

Aars2 Cas9-CKO Strategy

Designer:

Daohua Xu

Reviewer:

Huimin Su

Design Date:

2020-2-14

Project Overview

Project Name

Aars2

Project type

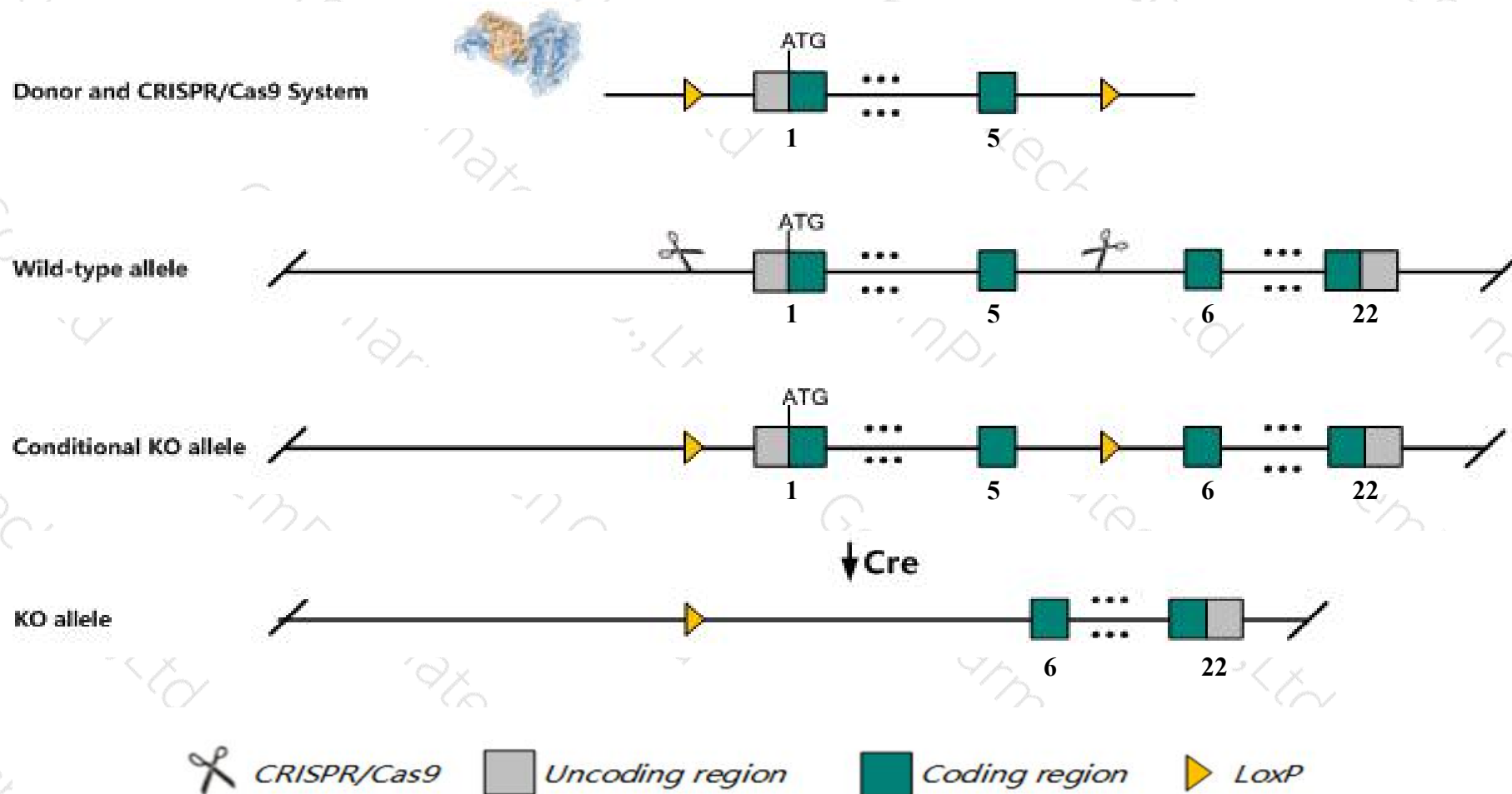
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Aars2* gene. The schematic diagram is as follows:



- The *Aars2* gene has 4 transcripts. According to the structure of *Aars2* gene, exon1-exon5 of *Aars2-201* (ENSMUST00000024733.8) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Aars2* 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 *Aars2* gene is located on the Chr17. 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)

Aars2 alanyl-tRNA synthetase 2, mitochondrial [Mus musculus (house mouse)]

Gene ID: 224805, updated on 31-Jan-2019

Summary



Official Symbol	Aars2 provided by MGI
Official Full Name	alanyl-tRNA synthetase 2, mitochondrial provided by MGI
Primary source	MGI:MGI:2681839
See related	Ensembl:ENSMUSG00000023938
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	Aarsl, AlaRS, Gm89
Expression	Ubiquitous expression in thymus adult (RPKM 20.6), ovary adult (RPKM 10.1) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

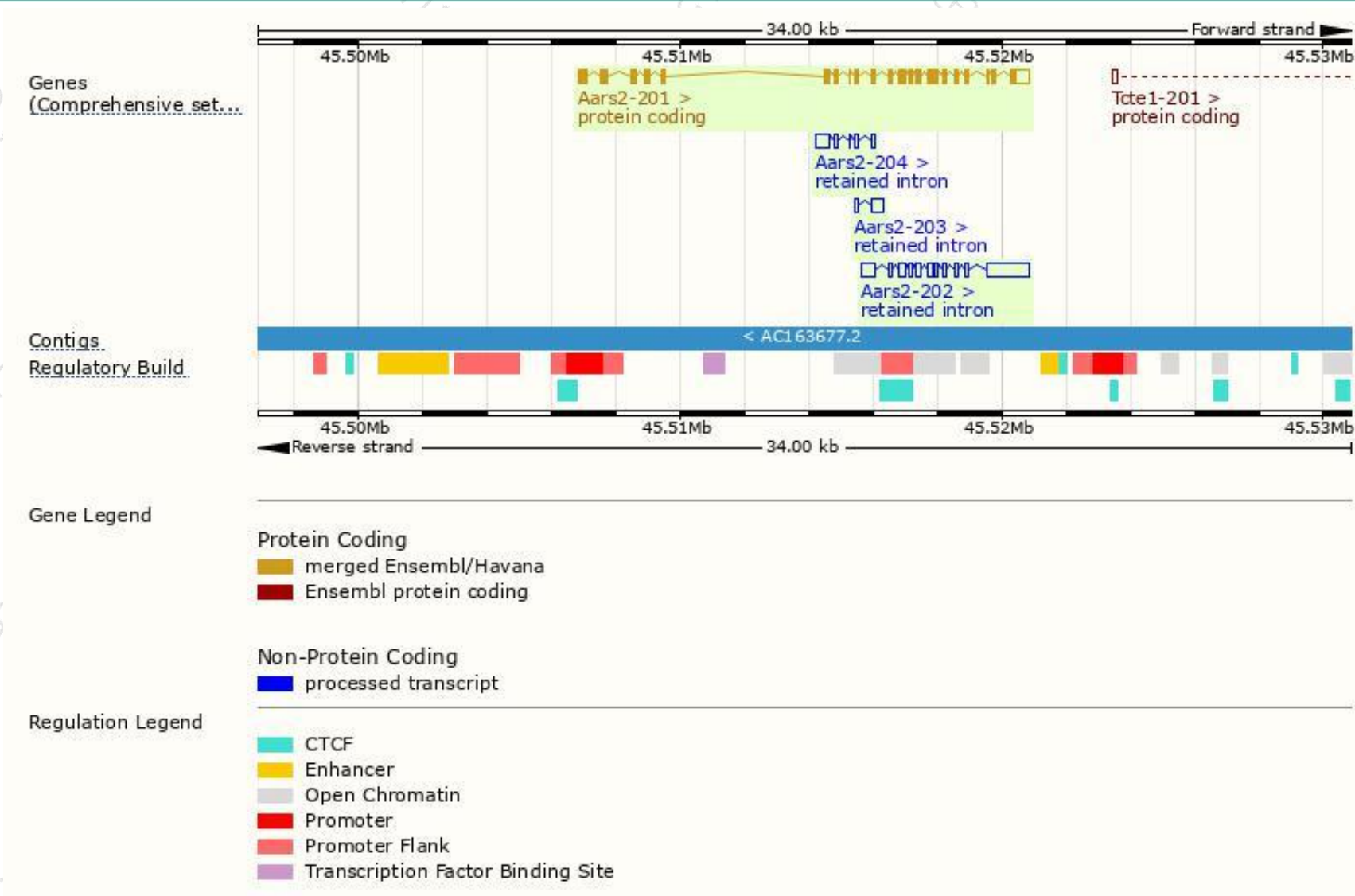
The gene has 4 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aars2-201	ENSMUST00000024733.8	3349	980aa	Protein coding	CCDS28809	Q14CH7	TSL:1 GENCODE basic APPRIS P1
Aars2-202	ENSMUST00000232693.1	2956	No protein	Retained intron	-	-	
Aars2-204	ENSMUST00000233523.1	791	No protein	Retained intron	-	-	
Aars2-203	ENSMUST00000233391.1	467	No protein	Retained intron	-	-	

