

Ms4a1 Cas9-KO Strategy

Designer: Jing Jin

Reviewer: Xiaojing Li

Design Date: 2020-6-28

Project Overview

Project Name

Ms4a1

Project type

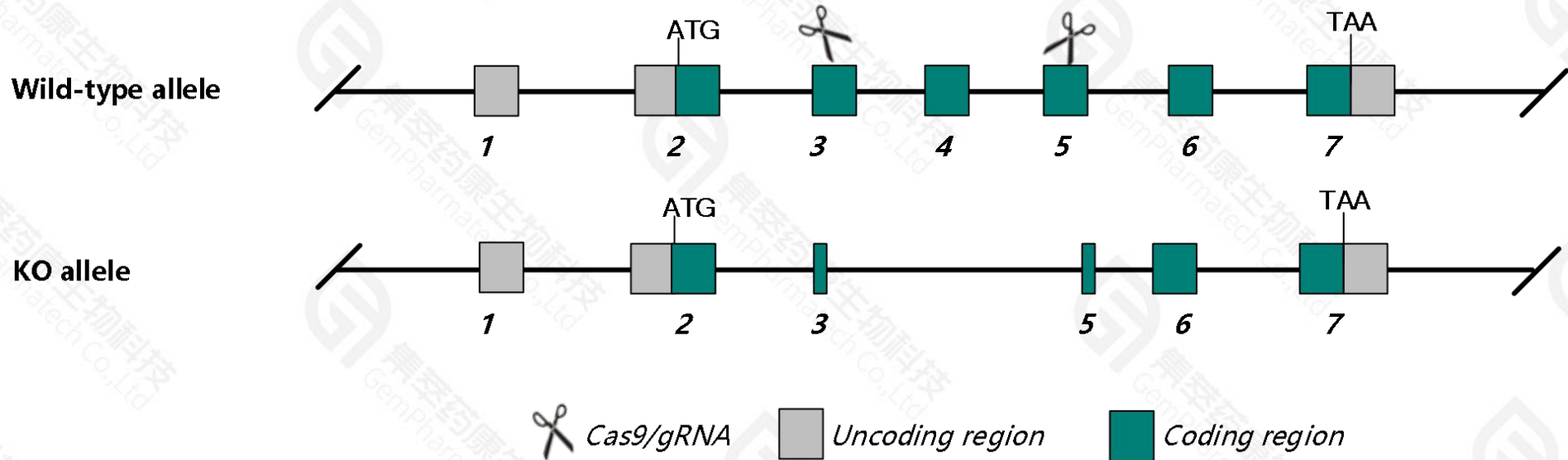
Cas9-KO

Strain background

BALB/cJGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ms4a1* gene. The schematic diagram is as follows:



- The *Ms4a1* gene has 4 transcripts. According to the structure of *Ms4a1* gene, exon3-exon5 of *MGP-BALBcJ-0051101.1* transcript is recommended as the knockout region. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ms4a1* gene. The brief process is as follows: gRNA was transcribed in vitro. Cas9 and gRNA were microinjected into the fertilized eggs of BALB/cJGpt 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 BALB/cJGpt mice.

- According to the existing MGI data, homozygous inactivation of this locus affects B cell physiology but does not impair B cell development or overall immune function.
- The *Ms4a1* gene is located on the Chr19. 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.

Ms4a1 membrane-spanning 4-domains, subfamily A, member 1 [Mus musculus (house mouse)]

Gene ID: 12482, updated on 13-Mar-2020

Summary



Official Symbol Ms4a1 provided by [MGI](#)

Official Full Name membrane-spanning 4-domains, subfamily A, member 1 provided by [MGI](#)

Primary source [MGI:MGI:88321](#)

See related [Ensembl:ENSMUSG00000024673](#)

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 AA960661, Cd20, Ly-44, Ms4a2

Expression Biased expression in spleen adult (RPKM 13.9), mammary gland adult (RPKM 3.4) and 2 other tissues [See more](#)

