

Ap2m1 Cas9-CKO Strategy

Designer:

Huimin Su

Reviewer:

Ruirui Zhang

Design Date:

2020-4-9

Project Overview

Project Name

Ap2m1

Project type

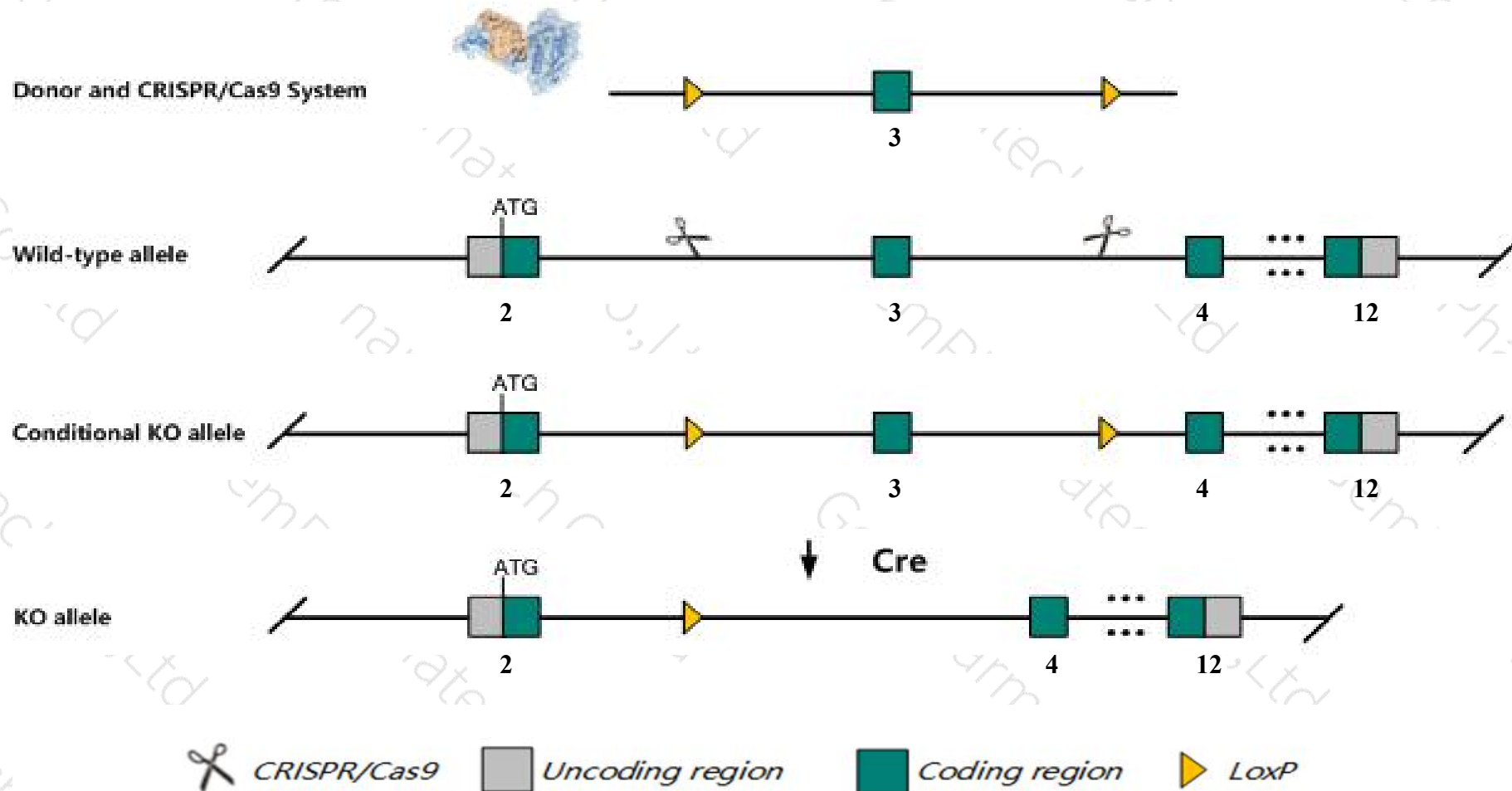
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ap2m1* gene. The schematic diagram is as follows:



- The *Ap2m1* gene has 11 transcripts. According to the structure of *Ap2m1* gene, exon3 of *Ap2m1-201* (ENSMUST00000007216.8) transcript is recommended as the knockout region. The region contains 266bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ap2m1* gene. The brief process is as follows: CRISPR/Cas9 system 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 will be 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.

