Telo2 Cas9-CKO Strategy

Designer: Shanhong Tao

Reviewer: Longyun Hu

Design Date: 2023-07-06

Overview

Target Gene Name
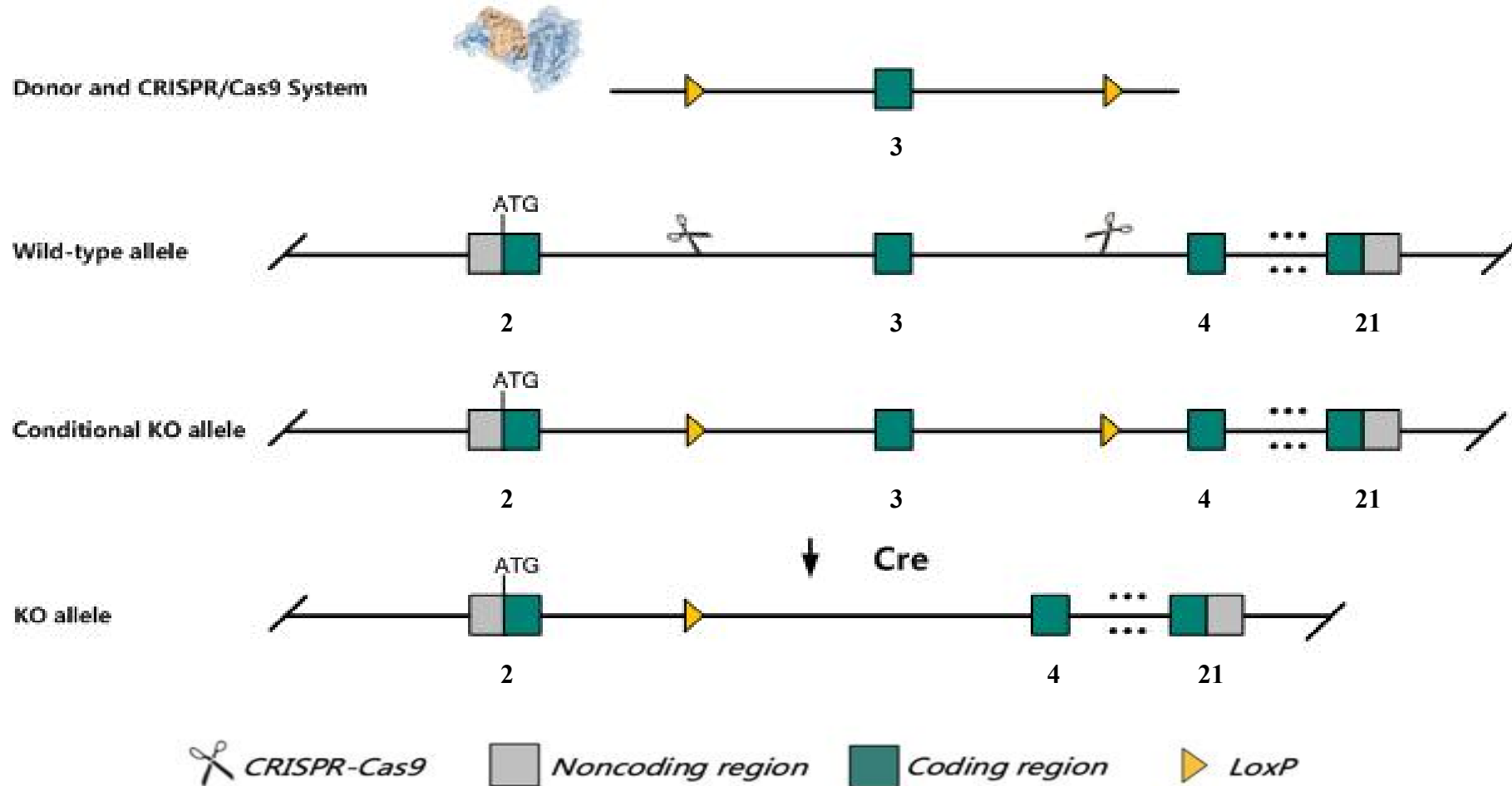
- Telo2

Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

GemPharmatech™

Strain Strategy

Schematic representation of CRISPR-Cas9 engineering used to edit the *Telo2* gene.

