Scnn1g Cas9-CKO Strategy

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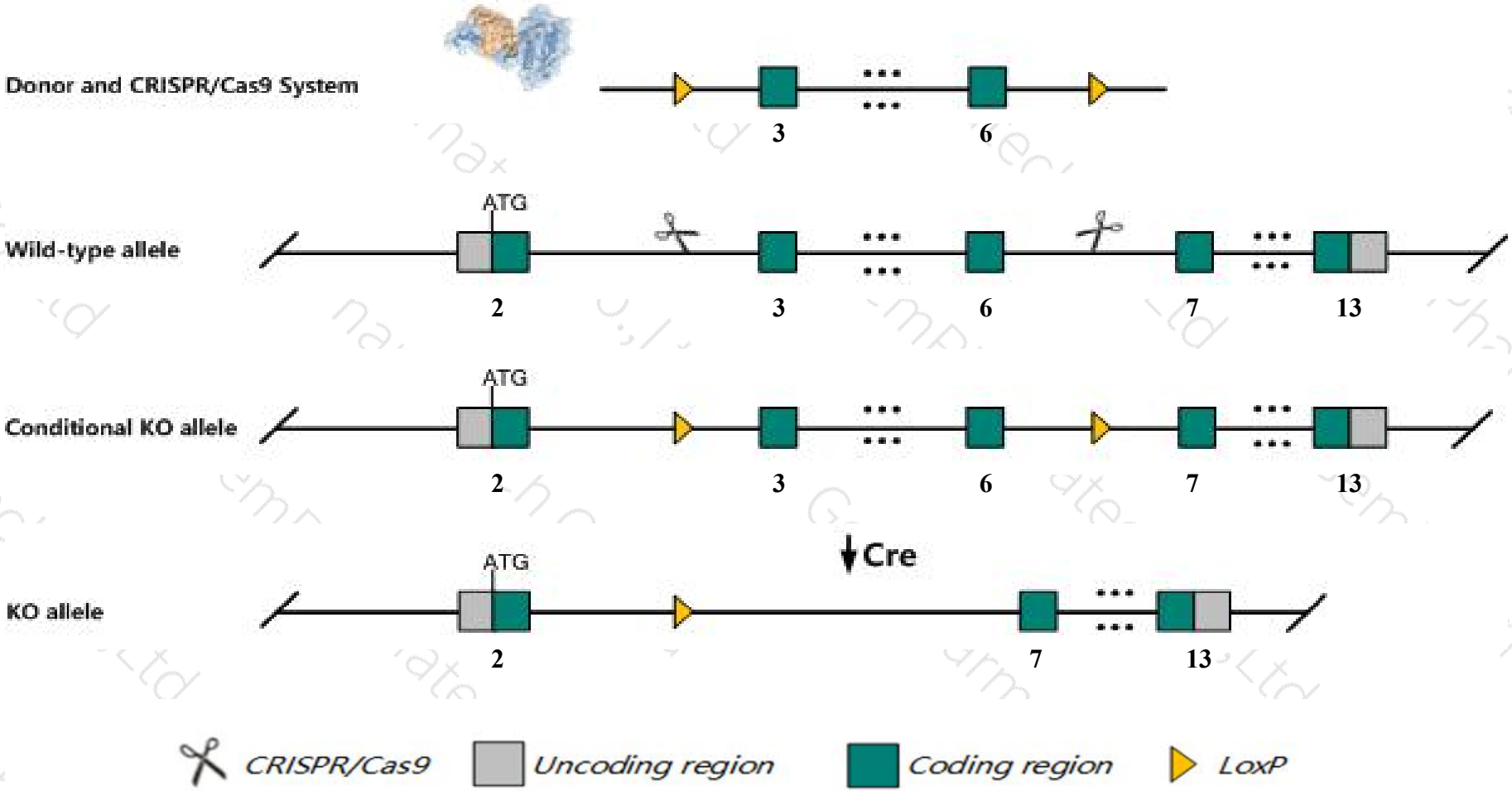
Design Date: 2020-4-27

Project Overview

Project Name	***Scnn1g***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Scnn1g* gene. The schematic diagram is as follows:



Technical routes

- The *Scnn1g* gene has 1 transcript. According to the structure of *Scnn1g* gene, exon3-exon6 of *Scnn1g-201* (ENSMUST00000000221.5) transcript is recommended as the knockout region.The region contains 778bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Scnn1g* 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 mutation of this gene results in partial lethality between 24-36 hours after birth. newborns exhibit hyperkalemia, clear lung liquid more slowly, and show low urinary potassium and high urinary sodium concentrations.
- The *Scnn1g* gene is located on the Chr7. 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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Scnn1g sodium channel, nonvoltage-gated 1 gamma [*Mus musculus* (house mouse)]

