

Ptpn22 Cas9-CKO Strategy

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Reviewer:

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Design Date:

2019-10-23

Project Overview

Project Name

Ptpn22

Project type

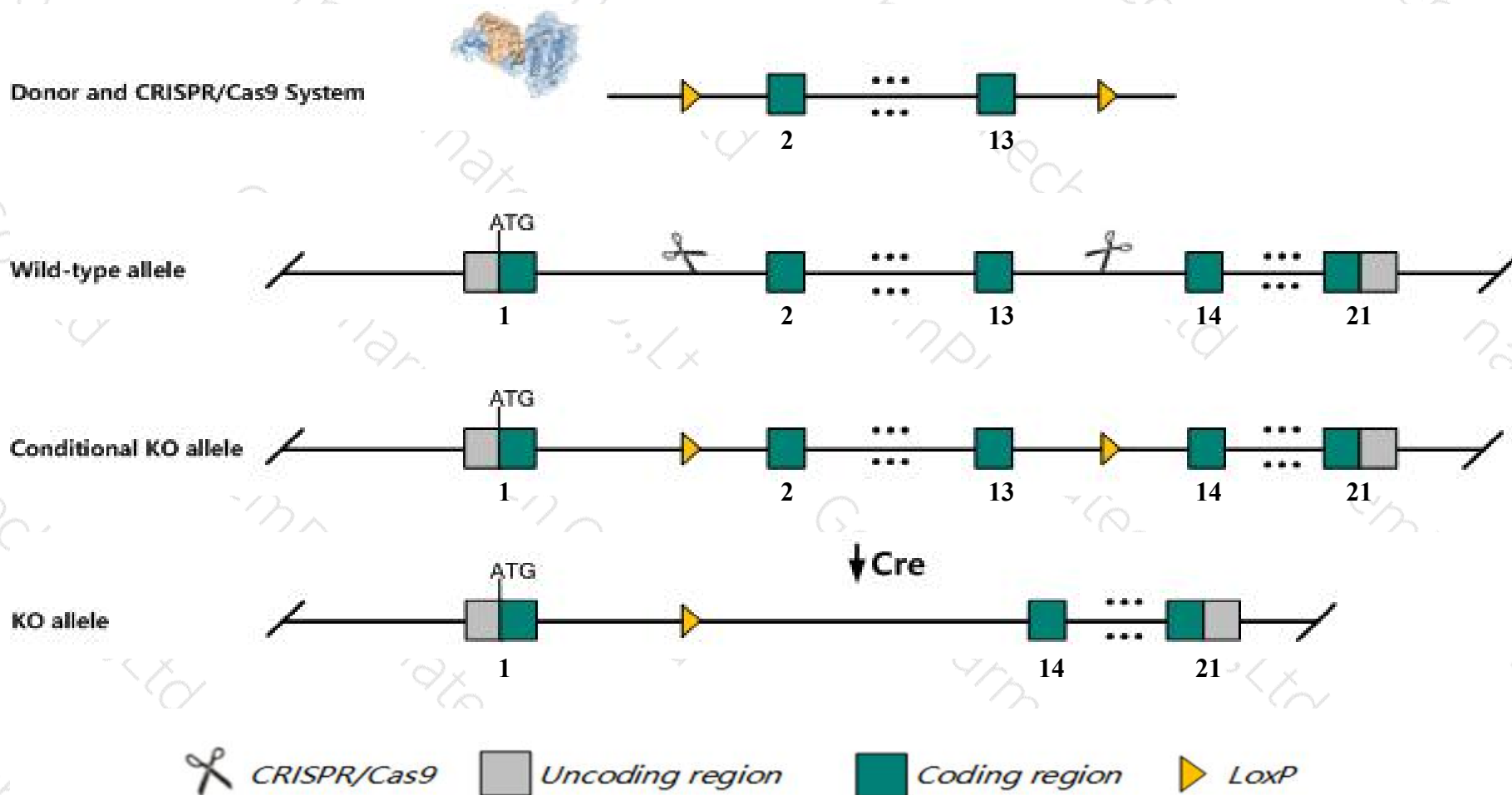
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ptpn22* gene. The schematic diagram is as follows:



- The *Ptpn22* gene has 8 transcripts. According to the structure of *Ptpn22* gene, exon2-exon13 of *Ptpn22-201* (ENSMUST00000029433.8) transcript is recommended as the knockout region. The region contains 1720bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ptpn22* 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 mice display antigen dependent increases in T cell proliferation and cytokine production, enlarged spleens and lymph nodes, increased spontaneous germinal center formation, increased B cell numbers, and increased serum IgG and IgE levels.
- The *Ptpn22* gene is located on the Chr3. 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)

