

# ***Mboat7*** Cas9-KO Strategy

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**Reviewer: Miaomiao Cui**

**Design Date: 2021-5-31**

# Project Overview

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**Project Name**

*Mboat7*

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**Project type**

**Cas9-KO**

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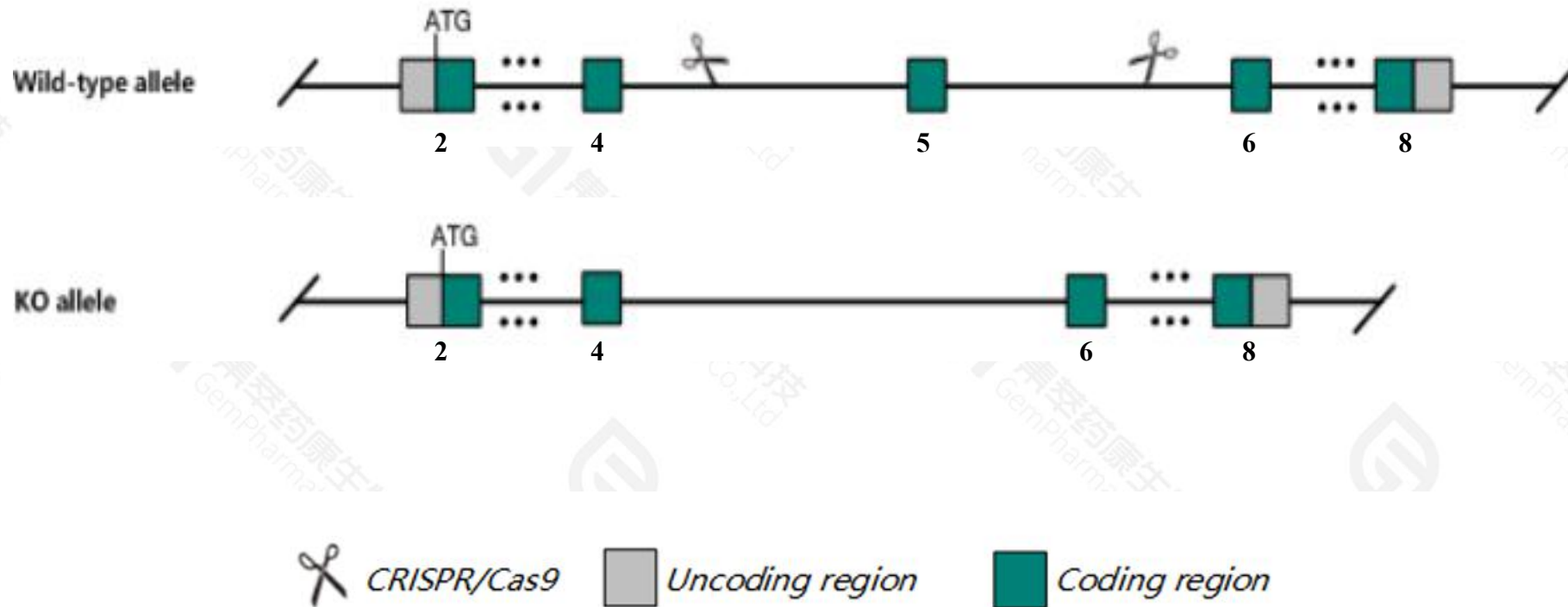
**Strain background**

**C57BL/6JGpt**

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# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mboat7* gene. The schematic diagram is as follows:



- The *Mboat7* gene has 13 transcripts. According to the structure of *Mboat7* gene, exon5 of *Mboat7*-201(ENSMUST00000038608.14) transcript is recommended as the knockout region. The region contains 160bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mboat7* 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.



- According to the existing MGI data, mice homozygous for a targeted mutation exhibit hydrocephaly and most die between 1-3 months of age. Mice homozygous for a knock-out allele exhibit partial lethality with decreased body size, decreased forebrain size, delayed neuronal migration and reduced neurite outgrowth.
- Transcript *Mboat7*-213 may not be affected.
- The *Mboat7* gene is located on the Chr7. 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.