Gene ID: 20278, updated on 13-Mar-2020

Summary

Official Symbol	Scnn1g provided by MGI
Official Full Name	sodium channel, nonvoltage-gated 1 gamma provided by MGI
Primary source	MGI:MGI:104695
See related	Ensembl:ENSMUSG00000000216
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	SCNEG
Summary	This gene encodes the gamma subunit of the epithelial sodium channel, a member of the amiloride-sensitive sodium channel family of proteins. This channel regulates sodium homeostasis and blood pressure, by controlling sodium transport in the kidney, colon and lung. Proteolytic processing of the encoded protein results in the release of an inhibitory peptide and channel activation. Homozygous knockout mice for this gene exhibit perinatal lethality, likely due to excess serum potassium. [provided by RefSeq, Oct 2015]
Expression	Biased expression in lung adult (RPKM 55.1), kidney adult (RPKM 20.3) and 1 other tissue See more
Orthologs	human all

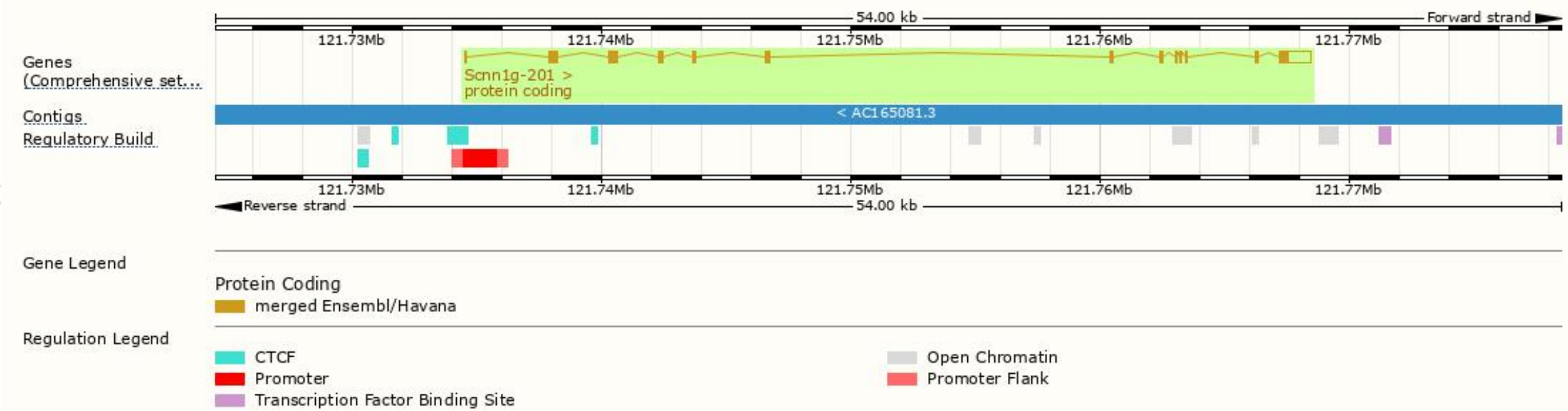
Transcript information（Ensembl）

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

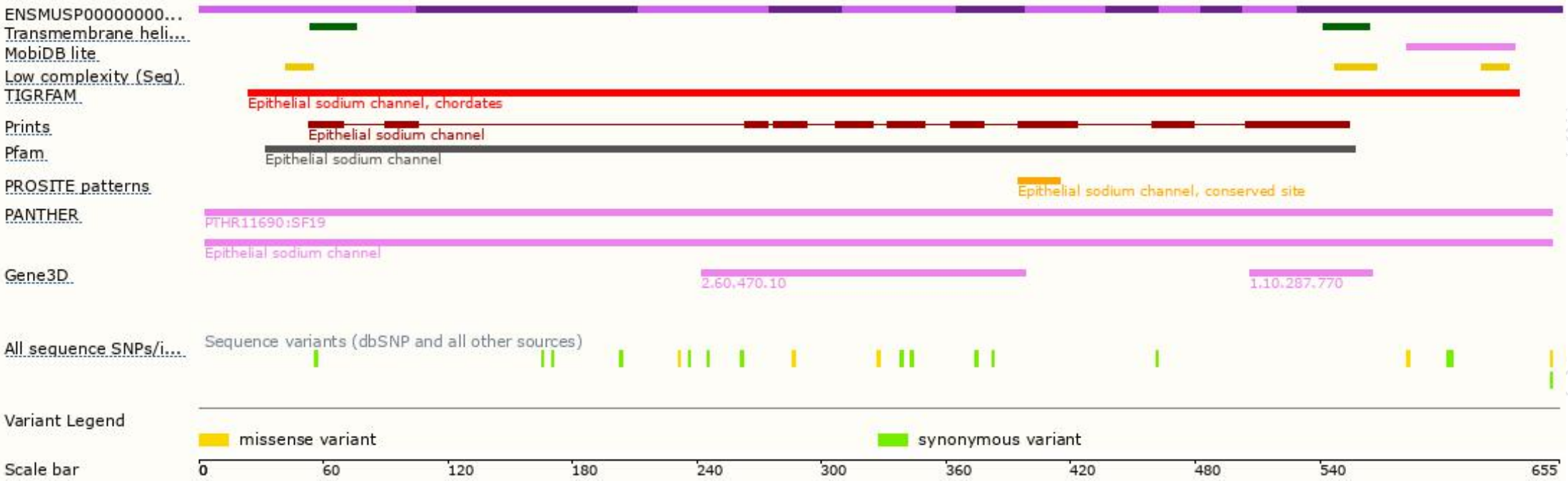
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Scnn1g-201	ENSMUST00000000221.5	2991	655aa	Protein coding	CCDS21803	Q9WU39	TSL:1 GENCODE basic APPRIS P1

The strategy is based on the design of *Scnn1g-201* transcript, the transcription is shown below

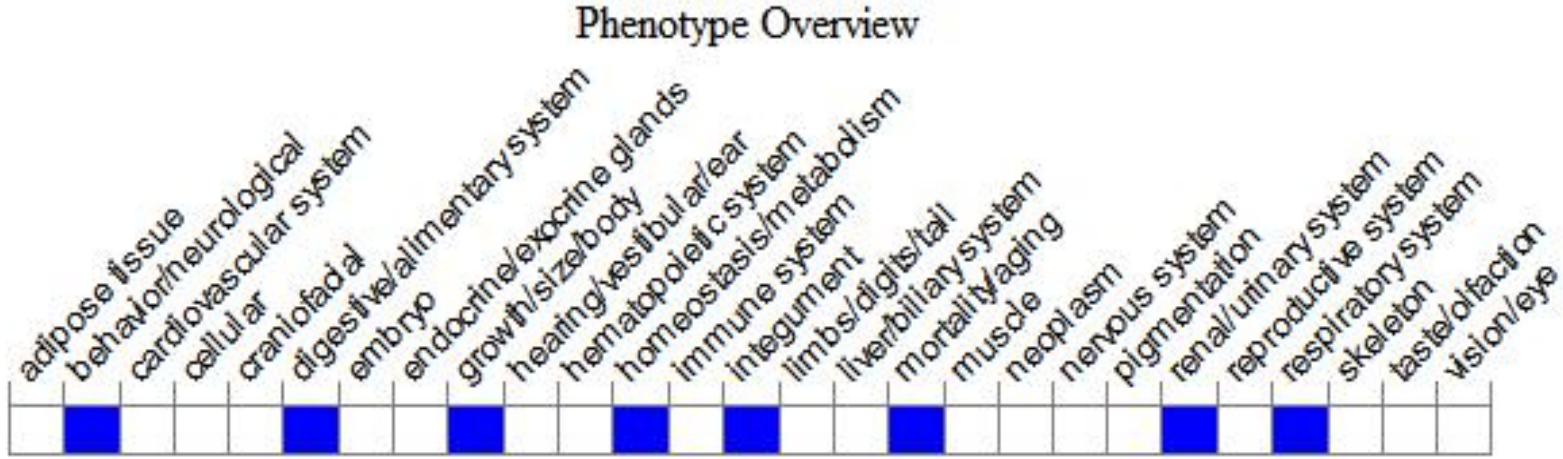
Genomic location distribution



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/).

According to the existing MGI data, homozygous mutation of this gene results in partial lethality between 24-36 hours after birth. Newborns exhibit hyperkalemia, clear lung liquid more slowly, and show low urinary potassium and high urinary sodium concentrations.

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If you have any questions, you are welcome to inquire.

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