

Acs15 Cas9-CKO Strategy

Designer: Jiaojiao Yan

Reviewer: Qin Xia

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Overview

Target Gene Name

- Acs15

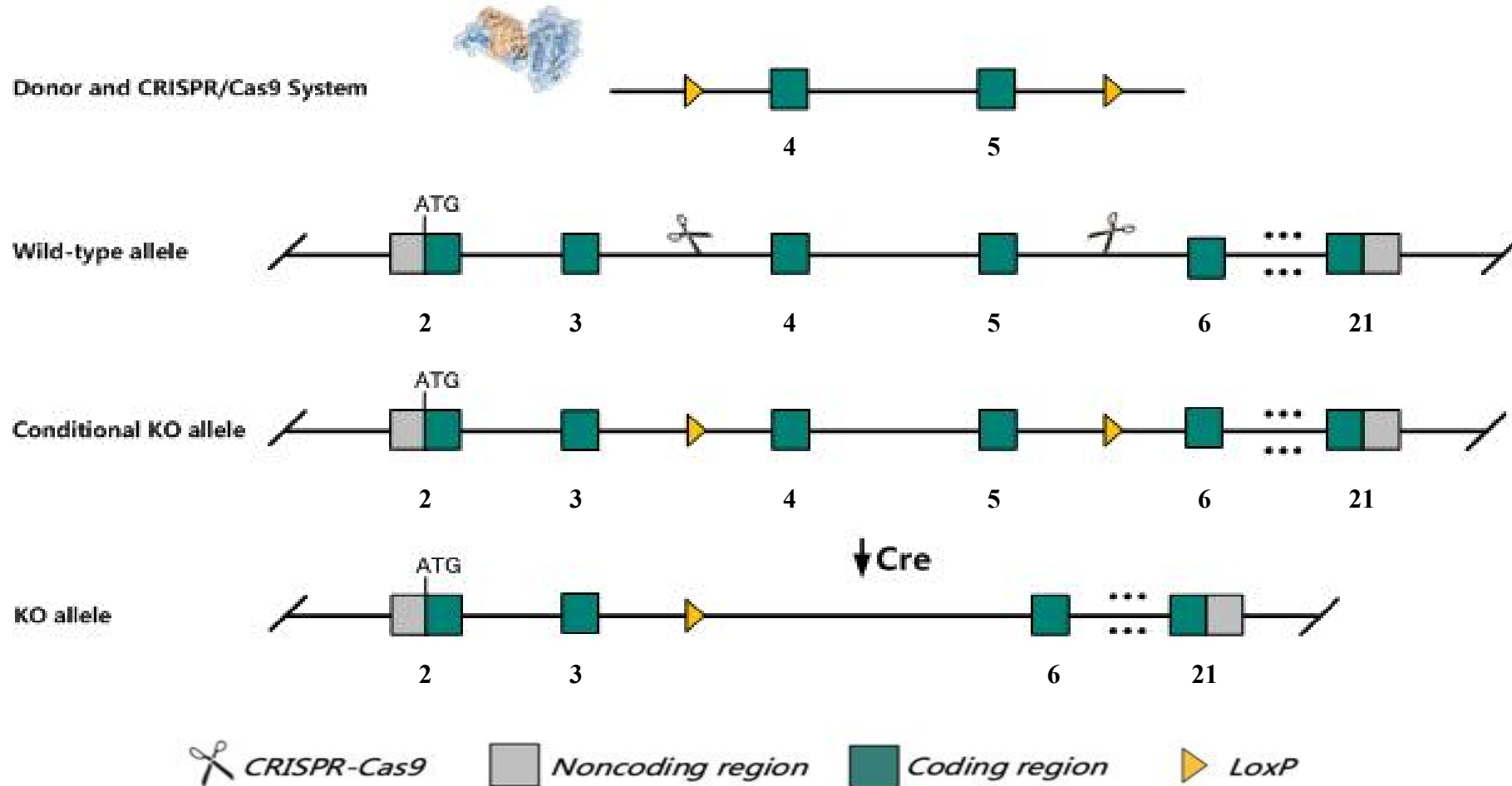
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Acs15* gene.

Technical Information

- The *Acsf5* gene has 6 transcripts. According to the structure of *Acsf5* gene, exon4-exon5 of *Acsf5*-201 (ENSMUST00000043150.6) transcript is recommended as the knockout region. The region contains 167bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Acsf5* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.

Gene Information

Acsl5 acyl-CoA synthetase long-chain family member 5 [Mus musculus (house mouse)]

Gene ID: 433256, updated on 18-May-2023

Summary	
Official Symbol	Acsl5 provided by MGI
Official Full Name	acyl-CoA synthetase long-chain family member 5 provided by MGI
Primary source	MGI:MGI:1919129
See related	Ensembl:ENSMUSG00000024981
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	1700030F05Rik, ACS2, ACS5, FacI5
Summary	Enables long-chain fatty acid-CoA ligase activity. Involved in long-chain fatty acid metabolic process. Located in mitochondrial inner membrane. Is expressed in several structures, including alimentary system; genitourinary system; integumental system; nervous system; and sensory organ. Orthologous to human ACSL5 (acyl-CoA synthetase long chain family member 5). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in liver E18 (RPKM 62.0), large intestine adult (RPKM 51.5) and 23 other tissues See more
Orthologs	human all

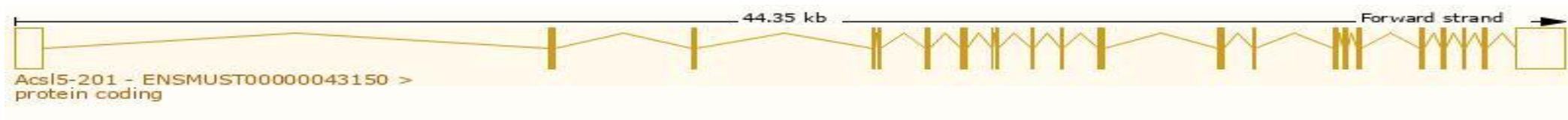
Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

