

Tmc2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Tmc2

Project type

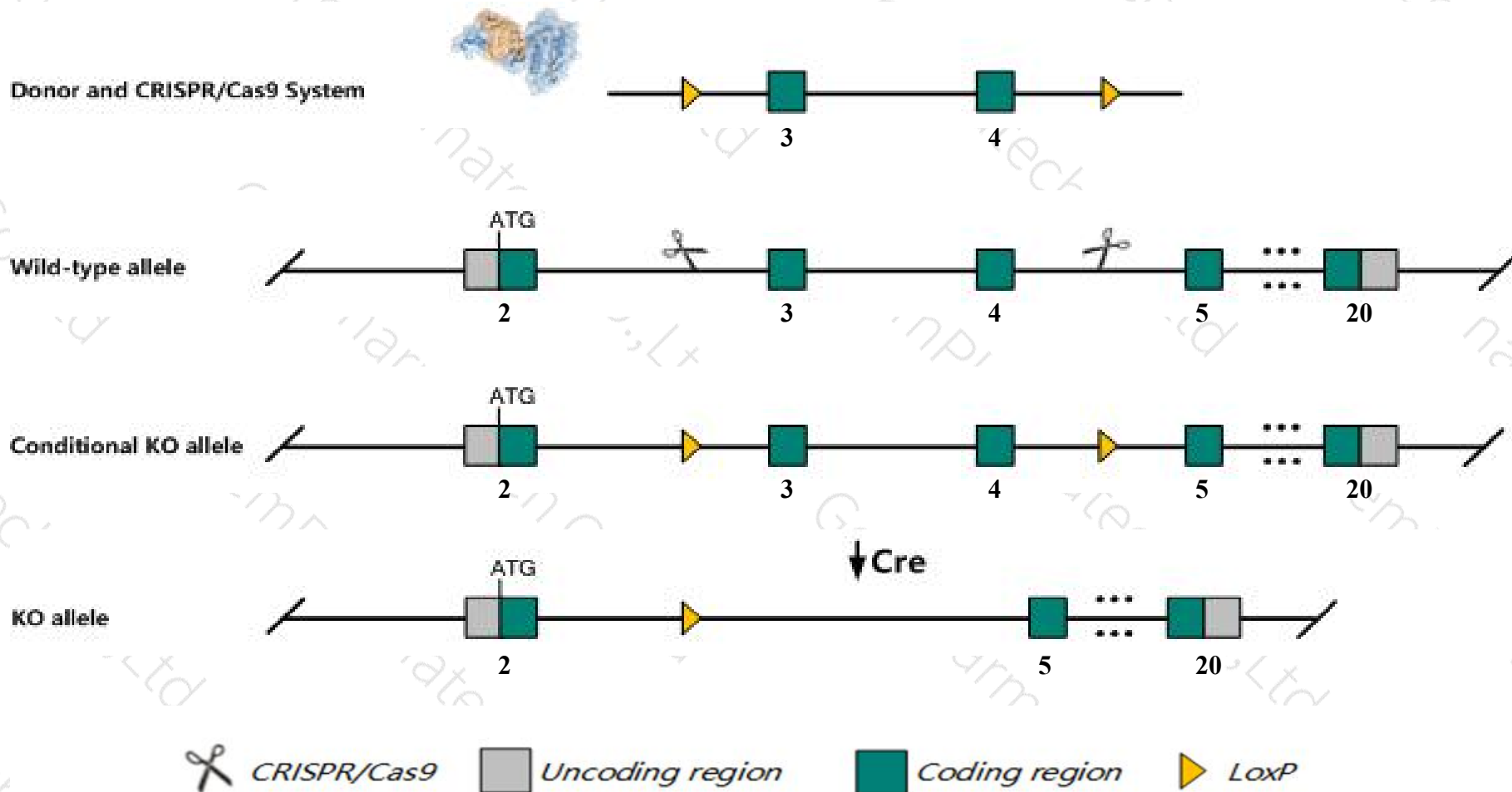
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tmc2* gene. The schematic diagram is as follows:



Technical routes

- The *Tmc2* gene has 2 transcripts. According to the structure of *Tmc2* gene, exon3-exon4 of *Tmc2-201* (ENSMUST00000077988.7) transcript is recommended as the knockout region. The region contains 466bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tmc2* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

- According to the existing MGI data, Mice homozygous for a null allele display normal hearing and motor behavior. Cochlear hair cells show partial resistance to gentamicin induced toxicity.
- The *Tmc2* gene is located on the Chr2. 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.

Gene information (NCBI)

Tmc2 transmembrane channel-like gene family 2 [Mus musculus (house mouse)]

Gene ID: 192140, updated on 19-Mar-2019

Summary



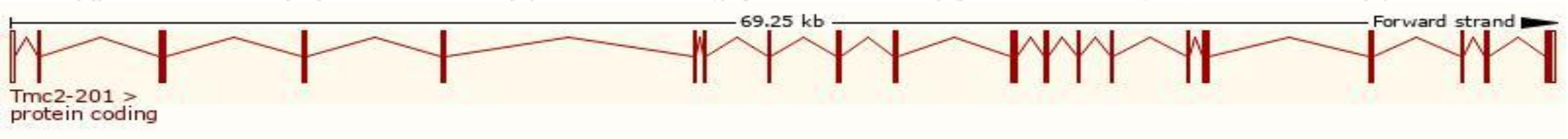
Official Symbol	Tmc2 provided by MGI
Official Full Name	transmembrane channel-like gene family 2 provided by MGI
Primary source	MGI:MGI:2151017
See related	Ensembl:ENSMUSG00000060332
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CWEA2
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information (Ensembl)

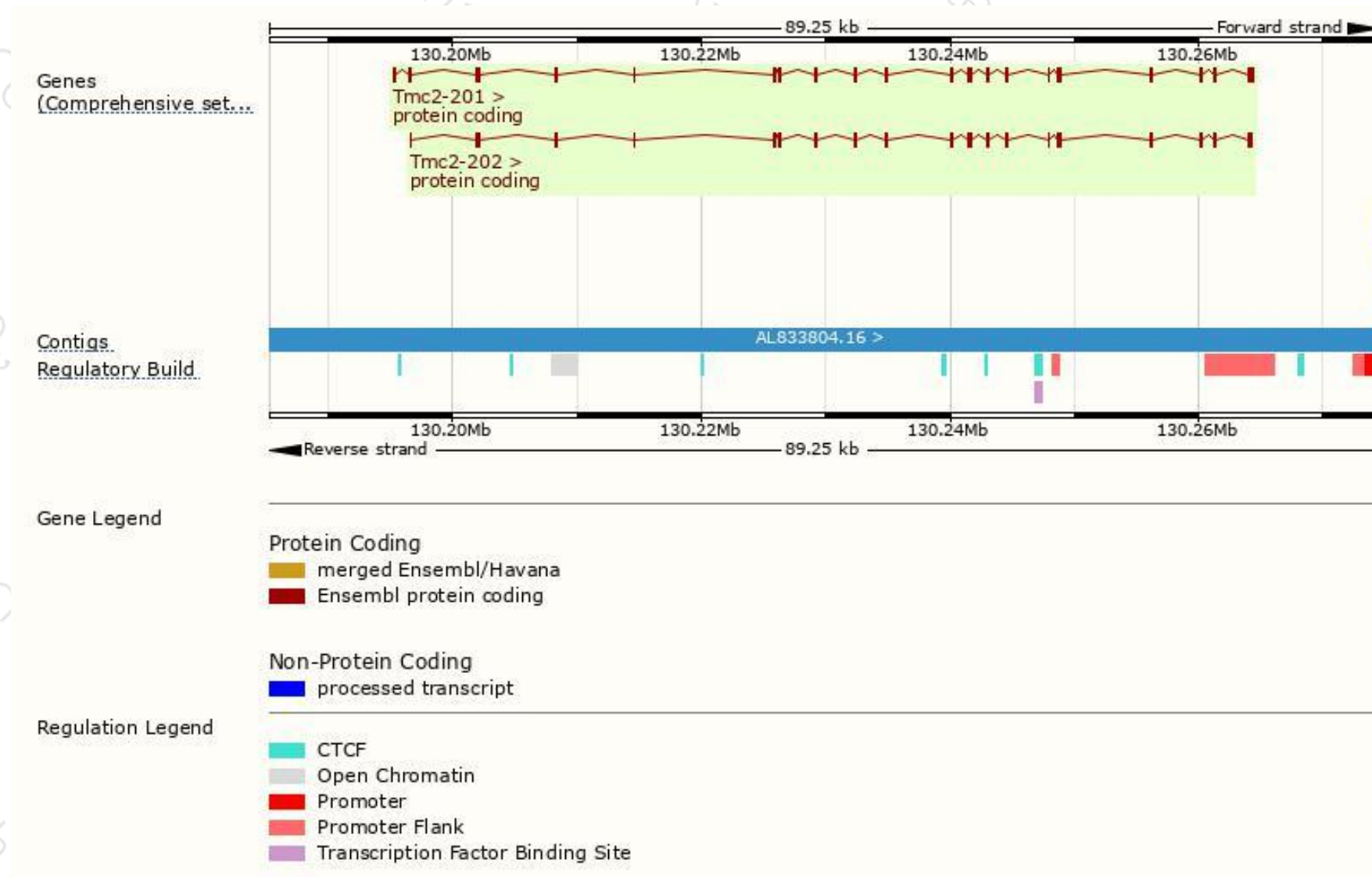
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tmc2-201	ENSMUST00000077988.7	3216	888aa	Protein coding	CCDS16736	Q8R4P4	TSL:1 GENCODE basic APPRIS P1
Tmc2-202	ENSMUST00000166774.2	2667	888aa	Protein coding	CCDS16736	Q8R4P4	TSL:2 GENCODE basic APPRIS P1

The strategy is based on the design of *Tmc2-201* transcript,The transcription is shown below



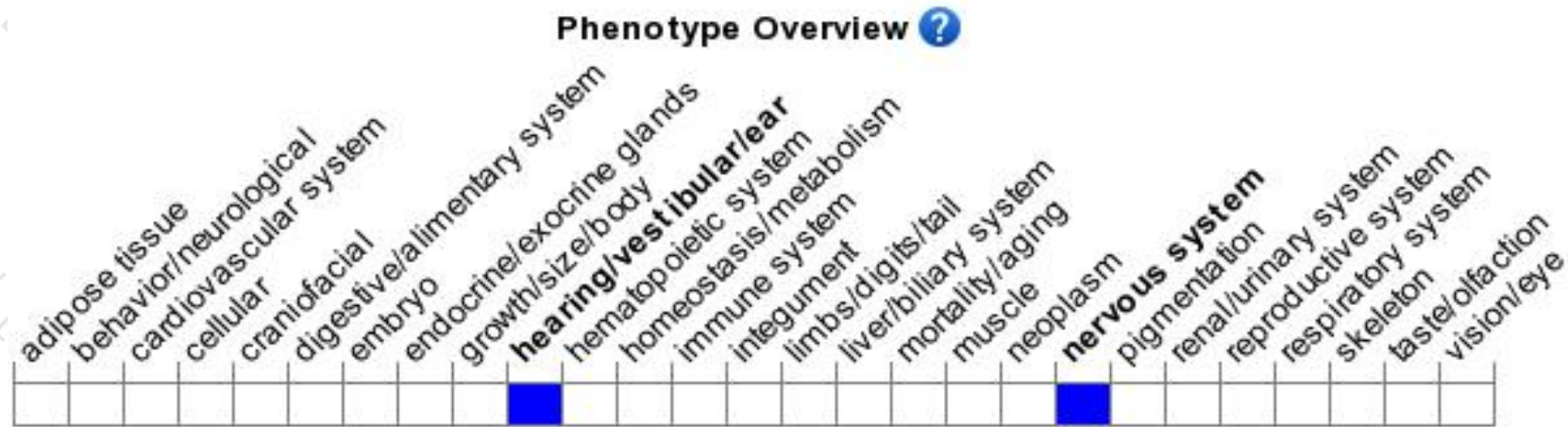
Genomic location distribution



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 a null allele display normal hearing and motor behavior.

Cochlear hair cells show partial resistance to gentamicin induced toxicity.

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

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