Dgat1 Cas9-KO Strategy

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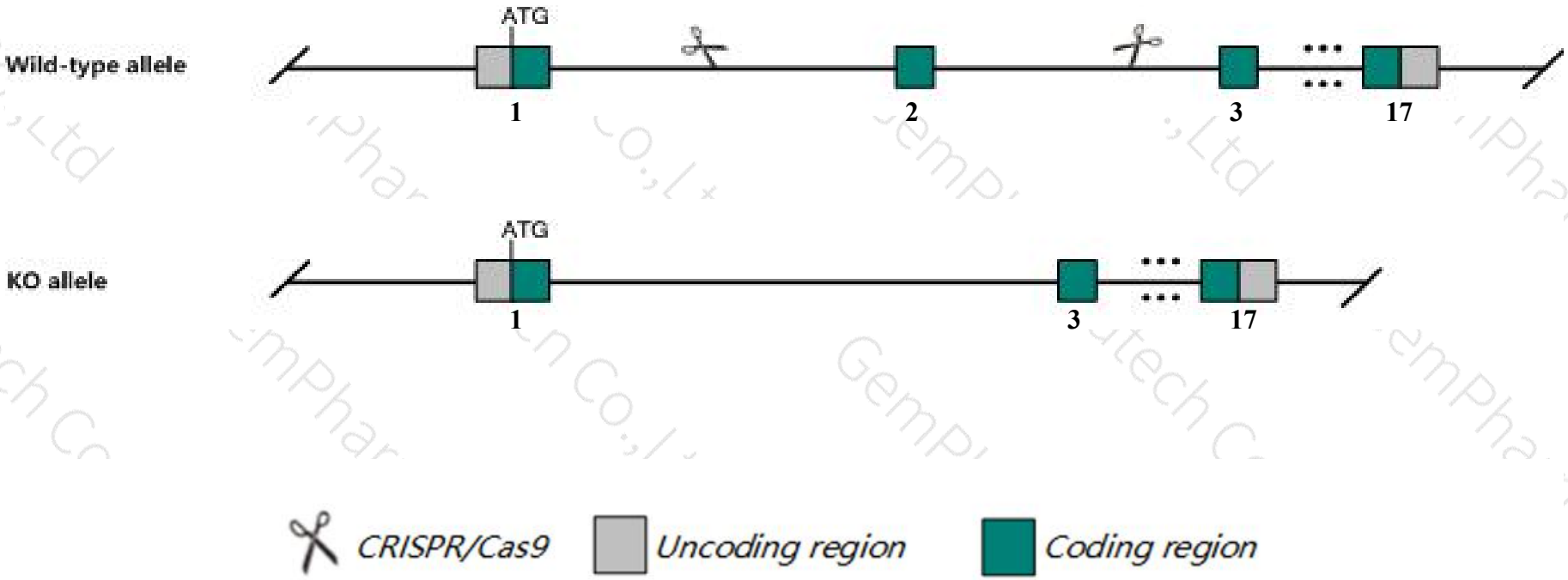
Project Overview

Project Name	***Dgat1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dgat1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Dgat1* gene has 12 transcripts. According to the structure of *Dgat1* gene, exon2 of *Dgat1-201* (ENSMUST00000023214.10) transcript is recommended as the knockout region.The region contains 88bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Dgat1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygous inactivation of this gene leads to decreased percent body fat, resistance to diet-induced obesity, altered energy, glucose and triglyceride metabolism, alopecia, hair cycle and skin defects, and a lactation failure associated with impaired mammary gland growth during pregnancy.

- The *Dgat1* gene is located on the Chr15. 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）

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Dgat1 diacylglycerol O-acyltransferase 1 [Mus musculus (house mouse)]

Gene ID: 13350, updated on 31-Jan-2019

Summary

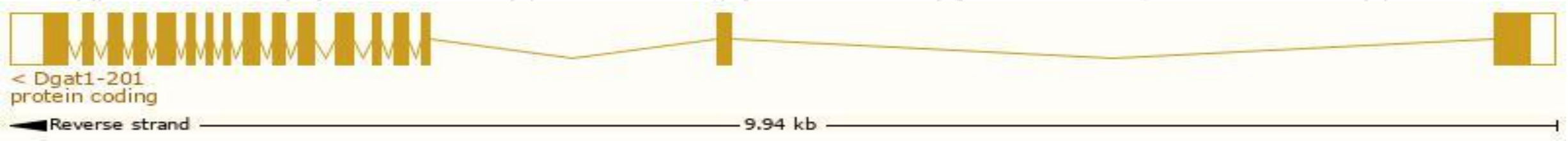
Official Symbol	Dgat1 provided by MGI
Official Full Name	diacylglycerol O-acyltransferase 1 provided by MGI
Primary source	MGI:MGI:1333825
See related	Ensembl:ENSMUSG00000022555
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	ARAT, C75990, D15Ertd23e, Dgat
Expression	Biased expression in duodenum adult (RPKM 359.0), small intestine adult (RPKM 242.2) and 9 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

