

Sp4 Cas9-KO Strategy

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Project Overview

Project Name

Sp4

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Sp4* gene. The schematic diagram is as follows:



- The *Sp4* gene has 3 transcripts. According to the structure of *Sp4* gene, exon1-exon3 of *Sp4*-203(ENSMUST00000222314.2) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sp4* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, homozygotes for targeted null mutations exhibit cardiac arrhythmias and most die shortly after birth. Surviving males complete spermatogenesis but do not copulate, while females show delayed sexual maturation and reduction in spleen, thymus, and uterus.
- The *Sp4* 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.

Sp4 trans-acting transcription factor 4 [Mus musculus (house mouse)]

Gene ID: 20688, updated on 17-Dec-2020

Summary



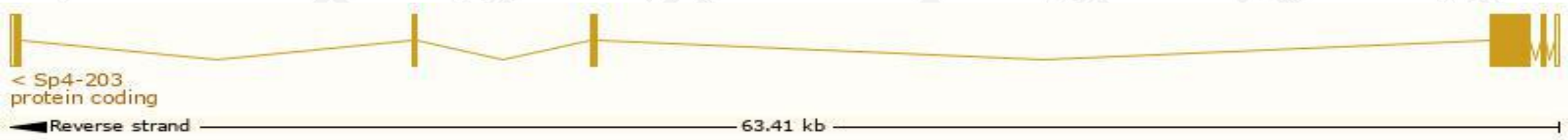
Official Symbol	Sp4 provided by MGI
Official Full Name	trans-acting transcription factor 4 provided by MGI
Primary source	MGI:MGI:107595
See related	Ensembl:ENSMUSG00000025323
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	5730497N03Rik, HF-1b, HF1-b
Expression	Broad expression in whole brain E14.5 (RPKM 2.8), CNS E14 (RPKM 2.6) and 23 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

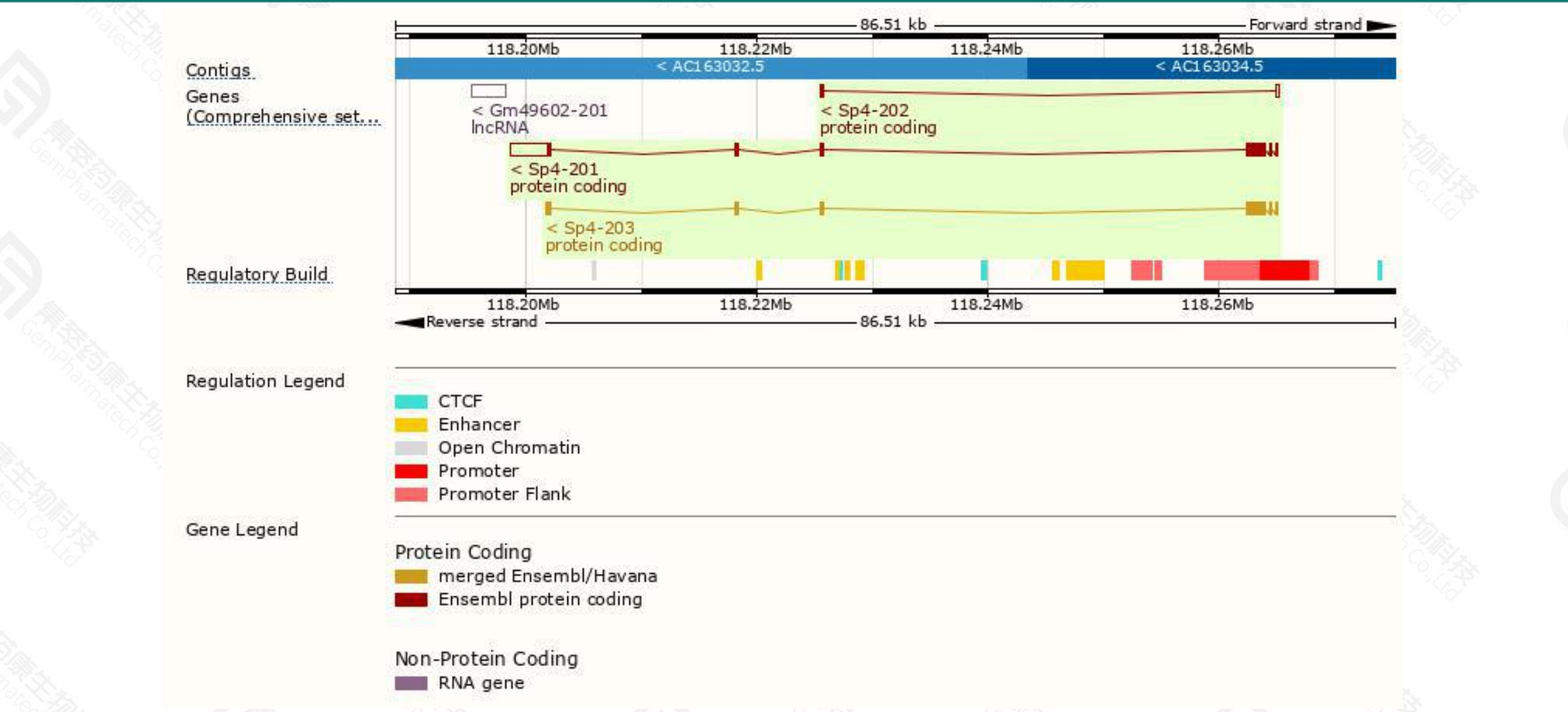
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sp4-203	ENSMUST00000222314.2	2677	782aa	Protein coding	CCDS36579		TSL:1 , GENCODE basic , APPRIS P2 ,
Sp4-201	ENSMUST0000026367.11	5694	780aa	Protein coding	-		TSL:1 , GENCODE basic , APPRIS ALT2 ,
Sp4-202	ENSMUST00000221844.2	378	57aa	Protein coding	-		CDS 3' incomplete , TSL:3 ,

