

Muc1 Cas9-KO Strategy

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Project Overview

Project Name

Muc1

Project type

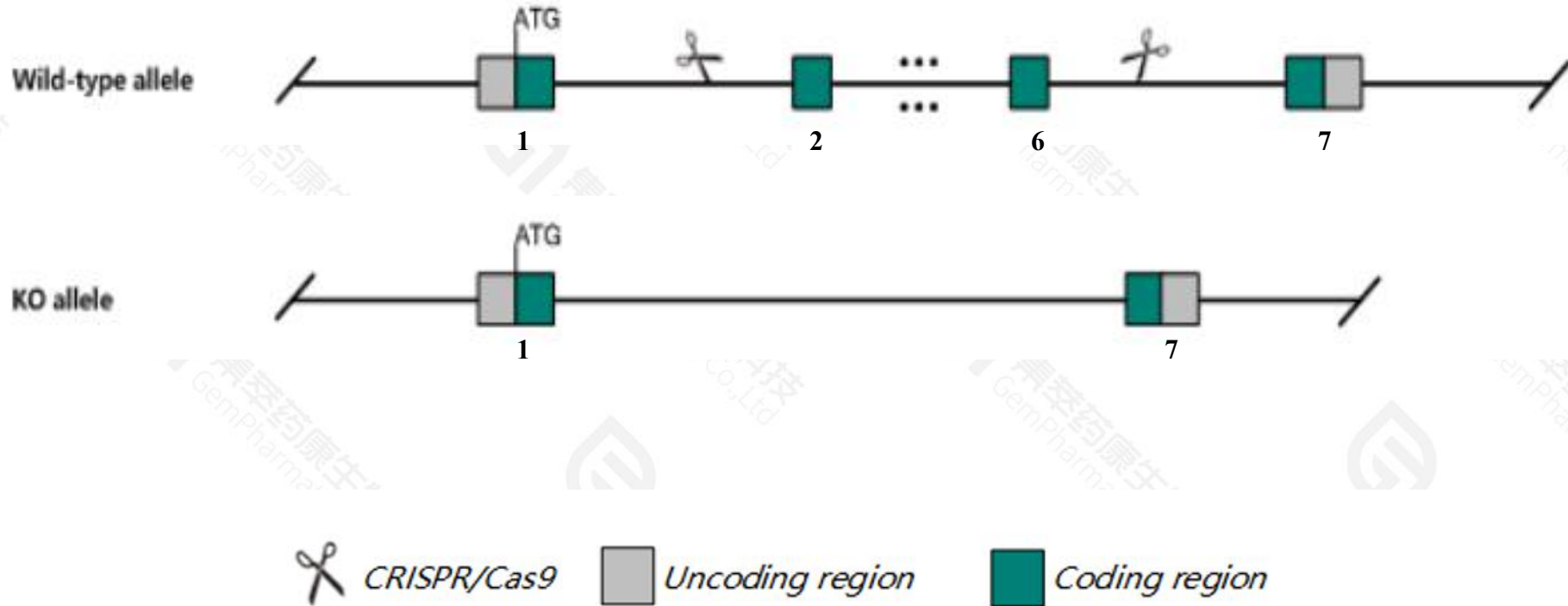
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Muc1* gene. The schematic diagram is as follows:



The *Muc1* gene has 3 transcripts. According to the structure of *Muc1* gene, exon2-exon6 of *Muc1-201*(ENSMUST00000041142.4) transcript is recommended as the knockout region. The region contains 1763bp coding sequence. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Muc1* 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, mice homozygous for a knock-out allele display delayed mammary tumor progression, impaired intestinal absorption of cholesterol, decreased gastric mucus accumulation, reduced secretion and accumulation of gallbladder mucin, and decreased susceptibility to cholesterol gallstone formation.

The *Muc1* gene is located on the Chr3. 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.

