

Tpm1 Cas9-KO Strategy

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Design Date: 2018-12-19

Project Overview

Project Name

Tpm1

Project type

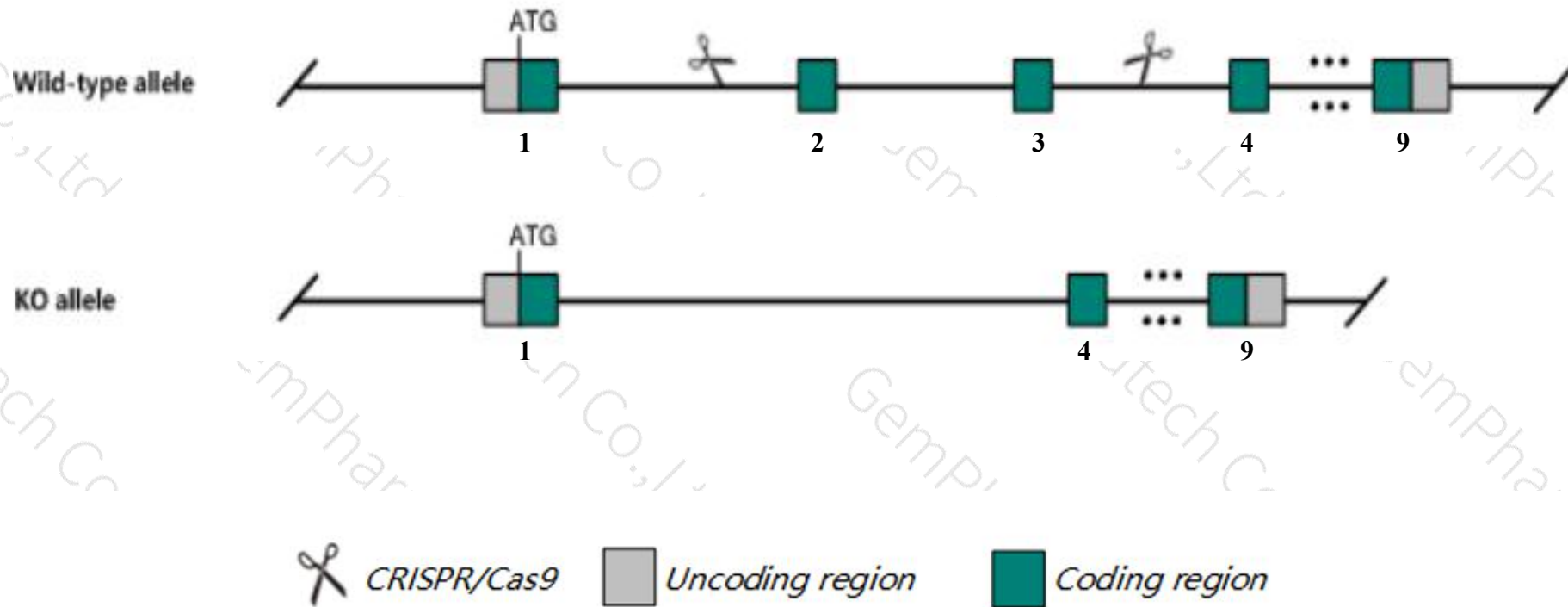
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tpm1* gene. The schematic diagram is as follows:



- The *Tpm1* gene has 21 transcripts. According to the structure of *Tpm1* gene, exon2-exon3 of *Tpm1*-216(ENSMUST00000113707.8) transcript is recommended as the knockout region. The region contains 260bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tpm1* 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 disruptions in this gene display embryonic lethality.
- The *Tpm1* gene is located on the Chr9. 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)

Tpm1 tropomyosin 1, alpha [Mus musculus (house mouse)]

Gene ID: 22003, updated on 13-Mar-2020

Summary



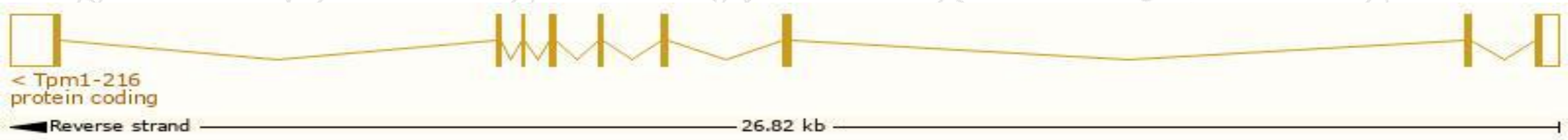
Official Symbol	Tpm1 provided by MGI
Official Full Name	tropomyosin 1, alpha provided by MGI
Primary source	MGI:MGI:98809
See related	Ensembl:ENSMUSG00000032366
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA986836, AI854628, TM2, TPM1kappa, Tm3, Tmpa, Tpm-1, alpha-TM
Expression	Biased expression in bladder adult (RPKM 766.9), heart adult (RPKM 589.0) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

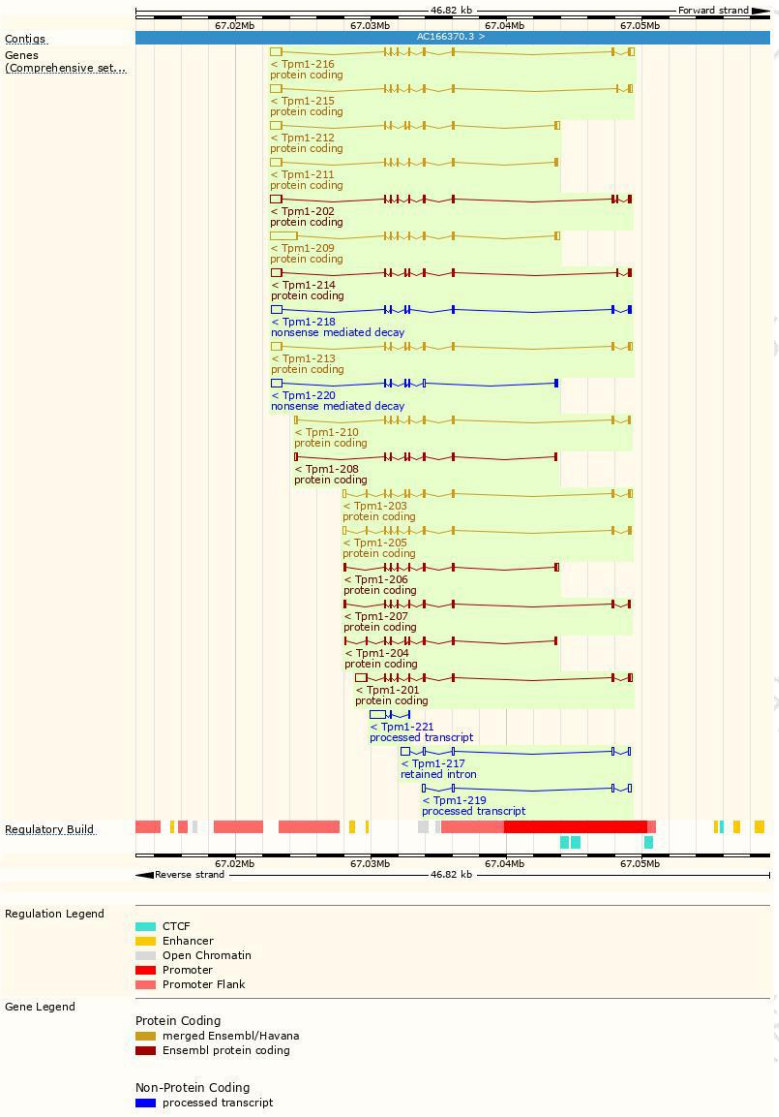
The gene has 21 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tpm1-209	ENSMUST00000113690.7	2890	245aa	Protein coding	CCDS52842	G5E8R0	TSL:3 GENCODE basic
Tpm1-216	ENSMUST00000113707.8	1898	284aa	Protein coding	CCDS23311	P58771_Q564G1	TSL:1 GENCODE basic APPRIS P3
Tpm1-215	ENSMUST00000113705.7	1759	284aa	Protein coding	CCDS52848	B7ZNL3	TSL:1 GENCODE basic APPRIS ALT1
Tpm1-213	ENSMUST00000113697.7	1742	284aa	Protein coding	CCDS52846	E9Q450	TSL:2 GENCODE basic APPRIS ALT1
Tpm1-212	ENSMUST00000113696.7	1714	248aa	Protein coding	CCDS52843	G5E8R2	TSL:2 GENCODE basic
Tpm1-211	ENSMUST00000113695.7	1607	248aa	Protein coding	CCDS52841	G5E8R1	TSL:3 GENCODE basic
Tpm1-203	ENSMUST00000050905.15	1259	284aa	Protein coding	CCDS52847	Q8BP43	TSL:1 GENCODE basic APPRIS ALT1
Tpm1-205	ENSMUST00000113685.9	1208	284aa	Protein coding	CCDS52845	P58771_Q545Y3	TSL:1 GENCODE basic APPRIS ALT1
Tpm1-210	ENSMUST00000113693.7	1054	281aa	Protein coding	CCDS52844	E9Q452	TSL:5 GENCODE basic
Tpm1-202	ENSMUST00000034928.11	1824	326aa	Protein coding	-	F8WID5	TSL:5 GENCODE basic
Tpm1-201	ENSMUST00000030185.4	1797	284aa	Protein coding	-	Q8BSH3	TSL:2 GENCODE basic APPRIS ALT1
Tpm1-214	ENSMUST00000113701.7	1677	284aa	Protein coding	-	E9Q448	TSL:5 GENCODE basic APPRIS ALT1
Tpm1-206	ENSMUST00000113686.7	998	251aa	Protein coding	-	E9Q455	TSL:5 GENCODE basic
Tpm1-207	ENSMUST00000113687.7	962	287aa	Protein coding	-	E9Q454	TSL:5 GENCODE basic
Tpm1-208	ENSMUST00000113689.7	904	245aa	Protein coding	-	E9Q453	TSL:5 GENCODE basic
Tpm1-204	ENSMUST00000113684.7	887	248aa	Protein coding	-	E9Q456	TSL:5 GENCODE basic
Tpm1-218	ENSMUST00000129733.7	1544	157aa	Nonsense mediated decay	-	S4R2U0	TSL:5
Tpm1-220	ENSMUST00000139046.7	1419	49aa	Nonsense mediated decay	-	S4R261	TSL:5
Tpm1-221	ENSMUST00000156899.1	1274	No protein	Processed transcript	-	-	TSL:1
Tpm1-219	ENSMUST00000131279.1	649	No protein	Processed transcript	-	-	TSL:2
Tpm1-217	ENSMUST00000129466.7	1123	No protein	Retained intron	-	-	TSL:2

