Spin1 Cas9-KO Strategy

Designer: Jiayuan Yao

Reviewer: Rui Xiong

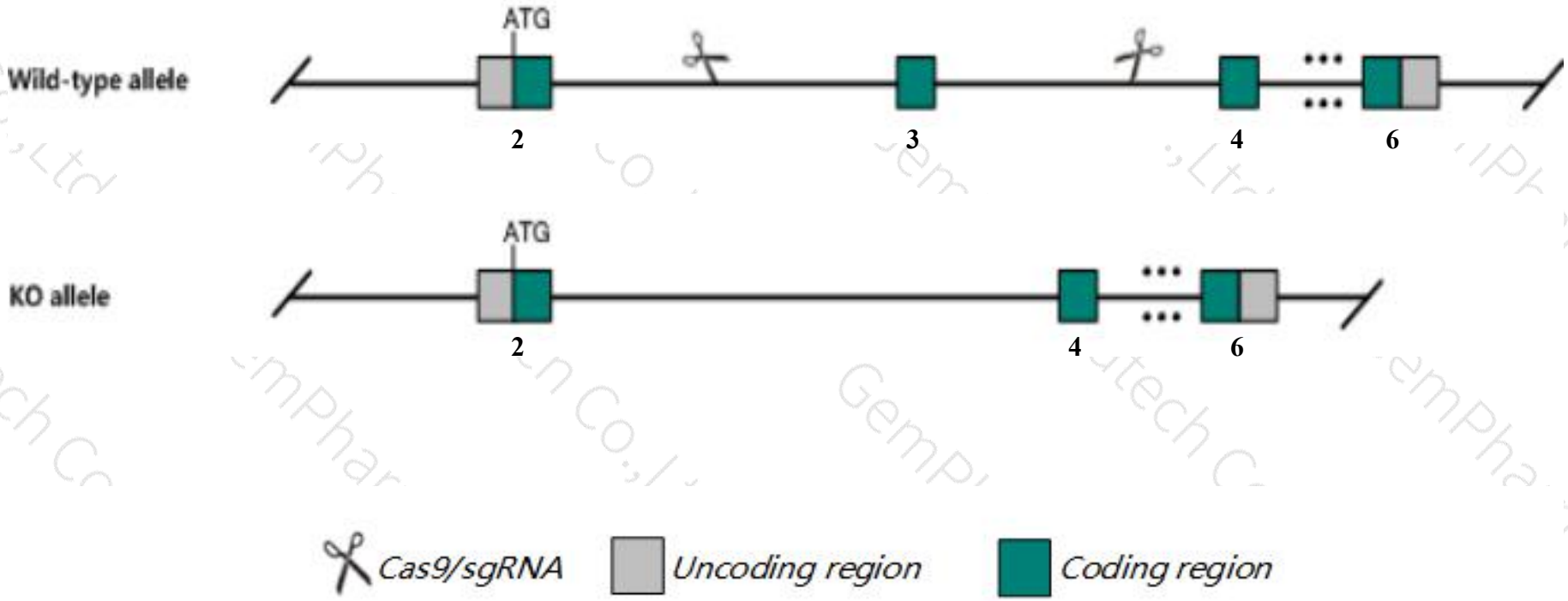
Design Date: 2020-12-1

Project Overview

Project Name	***Spin1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Spin1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Spin1* gene has 2 transcripts. According to the structure of *Spin1* gene, exon3 of *Spin1-201*(ENSMUST00000095797.5) transcript is recommended as the knockout region.The region contains 49bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Spin1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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 gene trapped allele display complete postnatal lethality. Although mutant female mice exhibit normal follicular development and oocyte growth, fully grown oocytes are defective in resuming meiosis.

➢ The *Spin1* gene is located on the Chr13. 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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Spin1 spindlin 1 [Mus musculus (house mouse)]

Gene ID: 20729, updated on 20-Mar-2020

Summary

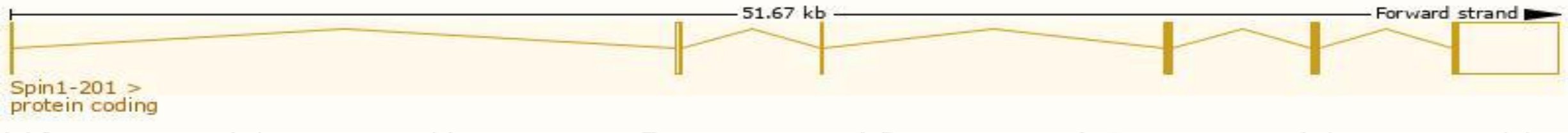
Official Symbol	Spin1 provided by MGI
Official Full Name	spindlin 1 provided by MGI
Primary source	MGI:MGI:109242
See related	Ensembl:ENSMUSG00000021395
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Spin
Expression	Ubiquitous expression in CNS E18 (RPKM 12.2), whole brain E14.5 (RPKM 10.6) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

