

Lctl Cas9-KO Strategy

Designer: Xiaojing Li

Reviewer: JiaYu

Design Date: 2020-7-21

Project Overview

Project Name

Lctl

Project type

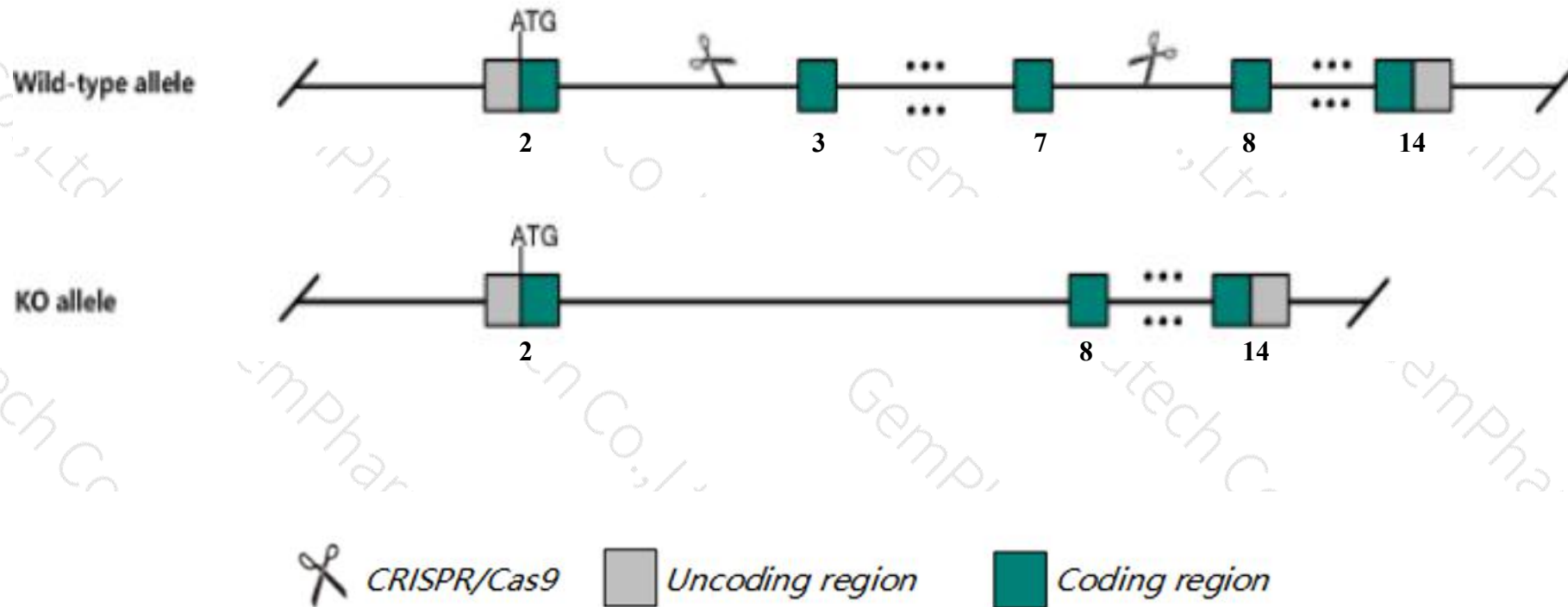
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Lctl* gene has 6 transcripts. According to the structure of *Lctl* gene, exon3-exon7 of *Lctl*-201(ENSMUST00000034969.13) transcript is recommended as the knockout region. The region contains 587bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lctl* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, no gross notable phenotype was detected in knockout mice. Homozygous mice develop distorted eye lenses and cataracts, progressive with age.
- The *Lctl* gene is located on the Chr9. 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)

Lct1 lactase-like [Mus musculus (house mouse)]

