Kcnq4 Cas9-KO Strategy

Designer: JiaYu

Reviewer: Xiaojing Li

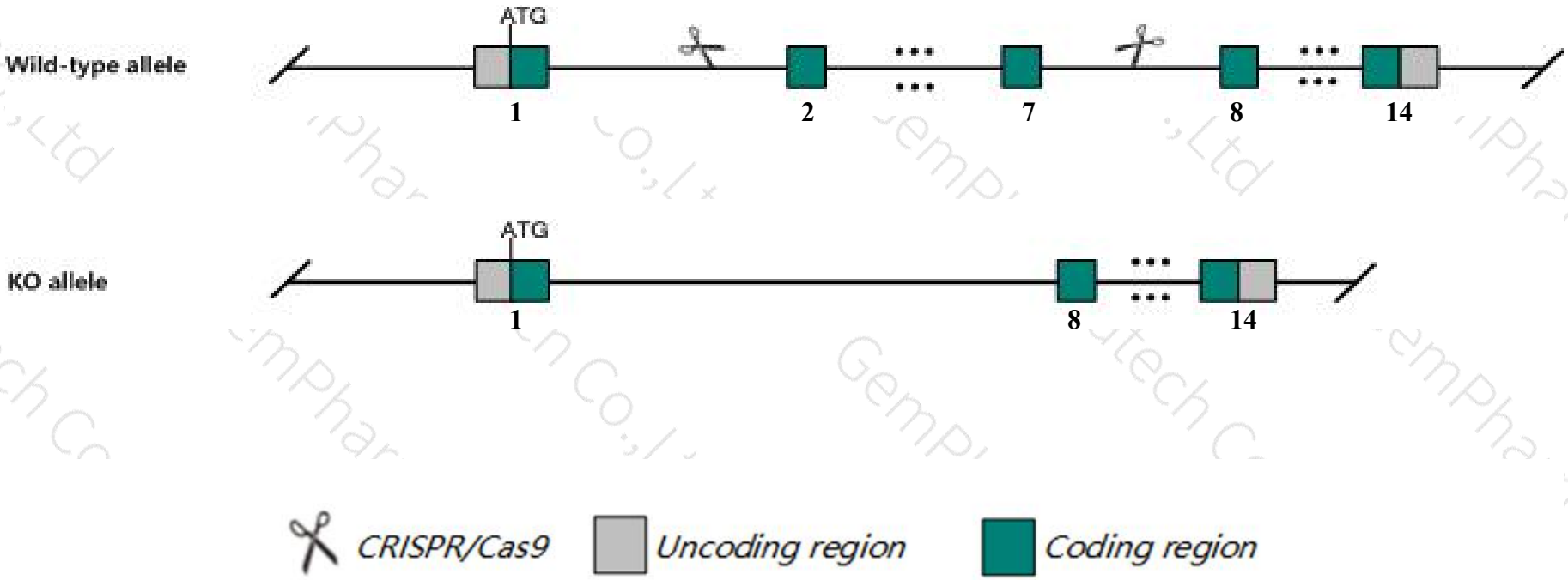
Design Date: 2019-8-27

Project Overview

Project Name	***Kcnq4***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kcnq4* gene. The schematic diagram is as follows:



Technical routes

➢ The *Kcnq4* gene has 2 transcripts. According to the structure of *Kcnq4* gene, exon2-exon7 of *Kcnq4-201* (ENSMUST00000030376.7) transcript is recommended as the knockout region.The region contains 727bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Kcnq4* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

➢ According to the existing MGI data,Mice that are either homozygous for a knock-out allele or homozygous for a dominant negative knock-in allele exhibit a slowly progressive hearing loss due to chronic depolarization and subsequent degeneration of cochlear outer hair cells.

➢ The *Kcnq4* gene is located on the Chr4. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information（NCBI）

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Kcnq4 potassium voltage-gated channel, subfamily Q, member 4 [Mus musculus (house mouse)]

Gene ID: 60613, updated on 5-Mar-2019

Summary

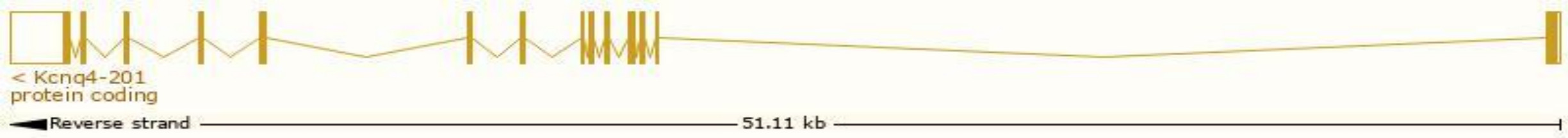
Official Symbol	Kcnq4 provided by MGI
Official Full Name	potassium voltage-gated channel, subfamily Q, member 4 provided by MGI
Primary source	MGI:MGI:1926803
See related	Ensembl:ENSMUSG00000028631
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Broad expression in subcutaneous fat pad adult (RPKM 8.4), mammary gland adult (RPKM 7.6) and 22 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

