

Ptprv Cas9-CKO Strategy

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Project Overview

Project Name

Ptprv

Project type

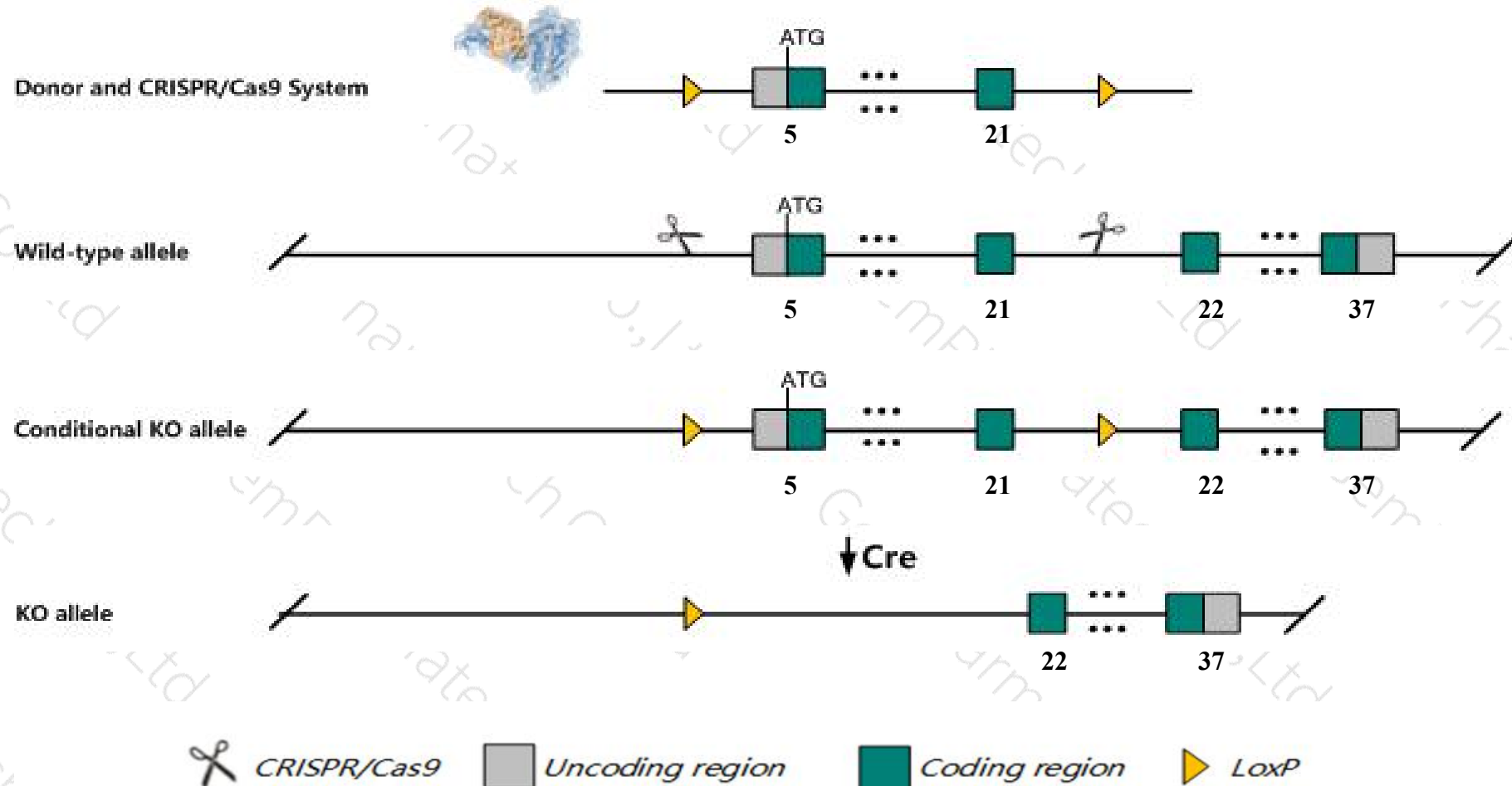
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



Technical routes

- The *Ptprv* gene has 11 transcripts. According to the structure of *Ptprv* gene, exon5-exon21 of *Ptprv*-210 (ENSMUST00000183317.7) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ptprv* 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, mice homozygous for a knock-out allele exhibit increased resistance to diet-induced obesity, decreased circulating glucose levels, and decreased susceptibility to death induced by streptozotocin treatment.
- Transcript *Ptprv* -201 may not be affected.
- The *Ptprv* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Ptprv protein tyrosine phosphatase, receptor type, V [Mus musculus (house mouse)]

Gene ID: 13924, updated on 13-Mar-2020

Summary



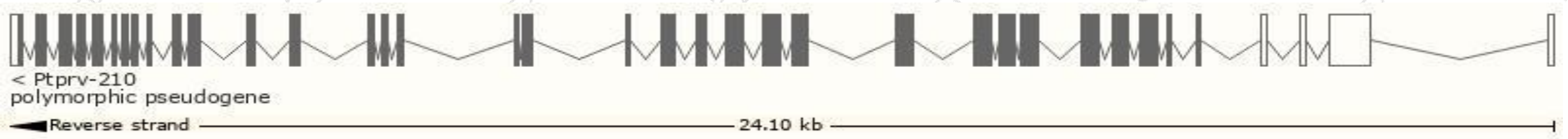
Official Symbol	Ptprv provided by MGI
Official Full Name	protein tyrosine phosphatase, receptor type, V provided by MGI
Primary source	MGI:MGI:108027
See related	Ensembl:ENSMUSG000000097993
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Esp, OST, OST-PTP
Expression	Biased expression in ovary adult (RPKM 6.0), limb E14.5 (RPKM 4.0) and 11 other tissues See more

Transcript information (Ensembl)

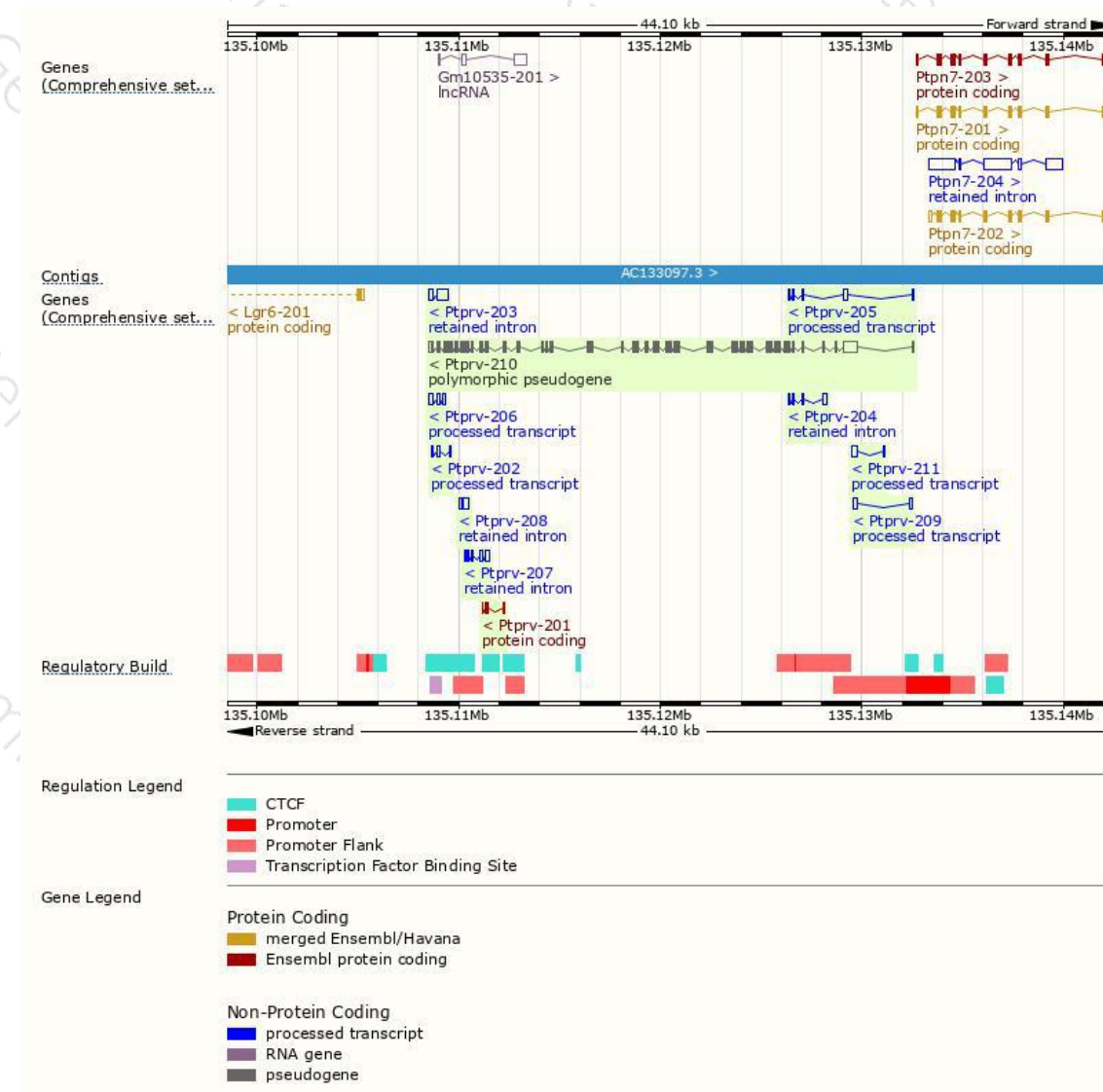
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ptprv-201	ENSMUST00000086432.6	291	97aa	Protein coding	-		TSL:5 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Ptprv-210	ENSMUST00000183317.7	6108	1705aa	Polymorphic pseudogene	-		TSL:1 GENCODE basic
Ptprv-206	ENSMUST00000182570.1	446	No protein	Processed transcript	-		TSL:3
Ptprv-205	ENSMUST00000182541.7	404	No protein	Processed transcript	-		TSL:5
Ptprv-211	ENSMUST00000183328.1	374	No protein	Processed transcript	-		TSL:2
Ptprv-209	ENSMUST00000183212.1	362	No protein	Processed transcript	-		TSL:2
Ptprv-202	ENSMUST00000182012.1	241	No protein	Processed transcript	-		TSL:5
Ptprv-203	ENSMUST00000182120.1	717	No protein	Retained intron	-		TSL:2
Ptprv-207	ENSMUST00000182718.1	593	No protein	Retained intron	-		TSL:3
Ptprv-204	ENSMUST00000182387.1	375	No protein	Retained intron	-		TSL:3
Ptprv-208	ENSMUST00000183089.1	359	No protein	Retained intron	-		TSL:3

