Ttll4 Cas9-CKO Strategy

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Reviewer: Yumeng Wang

Design Date: 2023-02-06

Overview

Target Gene Name

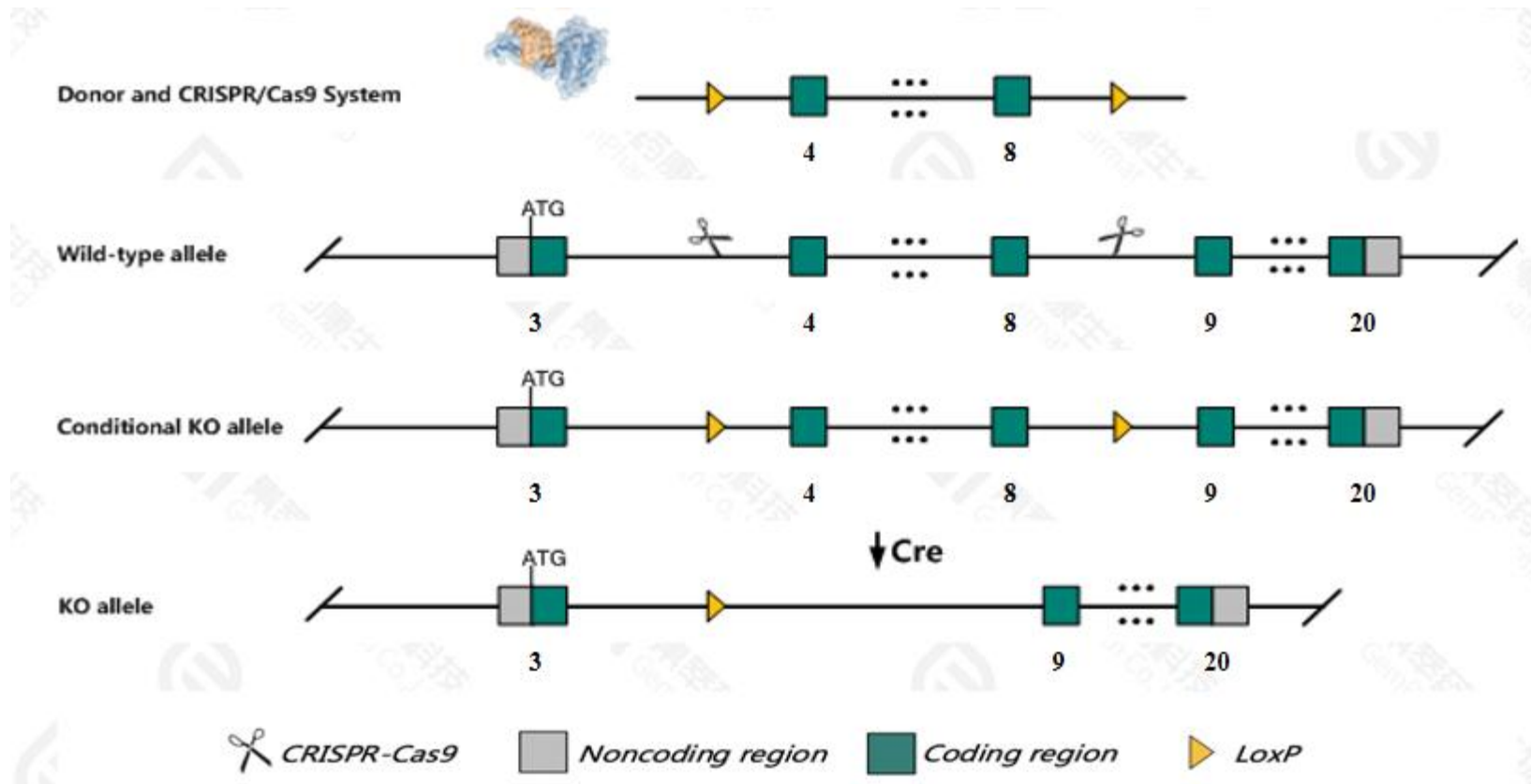- Ttll4

Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

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Strain Strategy

Schematic representation of CRISPR-Cas9 engineering used to edit the *Ttll4* gene.