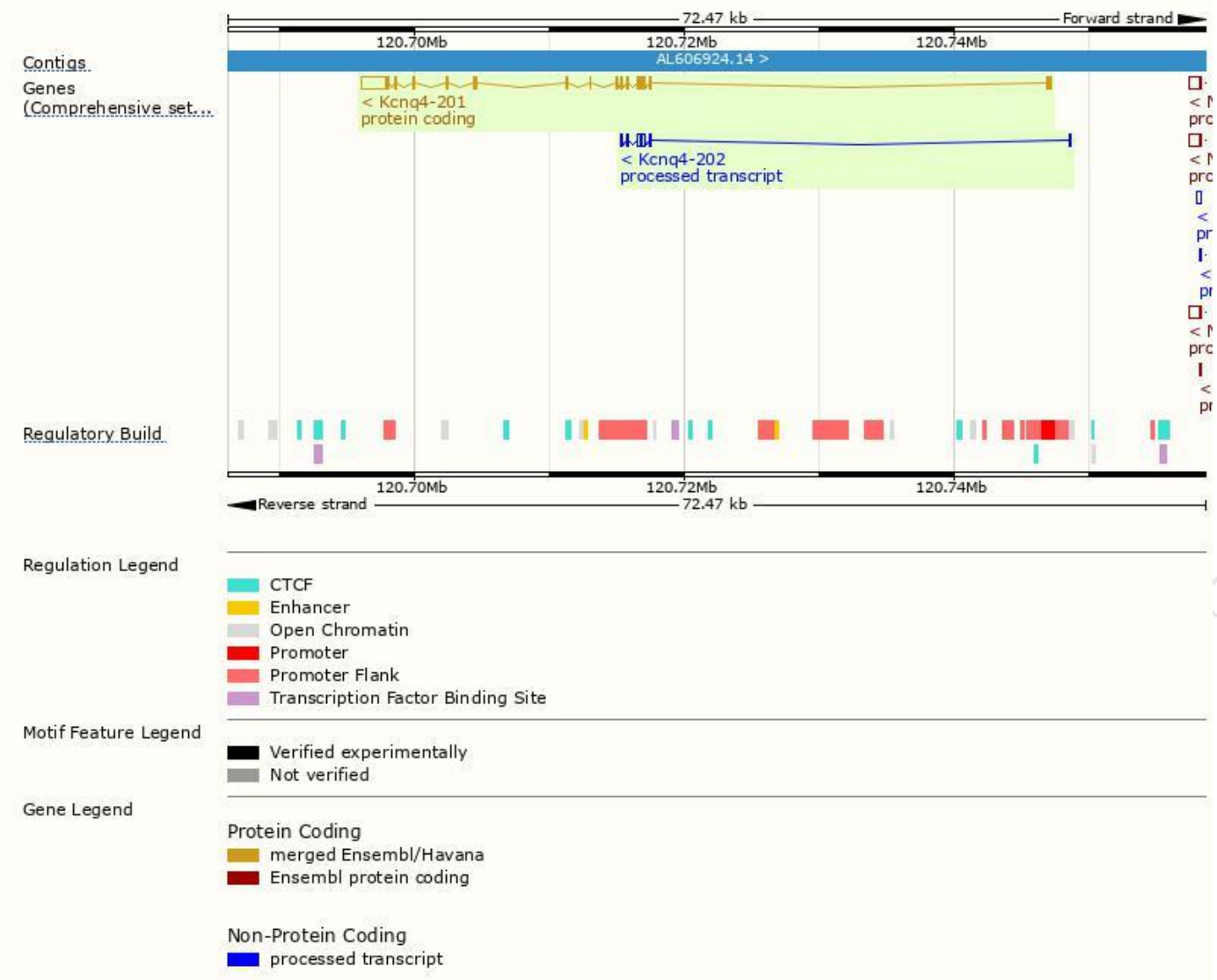
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kcnq4-201	ENSMUST00000030376.7	3919	696aa	Protein coding	CCDS38865	Q9JK97	TSL:5 GENCODE basic APPRIS P1
Kcnq4-202	ENSMUST00000129478.1	736	No protein	Processed transcript	-	-	TSL:3

