Kcnq3 Cas9-CKO Strategy

Designer: Yang Zeng
Reviewer: Xueting Zhang
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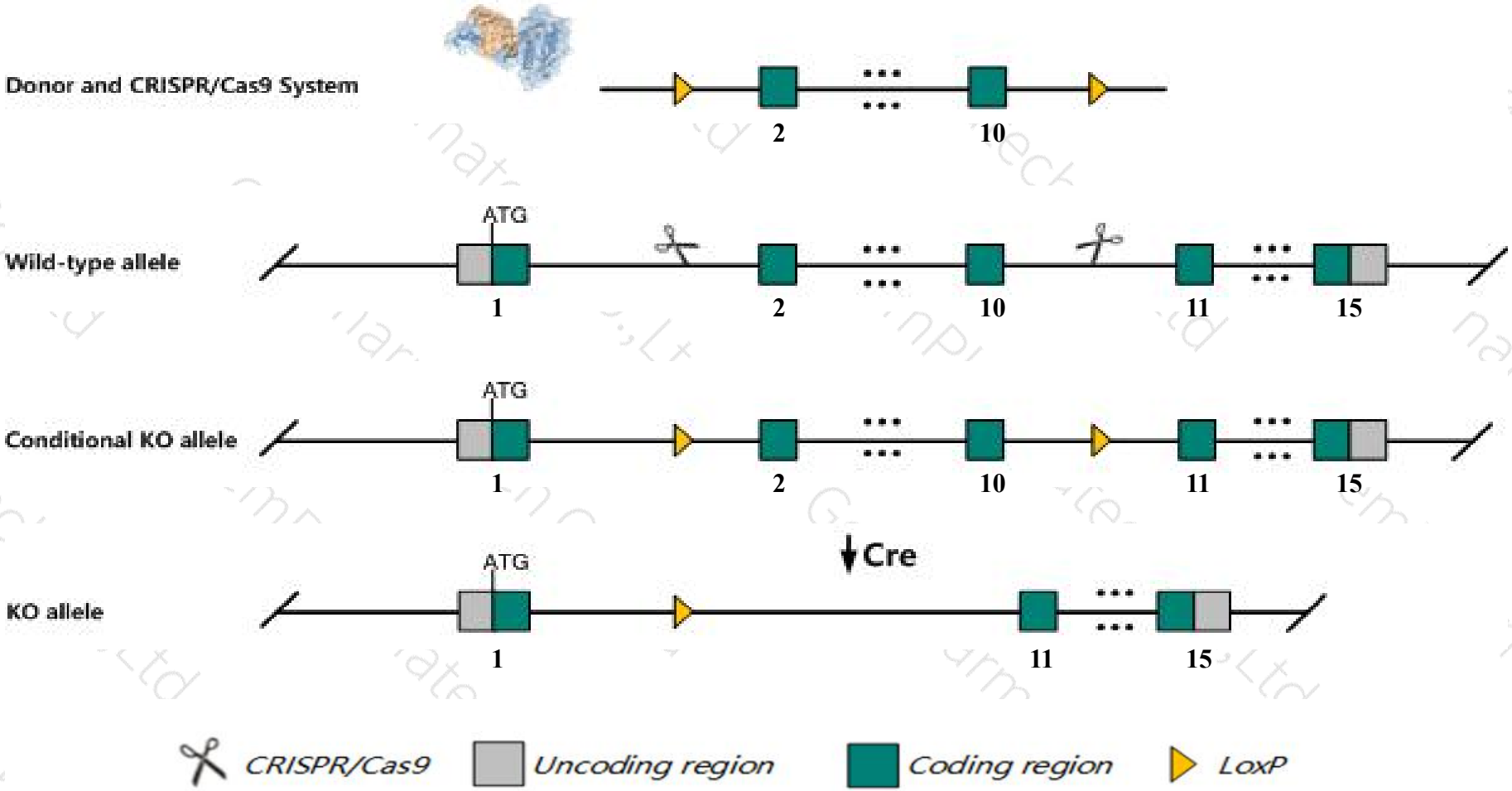
Project Overview

