

# *Ptprc* Cas9-KO Strategy

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# Project Overview

**Project Name**

*Ptprc*

**Project type**

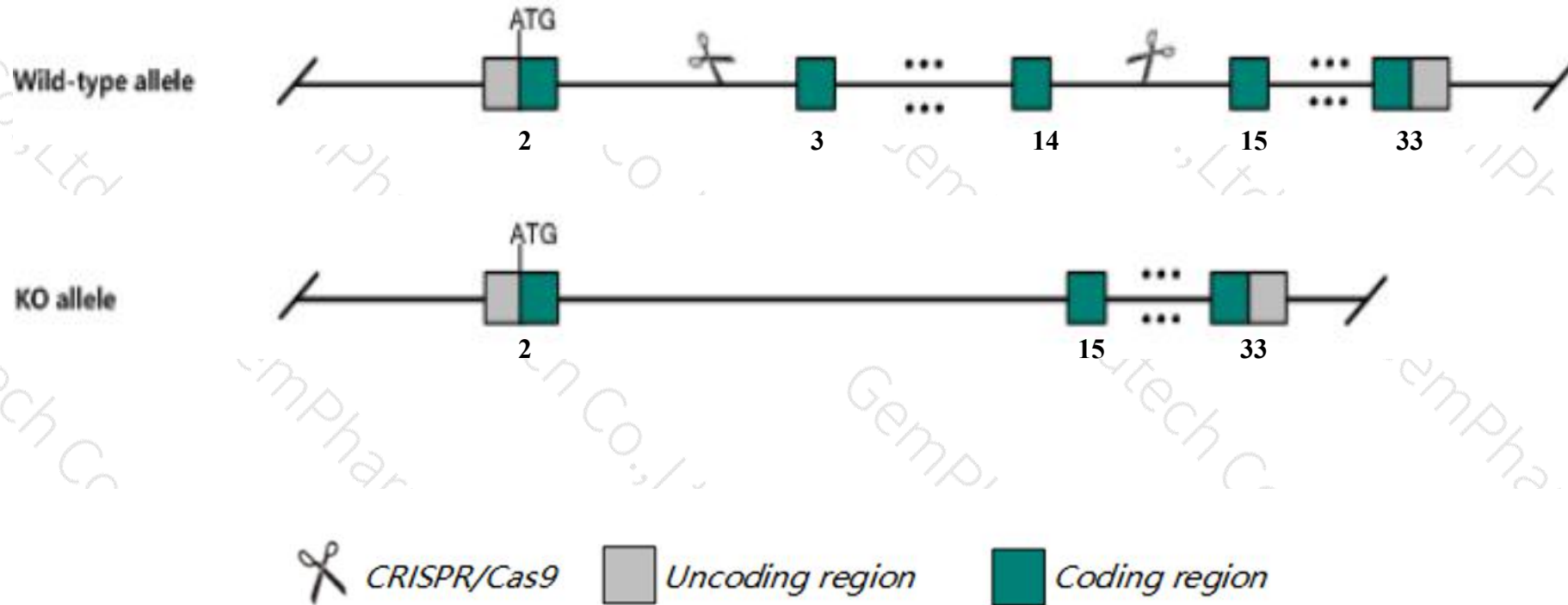
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- The *Ptprc* gene has 13 transcripts. According to the structure of *Ptprc* gene, exon3-exon14 of *Ptprc*-207(ENSMUST00000183301.7) transcript is recommended as the knockout region. The region contains 1553bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ptprc* gene. The brief process is as follows: CRISPR/Cas9 system 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 have defective T cell, B cell, and NK cell morphology and physiology. Mice carrying an engineered point mutation exhibit lymphoproliferation and autoimmunity that leads to premature death.
- The *Ptprc* gene is located on the Chr1. 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)



Ptprc protein tyrosine phosphatase, receptor type, C [Mus musculus (house mouse)]