Notice

- According to the existing MGI data, mice homozygous for a targeted deletion display embryonic lethality before implantation.
- The *Ap2m1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Ap2m1 adaptor-related protein complex 2, mu 1 subunit [*Mus musculus* (house mouse)]

Gene ID: 11773, updated on 6-Apr-2020

Summary

Official Symbol Ap2m1 provided by [MGI](#)
Official Full Name adaptor-related protein complex 2, mu 1 subunit provided by [MGI](#)
Primary source [MGI:MGI:1298405](#)
See related [Ensembl:ENSMUSG00000022841](#)
Gene type protein coding
RefSeq status REVIEWED
Organism [Mus musculus](#)
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Summary This gene encodes the mu subunit of the clathrin adaptor protein complex AP-2. It mediates sorting of cargo proteins harboring Y-X-X-Phi motifs into clathrin-coated vesicles. Alternate splicing of this gene results in multiple transcript variants. Pseudogenes of this gene are found on chromosomes 2, 8 and 19. [provided by RefSeq, Dec 2014]
Expression Ubiquitous expression in CNS E18 (RPKM 166.3), whole brain E14.5 (RPKM 141.3) and 28 other tissues [See more](#)
Orthologs [human](#) [all](#)

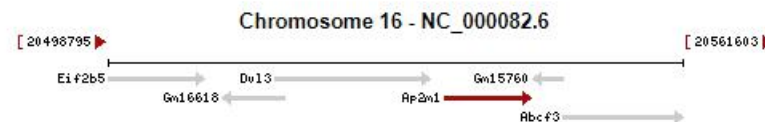
Genomic context

Location: 16; 16 A3

See Ap2m1 in [Genome Data Viewer](#)

Exon count: 12

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	16	NC_000082.6 (20535480..20544909)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	16	NC_000082.5 (20535577..20544126)

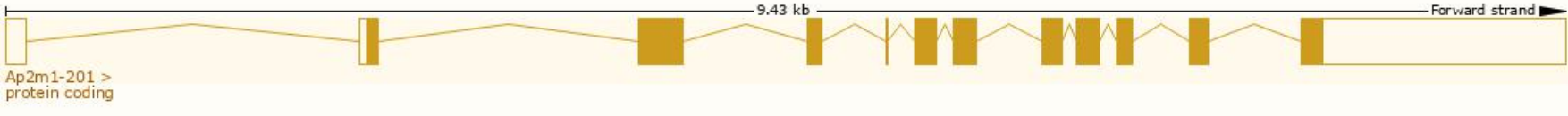


Transcript information (Ensembl)

