

Tmpo Cas9-KO Strategy

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Project Overview

Project Name

Tmpo

Project type

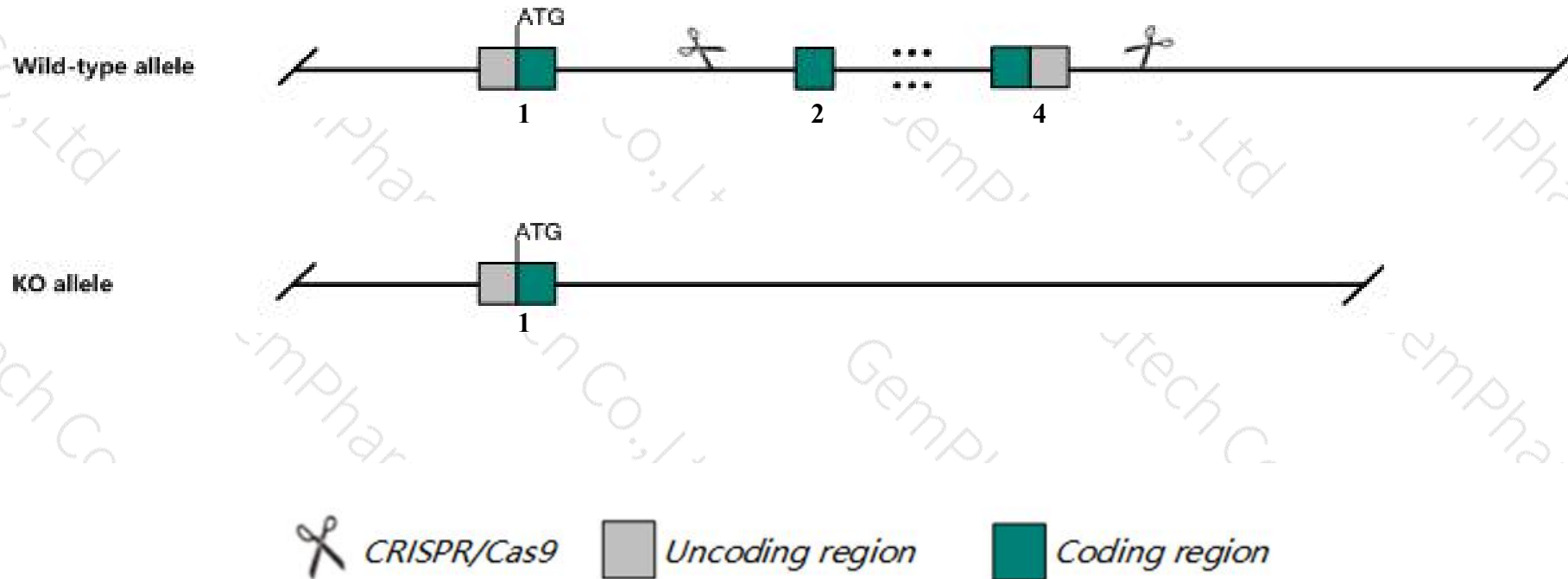
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Tmpo* gene has 13 transcripts. According to the structure of *Tmpo* gene, exon2-exon4 of *Tmpo-201* (ENSMUST00000020123.6) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tmpo* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous null for a protein isoform generated from this locus have hyperproliferation of epidermal and erythroid progenitor cells that leads to thickened paws and increased crypt lengths in the colon.
- Transcript *Tmpo*-206&207&210 may not be affected.
- The *Tmpo* gene is located on the Chr10. 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)

Tmpo thymopoietin [*Mus musculus* (house mouse)]

Gene ID: 21917, updated on 5-Jan-2020

Summary

- Official Symbol** Tmpo provided by [MGI](#)
- Official Full Name** thymopoietin provided by [MGI](#)
- Primary source** [MGI:MGI:106920](#)
- See related** [Ensembl:ENSMUSG00000019961](#)
- 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** TP; LAP2; AI195756; AI606875; AW214352; AW547477; 5630400D24Rik
- Expression** Broad expression in CNS E11.5 (RPKM 41.2), limb E14.5 (RPKM 32.4) and 27 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 10 C2; 10 45.66 cM See Tmpo in [Genome Data Viewer](#)

