

Mgat1 Cas9-KO Strategy

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Project Overview

Project Name

Mgat1

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mgat1* gene. The schematic diagram is as follows:



- The *Mgat1* gene has 13 transcripts. According to the structure of *Mgat1* gene, exon4 of *Mgat1-213* (ENSMUST00000167400.7) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mgat1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygotes for targeted null mutations develop a deficiency of complex N-glycans during embryogenesis, exhibit defects of neural tube formation, vascularization, and left-right body axis determination, and die by embryonic day 10.5.
- The *Mgat1* gene is located on the Chr11. 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)

Mgat1 mannoside acetylglucosaminyltransferase 1 [Mus musculus (house mouse)]

Gene ID: 17308, updated on 31-Jan-2019

Summary



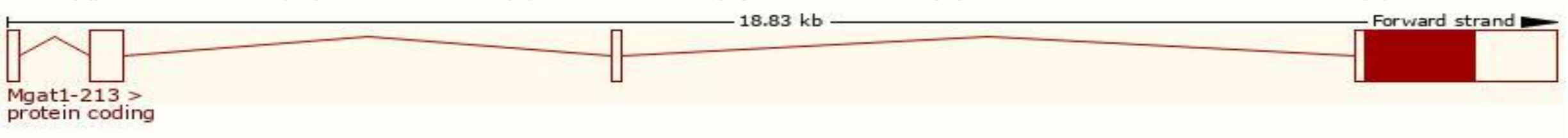
Official Symbol	Mgat1 provided by MGI
Official Full Name	mannoside acetylglucosaminyltransferase 1 provided by MGI
Primary source	MGI:MGI:96973
See related	Ensembl:ENSMUSG00000020346
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Mgat-1
Expression	Ubiquitous expression in thymus adult (RPKM 29.2), spleen adult (RPKM 26.9) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

