Nkx2-9 Cas9-KO Strategy

Designer: JiaYu

Reviewer: Xiaojing Li

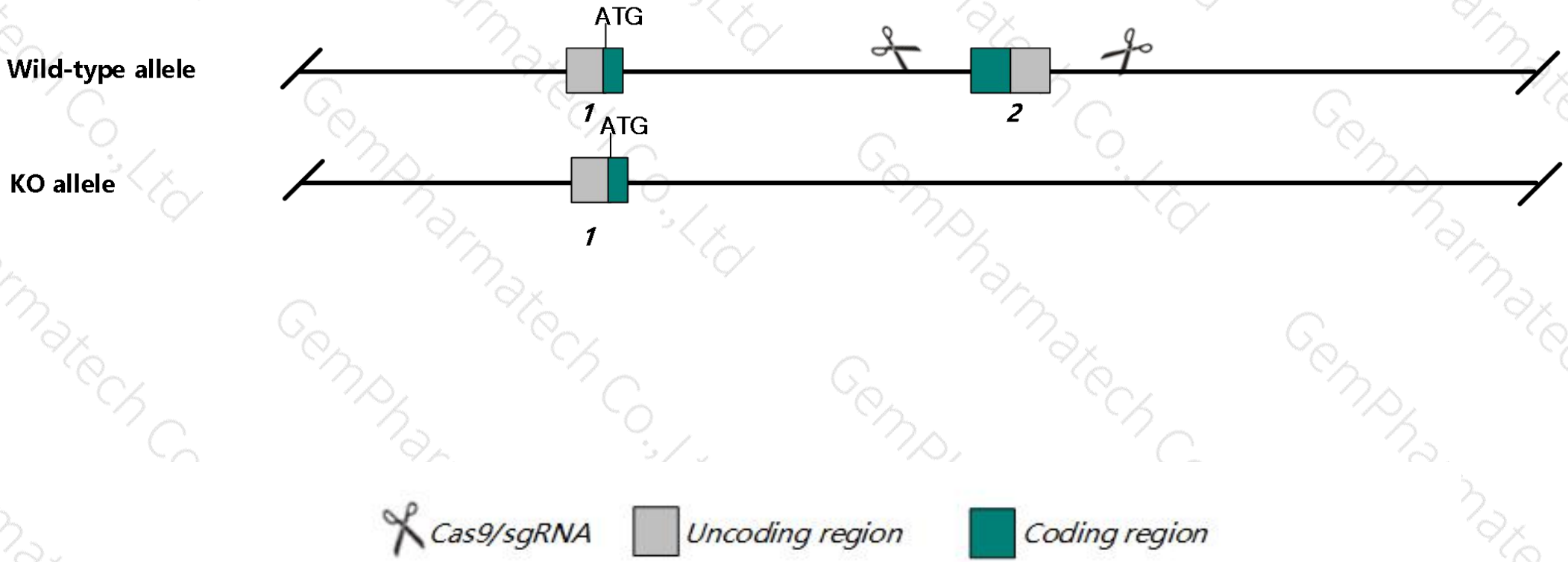
Design Date: 2020-3-17

Project Overview

Project Name	***Nkx2-9***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nkx2-9* gene. The schematic diagram is as follows:



Technical routes

➢ The *Nkx2-9* gene has 1 transcript. According to the structure of *Nkx2-9* gene, exon2 of *Nkx2-9-201* (ENSMUST00000072631.5) 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 *Nkx2-9* gene. The brief process is as follows: CRISPR/Cas9 systen

Notice

➢ According to the existing MGI data,Mutant mice lacking both functional copies of the gene are viable and fertile but display abnormal development of the spinal accessory nerve. Another mutant exhibits progressive bronchial dysplasia leading to lung cancer in aged mutants.

