

Lipa Cas9-KO Strategy

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-03-11

Project Overview

Project Name

Lipa

Project type

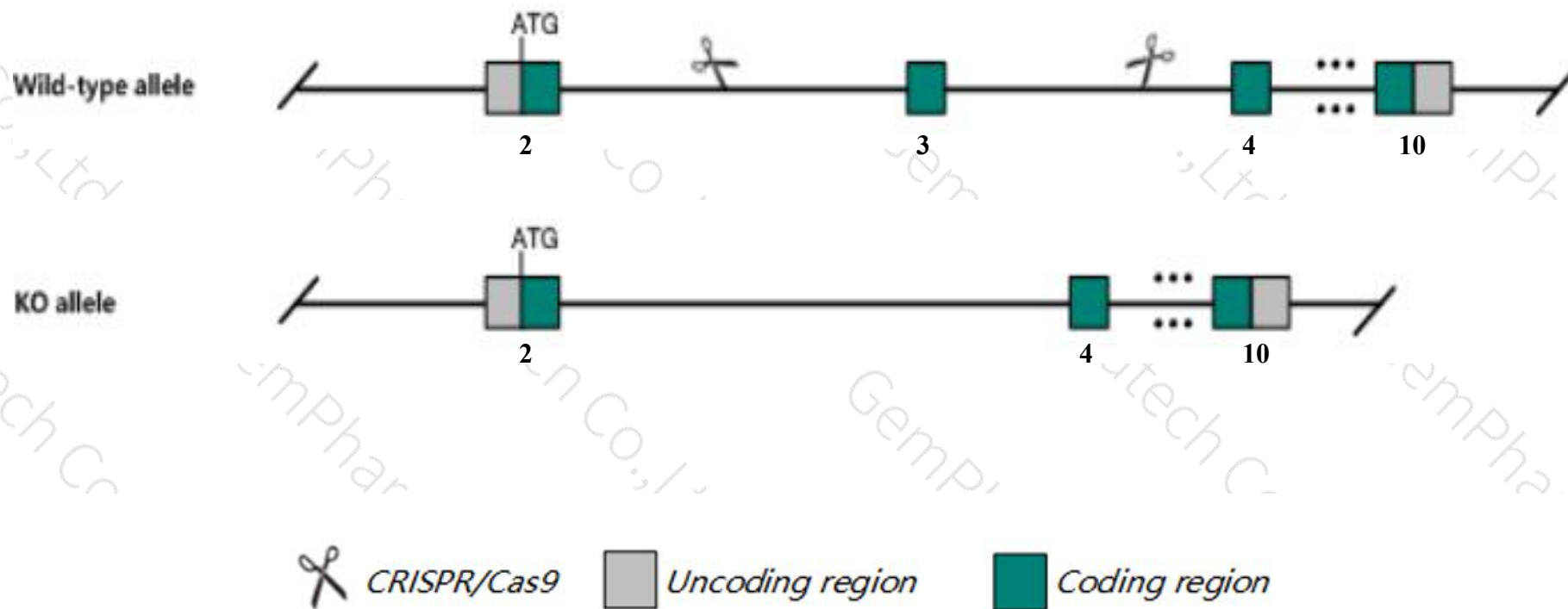
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Lipa* gene has 6 transcripts. According to the structure of *Lipa* gene, exon3 of *Lipa-201* (ENSMUST00000049572.14) transcript is recommended as the knockout region. The region contains 118bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lipa* gene. The brief process is as follows: CRISPR/Cas9 system w

- According to the existing MGI data, Homozygous null mice show massive accumulation of triglycerides and cholesteryl esters in several organs, depletion of white and brown fat, hepatosplenomegaly, increased energy intake and plasma free fatty acid levels, insulin resistance, lung inflammation, alveolar destruction and premature death.
- Transcript *Lipa*-203&204 may not be affected.
- The *Lipa* gene is located on the Chr19. 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)

