Prkdc Cas9-CKO Strategy

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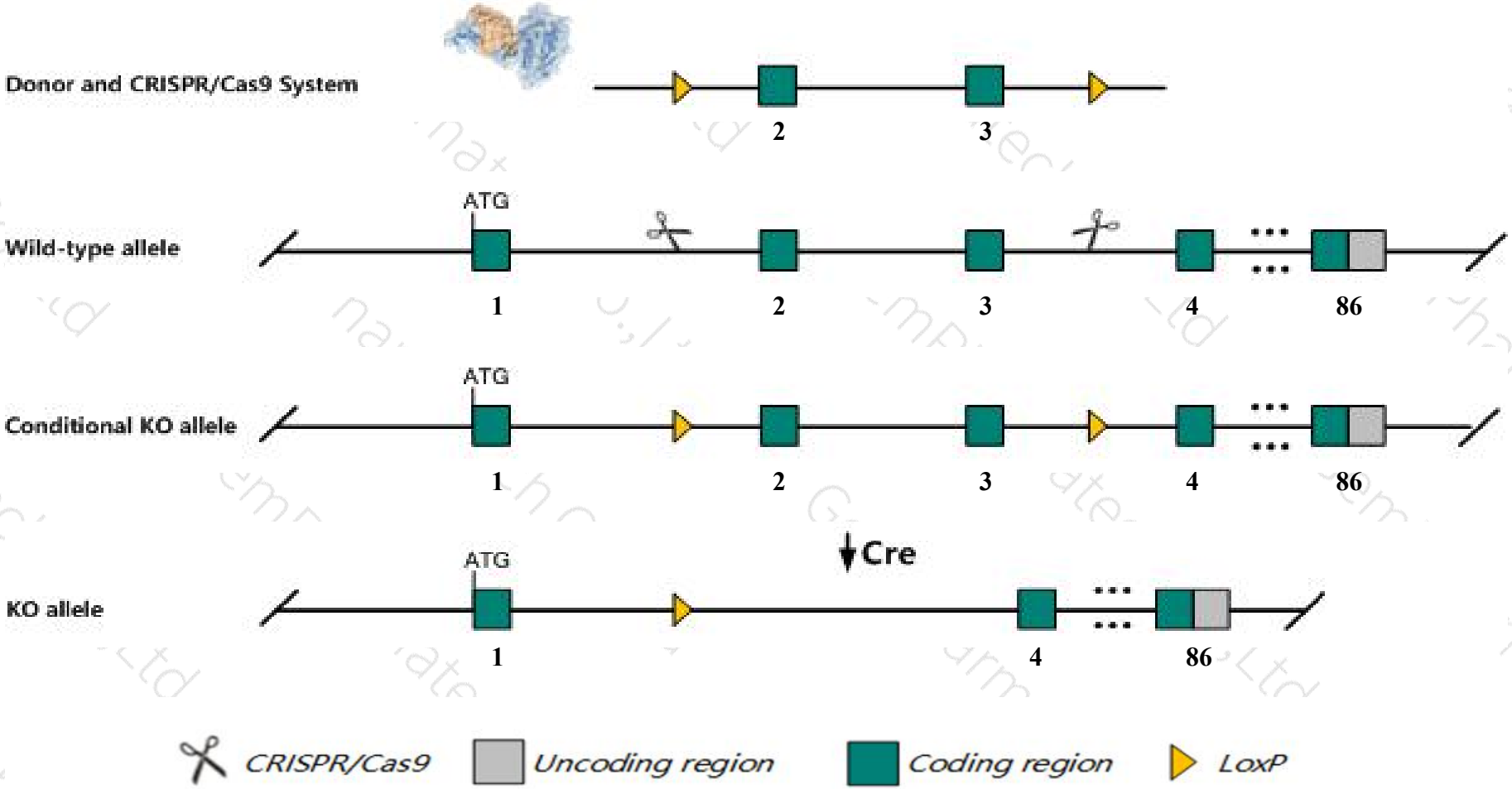
Date: 2018/11/12

Project Overview

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

Conditional Knockout strategy

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



Technical routes

- The *Prkdc* gene has 2 transcripts. According to the structure of *Prkdc* gene, exon2-exon3 of *Prkdc-201* (ENSMUST00000023352.8) transcript is recommended as the knockout region.The region contains 170bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Prkdc* 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,Mutations at this locus effect genome stability, radiation sensitivity and DNA repair. Nonsense (scid) and null homozygotes have severe combined immunodeficiency. A BALB/c variant allele reduces enzyme activity and predisposes to breast cancer.