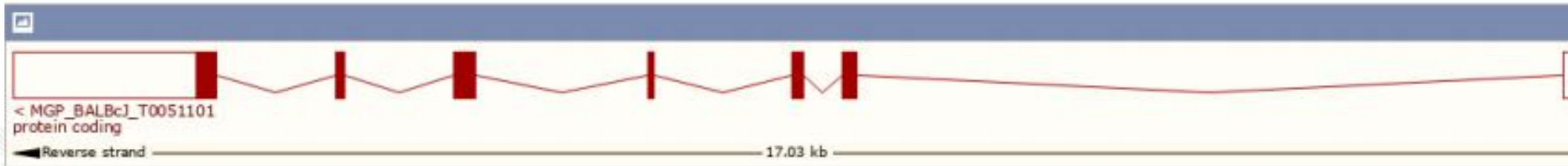
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

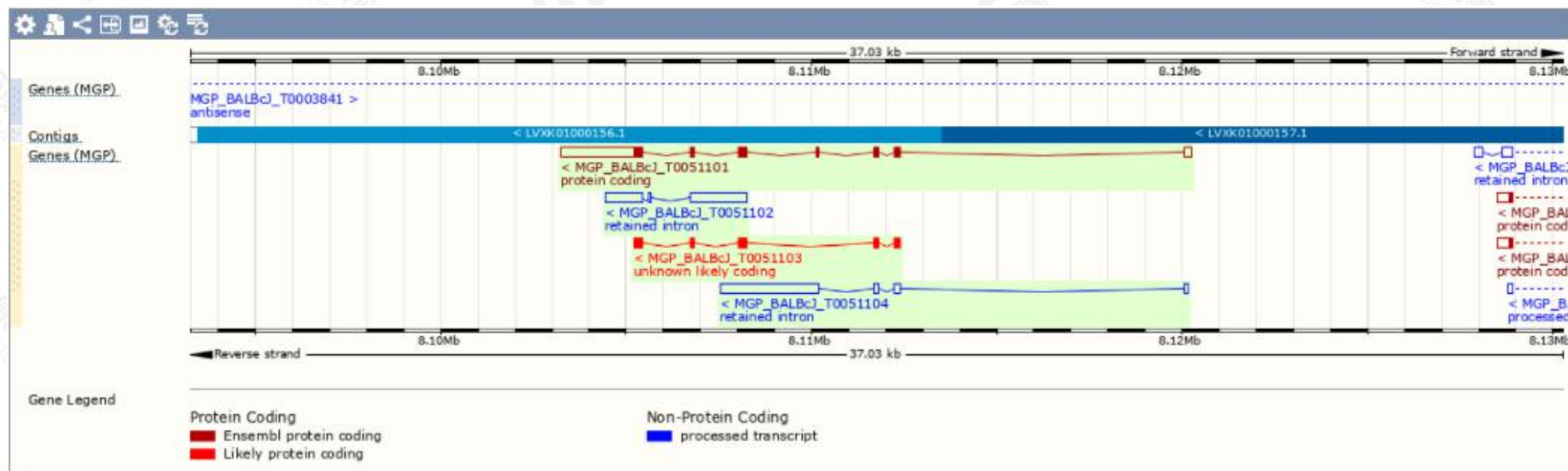
The gene has 4 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
-	MGP_BALBcJ_T0051101.1	3075	291aa	Protein coding	CCDS37923.2	P19437.2 Q542S5.2	NM_007641.2 NP_031667.2	
-	MGP_BALBcJ_T0051104.1	3012	No protein	Retained intron	-	-	-	
-	MGP_BALBcJ_T0051102.1	2575	No protein	Retained intron	-	-	-	
-	MGP_BALBcJ_T0051103.1	816	271aa	Unknown likely coding	-	-	-	