GemPharmatech™

Technical Information

- The *Telo2* gene has 11 transcripts. According to the structure of *Telo2* gene, exon3 of *Telo2*-202 (ENSMUST00000115181.9) transcript is recommended as the knockout region. The region contains 278bp coding sequence. Knocking out the region will result in disruption of protein function.

- In this project we use CRISPR-Cas9 technology to modify *Telo2* gene. The brief process is as follows: CRISPR-Cas9 system and Donor 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.

- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Gene Information

Telo2 telomere maintenance 2 [Mus musculus (house mouse)]

Gene ID: 71718, updated on 12-Apr-2023

Summary

Official Symbol	Telo2 provided by MGI
Official Full Name	telomere maintenance 2 provided by MGI
Primary source	MGI:MGI:1918968
See related	Ensembl:ENSMUSG00000024170
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	1200003M09Rik, Tel2, mKIAA0683
Summary	Enables molecular adaptor activity. Involved in protein stabilization. Predicted to be located in cytoplasm; nuclear body; and nuclear periphery. Predicted to be part of ASTRA complex; TORC1 complex; and TORC2 complex. Predicted to be active in cytosol. Is expressed in several structures, including genitourinary system; heart; liver; lung; and spleen. Orthologous to human TELO2 (telomere maintenance 2). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in ovary adult (RPKM 12.6), limb E14.5 (RPKM 9.0) and 28 other tissues See more
Orthologs	human all

Source: https://www.ncbi.nlm.nih.gov/

GemPharmatech

Transcript Information

The gene has 11 transcripts,all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000115181.9	Telo2-202	3530	840aa	Protein coding	CCDS28507	Q9DC40-1	Ensembl Canonical GENCODE basic APPRIS P1 TSL:1
ENSMUST00000024987.6	Telo2-201	3434	840aa	Protein coding	CCDS28507	Q9DC40-1	GENCODE basic APPRIS P1 TSL:1
ENSMUST00000152460.2	Telo2-208	841	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000155632.8	Telo2-210	498	No protein	Protein coding CDS not defined		-	TSL:5
ENSMUST00000139196.2	Telo2-204	439	No protein	Protein coding CDS not defined		-	TSL:1
ENSMUST00000143390.2	Telo2-205	425	No protein	Protein coding CDS not defined		-	TSL:1
ENSMUST00000146522.2	Telo2-206	346	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000156698.2	Telo2-211	4644	No protein	Retained intron		-	TSL:2
ENSMUST00000155607.8	Telo2-209	3358	No protein	Retained intron		-	TSL:2
ENSMUST00000130525.2	Telo2-203	1697	No protein	Retained intron		-	TSL:1
ENSMUST00000151205.2	Telo2-207	720	No protein	Retained intron		-	TSL:3

