Tcp1 Cas9-KO Strategy

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Project Overview

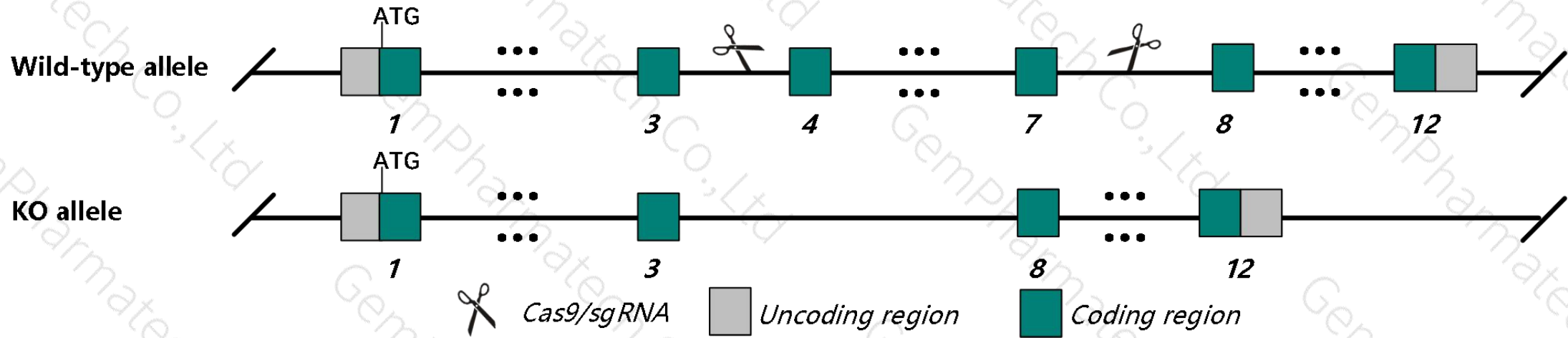|	
Project Name	*Tcp1*
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tcp1* gene. The schematic diagram is as follows:

Technical routes

➢ The *Tcp1* gene has 12 transcripts. According to the structure of *Tcp1* gene, exon2 of *Tcp1-209*(ENSMUST00000151287.7) transcript is recommended as the knockout region. The region contains 518bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Tcp1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

Notice

➢ According to the existing MGI data, There are two electrophoretic alleles known; allele a occurs in all complete t haplotype chromosomes and allele b in wild-type strains. There are multiple changes between the amino acid sequences of the TCP1A and TCP1B proteins encoded by the two alleles.

➢ The *Tcp1* gene is located on the Chr17. 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information （NCBI）

Tcp1   t-complex protein 1 [*Mus musculus* (house mouse)]
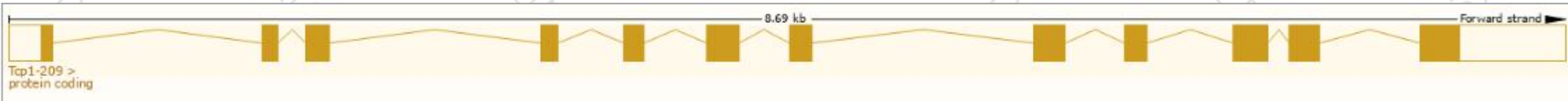
Gene ID: 21454, updated on 9-Jun-2019

