

Lpcat3 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Lpcat3

Project type

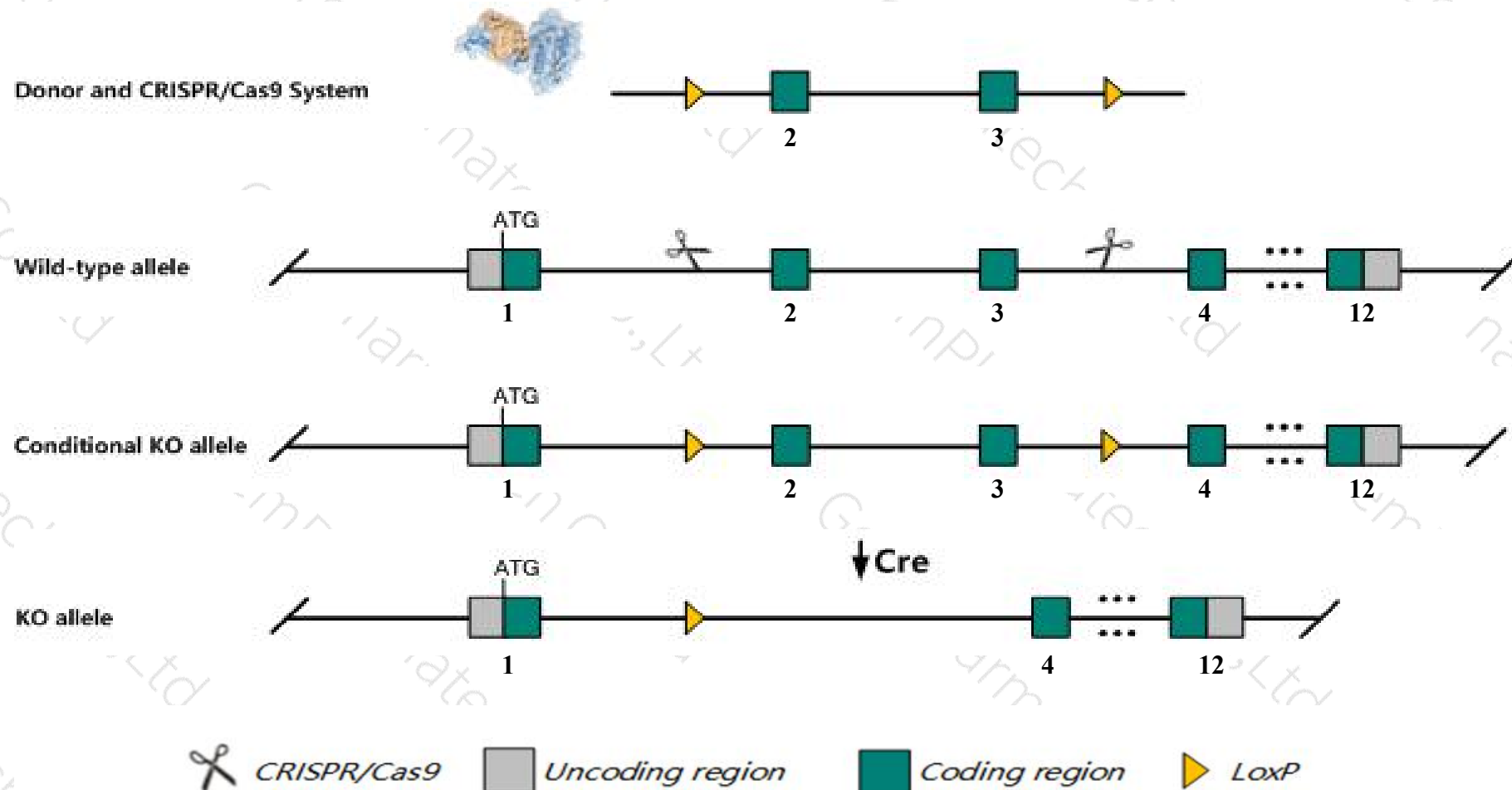
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lpcat3* gene. The schematic diagram is as follows:



- The *Lpcat3* gene has 9 transcripts. According to the structure of *Lpcat3* gene, exon2-exon3 of *Lpcat3-201* (ENSMUST00000004381.13) transcript is recommended as the knockout region. The region contains 215bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lpcat3* 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.

- According to the existing MGI data, Nullizygous mice show low blood glucose levels and postnatal death. Intestine-specific knockouts fail to thrive and show enterocyte lipid accumulation and low plasma triglycerides (TGs). Liver-specific knockouts show low plasma TGs, fatty liver, and secrete VLDL lacking arachidonoyl phospholipids.
- The *Lpcat3* 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)

Lpcat3 lysophosphatidylcholine acyltransferase 3 [Mus musculus (house mouse)]

Gene ID: 14792, updated on 5-Feb-2019

Summary



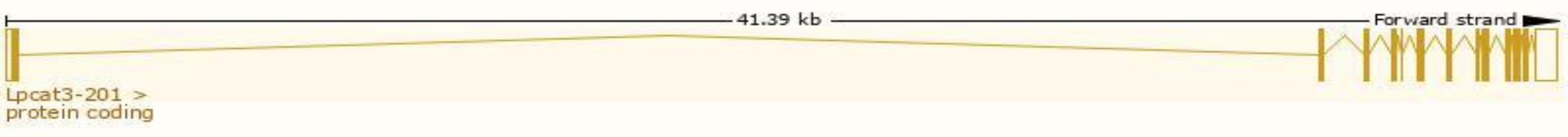
Official Symbol	Lpcat3 provided by MGI
Official Full Name	lysophosphatidylcholine acyltransferase 3 provided by MGI
Primary source	MGI:MGI:1315211
See related	Ensembl:ENSMUSG000000004270
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C3f, Grcc3f, Lpcat, Lpeat, Lplat5, Lpsat, Mboat5, Moact5, Oact5, PTG
Expression	Ubiquitous expression in large intestine adult (RPKM 97.2), testis adult (RPKM 92.5) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

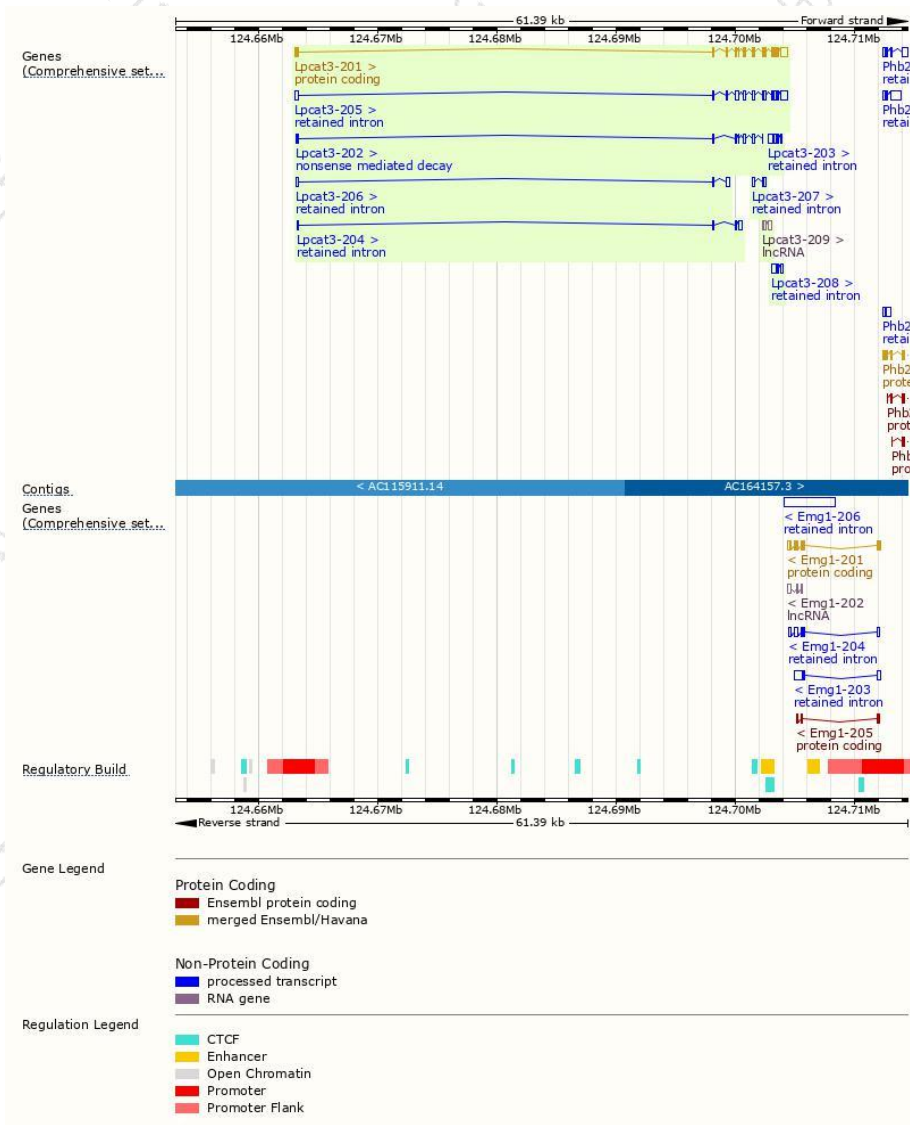
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lpcat3-201	ENSMUST00000004381.13	2281	487aa	Protein coding	CCDS20523	Q91V01	TSL:1 GENCODE basic APPRIS P1
Lpcat3-202	ENSMUST00000128721.6	771	99aa	Nonsense mediated decay	-	A0A0N4SUM3	TSL:3
Lpcat3-205	ENSMUST00000135516.7	2373	No protein	Retained intron	-	-	TSL:1
Lpcat3-203	ENSMUST00000130020.7	820	No protein	Retained intron	-	-	TSL:2
Lpcat3-208	ENSMUST00000150597.1	732	No protein	Retained intron	-	-	TSL:2
Lpcat3-204	ENSMUST00000133797.1	667	No protein	Retained intron	-	-	TSL:5
Lpcat3-206	ENSMUST00000141069.7	550	No protein	Retained intron	-	-	TSL:2
Lpcat3-207	ENSMUST00000141546.1	448	No protein	Retained intron	-	-	TSL:3
Lpcat3-209	ENSMUST00000152176.1	533	No protein	lncRNA	-	-	TSL:3

