

Tmbim1 Cas9-KO Strategy

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Reviewer:

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Project Overview

Project Name

Tmbim1

Project type

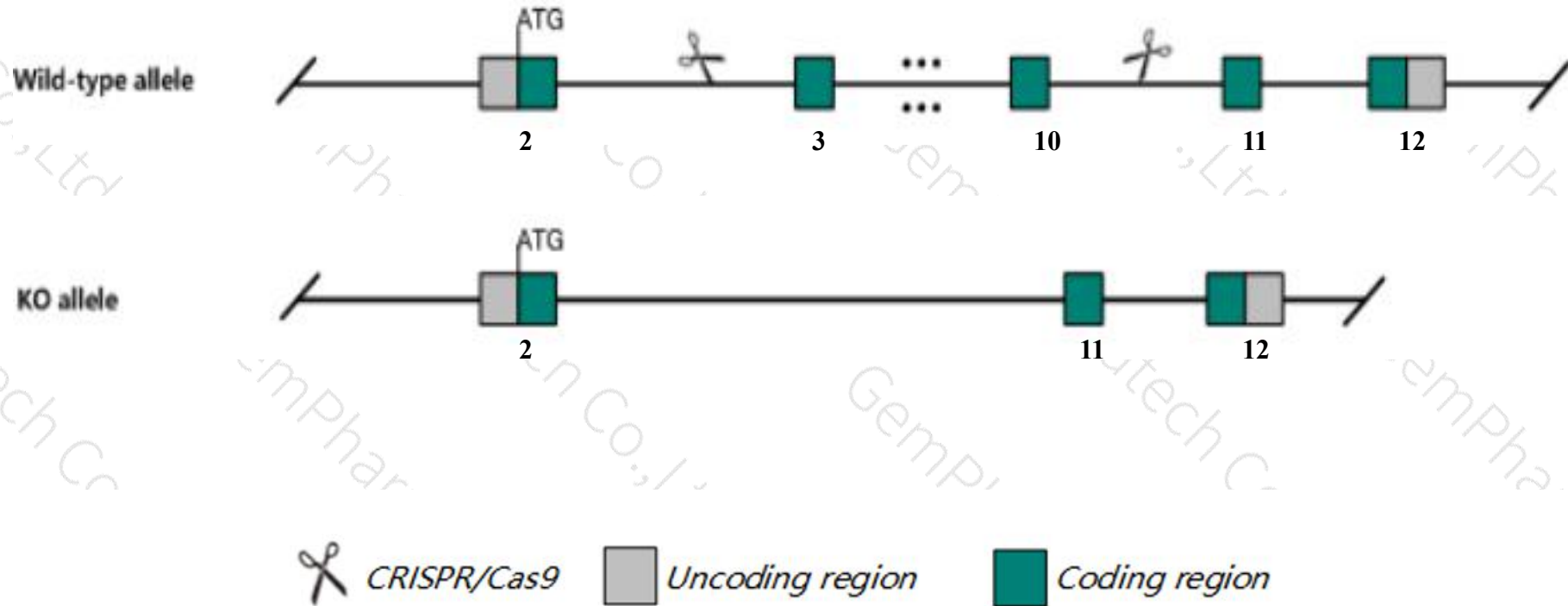
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tmbim1* gene. The schematic diagram is as follows:



Technical routes

- The *Tmbim1* gene has 8 transcripts. According to the structure of *Tmbim1* gene, exon3-exon10 of *Tmbim1-201*(ENSMUST00000016309.15) transcript is recommended as the knockout region. The region contains 527bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tmbim1* gene. The brief process is as follows: CRISPR/Cas9 system 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit susceptibility to cystic medial degeneration without inflammation or change in blood pressure and are prone to aortic dilation with age.
- The *Tmbim1* gene is located on the Chr1. 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)

Tmbim1 transmembrane BAX inhibitor motif containing 1 [*Mus musculus* (house mouse)]

Gene ID: 69660, updated on 26-Jun-2020

Summary

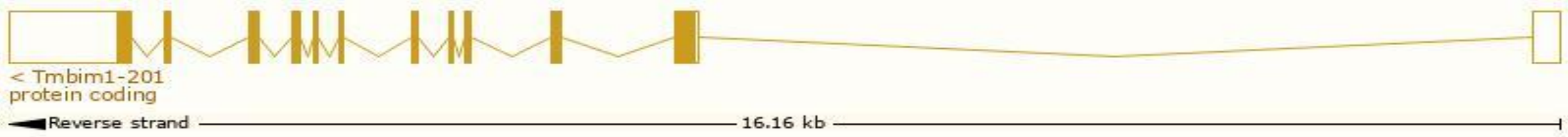
Official Symbol	Tmbim1 provided by MGI
Official Full Name	transmembrane BAX inhibitor motif containing 1 provided by MGI
Primary source	MGI:MGI:1916910
See related	Ensembl:ENSMUSG000000006301
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	RECS1; C78899; Tmbib1; AA960455; AU024746; mKIAA4161; 2310061B02Rik
Expression	Broad expression in lung adult (RPKM 77.4), duodenum adult (RPKM 73.5) and 23 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

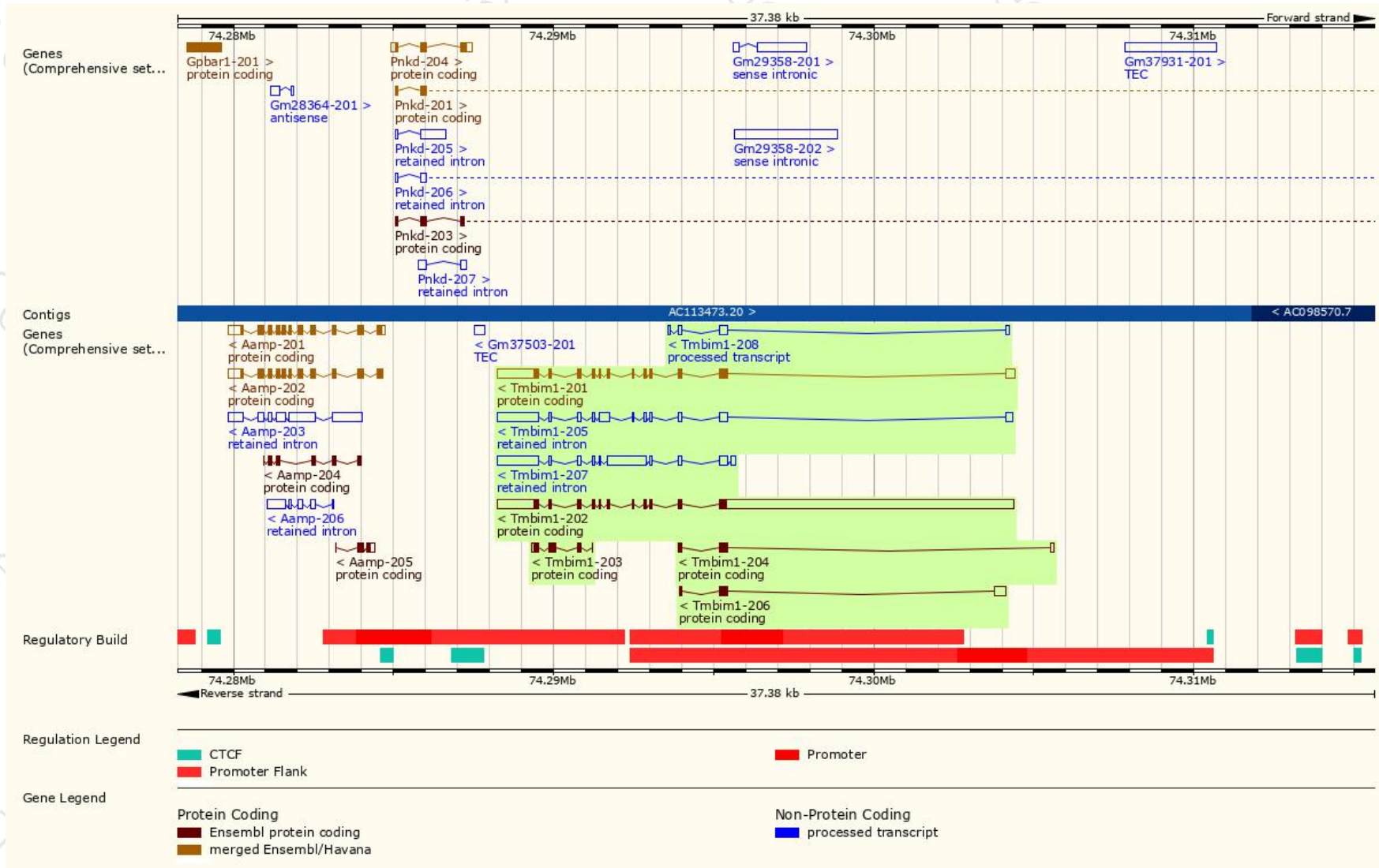
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tmbim1-207	ENSMUST00000152603.7	3311	No protein	Retained intron	-	-	TSL:1
Tmbim1-205	ENSMUST00000135384.7	2546	No protein	Retained intron	-	-	TSL:1
Tmbim1-202	ENSMUST00000113796.7	11011	309aa	Protein coding	CCDS15044	Q3U717	TSL:1 GENCODE basic APPRIS P1
Tmbim1-201	ENSMUST00000016309.15	2378	309aa	Protein coding	CCDS15044	Q3U717	TSL:1 GENCODE basic APPRIS P1
Tmbim1-206	ENSMUST00000141560.1	664	92aa	Protein coding	-	D3Z0A5	CDS 3' incomplete TSL:3
Tmbim1-203	ENSMUST00000128505.1	542	156aa	Protein coding	-	F6YG30	CDS 5' incomplete TSL:3
Tmbim1-204	ENSMUST00000130763.7	445	98aa	Protein coding	-	D3Z225	CDS 3' incomplete TSL:3
Tmbim1-208	ENSMUST00000154859.1	499	No protein	Processed transcript	-	-	TSL:3