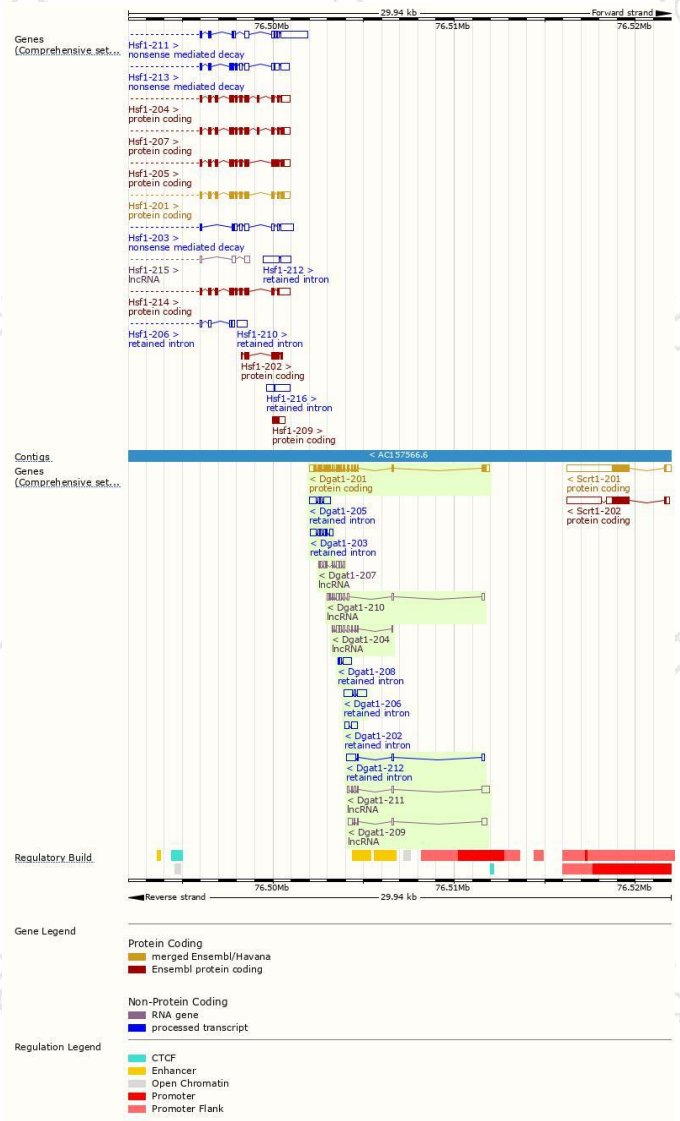
The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dgat1-201	ENSMUST00000023214.10	1888	498aa	Protein coding	CCDS27573	Q54AA6 Q9Z2A7	TSL:1 GENCODE basic APPRIS P1
Dgat1-206	ENSMUST00000161499.1	1116	No protein	Retained intron	-	-	TSL:3
Dgat1-205	ENSMUST00000160294.7	885	No protein	Retained intron	-	-	TSL:1
Dgat1-212	ENSMUST00000231035.1	780	No protein	Retained intron	-	-	
Dgat1-203	ENSMUST00000159908.1	742	No protein	Retained intron	-	-	TSL:5
Dgat1-202	ENSMUST00000159776.1	584	No protein	Retained intron	-	-	TSL:3
Dgat1-208	ENSMUST00000162813.1	564	No protein	Retained intron	-	-	TSL:2
Dgat1-210	ENSMUST00000230722.1	803	No protein	lncRNA	-	-	
Dgat1-211	ENSMUST00000230894.1	788	No protein	lncRNA	-	-	
Dgat1-209	ENSMUST00000229569.1	659	No protein	lncRNA	-	-	
Dgat1-204	ENSMUST00000160293.1	602	No protein	lncRNA	-	-	TSL:5
Dgat1-207	ENSMUST00000162354.7	569	No protein	lncRNA	-	-	TSL:3

