

Il2rb Cas9-KO Strategy

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Project Overview

Project Name

Il2rb

Project type

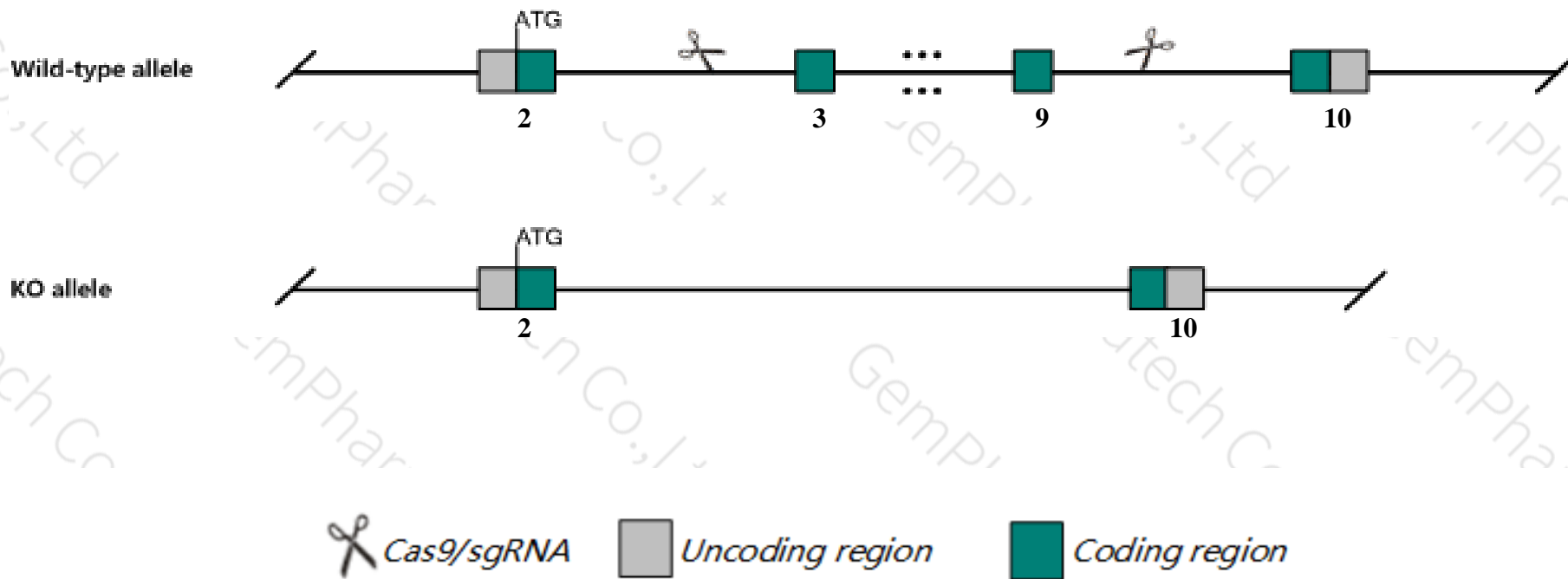
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il2rb* gene. The schematic diagram is as follows:



- The *Il2rb* gene has 2 transcripts. According to the structure of *Il2rb* gene, exon3-exon9 of *Il2rb-201* (ENSMUST00000089398.8) transcript is recommended as the knockout region. The region contains 824bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il2rb* 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, Homozygotes for a targeted null mutation exhibit spontaneous activation of T cells and differentiation of B cells, elevated immunoglobulins including autoantibodies causing hemolytic anemia, granulocytopenia, and death after 3 months of age.
- The *Il2rb* gene is located on the Chr15. 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)

Il2rb interleukin 2 receptor, beta chain [Mus musculus (house mouse)]

Gene ID: 16185, updated on 19-Mar-2019

Summary



Official Symbol	Il2rb provided by MGI
Official Full Name	interleukin 2 receptor, beta chain provided by MGI
Primary source	MGI:MGI:96550
See related	Ensembl:ENSMUSG00000068227
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	CD122, IL-15Rbeta, IL15Rbeta, IL-2/15Rbeta, IL-2Rbeta, p70
Summary	The interleukin 2 receptor is composed of alpha and beta subunits. The beta subunit encoded by this gene is very homologous to the human beta subunit and also shows structural similarity to other cytokine receptors. [provided by RefSeq, Jul 2008]
Expression	Biased expression in spleen adult (RPKM 30.6), mammary gland adult (RPKM 14.0) and 8 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