Muc1 mucin 1, transmembrane [Mus musculus (house mouse)]

Gene ID: 17829, updated on 23-Feb-2021

Summary



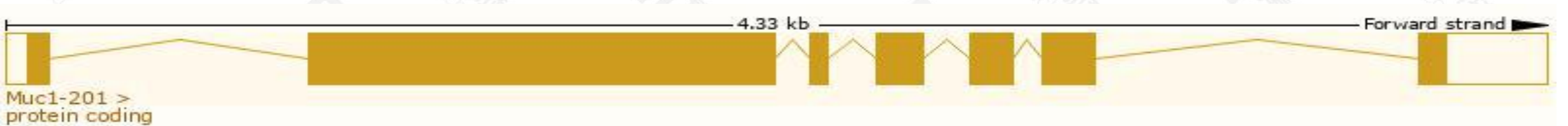
Official Symbol	Muc1 provided by MGI
Official Full Name	mucin 1, transmembrane provided by MGI
Primary source	MGI:MGI:97231
See related	Ensembl:ENSMUSG00000042784
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CD227, EM, EMA, Muc-1
Expression	Biased expression in stomach adult (RPKM 255.6), lung adult (RPKM 94.3) and 2 other tissues See more
Orthologs	human all

Transcript information Ensembl

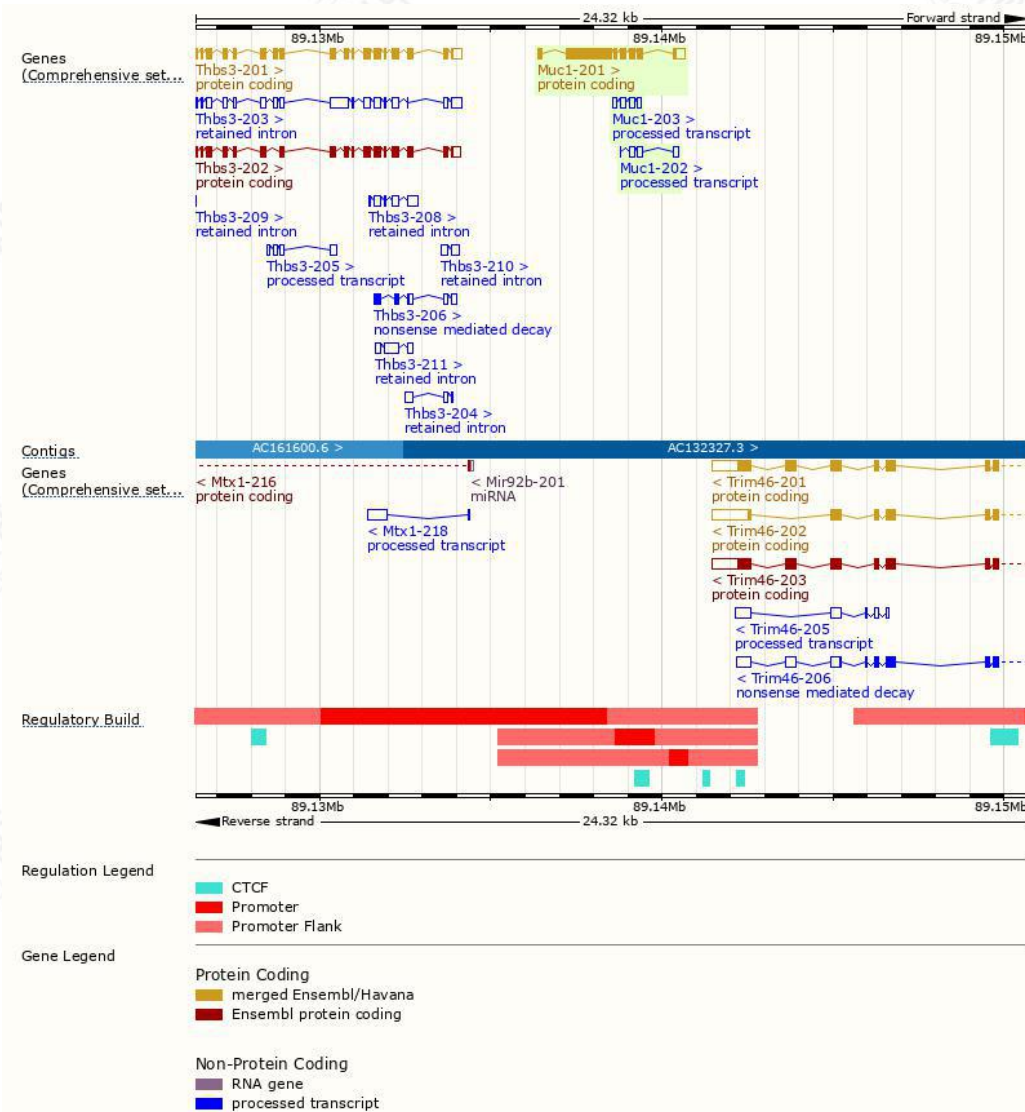
The gene has 3 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Muc1-201	ENSMUST00000041142.4	2242	631aa	Protein coding	CCDS17496		TSL:1 , GENCODE basic , APPRIS P1 ,
Muc1-203	ENSMUST00000146844.8	500	No protein	Processed transcript	-		TSL:3 ,
Muc1-202	ENSMUST00000139206.2	476	No protein	Processed transcript	-		TSL:3 ,