➢ The *Nkx2-9* gene is located on the Chr12. 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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Nkx2-9 NK2 homeobox 9 [*Mus musculus* (house mouse)]

Gene ID: 18094, updated on 13-Mar-2020

Summary

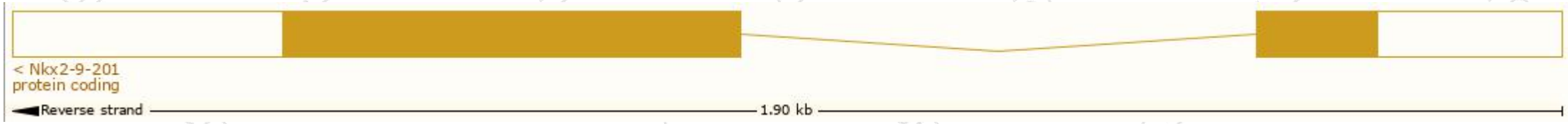
Official Symbol	Nkx2-9 provided by MGI
Official Full Name	NK2 homeobox 9 provided by MGI
Primary source	MGI:MGI:1270158
See related	Ensembl:ENSMUSG00000058669
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Nkx2-8; Nkx2.9; tinman; Nkx-2.9
Expression	Biased expression in cerebellum adult (RPKM 1.1), CNS E11.5 (RPKM 0.9) and 11 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

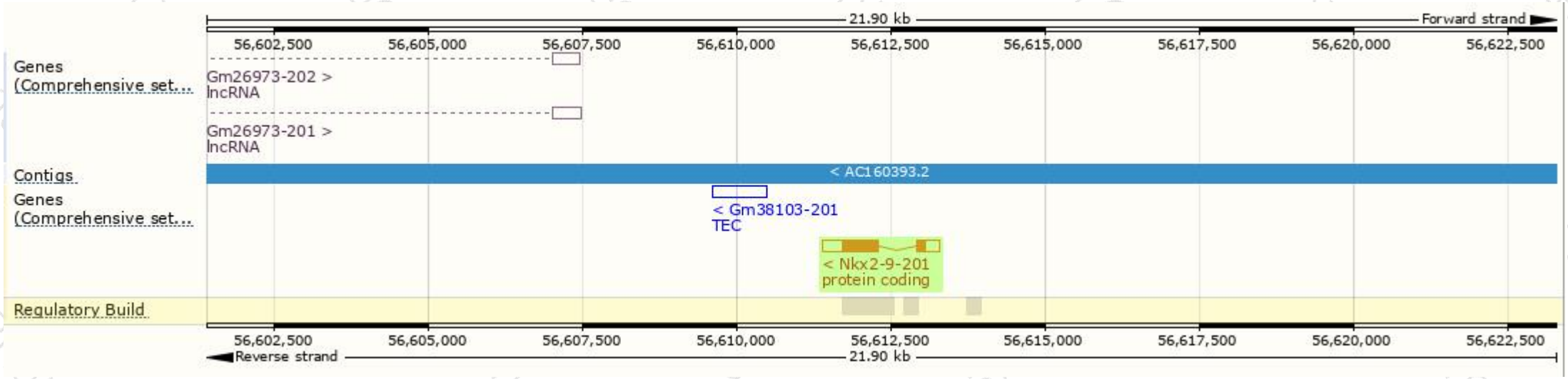
The gene has 1 transcript,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nkx2-9-201	ENSMUST00000072631.5	1264	235aa	Protein coding	CCDS25923	O70584	TSL:1 GENCODE basic APPRIS P1

