

# *Aasdh* Cas9-KO Strategy

Designer: Xueting Zhang

Reviwer: Yanhua Shen

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# Project Overview

**Project Name**

*Aasdh*

**Project type**

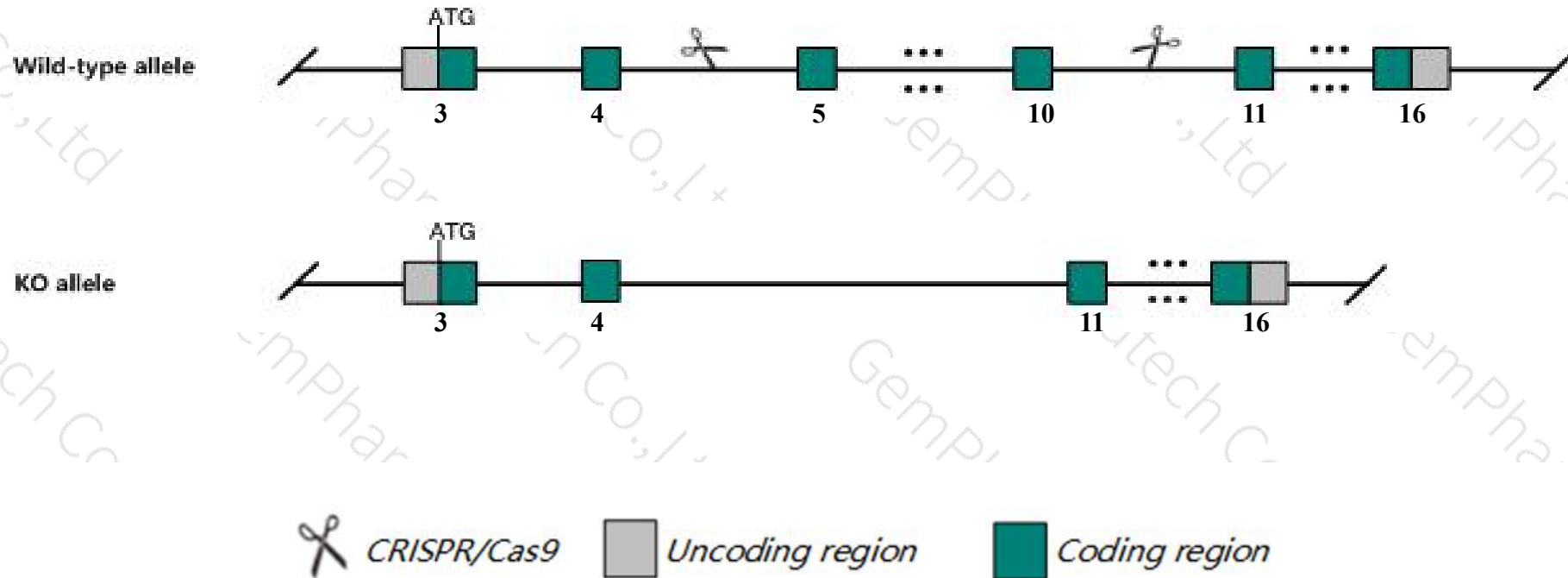
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- The *Aasdh* gene has 15 transcripts. According to the structure of *Aasdh* gene, exon5-exon10 of *Aasdh*-202 (ENSMUST00000120963.7) transcript is recommended as the knockout region. The region contains 1222bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Aasdh* gene. The brief process is as follows: CRISPR/Cas9 system

- The effect on transcript *Aasdh*-208&210&213 is unknown.
- Transcript *Aasdh*-203&206&211 may not be affected.
- The N-terminal of *Aasdh* gene will remain some amino acids, it may remain the partial function of *Aasdh* gene.
- The *Aasdh* gene is located on the Chr5. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.