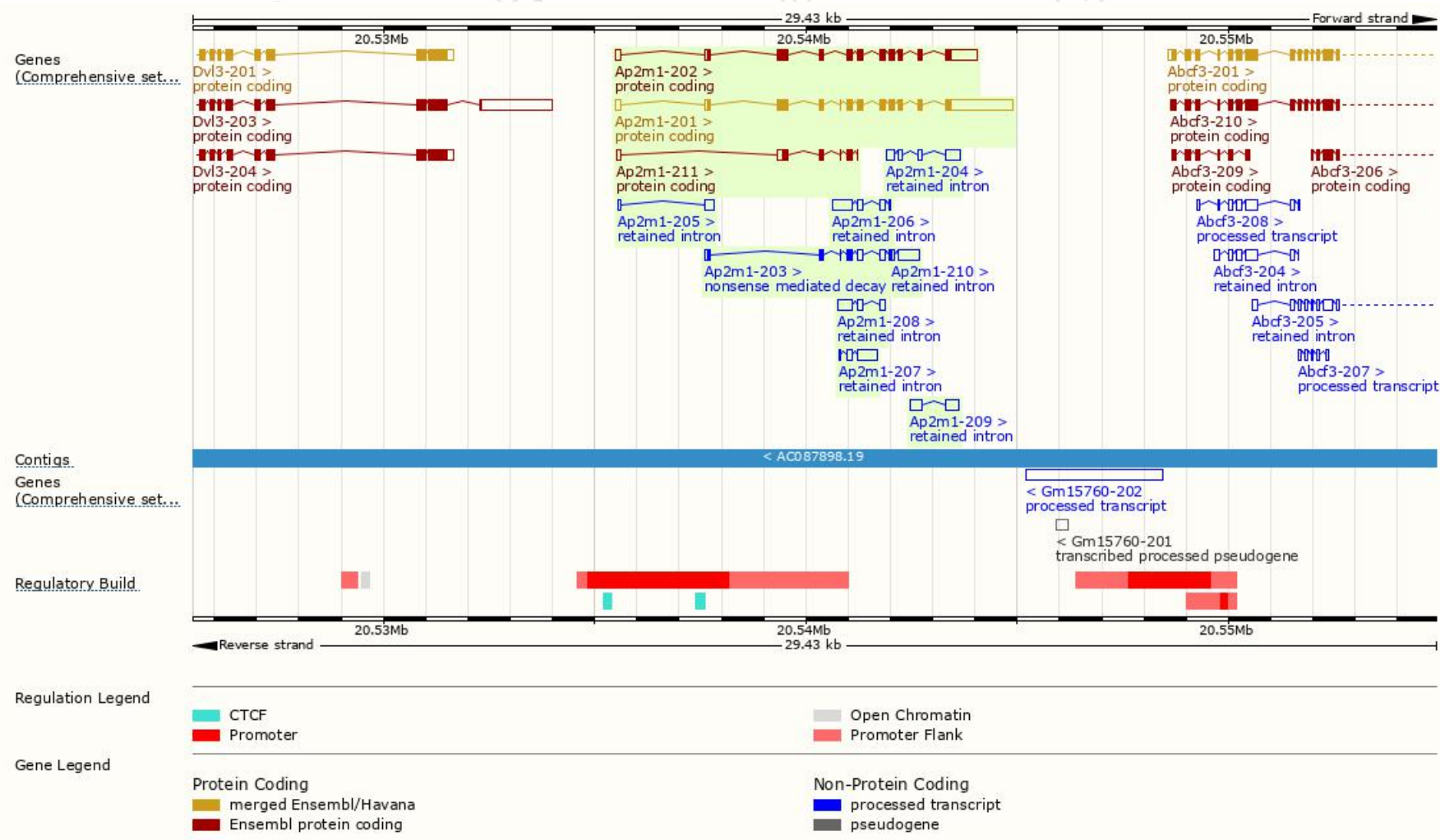
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ap2m1-201	ENSMUST00000007216.8	2937	435aa	Protein coding	CCDS28048	P84091 Q5FWI9	TSL:5 GENCODE basic APPRIS P3
Ap2m1-202	ENSMUST00000090023.12	2080	433aa	Protein coding	CCDS79436	Q3TWV4	TSL:1 GENCODE basic APPRIS ALT1
Ap2m1-211	ENSMUST00000232001.1	594	119aa	Protein coding	-	A0A338P6T4	CDS 3' incomplete
Ap2m1-203	ENSMUST00000126788.8	655	82aa	Nonsense mediated decay	-	A0A338P798	TSL:5
Ap2m1-206	ENSMUST00000134981.7	791	No protein	Retained intron	-	-	TSL:2
Ap2m1-204	ENSMUST00000131203.1	752	No protein	Retained intron	-	-	TSL:2
Ap2m1-208	ENSMUST00000148507.1	625	No protein	Retained intron	-	-	TSL:3
Ap2m1-207	ENSMUST00000135420.2	618	No protein	Retained intron	-	-	TSL:5
Ap2m1-209	ENSMUST00000150537.1	593	No protein	Retained intron	-	-	TSL:2
Ap2m1-210	ENSMUST00000150986.1	530	No protein	Retained intron	-	-	TSL:2
Ap2m1-205	ENSMUST00000133443.1	275	No protein	Retained intron	-	-	TSL:2