- The *Prkdc* gene is located on the Chr16. 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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Prkdc protein kinase, DNA activated, catalytic polypeptide [Mus musculus (house mouse)]

Gene ID: 19090, updated on 9-Apr-2019

Summary

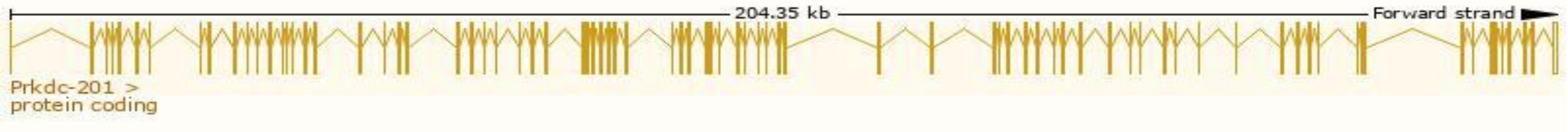
Official Symbol	Prkdc provided by MGI
Official Full Name	protein kinase, DNA activated, catalytic polypeptide provided by MGI
Primary source	MGI:MGI:104779
See related	Ensembl:ENSMUSG00000022672
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI326420, AU019811, DNA-PKcs, DNAPDcs, DNAPK, DNPK1, DOXNPH, HYRC1, XRCC7, dxnph, p460, scid, slip
Expression	Ubiquitous expression in CNS E11.5 (RPKM 1.5), frontal lobe adult (RPKM 1.2) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

The gene has 2 transcripts,all transcripts are shown below:

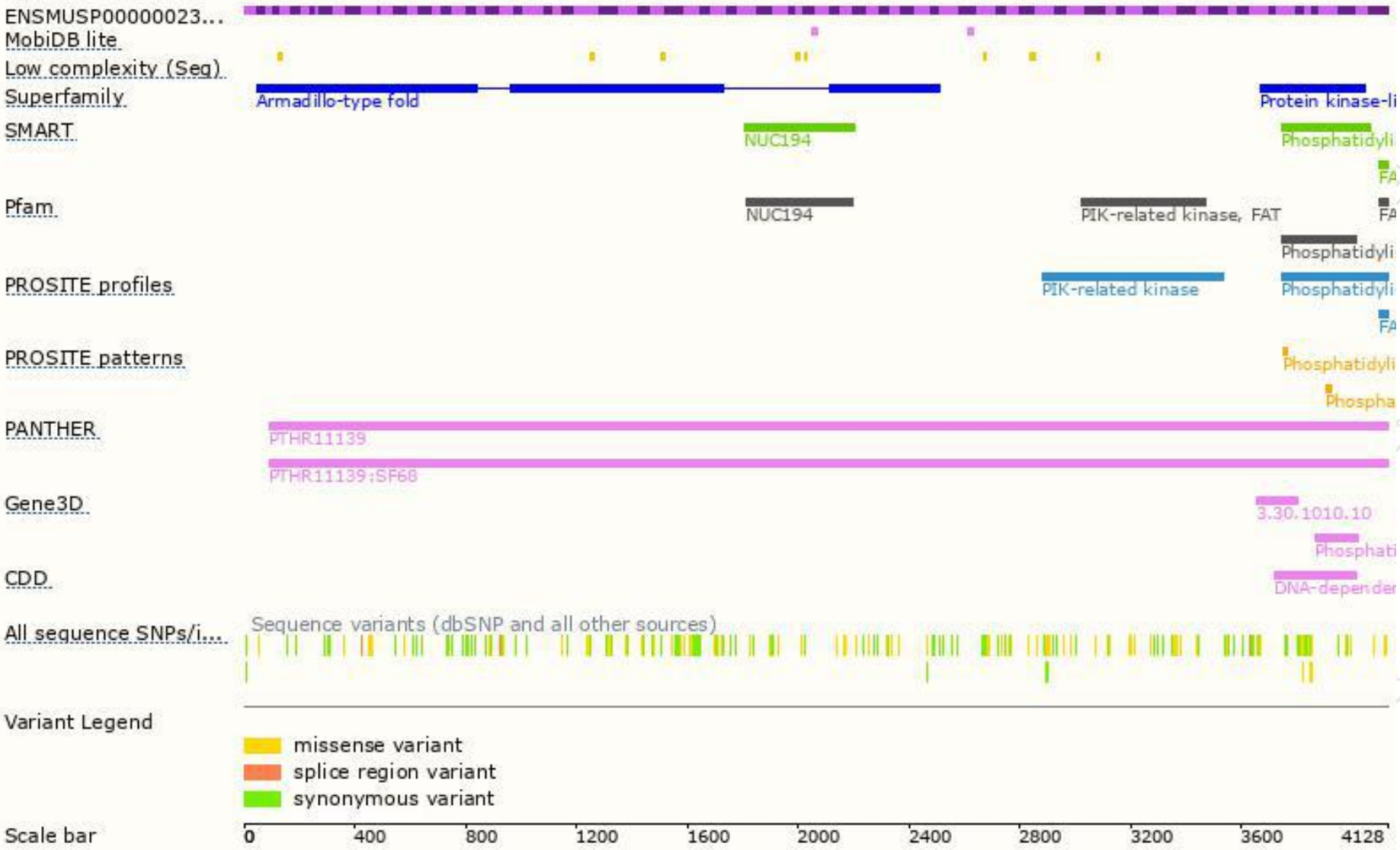
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prkdc-201	ENSMUST00000023352.8	12647	4128aa	Protein coding	CCDS27978	P97313	TSL:1 GENCODE basic APPRIS P1
Prkdc-202	ENSMUST00000182134.1	3063	No protein	Retained intron	-	-	TSL:5

