

Mical3 Cas9-CKO Strategy

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Project Overview

Project Name

Mical3

Project type

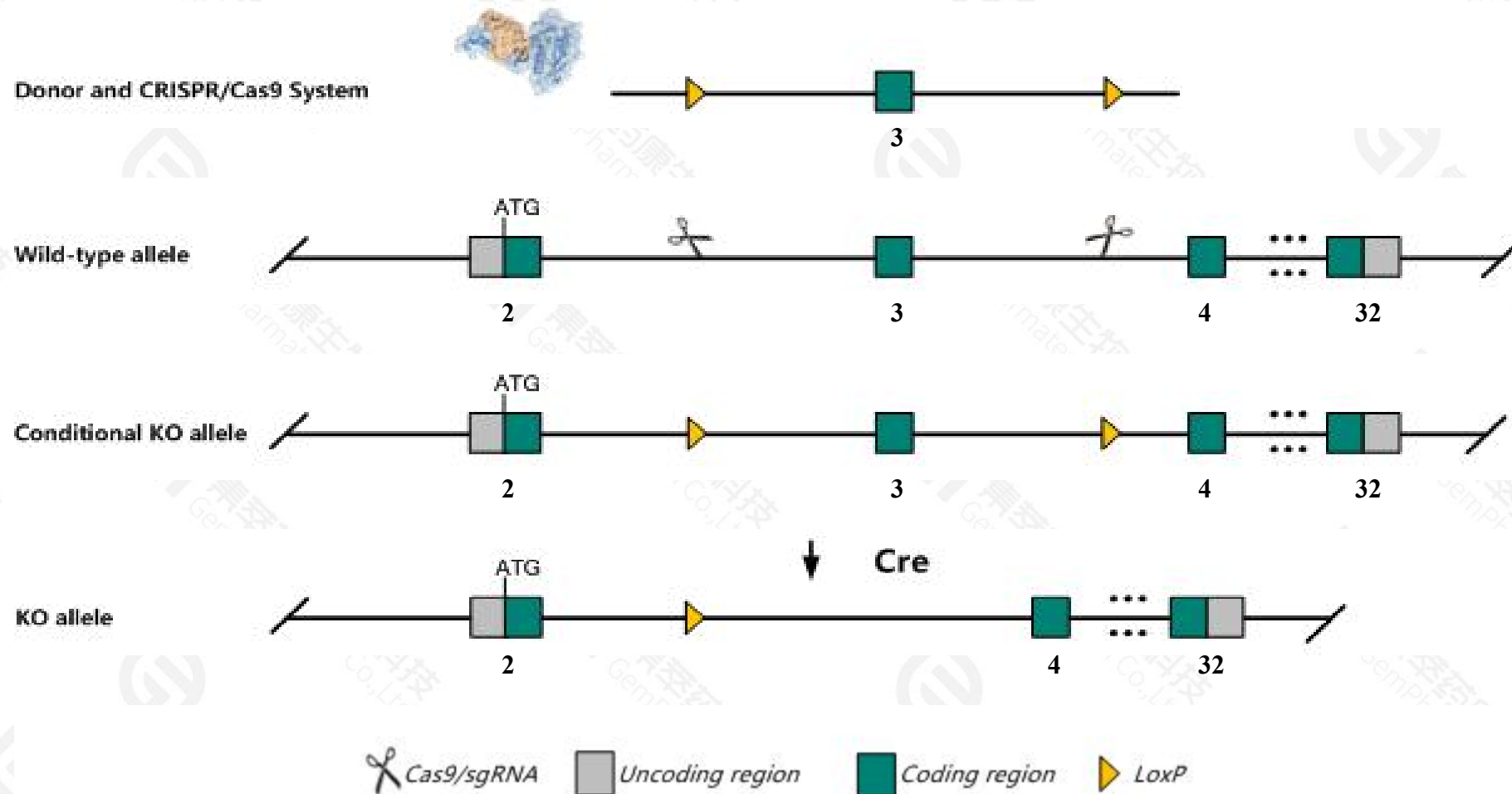
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mical3* gene. The schematic diagram is as follows:



Technical routes

- The *Mical3* gene has 23 transcripts. According to the structure of *Mical3* gene, exon3 of *Mical3*-216(ENSMUST00000207889.2) transcript is recommended as the knockout region. The region contains 208bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mical3* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor was constructed. Cas9, sgRNA and Donor 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.
- The flox mice was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- The *Mical3* gene is located on the Chr6. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Mical3 microtubule associated monooxygenase, calponin and LIM domain containing 3 [Mus musculus (house mouse)]