The strategy is based on the design of *Telo2*-202 transcript, the transcription is shown below:
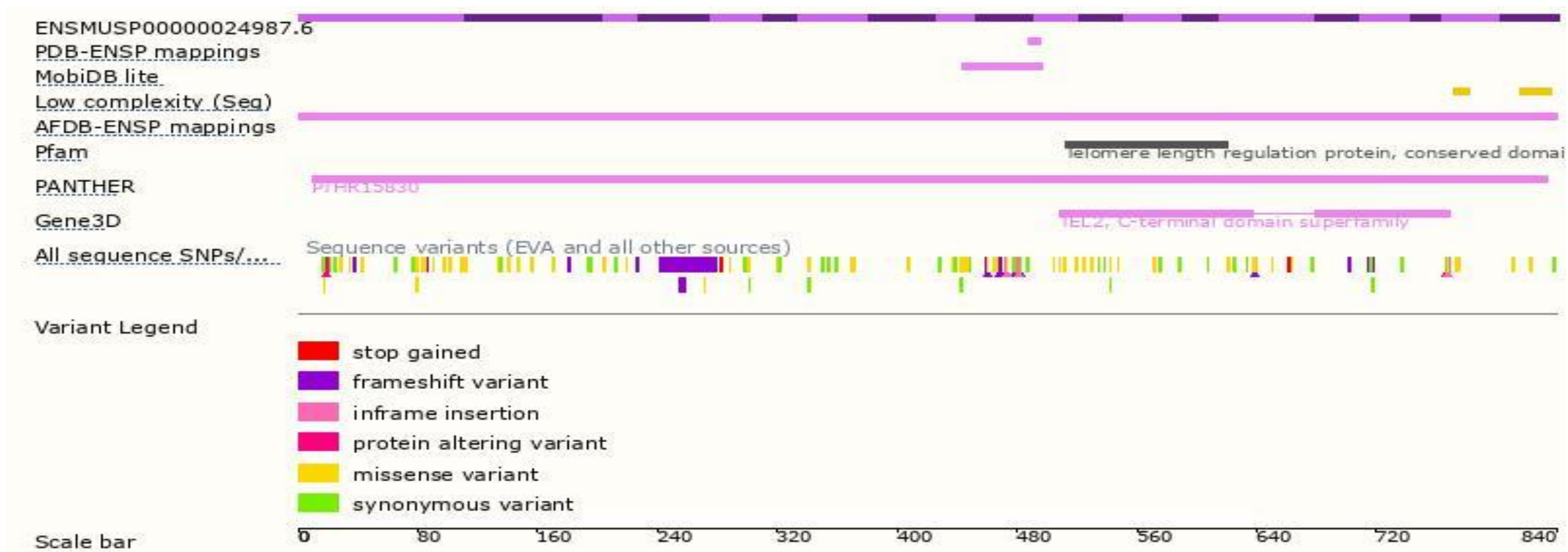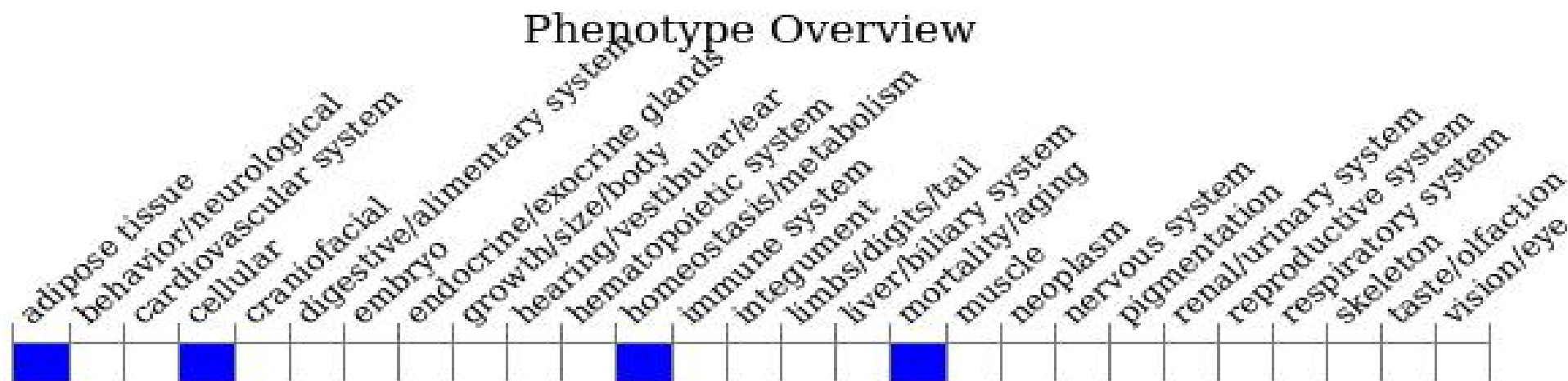

