

Dgat2 Cas9-KO Strategy

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Project Overview

Project Name

Dgat2

Project type

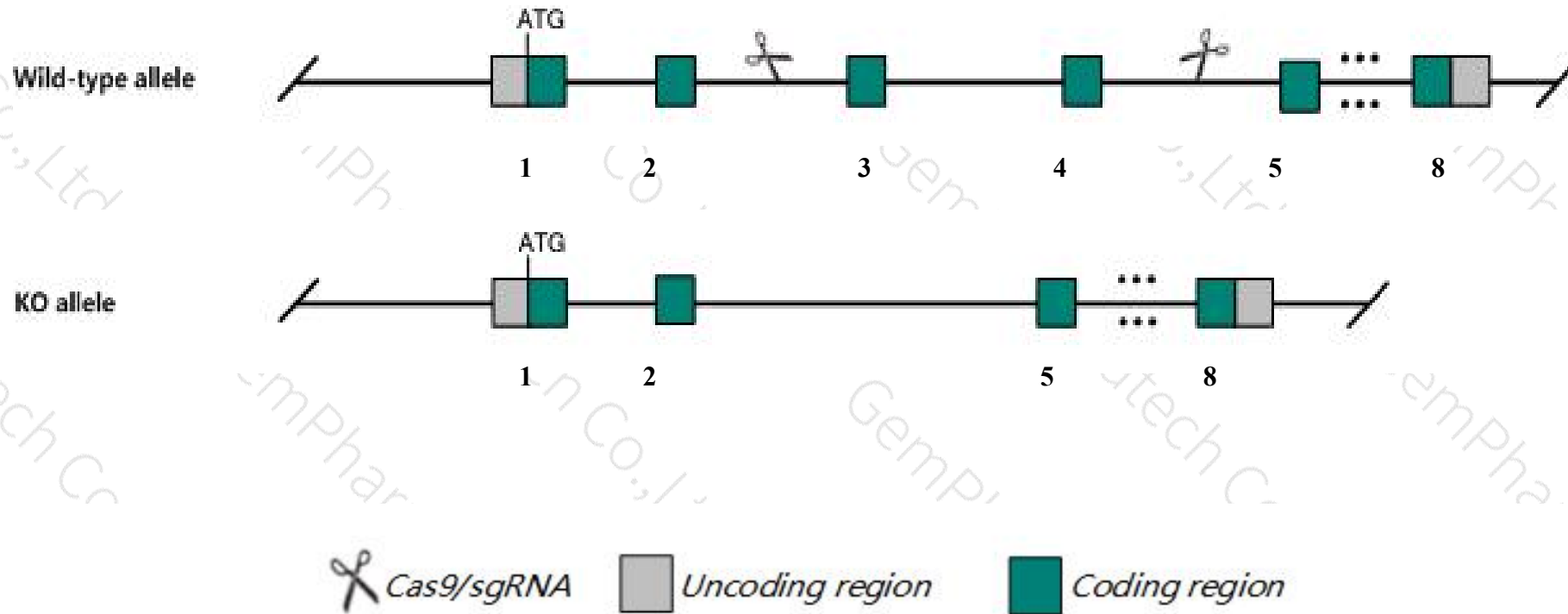
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dgat2* gene. The schematic diagram is as follows:



- The *Dgat2* gene has 6 transcripts. According to the structure of *Dgat2* gene, exon3-exon4 of *Dgat2-201* (ENSMUST00000033001.5) transcript is recommended as the knockout region. The region contains 179bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dgat2* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Homozygous mutant mice die shortly after birth due to inadequate substrates for energy and impaired skin barrier function leading to dehydration.
- The *Dgat2* 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.

Gene information (NCBI)

Dgat2 diacylglycerol O-acyltransferase 2 [Mus musculus (house mouse)]

Gene ID: 67800, updated on 31-Jan-2019

Summary



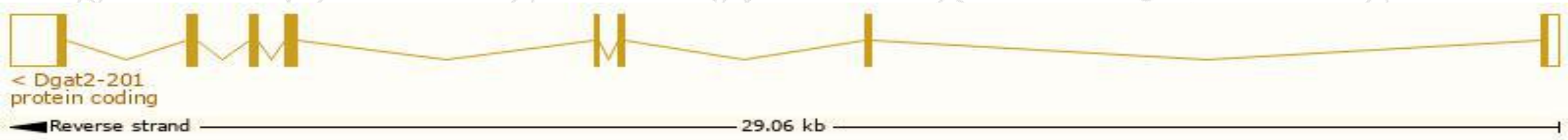
Official Symbol	Dgat2 provided by MGI
Official Full Name	diacylglycerol O-acyltransferase 2 provided by MGI
Primary source	MGI:MGI:1915050
See related	Ensembl:ENSMUSG00000030747
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	0610010B06Rik, ARAT, DGAT-2
Expression	Biased expression in subcutaneous fat pad adult (RPKM 1253.2), mammary gland adult (RPKM 752.2) and 12 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