The strategy is based on the design of *Muc1-201* transcript, the transcription is shown below:



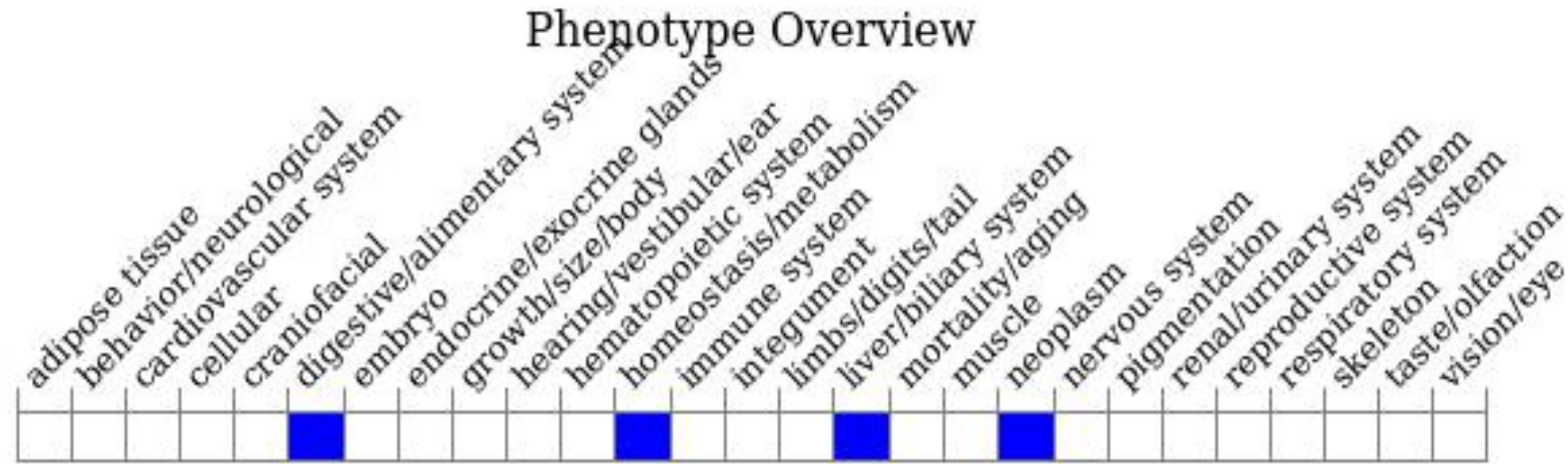
Genomic location distribution



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 display delayed mammary tumor progression, impaired intestinal absorption of cholesterol, decreased gastric mucus accumulation, reduced secretion and accumulation of gallbladder mucin, and decreased susceptibility to cholesterol gallstone formation.

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

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