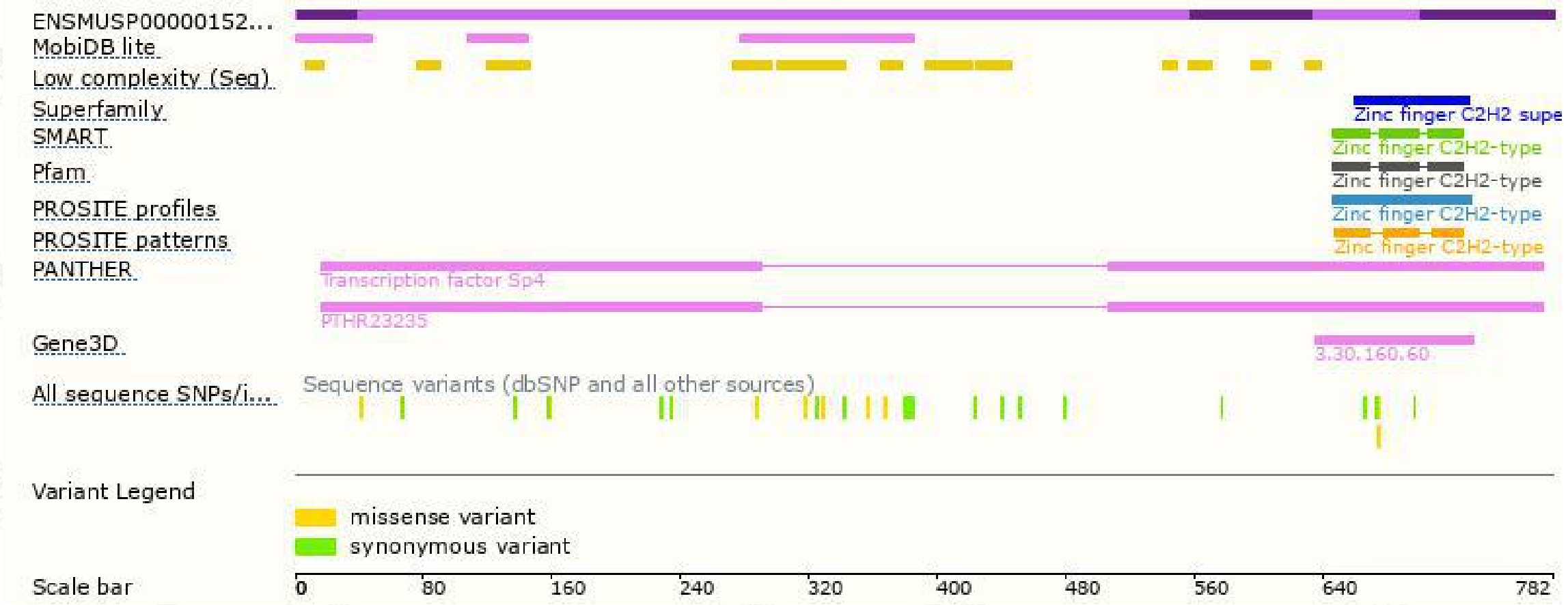
The strategy is based on the design of *Sp4-203* transcript,the transcription is shown below:



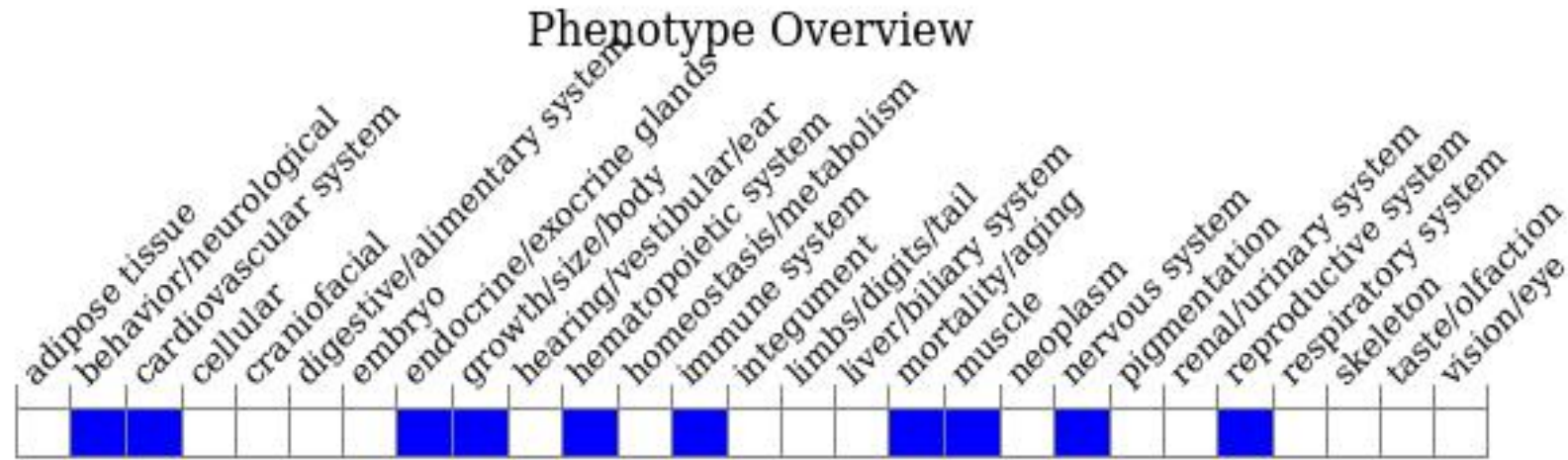
Genomic location distribution



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, homozygotes for targeted null mutations exhibit cardiac arrhythmias and most die shortly after birth. Surviving males complete spermatogenesis but do not copulate, while females show delayed sexual maturation and reduction in spleen, thymus, and uterus.

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