Kcnk2 Cas9-CKO Strategy

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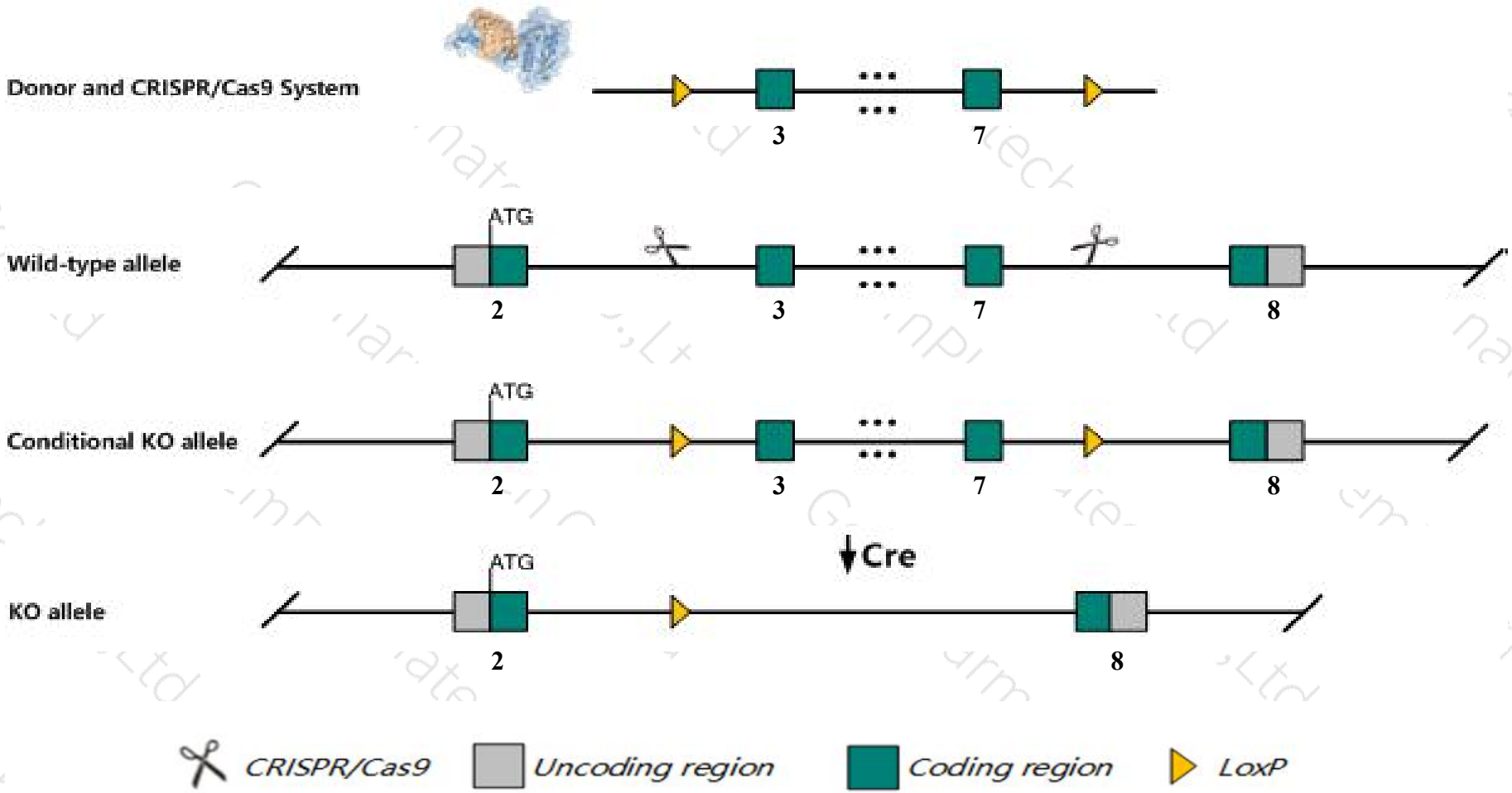
Date:2019-11-13

Project Overview

Project Name	***Kcnk2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kcnk2* gene. The schematic diagram is as follows:



Technical routes

- The *Kcnk2* gene has 10 transcripts. According to the structure of *Kcnk2* gene, exon3-exon7 of *Kcnk2-202* (ENSMUST00000110920.6) transcript is recommended as the knockout region.The region contains 917bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Kcnk2* 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,Homozygous null mice display increased sensitivity to pharmacologically induced seizures and ischemia.
- Transcript *Kcnk2*-207&210 may not be affected.
- The *Kcnk2* 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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Kcnk2 potassium channel, subfamily K, member 2 [*Mus musculus* (house mouse)]

Gene ID: 16526, updated on 16-Sep-2019

Summary

Official Symbol	Kcnk2 provided by MGI
Official Full Name	potassium channel, subfamily K, member 2 provided by MGI
Primary source	MGI:MGI:109366
See related	Ensembl:ENSMUSG00000037624
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	TREK-1; AI848635; A430027H14Rik
Expression	Broad expression in CNS E18 (RPKM 6.7), cortex adult (RPKM 5.7) and 19 other tissues See more
Orthologs	human all

Genomic context

Location: 1; 1 H6

See Kcnk2 in Genome Data Viewer

Exon count: 9

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	1	NC_000067.6 (189207930..189402782, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	1	NC_000067.5 (191031809..191168071, complement)

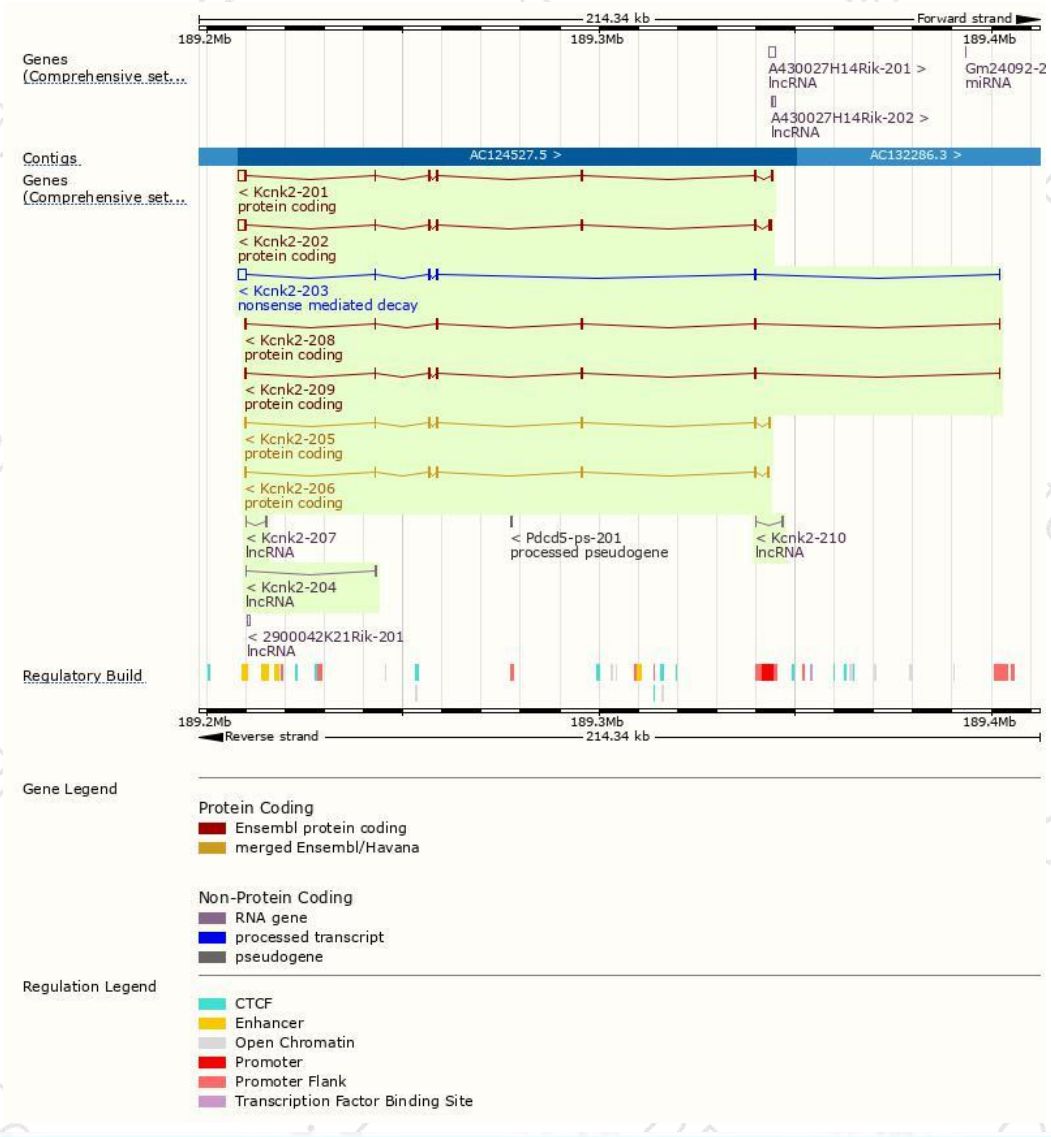
Transcript information（Ensembl）

The gene has 10 transcripts,all transcripts are shown below:

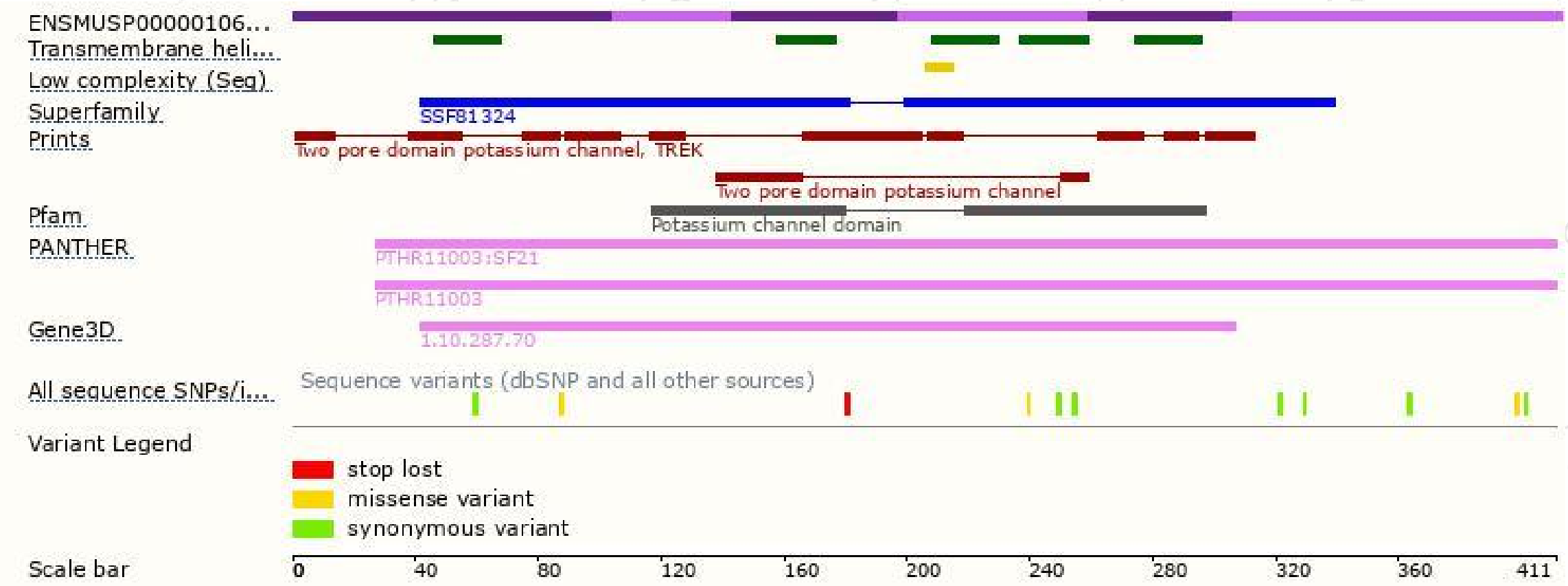
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kcnk2-202	ENSMUST00000110920.6	3572	411aa	Protein coding	CCDS48481	P97438	TSL:5 GENCODE basic APPRIS ALT1
Kcnk2-201	ENSMUST00000079451.12	3297	414aa	Protein coding	CCDS78773	Q6P6P9	TSL:1 GENCODE basic APPRIS ALT1
Kcnk2-205	ENSMUST00000192723.1	1642	411aa	Protein coding	CCDS48481	P97438	TSL:1 GENCODE basic APPRIS ALT1
Kcnk2-206	ENSMUST00000193319.5	1548	426aa	Protein coding	CCDS48480	P97438	TSL:1 GENCODE basic APPRIS P4
Kcnk2-209	ENSMUST00000194402.5	1373	422aa	Protein coding	-	A0A0A6YXK1	TSL:5 GENCODE basic APPRIS ALT1
Kcnk2-208	ENSMUST00000194172.5	1200	237aa	Protein coding	-	A0A0A6YXX0	TSL:5 GENCODE basic
Kcnk2-203	ENSMUST00000180044.7	3131	152aa	Nonsense mediated decay	-	A0A0R4J279	TSL:1
Kcnk2-210	ENSMUST00000195016.1	493	No protein	lncRNA	-	-	TSL:3
Kcnk2-204	ENSMUST00000192529.1	384	No protein	lncRNA	-	-	TSL:5
Kcnk2-207	ENSMUST00000193686.1	334	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Kcnk2-202* transcript,The transcription is shown below

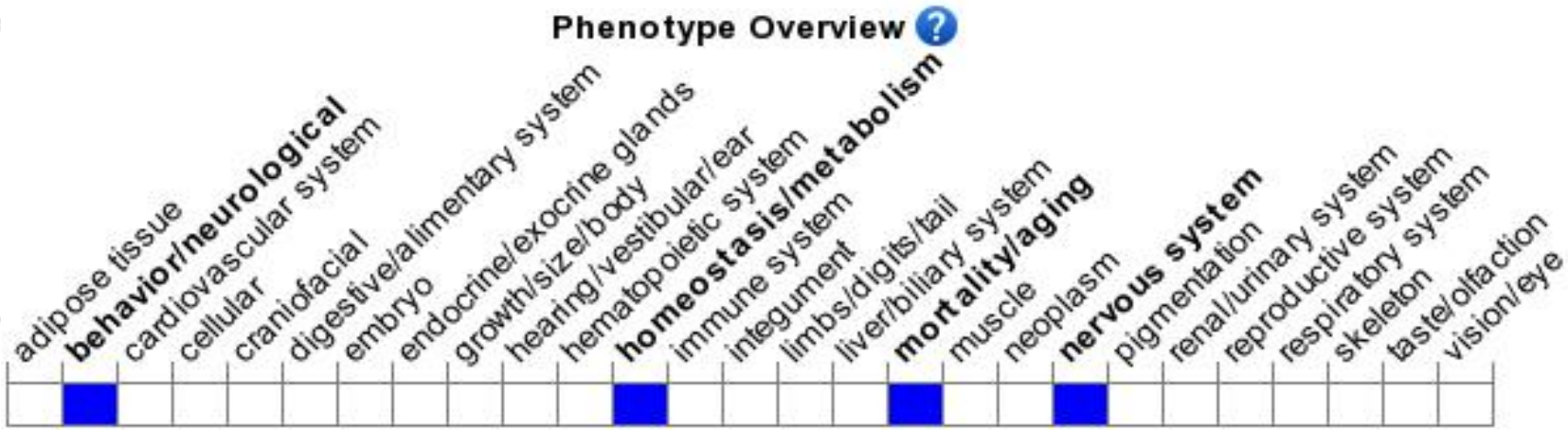
Genomic location distribution



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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