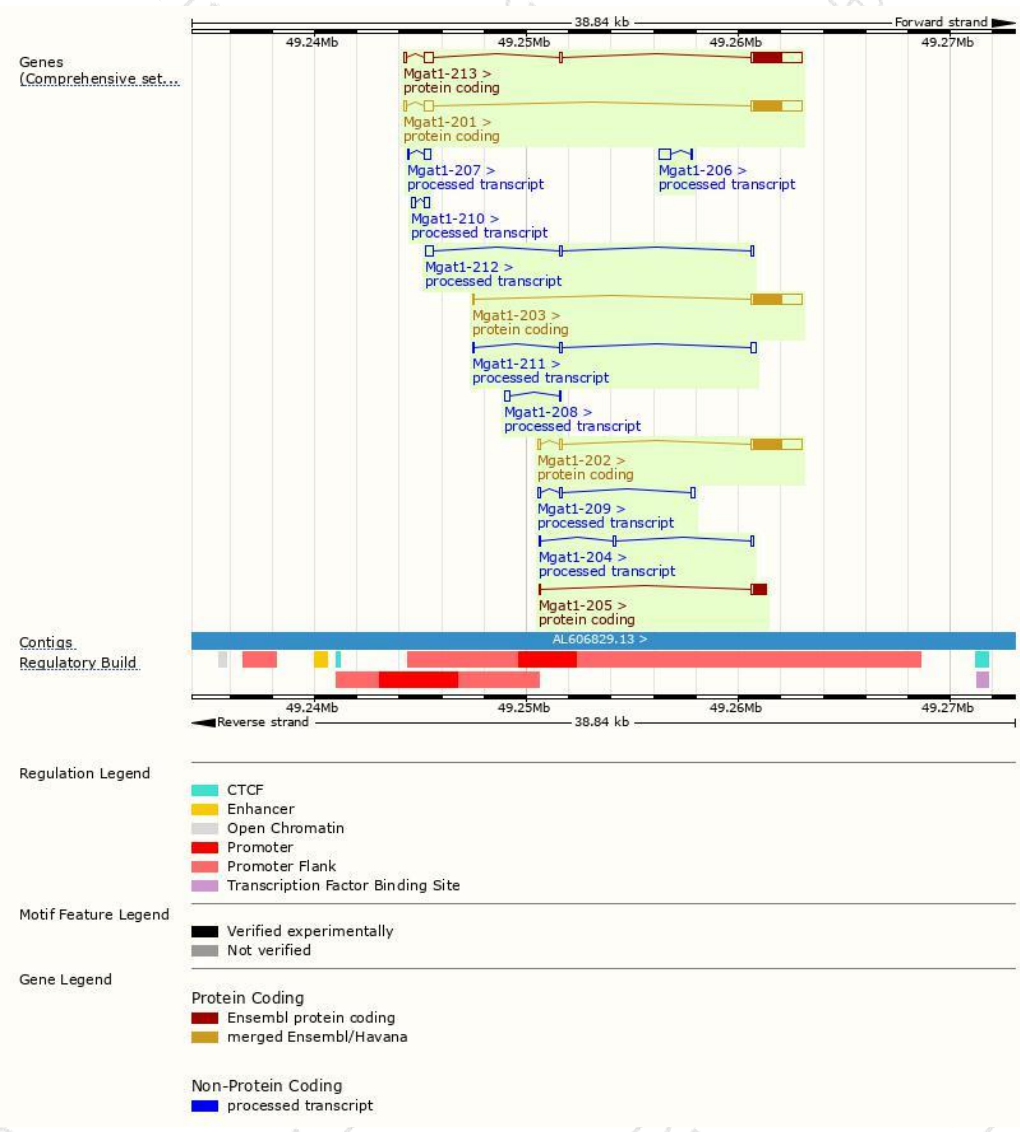
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mgat1-213	ENSMUST00000167400.7	3151	447aa	Protein coding	CCDS24602	P27808 Q544F0	TSL:5 GENCODE basic APPRIS P1
Mgat1-201	ENSMUST00000081794.6	2976	447aa	Protein coding	CCDS24602	P27808 Q544F0	TSL:1 GENCODE basic APPRIS P1
Mgat1-202	ENSMUST00000101293.10	2729	447aa	Protein coding	CCDS24602	P27808 Q544F0	TSL:1 GENCODE basic APPRIS P1
Mgat1-203	ENSMUST00000109194.1	2480	447aa	Protein coding	CCDS24602	P27808 Q544F0	TSL:1 GENCODE basic APPRIS P1
Mgat1-205	ENSMUST00000129588.1	787	200aa	Protein coding	-	J3JS24	CDS 3' incomplete TSL:3
Mgat1-206	ENSMUST00000135314.1	635	No protein	Processed transcript	-	-	TSL:3
Mgat1-212	ENSMUST00000156607.7	633	No protein	Processed transcript	-	-	TSL:1
Mgat1-211	ENSMUST00000155806.7	426	No protein	Processed transcript	-	-	TSL:2
Mgat1-210	ENSMUST00000152451.1	422	No protein	Processed transcript	-	-	TSL:3
Mgat1-209	ENSMUST00000149406.1	402	No protein	Processed transcript	-	-	TSL:2
Mgat1-208	ENSMUST00000148962.1	341	No protein	Processed transcript	-	-	TSL:3
Mgat1-207	ENSMUST00000135489.1	315	No protein	Processed transcript	-	-	TSL:3
Mgat1-204	ENSMUST00000129541.1	310	No protein	Processed transcript	-	-	TSL:5

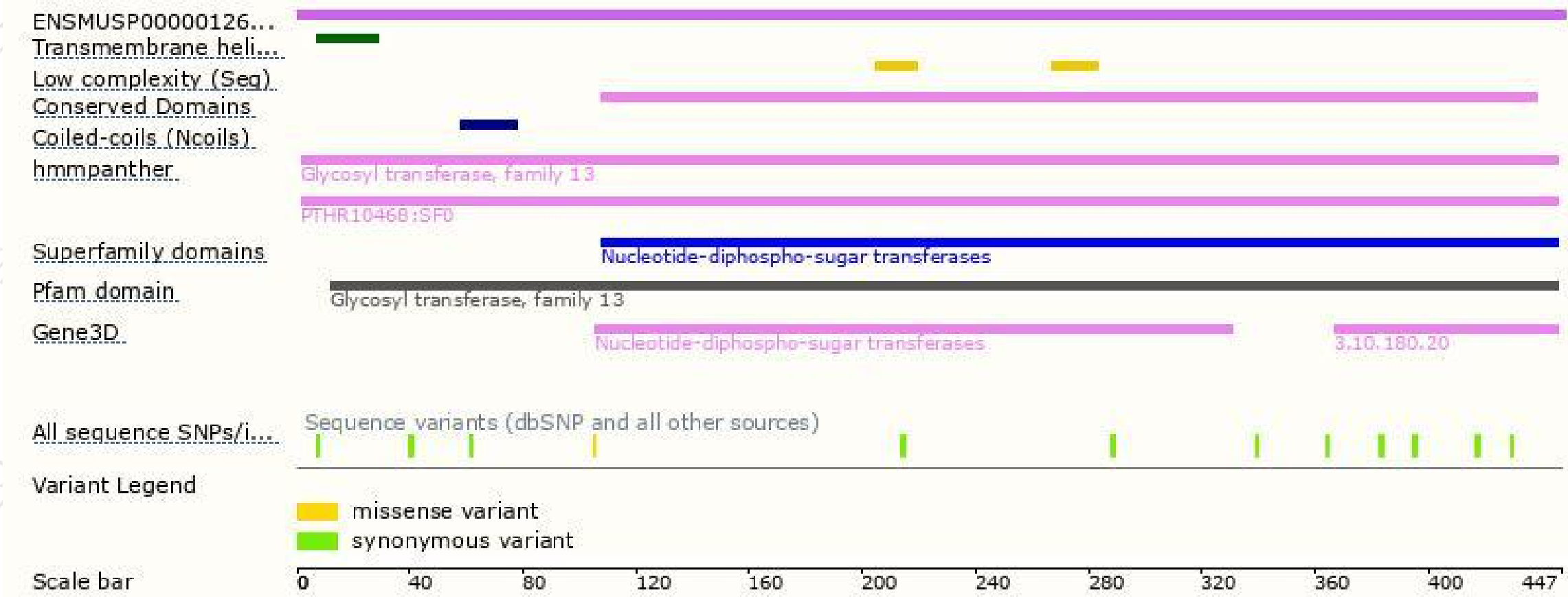
The strategy is based on the design of *Mgat1-213* transcript,The transcription is shown below



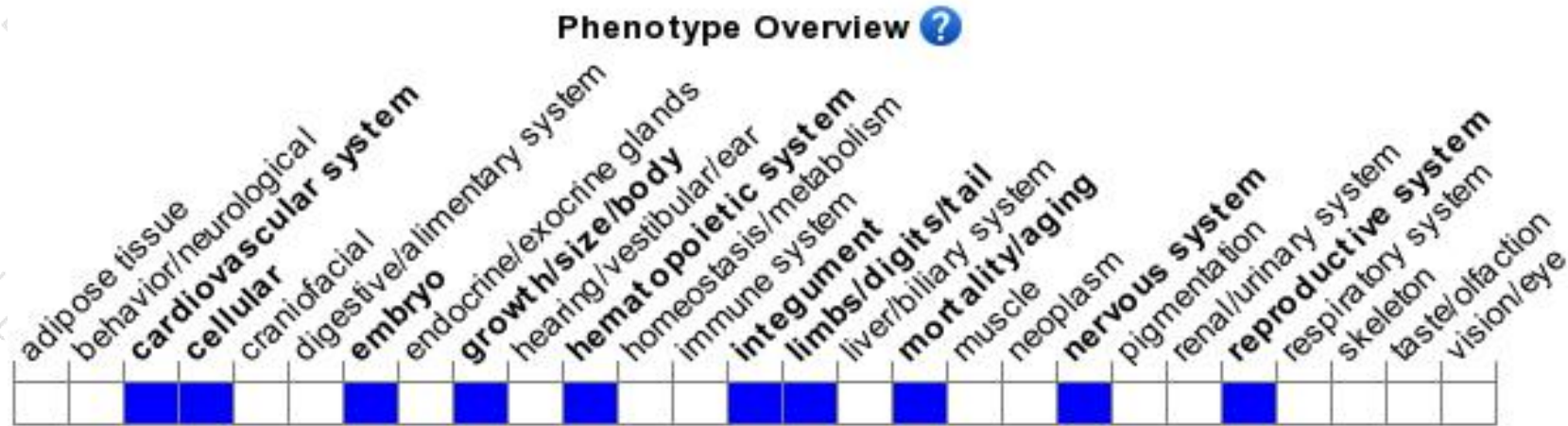
Genomic location distribution



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, Homozygotes for targeted null mutations develop a deficiency of complex N-glycans during embryogenesis, exhibit defects of neural tube formation, vascularization, and left-right body axis determination, and die by embryonic day 10.5.

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

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