Lipa lysosomal acid lipase A [*Mus musculus* (house mouse)]

Gene ID: 16889, updated on 29-Oct-2019

Summary

- Official Symbol** Lipa provided by MGI
- Official Full Name** lysosomal acid lipase A provided by MGI
- Primary source** MGI:MGI:96789
- See related** Ensembl:ENSMUSG00000024781
- 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** Lal; Lip1; Lip-1; AA960673
- Expression** Broad expression in kidney adult (RPKM 86.1), liver adult (RPKM 55.5) and 24 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 19; 19 C1

See Lipa in [Genome Data Viewer](#)

Exon count: 10

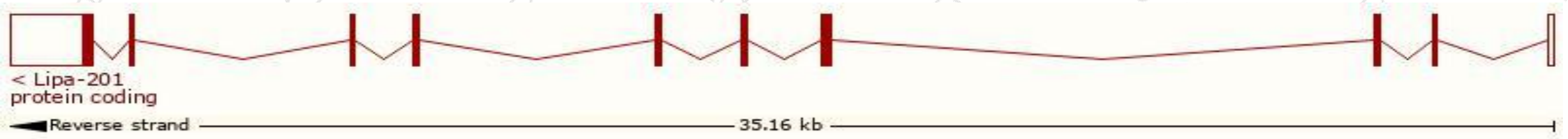
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	19	NC_000085.6 (34492316..34527474, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	19	NC_000085.5 (34566806..34601964, complement)

Transcript information (Ensembl)

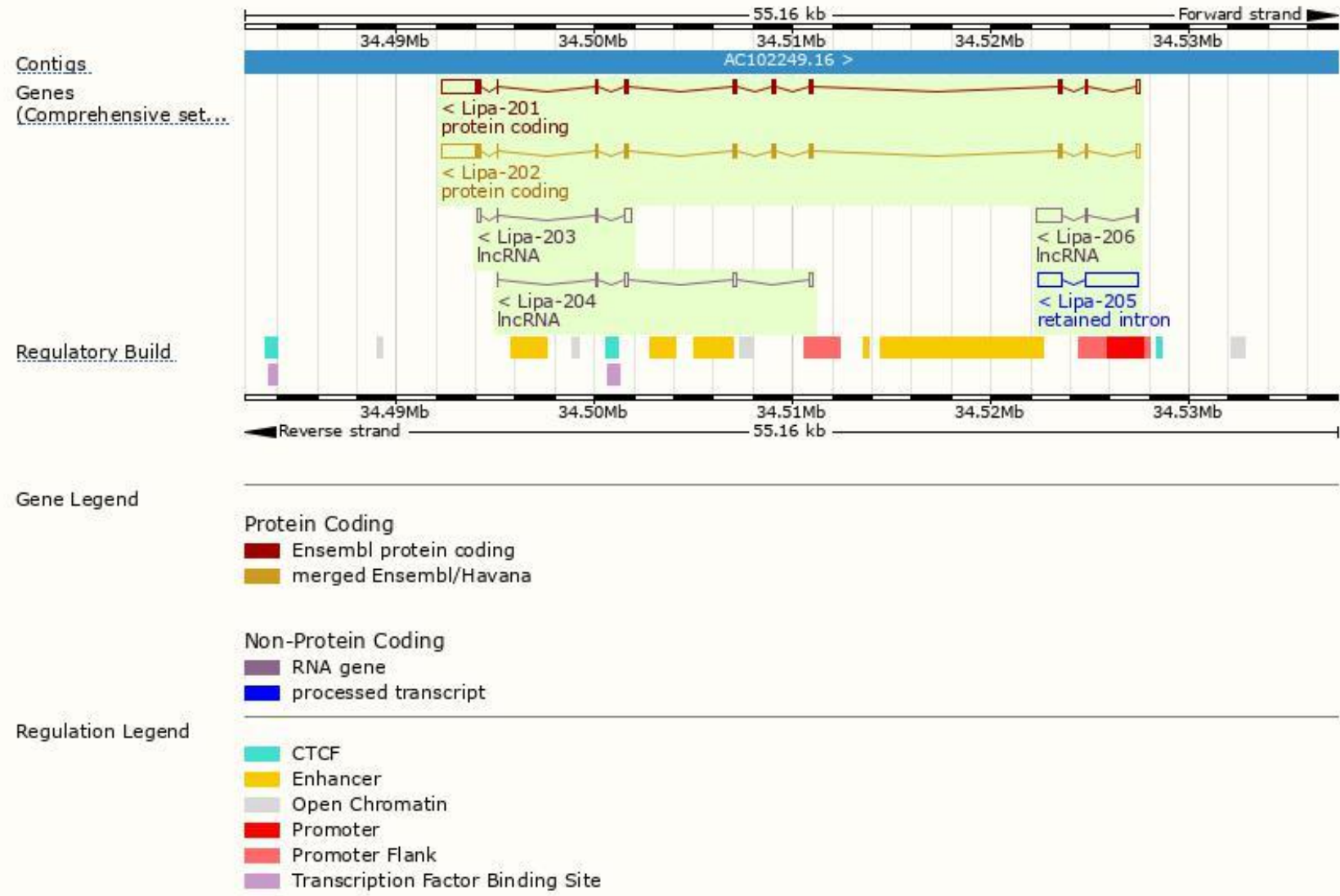
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lipa-201	ENSMUST00000049572.14	2969	397aa	Protein coding	CCDS29760	Q9Z0M5	TSL:1 GENCODE basic APPRIS P1
Lipa-202	ENSMUST00000178114.1	2965	397aa	Protein coding	CCDS29760	Q9Z0M5	TSL:1 GENCODE basic APPRIS P1
Lipa-205	ENSMUST00000237513.1	3895	No protein	Retained intron	-	-	
Lipa-206	ENSMUST00000237617.1	1361	No protein	lncRNA	-	-	
Lipa-203	ENSMUST00000236641.1	663	No protein	lncRNA	-	-	
Lipa-204	ENSMUST00000237497.1	586	No protein	lncRNA	-	-	

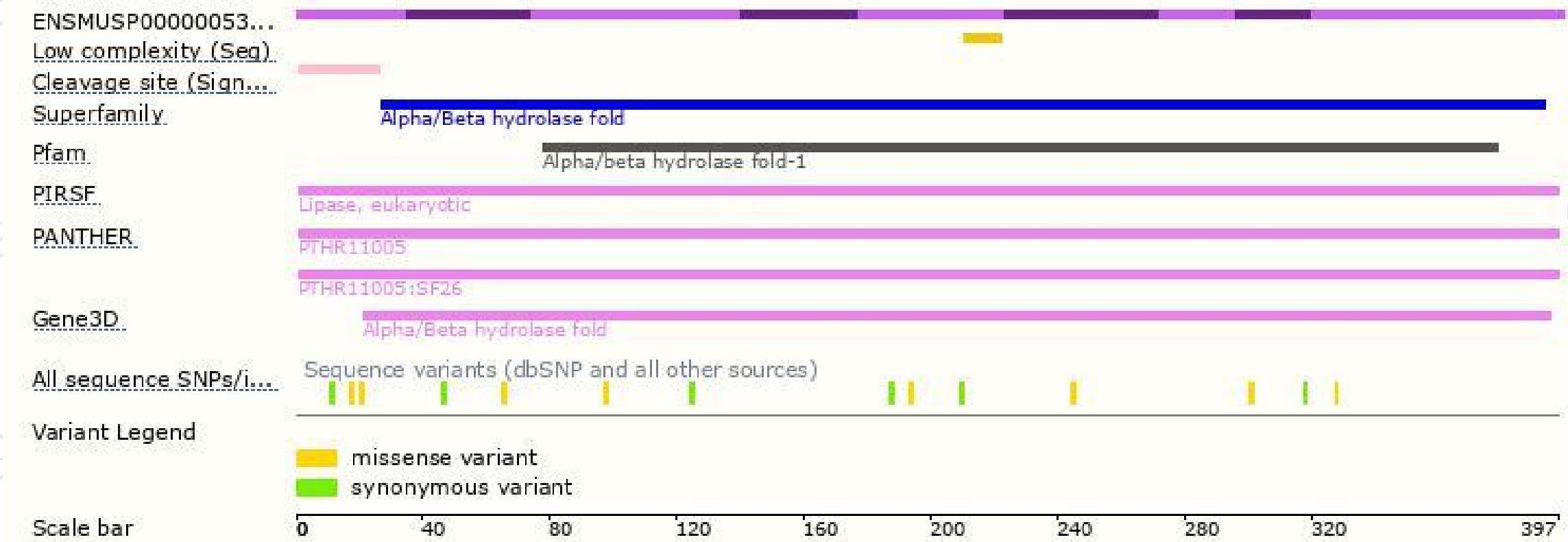
The strategy is based on the design of *Lipa-201* transcript,The transcription is shown below



