Scn2b Cas9-CKO Strategy

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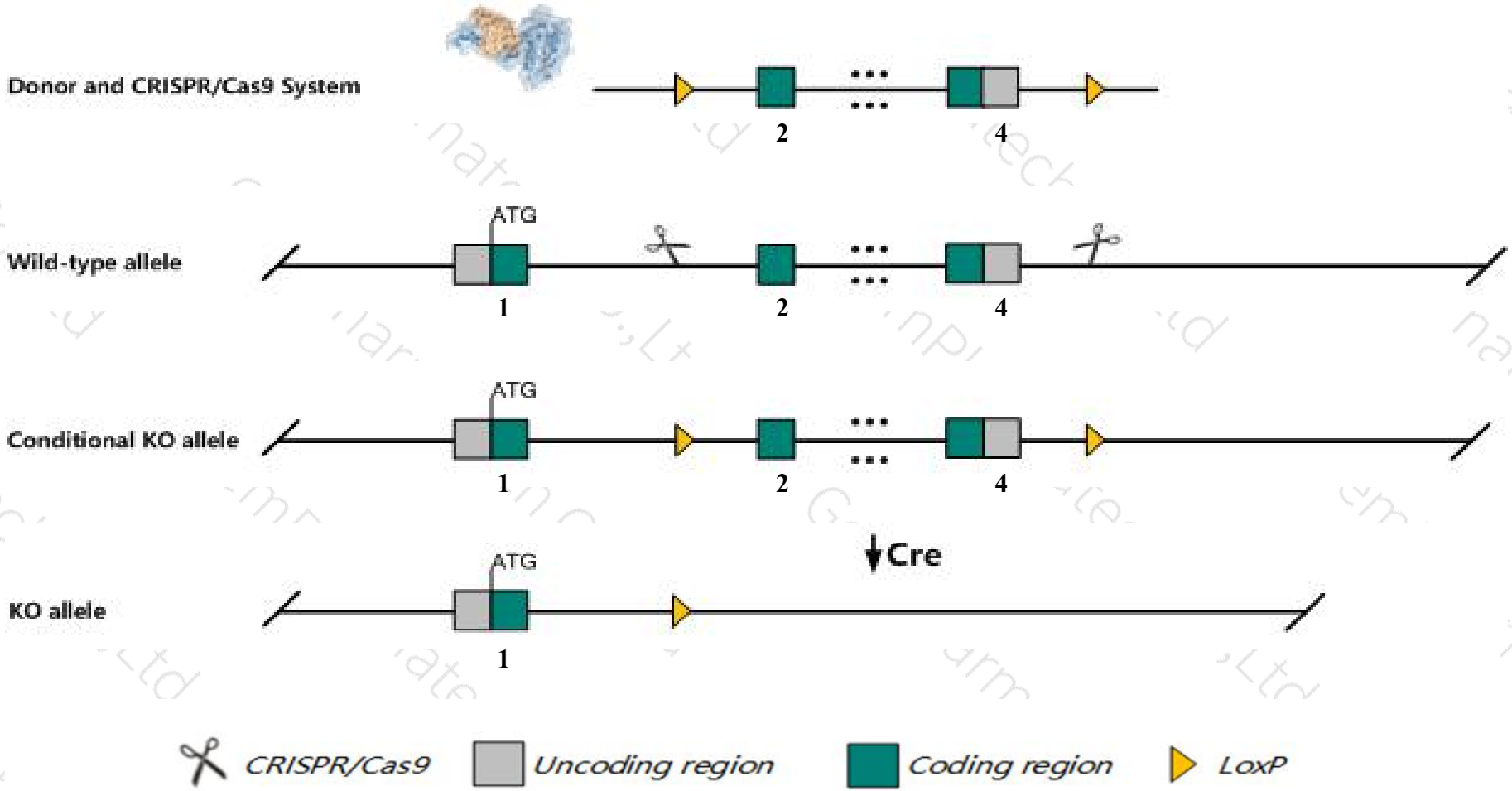
Project Overview

Project Name	***Scn2b***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Scn2b* gene. The schematic diagram is as follows:



Technical routes

- The *Scn2b* gene has 2 transcripts. According to the structure of *Scn2b* gene, exon2-exon4 of *Scn2b-202* (ENSMUST00000170998.8) 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 *Scn2b* 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 knock-out allele display decreased sodium channel density, altered voltage dependence of inactivation, and increased susceptibility to pilocarpine-induced seizures but appear normal in other neurological tests. Impaired glucose tolerance in homozygous mutant males is seen.

➢ The flox region overlap with part of the Gm10684 gene, which may affect the regulation of this gene.

➢ The *Scn2b* gene is located on the Chr9. 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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Scn2b sodium channel, voltage-gated, type II, beta [*Mus musculus* (house mouse)]

Gene ID: 72821, updated on 13-Mar-2020

Summary

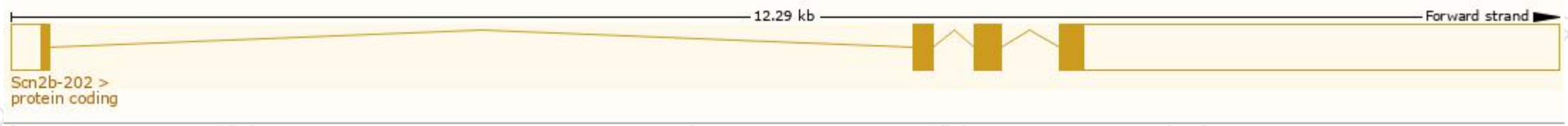
Official Symbol	Scn2b provided by MGI
Official Full Name	sodium channel, voltage-gated, type II, beta provided by MGI
Primary source	MGI:MGI:106921
See related	Ensembl:ENSMUSG00000070304
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gm183; AI840361; 2810451E09Rik
Expression	Biased expression in cerebellum adult (RPKM 40.5), cortex adult (RPKM 29.4) and 6 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

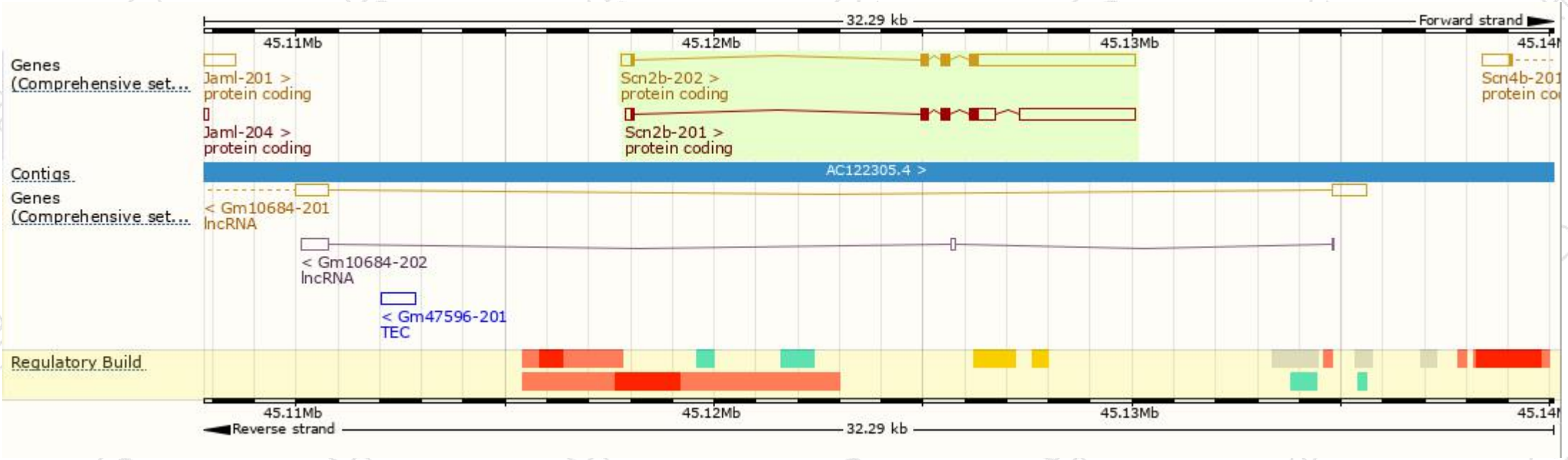
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Scn2b-202	ENSMUST00000170998.8	4656	215aa	Protein coding	CCDS40606	Q1MXF8 Q56A07	TSL:1 GENCODE basic APPRIS P1
Scn2b-201	ENSMUST00000093855.3	3958	215aa	Protein coding	CCDS40606	Q1MXF8 Q56A07	TSL:2 GENCODE basic APPRIS P1

