Kcna3 Cas9-KO Strategy

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Project Overview

Project Name	***Kcna3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kcna3* gene. The schematic diagram is as follows:

Technical routes

➢ The *Kcna3* gene has 1 transcript. According to the structure of *Kcna3* gene, exon1 of *Kcna3-201* (ENSMUST00000052718.4) transcript is recommended as the knockout region.The region contains all 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 *Kcna3* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

- According to the existing MGI data, Mice homozygous for a knock-out allele display no apparent immune system defects. Mice homozygous for a different knock-out allele show reduced body weight, increased basal metabolic rate, resistance to diet-induced obesity, increased insulin sensitivity, and altered peripheral glucose metabolism.
- The partial sequence of intron of *Gm27008* gene will be deleted together in this strategy.
- The knockout region is near to the N-terminal of *AI504432* gene,this strategy may influence the regulatory function of the N-terminal of *AI504432* gene.
- The *Kcna3* gene is located on the Chr3. 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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Kcna3 potassium voltage-gated channel, shaker-related subfamily, member 3 [*Mus musculus* (house mouse)]

Gene ID: 16491, updated on 10-Oct-2019

Summary

Official Symbol	Kcna3 provided by MGI
Official Full Name	potassium voltage-gated channel, shaker-related subfamily, member 3 provided by MGI
Primary source	MGI:MGI:96660
See related	Ensembl:ENSMUSG00000047959
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	Mk-3; Kv1.3; Kca1-3
Orthologs	human all

Genomic context

Location: 3 F2.3; 3 46.59 cM

See Kcna3 in Genome Data Viewer

Exon count: 1

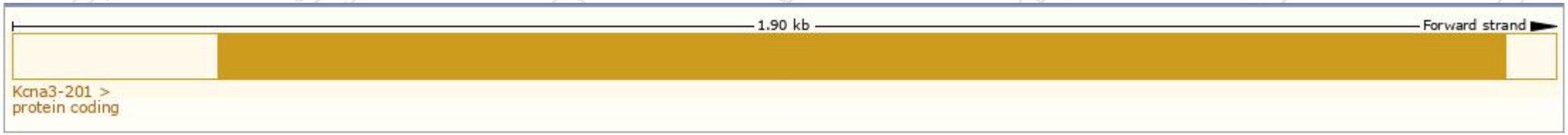
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	3	NC_000069.6 (107036162..107038129)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	3	NC_000069.5 (106839080..106841047)

Transcript information（Ensembl）

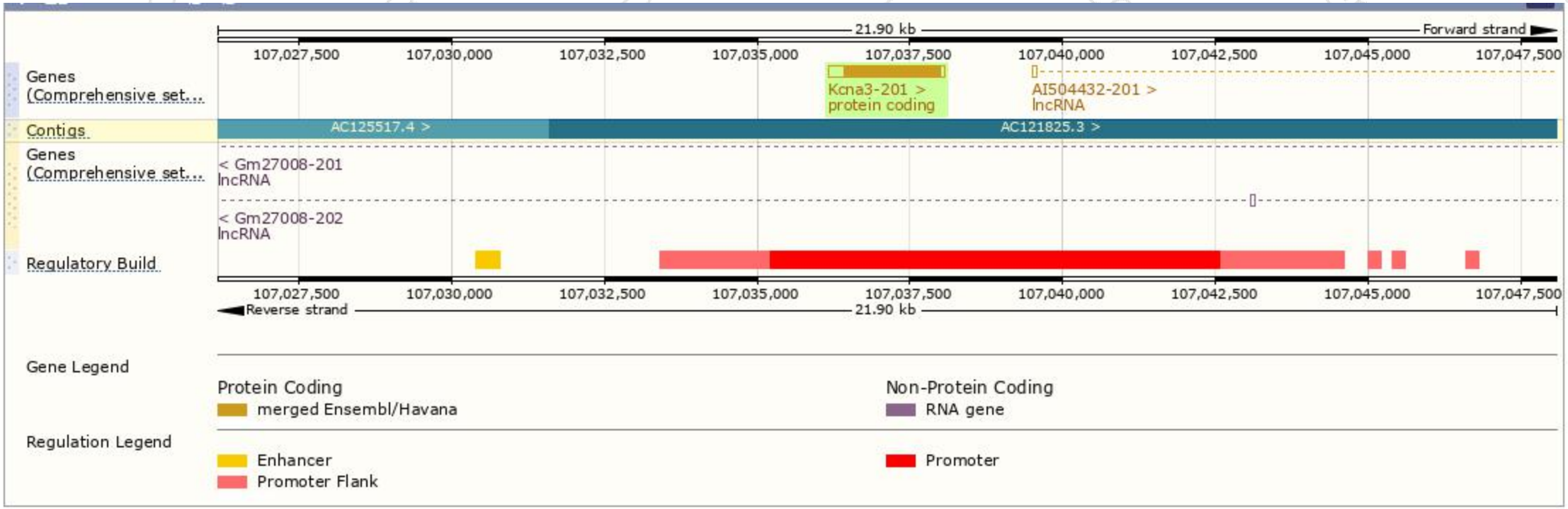
The gene has 1 transcript,the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kcna3-201	ENSMUST00000052718.4	1902	528aa	Protein coding	CCDS17730	P16390	TSL:NA GENCODE basic APPRIS P1