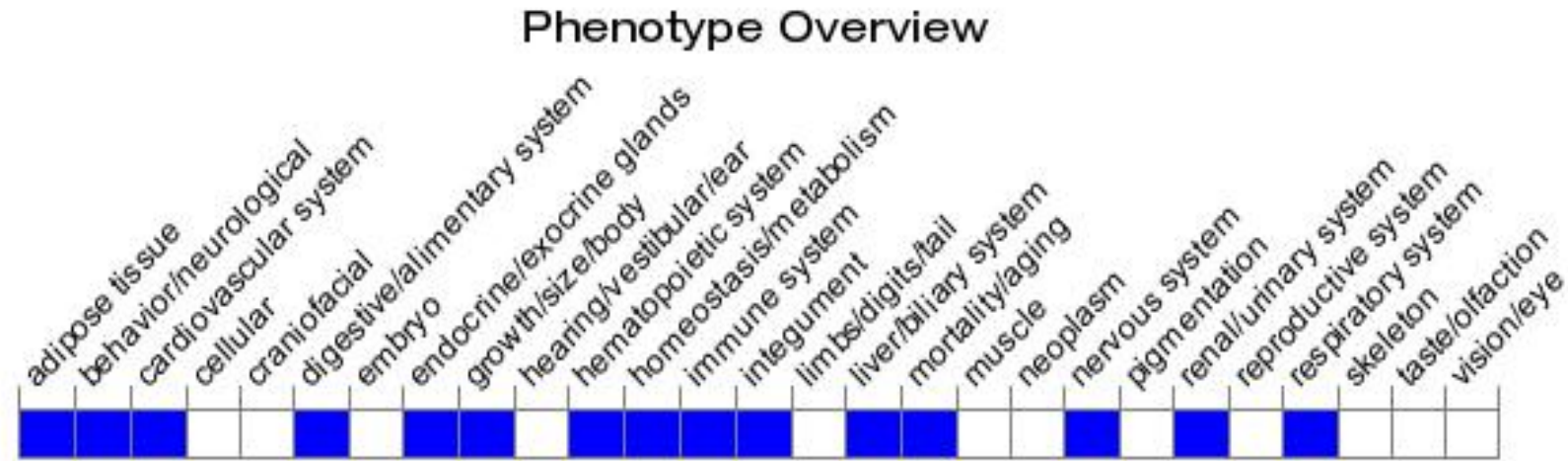
Genomic location distribution



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, Homozygous null mice show massive accumulation of triglycerides and cholesteryl esters in several organs, depletion of white and brown fat, hepatosplenomegaly, increased energy intake and plasma free fatty acid levels, insulin resistance, lung inflammation, alveolar destruction and premature death.

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

Tel: 400-9660890

