Aldh1a2 Cas9-CKO Strategy

Designer: Huimin Su

Reviewer: Ruiuri Zhang

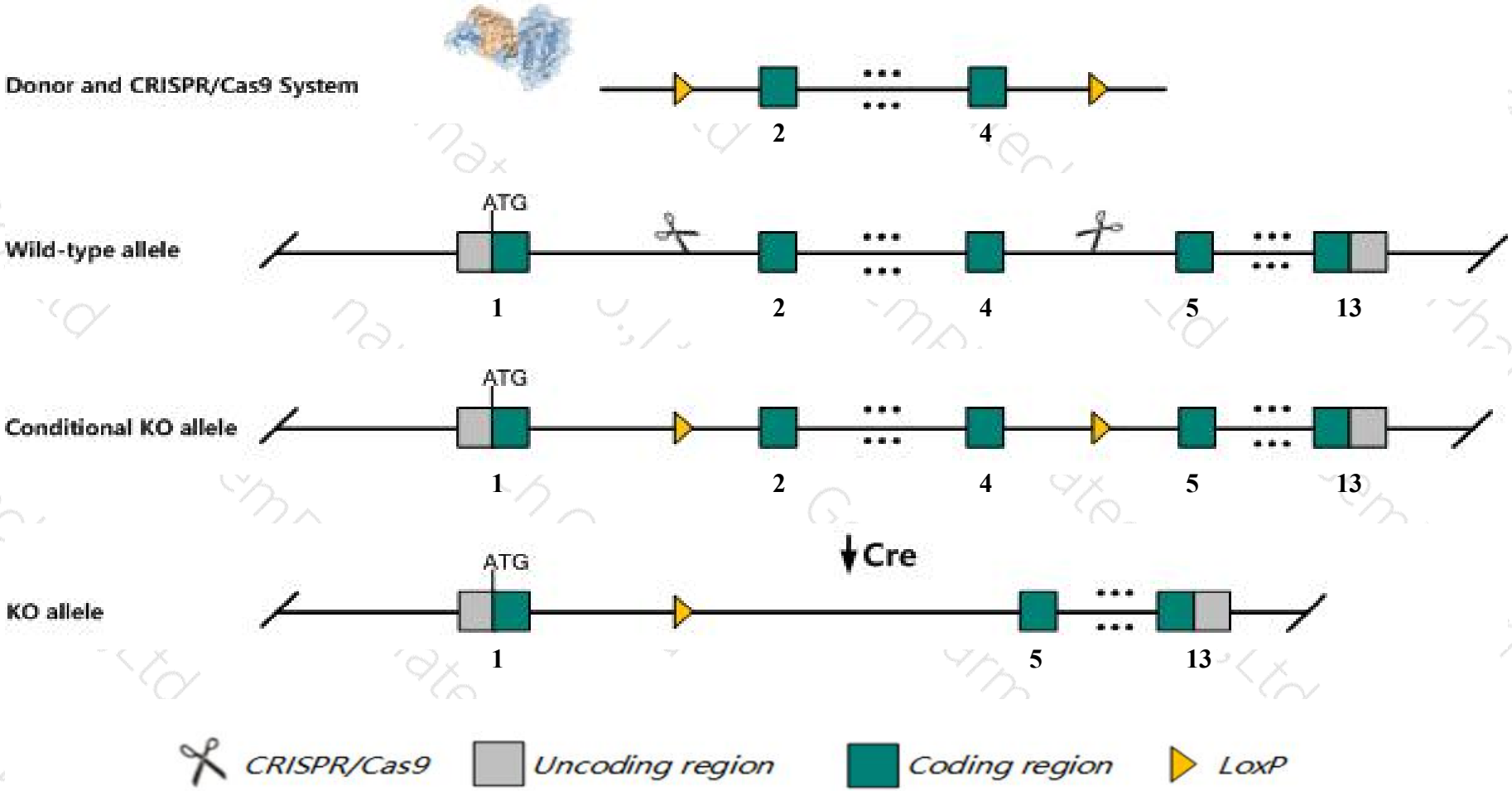
Design Date: 2020-4-20

Project Overview

Project Name	***Aldh1a2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Aldh1a2* gene. The schematic diagram is as follows:



Technical routes

- The *Aldh1a2* gene has 1 transcript. According to the structure of *Aldh1a2* gene, exon2-exon4 of *Aldh1a2-201* (ENSMUST00000034723.5) transcript is recommended as the knockout region.The region contains 376bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Aldh1a2* 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

