

Prkd2 Cas9-CKO Strategy

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Project Overview

Project Name

Prkd2

Project type

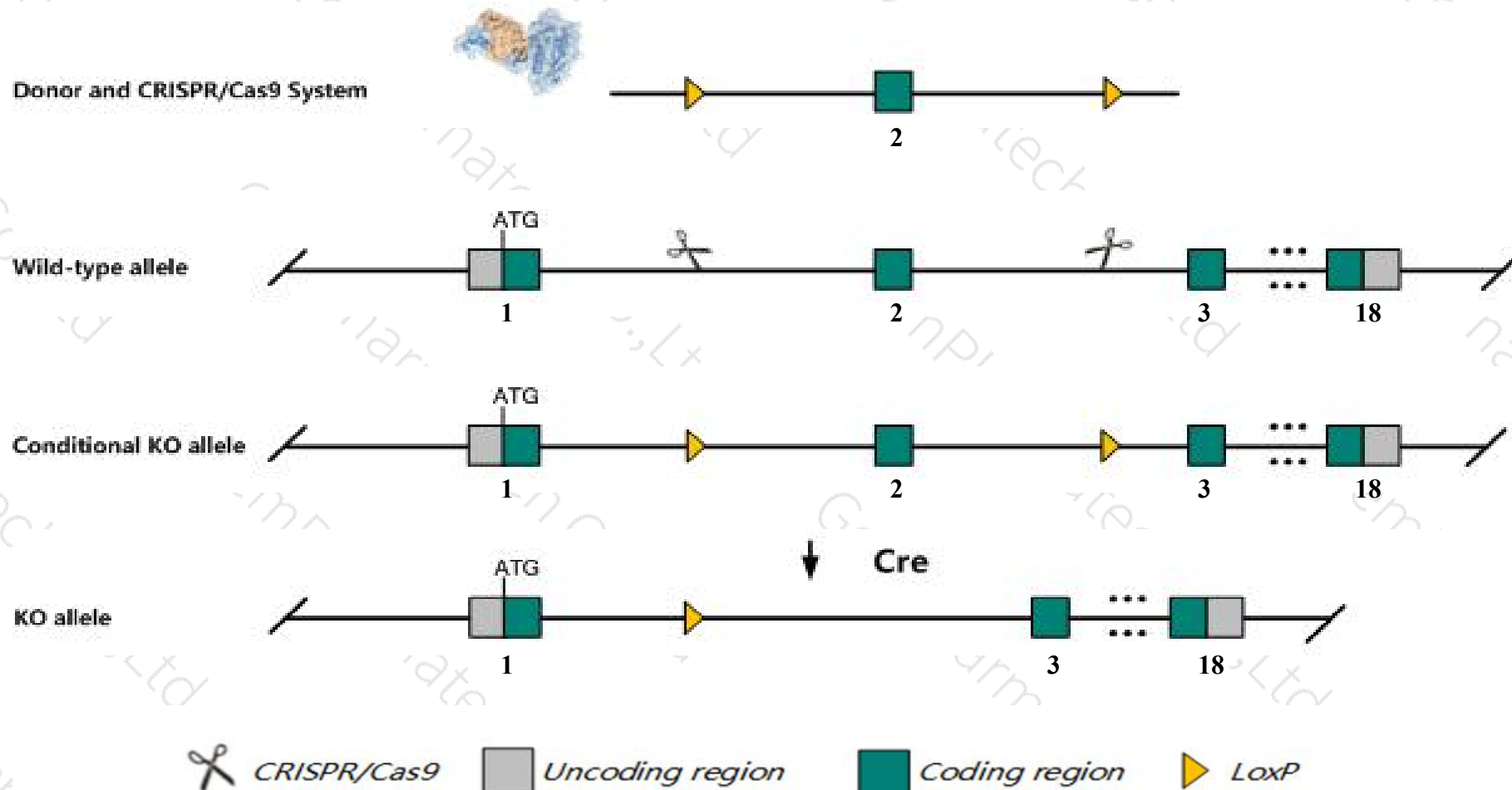
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prkd2* gene. The schematic diagram is as follows:



- The *Prkd2* gene has 8 transcripts. According to the structure of *Prkd2* gene, exon2 of *Prkd2-201* (ENSMUST00000086104.5) transcript is recommended as the knockout region. The region contains 139bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prkd2* 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-in allele exhibit impaired IgM and IgG1 antigen responses and CD4⁺ and CD8⁺ T cell production of IL2 and IFN-gamma in response to TCR stimulation. Mice homozygous for a gene trap allele exhibit normal T lymphocyte maturation.
- Transcript *Prkd2*-204,205,208 may not be affected.
- The *Prkd2* gene is located on the Chr7. 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)

Prkd2 protein kinase D2 [Mus musculus (house mouse)]

Gene ID: 101540, updated on 31-Jan-2019

Summary



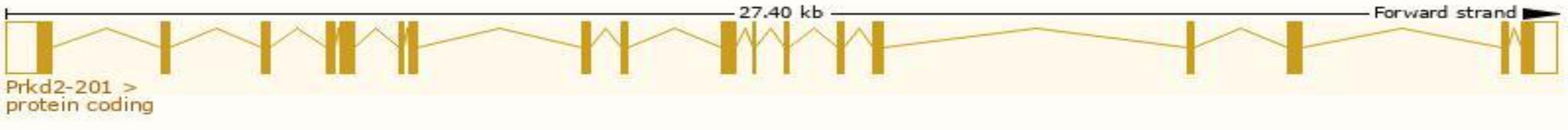
Official Symbol	Prkd2 provided by MGI
Official Full Name	protein kinase D2 provided by MGI
Primary source	MGI:MGI:2141917
See related	Ensembl:ENSMUSG00000041187
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI325941, PKD2
Expression	Broad expression in thymus adult (RPKM 86.1), spleen adult (RPKM 56.3) and 16 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

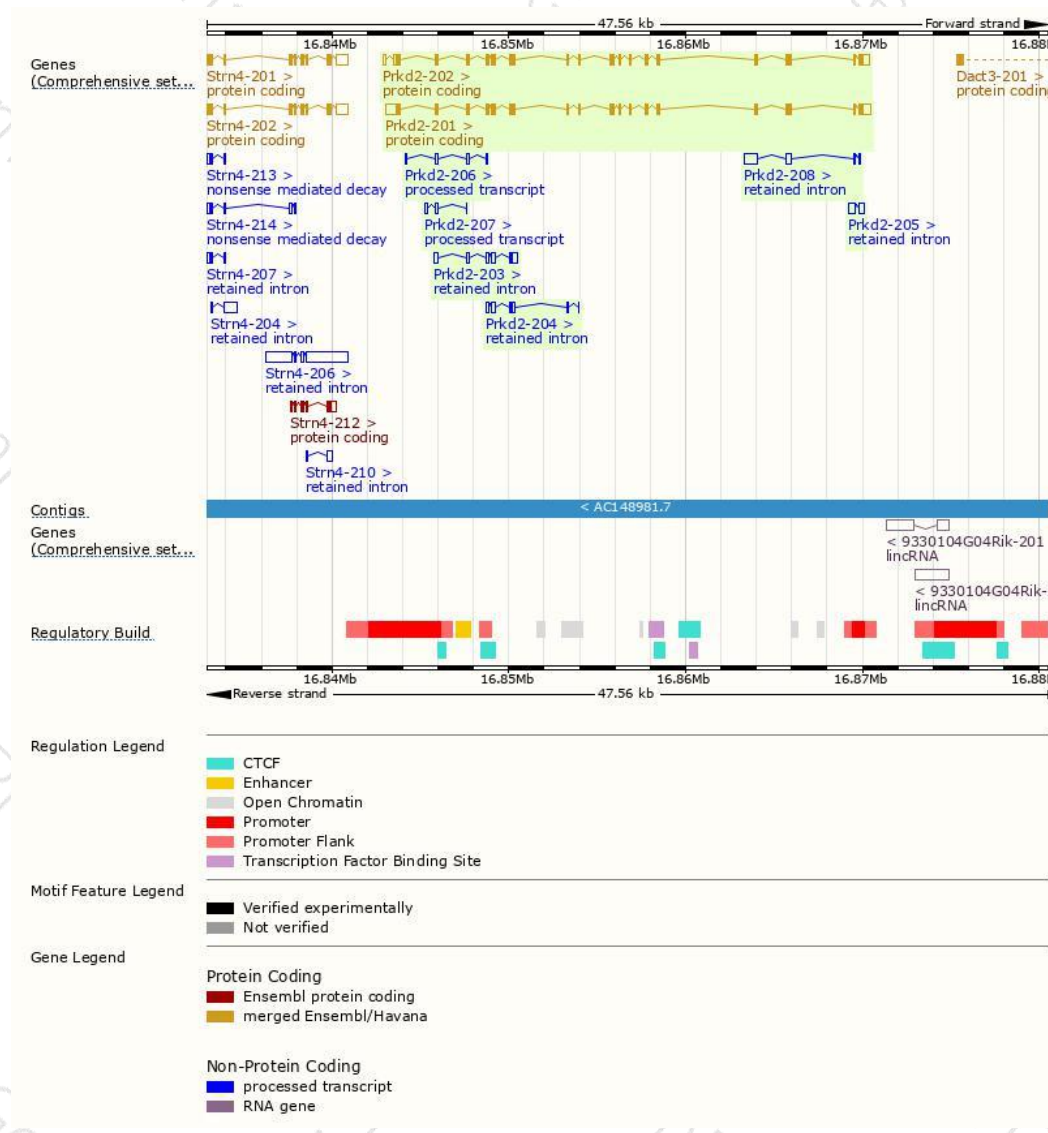
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prkd2-201	ENSMUST00000086104.5	3628	875aa	Protein coding	CCDS20855	Q8BZ03	TSL:1 GENCODE basic APPRIS P1
Prkd2-202	ENSMUST00000168093.8	3251	875aa	Protein coding	CCDS20855	Q8BZ03	TSL:1 GENCODE basic APPRIS P1
Prkd2-206	ENSMUST00000205841.1	396	No protein	Processed transcript	-	-	TSL:5
Prkd2-207	ENSMUST00000205999.1	370	No protein	Processed transcript	-	-	TSL:5
Prkd2-208	ENSMUST00000206510.1	1115	No protein	Retained intron	-	-	TSL:3
Prkd2-203	ENSMUST00000205386.1	1056	No protein	Retained intron	-	-	TSL:1
Prkd2-204	ENSMUST00000205456.1	779	No protein	Retained intron	-	-	TSL:5
Prkd2-205	ENSMUST00000205798.1	636	No protein	Retained intron	-	-	TSL:2

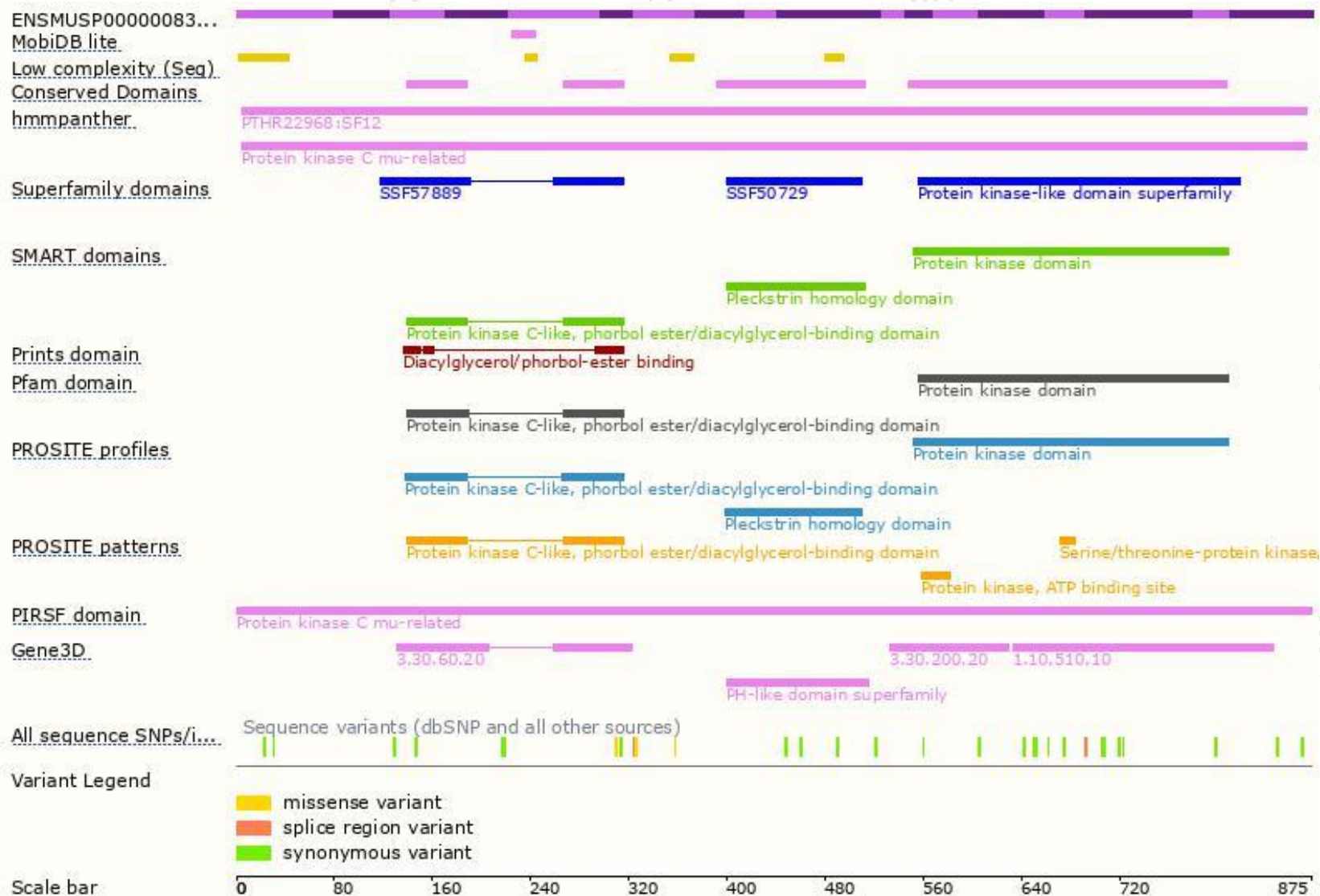
The strategy is based on the design of *Prkd2-201* transcript,The transcription is shown below



