Ptpn12 Cas9-CKO Strategy

Designer: Ruirui Zhang
Reviewer: Huimin Su

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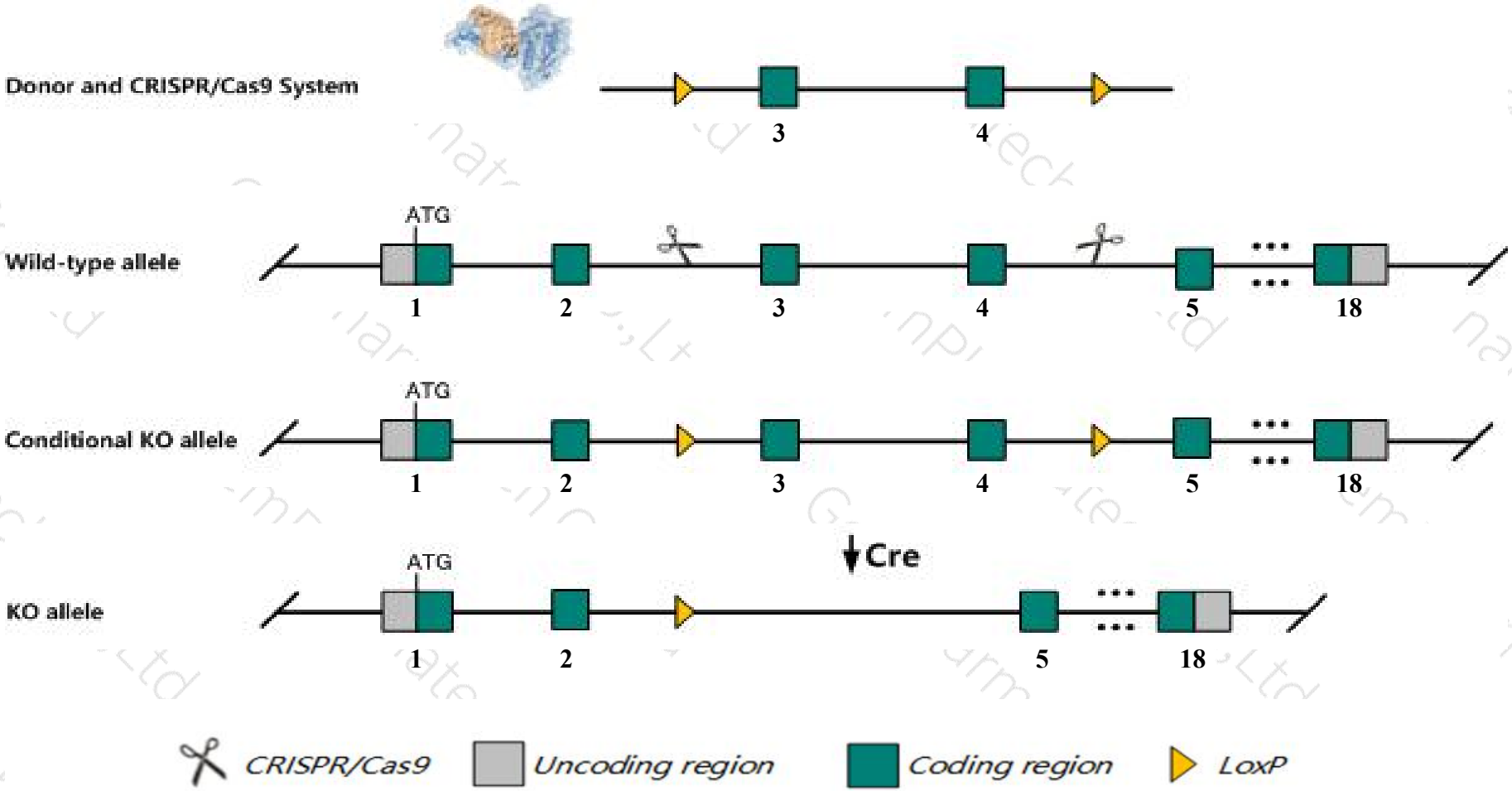
Project Overview

Project Name	***Ptpn12***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ptpn12* gene. The schematic diagram is as follows:



Technical routes

- The *Ptpn12* gene has 7 transcripts. According to the structure of *Ptpn12* gene, exon3-exon4 of *Ptpn12-201* (ENSMUST00000030556.7) transcript is recommended as the knockout region.The region contains 173bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Ptpn12* 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.

Notice

➢ According to the existing MGI data,Homozygous mutation of this gene results in early embryonic lethality, defective embryo turning, improper somitogenesis and vasculogenesis, impaired liver development, truncation of the caudal region and mesenchyme deficiency.

➢ The *Ptpn12* gene is located on the Chr5. 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）

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Ptpn12 protein tyrosine phosphatase, non-receptor type 12 [*Mus musculus* (house mouse)]

Gene ID: 19248, updated on 12-Aug-2019

Summary

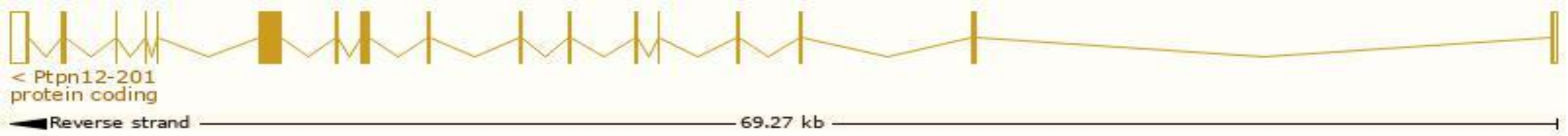
Official Symbol	Ptpn12 provided by MGI
Official Full Name	protein tyrosine phosphatase, non-receptor type 12 provided by MGI
Primary source	MGI:MGI:104673
See related	Ensembl:ENSMUSG00000028771
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	PTPG1; P19-PTP; PTP-P19; PTP-PEST
Expression	Ubiquitous expression in CNS E14 (RPKM 8.7), CNS E18 (RPKM 8.5) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

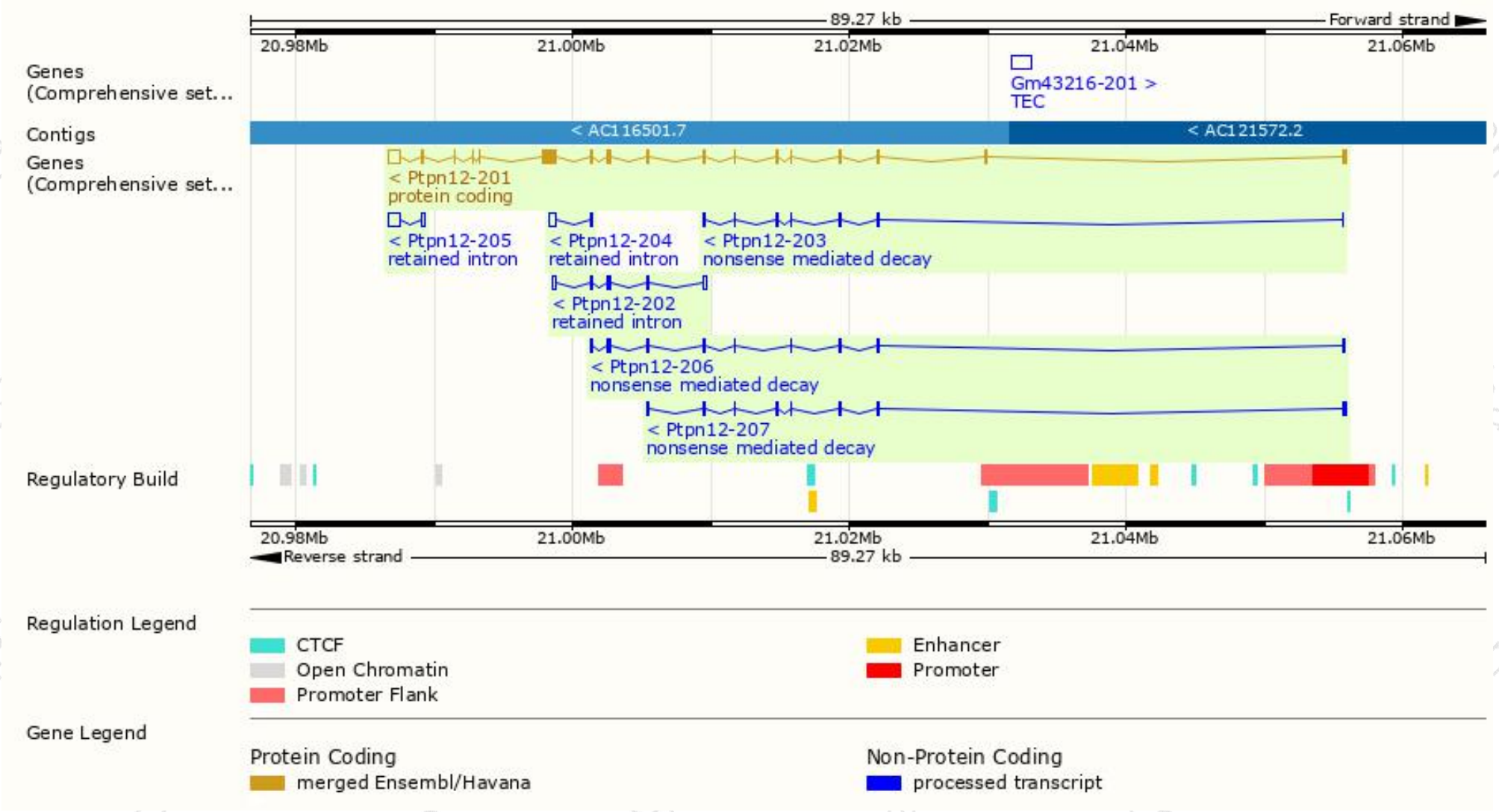
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Ptpn12-201	ENSMUST00000030556.7	3280	775aa	ENSMUSP00000030556.7	Protein coding	CCDS19102	P35831	TSL:1 GENCODE basic APPRIS P1
Ptpn12-206	ENSMUST00000151813.7	831	40aa	ENSMUSP00000116989.1	Nonsense mediated decay	-	D6RGT2	TSL:5
Ptpn12-207	ENSMUST00000199774.4	790	40aa	ENSMUSP00000142550.1	Nonsense mediated decay	-	D6RGT2	TSL:3
Ptpn12-203	ENSMUST00000140057.1	541	33aa	ENSMUSP00000117697.1	Nonsense mediated decay	-	F6Z0X5	CDS 5' incomplete TSL:5
Ptpn12-205	ENSMUST00000151366.1	1104	No protein	-	Retained intron	-	-	TSL:1
Ptpn12-202	ENSMUST00000126853.7	796	No protein	-	Retained intron	-	-	TSL:2
Ptpn12-204	ENSMUST00000148711.1	618	No protein	-	Retained intron	-	-	TSL:2

