

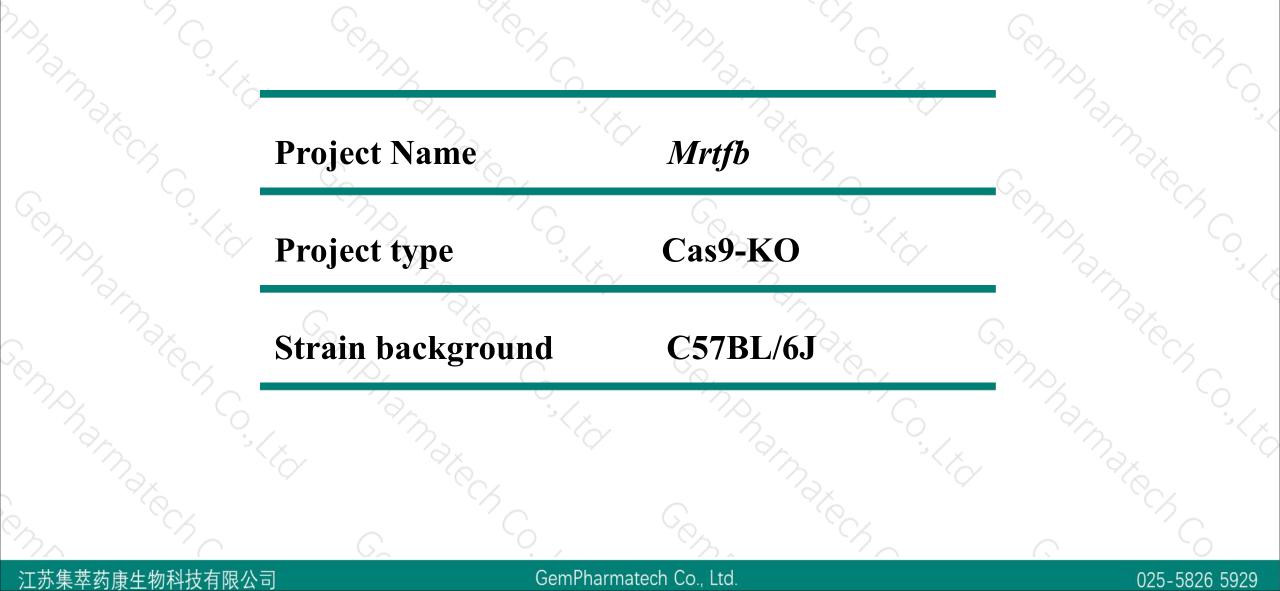
Mrtfb Cas9-KO Strategy

Designer: Reviewer: Design Date:

Yanhua Shen Xueting Zhang 2019-10-17

Project Overview



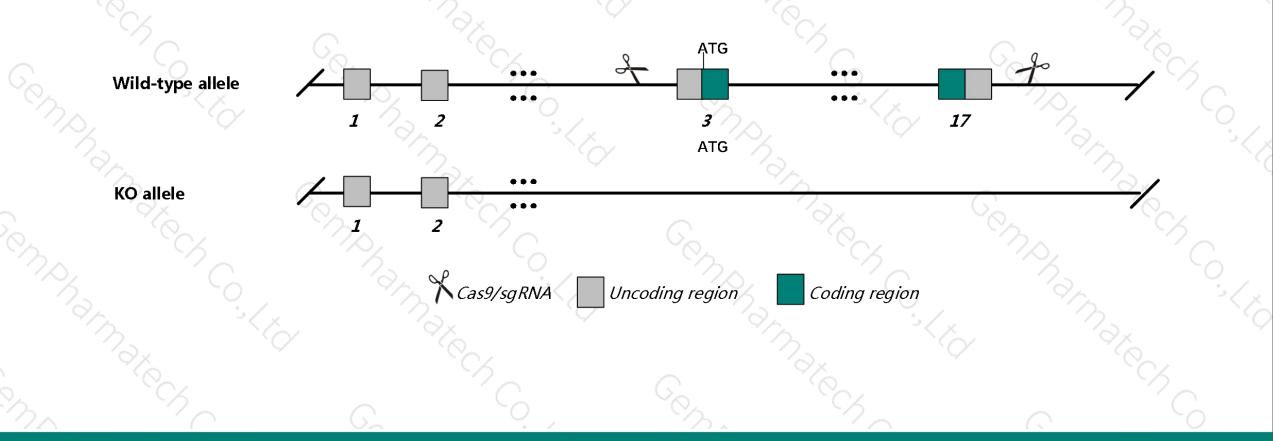


Knockout strategy



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



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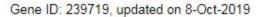
- The *Mrtfb* gene has 4 transcripts. According to the structure of *Mrtfb* gene, exon3-exon17 of *Mrtfb-201* (ENSMUST00000009713.13) transcript is recommended as the knockout region. The region contains all coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mrtfb* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Mice homozygous for knock-out alleles exhibit prenatal lethality with widespread hemorrhaging, cardiovascular defects, and craniofacial anomalies. Mice homozygous for a gene trap allele exhibit fetal lethality due to cardiac outflow tractdefects.
- > The knockout region overlaps with lncRNA Gm15738 and this strategy will destroy the gene.
- The Mrtfb 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.

Notice

Gene information (NCBI)

Mrtfb myocardin related transcription factor B [Mus musculus (house mouse)]



Summary

\$?

