

Prkg2 Cas9-CKO Strategy

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Project Overview

Project Name

Prkg2

Project type

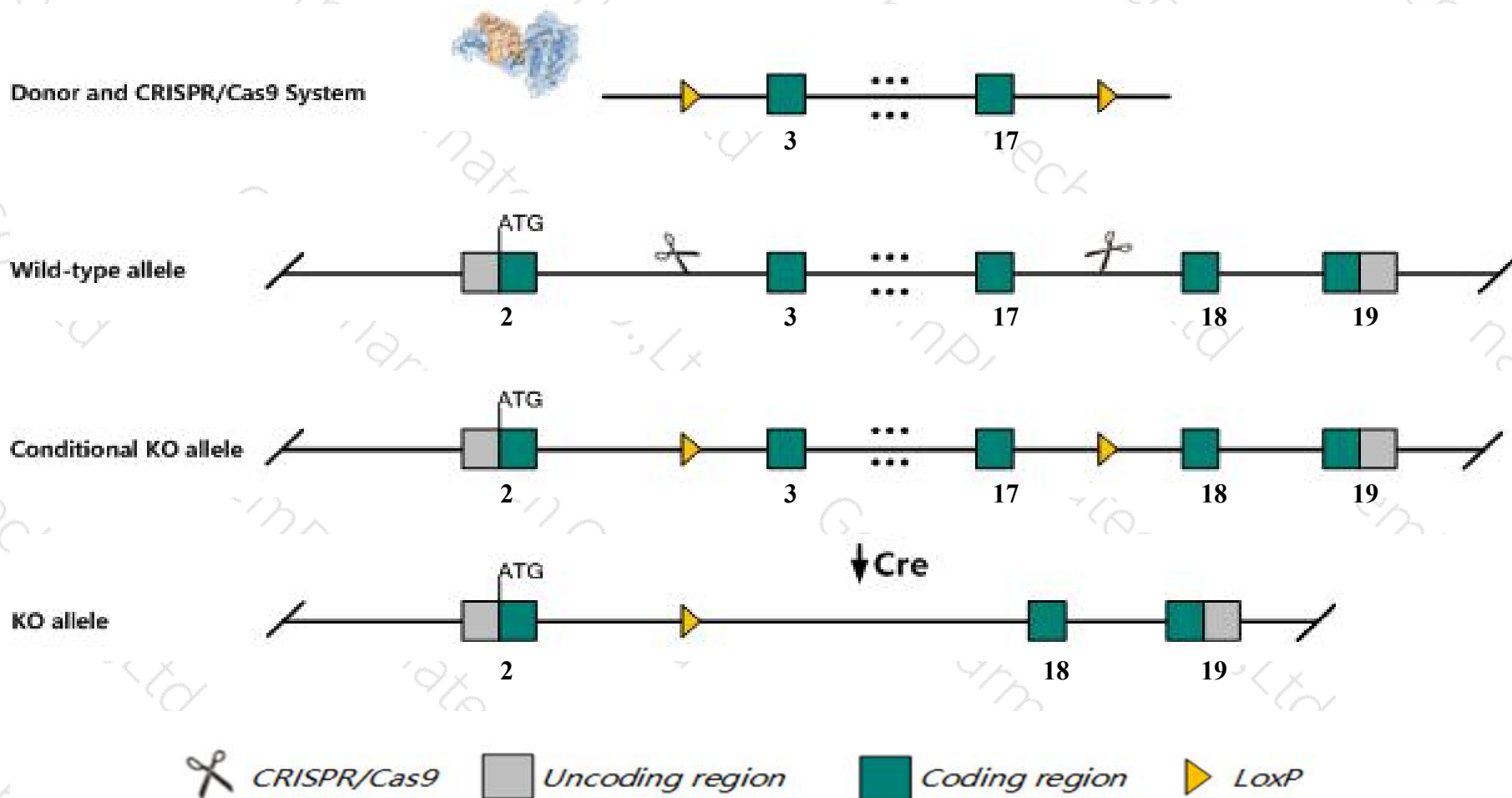
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prkg2* gene. The schematic diagram is as follows:



Technical routes

- The *Prkg2* gene has 5 transcripts. According to the structure of *Prkg2* gene, exon3-exon17 of *Prkg2-203* (ENSMUST00000161490.7) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prkg2* 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, Homozygous null mice exhibit dwarfism, with abnormal skull morphology and short limbs and vertebrae. Defects in axial organization of the growth plates was evident as mice aged. Digestive secretion in response to enterotoxin was reduced.
- The KO region deletes most of the coding sequence, but does not result in frameshift.
- The *Prkg2* 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)

Prkg2 protein kinase, cGMP-dependent, type II [*Mus musculus* (house mouse)]

Gene ID: 19092, updated on 27-Aug-2019

Summary

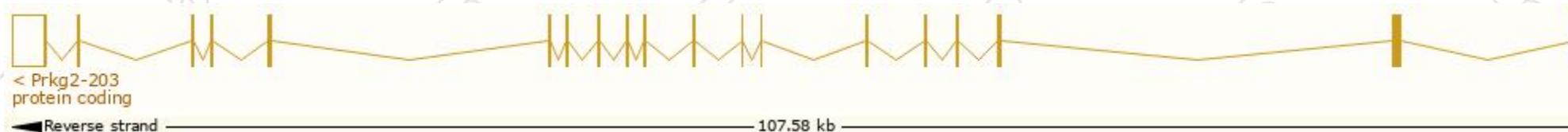
Official Symbol	Prkg2 provided by MGI
Official Full Name	protein kinase, cGMP-dependent, type II provided by MGI
Primary source	MGI:MGI:108173
See related	Ensembl:ENSMUSG00000029334
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CGKII; Prkgr2; cGK-II; AW212535
Expression	Broad expression in small intestine adult (RPKM 2.2), frontal lobe adult (RPKM 1.5) and 16 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

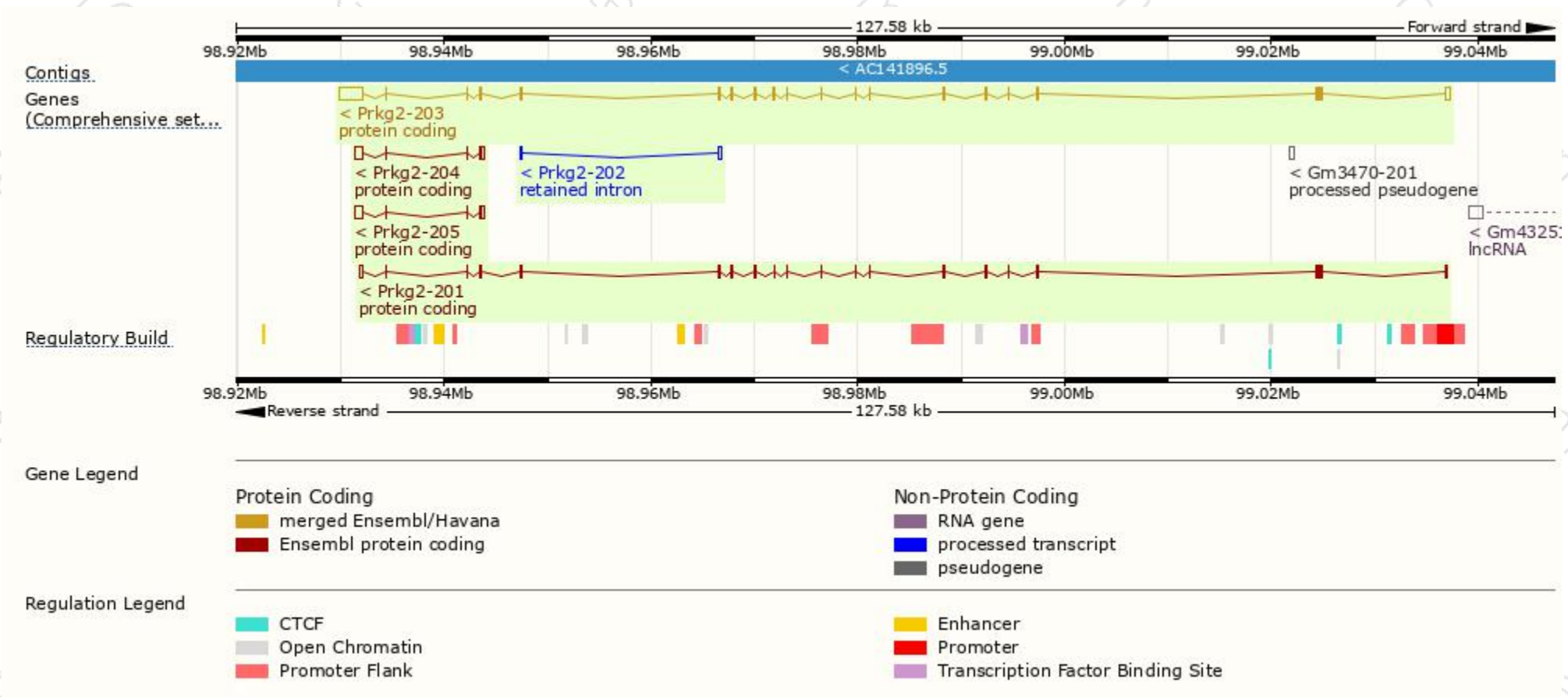
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prkg2-203	ENSMUST00000161490.7	4968	762aa	Protein coding	CCDS19459	Q8CAH8	TSL:1 APPRIS P1
Prkg2-201	ENSMUST00000031277.6	2618	733aa	Protein coding	-	E9QPH0	TSL:5 GENCODE basic
Prkg2-204	ENSMUST00000162147.5	1389	107aa	Protein coding	-	Q3TMJ2	TSL:1 GENCODE basic
Prkg2-205	ENSMUST00000162619.7	1308	94aa	Protein coding	-	A0A0G2JEE8	TSL:5 GENCODE basic
Prkg2-202	ENSMUST00000160765.1	387	No protein	Retained intron	-	-	TSL:3