Gene ID: 19264, updated on 15-Mar-2020

## Summary



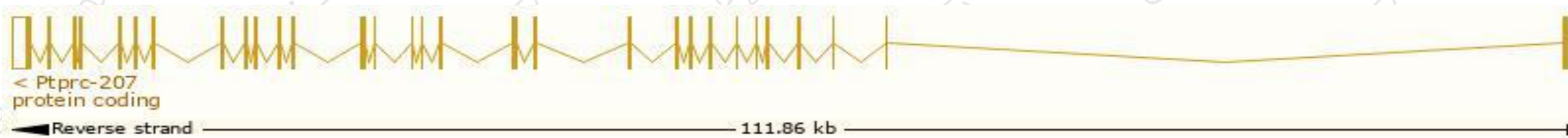
Official Symbol Ptprc provided by [MGI](#)  
Official Full Name protein tyrosine phosphatase, receptor type, C provided by [MGI](#)  
Primary source [MGI:MGI:97810](#)  
See related [Ensembl:ENSMUSG00000026395](#)  
Gene type protein coding  
RefSeq status VALIDATED  
Organism [Mus musculus](#)  
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus  
Also known as B220, CD45R, Cd45, L-CA, Ly-5, Lyl-4, T200, loc  
Expression Biased expression in spleen adult (RPKM 50.1), thymus adult (RPKM 49.7) and 5 other tissues [See more](#)  
Orthologs [human all](#)

# Transcript information (Ensembl)

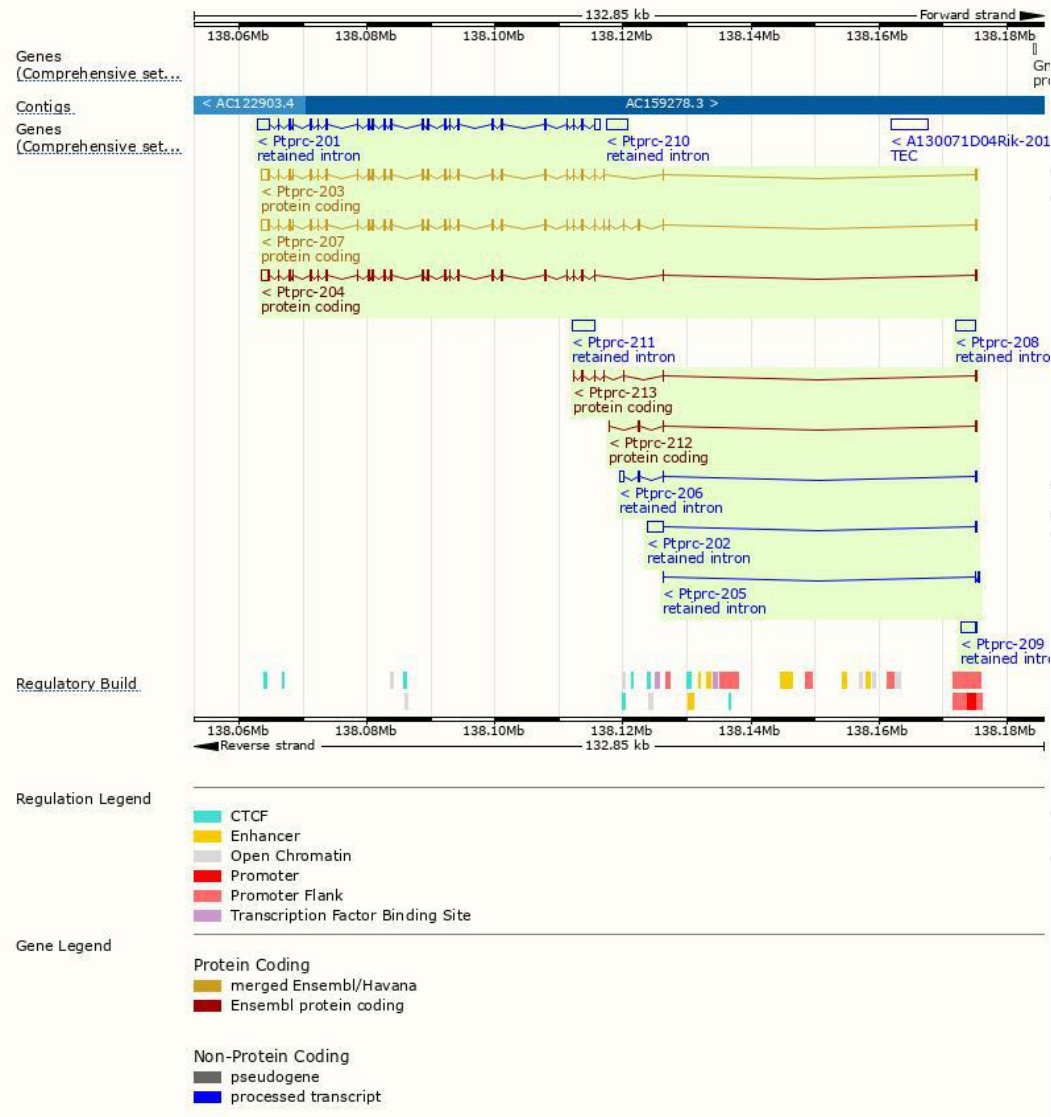
The gene has 13 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptprc-207	<a href="#">ENSMUST00000183301.7</a>	5074	<a href="#">1293aa</a>	Protein coding	<a href="#">CCDS48383</a>	<a href="#">P06800</a>	TSL:5 GENCODE basic APPRIS ALT2
Ptprc-203	<a href="#">ENSMUST00000182283.7</a>	4702	<a href="#">1154aa</a>	Protein coding	<a href="#">CCDS15330</a>	<a href="#">P06800</a>	TSL:1 GENCODE basic APPRIS P3
Ptprc-204	<a href="#">ENSMUST00000182755.7</a>	4611	<a href="#">1130aa</a>	Protein coding	<a href="#">CCDS59542</a>	<a href="#">S4R1M0</a>	TSL:1 GENCODE basic APPRIS ALT2
Ptprc-213	<a href="#">ENSMUST00000195533.5</a>	702	<a href="#">212aa</a>	Protein coding	-	<a href="#">A0A0A6YXM4</a>	CDS 3' incomplete TSL:5
Ptprc-212	<a href="#">ENSMUST00000193650.1</a>	415	<a href="#">94aa</a>	Protein coding	-	<a href="#">A0A0A6YWF2</a>	CDS 3' incomplete TSL:5
Ptprc-201	<a href="#">ENSMUST00000112036.4</a>	5740	No protein	Retained intron	-	-	TSL:1
Ptprc-211	<a href="#">ENSMUST00000188596.2</a>	3445	No protein	Retained intron	-	-	TSL:NA
Ptprc-210	<a href="#">ENSMUST00000187586.1</a>	3384	No protein	Retained intron	-	-	TSL:NA
Ptprc-208	<a href="#">ENSMUST00000185570.1</a>	3213	No protein	Retained intron	-	-	TSL:NA
Ptprc-202	<a href="#">ENSMUST00000182138.7</a>	2655	No protein	Retained intron	-	-	TSL:1
Ptprc-209	<a href="#">ENSMUST00000186628.1</a>	2425	No protein	Retained intron	-	-	TSL:1
Ptprc-206	<a href="#">ENSMUST00000183262.7</a>	1051	No protein	Retained intron	-	-	TSL:1
Ptprc-205	<a href="#">ENSMUST00000183229.2</a>	364	No protein	Retained intron	-	-	TSL:3

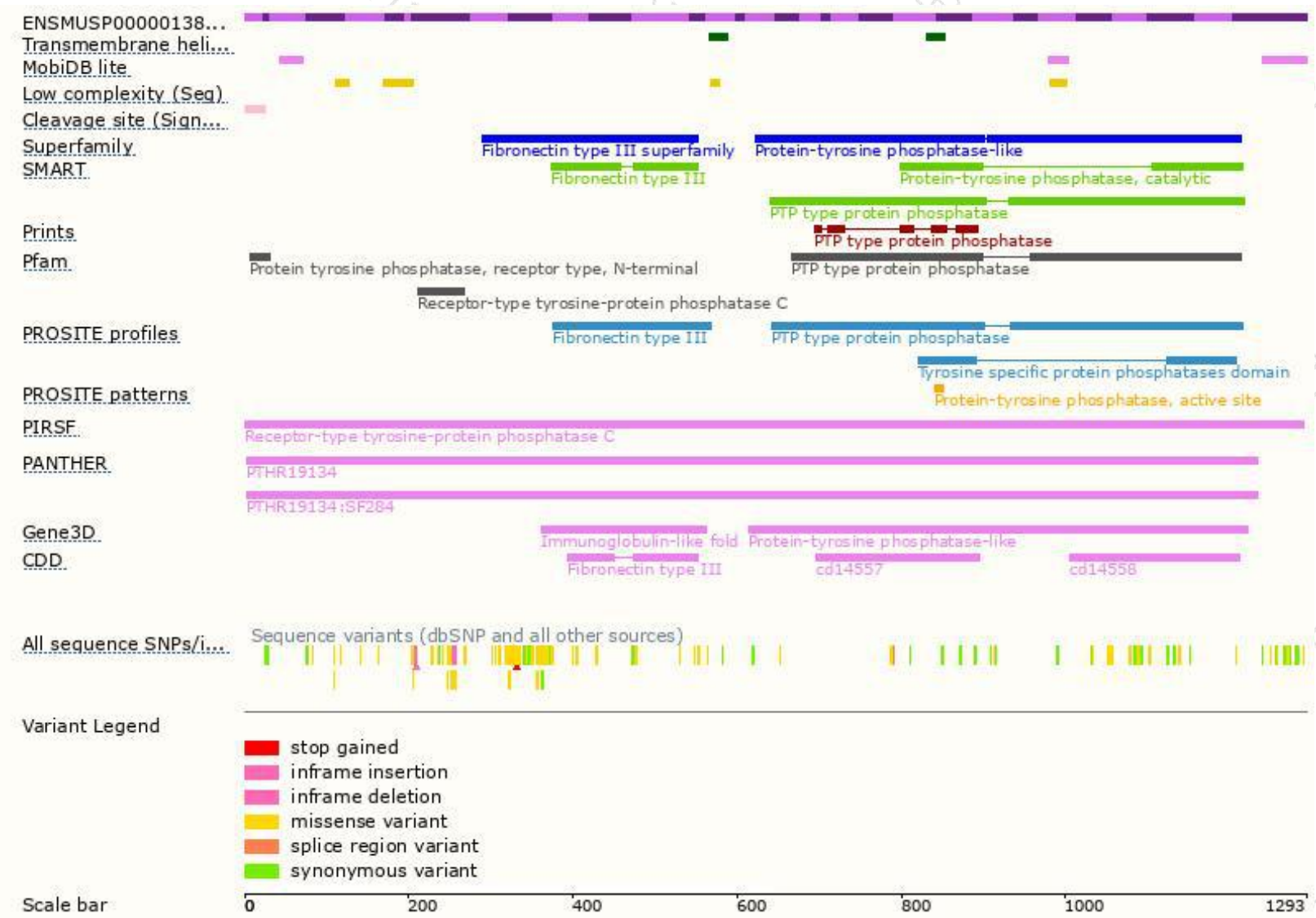
The strategy is based on the design of *Ptprc-207* transcript, the transcription is shown below:



# Genomic location distribution

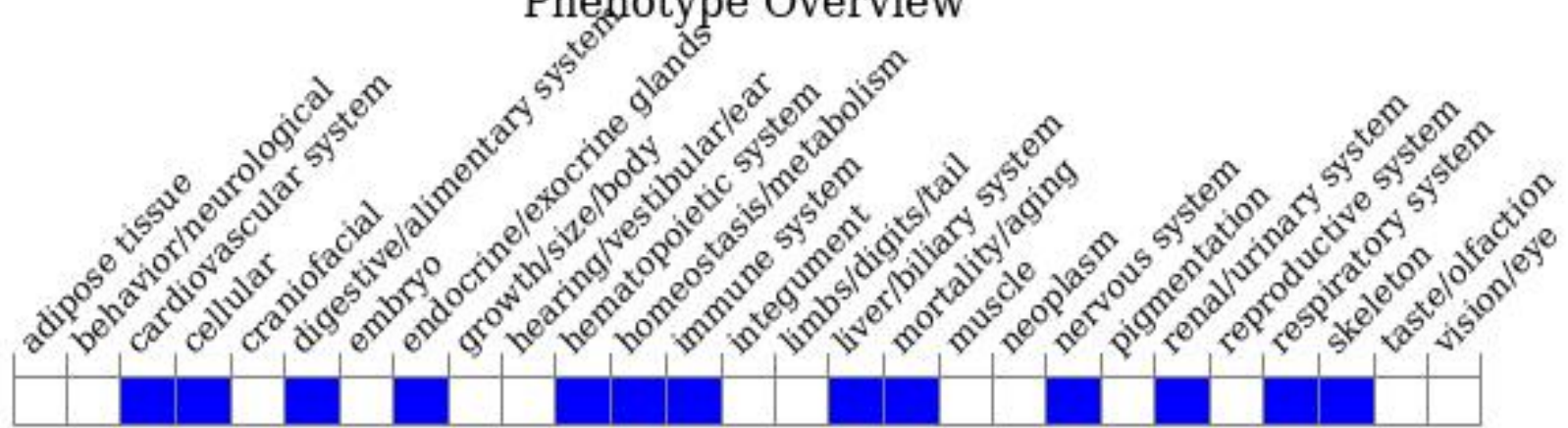


# Protein domain



# Mouse phenotype description(MGI)

## Phenotype Overview



*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 have defective T cell, B cell, and NK cell morphology and physiology. Mice carrying an engineered point mutation exhibit lymphoproliferation and autoimmunity that leads to premature death.

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

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