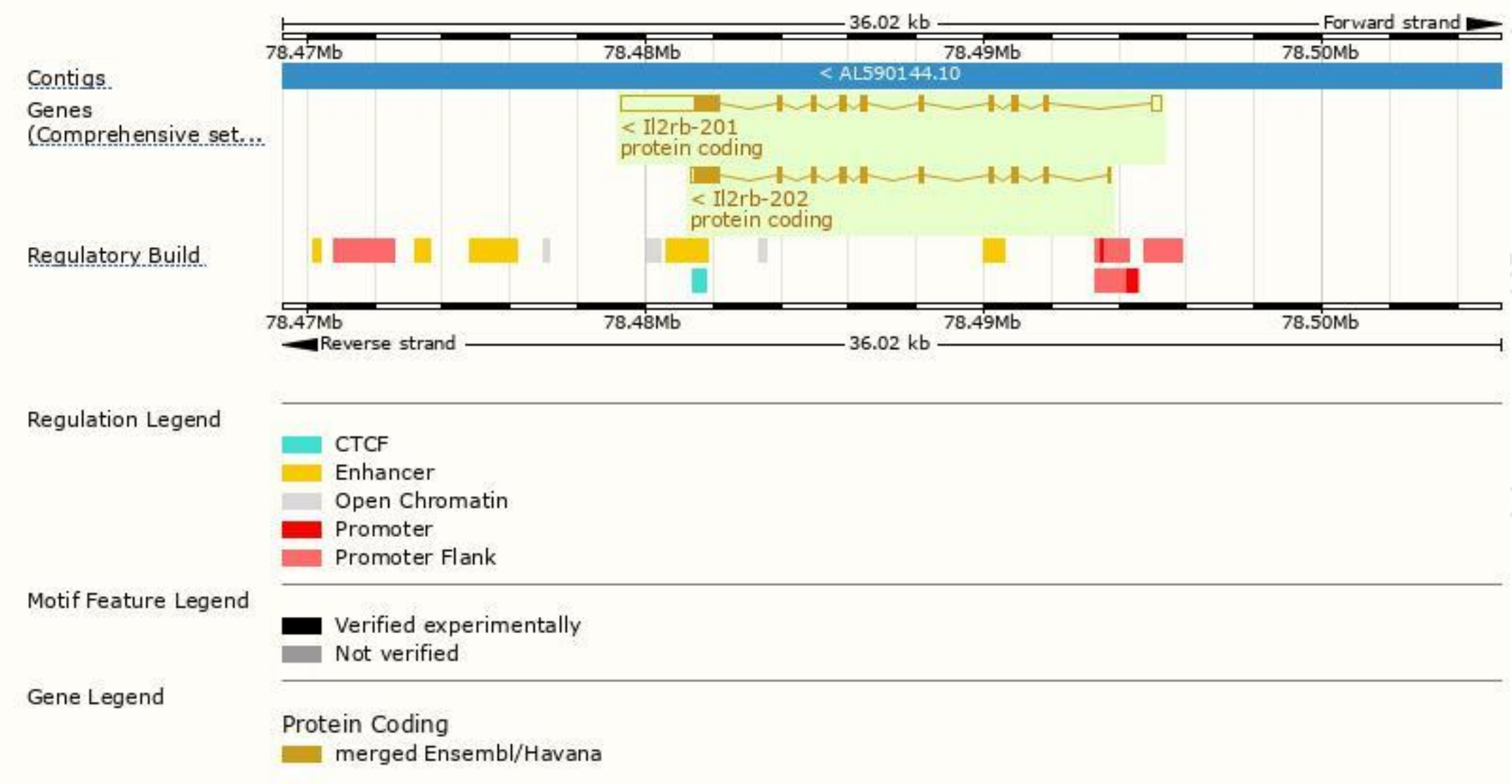
The gene has 2 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
II2rb-201	ENSMUST00000089398.8	4194	539aa	Protein coding	CCDS27616	P16297	TSL:1 GENCODE basic APPRIS P1
II2rb-202	ENSMUST00000163494.2	1895	539aa	Protein coding	CCDS27616	P16297	TSL:1 GENCODE basic APPRIS P1