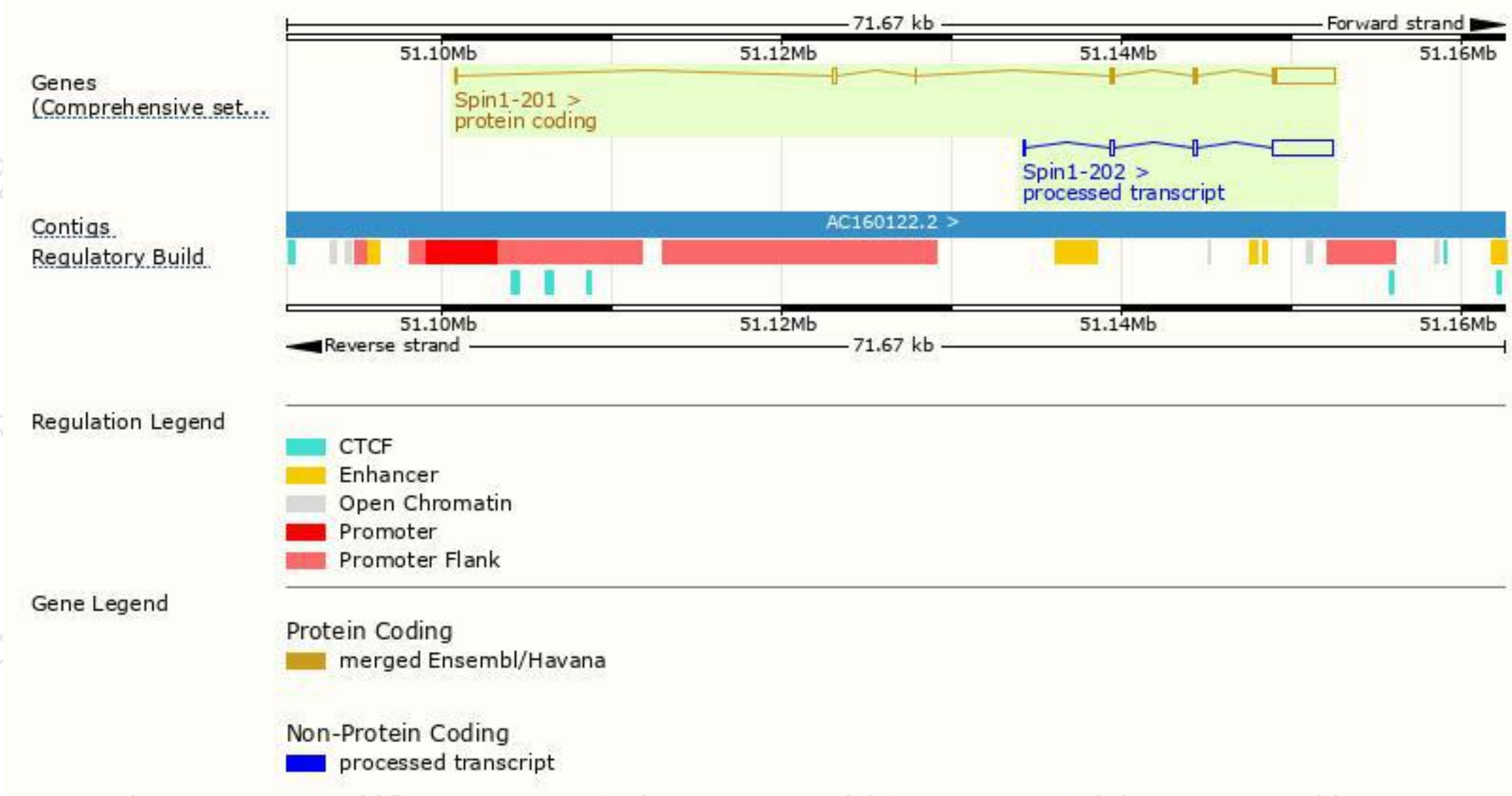
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Spin1-201	ENSMUST00000095797.5	4434	262aa	Protein coding	CCDS26510	Q61142	TSL:1 GENCODE basic APPRIS P1
Spin1-202	ENSMUST00000223152.1	4085	No protein	Processed transcript	-	-	TSL:1