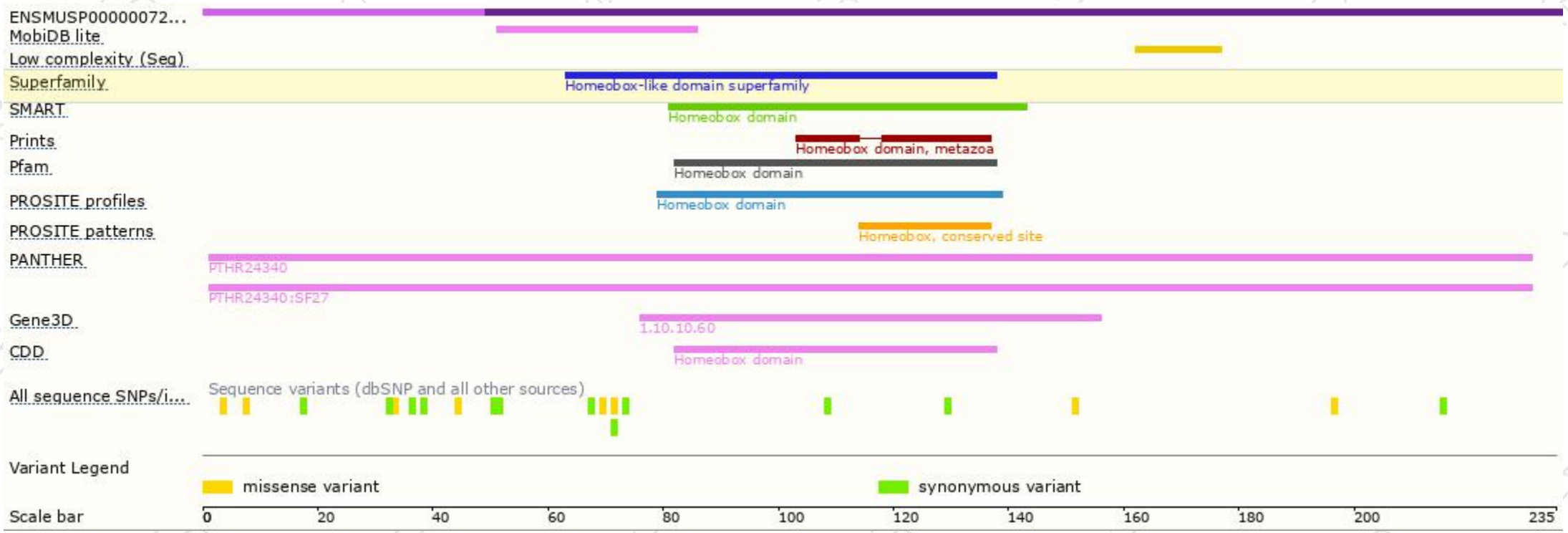
The strategy is based on the design of *Nkx2-9-201* transcript,The transcription is shown below



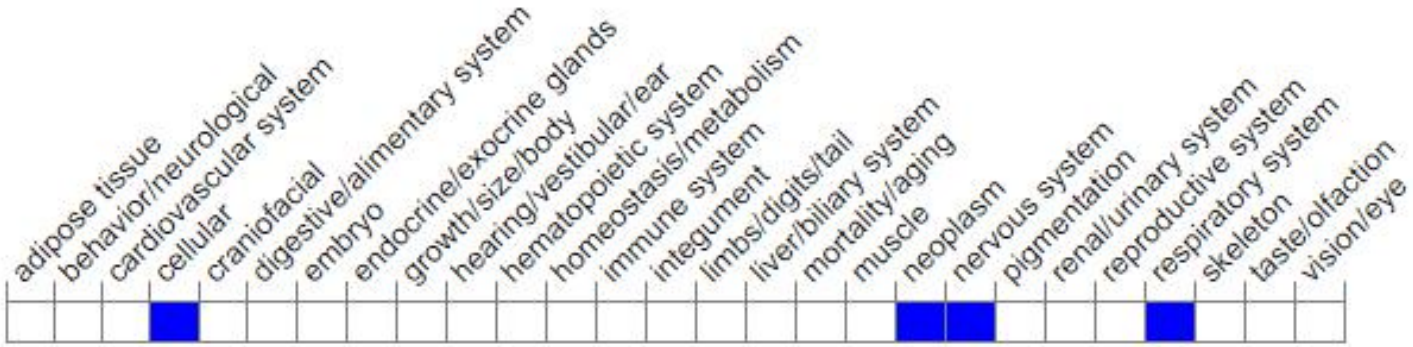
Genomic location distribution



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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