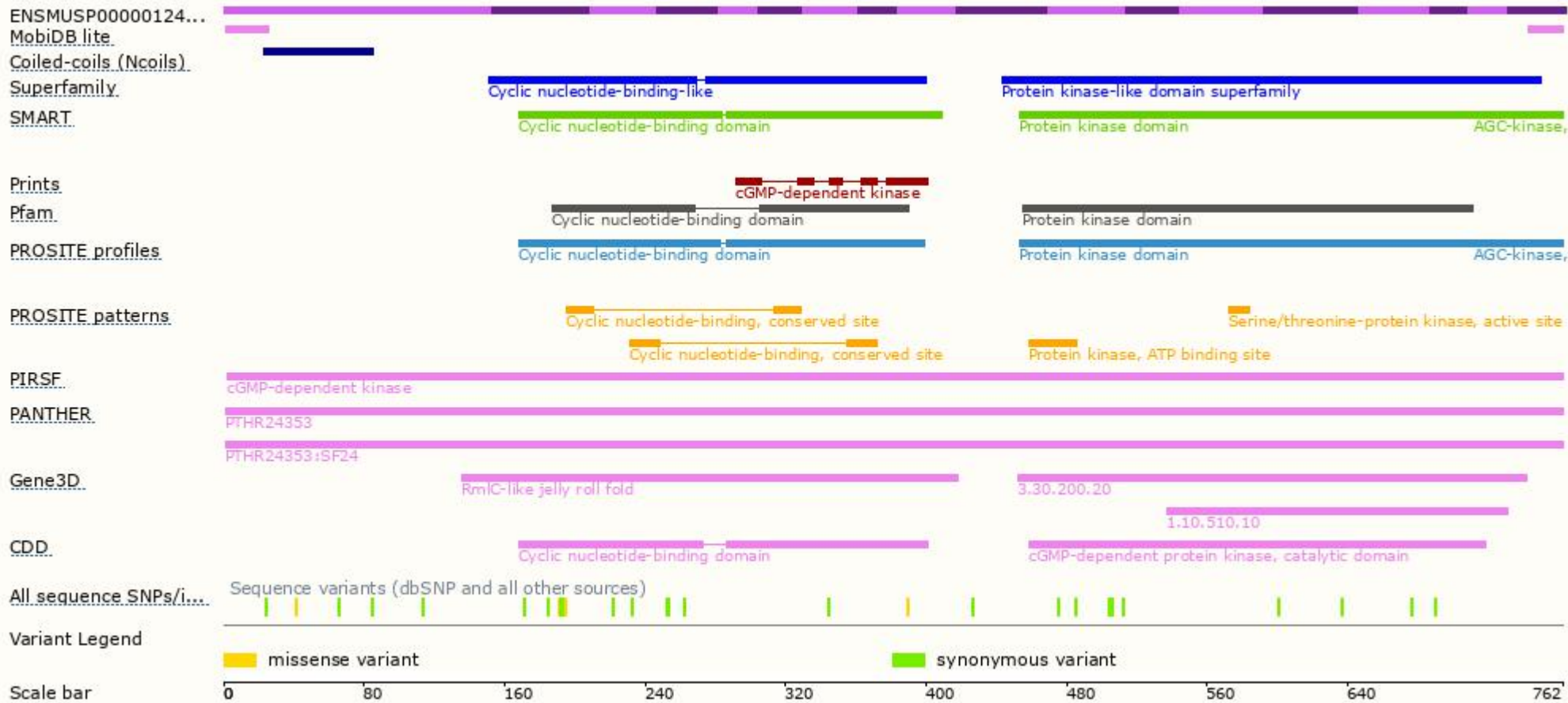
The strategy is based on the design of *Prkg2-203* transcript, The transcription is shown below



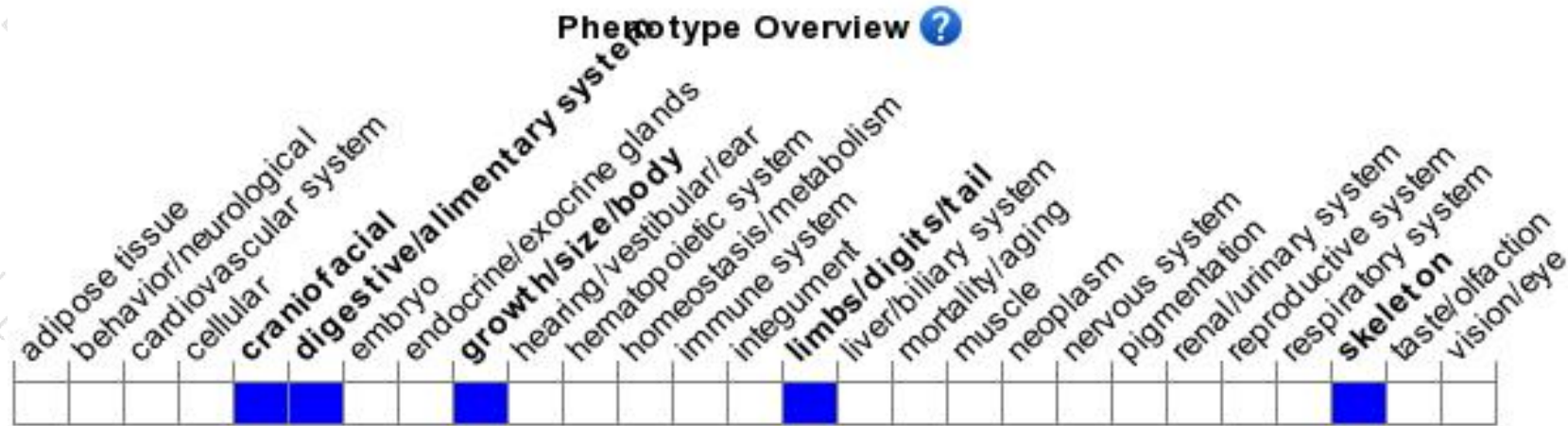
Genomic location distribution



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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