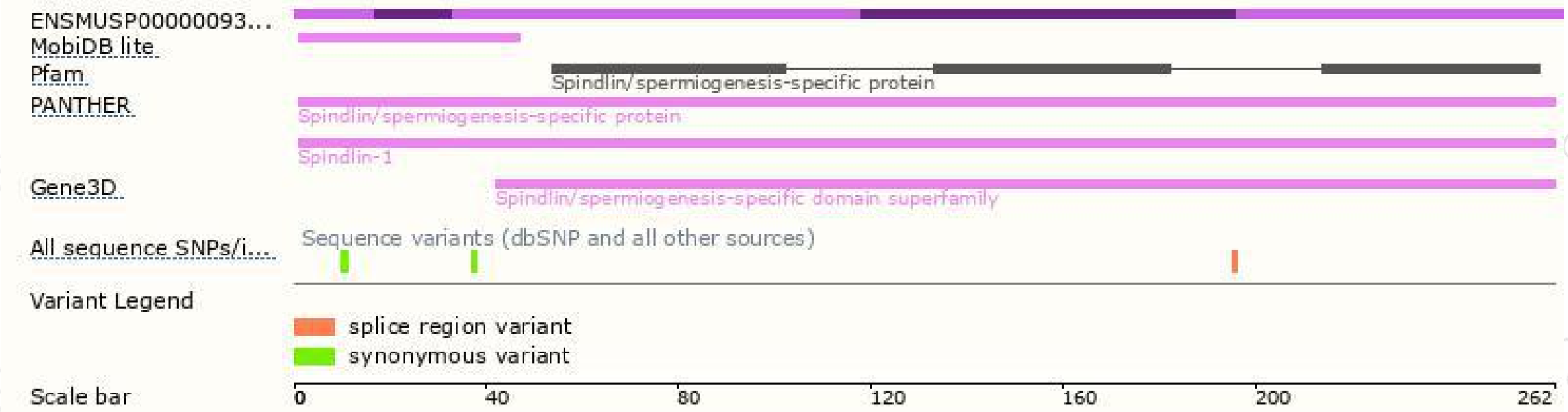
The strategy is based on the design of *Spin1-201* transcript,the transcription is shown below:



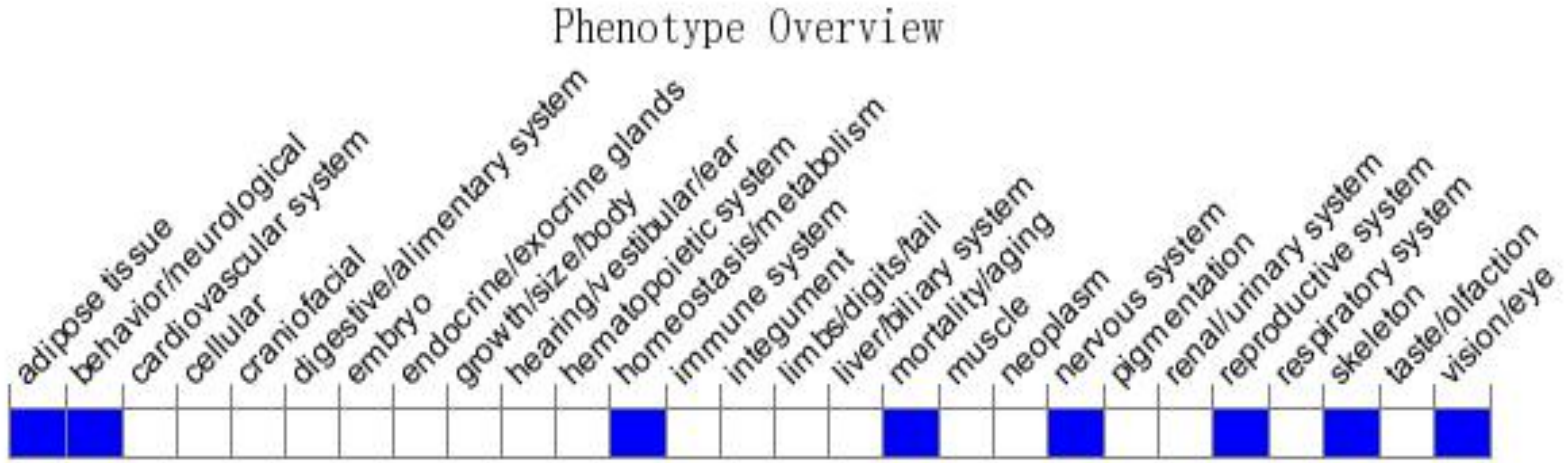
Genomic location distribution



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: 025-5864 1534

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GemPharmatech Co.,Ltd