Aldh16a1 Cas9-CKO Strategy

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Project Overview

Project Name	***Aldh16a1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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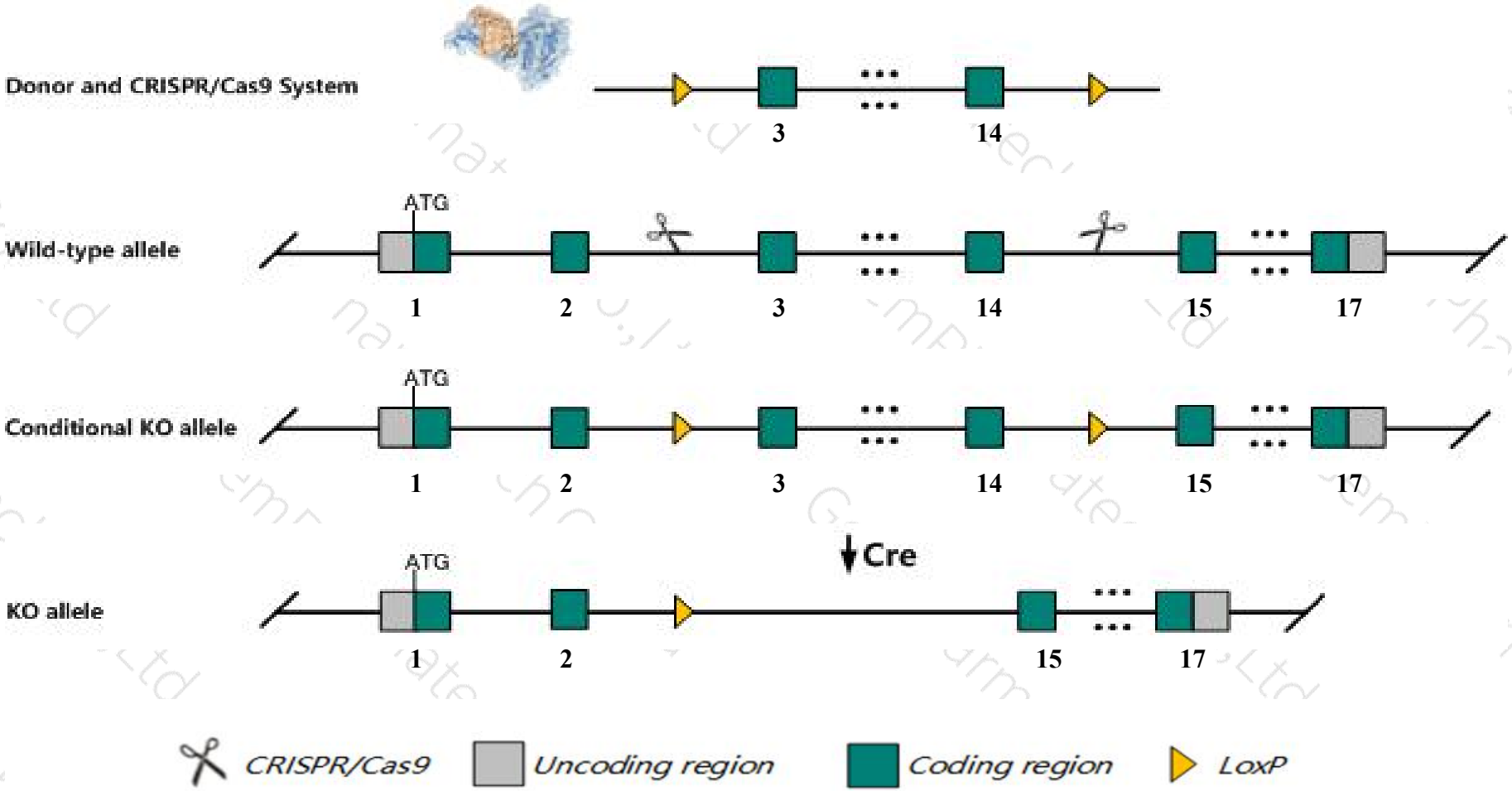
This model will use CRISPR/Cas9 technology to edit the *Aldh16a1* gene. The schematic diagram is as follows:



Technical routes

- The *Aldh16a1* gene has 12 transcripts. According to the structure of *Aldh16a1* gene, exon3-exon14 of *Aldh16a1-206* (ENSMUST00000209963.1) transcript is recommended as the knockout region.The region contains 1745bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Aldh16a1* 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, homozygous knockout mice exhibit abnormal blood plasma lipid and ion profiles.
- Transcript *Aldh16a1-211* is imcomplete, so the effect on it is unknown.
- The *Aldh16a1* gene is located on the Chr7. 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）

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Aldh16a1 aldehyde dehydrogenase 16 family, member A1 [Mus musculus (house mouse)]

Gene ID: 69748, updated on 13-Mar-2020

Summary

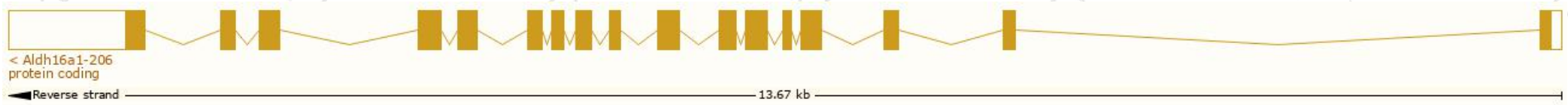
Official Symbol	Aldh16a1 provided by MGI
Official Full Name	aldehyde dehydrogenase 16 family, member A1 provided by MGI
Primary source	MGI:MGI:1916998
See related	Ensembl:ENSMUSG00000007833
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410004H02Rik, AI452234
Expression	Ubiquitous expression in duodenum adult (RPKM 63.9), small intestine adult (RPKM 38.4) and 25 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

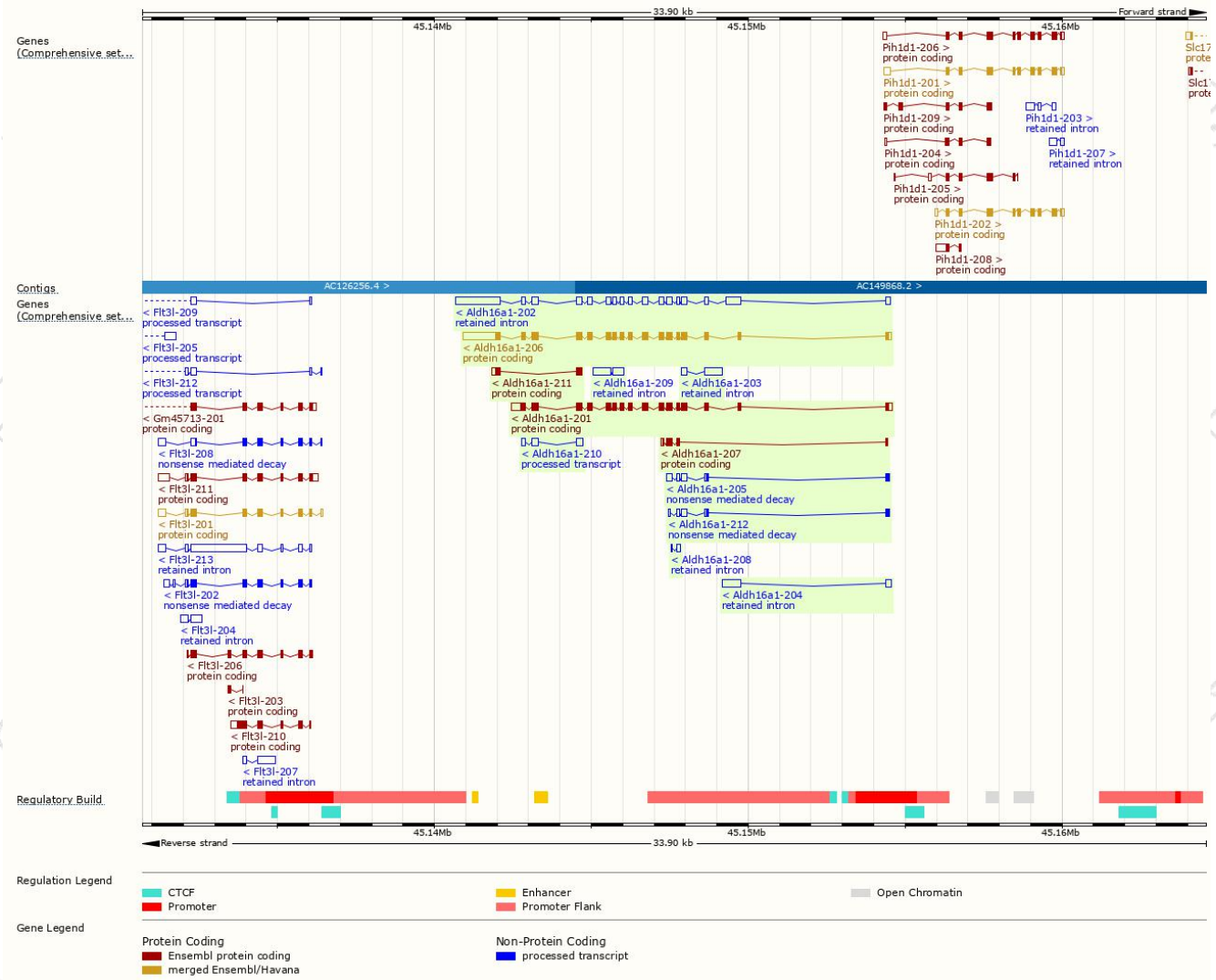
The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Aldh16a1-206	ENSMUST00000209963.1	3537	802aa	Protein coding	CCDS21231	A0A1B0GSU0	TSL:1 GENCODE basic APPRIS P1
Aldh16a1-201	ENSMUST00000107815.3	2685	754aa	Protein coding	-	D3Z0B9	TSL:1 GENCODE basic
Aldh16a1-211	ENSMUST00000211169.1	445	112aa	Protein coding	-	A0A1B0GSN3	CDS 5' incomplete TSL:3
Aldh16a1-207	ENSMUST00000210125.1	408	115aa	Protein coding	-	A0A1B0GRQ5	CDS 5' incomplete TSL:5
Aldh16a1-205	ENSMUST00000209957.1	666	53aa	Nonsense mediated decay	-	A0A1B0GS65	TSL:5
Aldh16a1-212	ENSMUST00000211362.1	556	53aa	Nonsense mediated decay	-	A0A1B0GS65	TSL:3
Aldh16a1-210	ENSMUST00000210725.1	521	No protein	Processed transcript	-	-	TSL:2
Aldh16a1-202	ENSMUST00000209581.1	4074	No protein	Retained intron	-	-	TSL:1
Aldh16a1-209	ENSMUST00000210539.1	905	No protein	Retained intron	-	-	TSL:3
Aldh16a1-204	ENSMUST00000209889.1	771	No protein	Retained intron	-	-	TSL:1
Aldh16a1-203	ENSMUST00000209755.1	746	No protein	Retained intron	-	-	TSL:5
Aldh16a1-208	ENSMUST00000210352.1	169	No protein	Retained intron	-	-	TSL:5

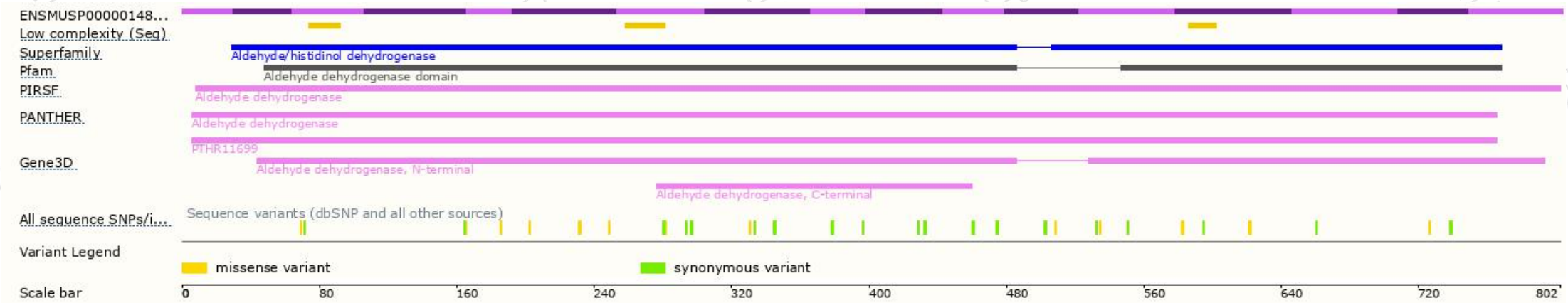
The strategy is based on the design of *Aldh16a1-206* transcript, the transcription is shown below



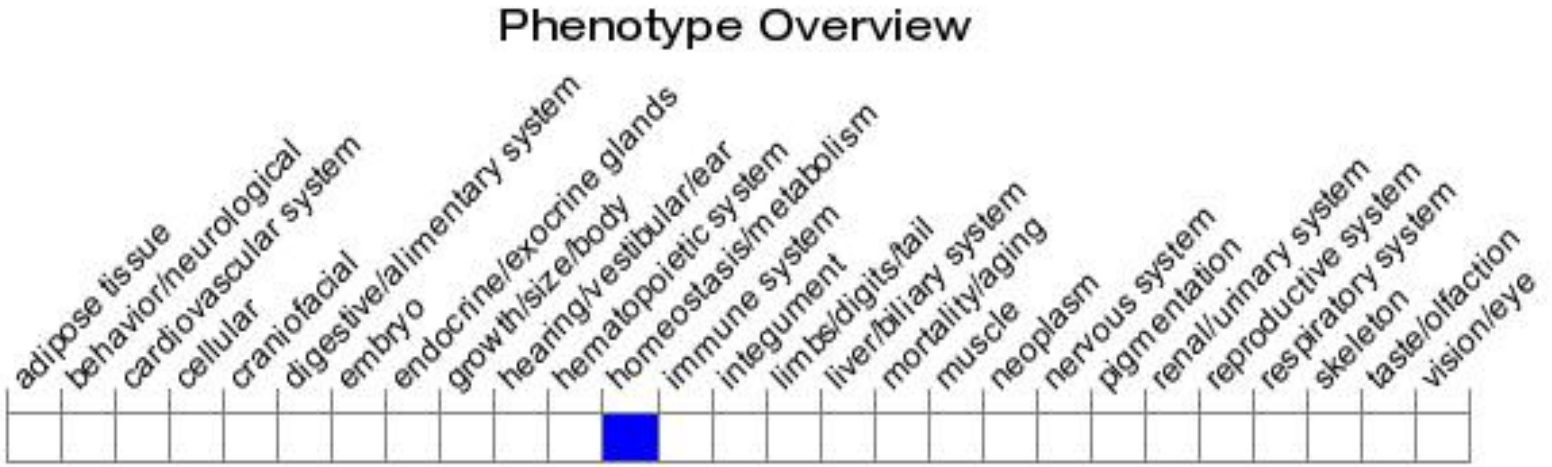
Genomic location distribution



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 knockout mice exhibit abnormal blood plasma lipid and ion profiles.

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

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