Ptpn22 protein tyrosine phosphatase, non-receptor type 22 (lymphoid) [Mus musculus (house mouse)]

Gene ID: 19260, updated on 31-Jan-2019

Summary



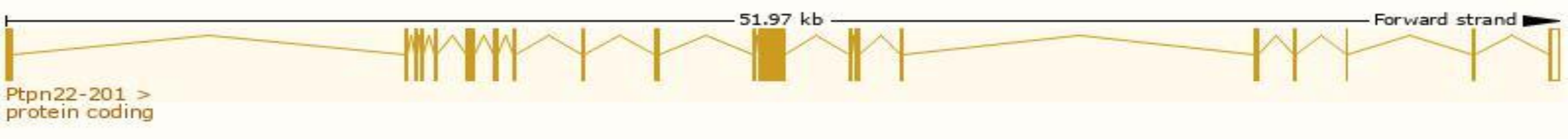
Official Symbol	Ptpn22 provided by MGI
Official Full Name	protein tyrosine phosphatase, non-receptor type 22 (lymphoid) provided by MGI
Primary source	MGI:MGI:107170
See related	Ensembl:ENSMUSG000000027843
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	70zpep, PEP, Ptpn8
Expression	Biased expression in cerebellum adult (RPKM 5.9), thymus adult (RPKM 4.1) and 10 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

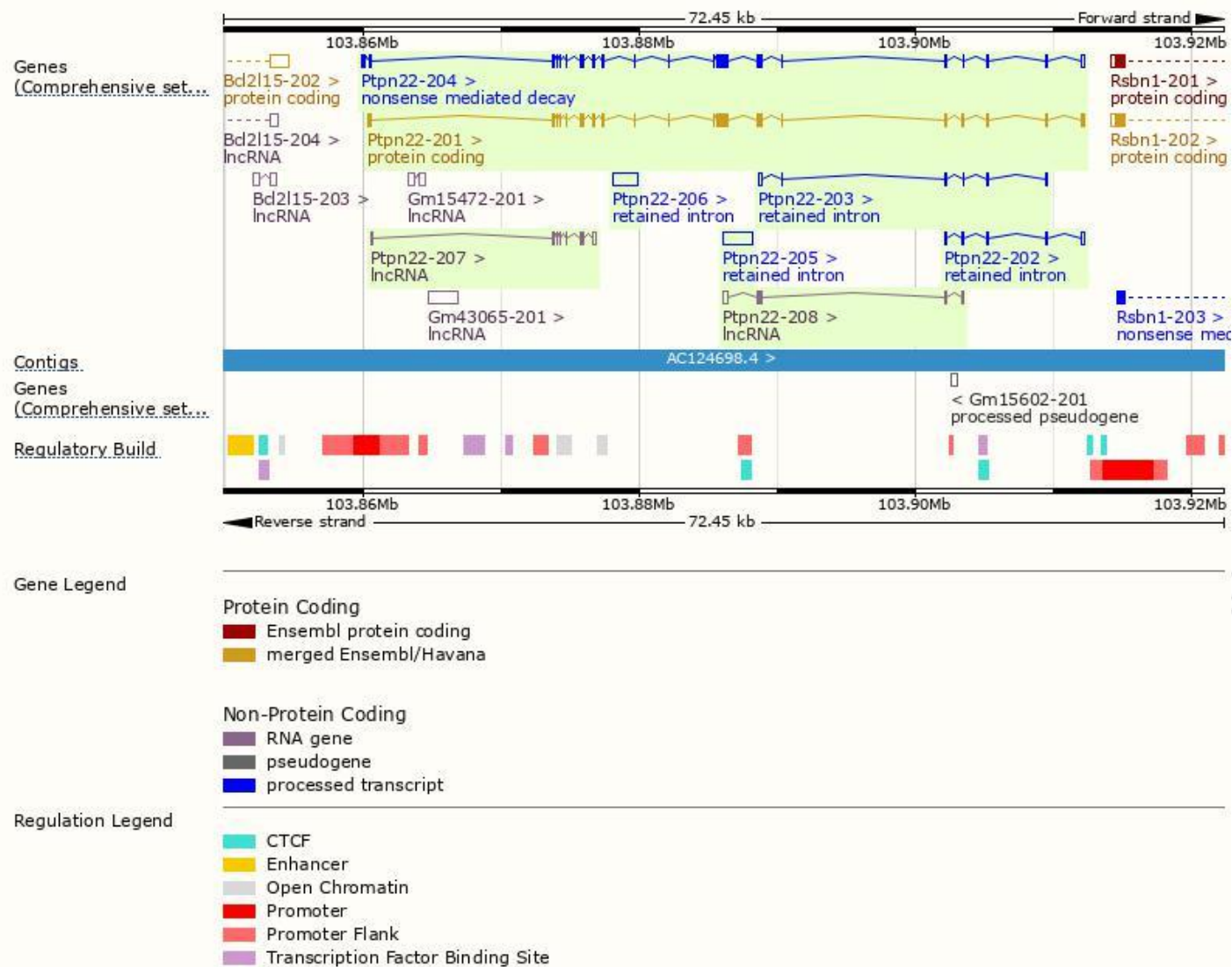
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptpn22-201	ENSMUST00000029433.8	2743	802aa	Protein coding	CCDS38577	P29352	TSL:1 GENCODE basic APPRIS P1
Ptpn22-204	ENSMUST00000146071.7	2757	715aa	Nonsense mediated decay	-	E9QAS3	TSL:1
Ptpn22-205	ENSMUST00000196385.1	2172	No protein	Retained intron	-	-	TSL:NA
Ptpn22-206	ENSMUST00000197997.1	1833	No protein	Retained intron	-	-	TSL:NA
Ptpn22-202	ENSMUST00000126548.1	649	No protein	Retained intron	-	-	TSL:2
Ptpn22-203	ENSMUST00000134373.7	558	No protein	Retained intron	-	-	TSL:5
Ptpn22-207	ENSMUST00000198530.1	737	No protein	lncRNA	-	-	TSL:3
Ptpn22-208	ENSMUST00000198701.4	570	No protein	lncRNA	-	-	TSL:5