# Gene information (NCBI)

## Aasdh aminoadipate-semialdehyde dehydrogenase [ *Mus musculus* (house mouse) ]

Gene ID: 231326, updated on 8-Dec-2019

### Summary

- Official Symbol** Aasdh provided by [MGI](#)
- Official Full Name** aminoadipate-semialdehyde dehydrogenase provided by [MGI](#)
- Primary source** [MGI:MGI:2442517](#)
- See related** [Ensembl:ENSMUSG00000055923](#)
- Gene type** protein coding
- RefSeq status** REVIEWED
- Organism** [Mus musculus](#)
- Lineage** Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
- Also known as** U26; Acsf4; A830035E16; A230062G08Rik
- Summary** The gene product is a cytosolic enzyme involved in the production of alpha-aminoadipic acid from alpha-aminoadipic semialdehyde. It is postulated that this enzyme plays a role in lysine metabolism. There is currently debate regarding this enzyme's putative requirement of pyrroloquinoline quinine as an essential cofactor. A related pseudogene has been identified on chromosome 2. [provided by RefSeq, Jan 2010]
- Expression** Ubiquitous expression in bladder adult (RPKM 4.3), CNS E14 (RPKM 3.1) and 28 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

### Genomic context

**Location:** 5; 5 C3.3 [See Aasdh in Genome Data Viewer](#)

**Exon count:** 21

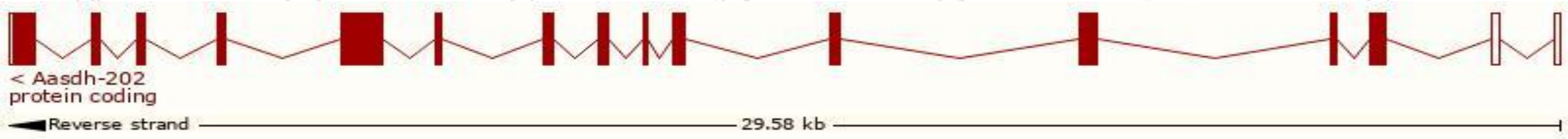
| Annotation release  | Status            | Assembly                                       | Chr | Location                                     |
|---------------------|-------------------|--|-----|--|
| <a href="#">108</a> | current           | GRCm38.p6 ( <a href="#">GCF_000001635.26</a> ) | 5   | NC_000071.6 (76873659..76905529, complement) |
| Build 37.2          | previous assembly | MGSCv37 ( <a href="#">GCF_000001635.18</a> )   | 5   | NC_000071.5 (77304960..77334539, complement) |

# Transcript information (Ensembl)

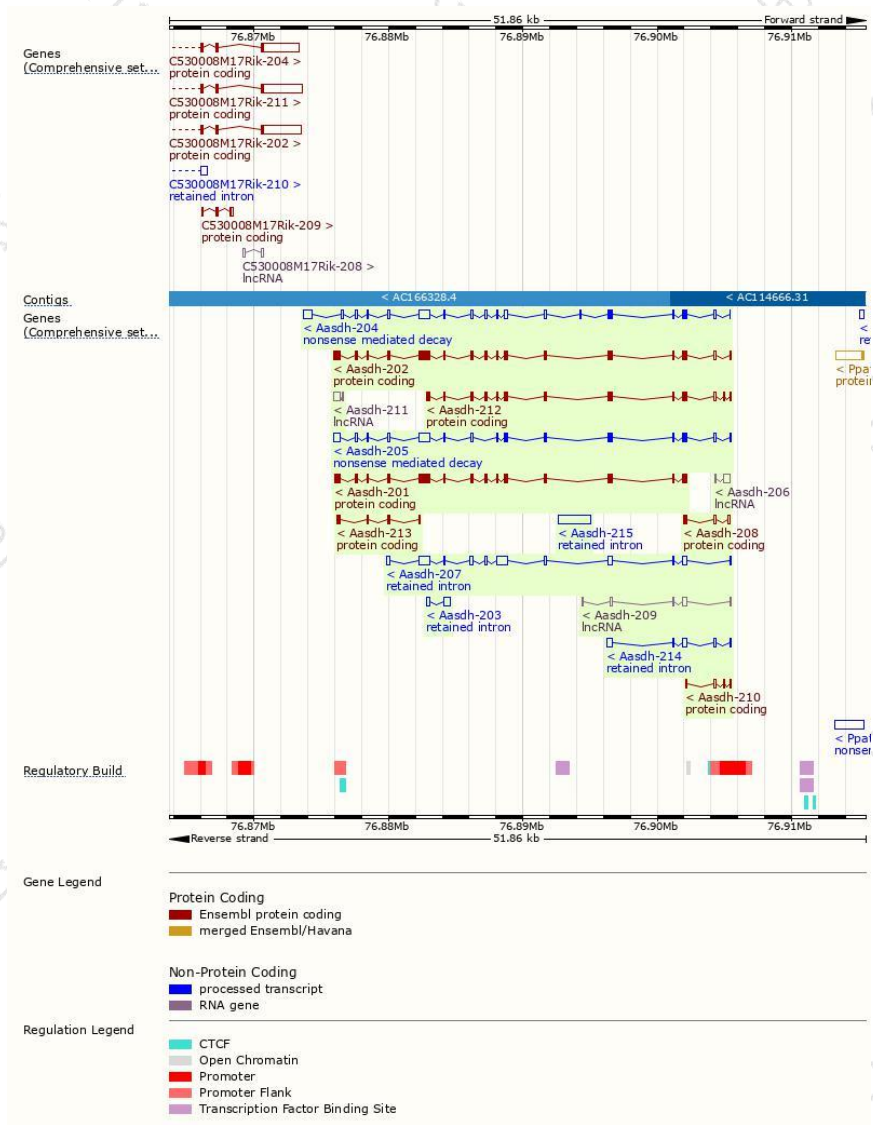
The gene has 15 transcripts,all transcripts are shown below:

| Name      | Transcript ID                         | bp   | Protein                | Biotype                 | CCDS                      | UniProt                    | Flags   |
|-----------|---------------------------------------|------|------------------------|-------------------------|---------------------------|----------------------------|---|
| Aasdh-202 | <a href="#">ENSMUST00000120963.7</a>  | 3694 | <a href="#">1100aa</a> | Protein coding          | <a href="#">CCDS19366</a> | <a href="#">Q80WC9</a>     | TSL:1 GENCODE basic APPRIS P1   |
| Aasdh-201 | <a href="#">ENSMUST00000069709.14</a> | 3381 | <a href="#">1100aa</a> | Protein coding          | <a href="#">CCDS19366</a> | <a href="#">Q80WC9</a>     | TSL:5 GENCODE basic APPRIS P1   |
| Aasdh-212 | <a href="#">ENSMUST00000146570.7</a>  | 2264 | <a href="#">645aa</a>  | Protein coding          | -                         | <a href="#">A0A0R4J1T8</a> | CDS 3' incomplete TSL:1   |
| Aasdh-213 | <a href="#">ENSMUST00000149602.1</a>  | 636  | <a href="#">212aa</a>  | Protein coding          | -                         | <a href="#">F7A4F9</a>     | 5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete TSL:3 |
| Aasdh-208 | <a href="#">ENSMUST00000135954.1</a>  | 472  | <a href="#">47aa</a>   | Protein coding          | -                         | <a href="#">D3YXV2</a>     | CDS 3' incomplete TSL:3   |
| Aasdh-210 | <a href="#">ENSMUST00000142450.1</a>  | 349  | <a href="#">17aa</a>   | Protein coding          | -                         | <a href="#">D3Z2L6</a>     | CDS 3' incomplete TSL:2   |
| Aasdh-204 | <a href="#">ENSMUST00000123682.7</a>  | 4066 | <a href="#">233aa</a>  | Nonsense mediated decay | -                         | <a href="#">E9PUJ1</a>     | TSL:5   |
| Aasdh-205 | <a href="#">ENSMUST00000126741.7</a>  | 3515 | <a href="#">404aa</a>  | Nonsense mediated decay | -                         | <a href="#">E9PUI6</a>     | TSL:1   |
| Aasdh-207 | <a href="#">ENSMUST00000135697.7</a>  | 3341 | No protein             | Retained intron         | -                         | -                          | TSL:2   |
| Aasdh-215 | <a href="#">ENSMUST00000201283.1</a>  | 2458 | No protein             | Retained intron         | -                         | -                          | TSL:NA  |
| Aasdh-214 | <a href="#">ENSMUST00000154548.7</a>  | 1080 | No protein             | Retained intron         | -                         | -                          | TSL:2   |
| Aasdh-203 | <a href="#">ENSMUST00000123059.1</a>  | 775  | No protein             | Retained intron         | -                         | -                          | TSL:2   |
| Aasdh-209 | <a href="#">ENSMUST00000136080.7</a>  | 651  | No protein             | lncRNA                  | -                         | -                          | TSL:5   |
| Aasdh-211 | <a href="#">ENSMUST00000145022.1</a>  | 614  | No protein             | lncRNA                  | -                         | -                          | TSL:3   |
| Aasdh-206 | <a href="#">ENSMUST00000134805.1</a>  | 521  | No protein             | lncRNA                  | -                         | -                          | TSL:5   |

The strategy is based on the design of *Aasdh-202* transcript,The transcription is shown below



# Genomic location distribution





# Protein domain



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

Tel: 400-9660890

