

# *Il7r* Cas9-CKO Strategy

Designer: JiaYu

# Project Overview

**Project Name**

***Il7r***

**Project type**

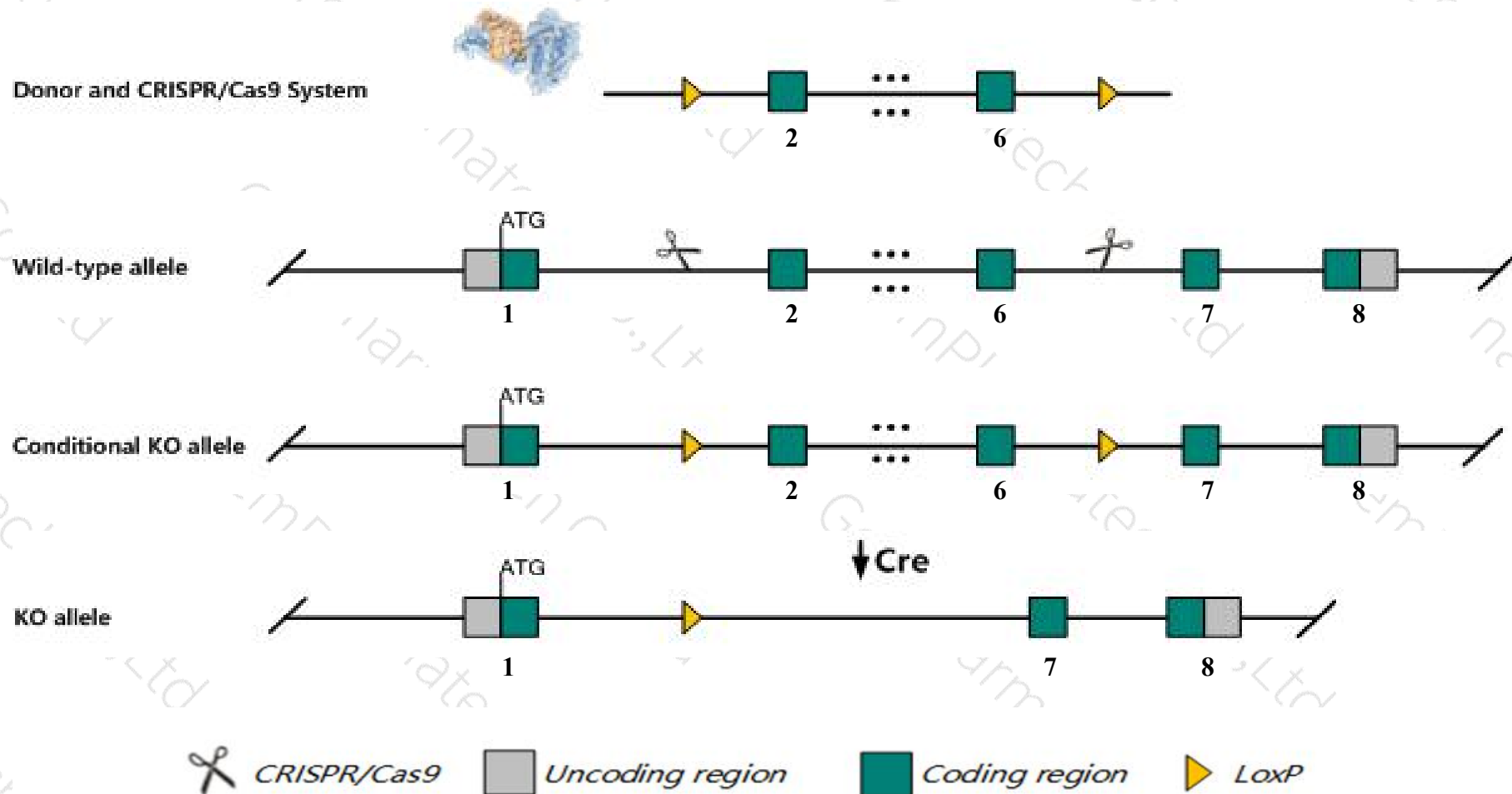
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il7r* gene. The schematic diagram is as follows:



- The *Il7r* gene has 4 transcripts. According to the structure of *Il7r* gene, exon2-exon6 of *Il7r-201* (ENSMUST00000003981.5) transcript is recommended as the knockout region. The region contains 718bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il7r* 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, Homozygous null mutations cause arrested T and B cell differentiation and severely reduced thymus and spleen cellularity. Mice homozygous for a knock-in allele show partial rescue of T cell numbers during late thymus development, and impaired CD8 T cell memory and CD4 T cell primary responses.
- The *Il7r* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

# Gene information (NCBI)

## Il7r interleukin 7 receptor [Mus musculus (house mouse)]

Gene ID: 16197, updated on 12-Mar-2019

### Summary



<b>Official Symbol</b>	Il7r provided by <a href="#">MGI</a>
<b>Official Full Name</b>	interleukin 7 receptor provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:96562</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000003882</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>	CD127, IL-7Ralpha
<b>Summary</b>	Interleukin-7 is a glycoprotein involved in the regulation of lymphopoiesis. Response of cells to IL7 is dependent on the presence of the interleukin 7 receptor (IL7R); the active receptor is a alpha/gamma chain heterodimer. The gamma(c) chain, which also associates with the interleukin-2 receptor, serves primarily to activate signal transduction by the IL7R complex, while the alpha chain of IL7R determines specific signaling events through its association with cytoplasmic signaling molecules. [provided by RefSeq, Jul 2008]
<b>Expression</b>	Biased expression in spleen adult (RPKM 3.1), thymus adult (RPKM 2.6) and 8 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

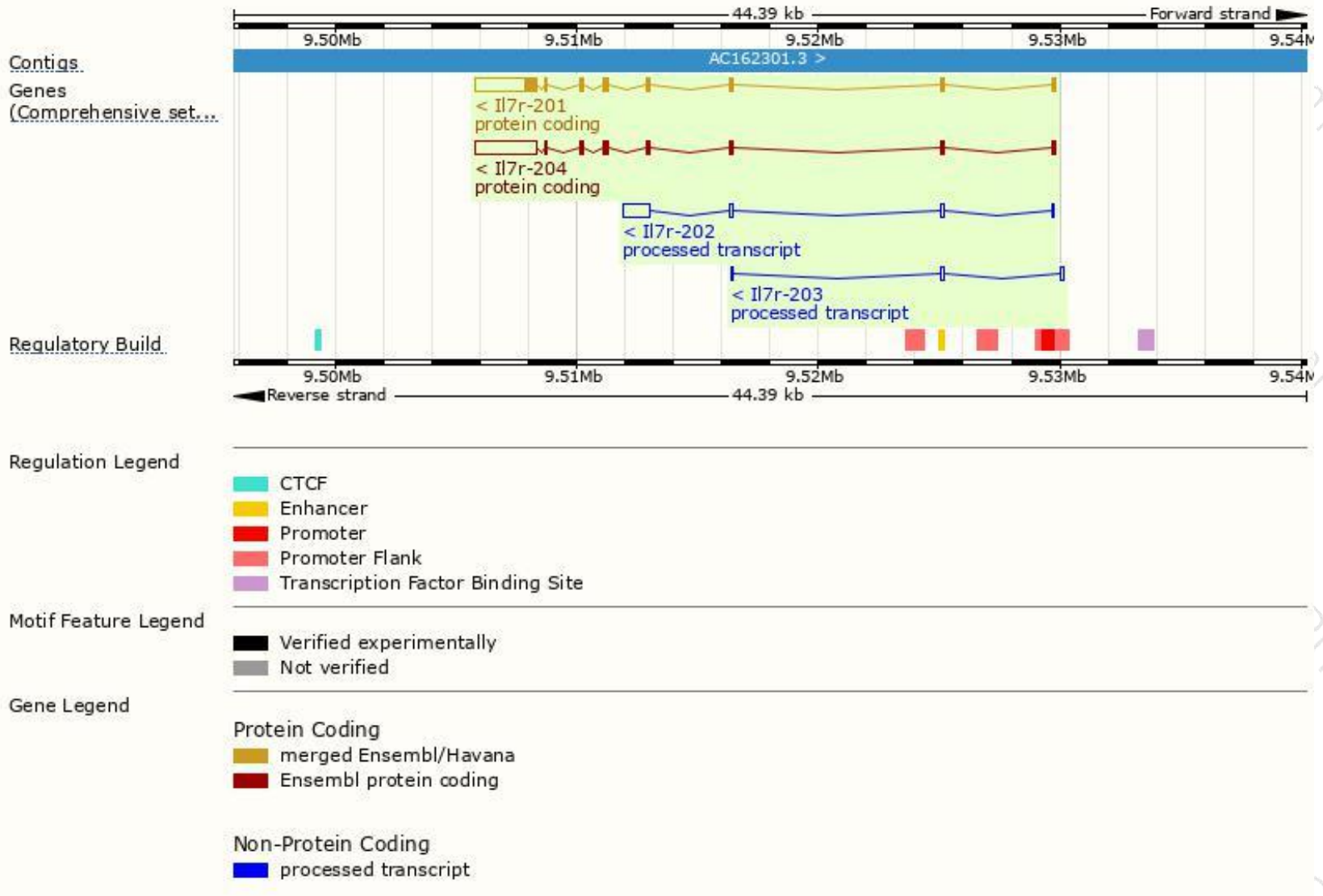
The gene has 4 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
<b>Il7r-201</b>	<a href="#">ENSMUST00000003981.5</a>	3540	<a href="#">459aa</a>	Protein coding	<a href="#">CCDS27376</a>	<a href="#">P16872</a>	TSL:1 GENCODE basic APPRIS P2
<b>Il7r-204</b>	<a href="#">ENSMUST00000228782.1</a>	3516	<a href="#">286aa</a>	Protein coding	-	<a href="#">A0A2I3BRC2</a>	GENCODE basic APPRIS ALT2
<b>Il7r-202</b>	<a href="#">ENSMUST00000227234.1</a>	1548	No protein	Processed transcript	-	-	
<b>Il7r-203</b>	<a href="#">ENSMUST00000228673.1</a>	359	No protein	Processed transcript	-	-	