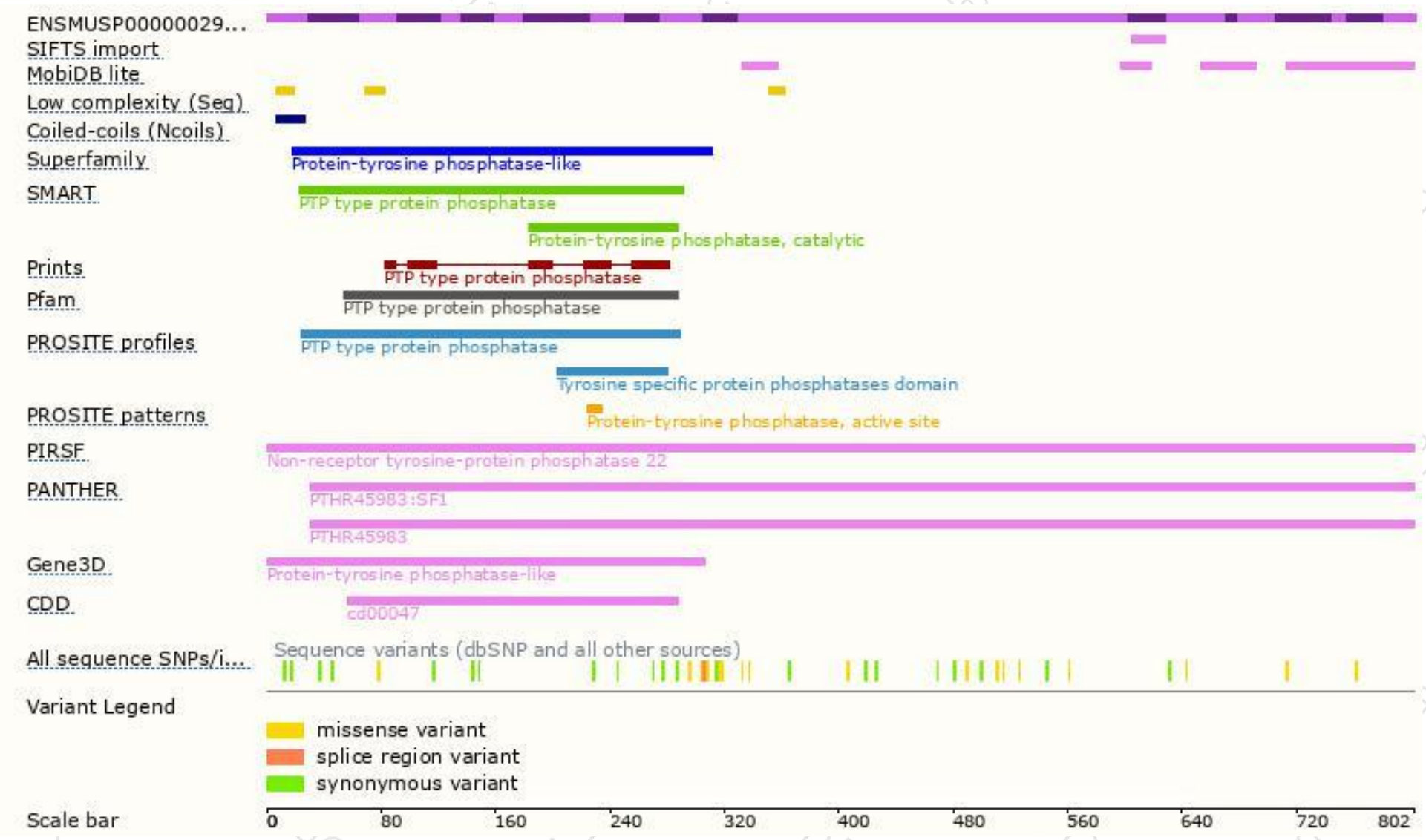
The strategy is based on the design of *Ptpn22-201* transcript,The transcription is shown below