Gene ID: 194401, updated on 17-Feb-2021

Summary



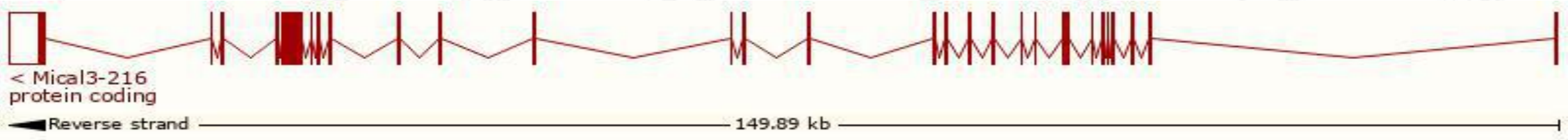
Official Symbol	Mical3 provided by MGI
Official Full Name	microtubule associated monooxygenase, calponin and LIM domain containing 3 provided by MGI
Primary source	MGI:MGI:2442733
See related	Ensembl:ENSMUSG00000051586
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C130040D16Rik, MICA, Mical-3, mKIAA1364
Expression	Ubiquitous expression in testis adult (RPKM 14.5), ovary adult (RPKM 11.3) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

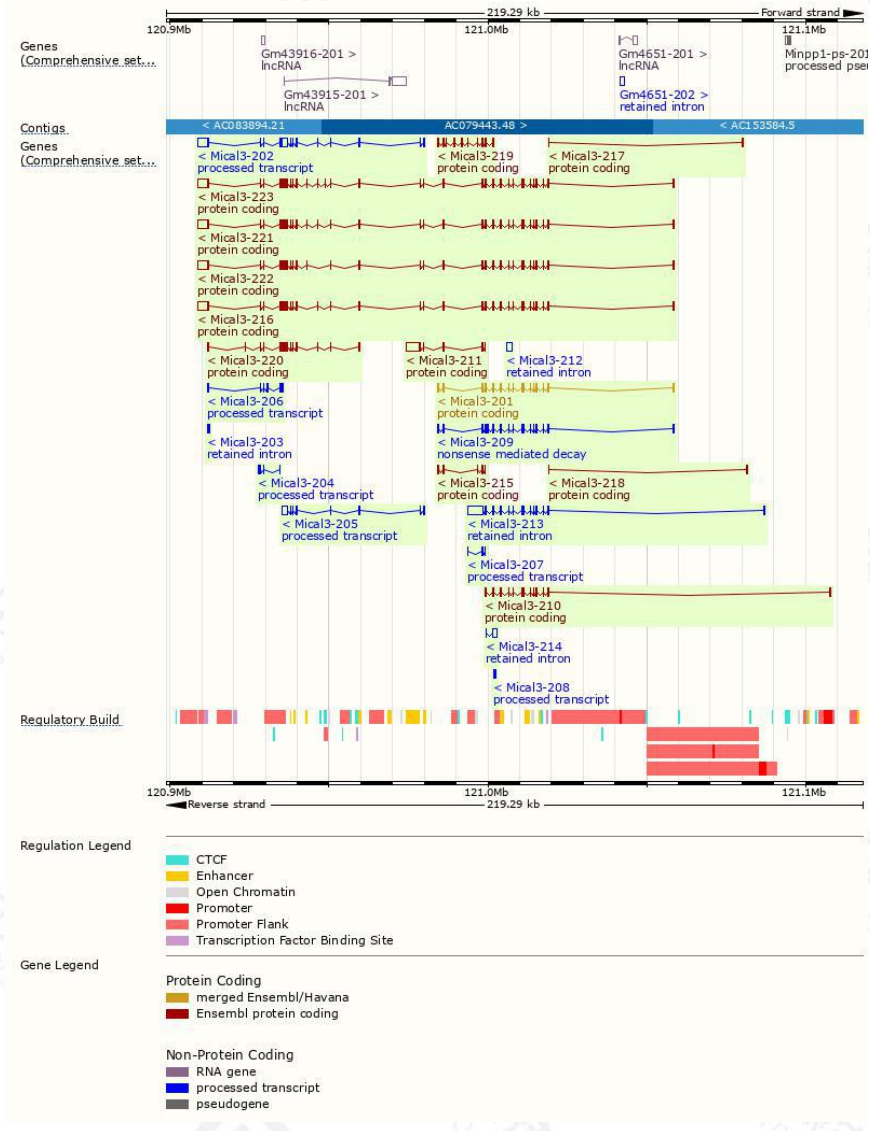
The gene has 23 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mical3-216	ENSMUST00000207889.2	9204	1993aa	Protein coding	CCDS85152		TSL:5 , GENCODE basic , APPRIS P2 ,
Mical3-201	ENSMUST00000077159.8	2875	864aa	Protein coding	CCDS20487		TSL:1 , GENCODE basic ,
Mical3-223	ENSMUST00000238968.2	9357	2044aa	Protein coding	-		GENCODE basic , APPRIS ALT2 ,
Mical3-221	ENSMUST00000238920.2	9267	2014aa	Protein coding	-		GENCODE basic , APPRIS ALT2 ,
Mical3-222	ENSMUST00000238957.2	9129	1968aa	Protein coding	-		GENCODE basic , APPRIS ALT2 ,
Mical3-211	ENSMUST00000204302.3	4854	268aa	Protein coding	-		CDS 5' incomplete , TSL:1 ,
Mical3-220	ENSMUST00000212333.2	3419	1139aa	Protein coding	-		CDS 5' incomplete , TSL:5 ,
Mical3-210	ENSMUST00000204248.2	2390	695aa	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Mical3-219	ENSMUST00000212208.2	1382	451aa	Protein coding	-		CDS 5' incomplete , TSL:5 ,
Mical3-215	ENSMUST00000205030.2	673	216aa	Protein coding	-		CDS 5' incomplete , TSL:3 ,
Mical3-217	ENSMUST00000207968.2	551	65aa	Protein coding	-		CDS 3' incomplete , TSL:2 ,
Mical3-218	ENSMUST00000207993.2	406	56aa	Protein coding	-		CDS 3' incomplete , TSL:3 ,
Mical3-209	ENSMUST00000203254.3	2953	661aa	Nonsense mediated decay	-		TSL:1 ,
Mical3-202	ENSMUST00000098457.9	6670	No protein	Processed transcript	-		TSL:5 ,
Mical3-205	ENSMUST00000150503.4	2810	No protein	Processed transcript	-		TSL:1 ,
Mical3-206	ENSMUST00000151602.4	992	No protein	Processed transcript	-		TSL:3 ,
Mical3-204	ENSMUST00000142924.2	731	No protein	Processed transcript	-		TSL:3 ,
Mical3-207	ENSMUST00000203095.2	448	No protein	Processed transcript	-		TSL:3 ,
Mical3-208	ENSMUST00000203188.2	342	No protein	Processed transcript	-		TSL:3 ,
Mical3-213	ENSMUST00000204994.2	6930	No protein	Retained intron	-		TSL:2 ,
Mical3-212	ENSMUST00000204644.2	1823	No protein	Retained intron	-		TSL:NA ,
Mical3-214	ENSMUST00000205020.2	1235	No protein	Retained intron	-		TSL:2 ,
Mical3-203	ENSMUST00000140854.2	312	No protein	Retained intron	-		TSL:3 ,

