Marf1 Cas9-KO Strategy

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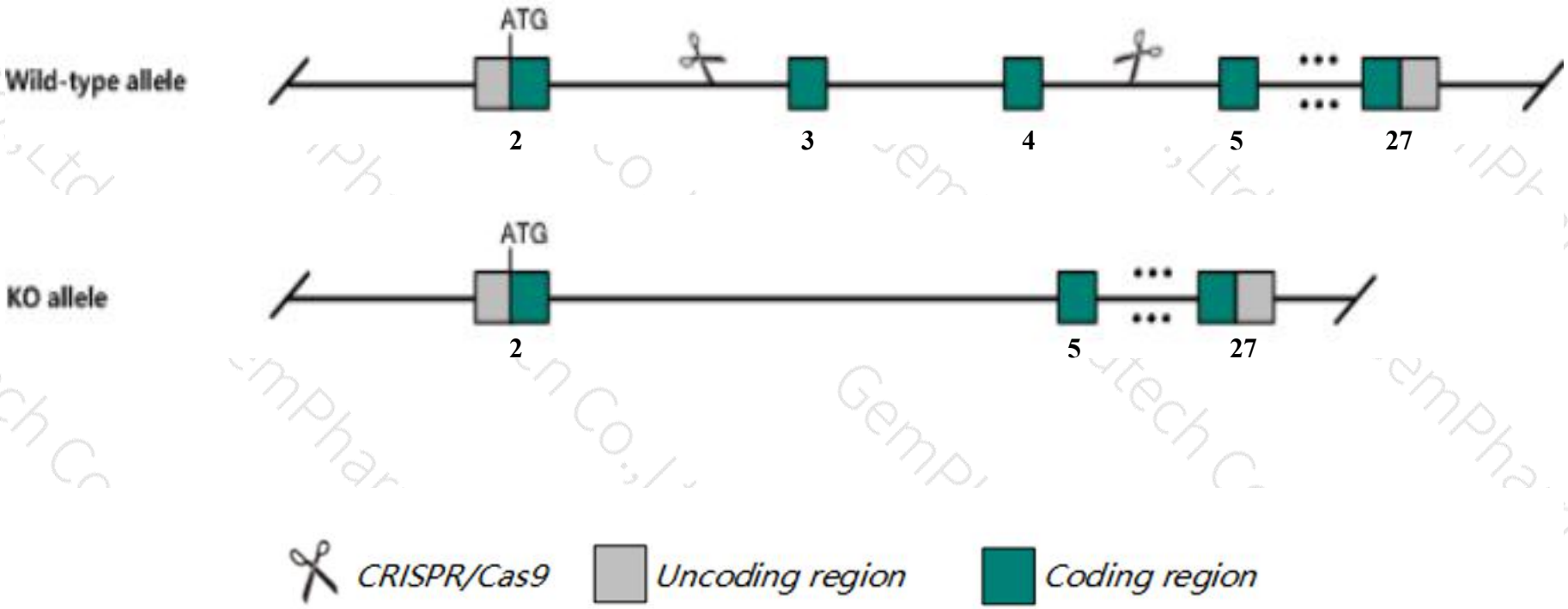
Project Overview

Project Name	***Marf1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Marf1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Marf1* gene has 3 transcripts. According to the structure of *Marf1* gene, exon3-exon4 of *Marf1-201*(ENSMUST00000090300.5) transcript is recommended as the knockout region.The region contains 862bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Marf1* 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,mice homozygous for an ENU-induced mutation exhibit female infertility with abnormalities in oogenic processes including meiotic progression, genomic integrity and acquisition of developmental competence.

➢ The *Marf1* gene is located on the Chr16. 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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Marf1 meiosis regulator and mRNA stability 1 [Mus musculus (house mouse)]

Gene ID: 223989, updated on 13-Mar-2020

Summary

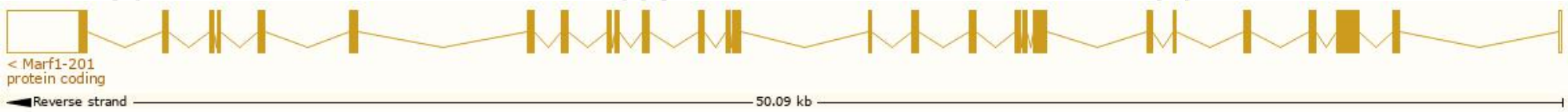
Official Symbol	Marf1 provided by MGI
Official Full Name	meiosis regulator and mRNA stability 1 provided byMGI
Primary source	MGI:MGI:2444505
See related	Ensembl:ENSMUSG00000060657
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	4921513D23Rik, BC031575, C87306, E030019O05, Lkap, mKIAA0430
Expression	Ubiquitous expression in cortex adult (RPKM 10.6), frontal lobe adult (RPKM 9.7) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

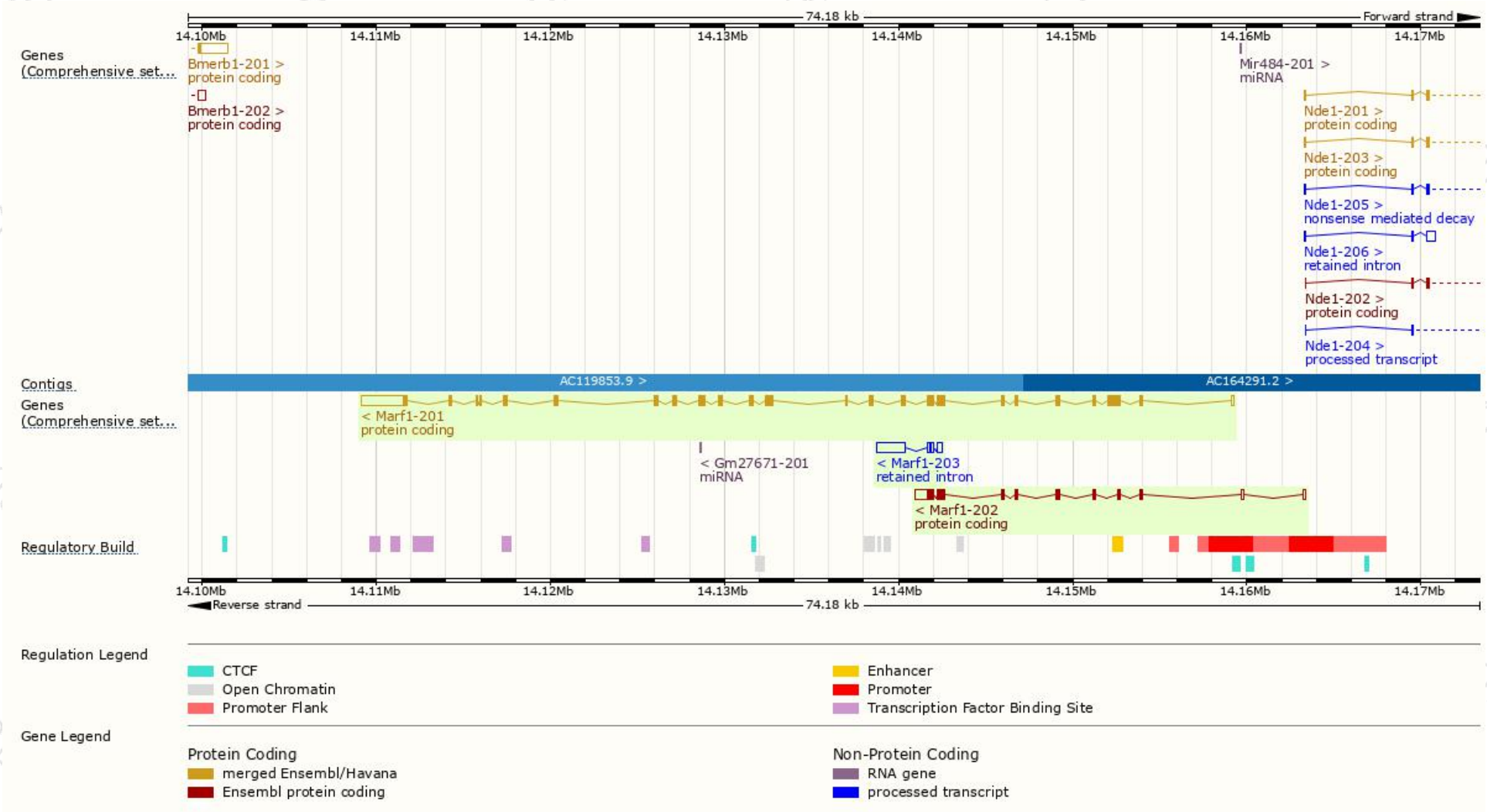
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein ▲	Biotype	CCDS	UniProt	Flags
Marf1-202	ENSMUST00000229614.1	2782	576aa	Protein coding	-	A0A2R8VH96	GENCODE basic
Marf1-201	ENSMUST00000090300.5	7751	1736aa	Protein coding	CCDS37262	Q8BJ34	TSL:5 GENCODE basic APPRIS P1
Marf1-203	ENSMUST00000231032.1	2222	No protein	Retained intron	-	-	-