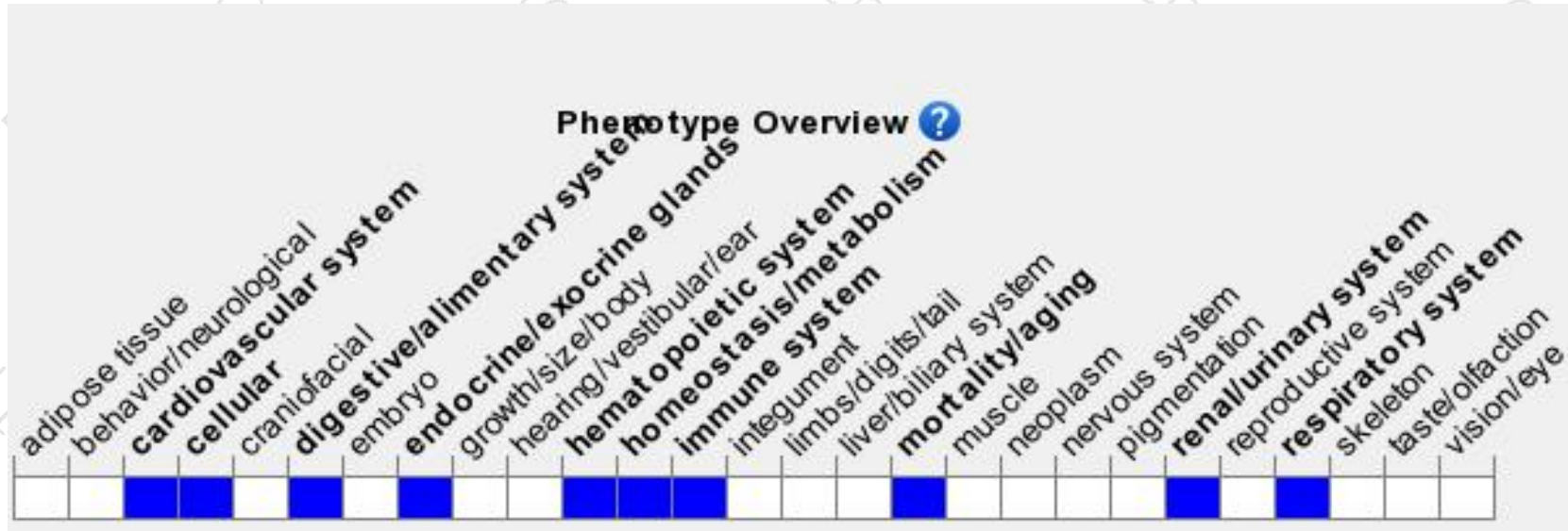
Genomic location distribution



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 mice display antigen dependent increases in T cell proliferation and cytokine production, enlarged spleens and lymph nodes, increased spontaneous germinal center formation, increased B cell numbers, and increased serum IgG and IgE levels.

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

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