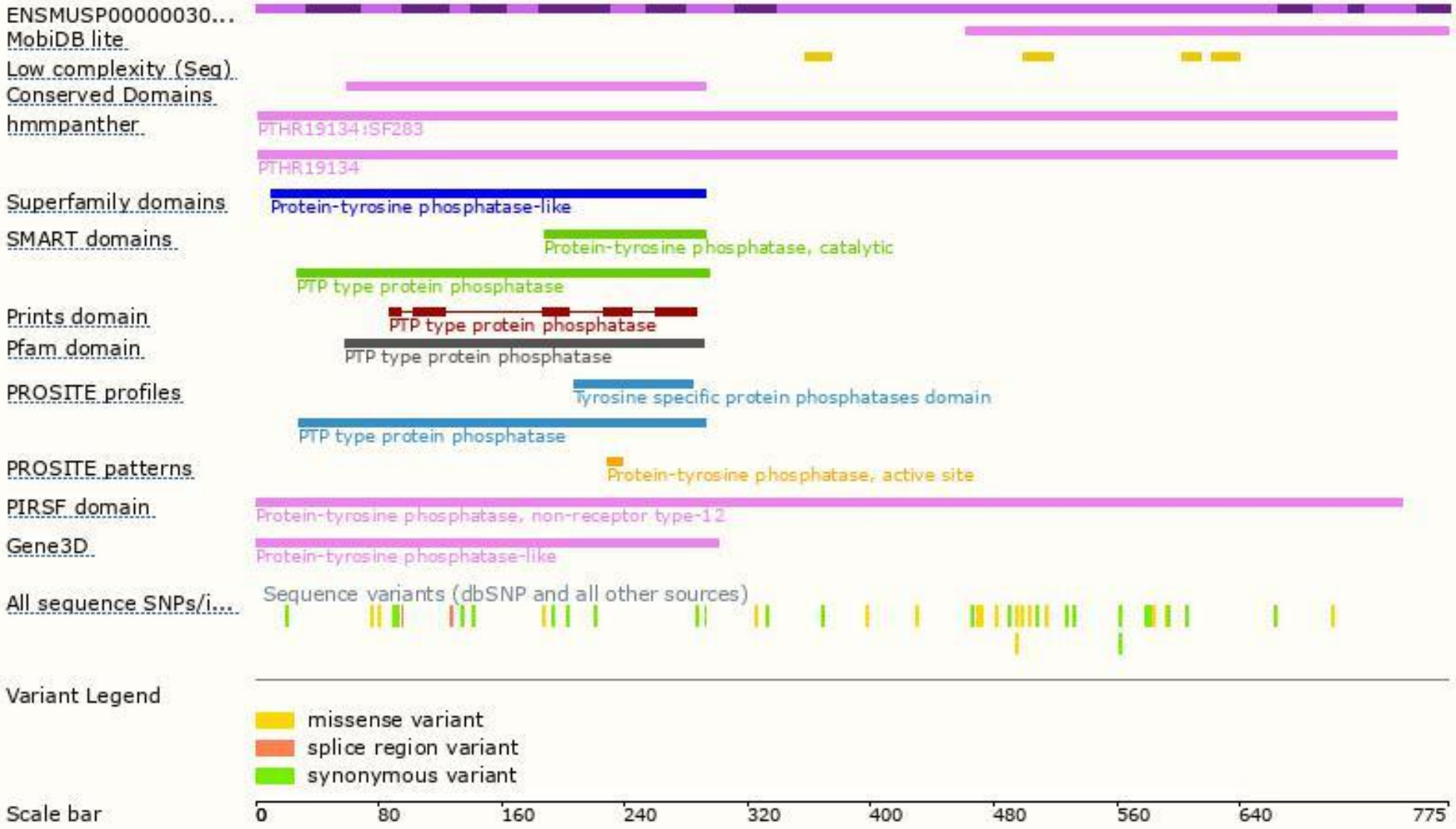
The strategy is based on the design of *Ptpn12-201* transcript,The transcription is shown below