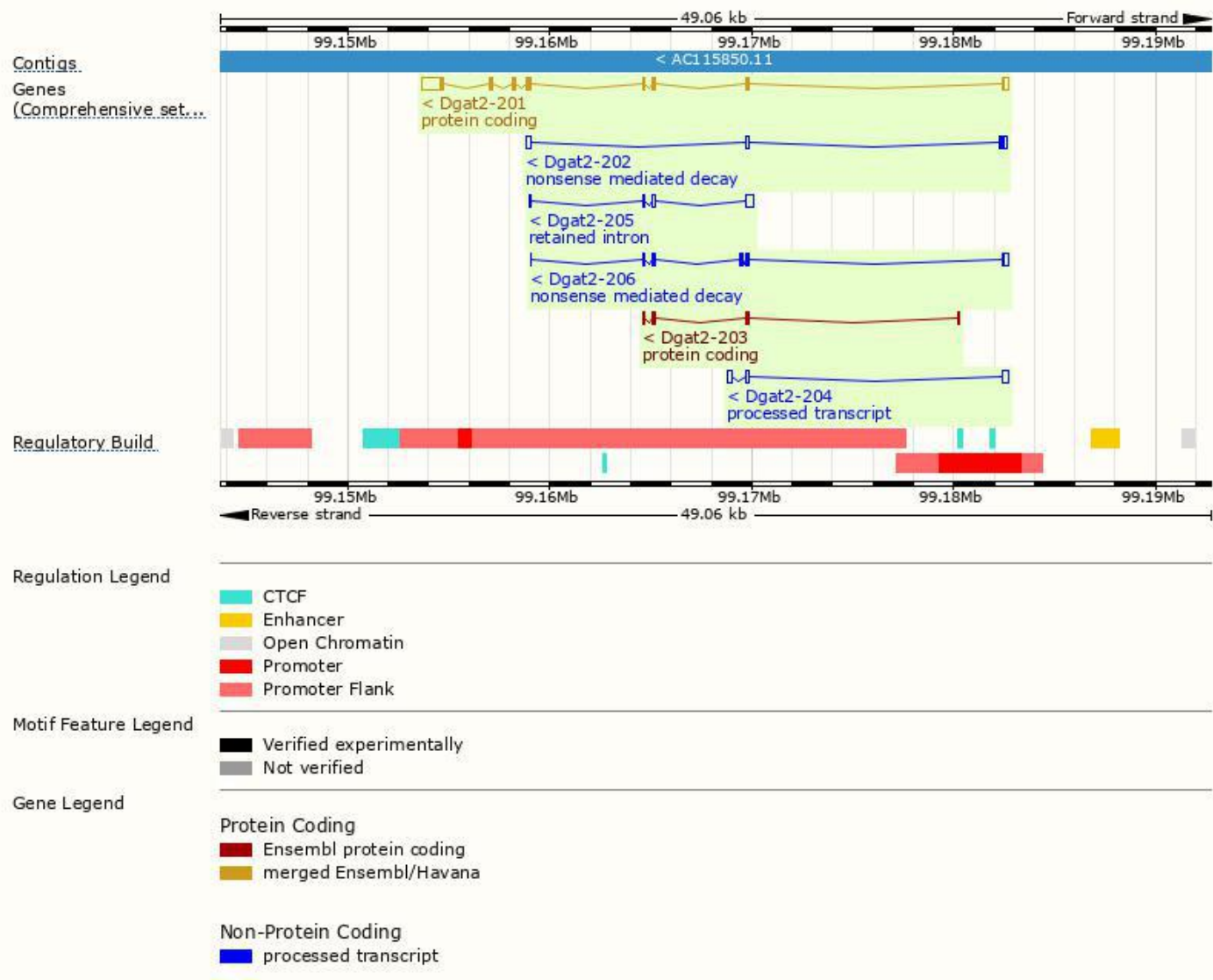
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dgat2-201	ENSMUST00000033001.5	2262	388aa	Protein coding	CCDS21477	Q9DCV3	TSL:1 GENCODE basic APPRIS P1
Dgat2-203	ENSMUST00000207611.1	379	110aa	Protein coding	-	A0A140LHF3	CDS 3' incomplete TSL:3
Dgat2-202	ENSMUST00000207491.1	740	51aa	Nonsense mediated decay	-	A0A140LHA9	TSL:3
Dgat2-206	ENSMUST00000208591.1	739	133aa	Nonsense mediated decay	-	A0A140LJ48	TSL:5
Dgat2-204	ENSMUST00000207893.1	679	No protein	Processed transcript	-	-	TSL:3
Dgat2-205	ENSMUST00000207894.1	642	No protein	Retained intron	-	-	TSL:2

