

***Prkdc* Cas9-KO Strategy**

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Project Overview

Project Name

Prkdc

Project type

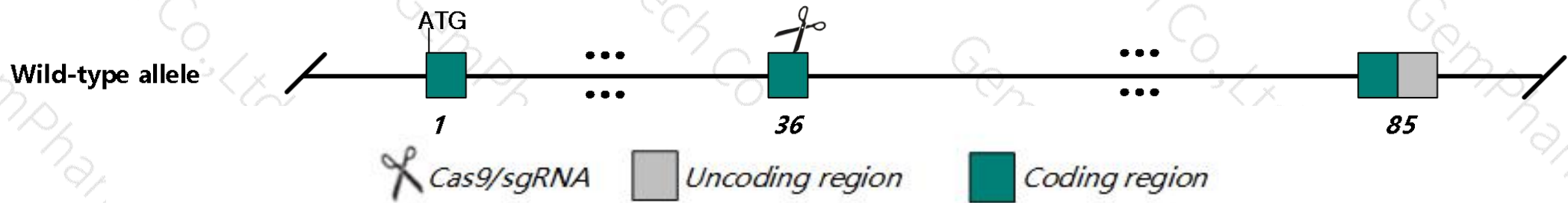
Cas9-KO

Strain background

NOD/ShiLtJ

Knockout strategy

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



- The *Prkdc* gene has 2 transcripts. According to the structure of *Prkdc* gene, exon36 part of the coding area of MGP_NODShiLtJ_T0042994.1 transcript is recommended as the knockout region. The region contains key 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: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of NOD/ShiLtJ 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 NOD/ShiLtJ mice.

- 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information (NCBI)

Prkdc protein kinase, DNA activated, catalytic polypeptide [*Mus musculus* (house mouse)]

Gene ID: 19090, updated on 28-May-2019

Summary

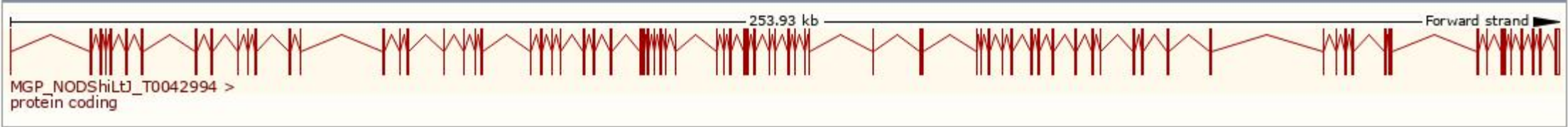
Official Symbol	Prkdc provided by MGI
Official Full Name	protein kinase, DNA activated, catalytic polypeptide provided by MGI
Primary source	MGI:MGI:104779
See related	Ensembl:ENSMUSG00000022672
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	p460; scid; slp; DNAPK; DNPK1; HYRC1; XRCC7; dxnph; DOXNPH; DNAPDcs; AI326420; AU019811; DNA-PKcs
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:

Show/hide columns (1 hidden)				Filter		
Name	Transcript ID	bp	Protein	Biotype	CCDS	Flags
-	MGP_NODShiLtJ_T0042994.1	12567	4099aa	Protein coding	-	-
-	MGP_NODShiLtJ_T0042993.1	2903	No protein	Retained intron	CCDS27978	-