- According to the existing MGI data,homozygotes for null mutations are largely devoid of retinoic acid and die by embryonic day 10.5 with impaired hindbrain development, failure to turn, lack of limb buds, heart abnormalities, reduced otocysts and a truncated frontonasal region.
- The *Aldh1a2* gene is located on the Chr9. 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）

集萃药康 GemPharmatech

Aldh1a2 aldehyde dehydrogenase family 1, subfamily A2 [Mus musculus (house mouse)]

Gene ID: 19378, updated on 13-Mar-2020

Summary

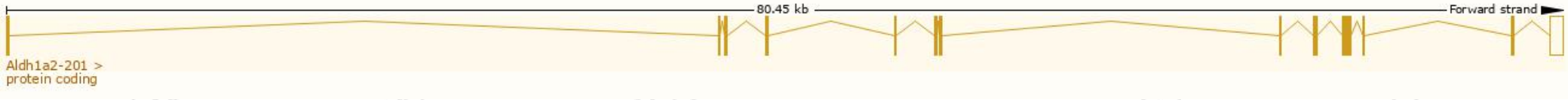
Official Symbol	Aldh1a2 provided by MGI
Official Full Name	aldehyde dehydrogenase family 1, subfamily A2 provided by MGI
Primary source	MGI:MGI:107928
See related	Ensembl:ENSMUSG00000013584
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AV116159, Aldh1a7, Raldh1, Raldh2
Expression	Broad expression in testis adult (RPKM 26.6), subcutaneous fat pad adult (RPKM 13.9) and 20 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

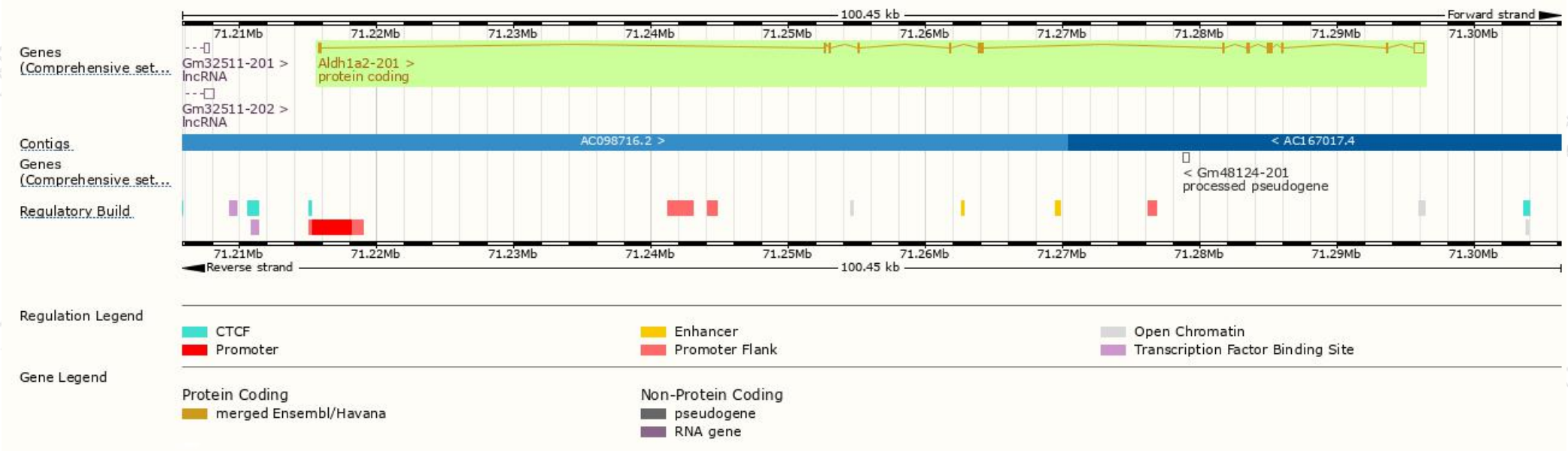
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aldh1a2-201	ENSMUST00000034723.5	2264	518aa	Protein coding	CCDS52852	Q62148	TSL:1 GENCODE basic APPRIS P1

