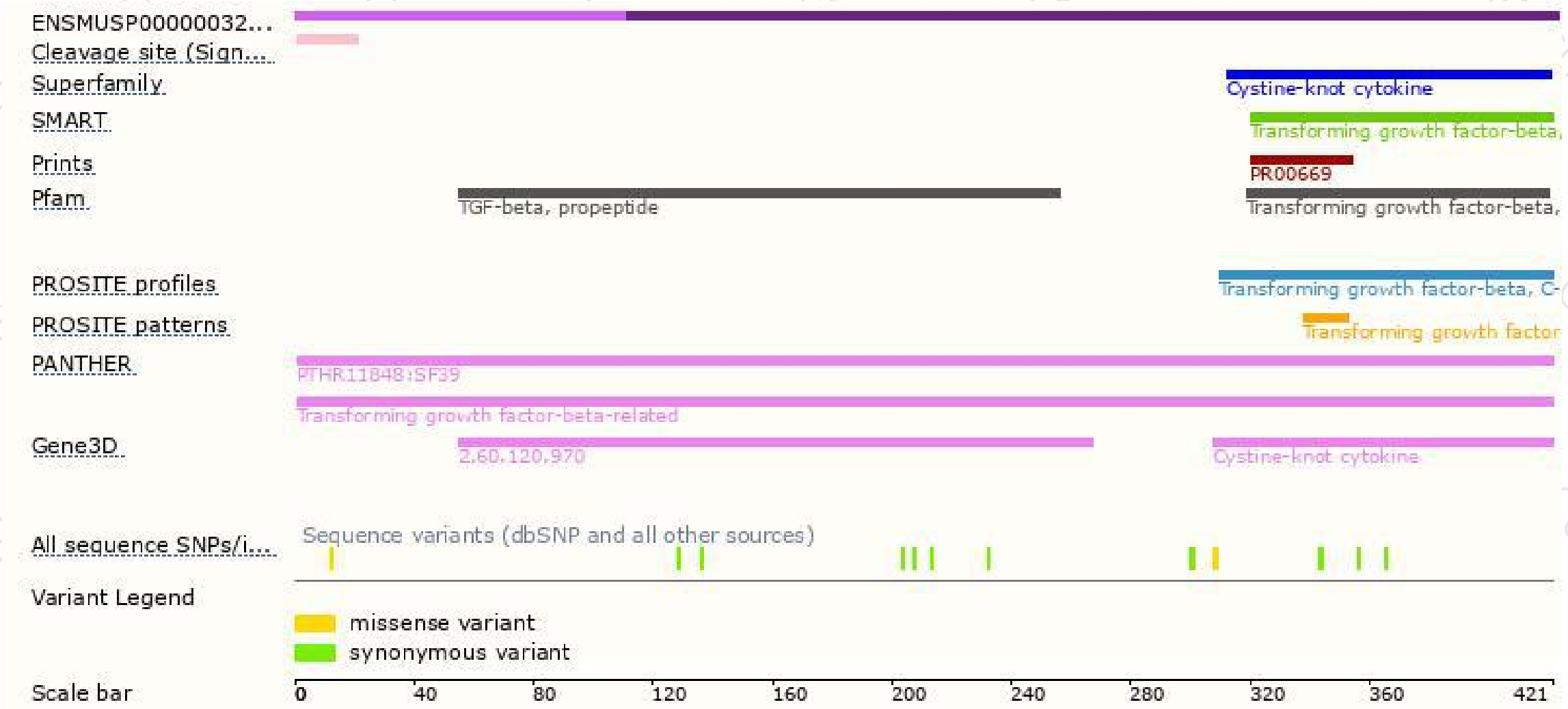
The strategy is based on the design of *Bmp10-201* transcript,the transcription is shown below



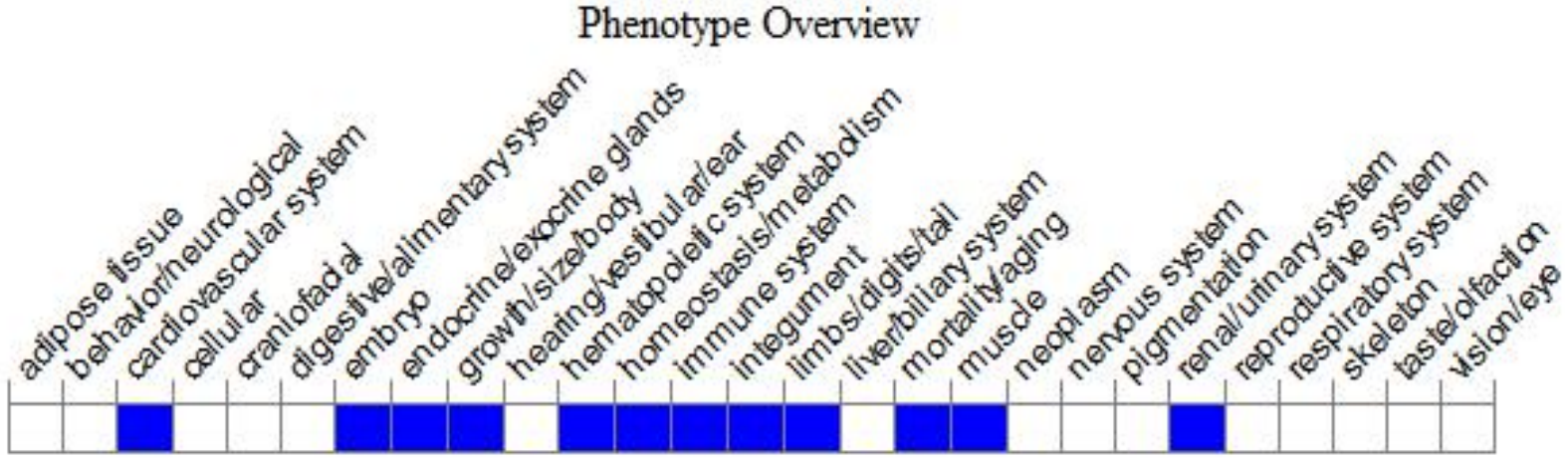
# Genomic location distribution



# 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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