Msi1 Cas9-KO Strategy

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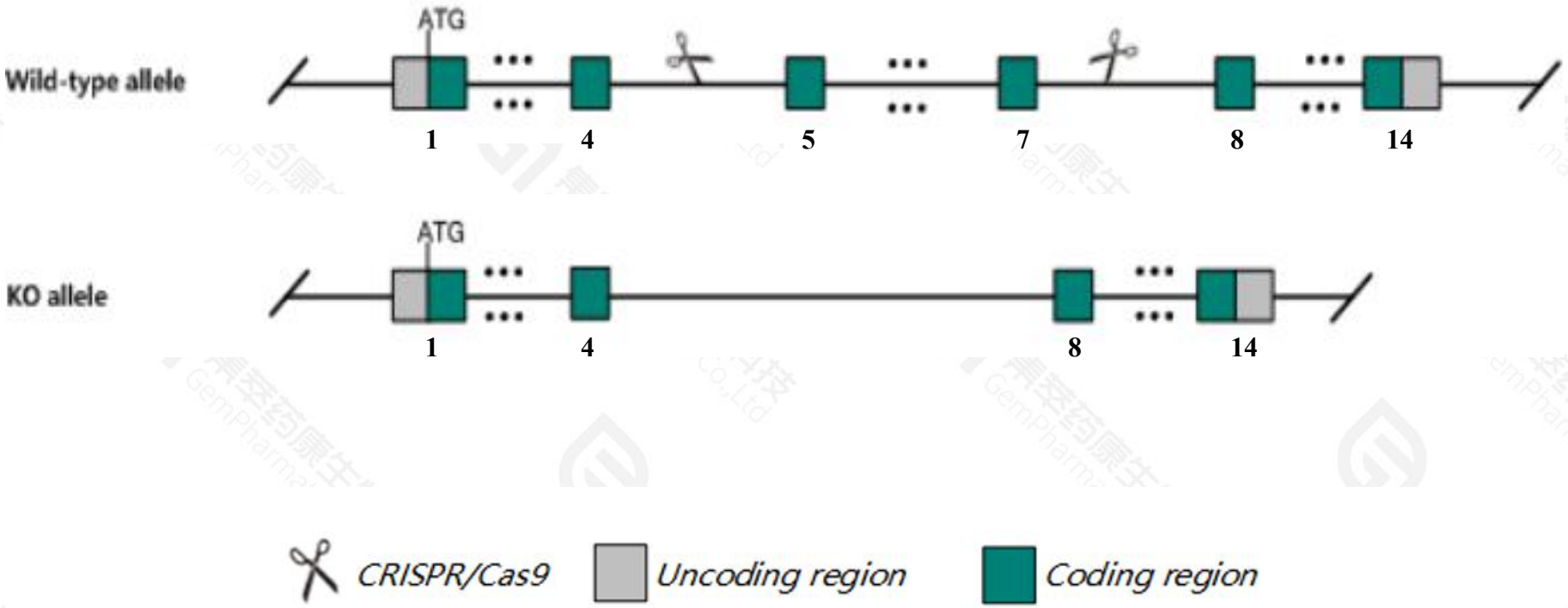
Design Date: 2021-5-11

Project Overview

Project Name	***Msi1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Msi1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Msi1* gene has 9 transcripts. According to the structure of *Msi1* gene, exon5-exon7 of *Msi1-208*(ENSMUST00000150779.8) transcript is recommended as the knockout region.The region contains 184bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Msi1* 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.

Notice

➢ According to the existing MGI data,most homozygous null mice develop hydrocephalus associated with progressive ventricular dilation, a large domed cranium, thin cerebral cortices, callosal agenesis, aberrant proliferation and polyposis of ependymal cells, intracerebral bleeding, ataxia, dehydration and death at 1-2 months of age.

➢ *4930430O22Rik* gene will be deleted.

➢ The *Msi1* gene is located on the Chr5. 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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Msi1 musashi RNA-binding protein 1 [Mus musculus (house mouse)]

Gene ID: 17690, updated on 13-Mar-2020

Summary

Official Symbol	Msi1 provided by MGI
Official Full Name	musashi RNA-binding protein 1 provided by MGI
Primary source	MGI:MGI:107376
See related	Ensembl:ENSMUSG00000054256
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	Msi1h, Musahi1, m-Msi-1
Expression	Biased expression in CNS E11.5 (RPKM 68.1), whole brain E14.5 (RPKM 37.5) and 9 other tissues See more
Orthologs	human all

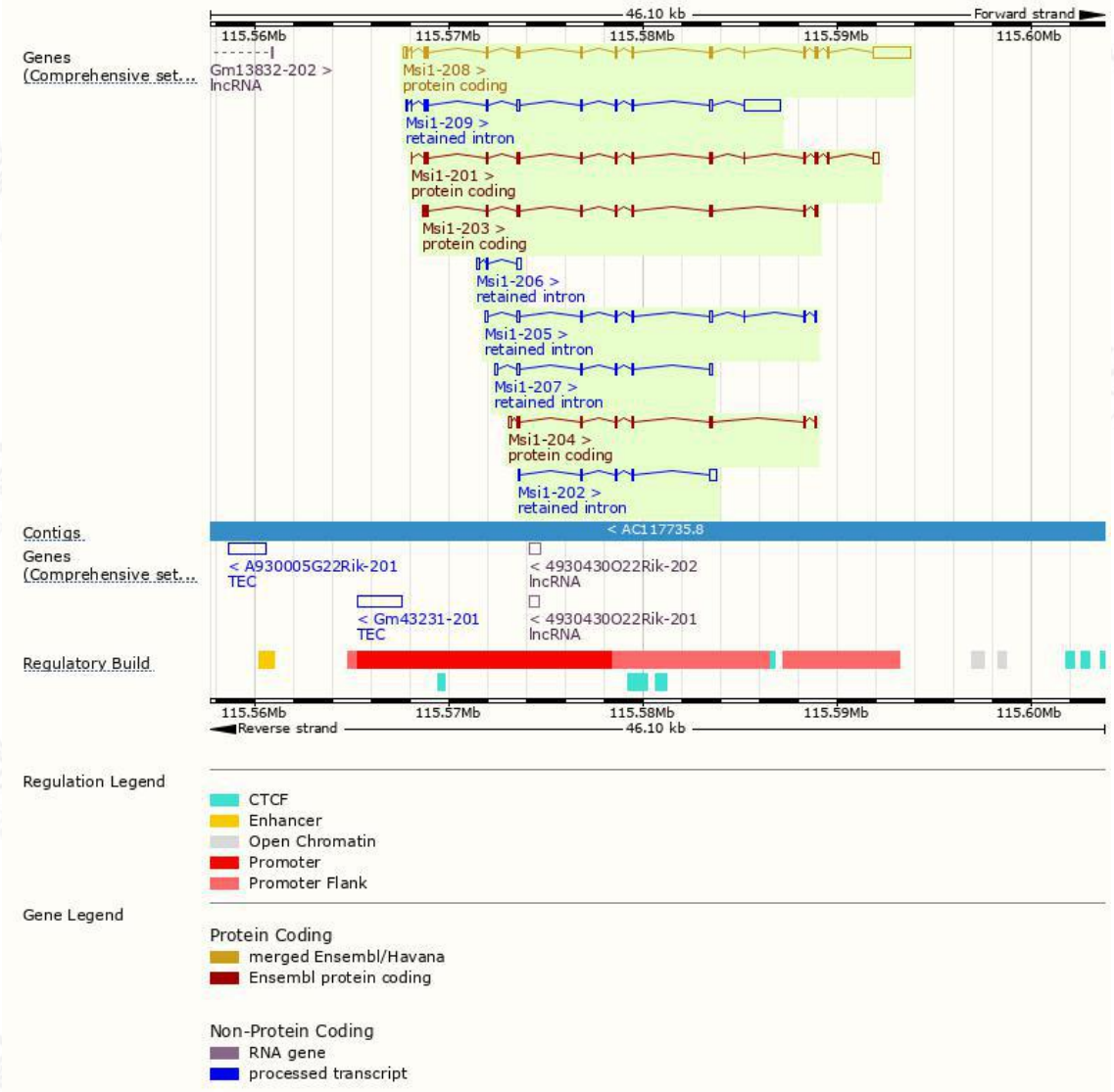
Transcript information（Ensembl）

The gene has 9 transcripts,all transcripts are shown below:

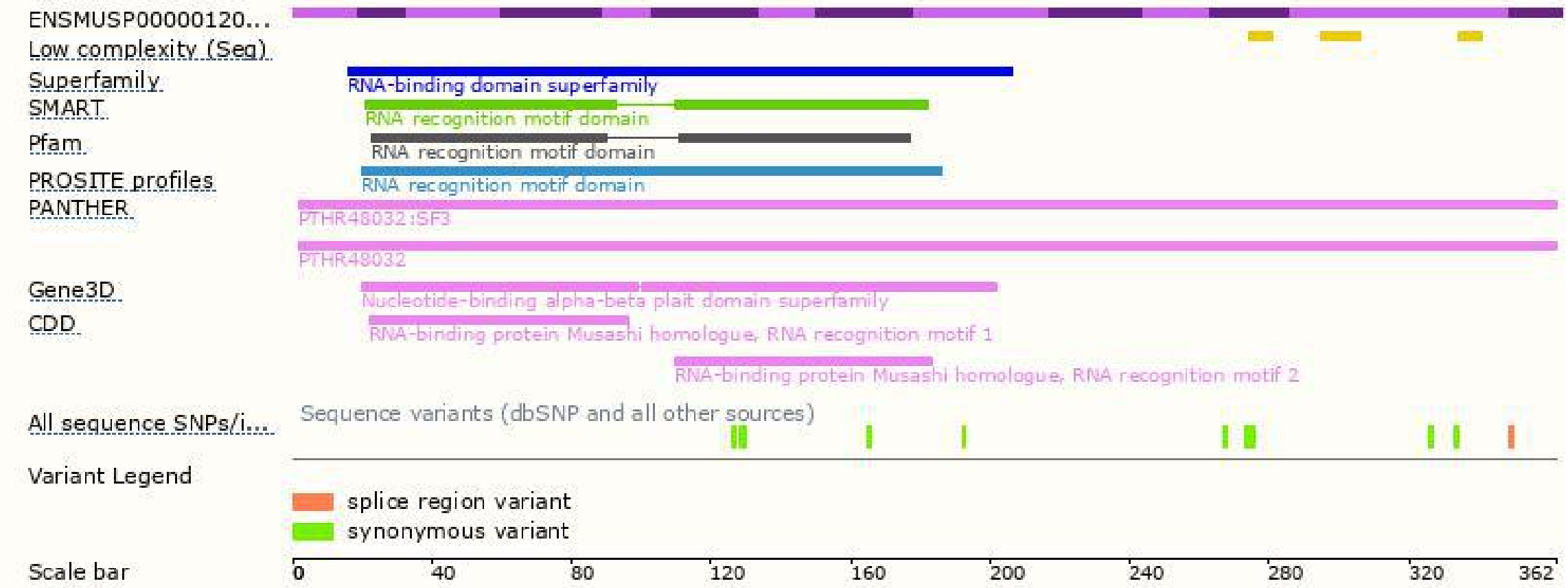
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Msi1-208	ENSMUST00000150779.7	3133	362aa	Protein coding	CCDS19591	Q61474	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Msi1-201	ENSMUST00000067168.8	1254	325aa	Protein coding	-	F8WJA5	CDS 5' incomplete TSL:5
Msi1-203	ENSMUST00000131079.7	807	269aa	Protein coding	-	A0A0J9YU67	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:5
Msi1-204	ENSMUST00000136586.5	726	196aa	Protein coding	-	A0A0J9YTX9	CDS 3' incomplete TSL:5
Msi1-209	ENSMUST00000151444.7	2636	No protein	Retained intron	-	-	TSL:1
Msi1-205	ENSMUST00000139918.7	806	No protein	Retained intron	-	-	TSL:3
Msi1-202	ENSMUST00000130849.1	599	No protein	Retained intron	-	-	TSL:3
Msi1-207	ENSMUST00000145840.7	581	No protein	Retained intron	-	-	TSL:5
Msi1-206	ENSMUST00000145005.1	367	No protein	Retained intron	-	-	TSL:5

The strategy is based on the design of *Msi1-208* transcript,the transcription is shown below:

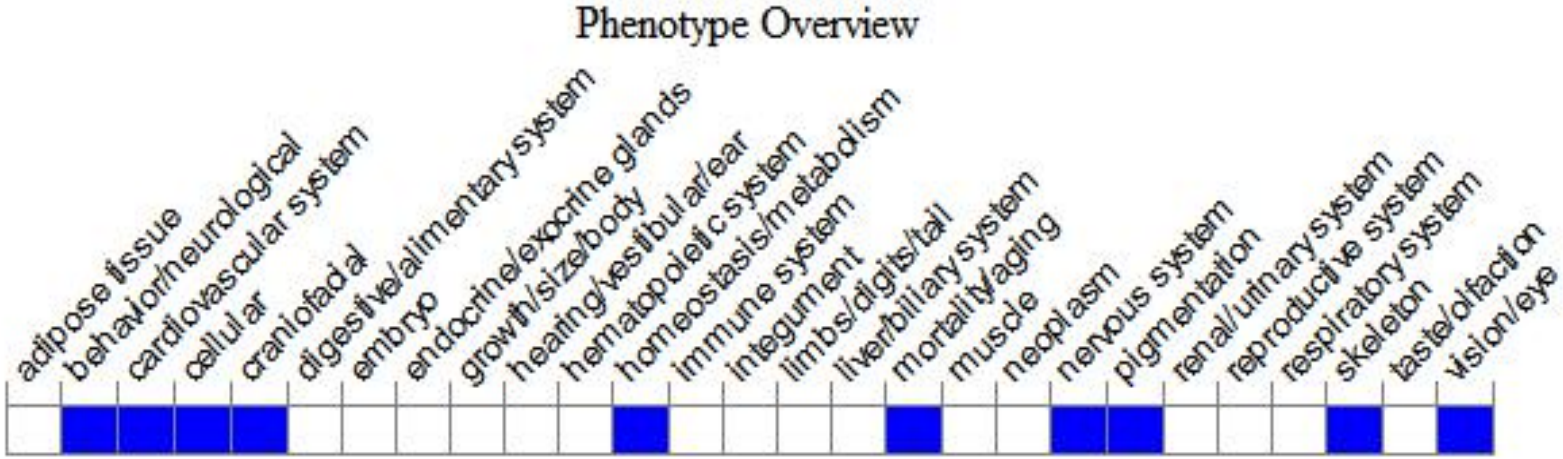
Genomic location distribution



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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