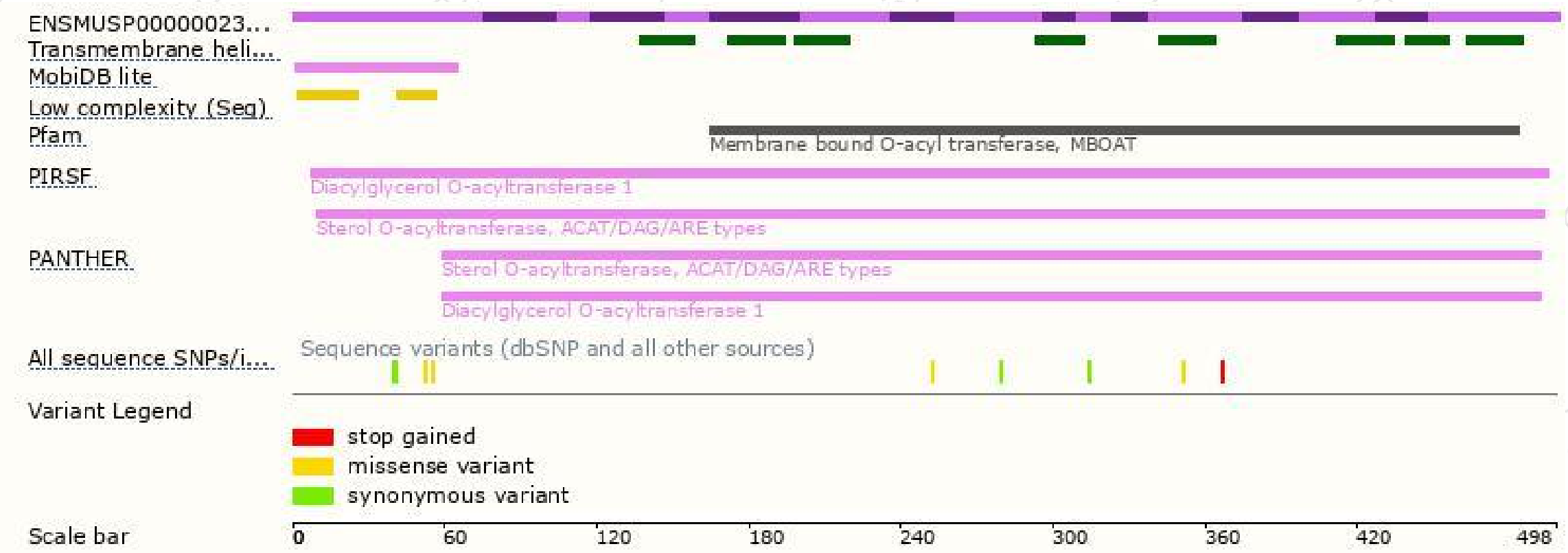
The strategy is based on the design of *Dgat1-201* transcript,The transcription is shown below



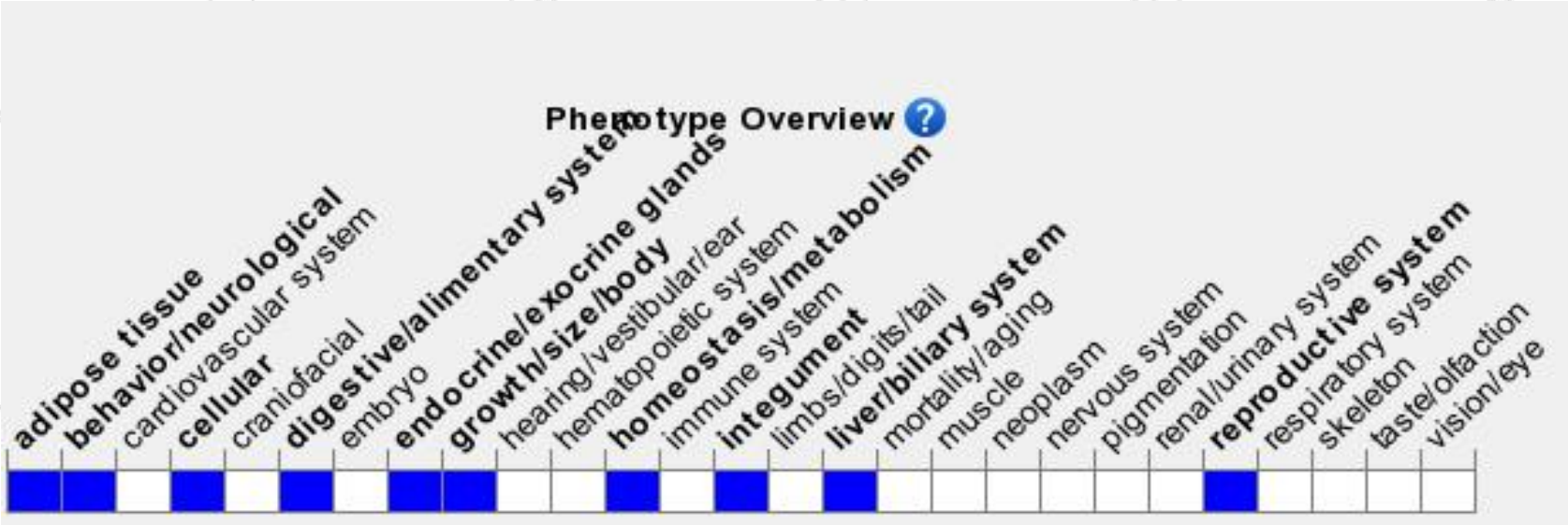
Genomic location distribution



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/).

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

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