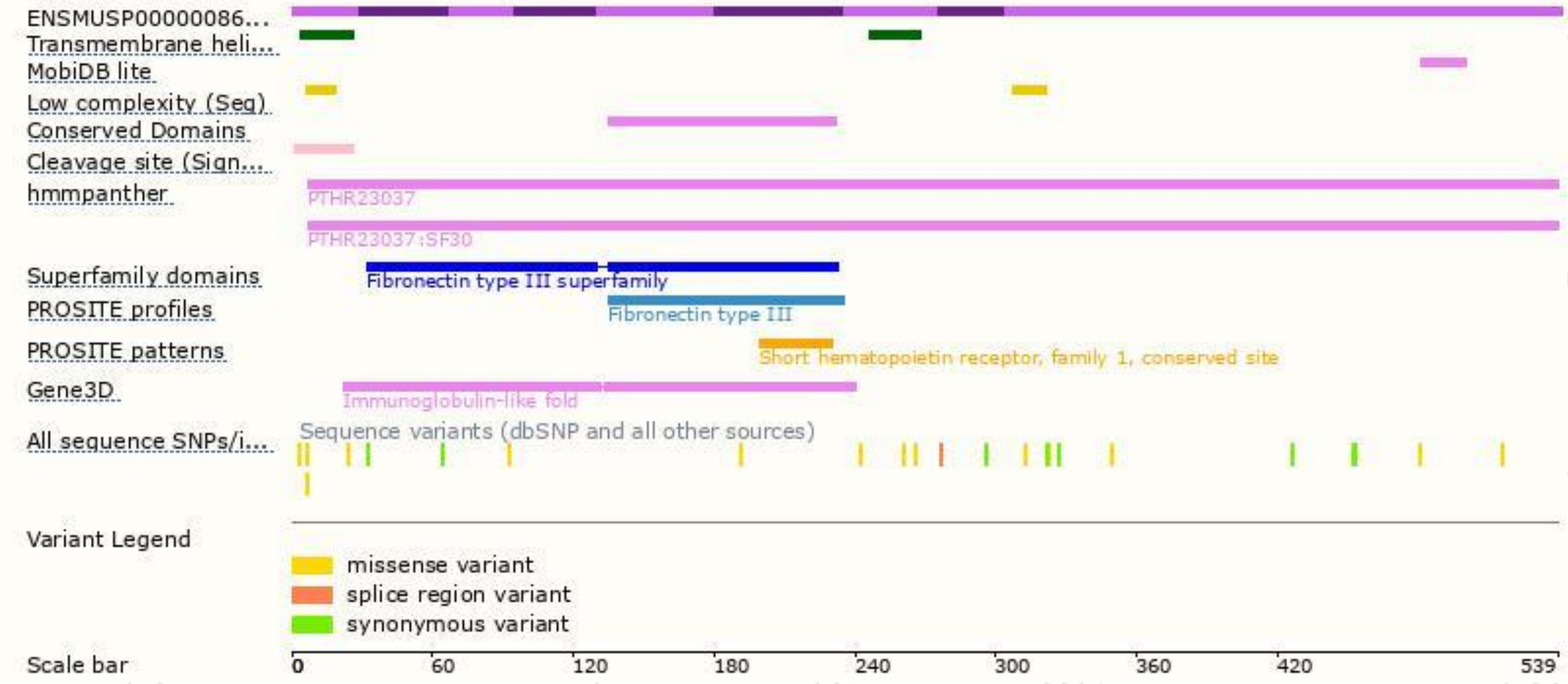
The strategy is based on the design of *II2rb-201* transcript, The transcription is shown below



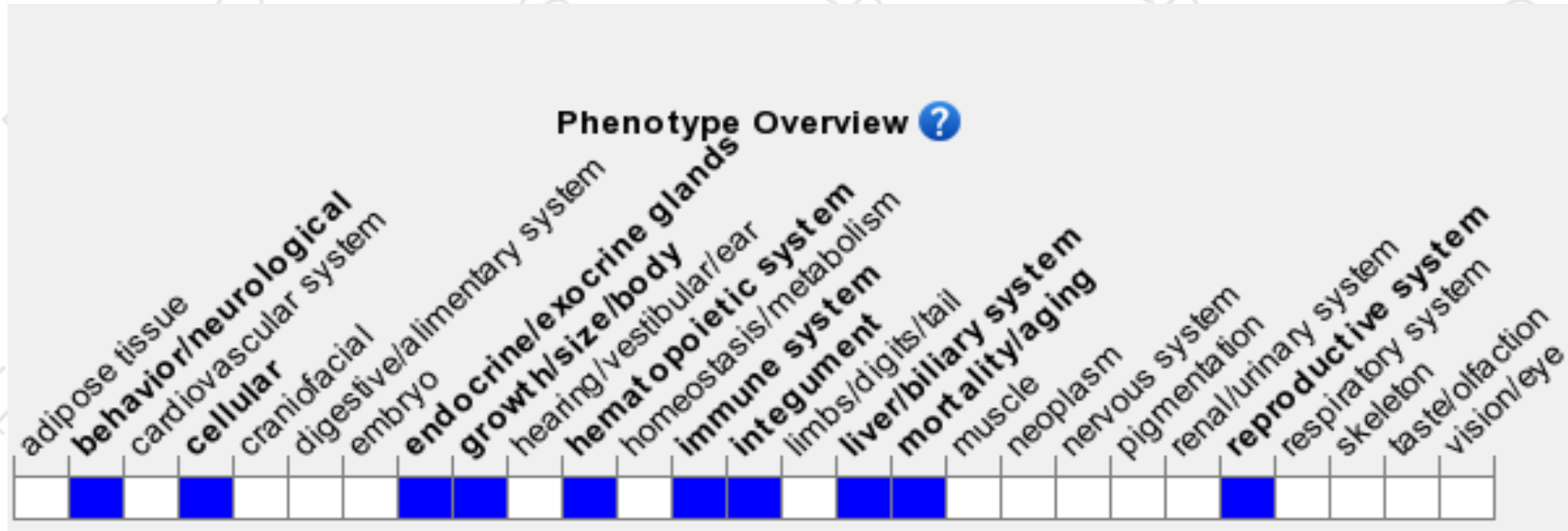
Genomic location distribution



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, Homozygotes for a targeted null mutation exhibit spontaneous activation of T cells and differentiation of B cells, elevated immunoglobulins including autoantibodies causing hemolytic anemia, granulocytopenia, and death after 3 months of age.

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

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