

Iars2 Cas9-CKO Strategy

Designer:

Huan Fan

Reviewer:

Huan Wang

Design Date:

2019-12-16

Project Overview

Project Name

Iars2

Project type

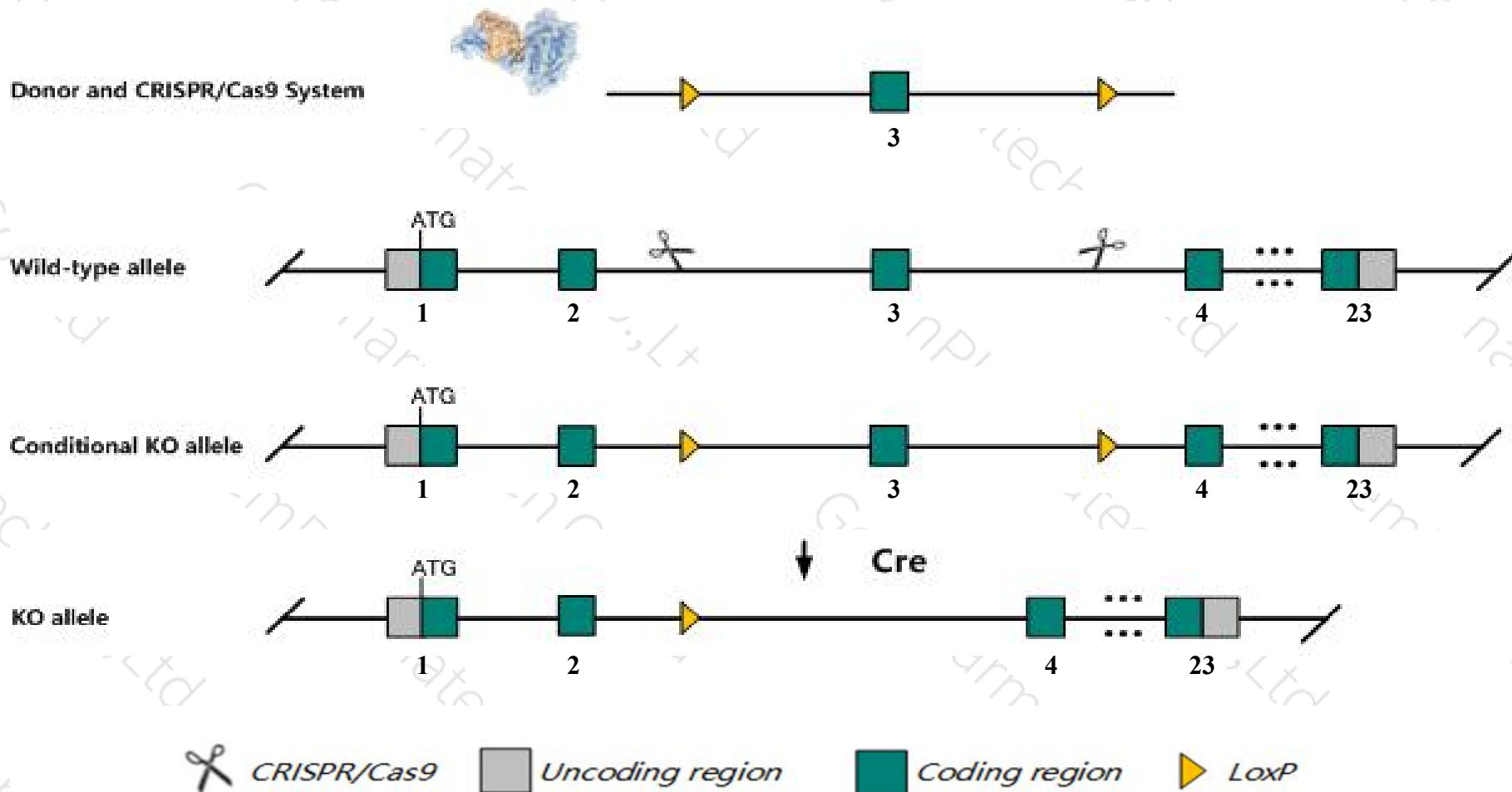
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Iars2* gene. The schematic diagram is as follows:



Technical routes

- The *Iars2* gene has 5 transcripts. According to the structure of *Iars2* gene, exon3 of *Iars2-201* (ENSMUST00000027921.10) transcript is recommended as the knockout region. The region contains 160bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Iars2* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

Notice

- The *Iars2* gene is located on the Chr1. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

lars2 isoleucine-tRNA synthetase 2, mitochondrial [Mus musculus (house mouse)]

Gene ID: 381314, updated on 31-Jan-2019

Summary



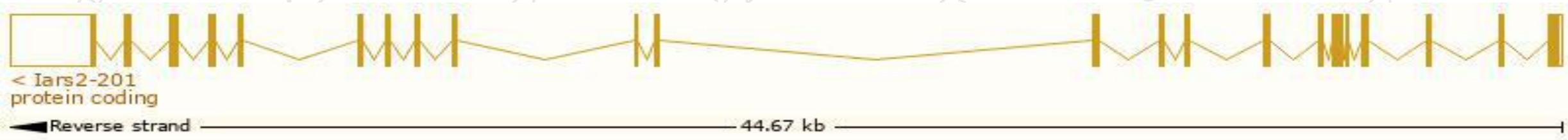
Official Symbol	lars2 provided by MGI
Official Full Name	isoleucine-tRNA synthetase 2, mitochondrial provided by MGI
Primary source	MGI:MGI:1919586
See related	Ensembl:ENSMUSG00000026618
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2010002H18Rik, C79125
Expression	Ubiquitous expression in adrenal adult (RPKM 24.1), subcutaneous fat pad adult (RPKM 16.6) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

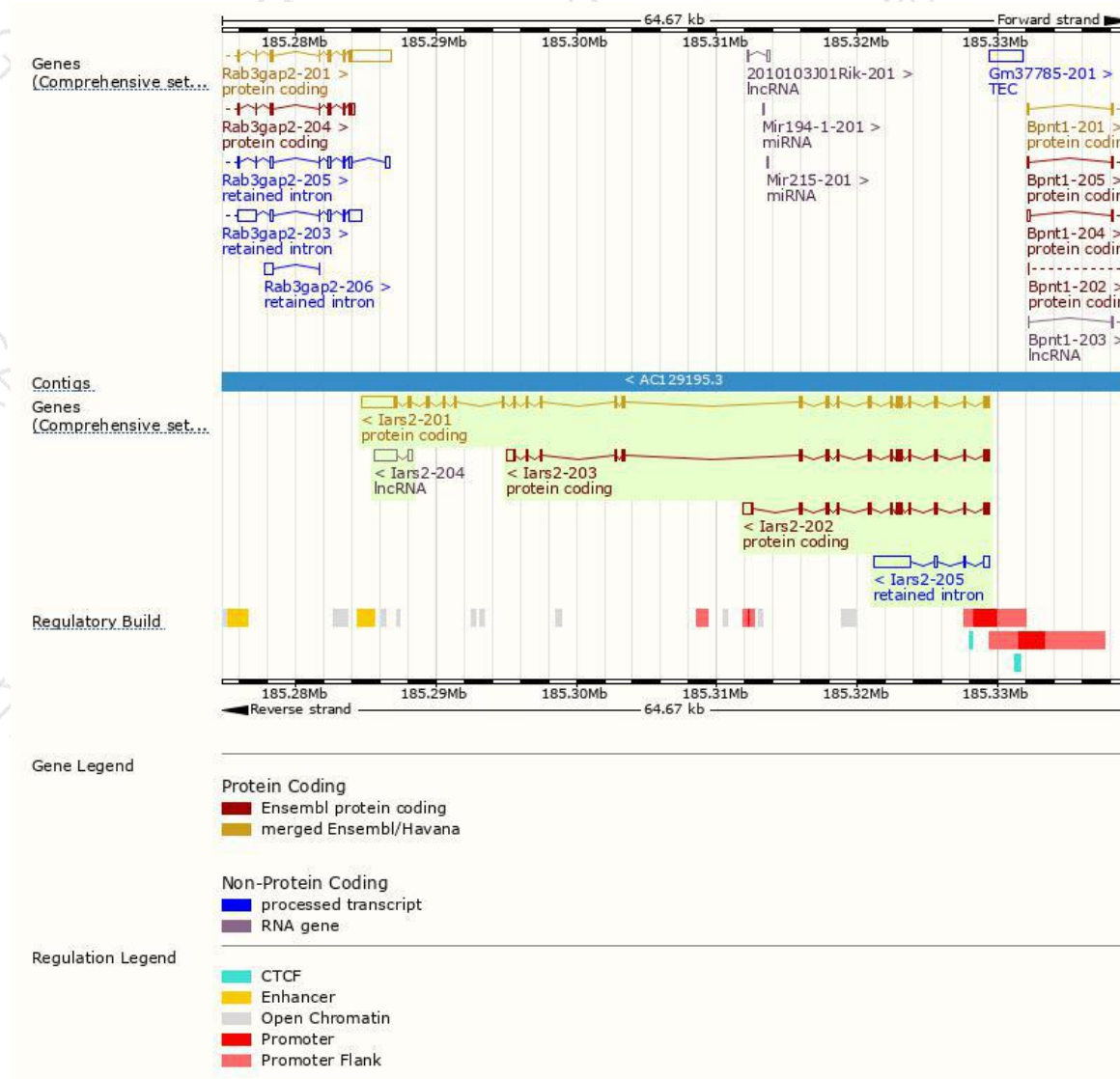
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
lars2-201	ENSMUST00000027921.10	5471	1012aa	Protein coding	CCDS15596	Q8BIJ6	TSL:1 GENCODE basic APPRIS P1
lars2-203	ENSMUST00000110975.7	2801	733aa	Protein coding	-	E9PWN2	TSL:5 GENCODE basic
lars2-202	ENSMUST00000110974.3	2431	560aa	Protein coding	-	E9PWN3	TSL:1 GENCODE basic
lars2-205	ENSMUST00000153211.1	3292	No protein	Retained intron	-	-	TSL:1
lars2-204	ENSMUST00000131770.1	1866	No protein	lncRNA	-	-	TSL:1

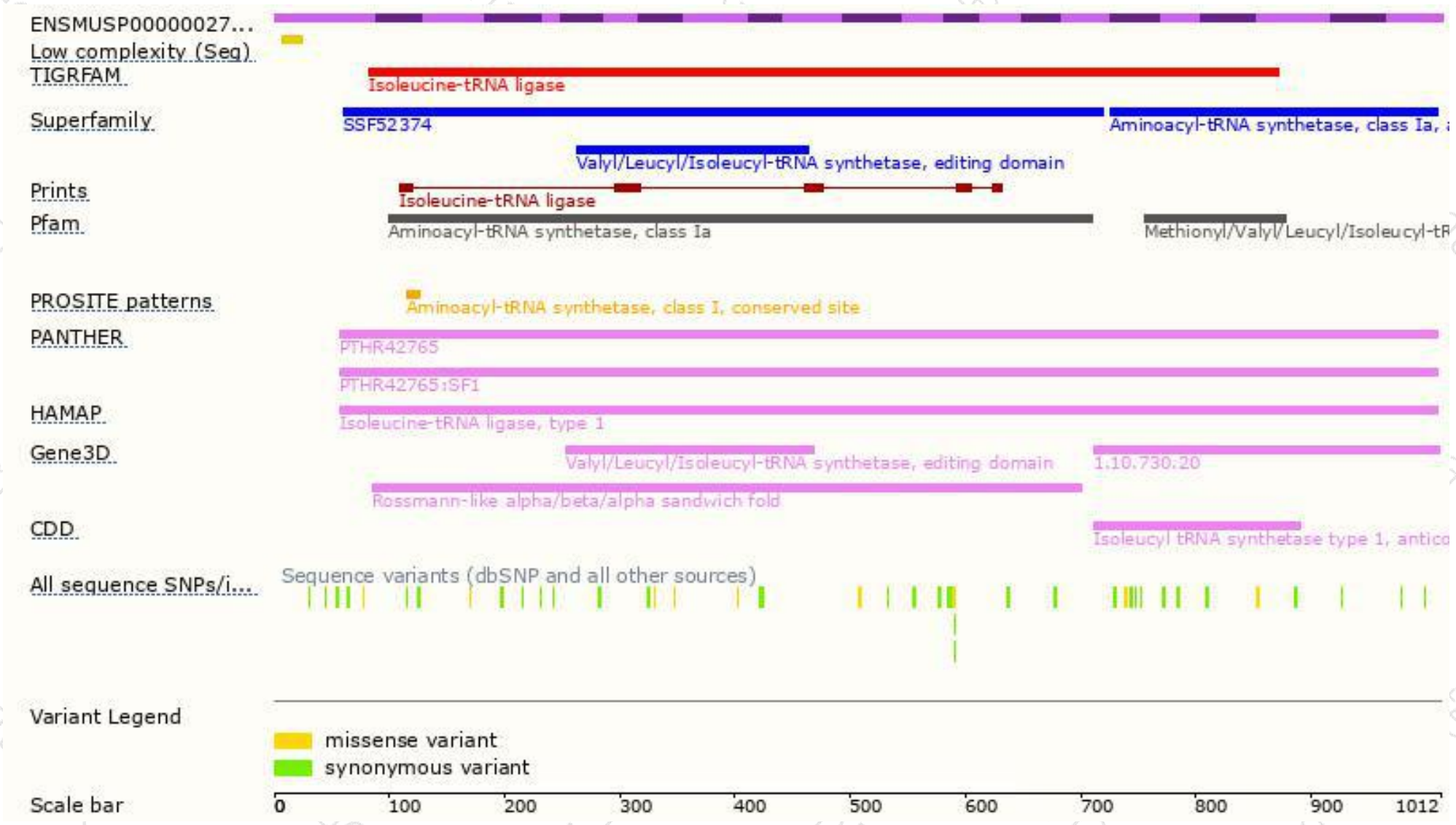
The strategy is based on the design of *lars2-201* transcript,The transcription is shown below



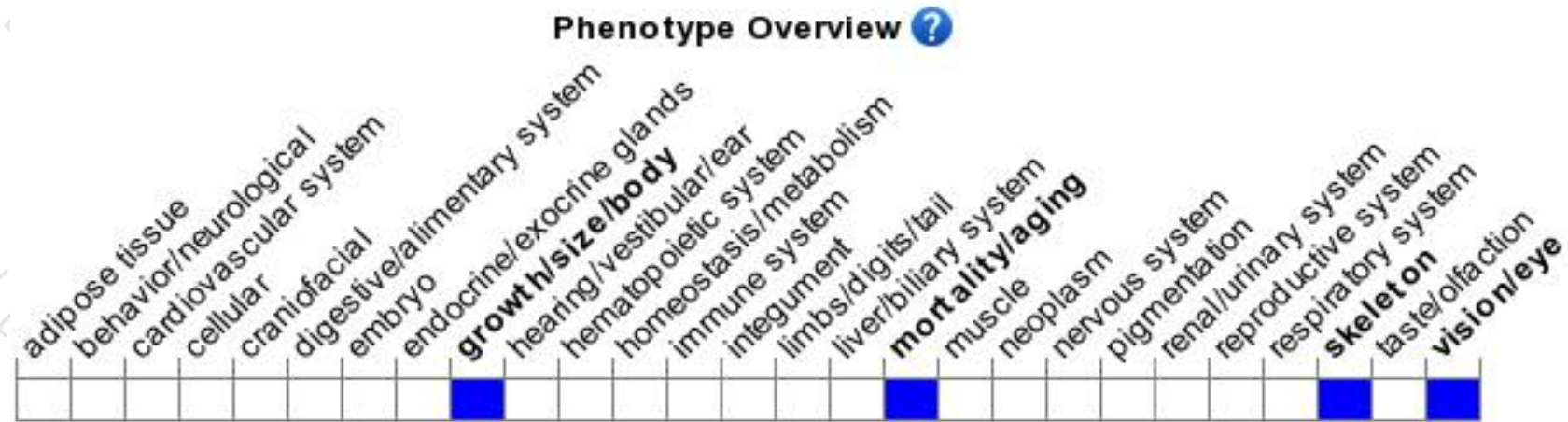
Genomic location distribution



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/>).

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

Tel: 400-9660890