< Telo2-202 - ENSMUST00000115181
protein coding

Reverse strand — 16.40 kb

Source: https://www.ensembl.org

GemPharmatech™

Genomic Information
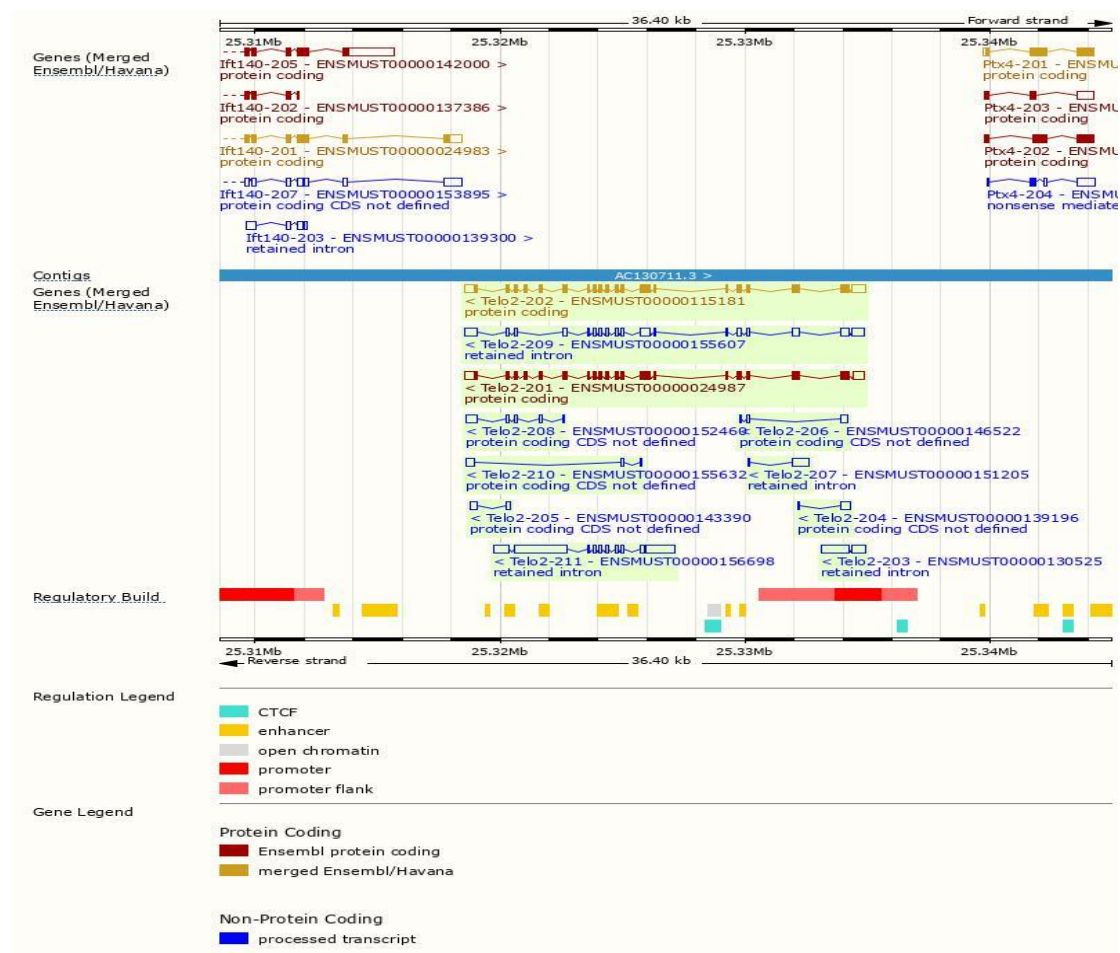
Protein Information

Mouse Phenotype Information (MGI)

Phenotype Overview

- Mice homozygous for a knock-out allele exhibit embryonic lethality prior to E13.5.

GemPharmatech

Important Information

- *Telo2* is located on Chr17. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.