

Marchf5 Cas9-KO Strategy

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Overview

Target Gene Name

- Marchf5

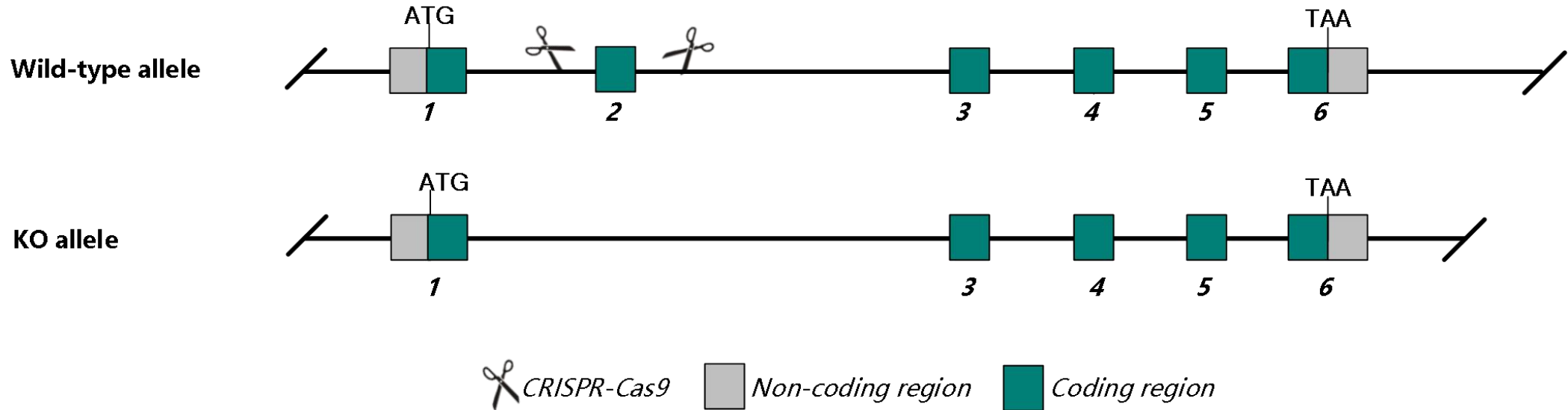
Project Type

- Cas9-KO

Genetic Background

- BALB/cJGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *March5* gene.

Technical Information

- The sequence of BALB/cJ background *Marchf5* gene is not included in Ensembl website, this strategy refers to the sequence of C57BL/6J background *Marchf5* gene.
- The *Marchf5* gene has 4 transcripts. According to the structure of *Marchf5* gene, exon3 of *Marchf5*-201 (ENSMUST00000024078.15) transcript is recommended as the knockout region. The region contains 203bp of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Marchf5* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs were microinjected into the fertilized eggs of BALB/cJGpt mice. Fertilized eggs were transplanted to obtain positive F0 mice which were confirmed by PCR and on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with BALB/cJGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

Gene Information

Marchf5 membrane associated ring-CH-type finger 5 [*Mus musculus* (house mouse)]

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Gene ID: 69104, updated on 30-Aug-2022

Summary

Official Symbol	Marchf5 provided by MGI
Official Full Name	membrane associated ring-CH-type finger 5 provided by MGI
Primary source	MGI:MGI:1915207
See related	Ensembl:ENSMUSG00000023307 AllianceGenome:MGI:1915207
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	MITOL; March5; Marchv; Rnf153; MARCH-V; 1810015H18Rik; 2310008I22Rik; 2700055A20Rik; 5730499H23Rik; E130202O05Rik
Summary	Predicted to enable GTPase binding activity and ubiquitin protein ligase activity. Predicted to be involved in several processes, including negative regulation of cell aging; positive regulation of mitochondrial fission; and protein ubiquitination. Predicted to be located in endoplasmic reticulum membrane and mitochondrial outer membrane. Orthologous to human MARCHF5 (membrane associated ring-CH-type finger 5). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in liver E14 (RPKM 15.2), CNS E14 (RPKM 13.7) and 28 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 4 transcripts, all transcripts are shown below:

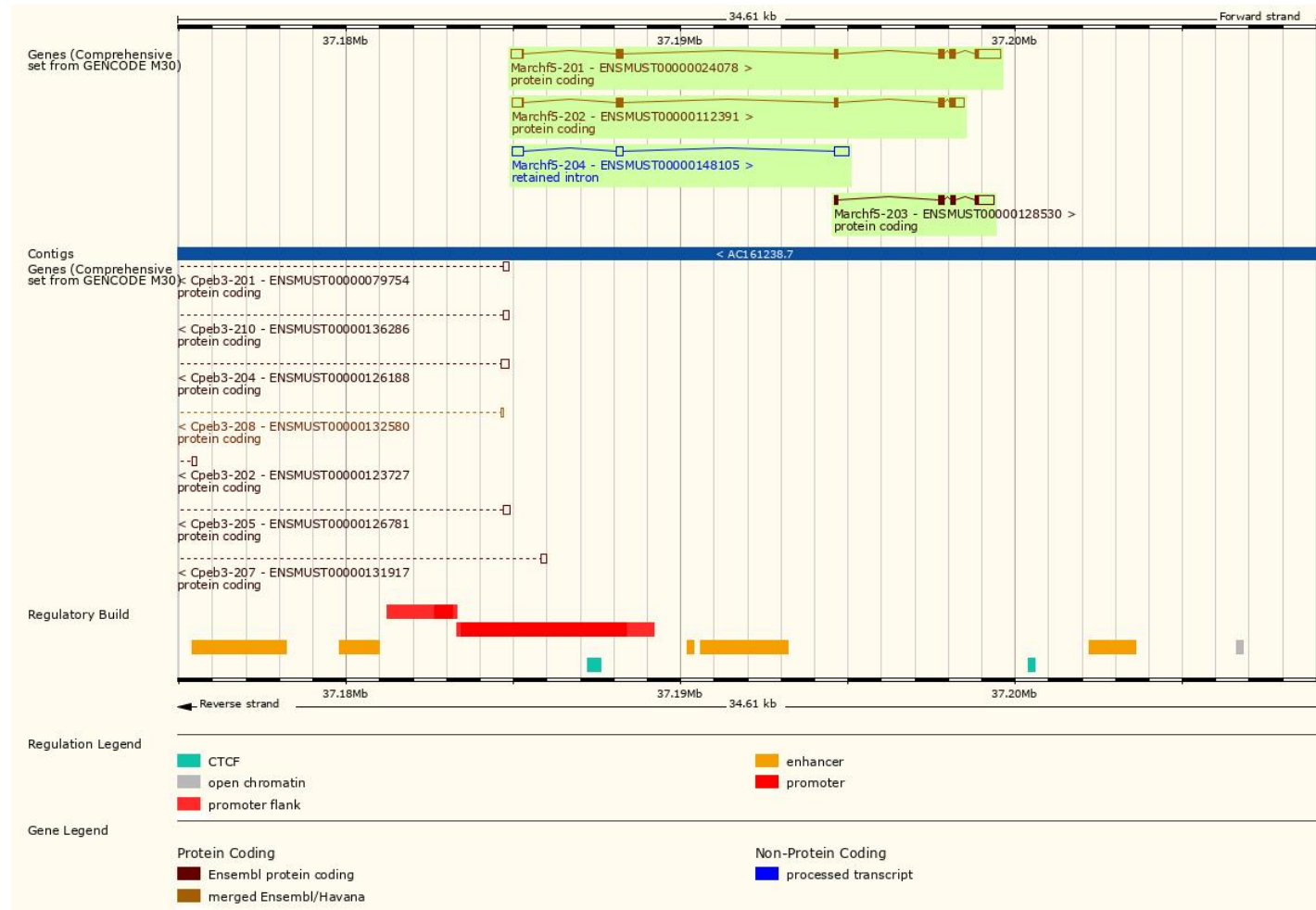
Show/hide columns (1 hidden)							Filter	
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags	
ENSMUST00000024078.15	Marchf5-201	1809	278aa	Protein coding	CCDS29776	A2RTC8 Q3KNM2	Ensembl Canonical	GENCODE basic APPRIS P1 TSL:1
ENSMUST00000112391.8	Marchf5-202	1293	244aa	Protein coding	CCDS50427	A0A0R4J1H0	GENCODE basic	TSL:1
ENSMUST00000128530.2	Marchf5-203	1033	187aa	Protein coding		F6W8T3	TSL:3	CDS 5' incomplete
ENSMUST00000148105.2	Marchf5-204	991	No protein	Retained intron		-	TSL:1	

The strategy is based on the design of *Marchf5*-201 transcript, the transcription is shown below:

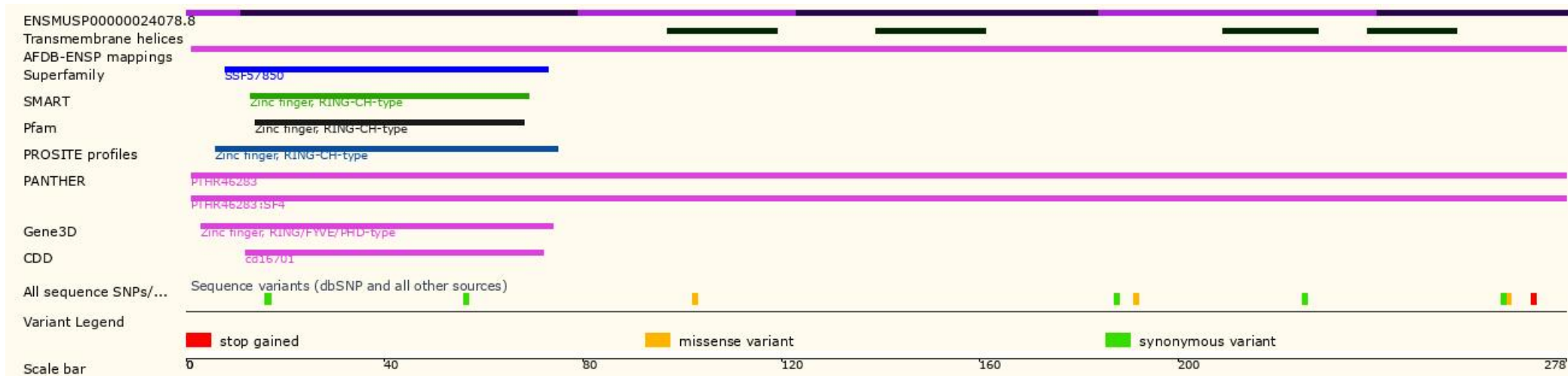


Source: <https://www.ensembl.org>

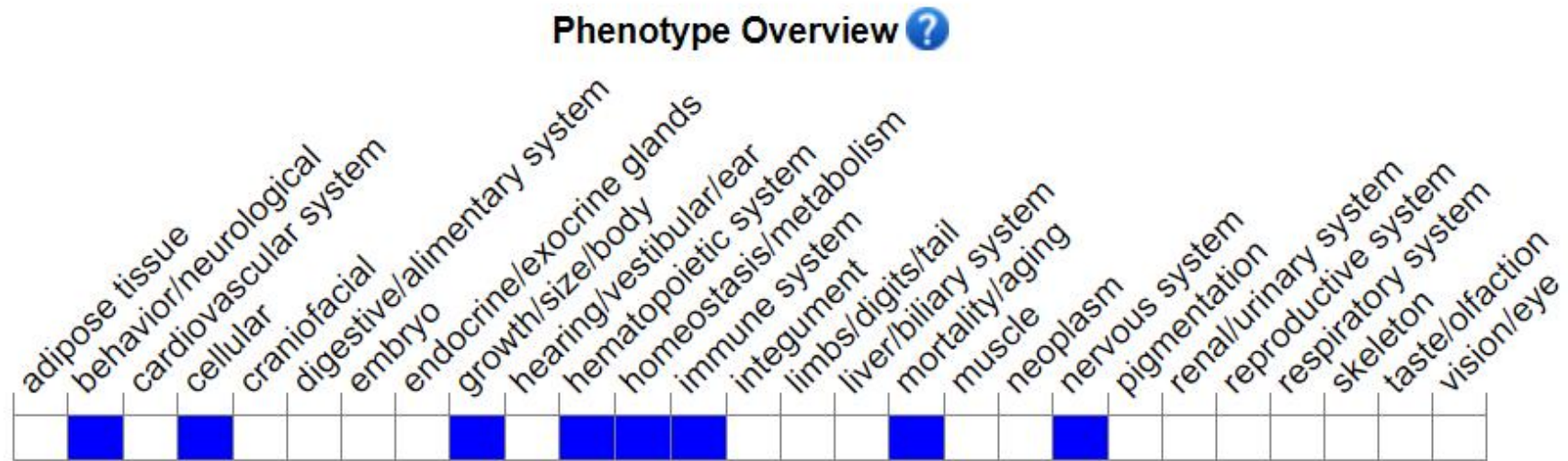
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



- Homozygous mutant knockout mice exhibit embryonic lethality. Heterozygous mutant mice exhibit defective immune responses to RNA viruses.

Important Information

- According to the existing MGI data, mice homozygous mutant knockout mice exhibit embryonic lethality. Heterozygous mutant mice exhibit defective immune responses to RNA viruses.
- The flox region is about 3 kb away from the 5th end of the *Cpeb3* gene, which may affect the regulation of this gene.
- On this strategy, the influences of transcript Marchf5-203 CDS 5' incomplete is unknown.
- *Marchf5* is located on Chr19. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is on the same chromosome.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.