

Gpat3 Cas9-KO Strategy

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Project Overview

Project Name

Gpat3

Project type

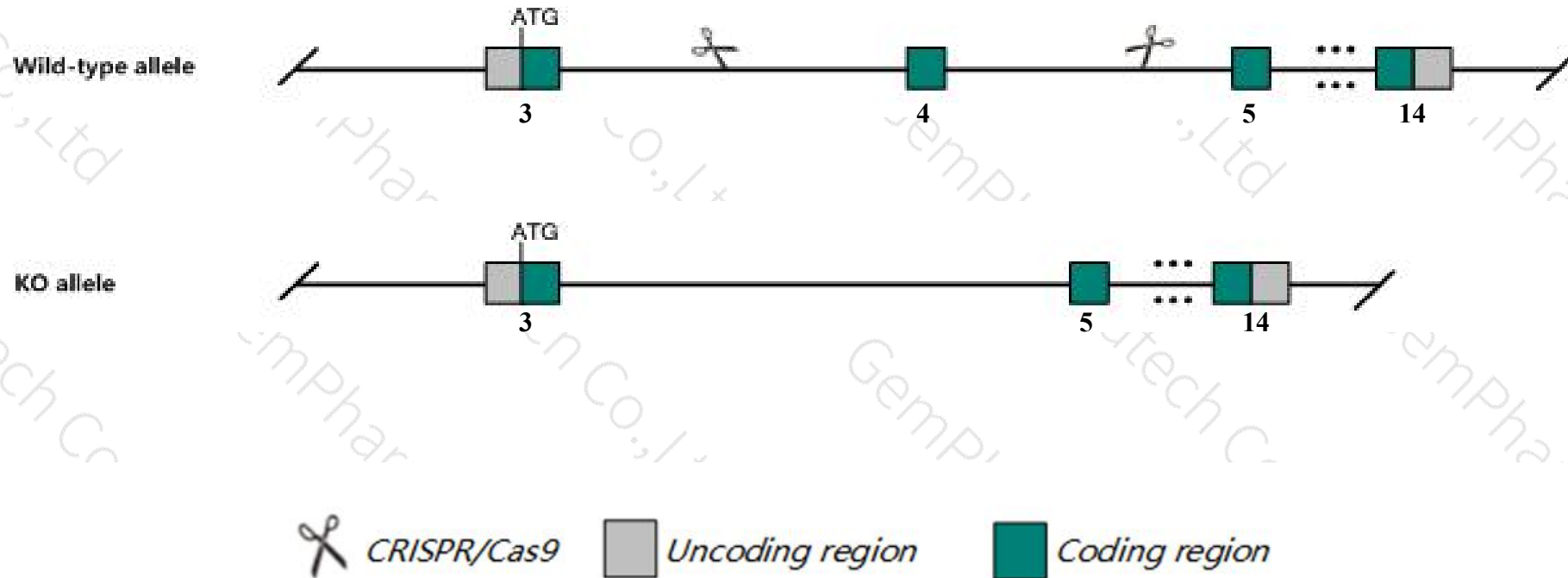
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gpat3* gene. The schematic diagram is as follows:



- The *Gpat3* gene has 5 transcripts. According to the structure of *Gpat3* gene, exon4 of *Gpat3-203* (ENSMUST00000112887.7) transcript is recommended as the knockout region. The region contains 67bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gpat3* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Under high-fat feeding, mice homozygous for a knock-out allele exhibit increased energy expenditure, improved glucose homeostasis, enlarged livers, increased total serum cholesterol levels, altered liver cholesterol metabolism, and female-specific protection from diet-induced obesity.
- The transcripts 204, 205 are incomplete and the effects are unknown.
- The *Gpat3* gene is located on the Chr5. 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)

Gpat3 glycerol-3-phosphate acyltransferase 3 [*Mus musculus* (house mouse)]

Gene ID: 231510, updated on 7-Sep-2019

Summary

Official Symbol	Gpat3 provided by MGI
Official Full Name	glycerol-3-phosphate acyltransferase 3 provided by MGI
Primary source	MGI:MGI:3603816
See related	Ensembl:ENSMUSG00000029314
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	Agpat9; GPAT-3; mGPAT3; 1-AGPAT; AGPAT 10; 1-AGPAT 9; 4933408F15; 4933407I02Rik; A230097K15Rik
Expression	Broad expression in subcutaneous fat pad adult (RPKM 11.7), large intestine adult (RPKM 11.5) and 17 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

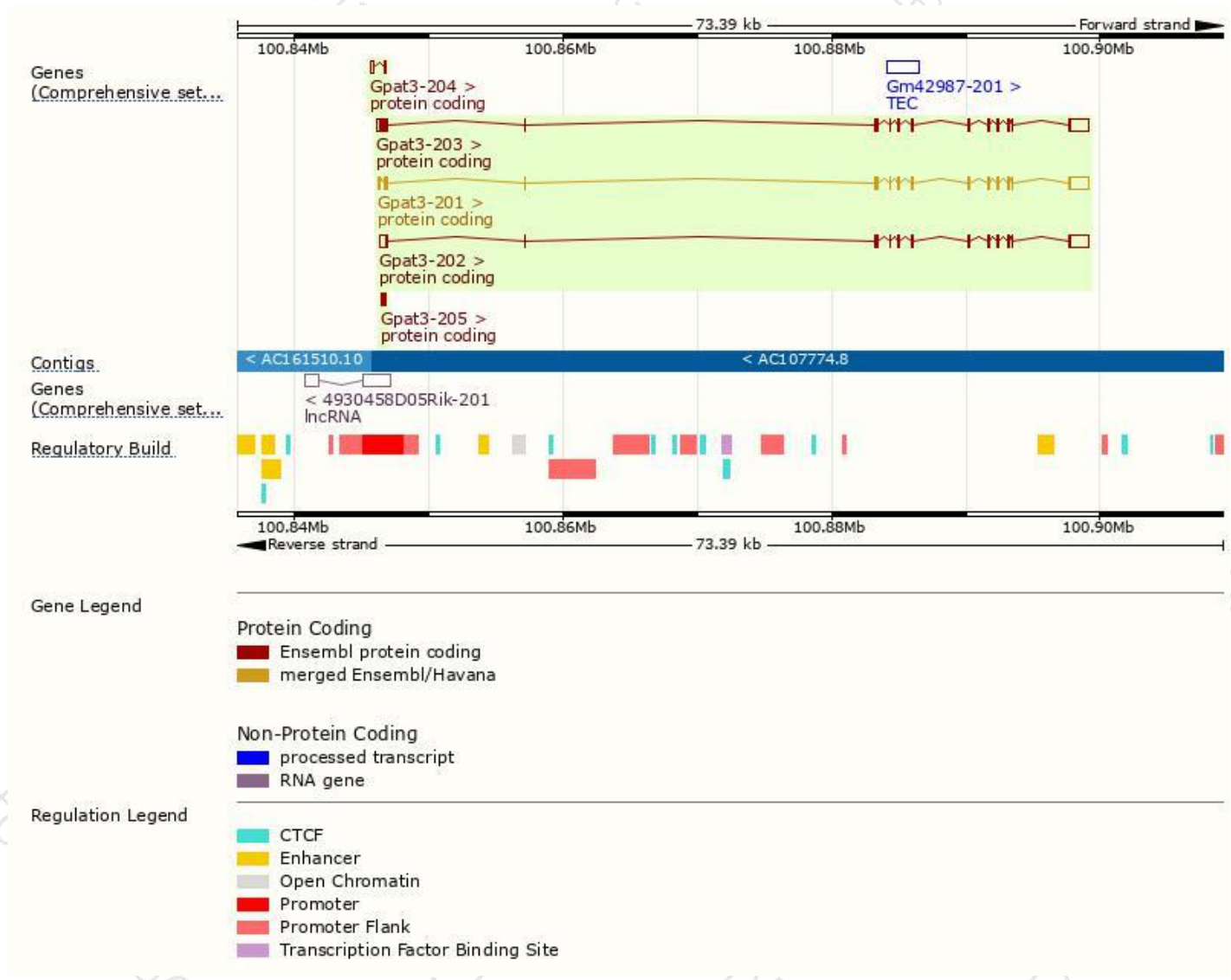
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpat3-203	ENSMUST00000112887.7	3059	438aa	Protein coding	CCDS19470	Q8C0N2	TSL:1 GENCODE basic APPRIS P1
Gpat3-202	ENSMUST00000092990.3	3035	438aa	Protein coding	CCDS19470	Q8C0N2	TSL:1 GENCODE basic APPRIS P1
Gpat3-201	ENSMUST00000031255.14	2884	438aa	Protein coding	CCDS19470	Q8C0N2	TSL:1 GENCODE basic APPRIS P1
Gpat3-204	ENSMUST00000144623.1	391	1aa	Protein coding	-	-	CDS 3' incomplete TSL:2
Gpat3-205	ENSMUST00000145612.1	337	14aa	Protein coding	-	D3YUY8	CDS 3' incomplete TSL:2

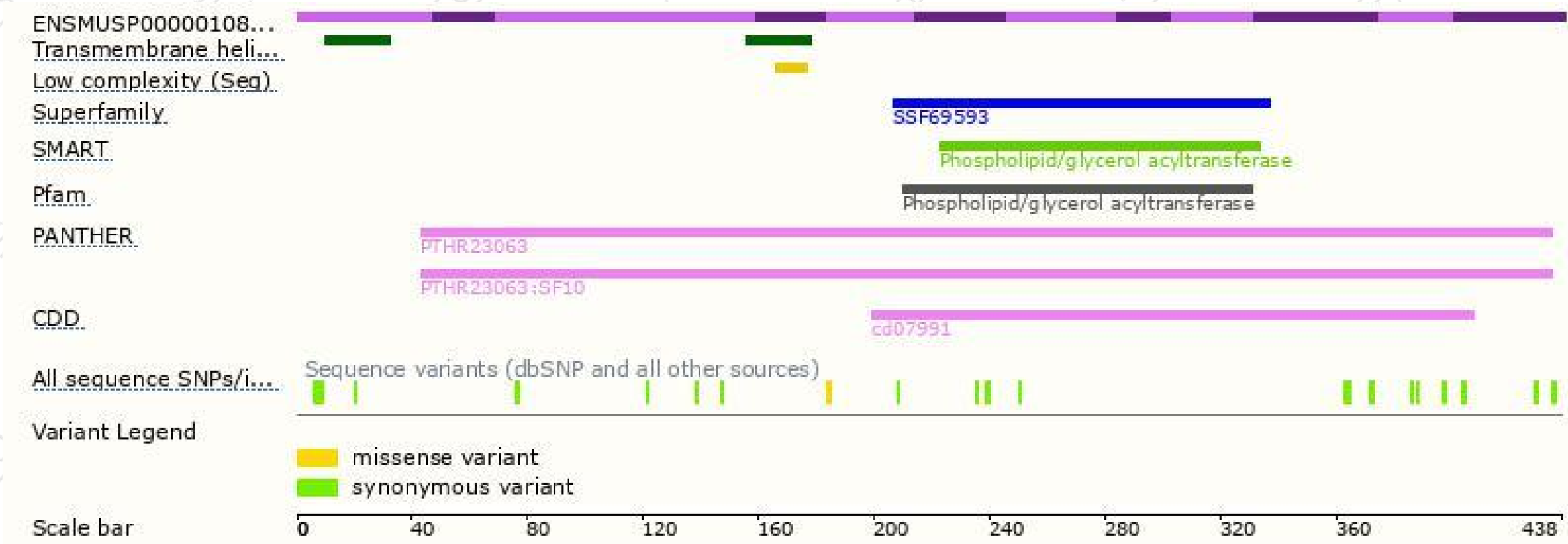
The strategy is based on the design of *Gpat3-203* transcript,The transcription is shown below



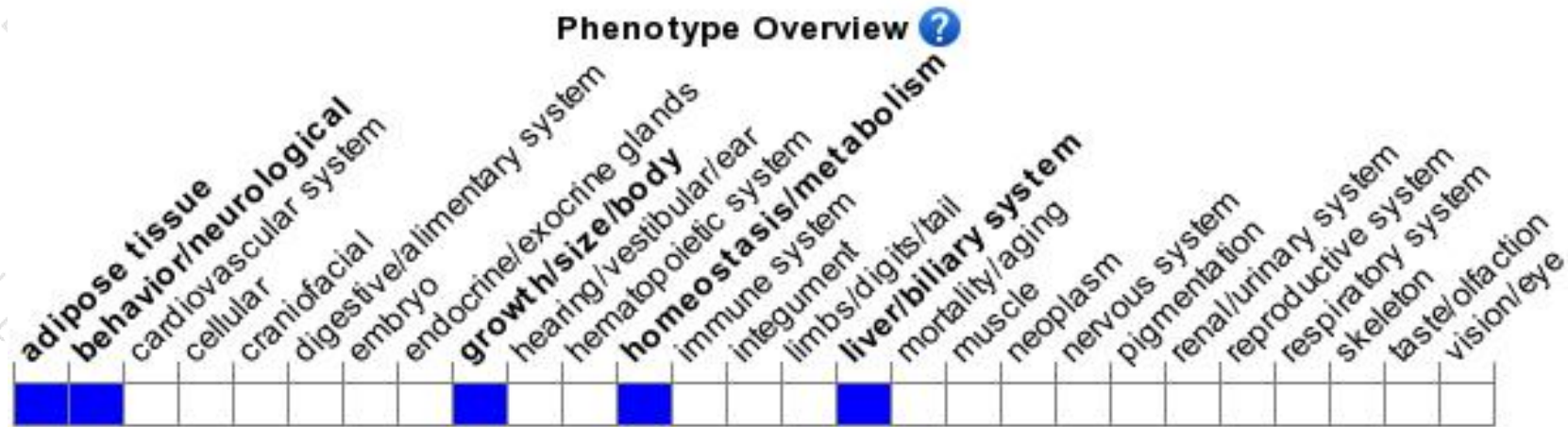
Genomic location distribution



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, Under high-fat feeding, mice homozygous for a knock-out allele exhibit increased energy expenditure, improved glucose homeostasis, enlarged livers, increased total serum cholesterol levels, altered liver cholesterol metabolism, and female-specific protection from diet-induced obesity.

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

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