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

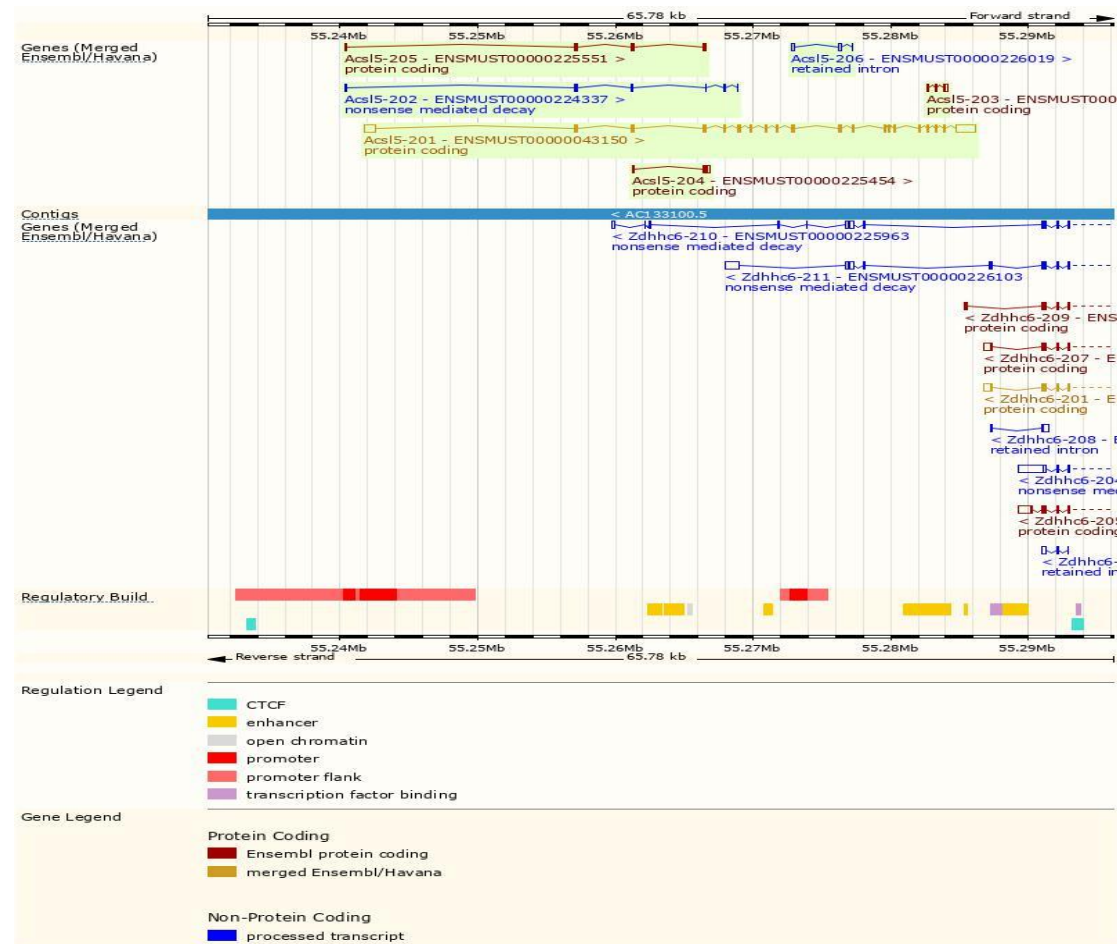
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000043150.6	AcsI5-201	4243	683aa	Protein coding	CCDS29908	Q3UC67 Q8JZR0	Ensembl Canonical Gencode basic APPRIS P1 TSL:1
ENSMUST00000225551.2	AcsI5-205	520	117aa	Protein coding		A0A286YD68	CDS 3' incomplete
ENSMUST00000224414.2	AcsI5-203	455	96aa	Protein coding		A0A286YCG4	CDS 5' incomplete
ENSMUST00000225454.2	AcsI5-204	432	62aa	Protein coding		A0A286YCF3	CDS 5' incomplete
ENSMUST00000224337.2	AcsI5-202	529	95aa	Nonsense mediated decay		A0A286YE29	-
ENSMUST00000226019.2	AcsI5-206	358	No protein	Retained intron		-	-

The strategy is based on the design of *AcsI5-201* transcript, the transcription is shown below:

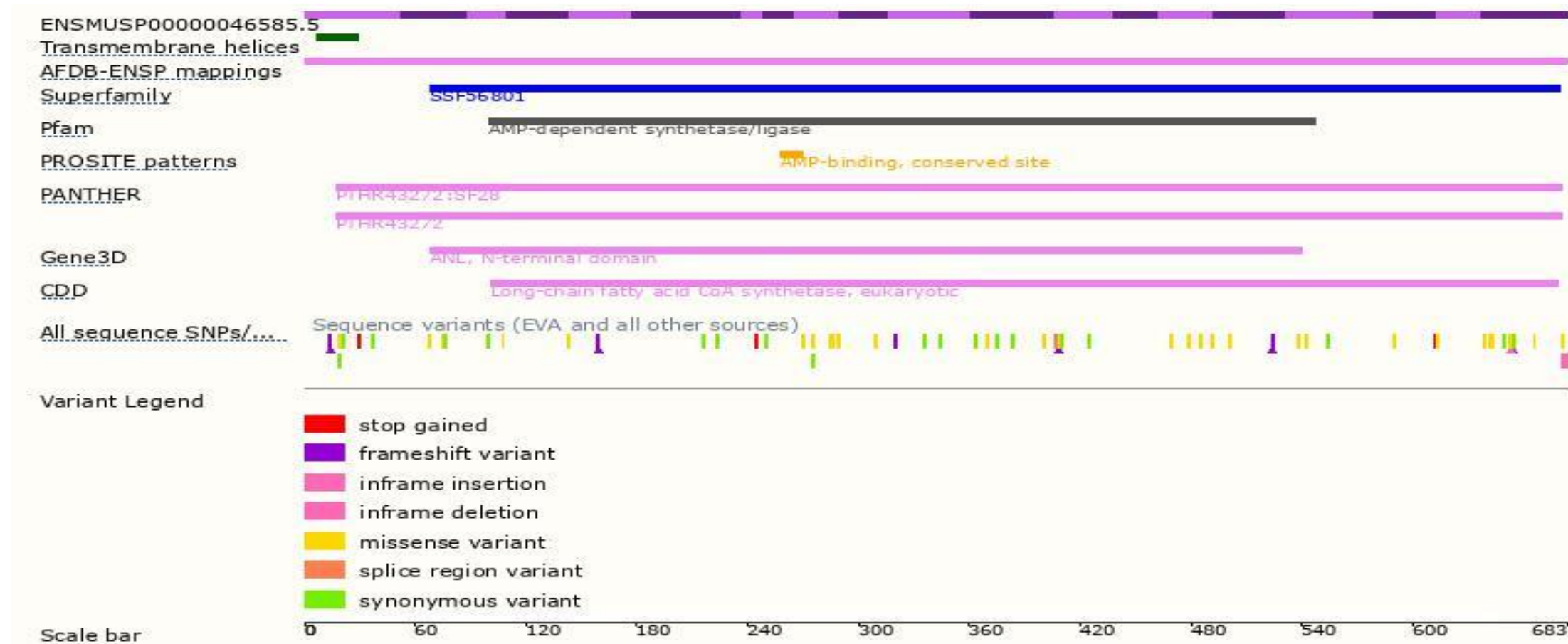


Source: <https://www.ensembl.org>

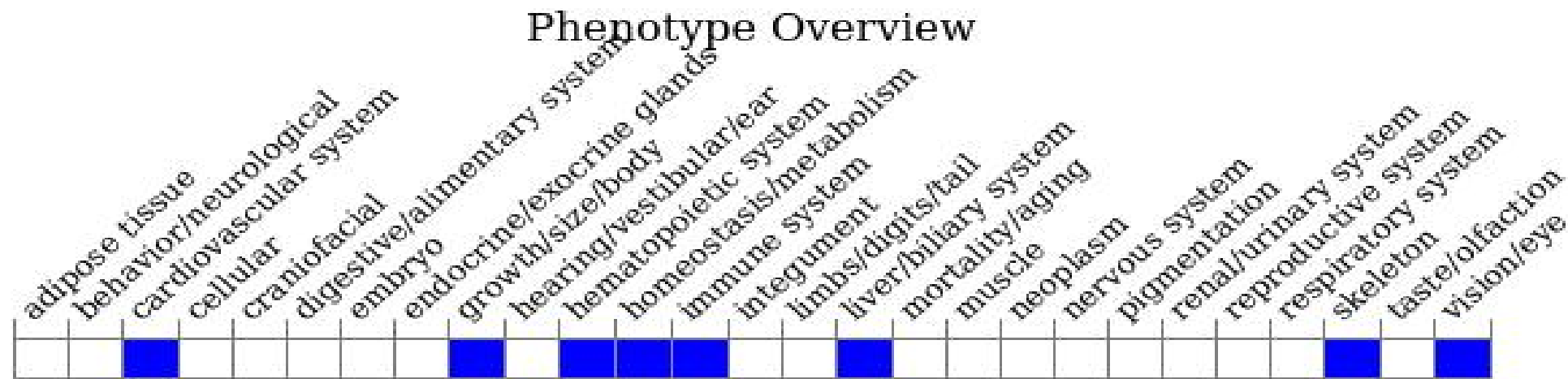
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



- Homozygous mutant mice exhibit decreased mean bone mineral content and density measurements when compared with controls. A notably decreased mean platelet count is also observed.

Important Information

- According to MGI, homozygous mutant mice exhibit decreased mean bone mineral content and density measurements when compared with controls. A notably decreased mean platelet count is also observed.
- The effect of this strategy on the transcripts of this gene *Acsf5*-203, *Acsf5*-204 and *Acsf5*-205 are unknown.
- The introns of the gene *Zdhc6* overlap in the knockout region, and the effect on the gene *Zdhc6* is unknown.
- *Acsf5* is located on Chr19. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 the existing technology level.