Pms1 Cas9-CKO Strategy

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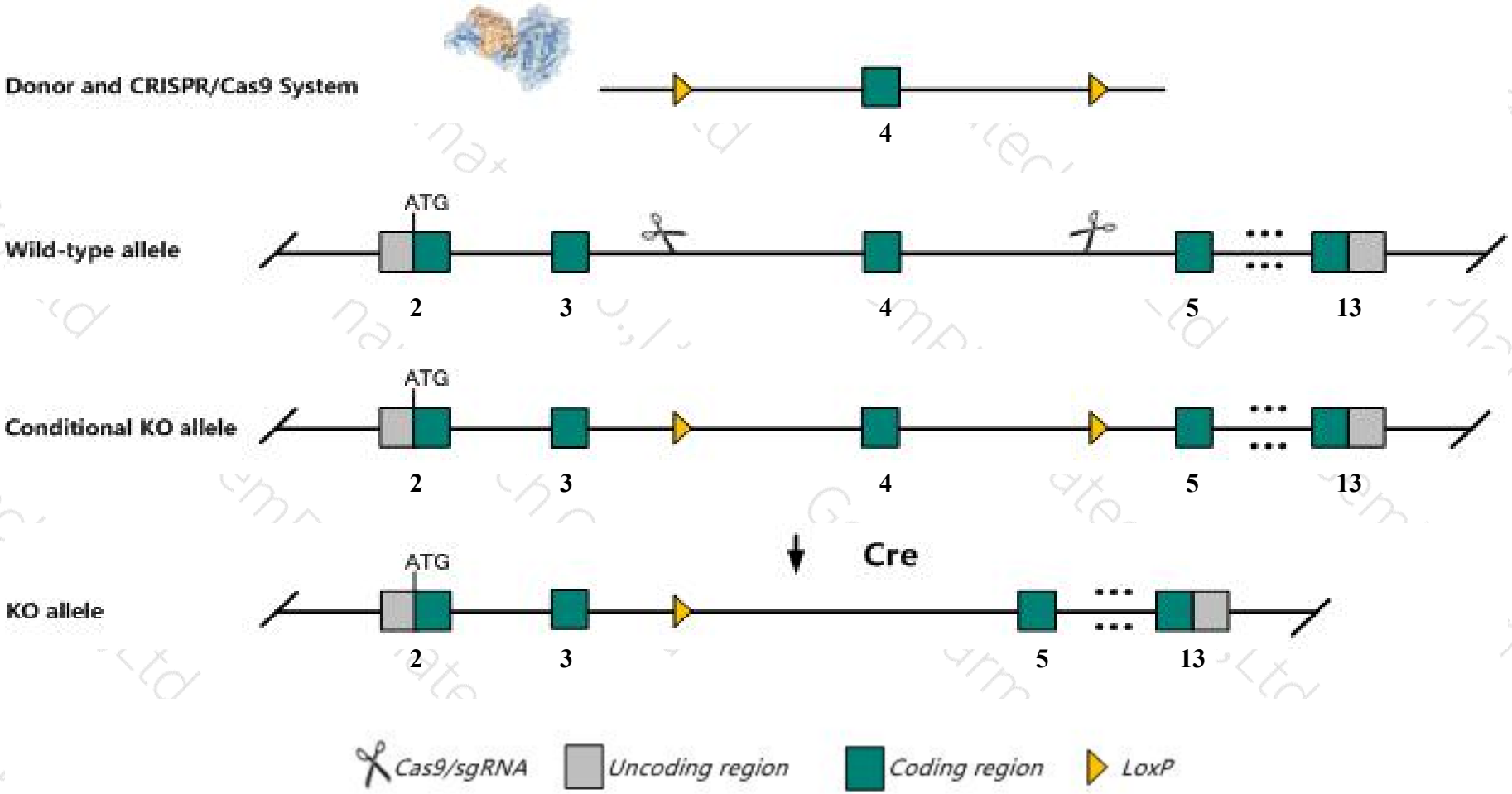
Project Overview

Project Name	***Pms1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pms1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Pms1* gene has 8 transcripts. According to the structure of *Pms1* gene, exon4 of *Pms1-201*(ENSMUST00000027267.13) transcript is recommended as the knockout region.The region contains 103bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Pms1* gene. The brief process is as follows:sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was 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,homozygotes for a targeted null mutation exhibit a modest increase in DNA mismatch repair errors, primarily single base pair substitutions.

