

# ***Il6 Cas9-KO Strategy***

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**Reviewer:**

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# Project Overview

**Project Name**

*Il6*

**Project type**

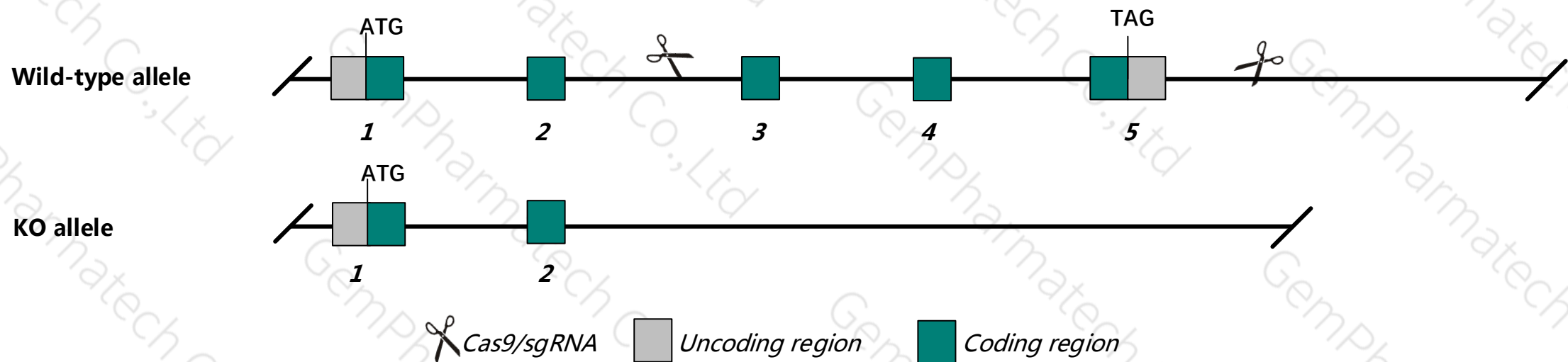
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il6* gene. The schematic diagram is as follows:



- The *Il6* gene has 4 transcripts. According to the structure of *Il6* gene, exon3-exon5 of *Il6-201* (ENSMUST00000026845.11) transcript is recommended as the knockout region. The region contains 432bp coding sequence and 3'UTR region. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il6* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Homozygous null mutants show impaired immune response to pathogens, decreased T cell numbers and resistance to plasma cell neoplasia. They are defective in wound healing and liver regeneration and show increased emotionality and high bone turnover rate.
- The *Il6* is close to 5'UTR region of the *A230098N10Rik* gene. Knockout the region may affect the function of the *A230098N10Rik* gene.
- The *Il6* gene is located on the Chr5. 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)

## Il6 interleukin 6 [ *Mus musculus* (house mouse) ]

Gene ID: 16193, updated on 13-Aug-2019

### Summary

|                    |   |
|--------------------|---|
| Official Symbol    | Il6 provided by <a href="#">MGI</a>   |
| Official Full Name | interleukin 6 provided by <a href="#">MGI</a>   |
| Primary source     | <a href="#">MGI:MGI:96559</a>   |
| See related        | <a href="#">Ensembl:ENSMUSG00000025746</a>  |
| Gene type          | protein coding  |
| RefSeq status      | REVIEWED  |
| 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      | Il-6  |
| Summary            | This gene encodes a member of the interleukin family of cytokines that have important functions in immune response, hematopoiesis, inflammation and the acute phase response. The ectopic overexpression of the encoded protein in mice results in excessive plasma cells in circulation, leading to death. Mice lacking the encoded protein exhibit abnormalities in hepatic acute phase response, some immune mechanisms, bone resorption in response to estrogen, liver regeneration and wound healing. Alternative splicing results in multiple transcript variants encoding different isoforms. [provided by RefSeq, Sep 2015] |
| Expression         | Low expression observed in reference dataset <a href="#">See more</a>   |
| Orthologs          | <a href="#">human</a> <a href="#">all</a>   |