The strategy is based on the design of *Il7r-201* transcript, The transcription is shown below

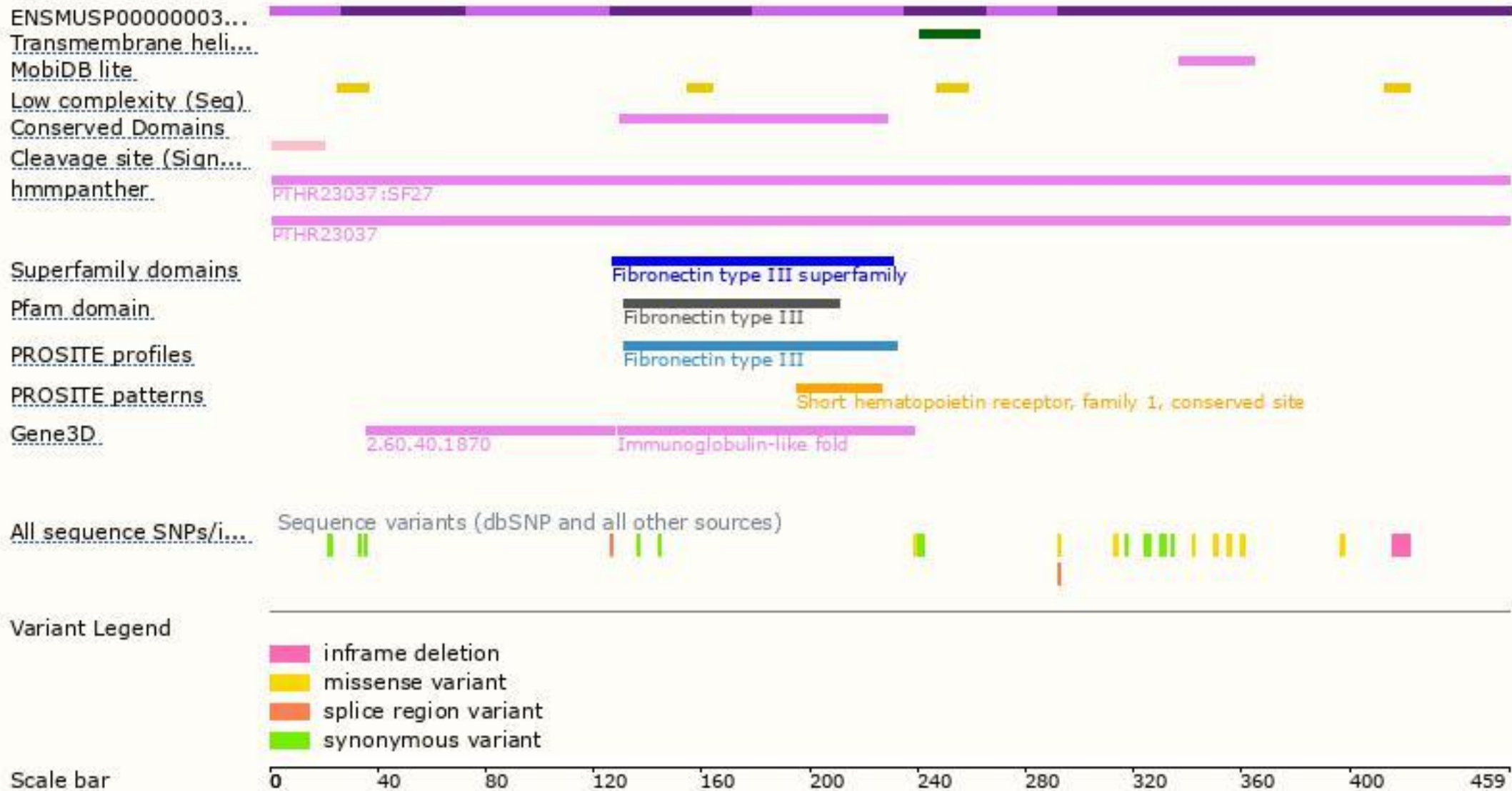


# Genomic location distribution

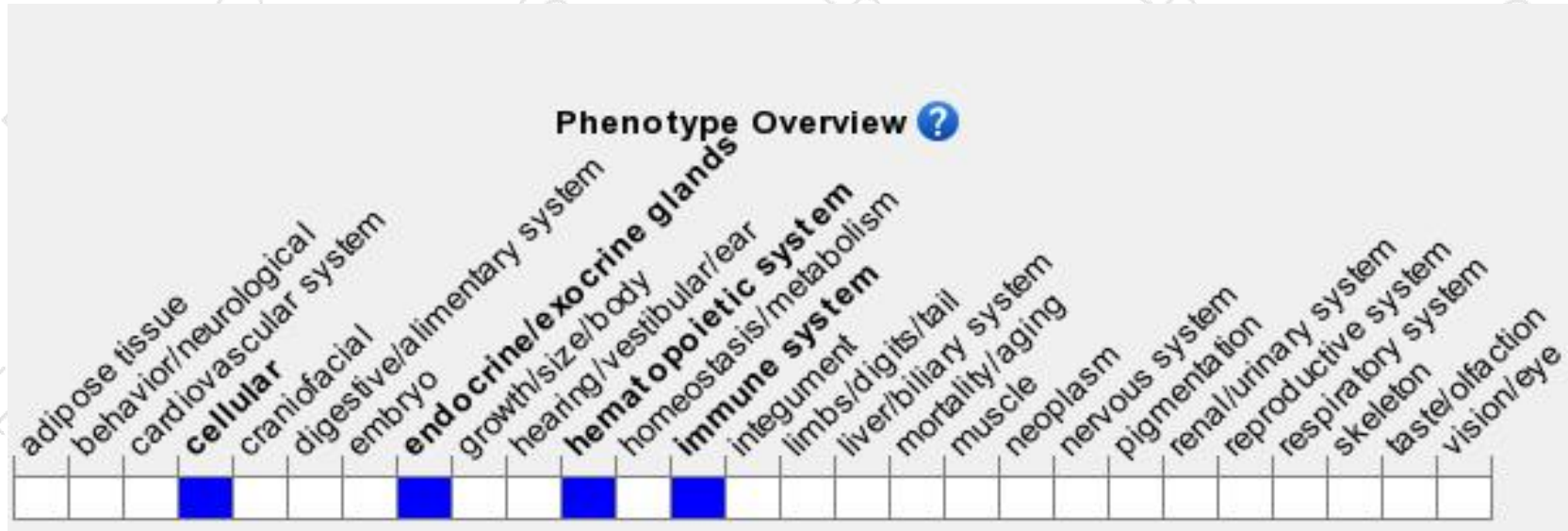




# Protein domain



# 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 mutations cause arrested T and B cell differentiation and severely reduced thymus and spleen cellularity. Mice homozygous for a knock-in allele show partial rescue of T cell numbers during late thymus development, and impaired CD8 T cell memory and CD4 T cell primary responses.

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

Tel: 400-9660890