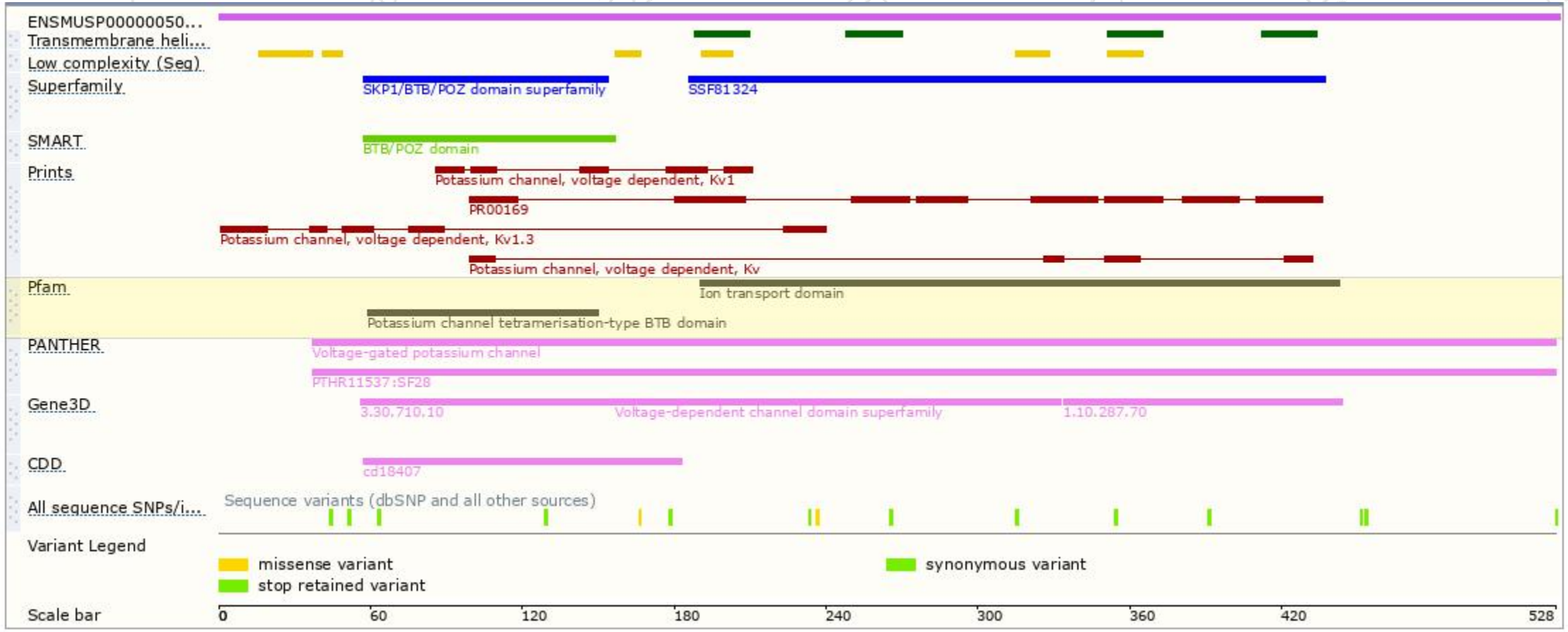
The strategy is based on the design of *Kcna3-201* transcript,The transcription is shown below



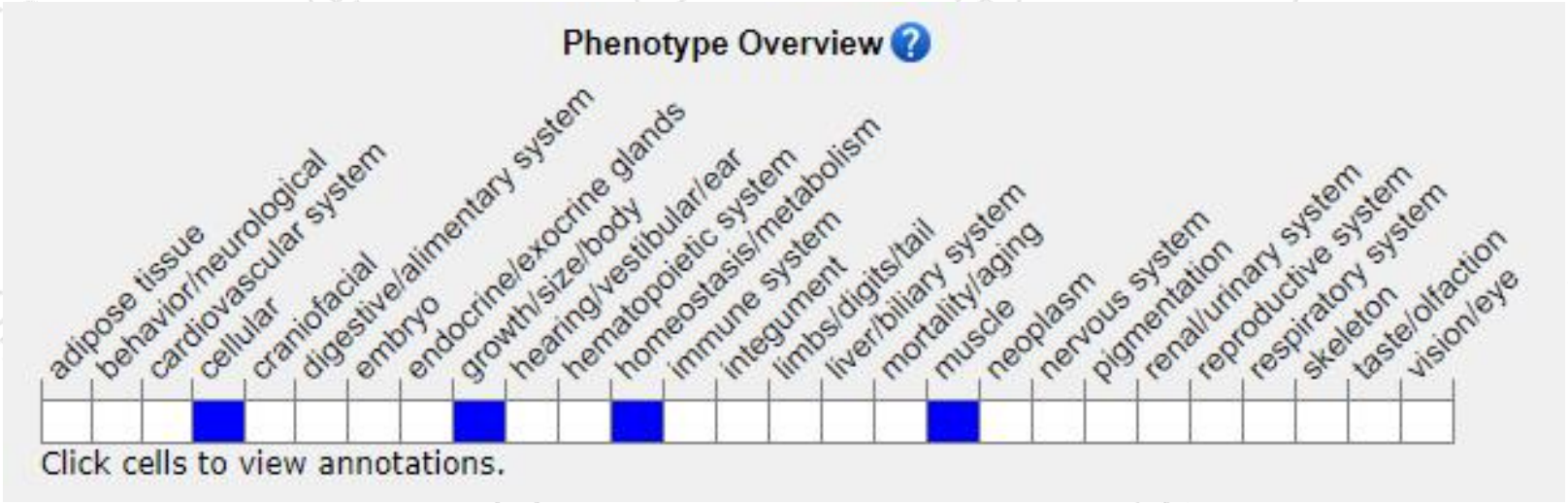
Genomic location distribution



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.

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