

***Cldn12* Cas9-KO Strategy**

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-02-14

Project Overview

Project Name

Cldn12

Project type

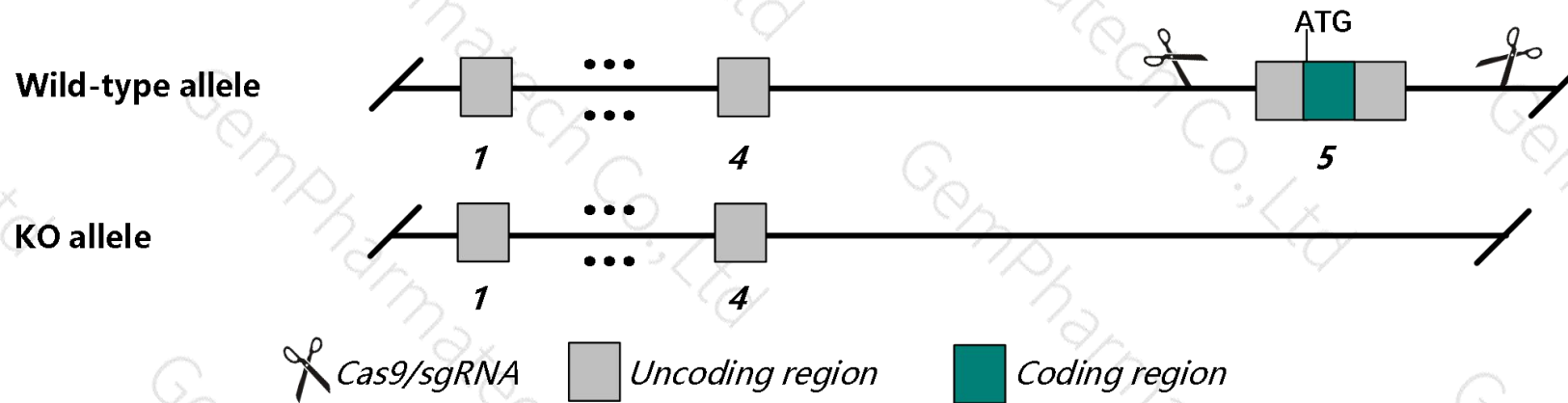
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cldn12* gene. The schematic diagram is as follows:



- The *Cldn12* gene has 8 transcripts. According to the structure of *Cldn12* gene, exon5 of *Cldn12*-207 (ENSMUST00000179804.7) transcript is recommended as the knockout region. The region contains all 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 *Cldn12* gene. The brief process is as follows: CRISPR/Cas9 system

- Transcript *Cldn12*-205&206&208 may not be affected.
- The effect on transcript *Cldn12*-204 is unknown.
- The *Cldn12* gene is located on the Chr5. 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)

Cldn12 claudin 12 [*Mus musculus* (house mouse)]

Gene ID: 64945, updated on 19-Nov-2019

Summary

- Official Symbol** Cldn12 provided by [MGI](#)
- Official Full Name** claudin 12 provided by [MGI](#)
- Primary source** [MGI:MGI:1929288](#)
- See related** [Ensembl:ENSMUSG00000046798](#)
- Gene type** protein coding
- RefSeq status** REVIEWED
- Organism** [Mus musculus](#)
- Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
- Summary** This gene encodes a member of the claudin family. Claudins are integral membrane proteins and components of tight junction strands. Tight junction strands serve as a physical barrier to prevent solutes and water from passing freely through the paracellular space between epithelial or endothelial cell sheets, and also play critical roles in maintaining cell polarity and signal transductions. This gene, along with several other family members, is expressed in the inner ear. The protein encoded by this gene and another family member, claudin 2, are critical for vitamin D-dependent Ca²⁺ absorption between enterocytes. Multiple alternatively spliced transcript variants encoding the same protein have been found. [provided by RefSeq, Oct 2011]
- Expression** Ubiquitous expression in kidney adult (RPKM 18.9), liver adult (RPKM 14.7) and 27 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 5; 5 A1

See Cldn12 in [Genome Data Viewer](#)

Exon count: 5

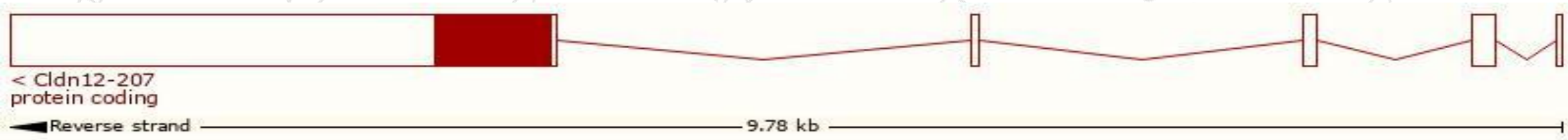
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	5	NC_000071.6 (5505015..5514976, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	5	NC_000071.5 (5505015..5514976, complement)

Transcript information (Ensembl)

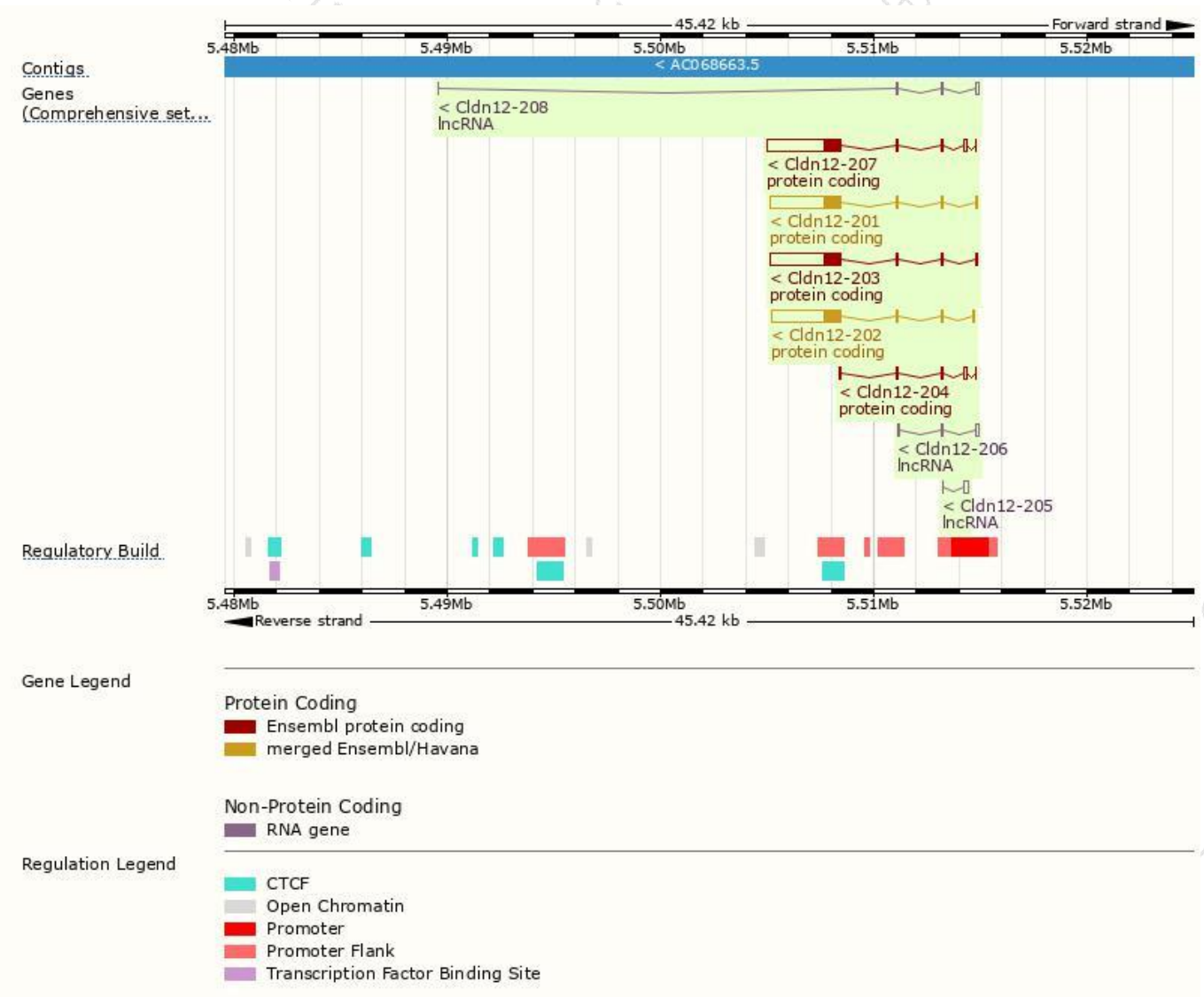
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cldn12-207	ENSMUST00000179804.7	3752	244aa	Protein coding	CCDS19074	Q9ET43	TSL:3 GENCODE basic APPRIS P1
Cldn12-201	ENSMUST00000060947.13	3597	244aa	Protein coding	CCDS19074	Q9ET43	TSL:1 GENCODE basic APPRIS P1
Cldn12-203	ENSMUST00000115446.7	3519	244aa	Protein coding	CCDS19074	Q9ET43	TSL:1 GENCODE basic APPRIS P1
Cldn12-202	ENSMUST00000115445.7	3477	244aa	Protein coding	CCDS19074	Q9ET43	TSL:1 GENCODE basic APPRIS P1
Cldn12-204	ENSMUST00000125110.1	359	6aa	Protein coding	-	-	CDS 3' incomplete TSL:3
Cldn12-206	ENSMUST00000134931.1	357	No protein	lncRNA	-	-	TSL:3
Cldn12-208	ENSMUST00000198303.4	349	No protein	lncRNA	-	-	TSL:3
Cldn12-205	ENSMUST00000134157.1	248	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Cldn12-207* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

Tel: 400-9660890