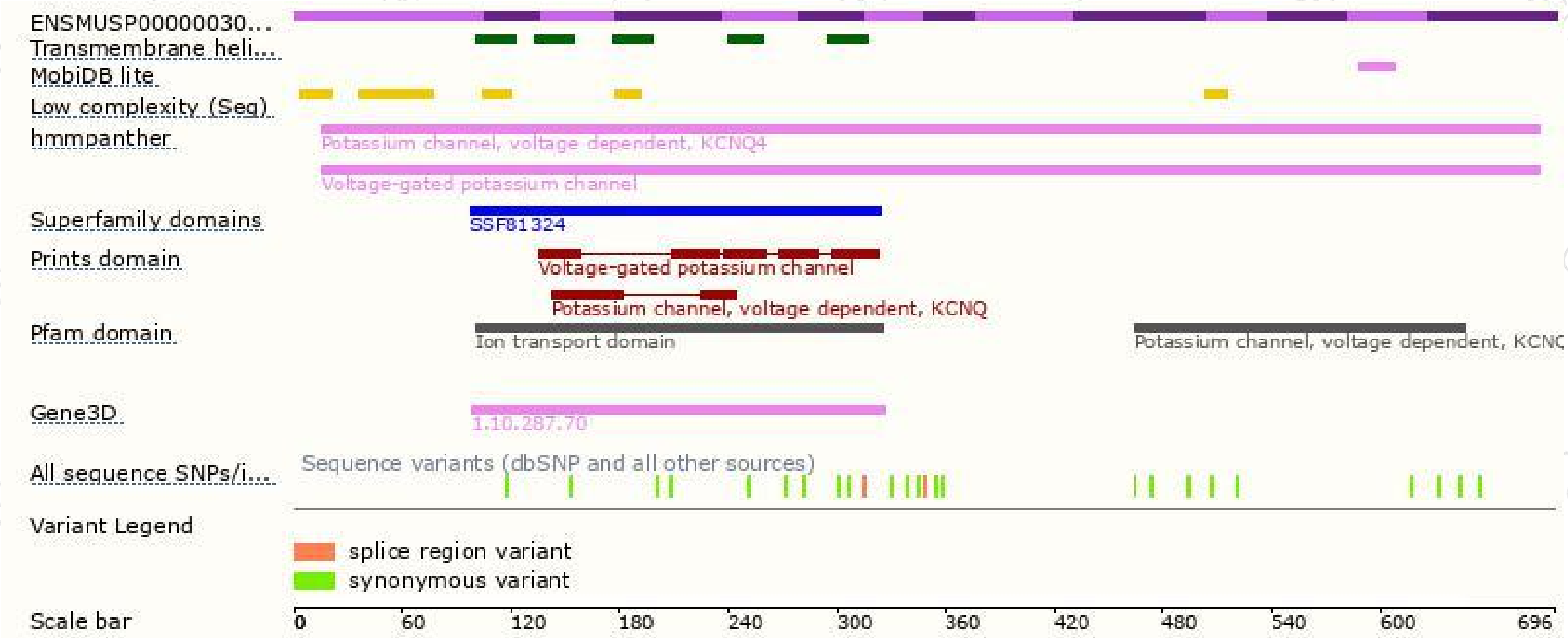
The strategy is based on the design of *Kcnq4-201* transcript,The transcription is shown below



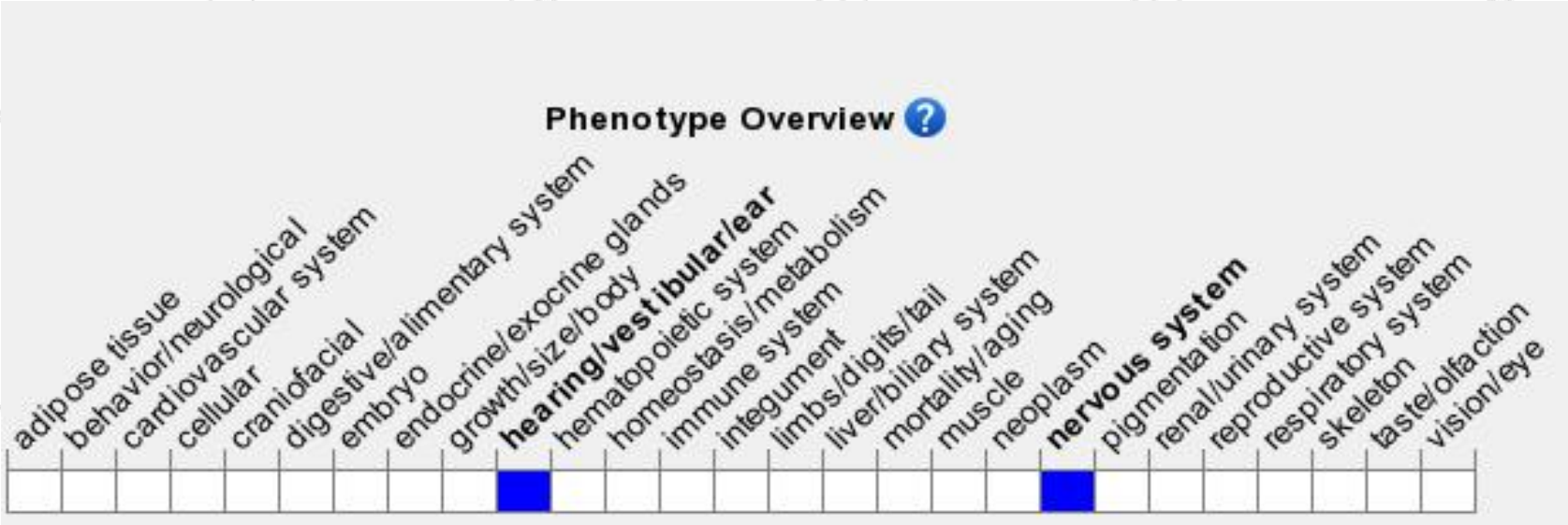
Genomic location distribution



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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