

Plaat3 Cas9-KO Strategy

Designer: Yupeng Yang

Reviewer: Yun Li

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Project Overview

Project Name

Plaat3

Project type

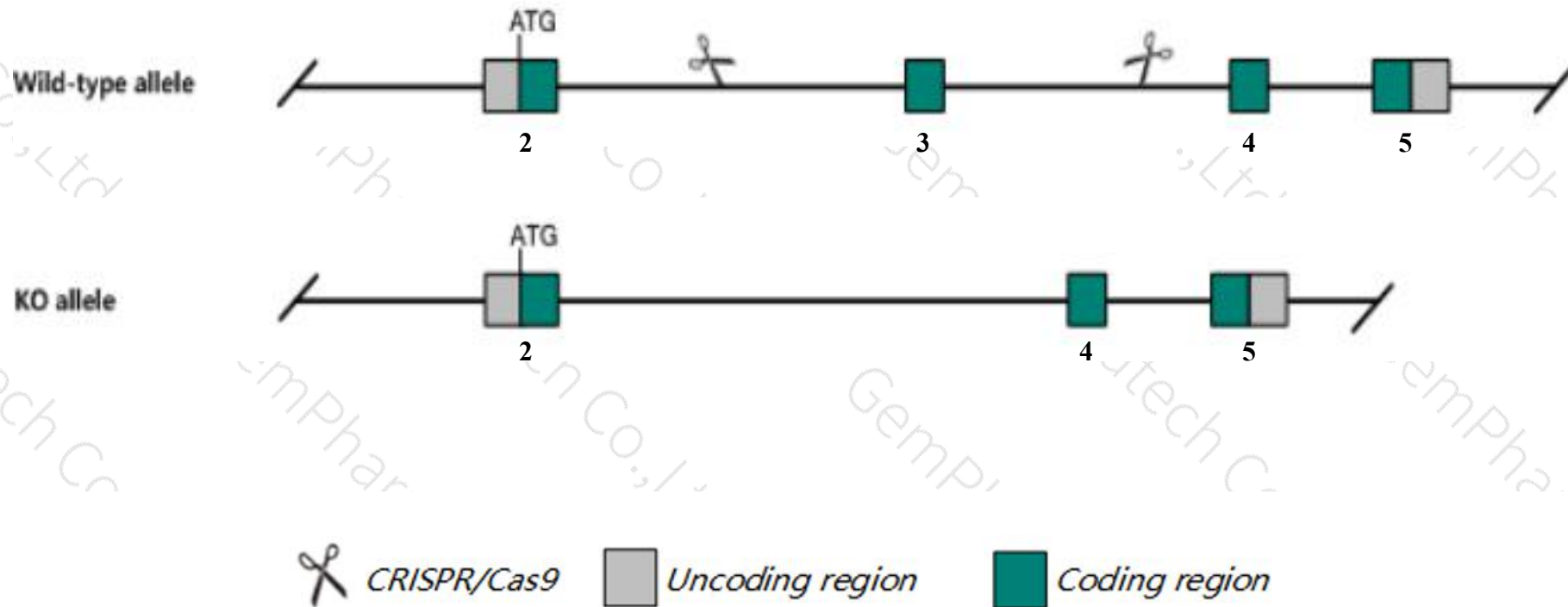
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Plaat3* gene. The schematic diagram is as follows:



Technical routes

- The *Plaat3* gene has 4 transcripts. According to the structure of *Plaat3* gene, exon3 of *Plaat3*-201(ENSMUST00000025925.10) transcript is recommended as the knockout region. The region contains 103bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Plaat3* 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 knock-out allele exhibit increased lipolysis, decreased susceptibility to diet- or leptin deficiency-induced obesity, hepatic steatosis and altered glucose homeostasis.
- The *Plaat3* gene is located on the Chr19. 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.

Gene information (NCBI)

Plaat3 phospholipase A and acyltransferase 3 [Mus musculus (house mouse)]

Gene ID: 225845, updated on 31-Jan-2019

Summary



Official Symbol	Plaat3 provided by MGI
Official Full Name	phospholipase A and acyltransferase 3 provided by MGI
Primary source	MGI:MGI:2179715
See related	Ensembl:ENSMUSG00000060675
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	AdPLA, C78643, HRSL3, Hrasls3, Hrev107, MLP-3, Pla2g16
Expression	Broad expression in subcutaneous fat pad adult (RPKM 47.3), genital fat pad adult (RPKM 30.1) and 19 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

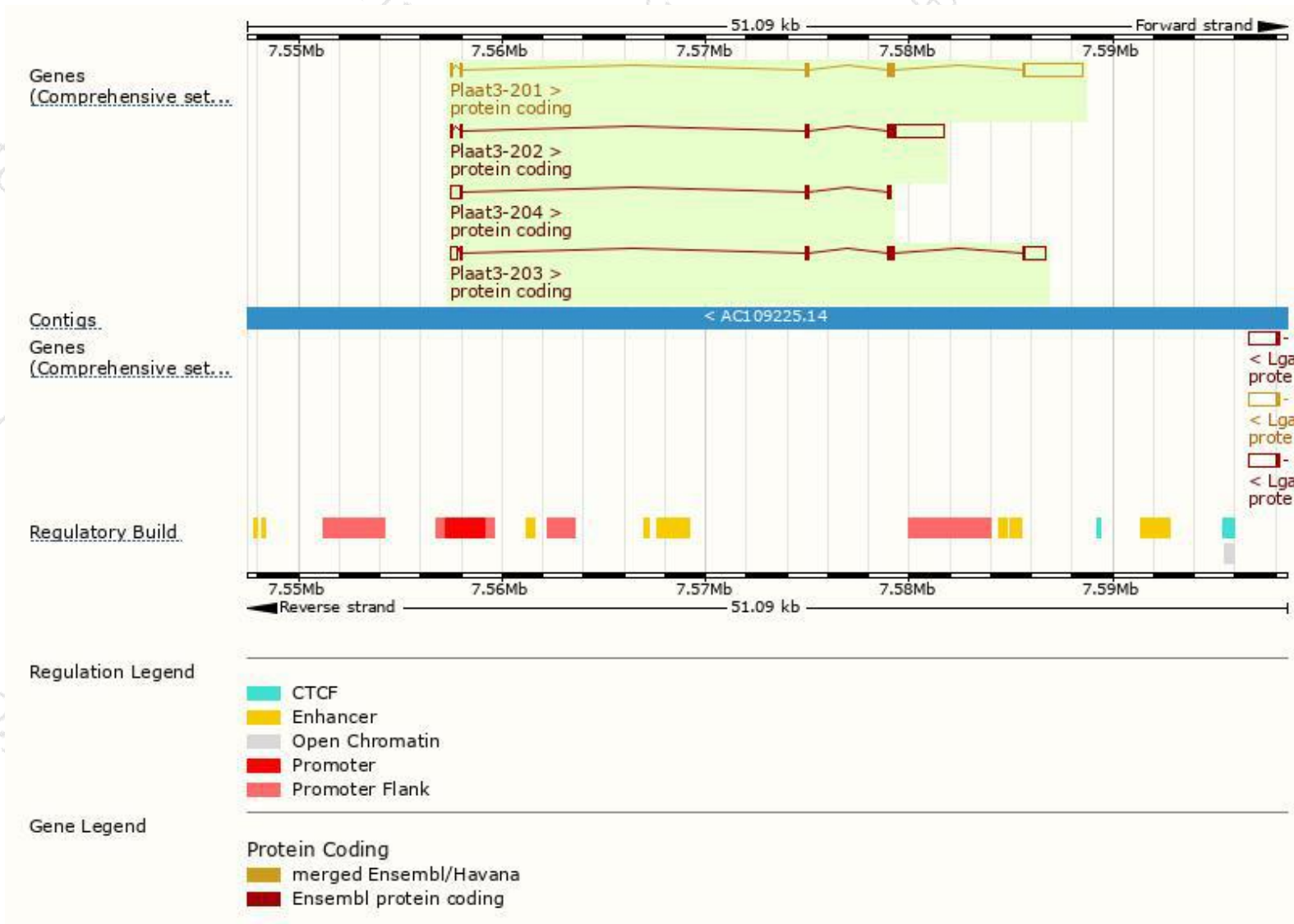
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pla2g16-201	ENSMUST00000025925.10	3523	162aa	Protein coding	CCDS29528	Q8R3U1	TSL:1 GENCODE basic APPRIS P1
Pla2g16-203	ENSMUST00000136756.1	1901	162aa	Protein coding	CCDS29528	Q8R3U1	TSL:1 GENCODE basic APPRIS P1
Pla2g16-202	ENSMUST00000136465.7	3048	168aa	Protein coding	-	Q8R3U1	TSL:1 GENCODE basic
Pla2g16-204	ENSMUST00000141887.7	802	99aa	Protein coding	-	D3YYG1	CDS 3' incomplete TSL:5

The strategy is based on the design of *Plaat3-201* transcript,the transcription is shown below:



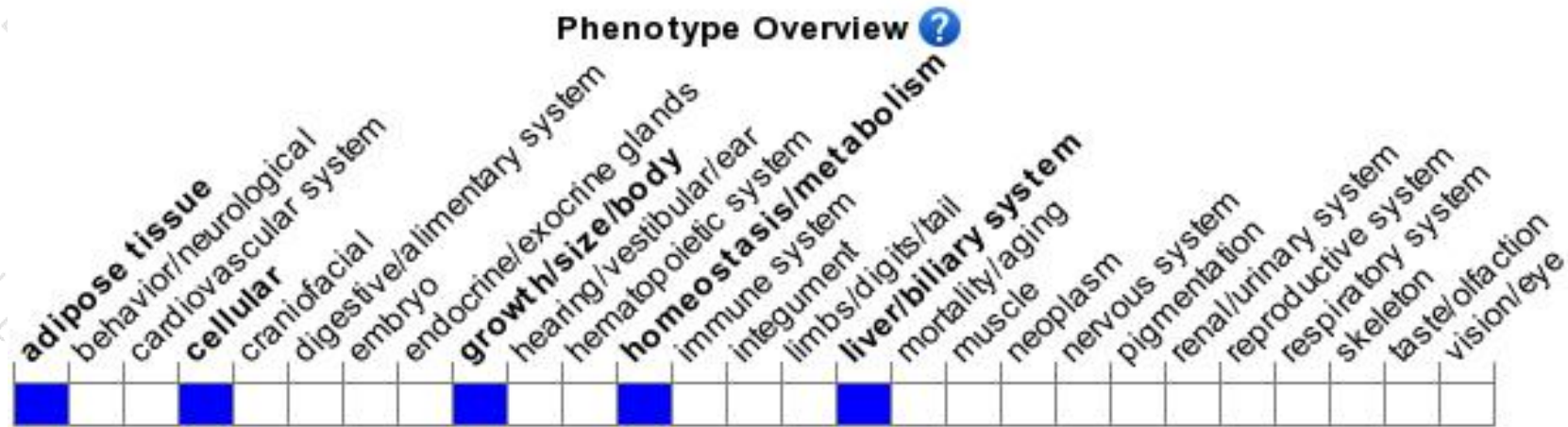
Genomic location distribution



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 knock-out allele exhibit increased lipolysis, decreased susceptibility to diet- or leptin deficiency-induced obesity, hepatic steatosis and altered glucose homeostasis.

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

Tel: 400-9660890