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

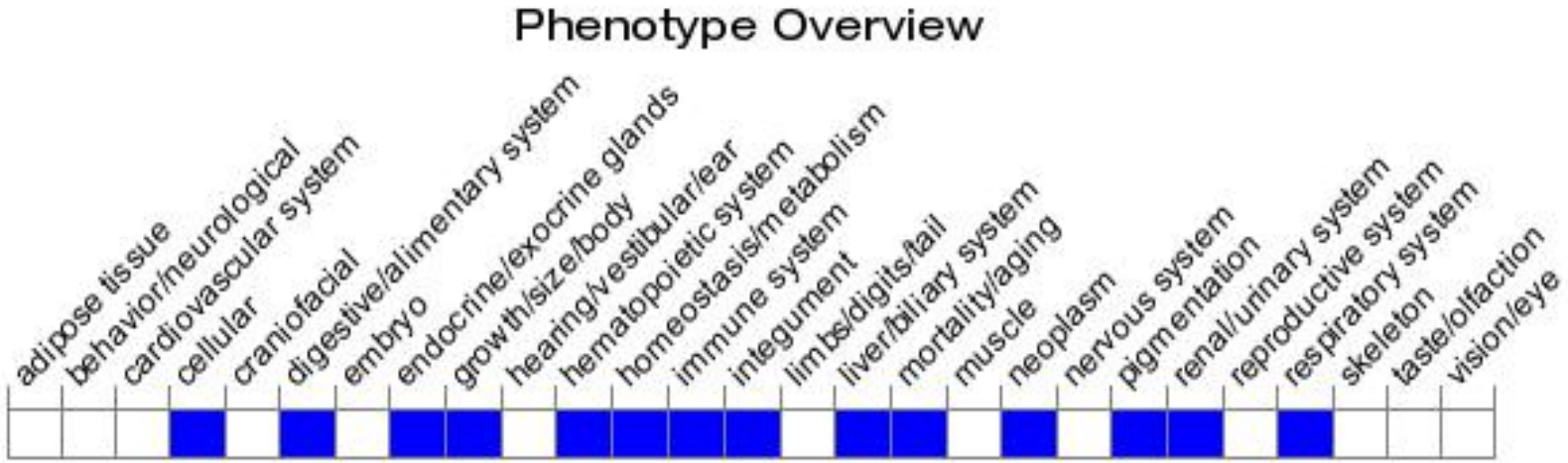


Genomic location distribution

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

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