

Angptl2 Cas9-CKO Strategy

Designer: Jiaojiao Yan

Reviewer: Ruirui Zhang

Design Date: 2022-11-21

Overview

Target Gene Name

- Angptl2

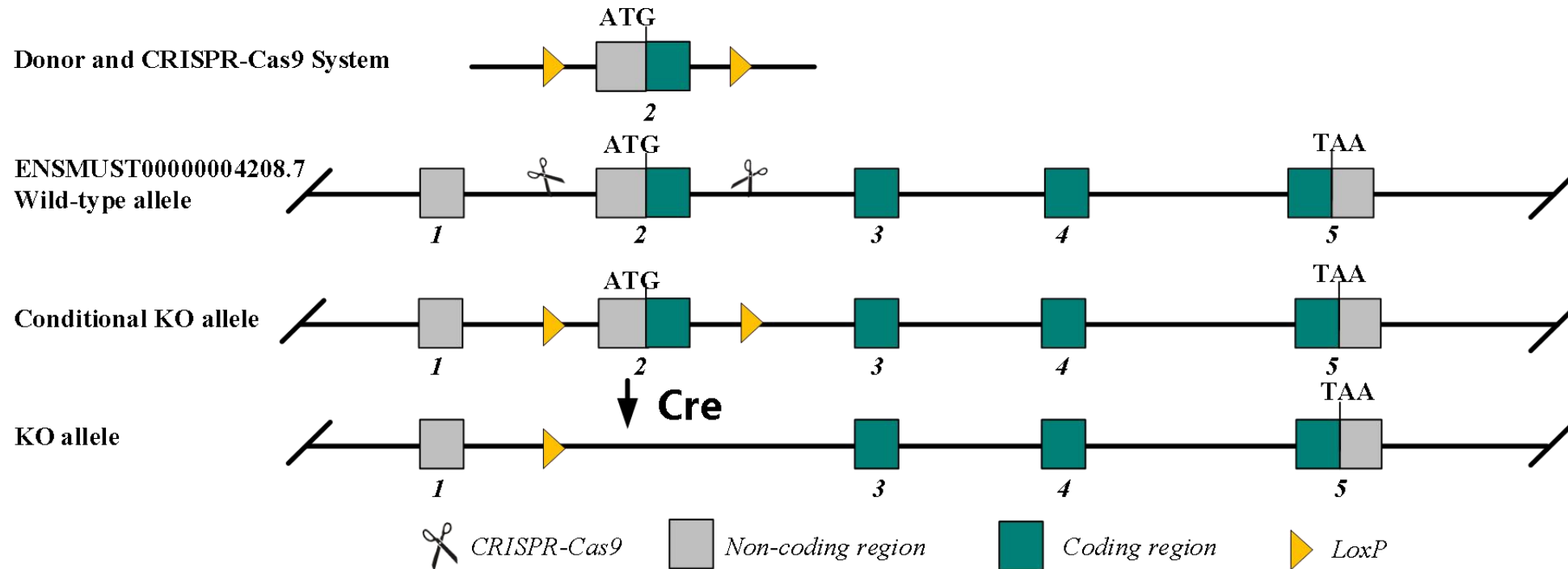
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Angptl2* gene.

Technical Information

- The *Angptl2* gene has 4 transcripts. According to the structure of *Angptl2* gene, exon2 of *Angptl2*-201 (ENSMUST00000004208.7) transcript is recommended as the knockout region. The region contains most of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Angptl2* 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

Angptl2 angiopoietin-like 2 [*Mus musculus* (house mouse)]

Gene ID: 26360, updated on 26-Sep-2022

[Download Datasets](#)

Summary

Official Symbol	Angptl2 provided by MGI
Official Full Name	angiopoietin-like 2 provided by MGI
Primary source	MGI:MGI:1347002
See related	Ensembl:ENSMUSG000000004105 AllianceGenome:MGI:1347002
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	Arp2
Summary	Predicted to enable signaling receptor binding activity. Located in extracellular space. Is expressed in several structures, including intraembryonic coelom; limb segment; meninges; s-shaped body; and skeleton. Used to study dermatomyositis. Orthologous to human ANGPTL2 (angiopoietin like 2). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in mammary gland adult (RPKM 99.1), subcutaneous fat pad adult (RPKM 61.8) and 19 other tissues See more
Orthologs	human all
NEW	Try the new Gene table
	Try the new Transcript table

Genomic context

Location: 2; 2 B

Exon count: 6

See Angptl2 in [Genome Data Viewer](#)

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

Transcript Information

The gene has 4 transcripts, all transcripts are shown below:

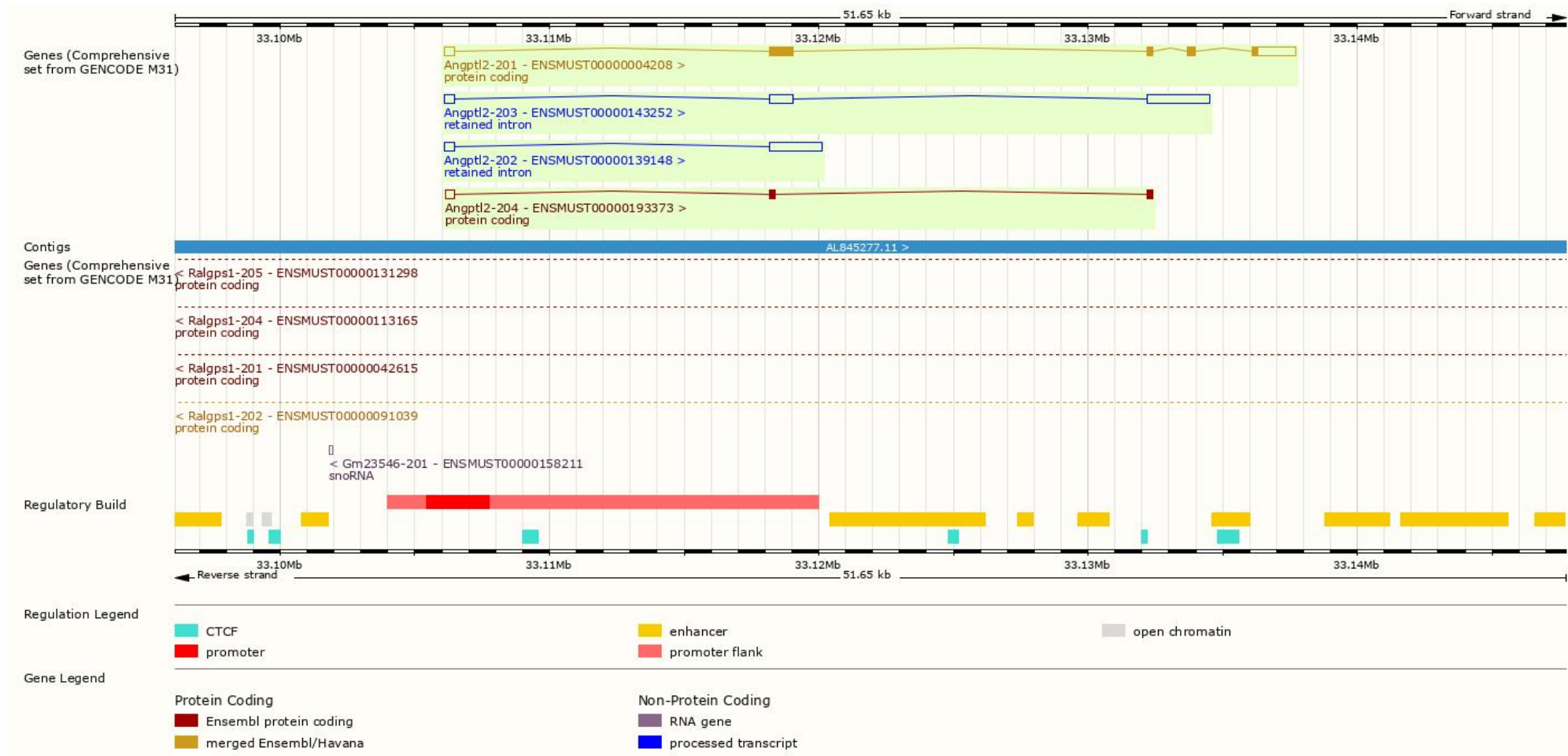
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000004208.7	Angptl2-201	3339	493aa	Protein coding	CCDS15940	Q9R045	Ensembl Canonical GENCODE basic APPRIS P1 TSL:1
ENSMUST00000193373.3	Angptl2-204	714	112aa	Protein coding		A0A0A6YXQ1	TSL:3 CDS 3' incomplete
ENSMUST00000143252.2	Angptl2-203	3559	No protein	Retained intron		-	TSL:1
ENSMUST00000139148.2	Angptl2-202	2306	No protein	Retained intron		-	TSL:1

The strategy is based on the design of *Angptl2*-201 transcript, the transcription is shown below:

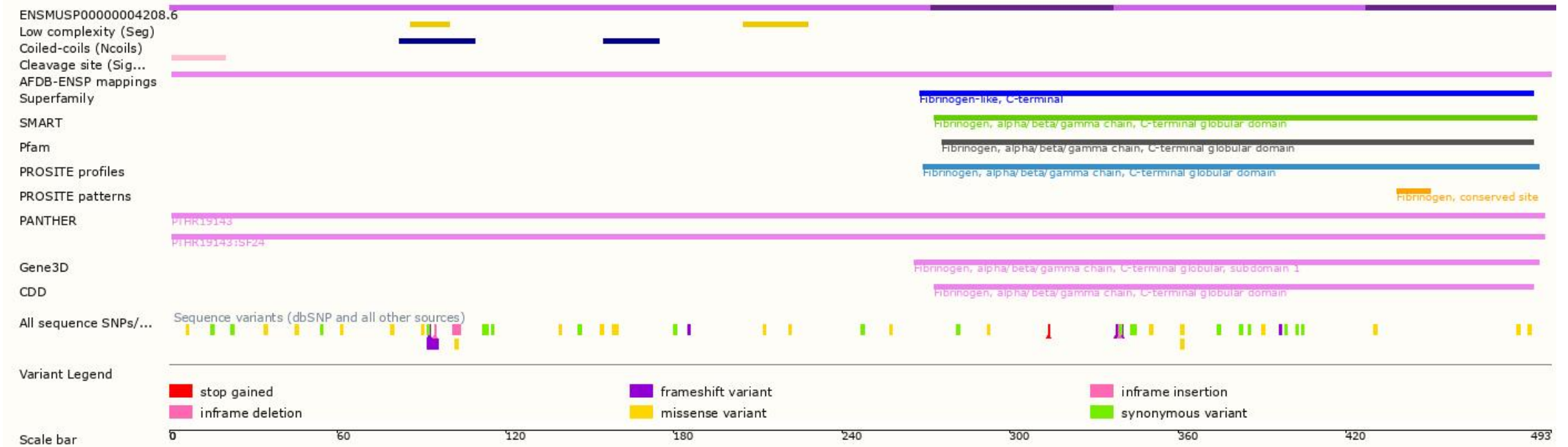


Source: <https://www.ensembl.org>

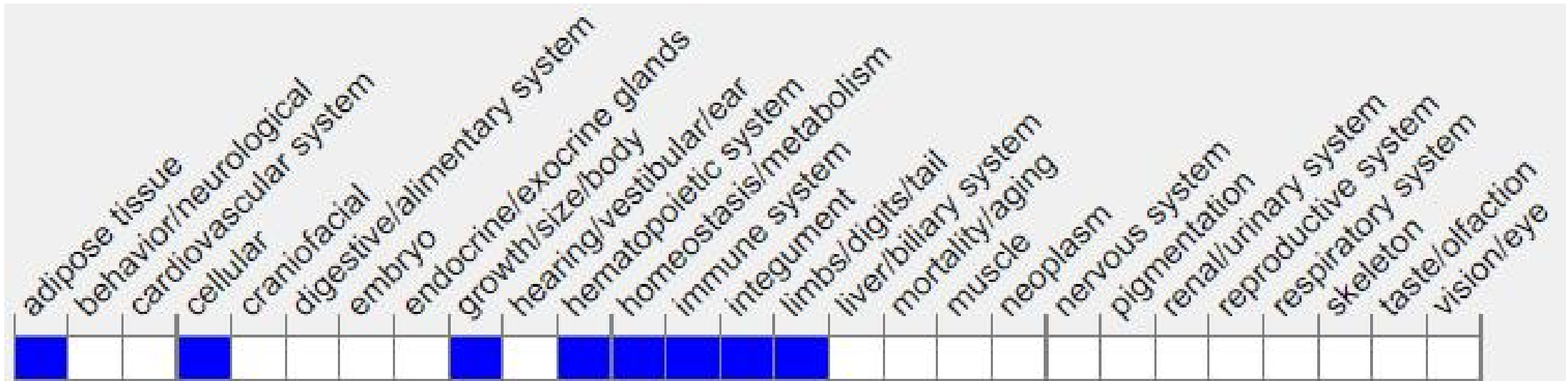
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



When fed a high-fat diet, mice homozygous for a knock-out allele show decreased weight gain, reduced adiposity, a lower respiratory quotient, reduced inflammation in adipose tissues, enhanced glucose tolerance, and increased insulin sensitivity in both skeletal muscle and liver relative to controls.

Important Information

- When fed a high-fat diet, mice homozygous for a knock-out allele show decreased weight gain, reduced adiposity, a lower respiratory quotient, reduced inflammation in adipose tissues, enhanced glucose tolerance, and increased insulin sensitivity in both skeletal muscle and liver relative to controls.
- The gene *Ralgps1* overlaps with the region knocked out and may affect its splicing regulatory function.
- *Angptl2* is located on Chr2. 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 risks of loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.