➢ The *Pms1* 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）

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Pms1 PMS1 homolog 1, mismatch repair system component [Mus musculus (house mouse)]

Gene ID: 227099, updated on 13-Mar-2020

Summary

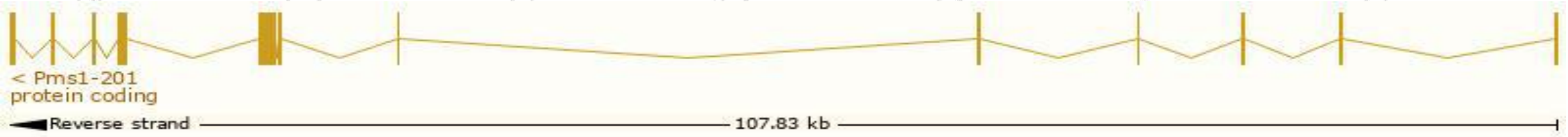
Official Symbol	Pms1 provided by MGI
Official Full Name	PMS1 homolog 1, mismatch repair system component provided byMGI
Primary source	MGI:MGI:1202302
See related	Ensembl:ENSMUSG00000026098
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Broad expression in CNS E11.5 (RPKM 3.0), liver E14 (RPKM 1.8) and 23 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

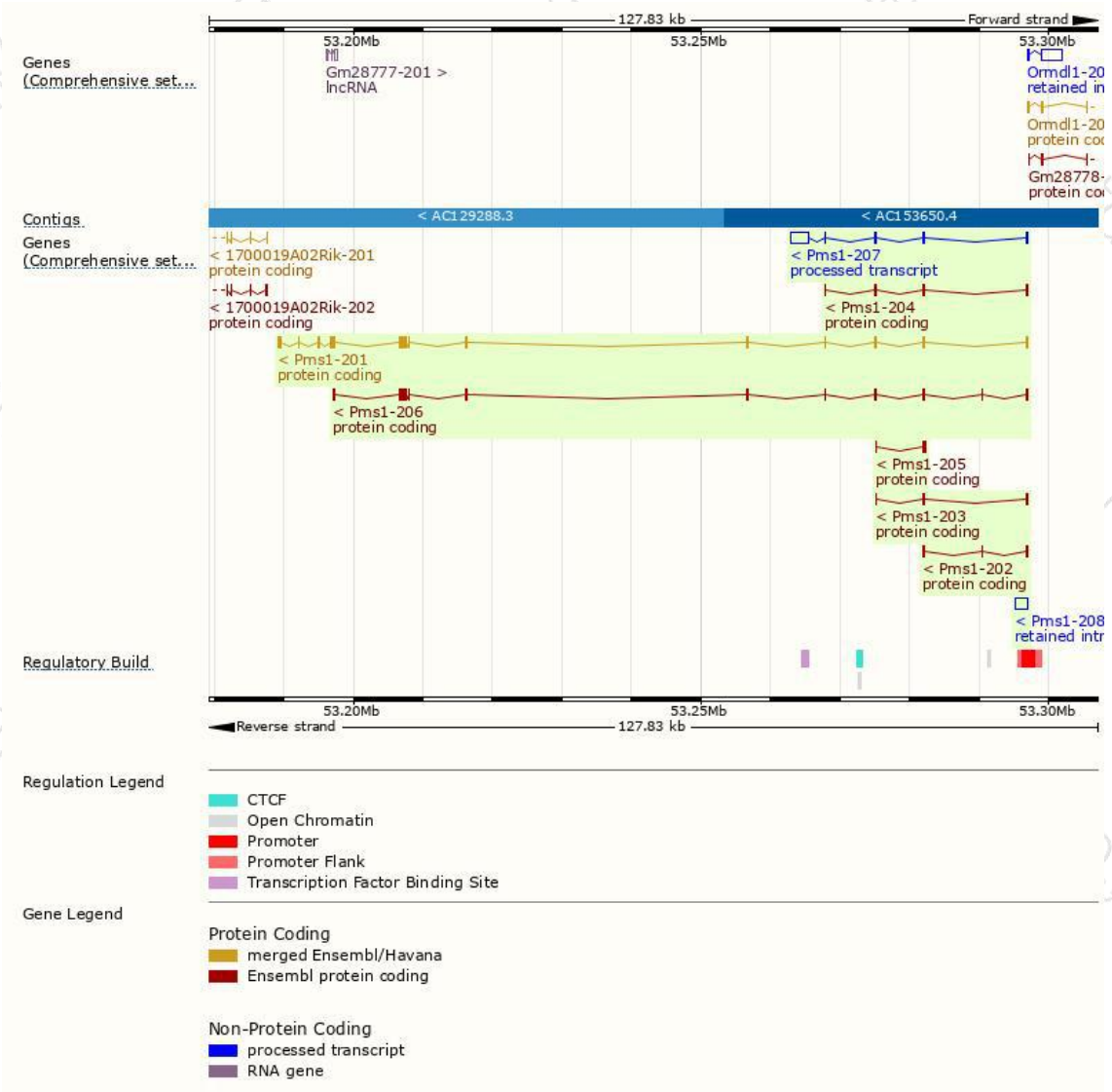
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pms1-201	ENSMUST00000027267.13	3054	917aa	Protein coding	CCDS14951	Q8K119	TSL:1 GENCODE basic APPRIS P1
Pms1-206	ENSMUST00000135246.7	2205	669aa	Protein coding	-	E9Q8A5	CDS 3' incomplete TSL:1
Pms1-204	ENSMUST00000128337.7	647	127aa	Protein coding	-	D3Z0R7	CDS 3' incomplete TSL:3
Pms1-205	ENSMUST00000133358.1	600	88aa	Protein coding	-	D3Z611	CDS 3' incomplete TSL:3
Pms1-202	ENSMUST00000126412.1	475	42aa	Protein coding	-	D3Z012	CDS 3' incomplete TSL:2
Pms1-203	ENSMUST00000126590.1	459	80aa	Protein coding	-	D3YX04	CDS 3' incomplete TSL:5
Pms1-207	ENSMUST00000142922.1	3054	No protein	Processed transcript	-	-	TSL:1
Pms1-208	ENSMUST00000188890.1	1723	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Pms1-201* transcript,the transcription is shown below:

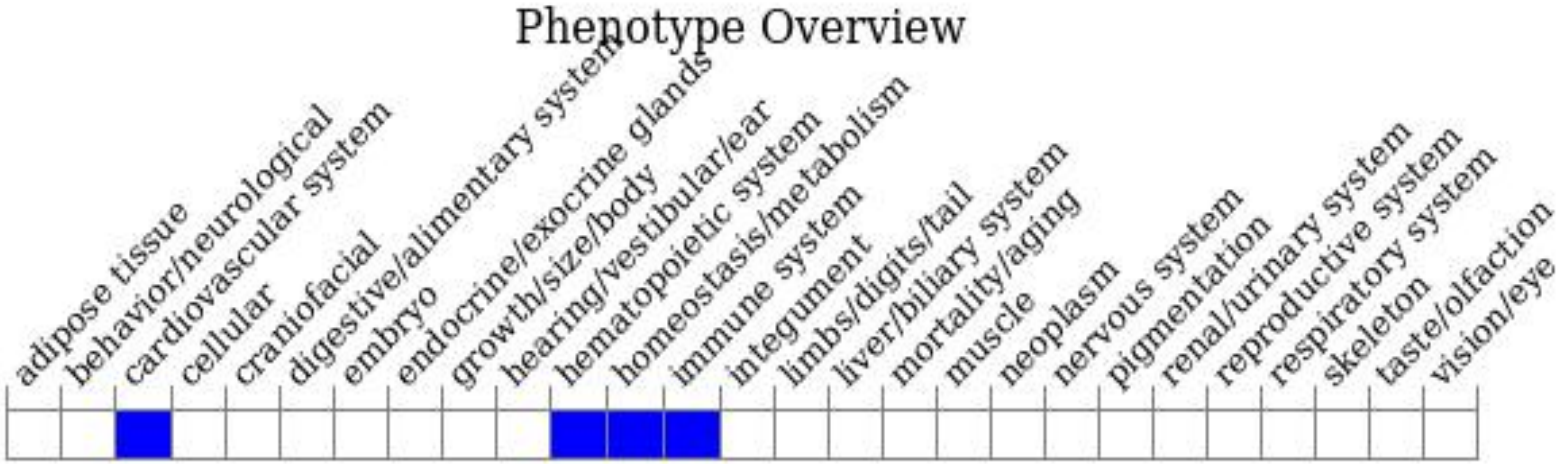


Genomic location distribution



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,homozygotes for a targeted null mutation exhibit a modest increase in DNA mismatch repair errors, primarily single base pair substitutions.

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

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