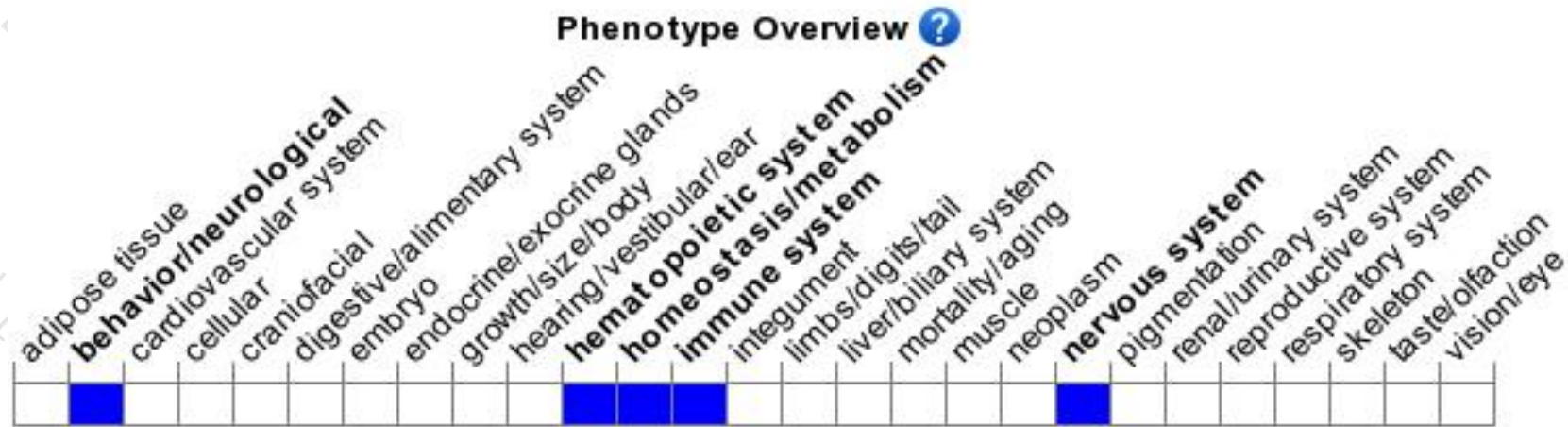
Genomic location distribution



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, Mice homozygous for a knock-in allele exhibit impaired IgM and IgG1 antigen responses and CD4⁺ and CD8⁺ T cell production of IL2 and IFN-gamma in response to TCR stimulation. Mice homozygous trap allele exhibit normal T lymphocyte maturation.

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

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