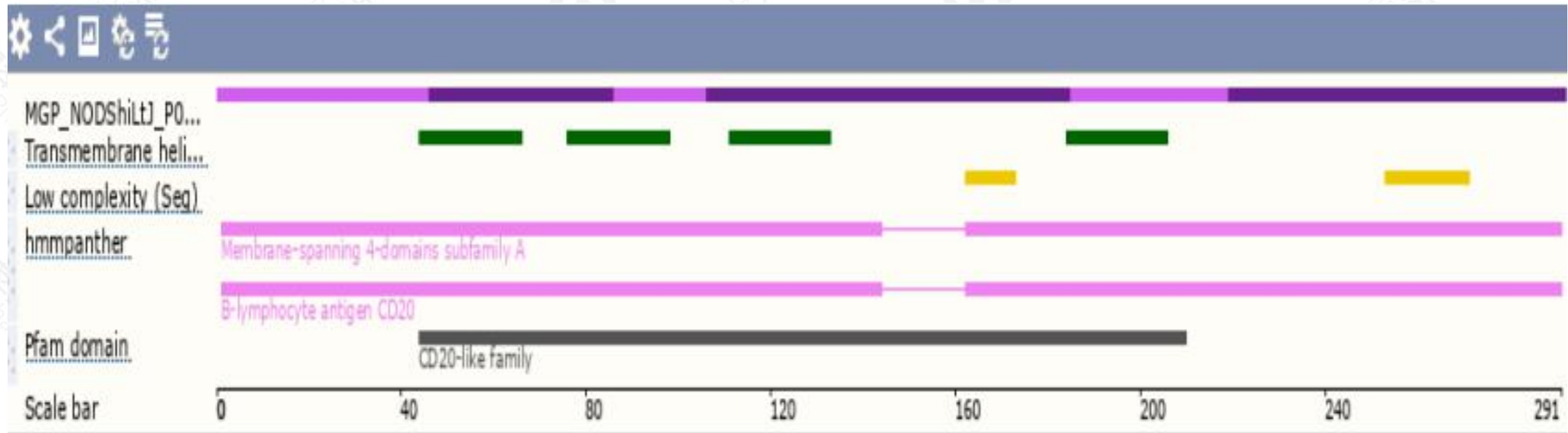
The strategy is based on the design of MGP-BALBcJ-0051101.1 transcript, the transcription is shown below:



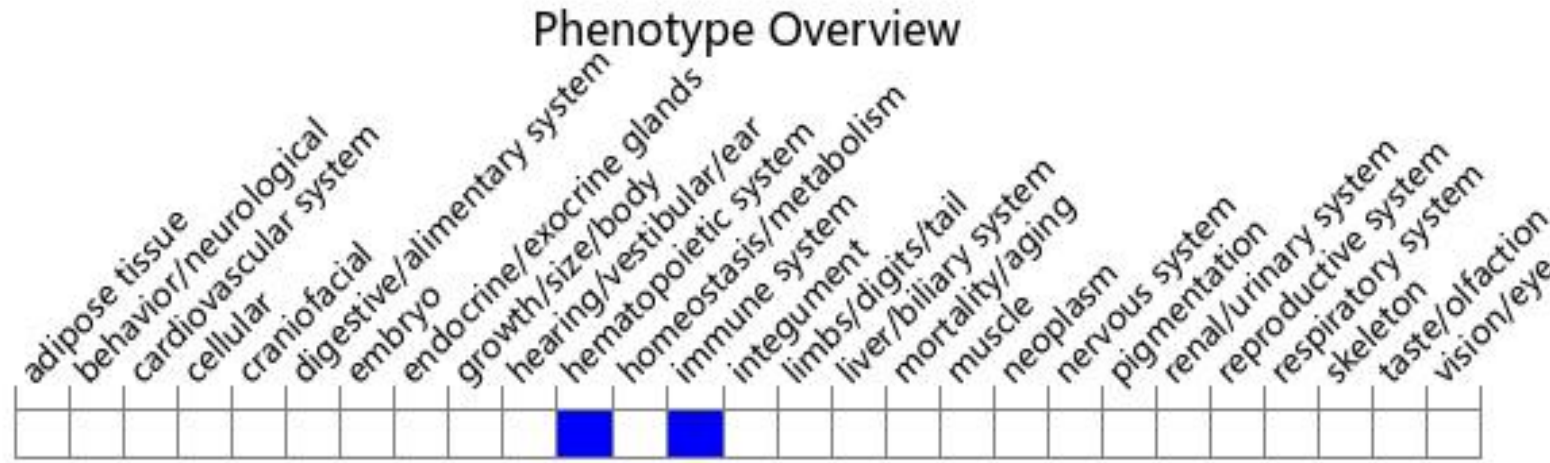
Genomic location distribution



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 inactivation of this locus affects B cell physiology but does not impair B cell development or overall immune function.

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

Tel: 025-5864 1534