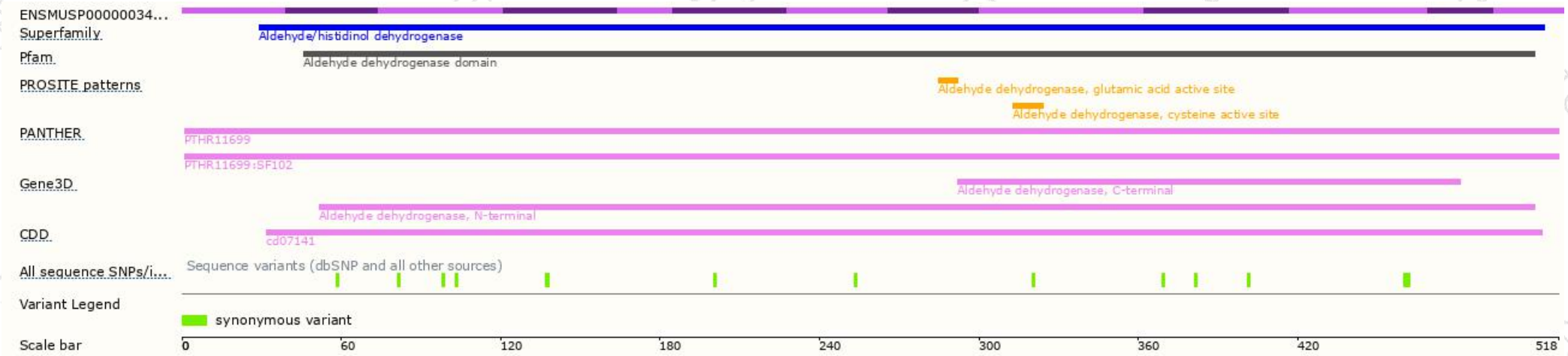
The strategy is based on the design of *Aldh1a2-201* transcript, the transcription is shown below



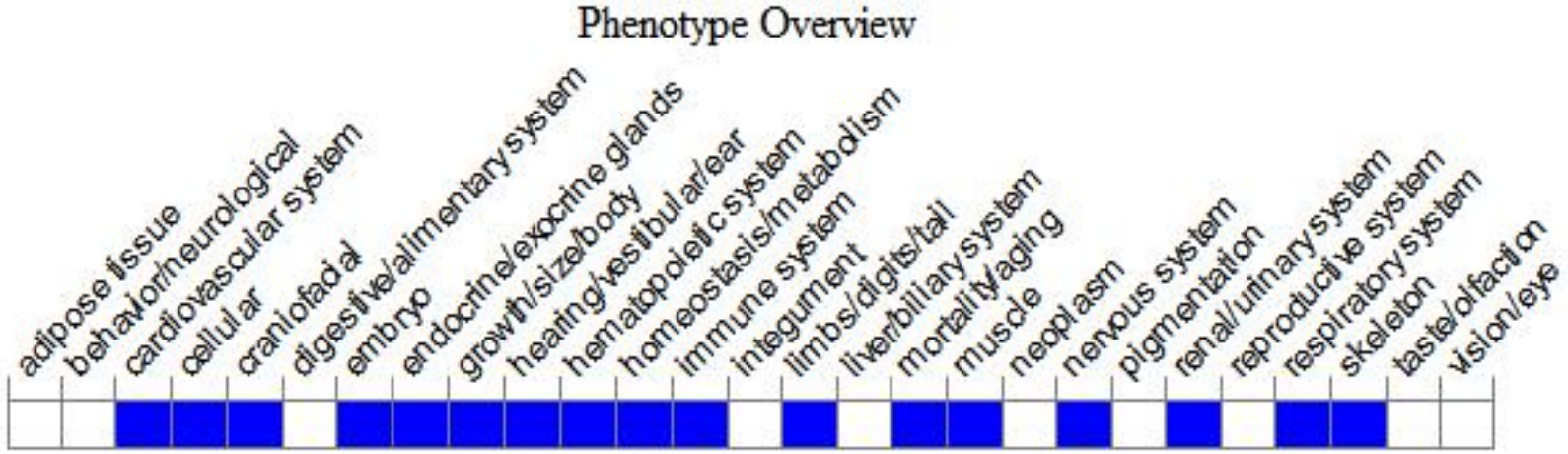
Genomic location distribution



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, homozygotes for null mutations are largely devoid of retinoic acid and die by embryonic day 10.5 with impaired hindbrain development, failure to turn, lack of limb buds, heart abnormalities, reduced otocysts and a truncated frontonasal region.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd