

Arhgef3 Cas9-KO Strategy

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Project Overview

Project Name

Arhgef3

Project type

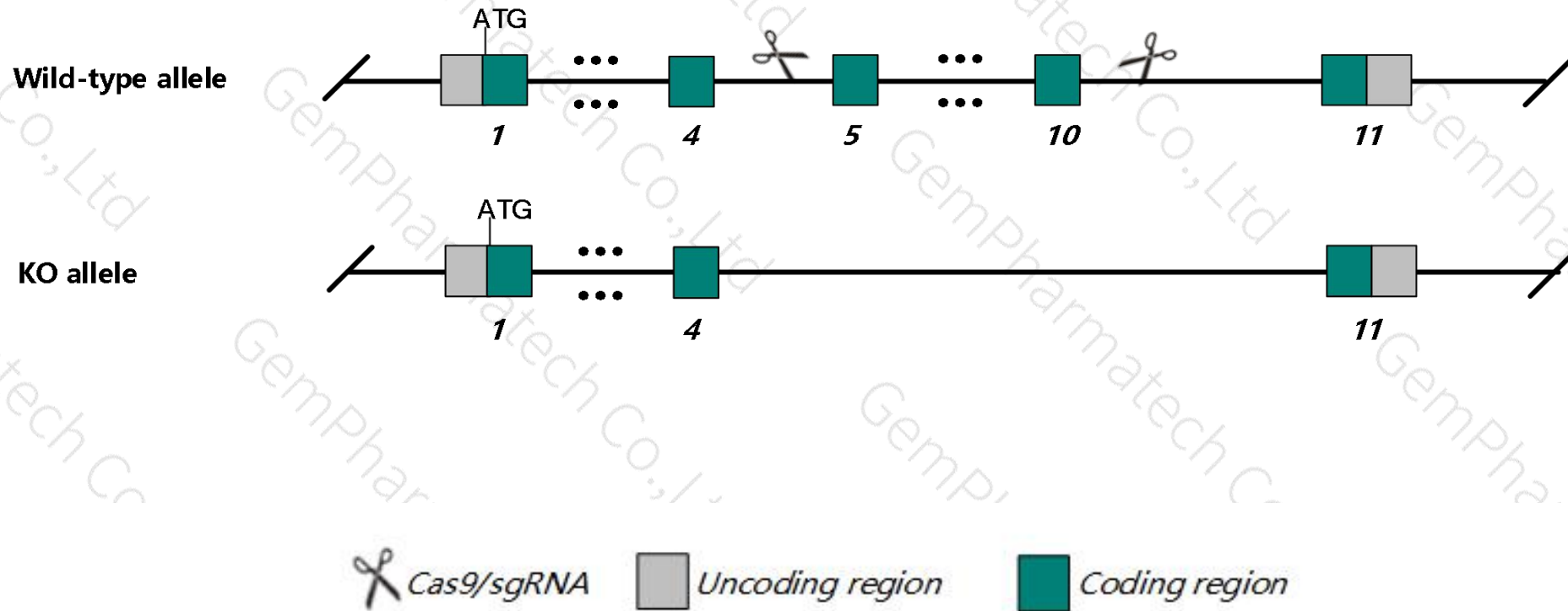
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arhgef3* gene. The schematic diagram is as follows:



- The *Arhgef3* gene has 4 transcripts. According to the structure of *Arhgef3* gene, exon5-exon10 of *Arhgef3-201* (ENSMUST00000049206.5) transcript is recommended as the knockout region. The region contains 853bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arhgef3* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit increased mean platelet volume and a mild delay in platelet recovery in response to thrombocytopenia.
- Some amino acids will remain at the N-terminus and some functions may be retained.
- The *Arhgef3* gene is located on the Chr14. 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)

Arhgef3 Rho guanine nucleotide exchange factor (GEF) 3 [*Mus musculus* (house mouse)]

Gene ID: 71704, updated on 13-Mar-2020

Summary

Official Symbol	Arhgef3 provided by MGI
Official Full Name	Rho guanine nucleotide exchange factor (GEF) 3 provided by MGI
Primary source	MGI:MGI:1918954
See related	Ensembl:ENSMUSG00000021895
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	Xpln; C76747; 1200004I24Rik; 9830169H03Rik
Expression	Ubiquitous expression in lung adult (RPKM 12.9), bladder adult (RPKM 8.6) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