▲ **Summary**

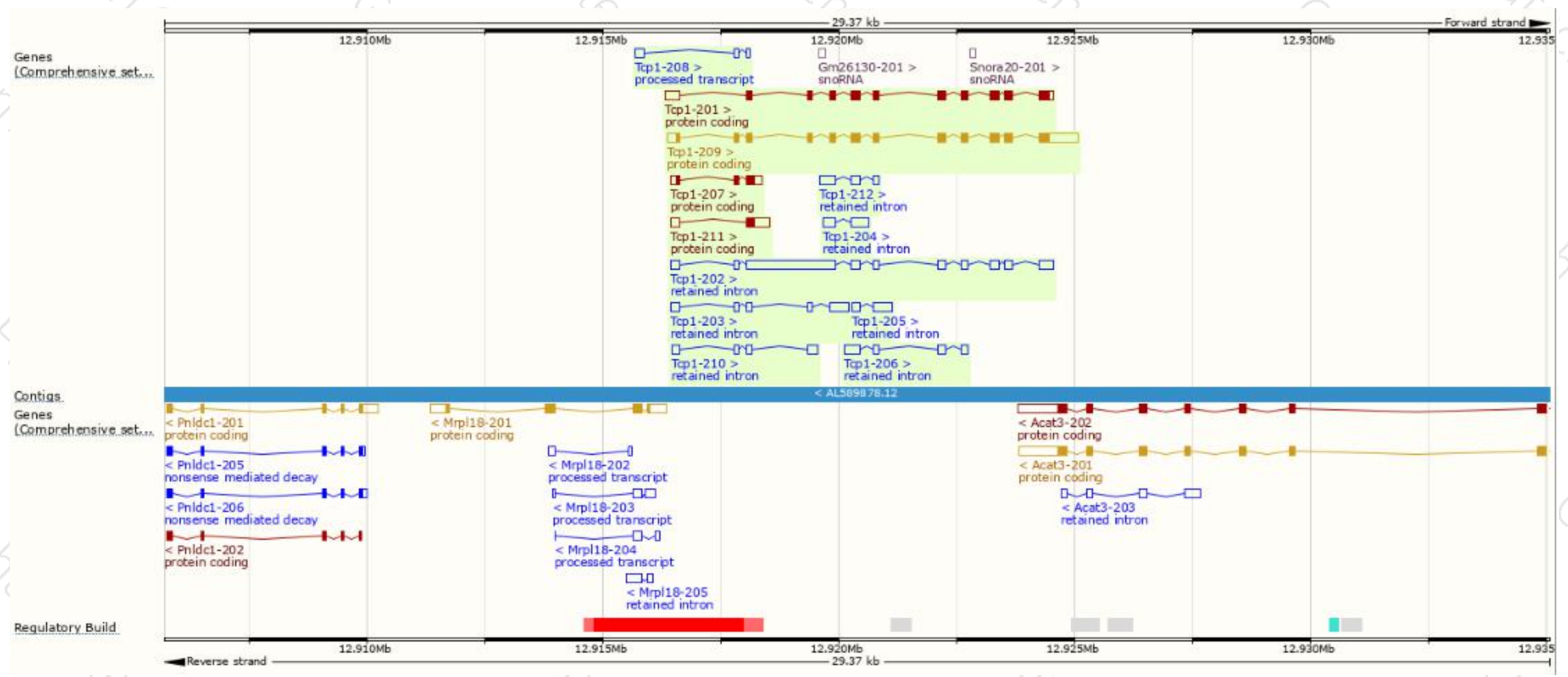|	
Official Symbol	Tcp1 provided by MGI
Official Full Name	t-complex protein 1 provided by MGI
Primary source	MGI:MGI:98535
See related	Ensembl:ENSMUSG00000068039
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CCT; p63; Cct1; Ccta; TRic; Tp63; Tcp-1; c-cpn; AI528772
Expression	Ubiquitous expression in testis adult (RPKM 173.1), CNS E11.5 (RPKM 109.2) and 25 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

The gene has 12 transcripts,all transcripts are shown below:

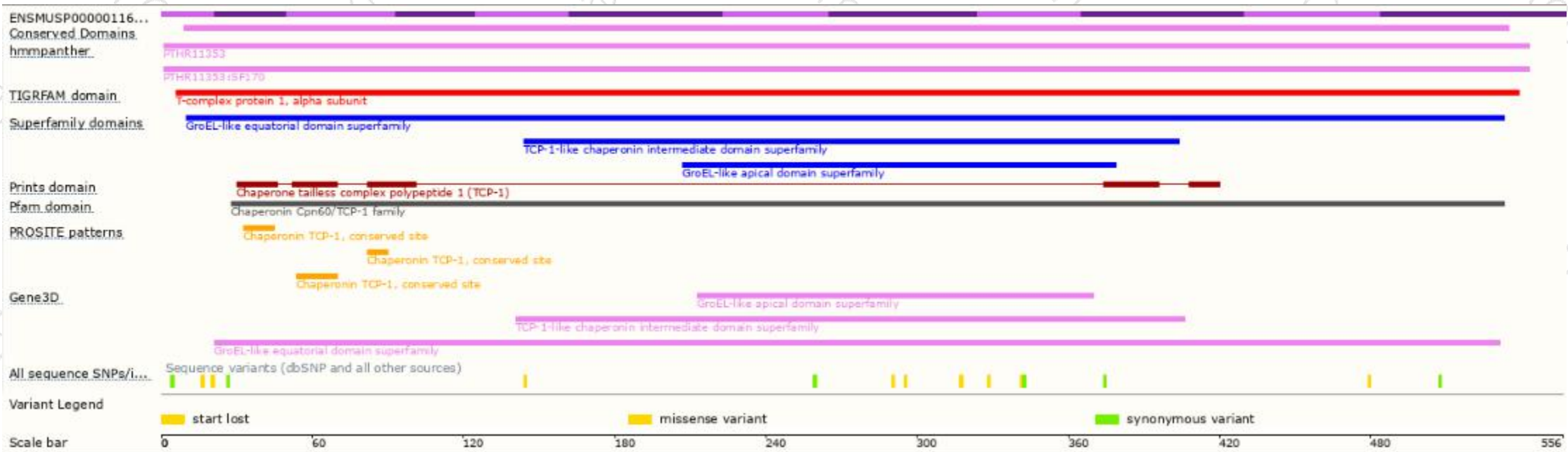| Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tcp1-209	ENSMUST00000151287.7	2446	556aa	Protein coding	CCDS28397	P11983	TSL:1 GENCODE basic APPRIS P1
Tcp1-201	ENSMUST00000089024.12	1902	507aa	Protein coding	CCDS70760	P11983	TSL:1 GENCODE basic
Tcp1-211	ENSMUST00000233286.1	678	54aa	Protein coding	-	A0A3B2WDE2	GENCODE basic
Tcp1-207	ENSMUST00000143961.1	614	103aa	Protein coding	-	F2Z483	TSL:2 GENCODE basic
Tcp1-208	ENSMUST00000147724.7	329	No protein	Processed transcript	-	-	TSL:3
Tcp1-202	ENSMUST00000129632.7	3419	No protein	Retained intron	-	-	TSL:2
Tcp1-203	ENSMUST00000133003.7	908	No protein	Retained intron	-	-	TSL:2
Tcp1-206	ENSMUST00000138709.1	768	No protein	Retained intron	-	-	TSL:2
Tcp1-212	ENSMUST00000233345.1	632	No protein	Retained intron	-	-	-
Tcp1-204	ENSMUST00000134665.1	618	No protein	Retained intron	-	-	TSL:2
Tcp1-205	ENSMUST00000137289.1	586	No protein	Retained intron	-	-	TSL:2
Tcp1-210	ENSMUST00000151715.1	578	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Tcp1-209*transcript,The transcription is shown below

Genomic location distribution

Protein domain

ENSMUSP00000116...	
Conserved Domains	
hmmpanther	PTHR11353
	PTHR11353:SF170
TIGRFAM domain	T-complex protein 1, alpha subunit
Superfamily domains	GroEL-like equatorial domain superfamily
	TCP-1-like chaperonin intermediate domain superfamily
	GroEL-like apical domain superfamily
Prints domain	Chaperone tailless complex polypeptide 1 (TCP-1)
Pfam domain	Chaperonin Cpn60/TCP-1 family
PROSITE patterns	Chaperonin TCP-1, conserved site
	Chaperonin TCP-1, conserved site
	Chaperonin TCP-1, conserved site
Gene3D	GroEL-like apical domain superfamily
	TCP-1-like chaperonin intermediate domain superfamily
	GroEL-like equatorial domain superfamily
All sequence SNPs/i...	Sequence variants (dbSNP and all other sources)
Variant Legend	start lost missense variant synonymous variant
Scale bar	0 60 120 180 240 300 360 420 480 556

Mouse phenotype description(MGI)

Phenotypes affected by the gene are marked in blue.Data quoted from MGI database(http://www.informatics.jax.org/).

There are two electrophoretic alleles known; allele a occurs in all complete t haplotype chromosomes and allele b in wild-type strains. There are multiple changes between the amino acid sequences of the TCP1A and TCP1B proteins encoded by the two alleles.

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