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Gramd1b Cas9-KO Strategy

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Overview

Target Gene Name

- *Gramd1b*

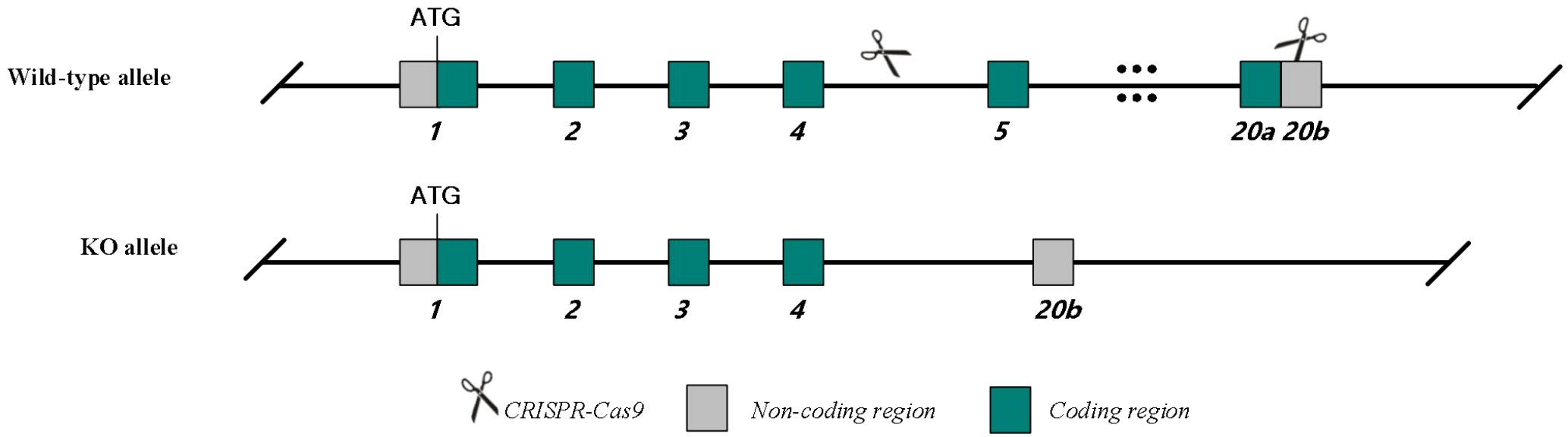
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Gramd1b* gene.

Technical Information

- The *Gramd1b* gene has 15 transcripts. According to the structure of *Gramd1b* gene, exon5-20 of *Gramd1b*-201 (ENSMUST00000045682.7) transcript is recommended as the knockout region. The region contains 1950 bp of coding sequences. Knocking out the region will result in deletion the most coding region of *Gramd1b*, which may disrupt the function of *Gramd1b*.
- In this project we use CRISPR-Cas9 technology to modify *Gramd1b* gene. The brief process is as follows: Cas9 and gRNAs 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

Gene Information

Gramd1b GRAM domain containing 1B [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 235283, updated on 6-Oct-2023

Summary

Official Symbol	Gramd1b provided by MGI
Official Full Name	GRAM domain containing 1B provided by MGI
Primary source	MGI:MGI:1925037
See related	Ensembl:ENSMUSG00000040111 AllianceGenome:MGI:1925037
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	mKIAA1201; 3222402H23; A930008A22Rik
Summary	Enables cholesterol binding activity; cholesterol transfer activity; and phospholipid binding activity. Involved in cellular response to cholesterol and cholesterol homeostasis. Located in endoplasmic reticulum membrane; endoplasmic reticulum-plasma membrane contact site; and plasma membrane. Is expressed in several structures, including adrenal medulla; retina; and testis. Orthologous to human GRAMD1B (GRAM domain containing 1B). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Biased expression in adrenal adult (RPKM 85.2), ovary adult (RPKM 32.3) and 13 other tissues See more
Orthologs	human all

NEW **Try the new Gene table**

Try the new Transcript table

Source: https://www.ncbi.nlm.nih.gov/

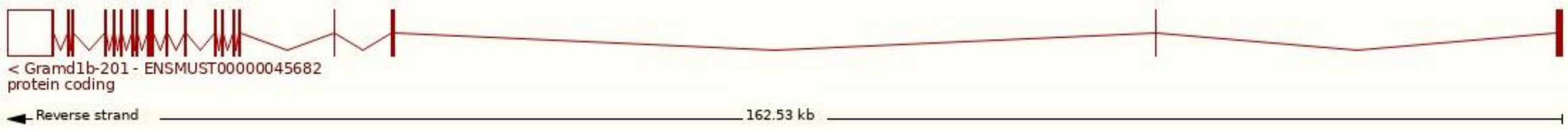
Transcript Information

The gene has 15 transcripts, all transcripts are shown below:

Show/hide columns (1 hidden) Filter

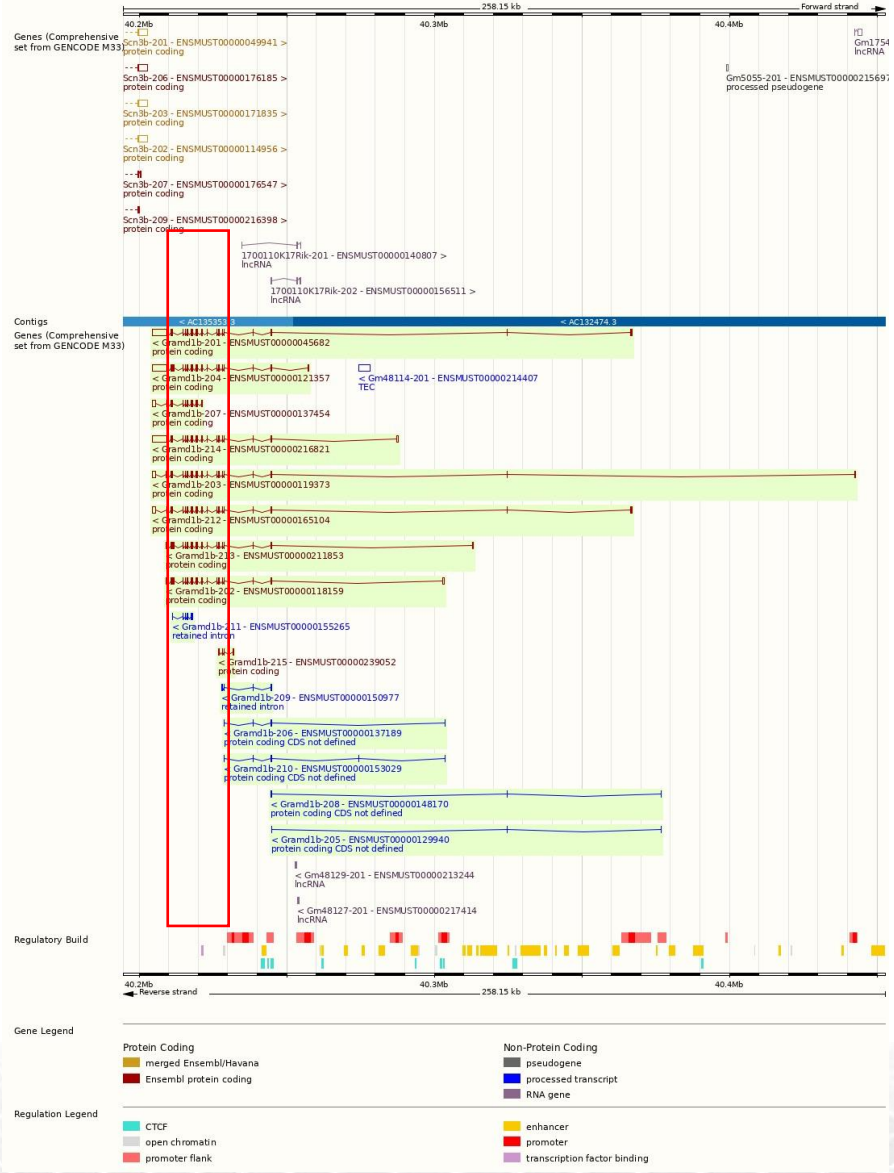
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000045682.7	Gramd1b-201	7488	878aa	Protein coding	CCDS23081	Q80TI0-4	Ensembl Canonical, GENCODE basic, APPRIS P1, TSL:1
ENSMUST00000216821.2	Gramd1b-214	7445	734aa	Protein coding		A0A1L1SQ42	GENCODE basic, TSL:5
ENSMUST00000121357.8	Gramd1b-204	7334	734aa	Protein coding		Q80TI0-3	GENCODE basic, TSL:1
ENSMUST00000119373.9	Gramd1b-203	3857	761aa	Protein coding		D3YWR0	GENCODE basic, TSL:1
ENSMUST00000165104.8	Gramd1b-212	3824	878aa	Protein coding	CCDS23081	Q80TI0-4	GENCODE basic, APPRIS P1, TSL:5
ENSMUST00000118159.8	Gramd1b-202	2781	698aa	Protein coding		Q80TI0-2	GENCODE basic, TSL:5
ENSMUST00000137454.8	Gramd1b-207	2667	489aa	Protein coding		F7BFL8	TSL:1, CDS 5' incomplete
ENSMUST00000211853.2	Gramd1b-213	2659	767aa	Protein coding		A0A1D5RLT6	GENCODE basic, TSL:5
ENSMUST00000239052.2	Gramd1b-215	630	133aa	Protein coding		A0A5F8MQ15	CDS 3' incomplete
ENSMUST00000153029.2	Gramd1b-210	487	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000137189.8	Gramd1b-206	437	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000148170.2	Gramd1b-208	342	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000129940.2	Gramd1b-205	316	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000155265.2	Gramd1b-211	865	No protein	Retained intron		-	TSL:5
ENSMUST00000150977.8	Gramd1b-209	412	No protein	Retained intron		-	TSL:3

The strategy is based on the design of *Gramd1b*-201 transcript, the transcription is shown below:



Source: https://www.ensembl.org

Genomic Information



Source: : https://www.ensembl.org

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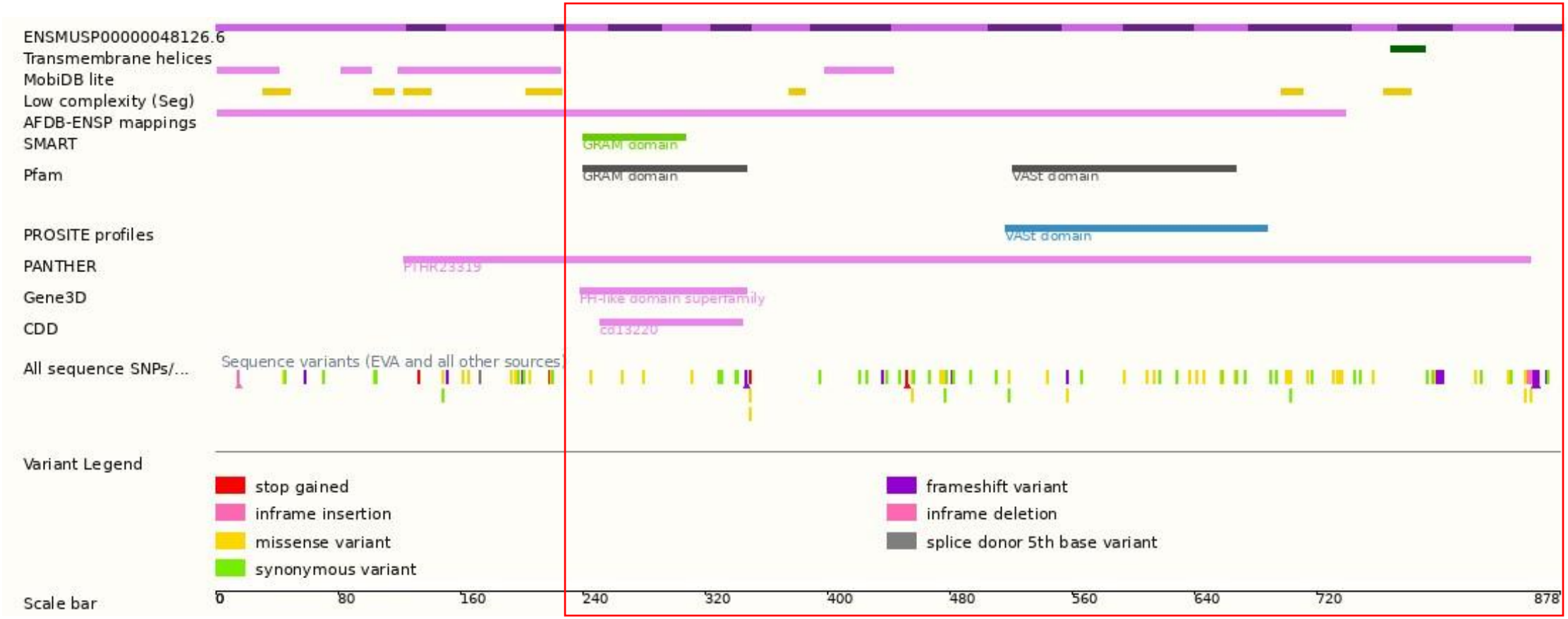
Protein Information



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Source: : https://www.ensembl.org

Important Information

- Mice homozygous for a knock-out allele show altered adrenal cholesterol homeostasis due to an inability to transport cholesterol from plasma membrane to the endoplasmic reticulum. According to IMPC, mice die before weaning, but there are currently no literature reports on it.
- In this strategy, 229 amino acid residues are retained at the 5' of *Gramd1b*, the risk is unknown.
- This strategy do not affect the transcript *Gramd1b*-205 and the *Gramd1b*-208, the risk is unknown.
- *Gramd1b* is located on Chr9. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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.