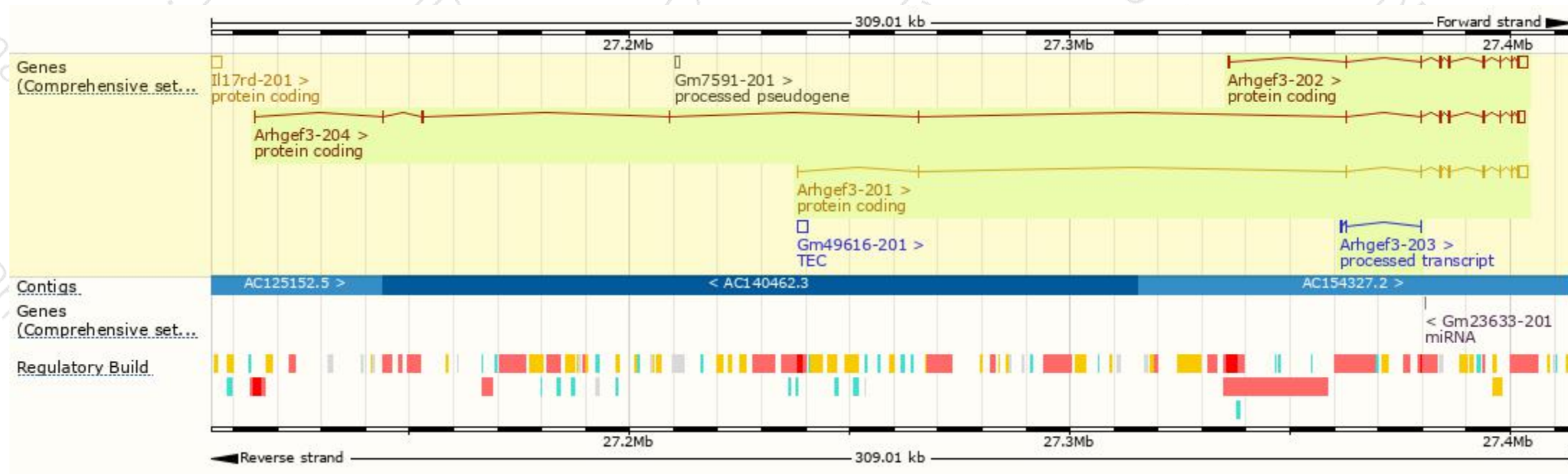
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Arhgef3-201	ENSMUST00000049206.5	3585	531aa	Protein coding	CCDS26886	Q91X46	TSL:1 GENCODE basic APPRIS P2
Arhgef3-202	ENSMUST00000224981.1	3618	524aa	Protein coding	-	A0A2X0SFN9 Q91X46	GENCODE basic APPRIS ALT1
Arhgef3-204	ENSMUST00000225949.1	3198	551aa	Protein coding	-	A0A286YDE6	GENCODE basic
Arhgef3-203	ENSMUST00000225494.1	572	No protein	Processed transcript	-	-	-