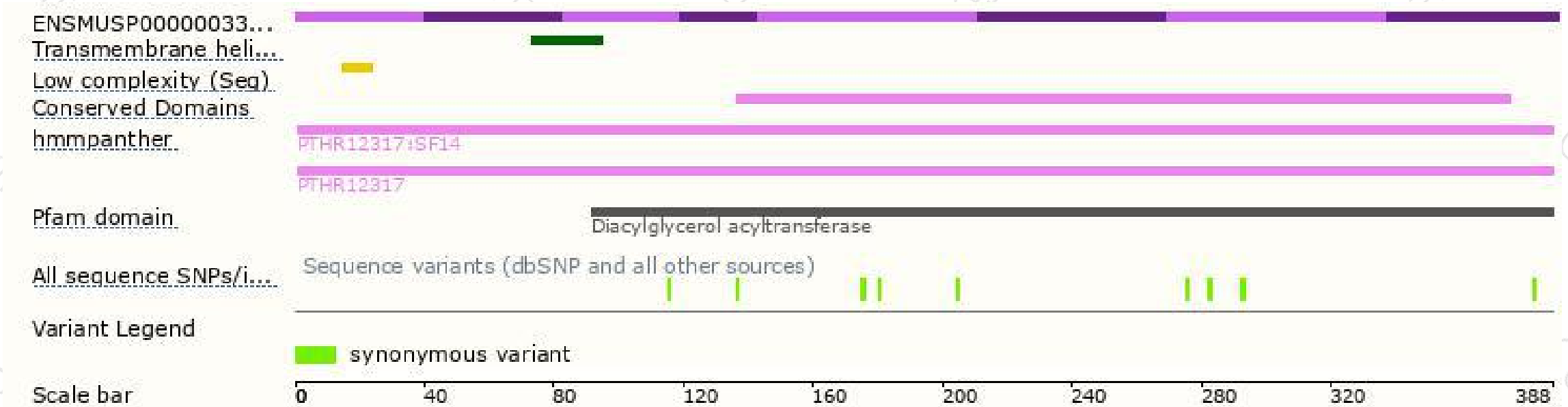
The strategy is based on the design of *Dgat2-201* transcript,The transcription is shown below



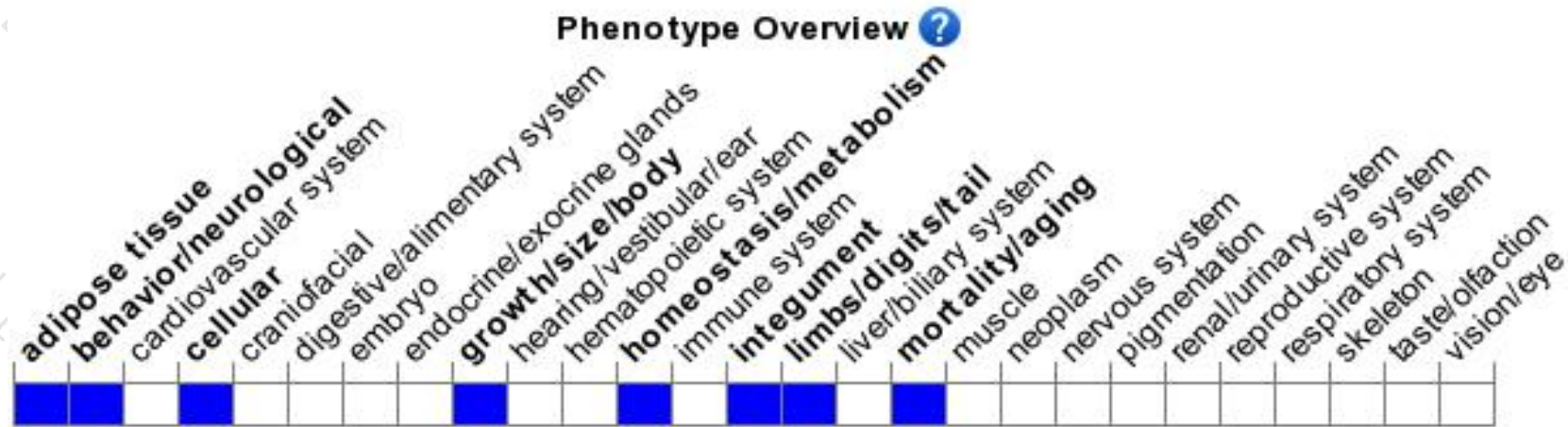
Genomic location distribution



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, Homozygous mutant mice die shortly after birth due to inadequate substrates for energy and impaired skin barrier function leading to dehydration.

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

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