## Mboat7 membrane bound O-acyltransferase domain containing 7 [Mus musculus (house mouse)]

Gene ID: 77582, updated on 17-Dec-2020

### Summary



**Official Symbol** Mboat7 provided by [MGI](#)

**Official Full Name** membrane bound O-acyltransferase domain containing 7 provided by [MGI](#)

**Primary source** [MGI:MGI:1924832](#)

**See related** [Ensembl:ENSMUSG00000035596](#)

**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** 5730589L02Rik, BB1, LPLAT 7, Len, Leng4, Lp, Lpiat, Lpiat1, m-mboa-7

**Expression** Ubiquitous expression in adrenal adult (RPKM 41.2), ovary adult (RPKM 26.4) and 28 other tissues [See more](#)

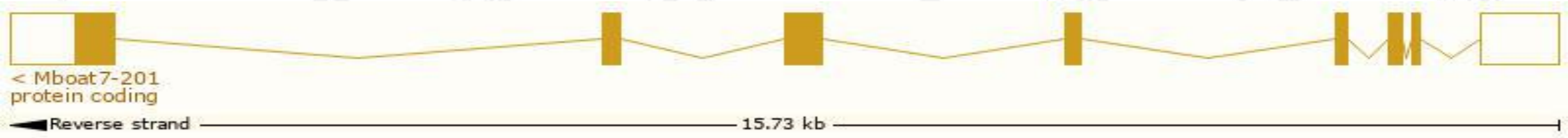
**Orthologs** [human](#) [all](#)

# Transcript information (Ensembl)

The gene has 13 transcripts,all transcripts are shown below:

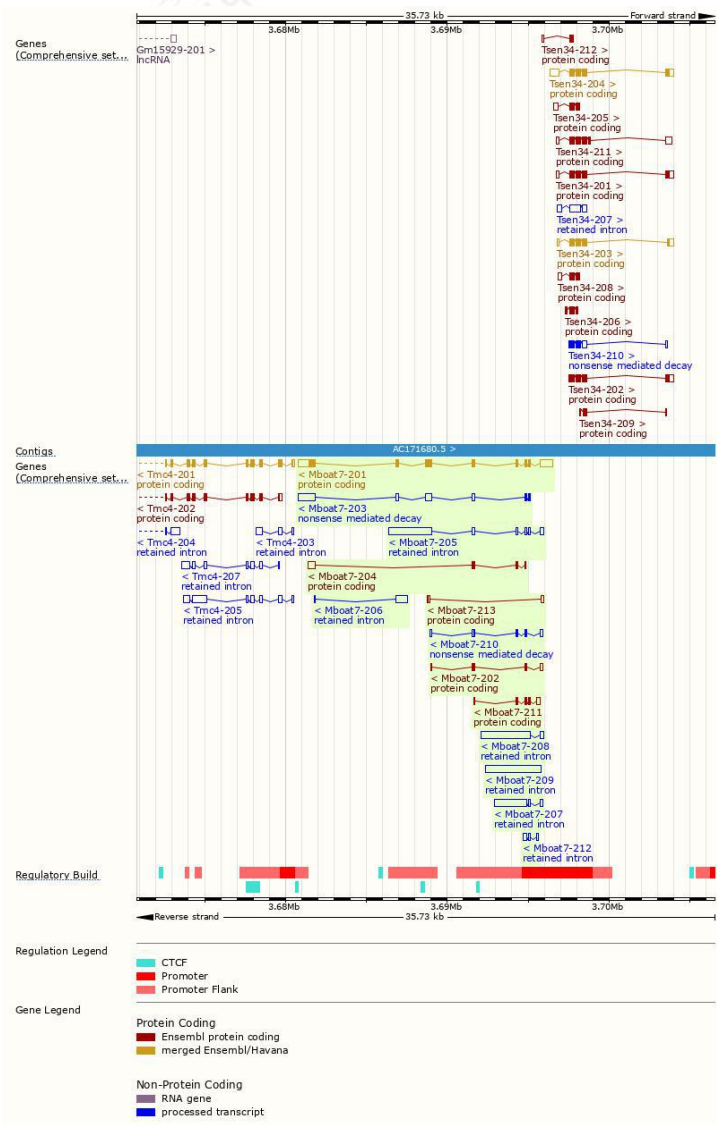
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mboat7-201	<a href="#">ENSMUST00000038608.14</a>	2878	<a href="#">473aa</a>	Protein coding	<a href="#">CCDS20724</a>		TSL:1 , GENCODE basic , APPRIS P1 ,
Mboat7-204	<a href="#">ENSMUST00000128364.8</a>	797	<a href="#">123aa</a>	Protein coding	-		CDS 5' incomplete , TSL:3 ,
Mboat7-211	<a href="#">ENSMUST00000206379.2</a>	595	<a href="#">120aa</a>	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Mboat7-202	<a href="#">ENSMUST00000118710.3</a>	498	<a href="#">111aa</a>	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Mboat7-213	<a href="#">ENSMUST00000206571.2</a>	347	<a href="#">20aa</a>	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Mboat7-203	<a href="#">ENSMUST00000127106.8</a>	1964	<a href="#">70aa</a>	Nonsense mediated decay	-		TSL:5 ,
Mboat7-210	<a href="#">ENSMUST00000206343.2</a>	641	<a href="#">85aa</a>	Nonsense mediated decay	-		TSL:5 ,
Mboat7-209	<a href="#">ENSMUST00000205644.2</a>	3399	No protein	Retained intron	-		TSL:NA ,
Mboat7-205	<a href="#">ENSMUST00000131688.8</a>	3379	No protein	Retained intron	-		TSL:1 ,
Mboat7-208	<a href="#">ENSMUST00000150785.2</a>	3258	No protein	Retained intron	-		TSL:1 ,
Mboat7-207	<a href="#">ENSMUST00000150684.3</a>	2303	No protein	Retained intron	-		TSL:1 ,
Mboat7-206	<a href="#">ENSMUST00000133223.2</a>	795	No protein	Retained intron	-		TSL:2 ,
Mboat7-212	<a href="#">ENSMUST00000206448.2</a>	436	No protein	Retained intron	-		TSL:2 ,

The strategy is based on the design of *Mboat7-201* transcript,the transcription is shown below:



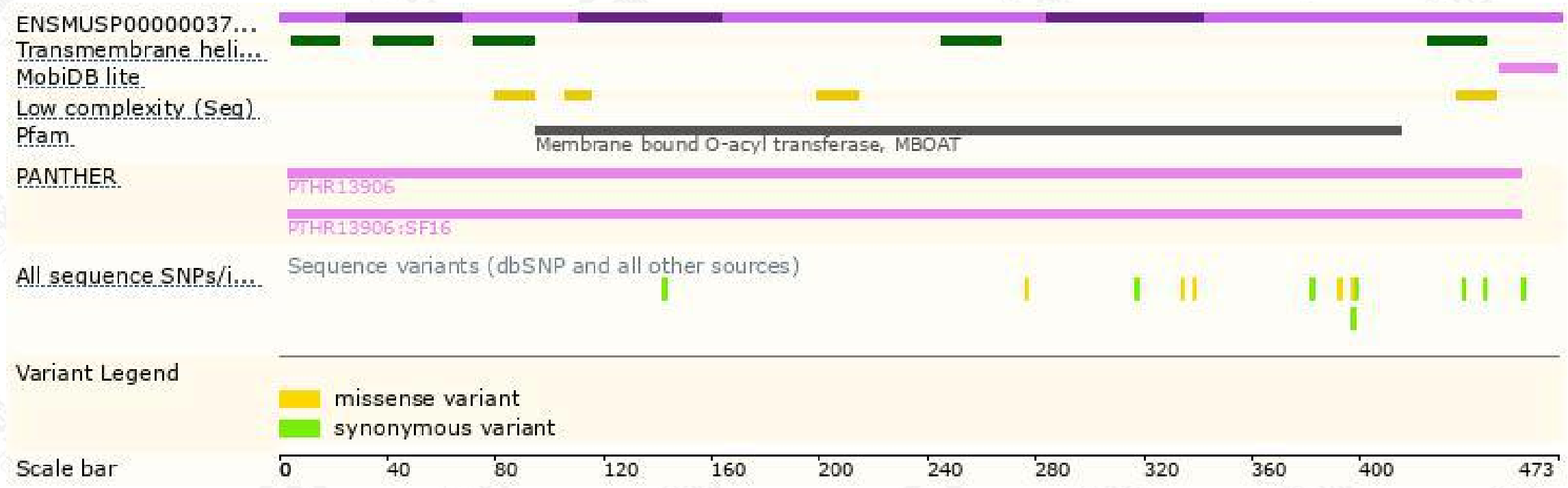


# Genomic location distribution

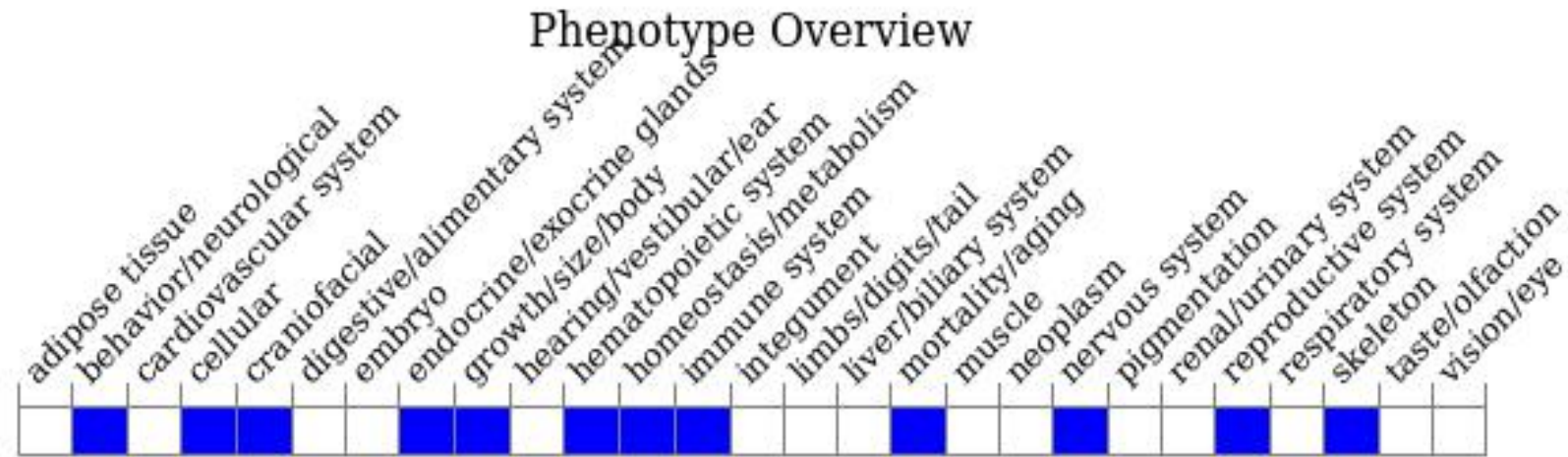




# Protein domain



# 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 mutation exhibit hydrocephaly and most die between 1-3 months of age. Mice homozygous for a knock-out allele exhibit partial lethality with decreased body size, decreased forebrain size, delayed neuronal migration and reduced neurite outgrowth.

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

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