Project Name	***Kcnq3***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kcnq3* gene. The schematic diagram is as follows:



Technical routes

- The *Kcnq3* gene has 3 transcripts. According to the structure of *Kcnq3* gene, exon2-exon10 of *Kcnq3-201* (ENSMUST00000070256.8) transcript is recommended as the knockout region.The region contains 1079bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Kcnq3* 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,Mice homozygous for a null allele exhibit abnormal apamin-insensitive afterhyperpolarization currents in granule cells, but not pyramidal cells, of the hippocampus. Mice homozygous for a knock-in allele exhibit spontaneous seizures and premature death.

➢ The *Kcnq3* gene is located on the Chr15. 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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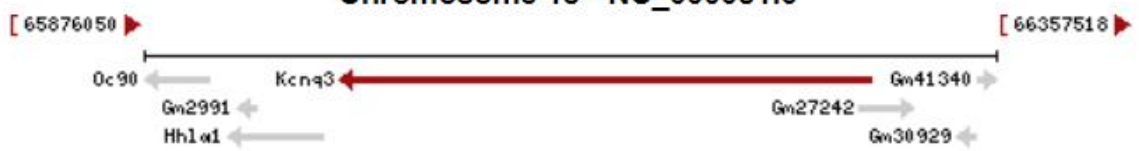
Kcnq3 potassium voltage-gated channel, subfamily Q, member 3 [*Mus musculus* (house mouse)]

Gene ID: 110862, updated on 12-Aug-2019

Summary

Official Symbol	Kcnq3 provided by MGI
Official Full Name	potassium voltage-gated channel, subfamily Q, member 3 provided by MGI
Primary source	MGI:MGI:1336181
See related	Ensembl:ENSMUSG00000056258
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
Expression	Biased expression in cortex adult (RPKM 8.4), frontal lobe adult (RPKM 5.4) and 5 other tissues See more
Orthologs	human all

Chromosome 15 - NC_000081.6

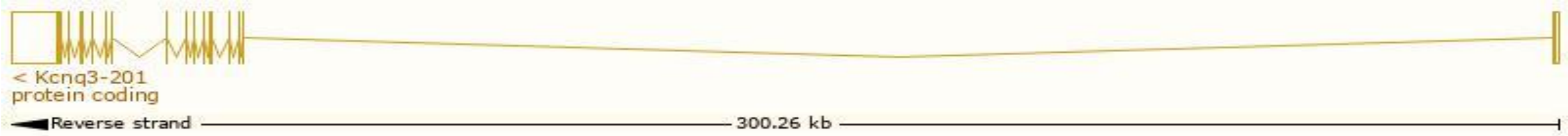


Transcript information（Ensembl）

The gene has 3 transcripts,all transcripts are shown below:

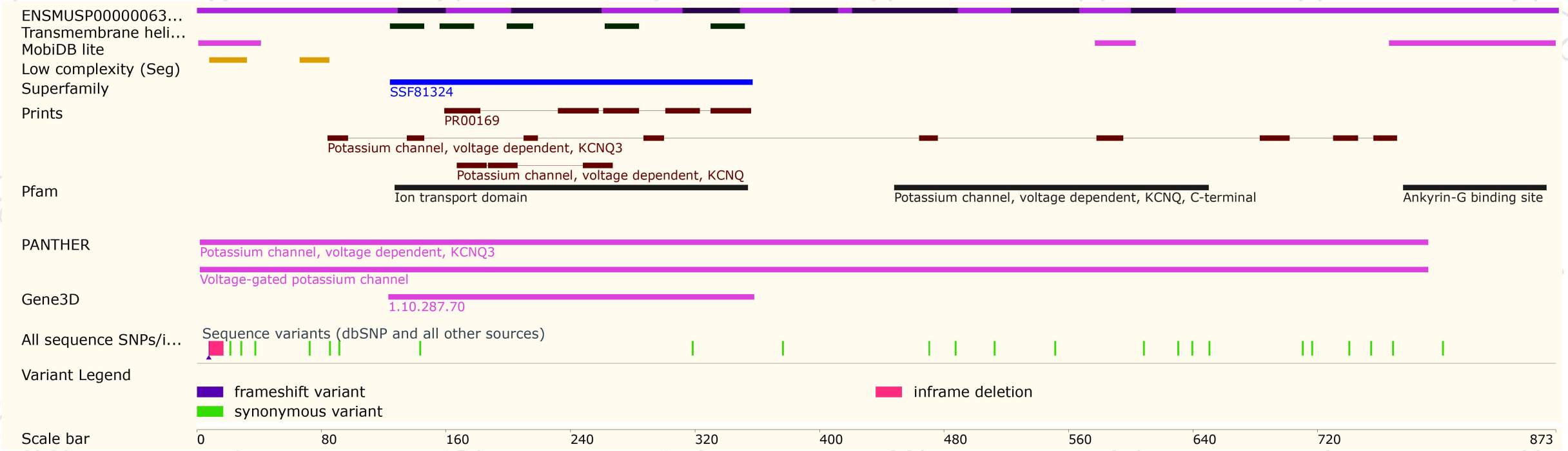
Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Kcnq3-201	ENSMUST00000070256.8	11824	873aa	ENSMUSP00000063380.6	Protein coding	CCDS49619	Q8K3F6	TSL:1 GENCODE basic APPRIS P1
Kcnq3-203	ENSMUST00000183633.1	2979	No protein	-	Retained intron	-	-	TSL:NA
Kcnq3-202	ENSMUST00000183354.1	666	No protein	-	lncRNA	-	-	TSL:3

The strategy is based on the design of *Kcnq3-201* transcript,The transcription is shown below

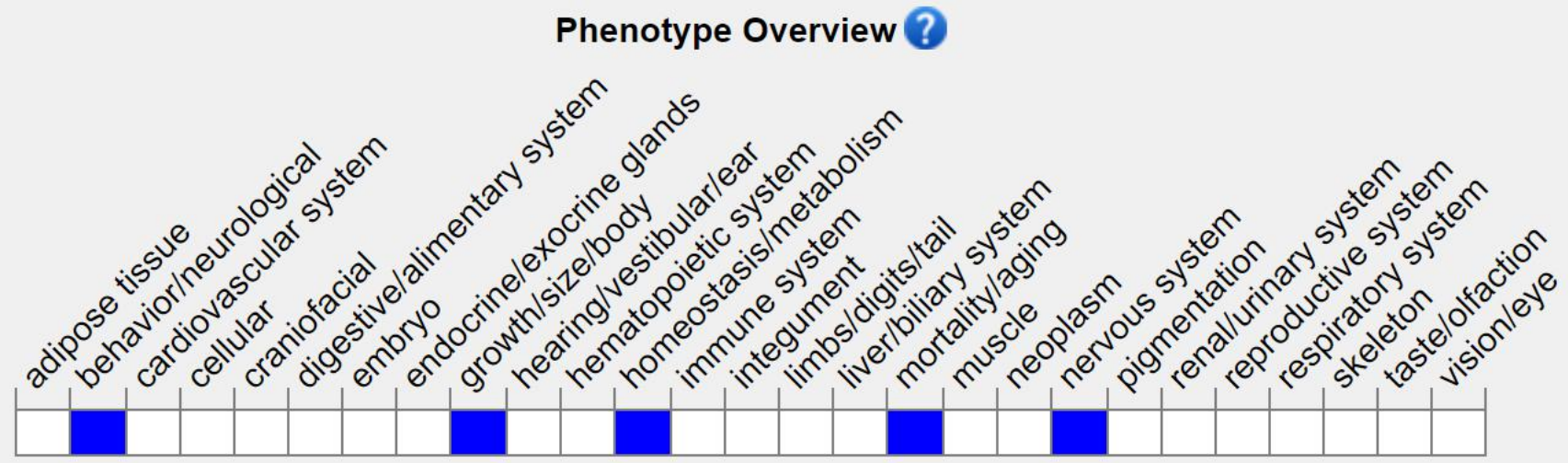


Genomic location distribution

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.

Tel: 400-9660890

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