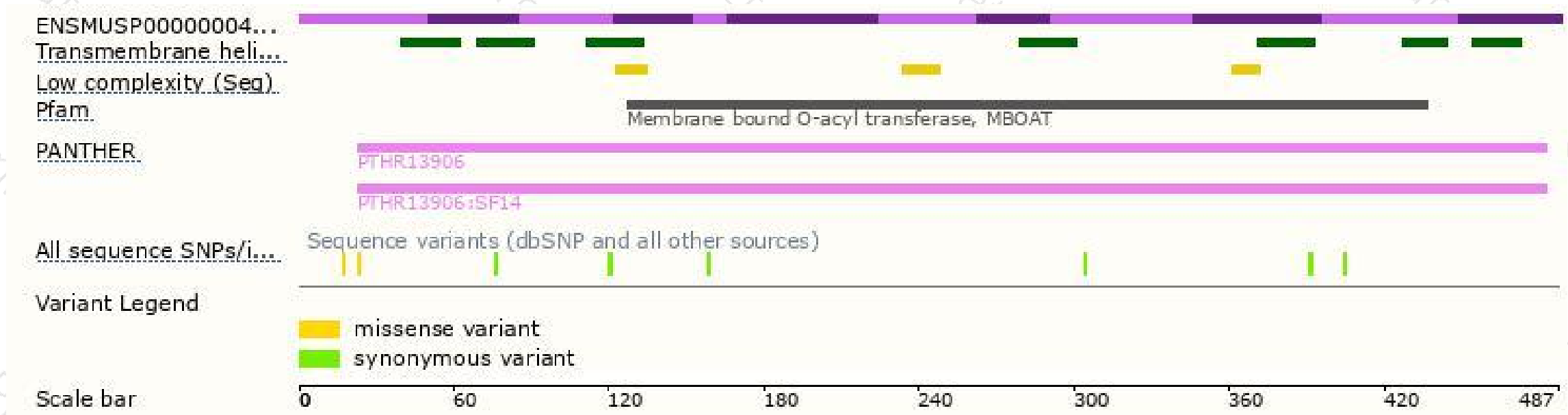
The strategy is based on the design of *Lpcat3-201* transcript,The transcription is shown below



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, Nullizygous mice show low blood glucose levels and postnatal death.

Intestine-specific knockouts fail to thrive and show enterocyte lipid accumulation and low plasma triglycerides (TGs). Liver-specific knockouts show low plasma TGs, fatty liver, and secrete VLDL lacking arachidonoyl phospholipids.

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

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