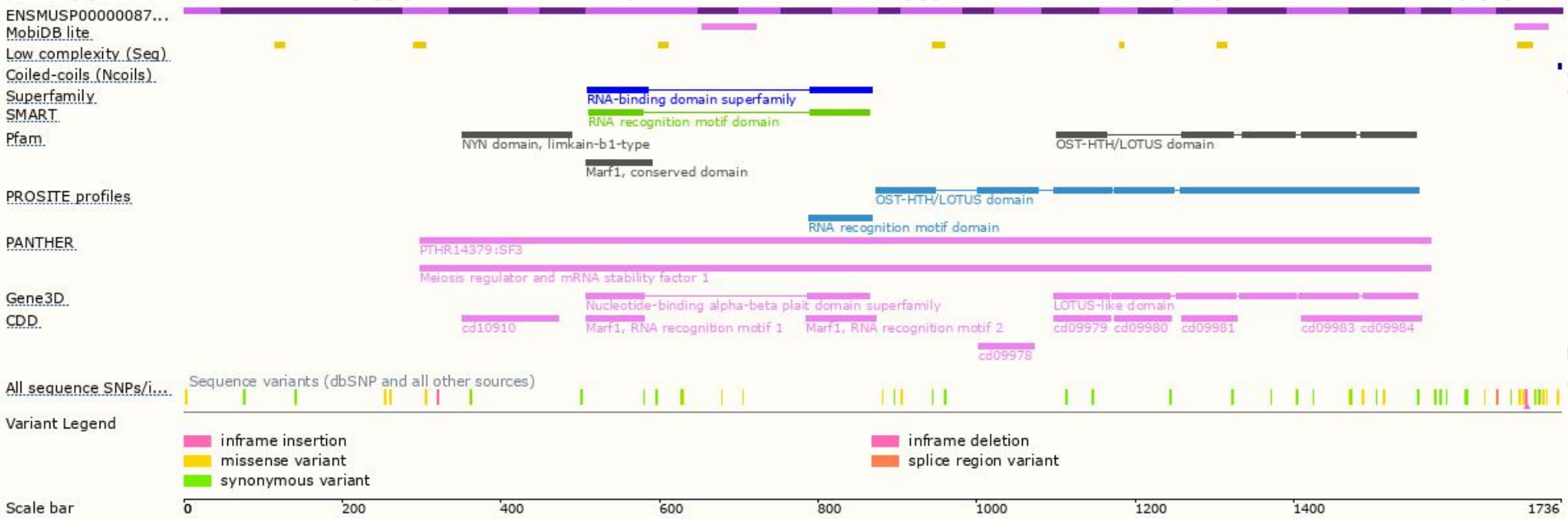
The strategy is based on the design of *Marf1-201* transcript,the transcription is shown below:



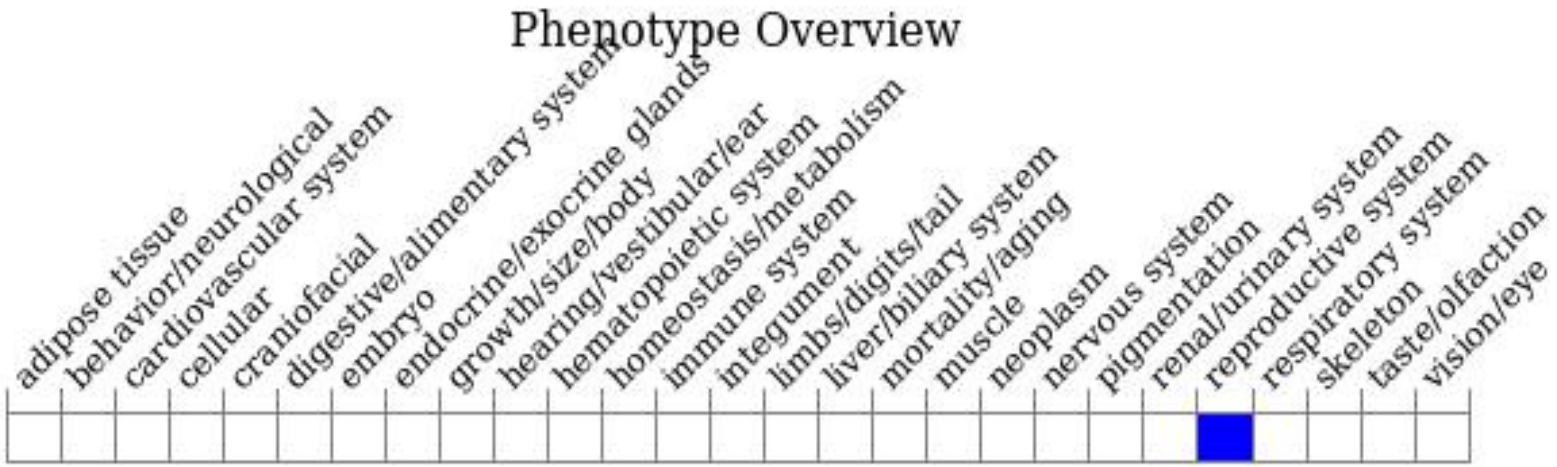
Genomic location distribution



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.

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