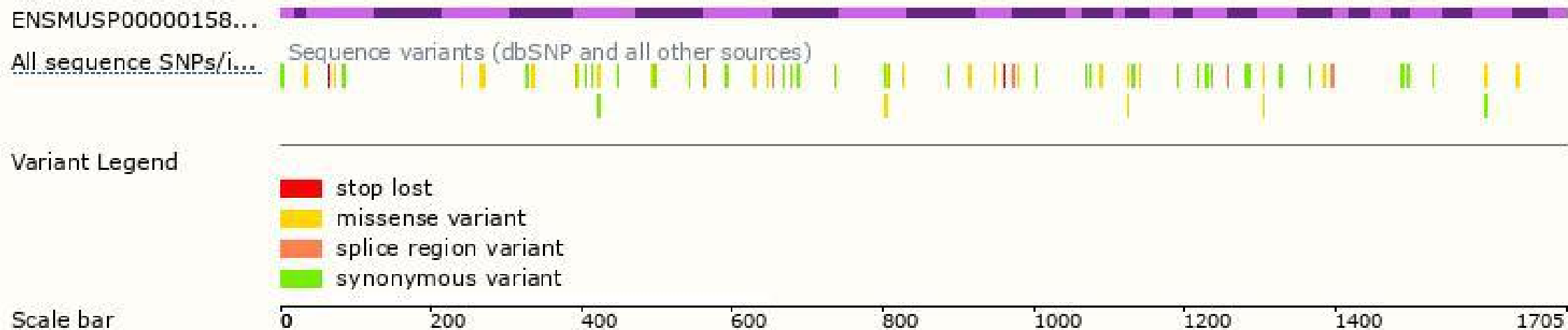
The strategy is based on the design of *Ptprv-210* transcript,the transcription is shown below



Genomic location distribution

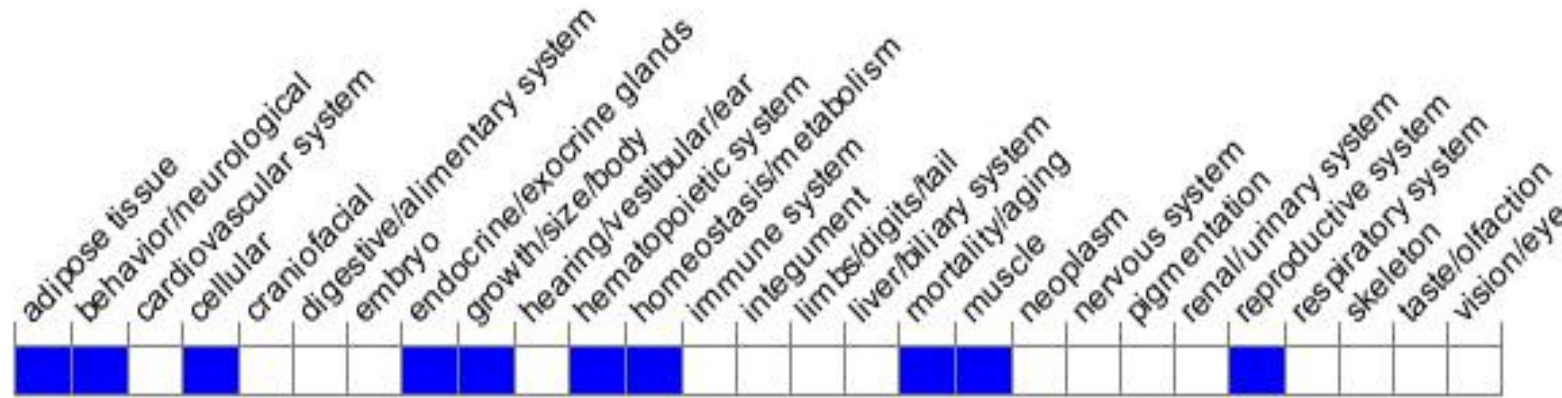


Protein domain



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, mice homozygous for a knock-out allele exhibit increased resistance to diet-induced obesity, decreased circulating glucose levels, and decreased susceptibility to death induced by streptozotocin treatment.

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

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