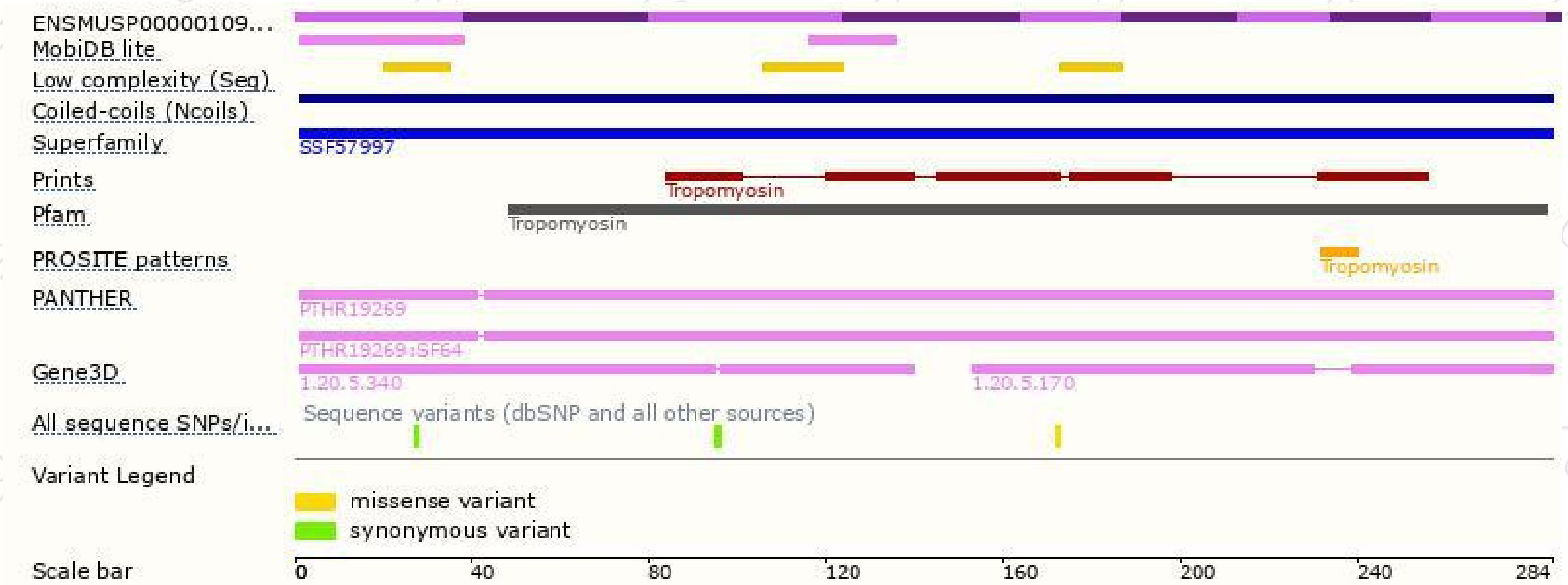
The strategy is based on the design of *Tpm1-216* transcript,the transcription is shown below:



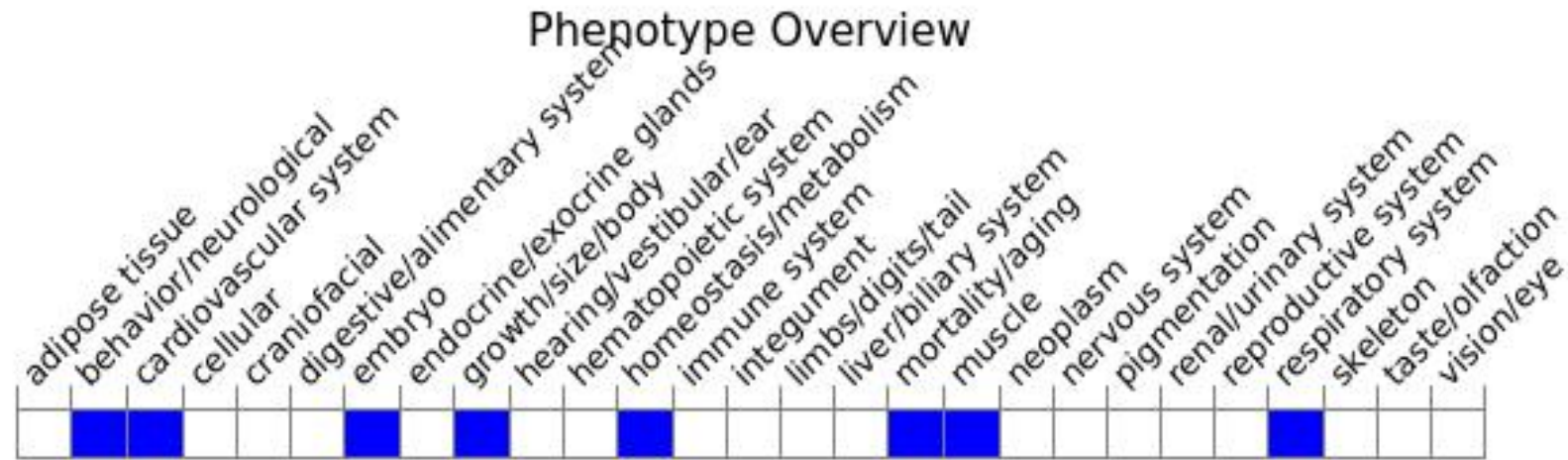
Genomic location distribution



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 disruptions in this gene display embryonic lethality.

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

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