

Cldn7 Cas9-KO Strategy

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Project Overview



Project Name

Cldn7

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cldn7* gene. The schematic diagram is as follows:



- The *Cldn7* gene has 5 transcripts. According to the structure of *Cldn7* gene, exon1 of *Cldn7-201* (ENSMUST00000018713.12) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cldn7* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit decreased body size, weight, and length; abnormal potassium, chloride, and sodium ion excretion; chronic dehydration; and postnatal lethality by P12.
- Transcript *Cldn7-205* may not be affected.
- The *Cldn7* gene is located on the Chr11. 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)

Cldn7 claudin 7 [Mus musculus (house mouse)]

Gene ID: 53624, updated on 9-Apr-2019

Summary



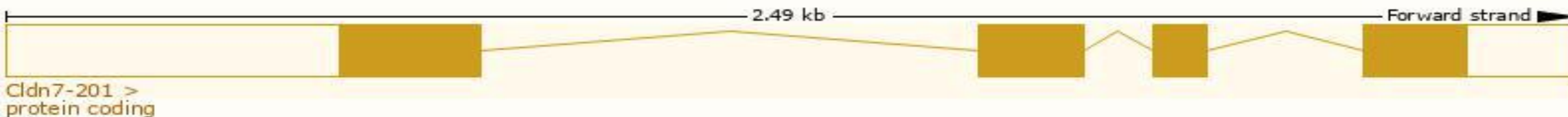
Official Symbol	Cldn7 provided by MGI
Official Full Name	claudin 7 provided by MGI
Primary source	MGI:MGI:1859285
See related	Ensembl:ENSMUSG00000018569
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; 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 is expressed constitutively in the mammary epithelium throughout development, and might be involved in vesicle trafficking to the basolateral membrane. It is essential for NaCl homeostasis in distal nephrons. The knockout mice lacking this gene showed severe salt wasting, chronic dehydration, and growth retardation, and died within 12 days after birth. Alternatively spliced transcript variants have been found for this gene. [provided by RefSeq, Aug 2010]
Expression	Biased expression in large intestine adult (RPKM 431.6), small intestine adult (RPKM 310.8) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

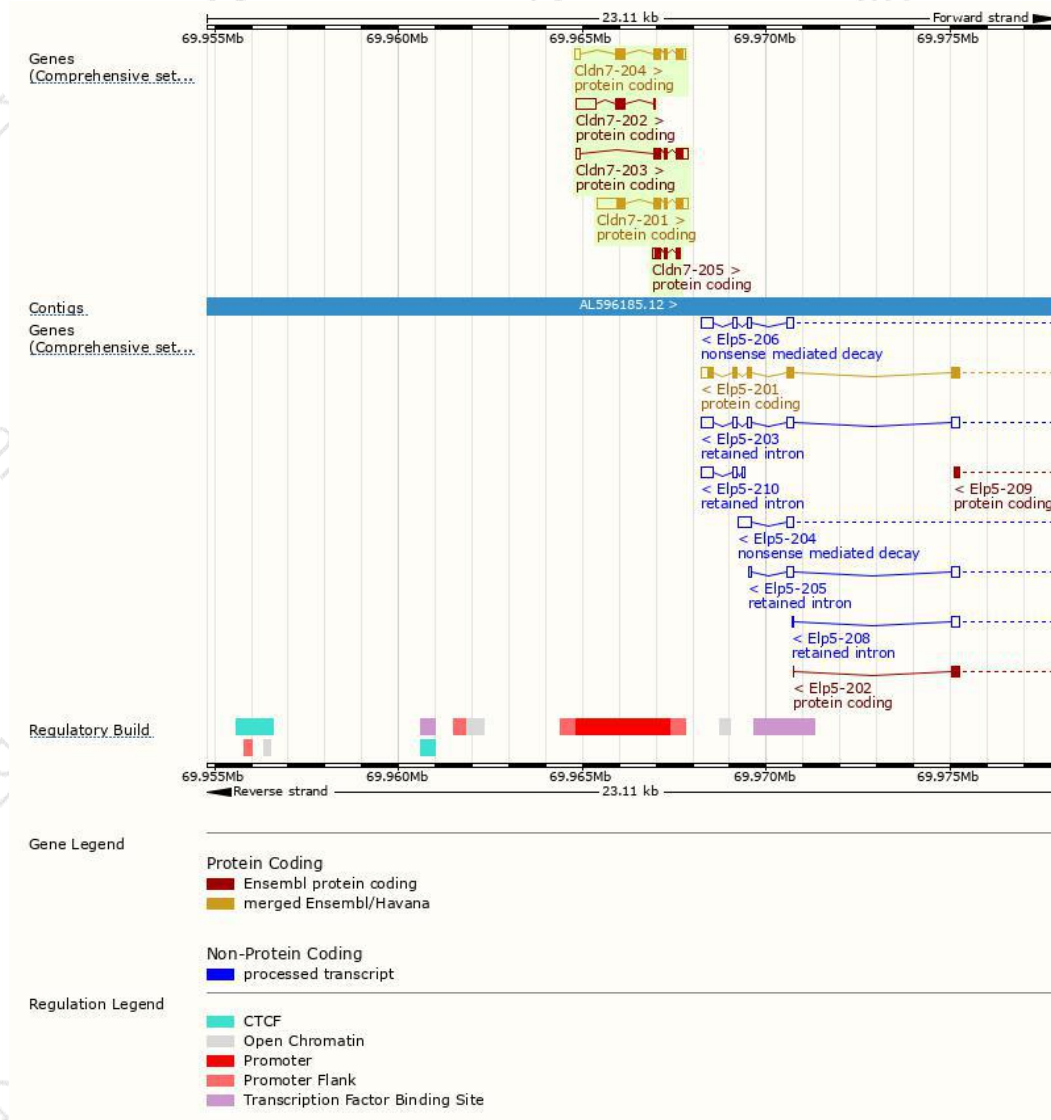
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cldn7-201	ENSMUST00000018713.12	1335	211aa	Protein coding	CCDS24925	Q9Z261	TSL:1 GENCODE basic APPRIS P1
Cldn7-204	ENSMUST00000108597.7	913	211aa	Protein coding	CCDS24925	Q9Z261	TSL:2 GENCODE basic APPRIS P1
Cldn7-202	ENSMUST00000060651.5	835	83aa	Protein coding	-	B1AR46	CDS 3' incomplete TSL:5
Cldn7-203	ENSMUST00000108596.7	664	128aa	Protein coding	-	B1AR47	TSL:3 GENCODE basic
Cldn7-205	ENSMUST00000151515.1	373	107aa	Protein coding	-	J3QQ48	CDS 3' incomplete TSL:2

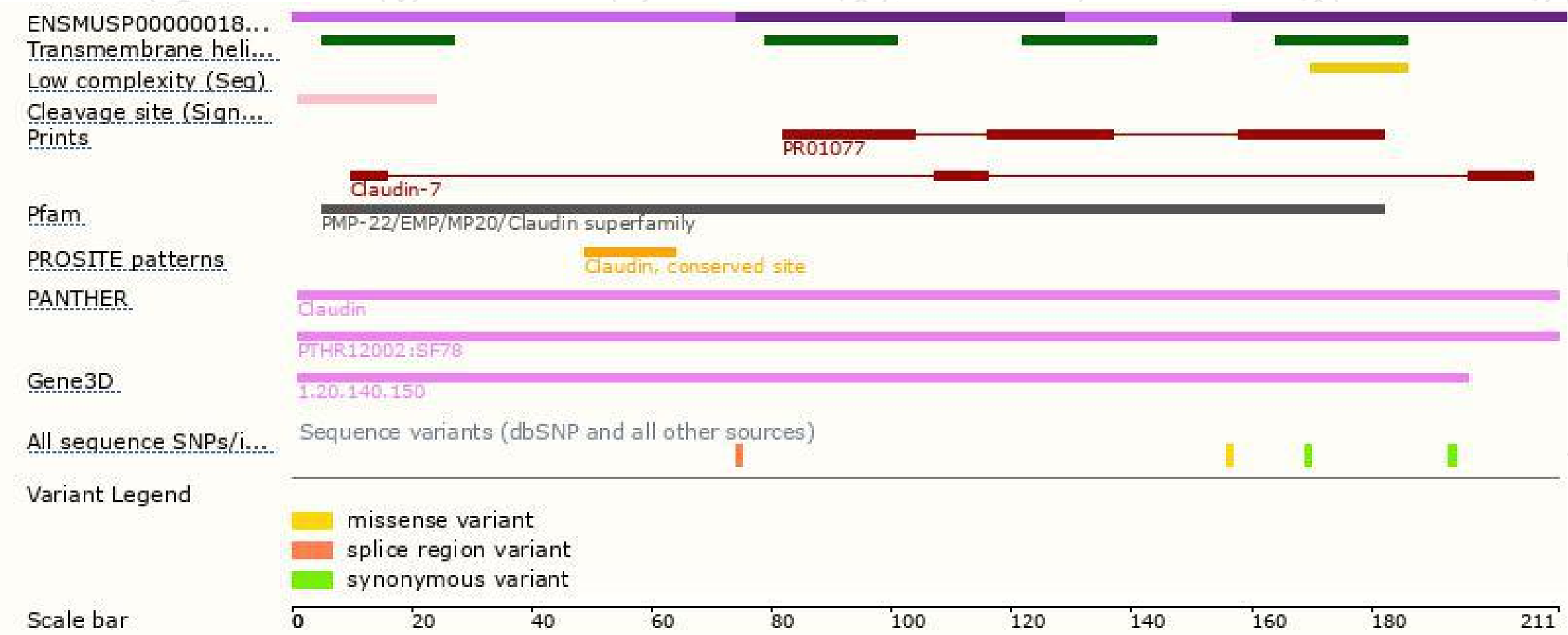
The strategy is based on the design of *Cldn7-201* transcript, The transcription is shown below



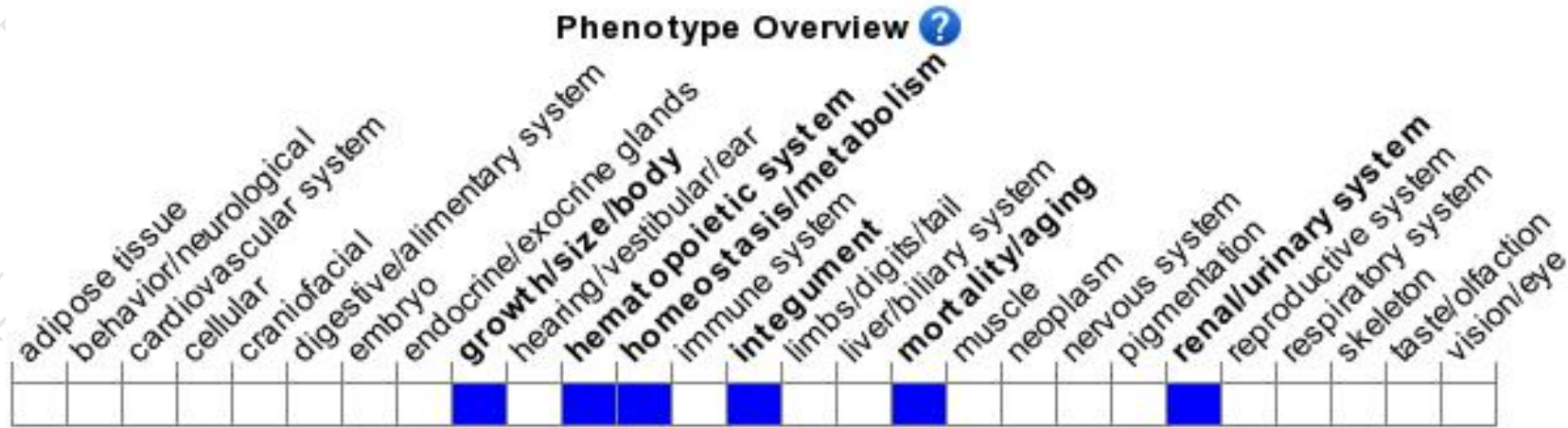
Genomic location distribution



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 knock-out allele exhibit decreased body size, weight, and length; abnormal potassium, chloride, and sodium ion excretion; chronic dehydration; and postnatal lethality by P12.

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

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