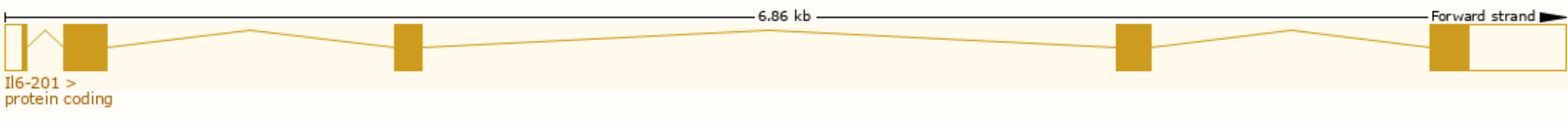


# Transcript information (Ensembl)

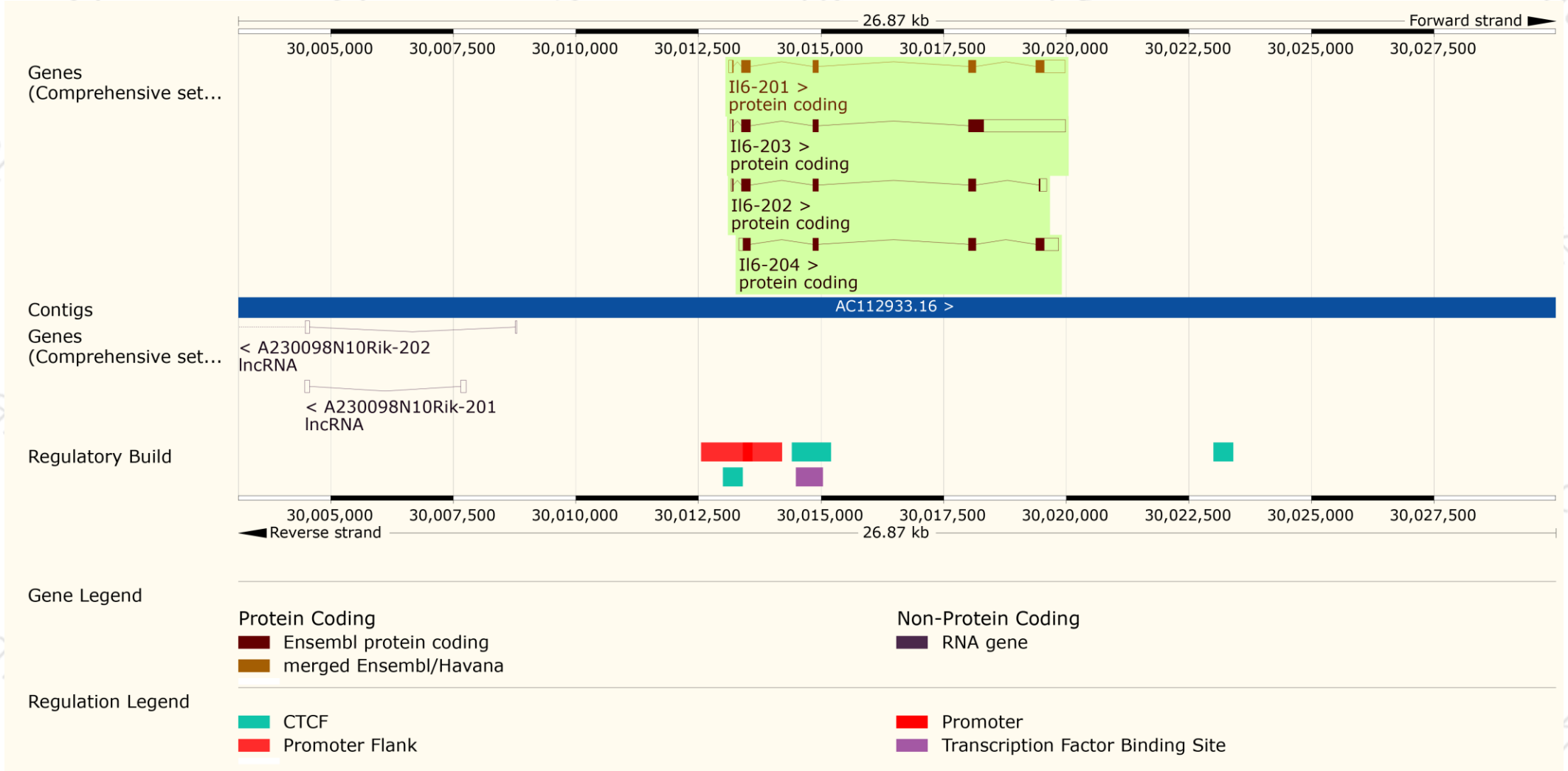
The gene has 4 transcripts, and all transcripts are shown below:

| Show/hide columns |                                       |      |                       |                                      |                |                           |   | Filter  |                           |
|-------------------|---------------------------------------|------|-----------------------|--------------------------------------|----------------|---------------------------|---|---------|---------------------------|
| Name ▲            | Transcript ID ▲                       | bp ▲ | Protein ▲             | Translation ID ▲                     | Biotype ▲      | CCDS ▲                    | UniProt ▲                                     | Flags ▲ |                           |
| Il6-201           | <a href="#">ENSMUST00000026845.11</a> | 1141 | <a href="#">211aa</a> | <a href="#">ENSMUSP00000026845.7</a> | Protein coding | <a href="#">CCDS19153</a> | <a href="#">A2RTD1</a> <a href="#">P08505</a> | TSL:1   | GENCODE basic APPRIS P2   |
| Il6-202           | <a href="#">ENSMUST00000195978.4</a>  | 651  | <a href="#">165aa</a> | <a href="#">ENSMUSP00000143544.1</a> | Protein coding | <a href="#">CCDS84856</a> | <a href="#">A0A0G2JGF4</a>                    | TSL:1   | GENCODE basic             |
| Il6-203           | <a href="#">ENSMUST00000199183.4</a>  | 2343 | <a href="#">208aa</a> | <a href="#">ENSMUSP00000143293.1</a> | Protein coding | -                         | <a href="#">A0A0G2JFT1</a>                    | TSL:2   | GENCODE basic             |
| Il6-204           | <a href="#">ENSMUST00000199765.1</a>  | 963  | <a href="#">194aa</a> | <a href="#">ENSMUSP00000143157.1</a> | Protein coding | -                         | <a href="#">A0A0G2JFG1</a>                    | TSL:2   | GENCODE basic APPRIS ALT2 |

The strategy is based on the design of *Il6-201* transcript, The transcription is shown below