Exon count: 12

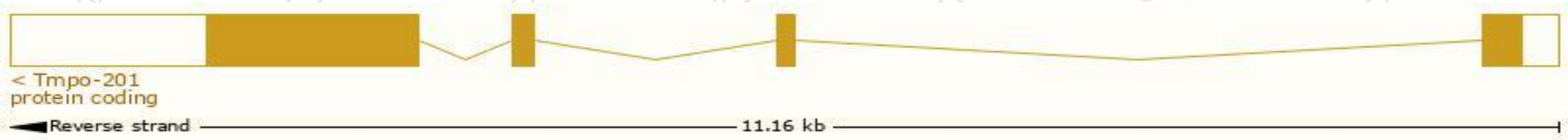
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_0000001635.26)	10	NC_000076.6 (91147571..91181752, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_0000001635.18)	10	NC_000076.5 (90610316..90634327, complement)

Transcript information (Ensembl)

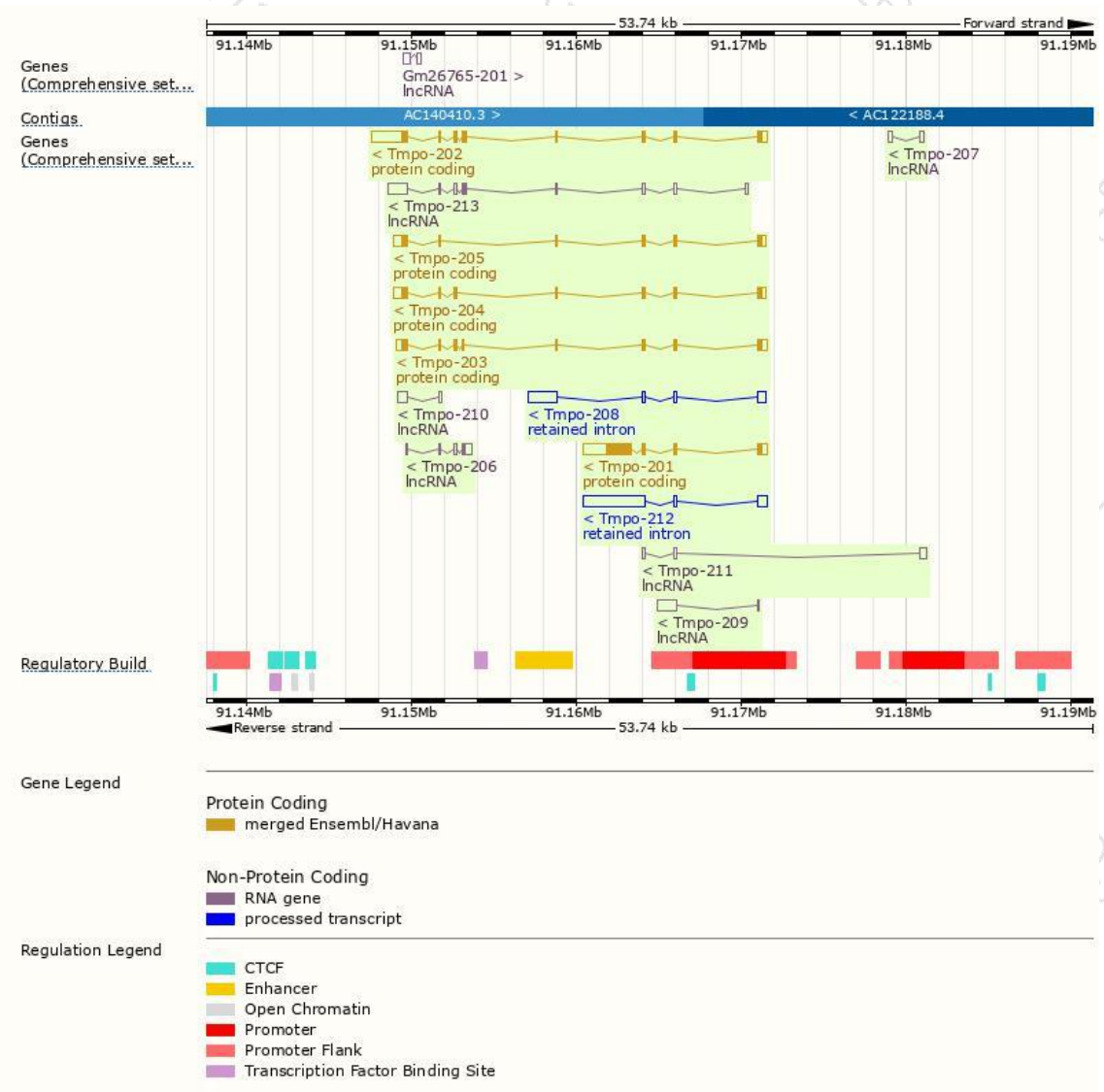
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tmpo-201	ENSMUST00000020123.6	3772	693aa	Protein coding	CCDS24122	Q61033	TSL:1 GENCODE basic APPRIS P1
Tmpo-202	ENSMUST00000072239.13	3533	452aa	Protein coding	CCDS36035	Q61029	TSL:1 GENCODE basic
Tmpo-204	ENSMUST00000099355.11	1953	380aa	Protein coding	CCDS36033	Q61029	TSL:1 GENCODE basic
Tmpo-203	ENSMUST00000092219.13	1854	412aa	Protein coding	CCDS36034	Q3TNH0 Q61029	TSL:1 GENCODE basic
Tmpo-205	ENSMUST00000105293.10	1842	343aa	Protein coding	CCDS36032	Q61029	TSL:1 GENCODE basic
Tmpo-212	ENSMUST00000216501.1	4441	No protein	Retained intron	-	-	TSL:1
Tmpo-208	ENSMUST00000214391.1	2520	No protein	Retained intron	-	-	TSL:1
Tmpo-213	ENSMUST00000217449.1	2115	No protein	lncRNA	-	-	TSL:1
Tmpo-209	ENSMUST00000215126.1	1213	No protein	lncRNA	-	-	TSL:1
Tmpo-206	ENSMUST00000213262.1	788	No protein	lncRNA	-	-	TSL:1
Tmpo-211	ENSMUST00000216402.1	732	No protein	lncRNA	-	-	TSL:3
Tmpo-210	ENSMUST00000215801.1	654	No protein	lncRNA	-	-	TSL:2
Tmpo-207	ENSMUST00000213270.1	471	No protein	lncRNA	-	-	TSL:2