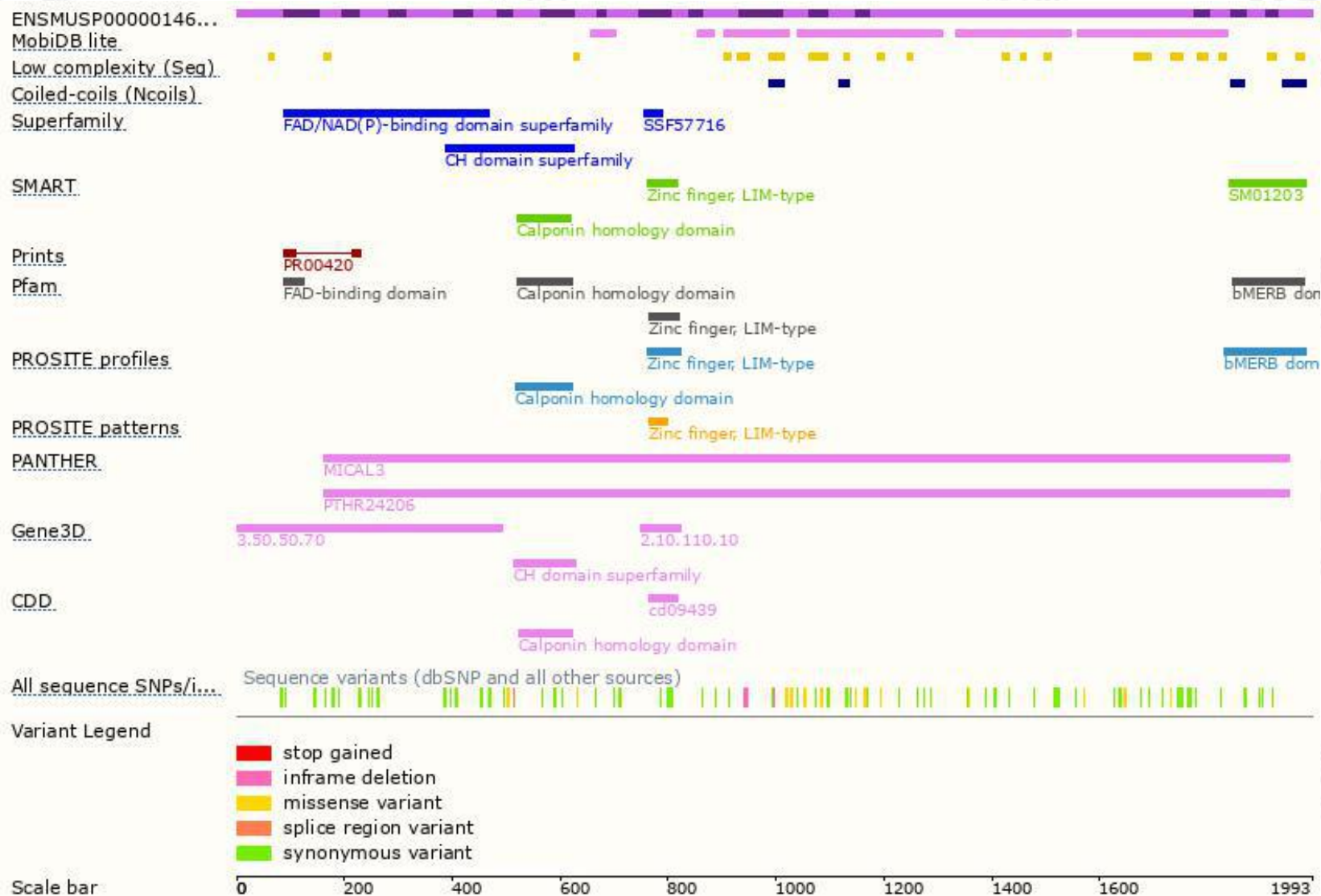
The strategy is based on the design of *Mical3-216* transcript,the transcription is shown below:



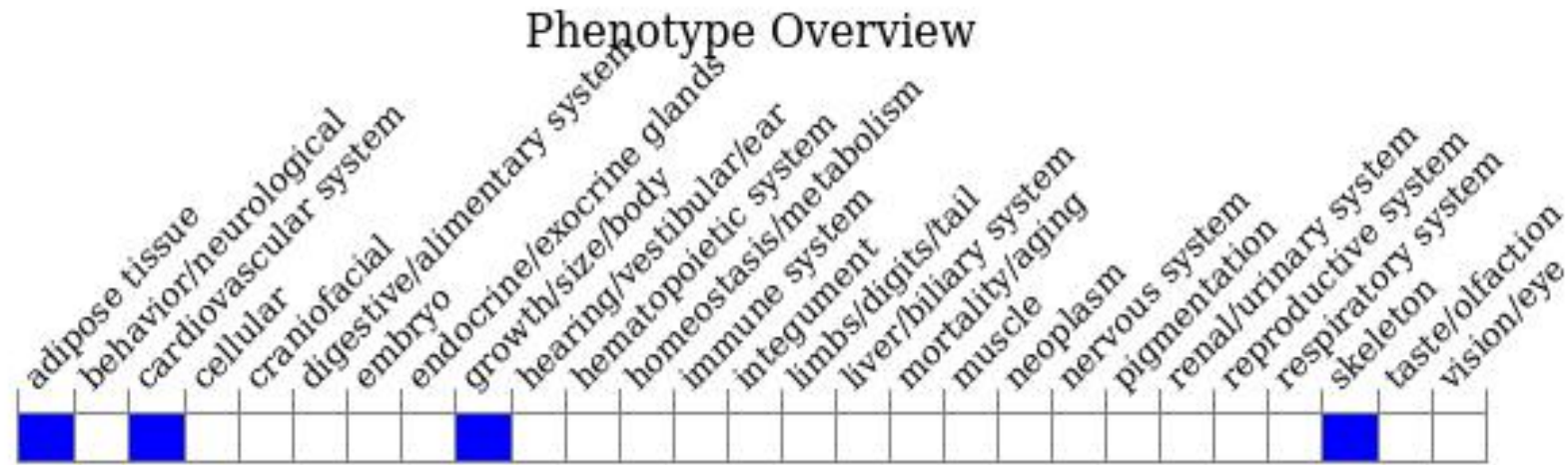
Genomic location distribution



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/>).

If you have any questions, you are welcome to inquire.

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