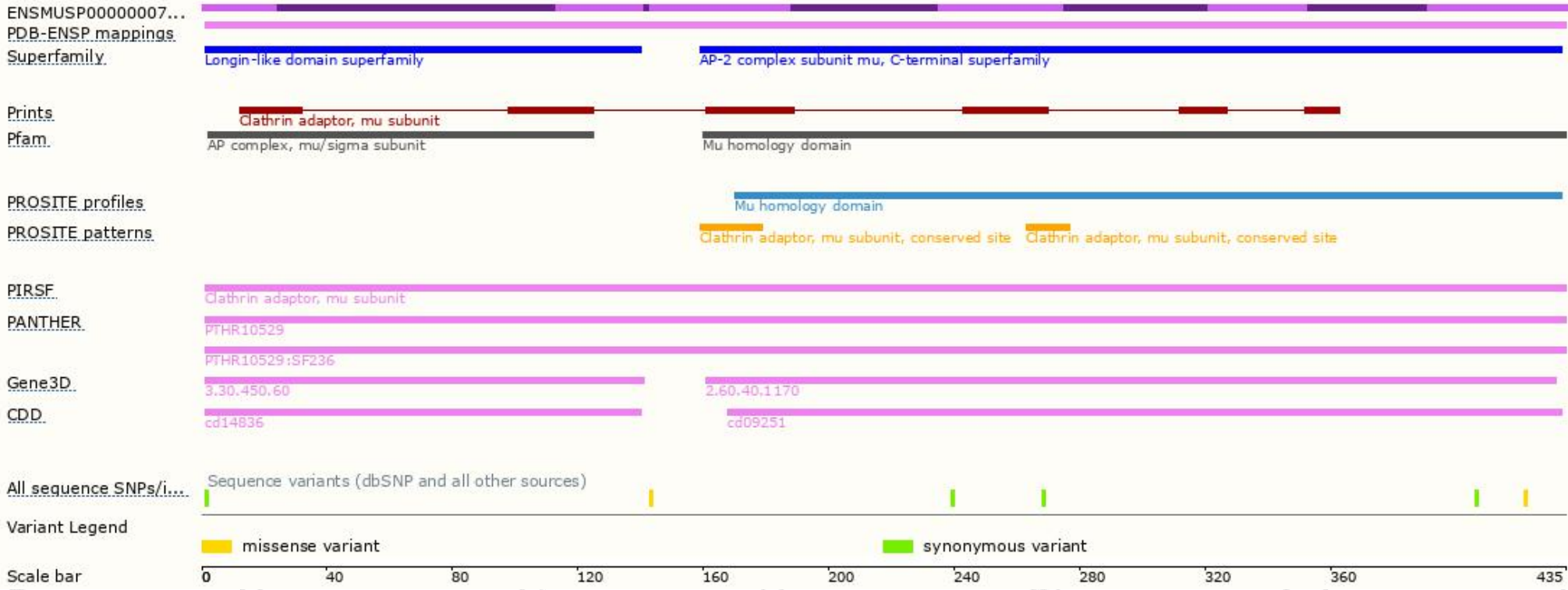
The strategy is based on the design of *Ap2m1-201* transcript, the transcription is shown below



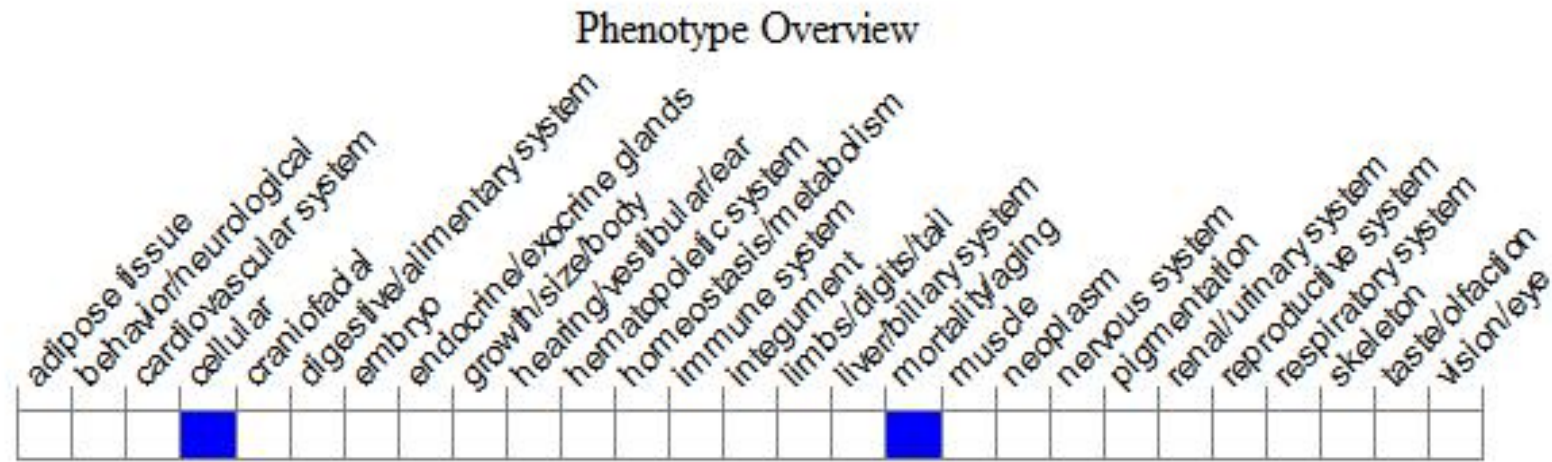
Genomic location distribution



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/>).

According to the existing MGI data, mice homozygous for a targeted deletion display embryonic lethality before implantation.

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

Tel: 400-9660890