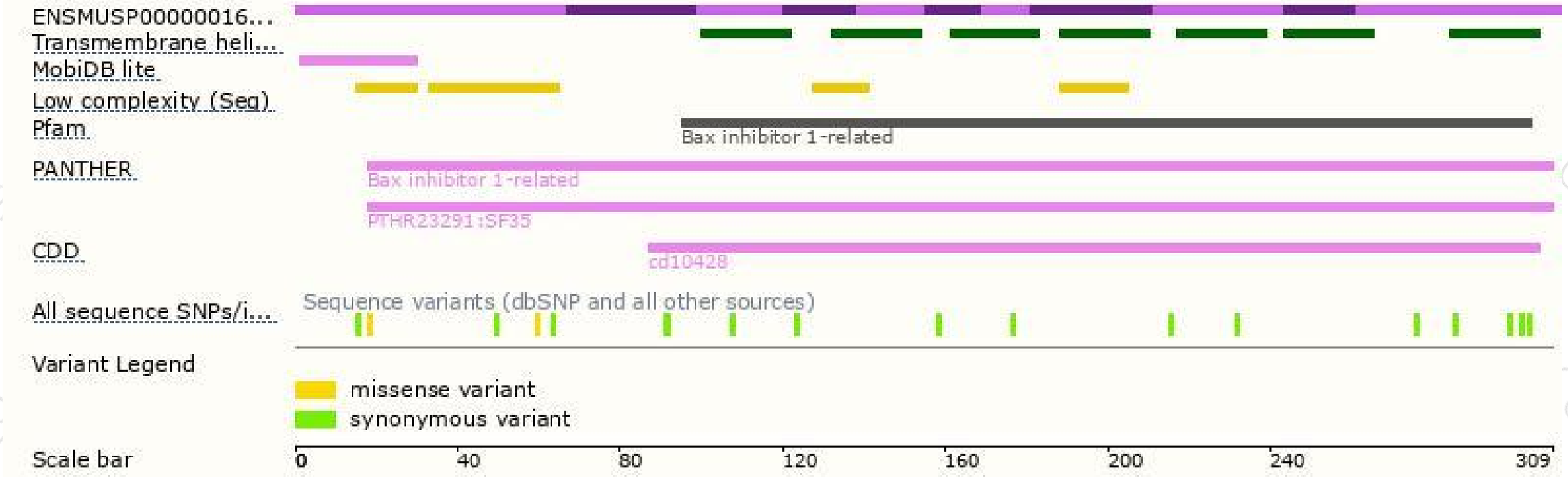
The strategy is based on the design of *Tmbim1-201* transcript,the transcription is shown below:



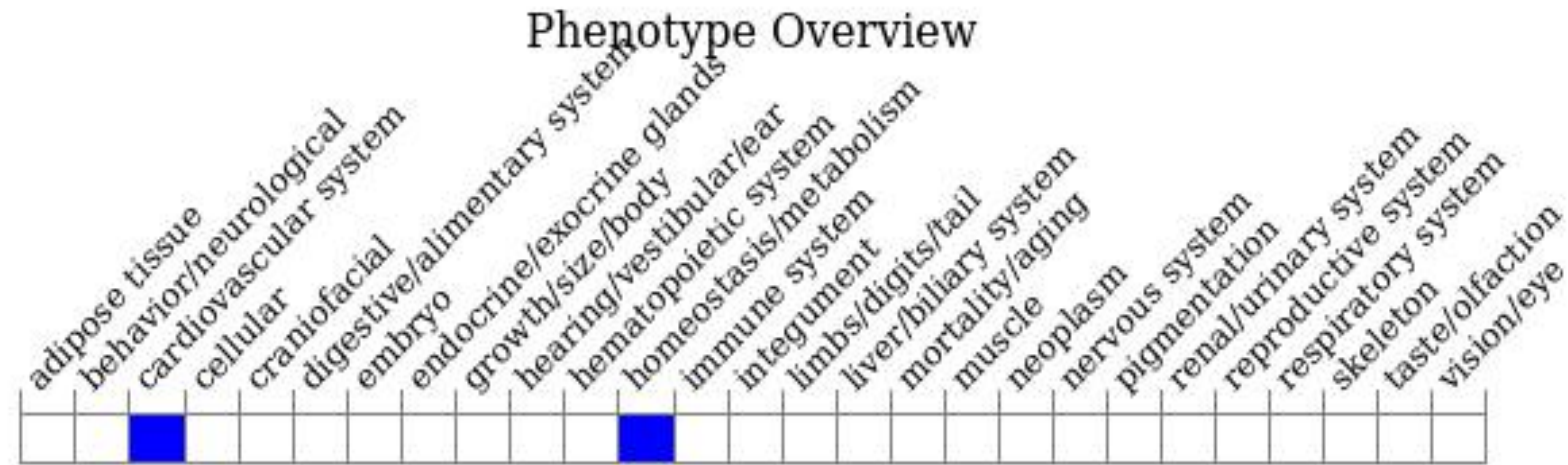
Genomic location distribution



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 susceptibility to cystic medial degeneration without inflammation or change in blood pressure and are prone to aortic dilation with age.

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

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