The strategy is based on the design of *Aars2-201* transcript, The transcription is shown below



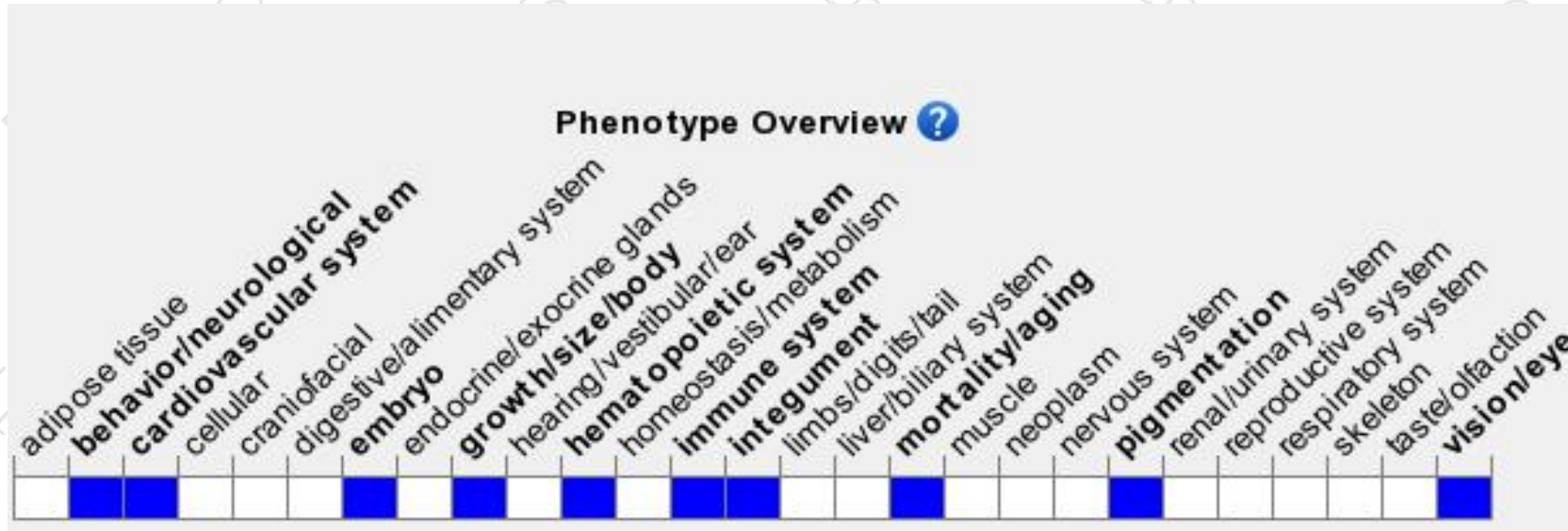
Genomic location distribution



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

