

***Aldh1l1-P2A-CreERT2* Cas9-KI Strategy**

Designer

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Reviewer

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Project Overview

Project Name

Aldh1l1-P2A-CreERT2

Project type

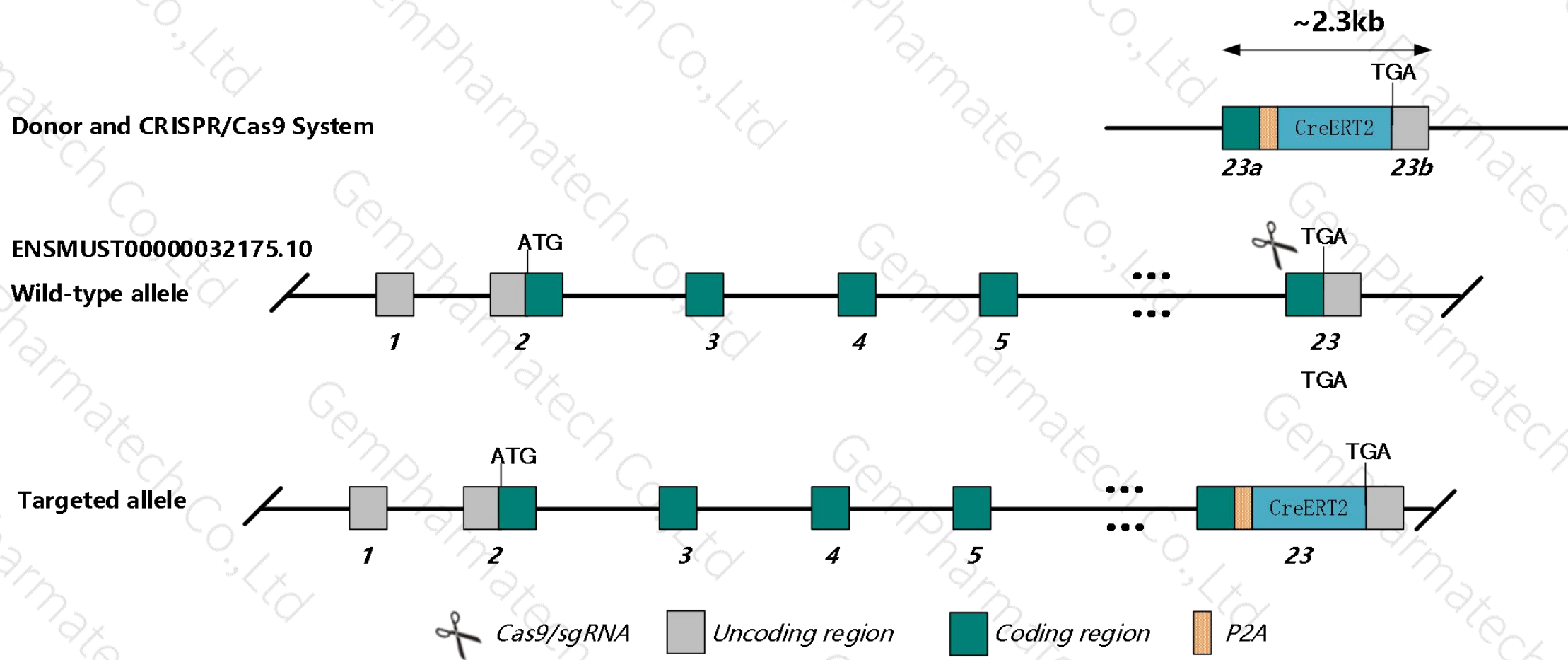
Cas9-KI

Strain background

C57BL/6JGpt

Knockin strategy

This model will use CRISPR/Cas9 technology to edit the *Aldh1lll* gene. The schematic diagram is as follows:



- The *Aldh1l1* gene has 7 transcripts. According to the structure of *Aldh1l1* gene, *Aldh1l1-201*(ENSMUST00000032175.10) is selected for presentation of the recommended strategy.
- *Aldh1l1-201* gene has 23 exons, with the ATG start codon at exon2 and TGA stop codon at exon23.
- We make *Aldh1l1-P2A-CreERT2* knockin mice via CRISPR/Cas9 system. Cas9 mRNA, sgRNA and donor will be co-injected into zygotes. sgRNA direct Cas9 endonuclease cleavage near stop codon(TGA) of *Aldh1l1* gene, and create a DSB(double-strand break). Such breaks will be repaired, and result in P2A-iCre before stop codon(TGA) of *Aldh1l1* gene by homologous recombination. The pups will be genotyped by PCR, followed by sequence analysis.

- According to the existing references, CreERT2-mediated recombination is expressed in the vast majority of astrocytes.
- The P2A-linked gene drives expression in the same promoter and is cleaved at the translational level. The gene expression levels are consistent, and the before of P2A expressing gene carries the P2A-translated polypeptide.
- The insertion of P2A-CreERT2 may affect the 5-terminal regulation of downstream *Slc41a3* gene.
- Insertion of CreERT2 may affect the regulation of the 3' end of the *Aldh1l1* gene.
- The *Aldh1l1* gene is located on the Chr6. If the knockin 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information (NCBI)

Aldh1l1 aldehyde dehydrogenase 1 family, member L1 [*Mus musculus* (house mouse)]

Gene ID: 107747, updated on 12-Aug-2019

Summary

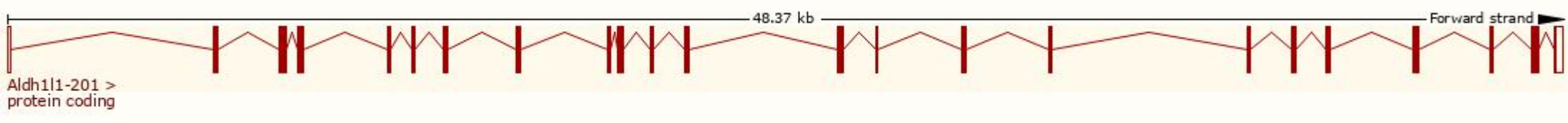
| | |
|--------------------|---|
| Official Symbol | Aldh1l1 provided by MGI |
| Official Full Name | aldehyde dehydrogenase 1 family, member L1 provided by MGI |
| Primary source | MGI:MGI:1340024 |
| See related | Ensembl:ENSMUSG00000030088 |
| Gene type | protein coding |
| RefSeq status | VALIDATED |
| Organism | Mus musculus |
| Lineage | Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus |
| Also known as | FDH; Fthfd; Neut2; 1810048F20Rik |
| Expression | Biased expression in liver adult (RPKM 382.3), kidney adult (RPKM 107.4) and 7 other tissues See more |
| Orthologs | human all |

Transcript information (Ensembl)

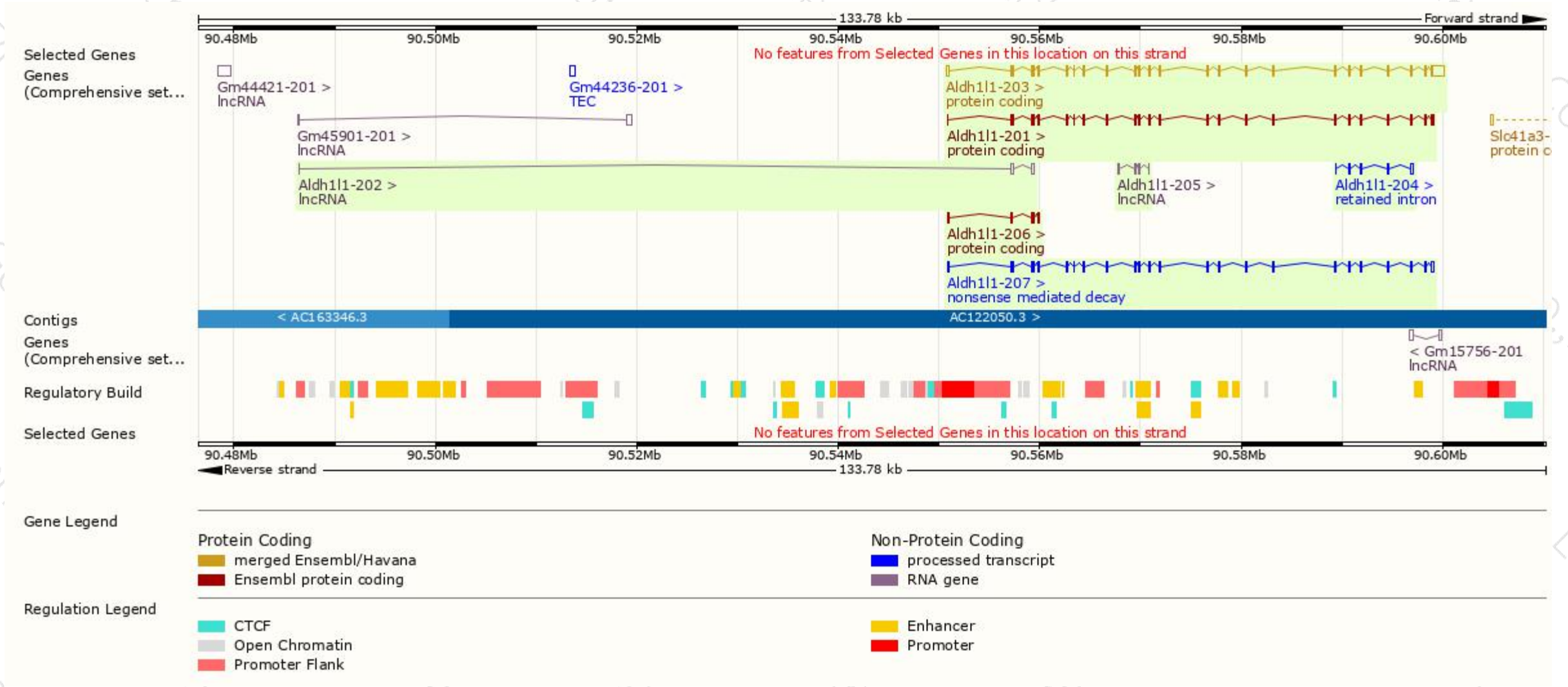
The gene has 7 transcripts, and the transcript is shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|-------------|---------------------------------------|------|-----------------------|-------------------------|---------------------------|----------------------------|-------------------------------|
| Aldh1l1-203 | ENSMUST00000130418.7 | 4175 | 902aa | Protein coding | CCDS20361 | Q8R0Y6 | TSL:1 Gencode basic APPRIS P1 |
| Aldh1l1-201 | ENSMUST00000032175.10 | 3052 | 902aa | Protein coding | CCDS20361 | Q8R0Y6 | TSL:1 Gencode basic APPRIS P1 |
| Aldh1l1-207 | ENSMUST00000204796.2 | 3025 | 359aa | Nonsense mediated decay | - | A0A0N4SW56 | TSL:5 |
| Aldh1l1-206 | ENSMUST00000203111.1 | 556 | 135aa | Protein coding | - | A0A0N4SVT2 | CDS 3' incomplete TSL:5 |
| Aldh1l1-204 | ENSMUST00000137669.1 | 653 | No protein | Retained intron | - | - | TSL:3 |
| Aldh1l1-205 | ENSMUST00000152436.1 | 472 | No protein | lncRNA | - | - | TSL:3 |
| Aldh1l1-202 | ENSMUST00000127199.1 | 400 | No protein | lncRNA | - | - | TSL:3 |

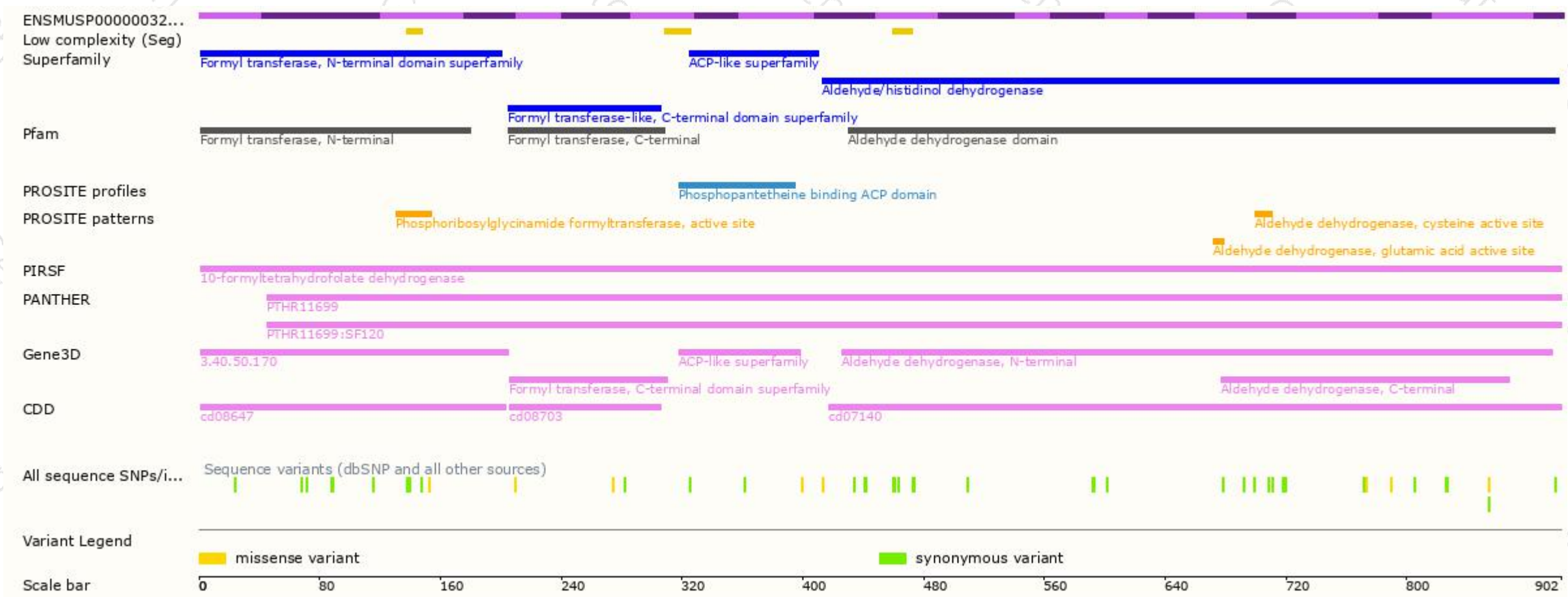
The strategy is based on the design of *Aldh1l1-201* transcript, The transcription is shown below:



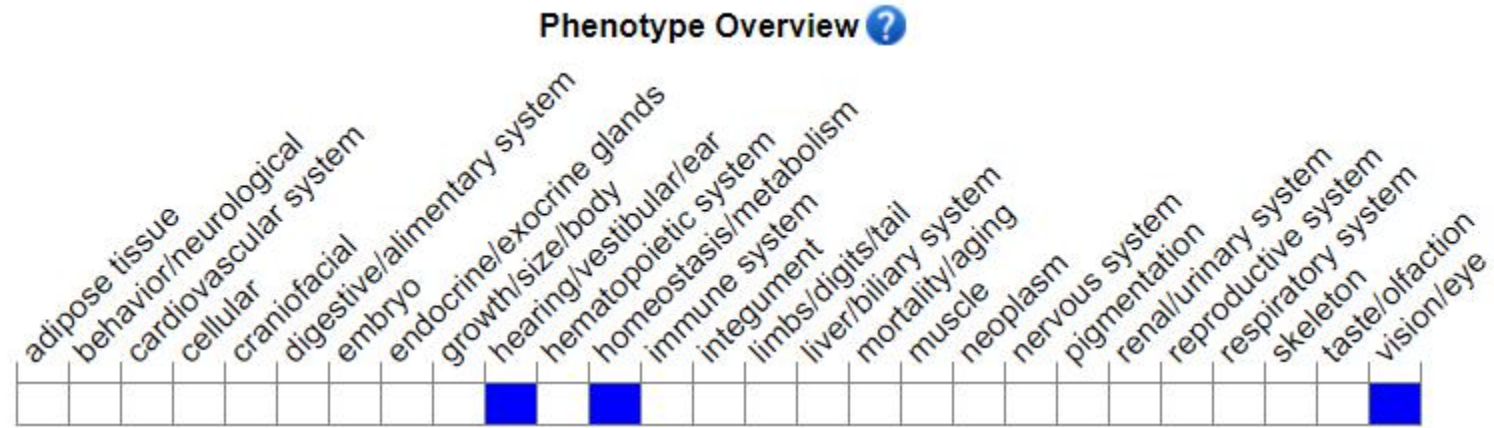
Genomic location distribution



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/marker/MGI:1340024>).

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