Technical Information

- The *Ttll4* gene has 11 transcripts. According to the structure of *Ttll4* gene, exon4-exon8 of *Ttll4*-201 (ENSMUST00000042125.15) transcript is recommended as the knockout region. The region contains 487bp of coding sequences. Knocking out the region will result in disruption of protein function.

- In this project we use CRISPR-Cas9 technology to modify *Ttll4* 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

Ttll4 tubulin tyrosine ligase-like family, member 4 [*Mus musculus* (house mouse)]

⬇ Download Datasets

Gene ID: 67534, updated on 26-Sep-2022

▲ Summary

Official Symbol	Ttll4 provided by MGI
Official Full Name	tubulin tyrosine ligase-like family, member 4 provided by MGI
Primary source	MGI:MGI:1914784
See related	Ensembl:ENSMUSG00000033257 AllianceGenome:MGI:1914784
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	mKIAA0173; 4632407P03Rik
Summary	Enables protein-glutamic acid ligase activity and tubulin binding activity. Involved in peptidyl-glutamic acid modification. Acts upstream of or within protein polyglutamylation and regulation of blastocyst development. Located in 9+0 non-motile cilium and ciliary basal body. Orthologous to human TTLL4 (tubulin tyrosine ligase like 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in testis adult (RPKM 16.4), CNS E11.5 (RPKM 10.3) and 27 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

▲ Genomic context

Location:	1; 1 C4
Exon count:	20

See Ttll4 in Genome Data Viewer

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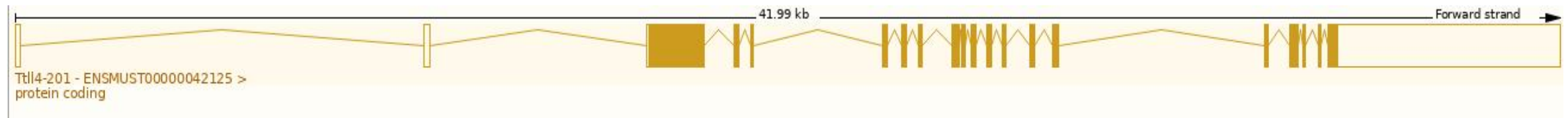
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Transcript Information

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

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000042125.15	Ttll4-201	10019	1193aa	Protein coding	CCDS15053	Q80UG8	Ensembl Canonical GENCODE basic APPRIS P1 TSL:1
ENSMUST00000113678.2	Ttll4-202	3762	1129aa	Protein coding		D3YY08	GENCODE basic TSL:5
ENSMUST00000141119.8	Ttll4-206	664	113aa	Protein coding		D3Z402	TSL:3 CDS 3' incomplete
ENSMUST00000129890.8	Ttll4-204	493	103aa	Protein coding		D3Z7H1	TSL:3 CDS 3' incomplete
ENSMUST00000145132.8	Ttll4-209	5078	No protein	Protein coding CDS not defined		-	TSL:5
ENSMUST00000143925.8	Ttll4-208	812	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000143790.2	Ttll4-207	760	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000140591.2	Ttll4-205	491	No protein	Protein coding CDS not defined		-	TSL:3
ENSMUST00000128891.8	Ttll4-203	3389	No protein	Retained intron		-	TSL:1
ENSMUST00000155753.2	Ttll4-211	754	No protein	Retained intron		-	TSL:3
ENSMUST00000153636.8	Ttll4-210	485	No protein	Retained intron		-	TSL:2

The strategy is based on the design of *Ttll4*-201 transcript, the transcription is shown below:
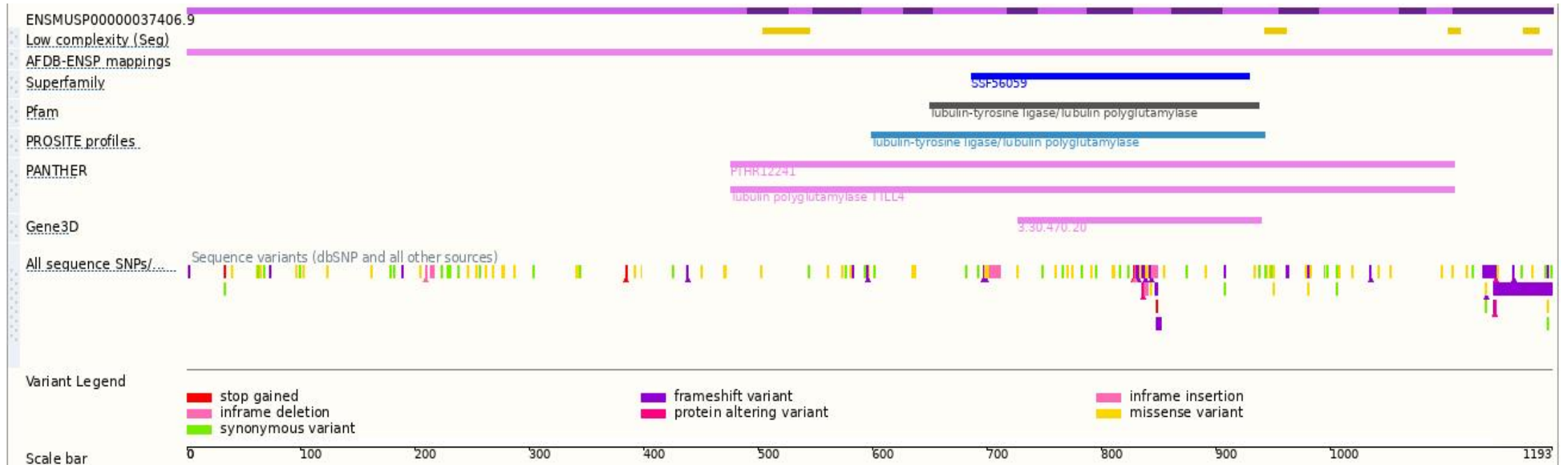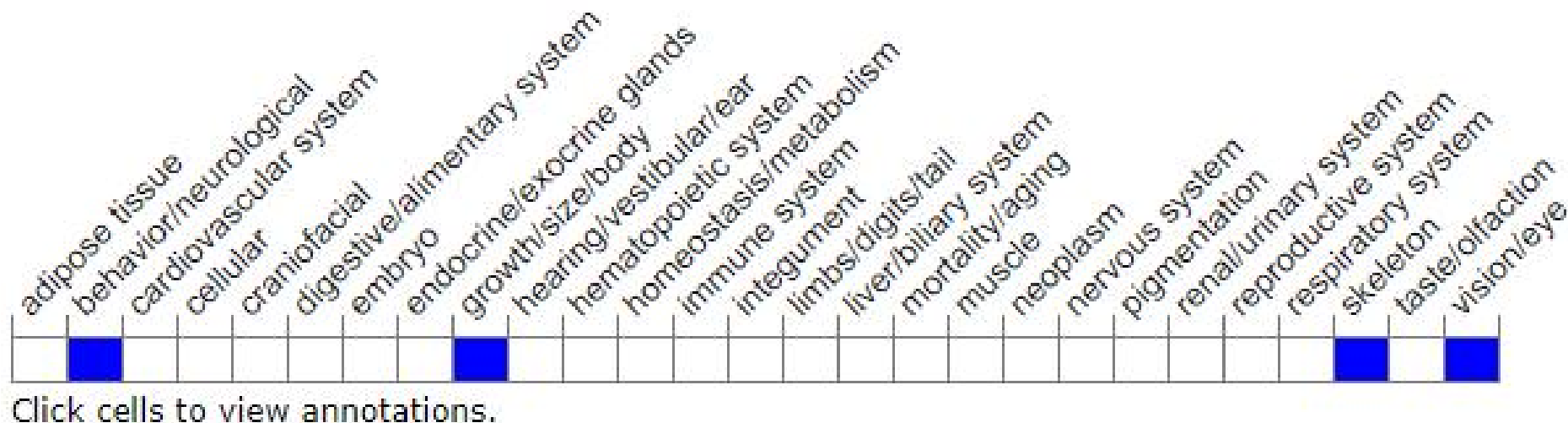

Source: https://www.ensembl.org

Genomic Information

Source: : https://www.ensembl.org

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Protein Information

Source: : https://www.ensembl.org

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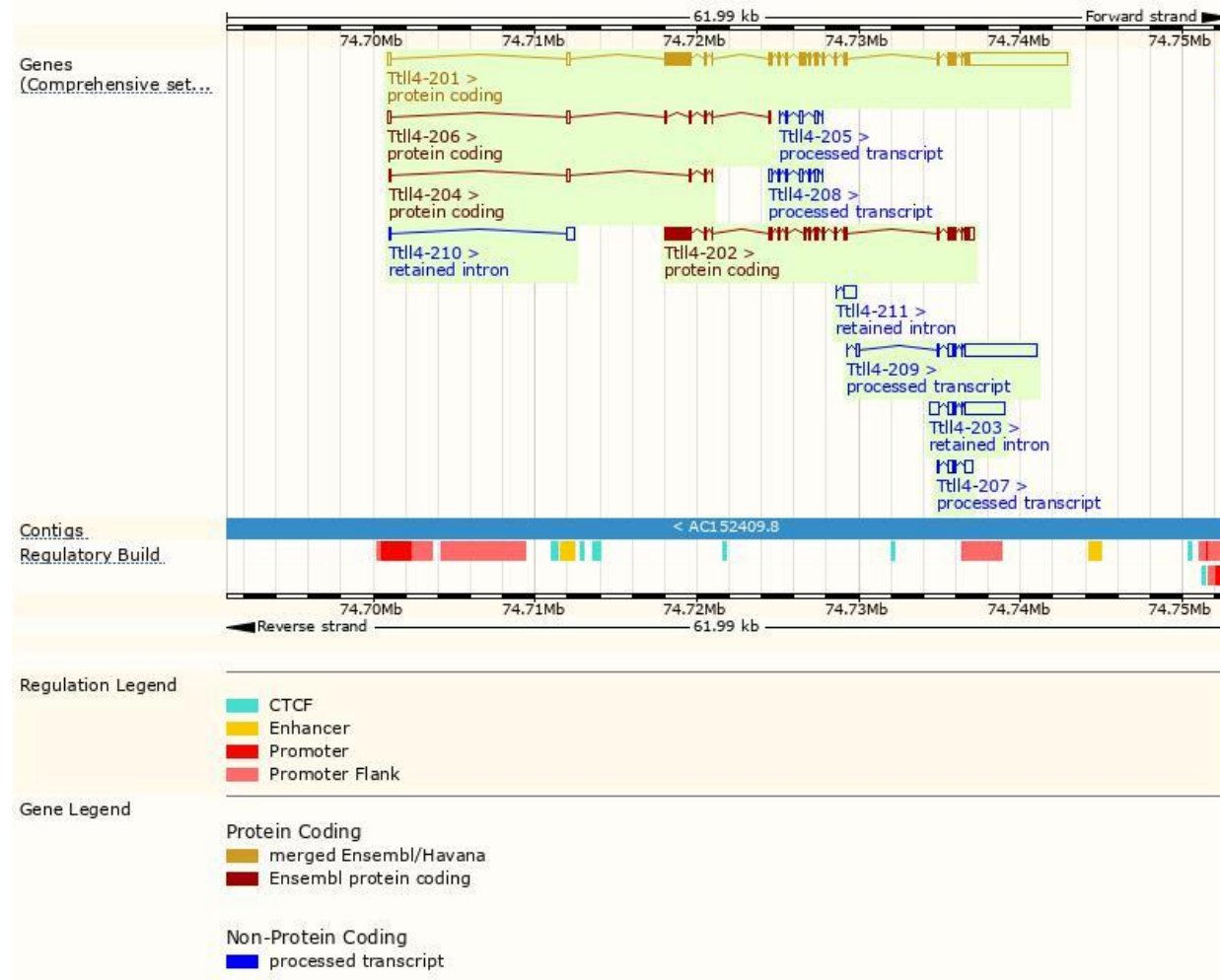
Mouse Phenotype Information (MGI)

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

Source: https://www.informatics.jax.org

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Important Information

- The *Ttll4* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

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