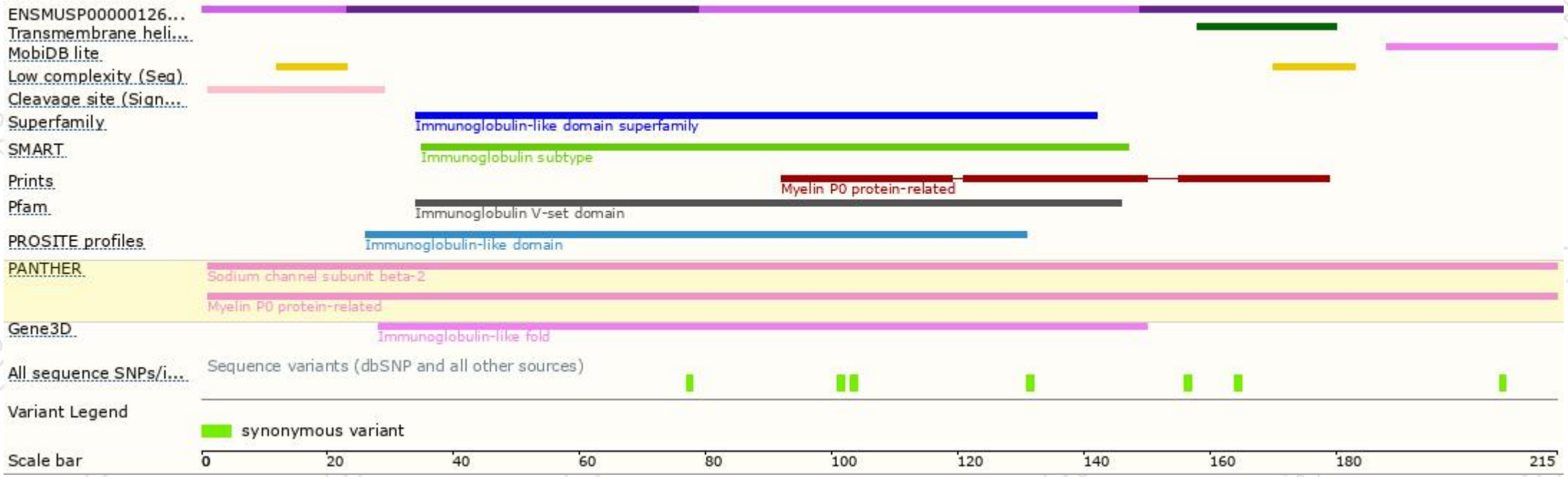
The strategy is based on the design of *Scn2b-202* transcript,The transcription is shown below



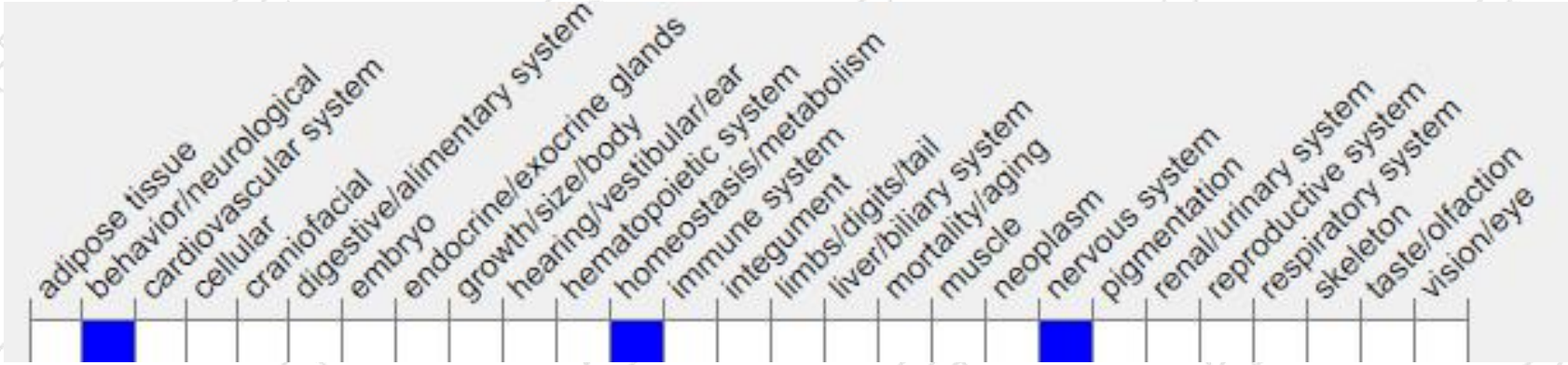
Genomic location distribution



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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