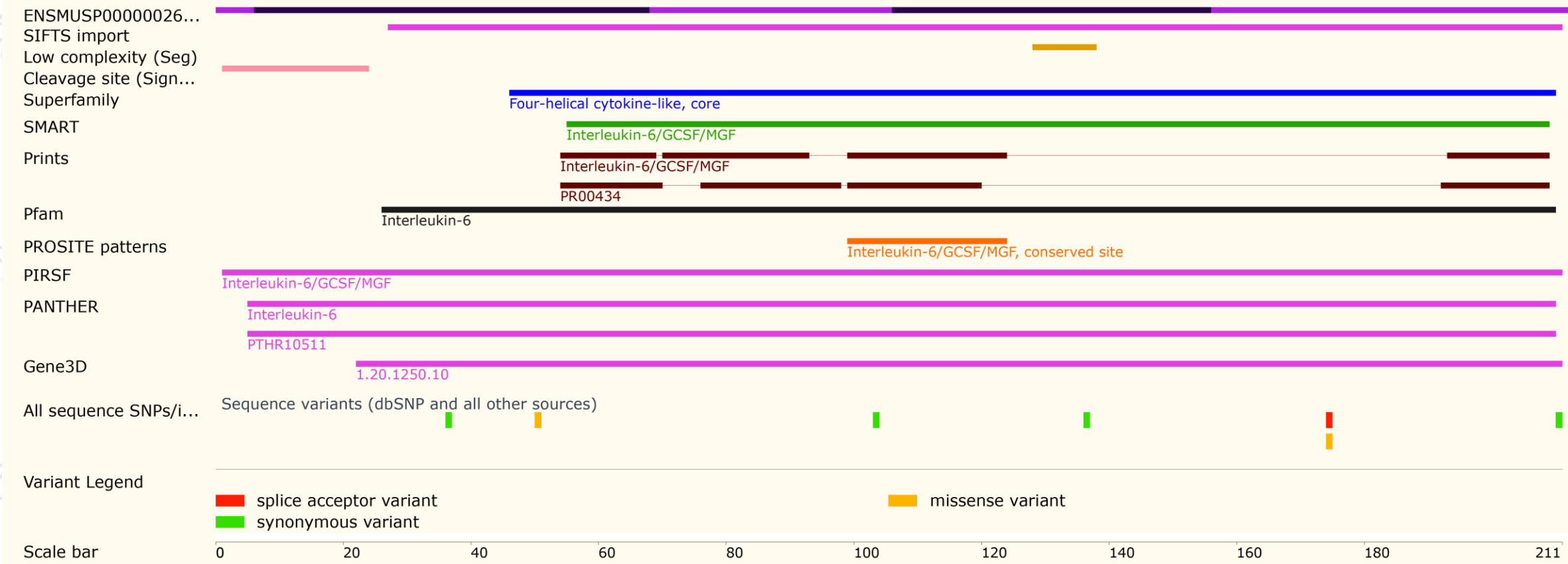


# Genomic location distribution

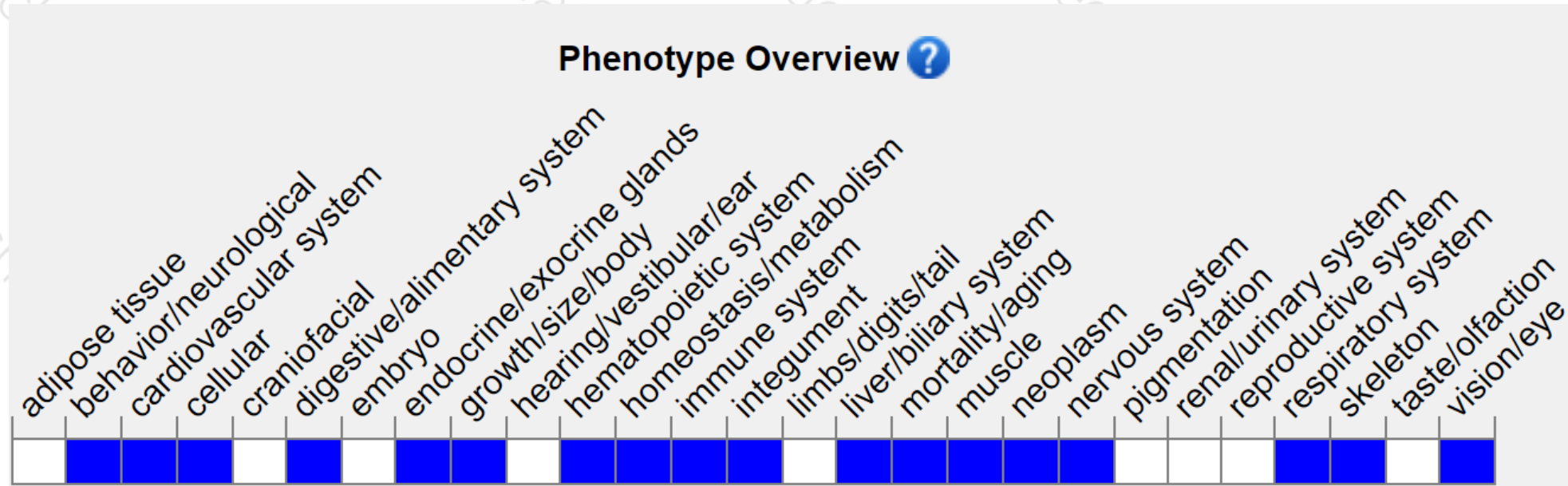




# Protein domain



# 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, Homozygous null mutants show impaired immune response to pathogens, decreased T cell numbers and resistance to plasma cell neoplasia. They are defective in wound healing and liver regeneration and show increased emotionality and high bone turnover rate.

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

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