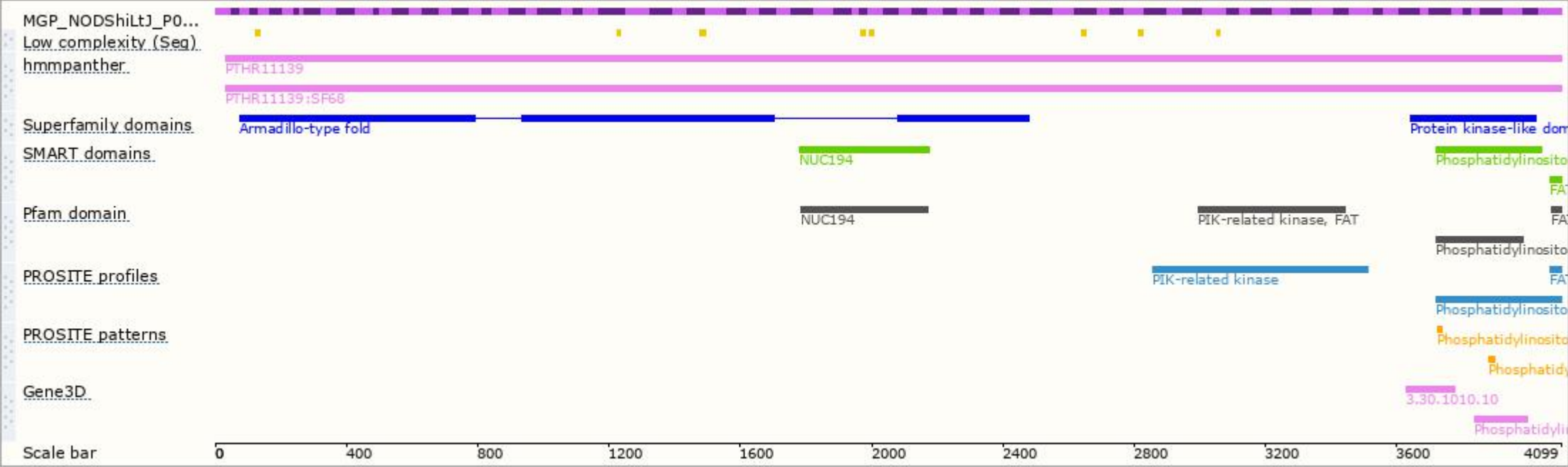
The strategy is based on the design of *MGP_NODShiLtJ_T0042994.1* transcript,The transcription is shown below



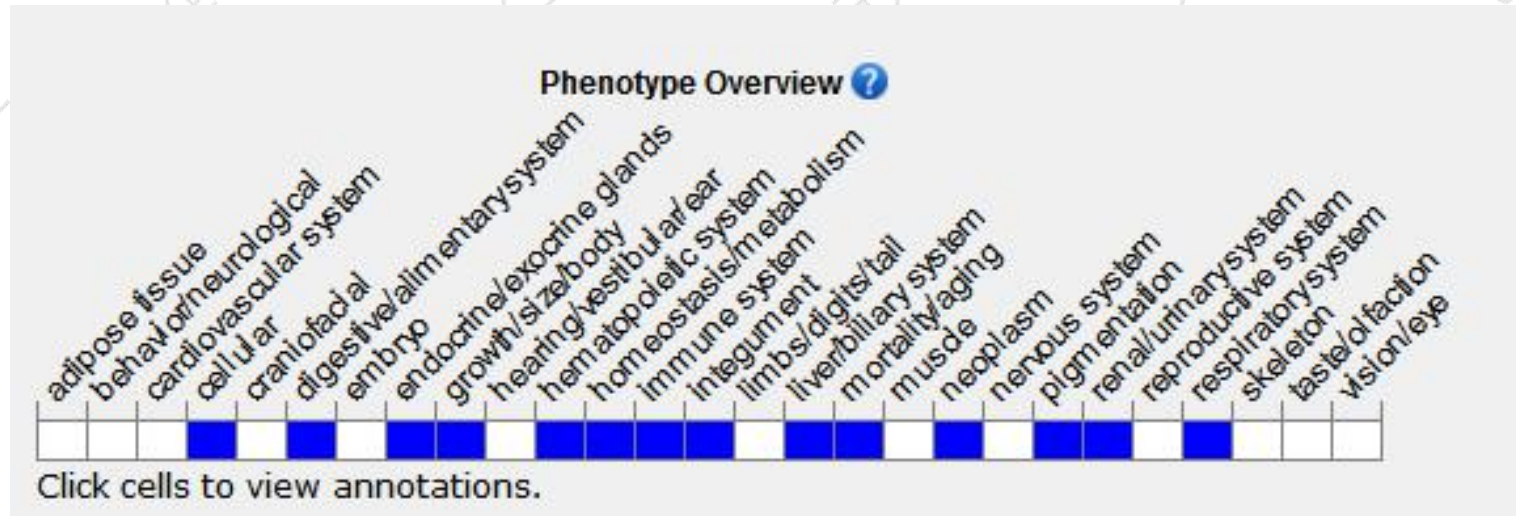
Genomic location distribution



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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