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

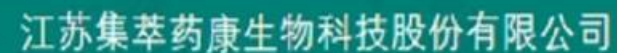


Genomic location distribution

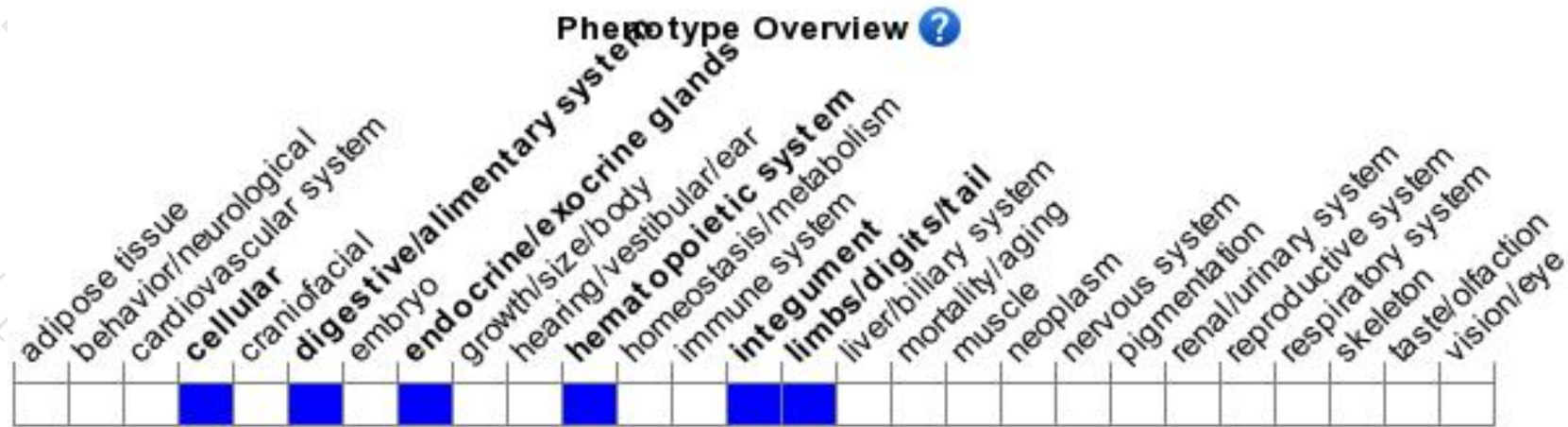




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Mouse phenotype description(MGI)



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 null for a protein isoform generated from this locus have hyperproliferation of epidermal and erythroid progenitor cells that leads to thickened paws and increased crypt lengths in the colon.

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

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