Gene ID: 235435, updated on 13-Mar-2020

Summary



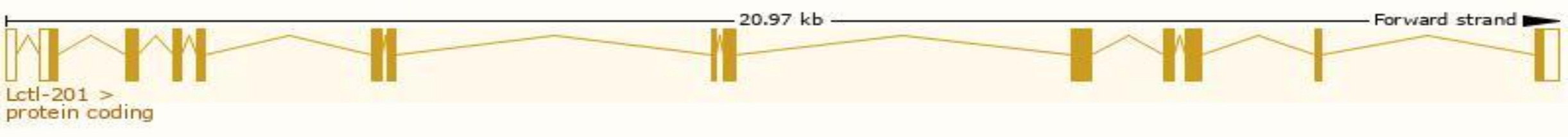
Official Symbol Lct1 provided by [MGI](#)
Official Full Name lactase-like provided by [MGI](#)
Primary source [MGI:MGI:2183549](#)
See related [Ensembl:ENSMUSG00000032401](#)
Gene type protein coding
RefSeq status PROVISIONAL
Organism [Mus musculus](#)
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as E130104I05Rik, KLPH
Expression Biased expression in subcutaneous fat pad adult (RPKM 18.1), liver E14 (RPKM 5.9) and 12 other tissues [See more](#)
Orthologs [human all](#)

Transcript information (Ensembl)

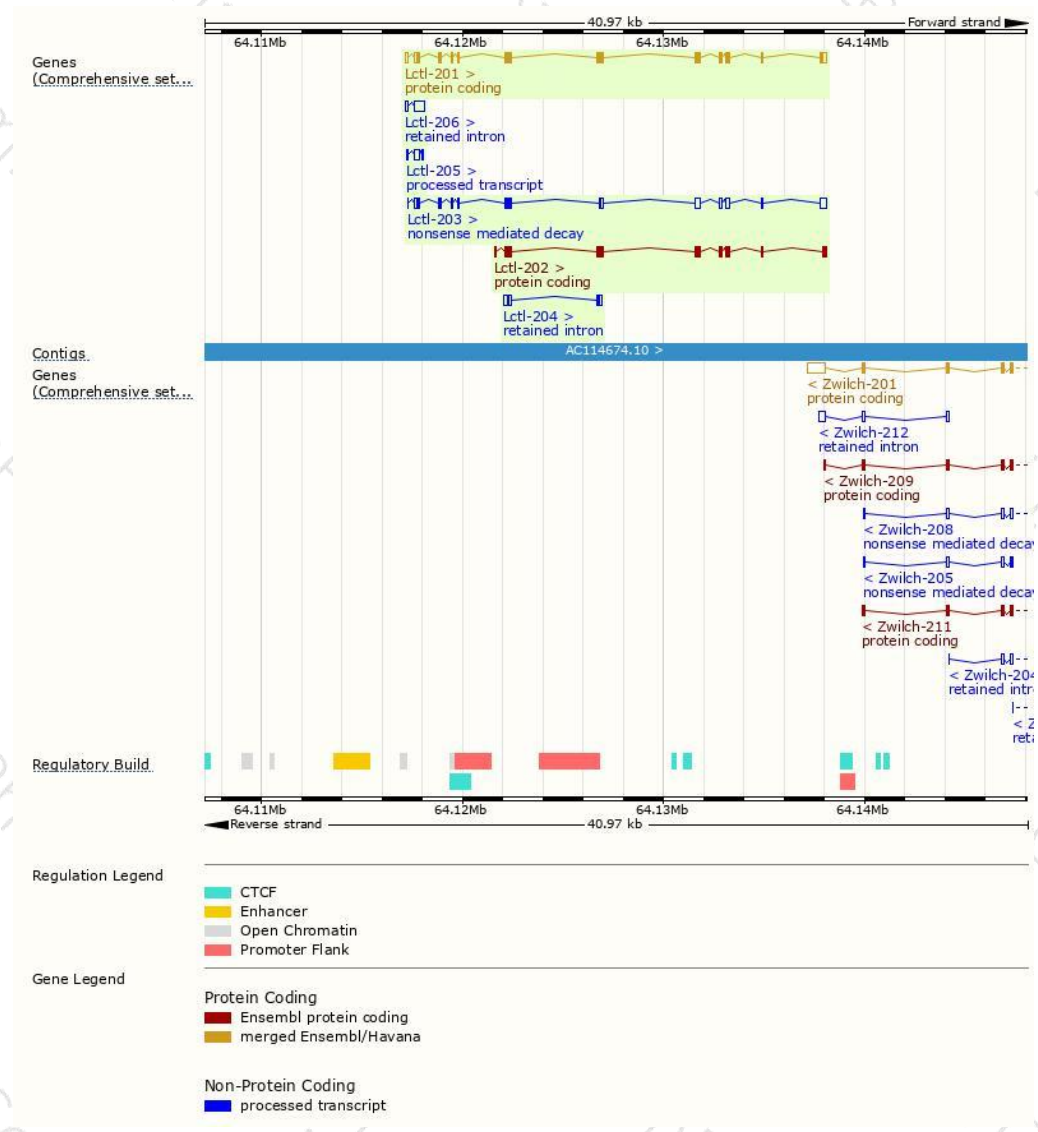
The gene has 6 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|----------|---------------------------------------|------|-----------------------|-------------------------|---------------------------|------------------------|-------------------------------|
| Lctl-201 | ENSMUST00000034969.13 | 2171 | 566aa | Protein coding | CCDS23274 | Q8K1F9 | TSL:1 GENCODE basic APPRIS P1 |
| Lctl-202 | ENSMUST00000118215.2 | 1380 | 409aa | Protein coding | - | D3YTQ7 | TSL:1 GENCODE basic |
| Lctl-203 | ENSMUST00000124020.7 | 2000 | 235aa | Nonsense mediated decay | - | D6RI22 | TSL:1 |
| Lctl-205 | ENSMUST00000139755.1 | 335 | No protein | Processed transcript | - | - | TSL:3 |
| Lctl-206 | ENSMUST00000145011.1 | 650 | No protein | Retained intron | - | - | TSL:2 |
| Lctl-204 | ENSMUST00000132018.1 | 440 | No protein | Retained intron | - | - | TSL:3 |