Official Full Name myocardin related transcription factor B provided by MGI Primary source MGI:MGI:3050795

See related Ensembl:ENSMUSG0000009569

Gene type protein coding RefSeq status VALIDATED

Official Symbol Mrtfb provided by MGI

Organism Mus musculus

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as Mkl2; Gt4-1; MRTF-B; mKIAA1243

Expression Ubiquitous expression in frontal lobe adult (RPKM 9.3), cortex adult (RPKM 9.3) and 28 other tissues See more Orthologs human all

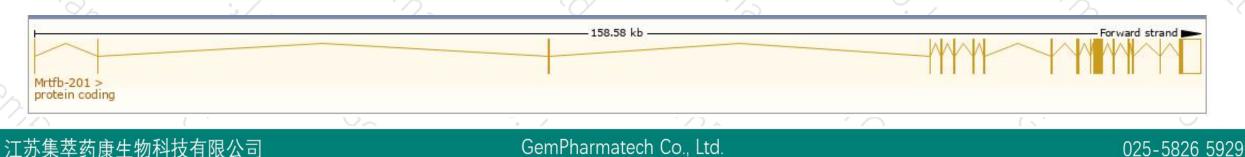
Transcript information (Ensembl)



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

Name 🍦	Transcript ID	bp 🖕	Protein 🖕	Biotype 🖕	CCDS 🍦	UniProt 🖕		Flags	4	
Mrtfb-204	ENSMUST00000149359.1	8295	<u>1080aa</u>	Protein coding	<u>CCDS37258</u> 교	Q5DTZ3₽	TSL:1	GENCODE basic	APPRIS P3	
Mrtfb-201	ENSMUST0000009713.13	5815	<u>1091aa</u>	Protein coding	<u>CCDS49768</u> &	<u>G3X8R8</u> @	TSL:5	GENCODE basic	APPRIS ALT2	
Mrtfb-203	ENSMUST00000115809.7	667	<u>102aa</u>	Protein coding	<u>CCDS37257</u> &	Q8R2L3@		TSL:2 GENCODE	E basic	
Mrtfb-202	ENSMUST0000056715.6	618	<u>102aa</u>	Protein coding	CCDS37257 @	Q8R2L3@		TSL:1 GENCODE	GENCODE basic	

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



Genomic location distribution

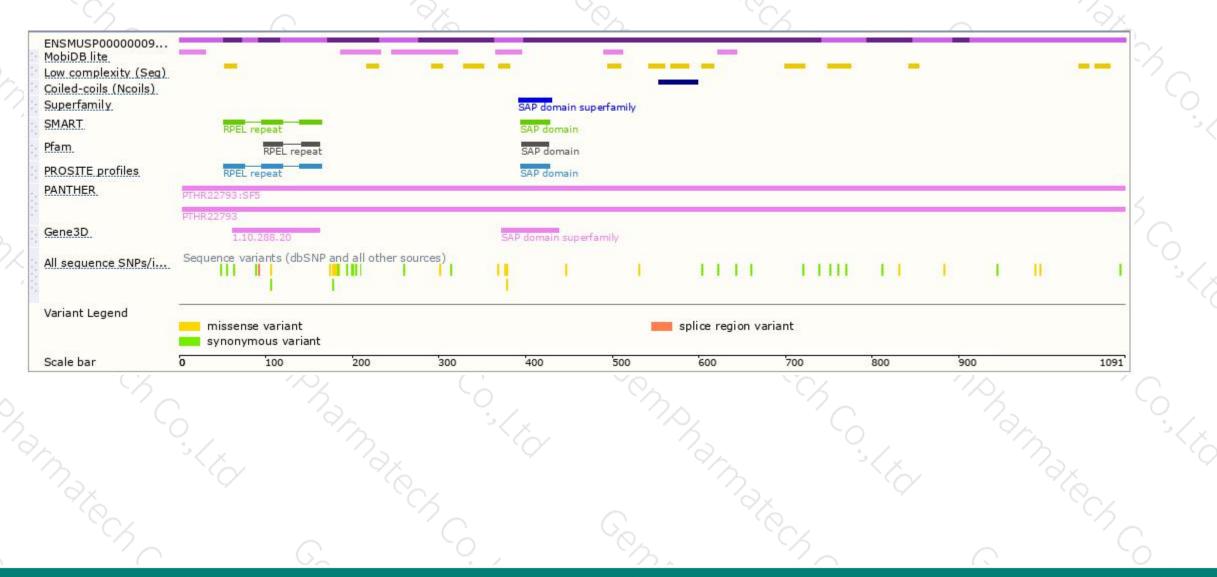


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Protein domain



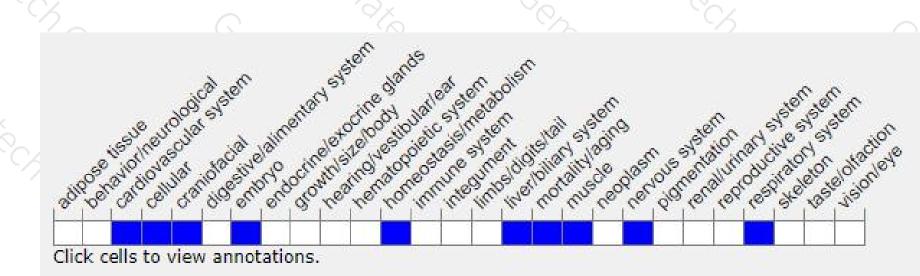


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Mouse phenotype description(MGI)





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, Mice homozygous for knock-out alleles exhibit prenatal lethality with widespread hemorrhaging, cardiovascular defects, and craniofacial anomalies. Mice homozygous for a gene trap allele exhibit fetal lethality due to cardiac outflow tractdefects.

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If you have any questions, you are welcome to inquire. Tel: 025-5864 1534