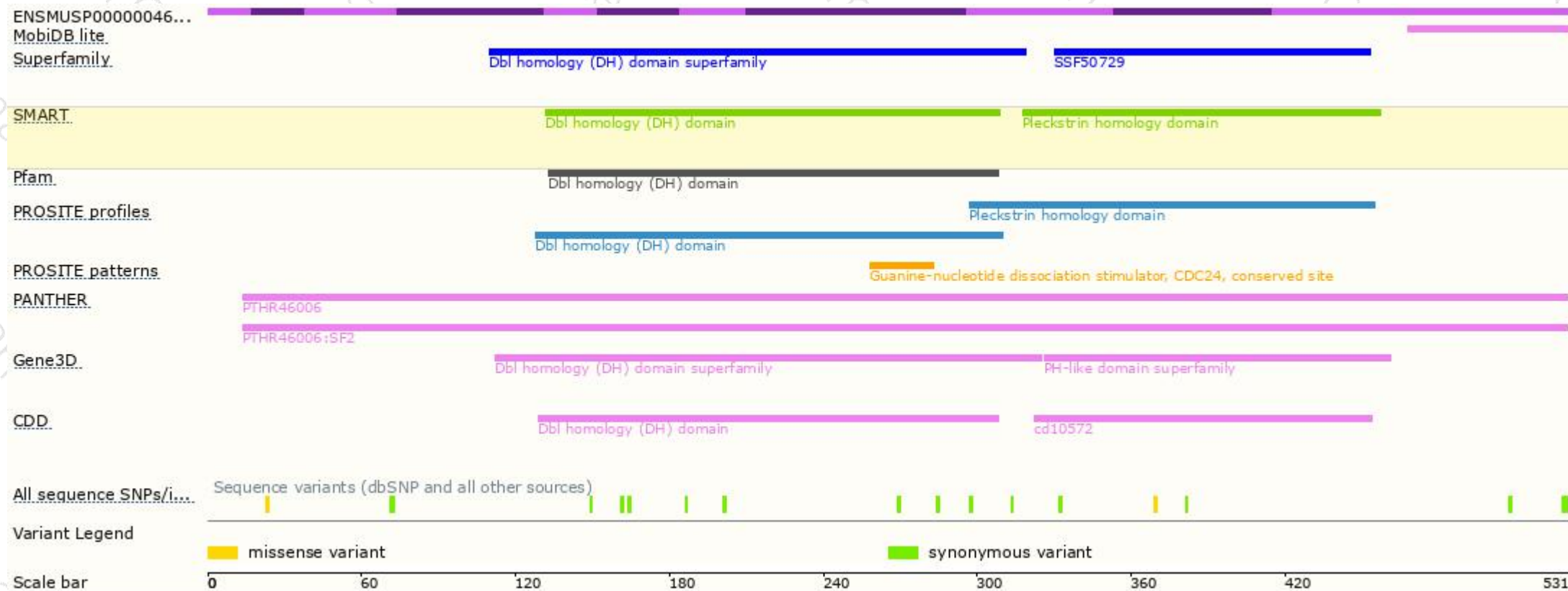
The strategy is based on the design of *Arhgef3-201* transcript,The transcription is shown below



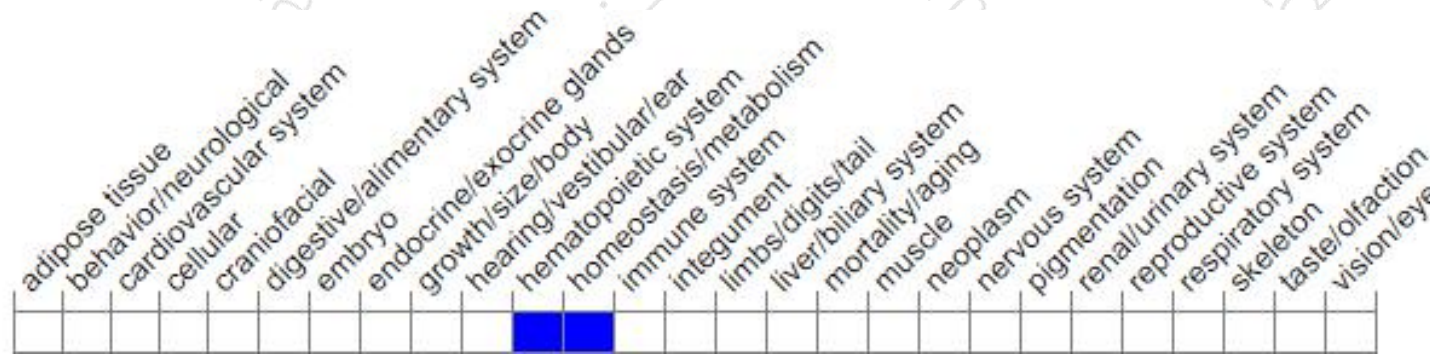
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit increased mean platelet volume and a mild delay in platelet recovery in response to thrombocytopenia.

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

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