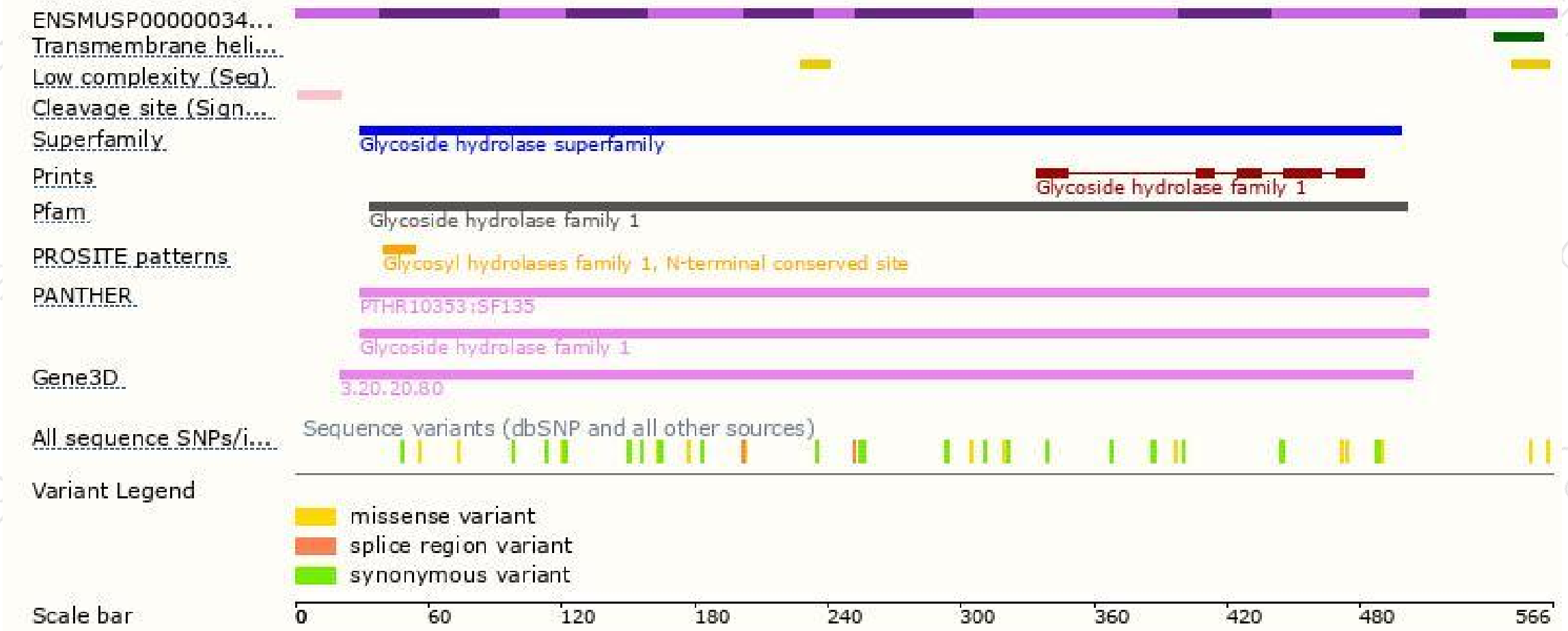
The strategy is based on the design of *Lctl-201* transcript,the transcription is shown below:



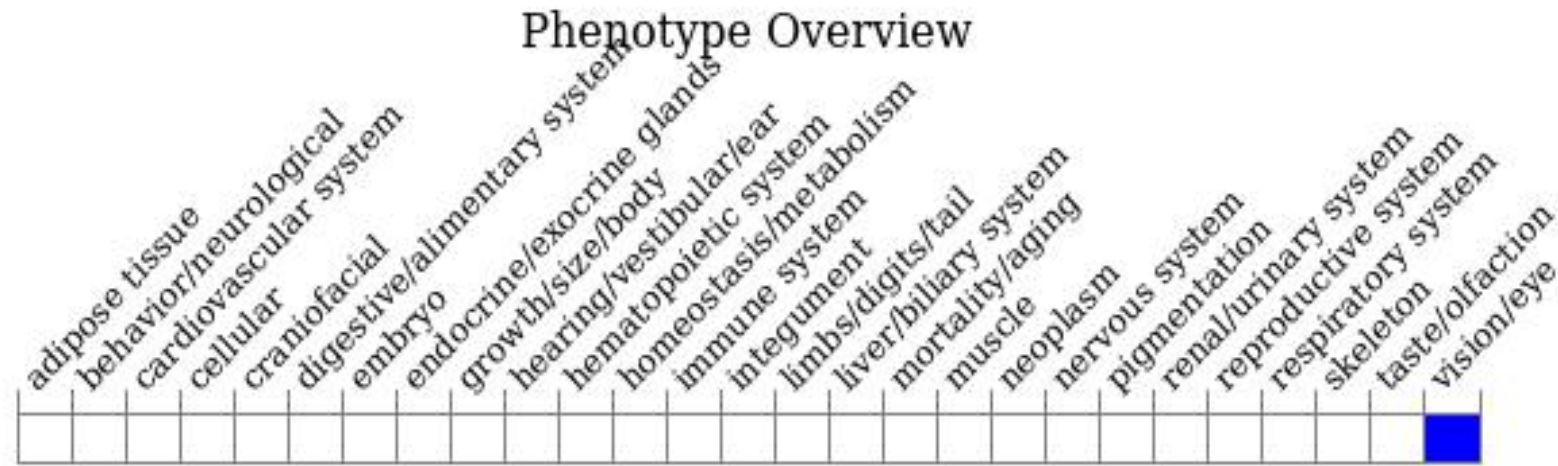
Genomic location distribution



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, no gross notable phenotype was detected in knockout mice. Homozygous mice develop distorted eye lenses and cataracts, progressive with age.

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

Tel: 400-9660890