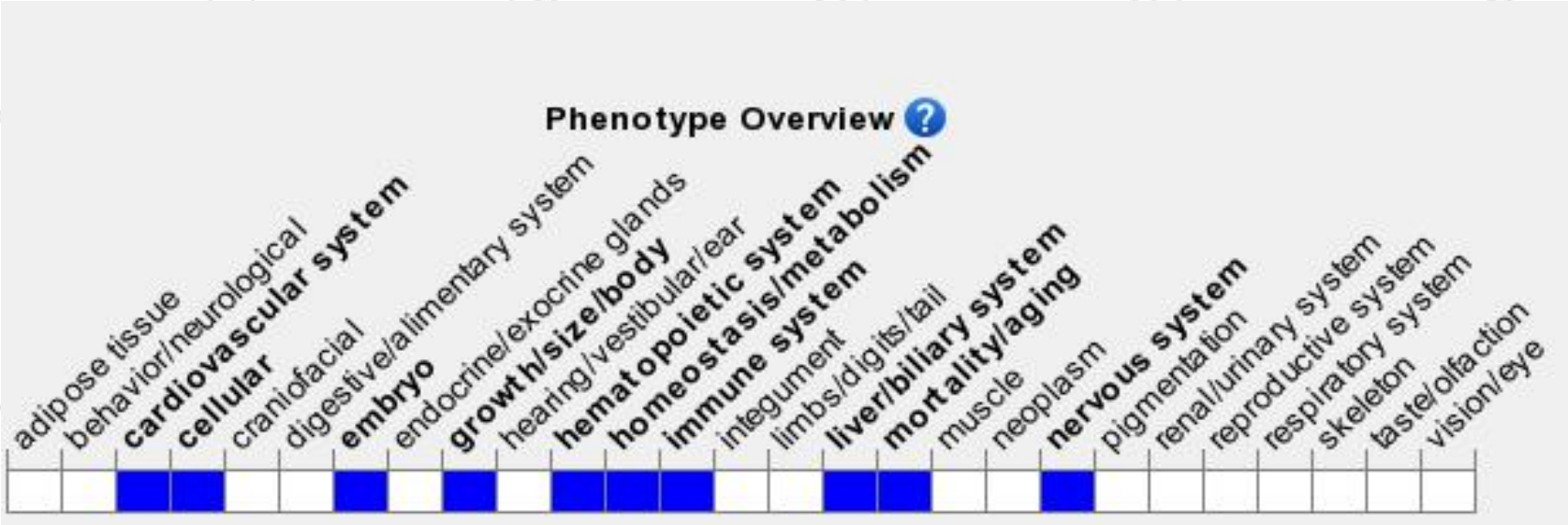
Genomic location distribution



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/).

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集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd