

Alkbh2 Cas9-KO Strategy

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Project Overview

Project Name

Alkbh2

Project type

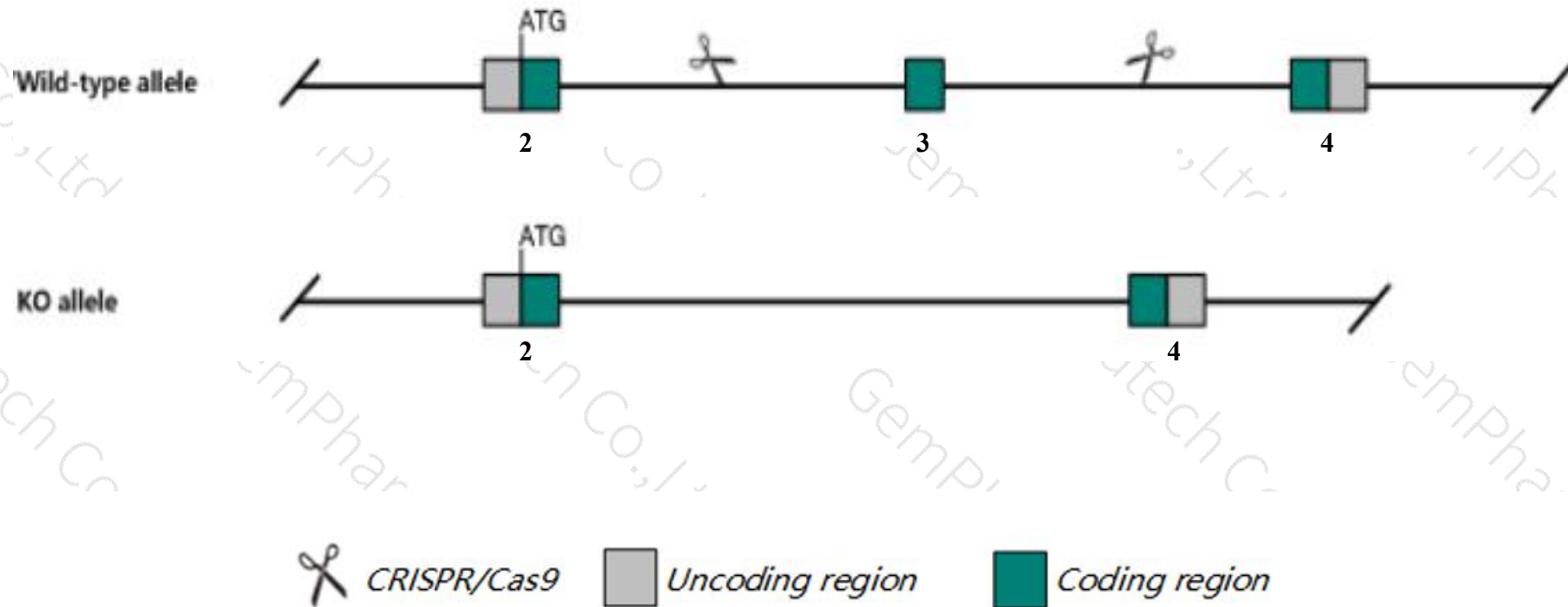
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Alkbh2* gene. The schematic diagram is as follows:



- The *Alkbh2* gene has 3 transcripts. According to the structure of *Alkbh2* gene, exon3 of *Alkbh2-201* (ENSMUST00000053657.12) transcript is recommended as the knockout region. The region contains 199bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Alkbh2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous null mice are viable and overtly normal but show progressive accumulation of 1-methyladenine (1meA) in their genomic DNA due to impaired DNA repair. Mutant MEFs fail to remove methyl methane sulfate (MMS)-induced 1meA from genomic DNA and show increased cytotoxicity after MMS exposure.
- The effect on transcript *Alkbh2*-203 is unknown.
- The knockout region is near to the C-terminal of *Usp30* gene and N-terminal of *Ung* gene, this strategy may influence the regulatory function of the C-terminal of *Usp30* gene and N-terminal of *Ung* gene.
- The *Alkbh2* 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)

Alkbh2 alkB homolog 2, alpha-ketoglutarate-dependent dioxygenase [*Mus musculus* (house mouse)]

Gene ID: 231642, updated on 27-Feb-2020

Summary

- Official Symbol** Alkbh2 provided by [MGI](#)
- Official Full Name** alkB homolog 2, alpha-ketoglutarate-dependent dioxygenase provided by [MGI](#)
- Primary source** [MGI:MGI:2141032](#)
- See related** [Ensembl:ENSMUSG00000044339](#)
- 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** Abh2; mABH2; AU016977; 9530023G02
- Expression** Ubiquitous expression in ovary adult (RPKM 4.9), CNS E11.5 (RPKM 4.1) and 28 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 5; 5 F

See Alkbh2 in [Genome Data Viewer](#)

Exon count: 6

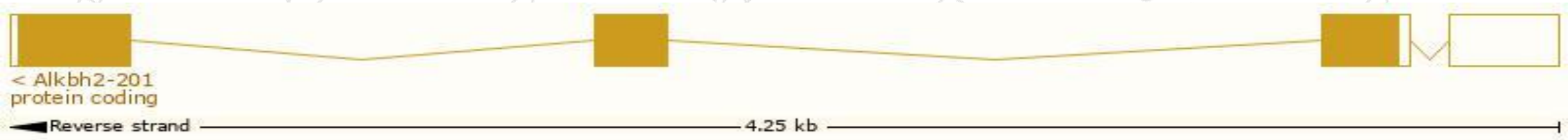
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	5	NC_000071.6 (114123926..114131233, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	5	NC_000071.5 (114573943..114578185, complement)

Transcript information (Ensembl)

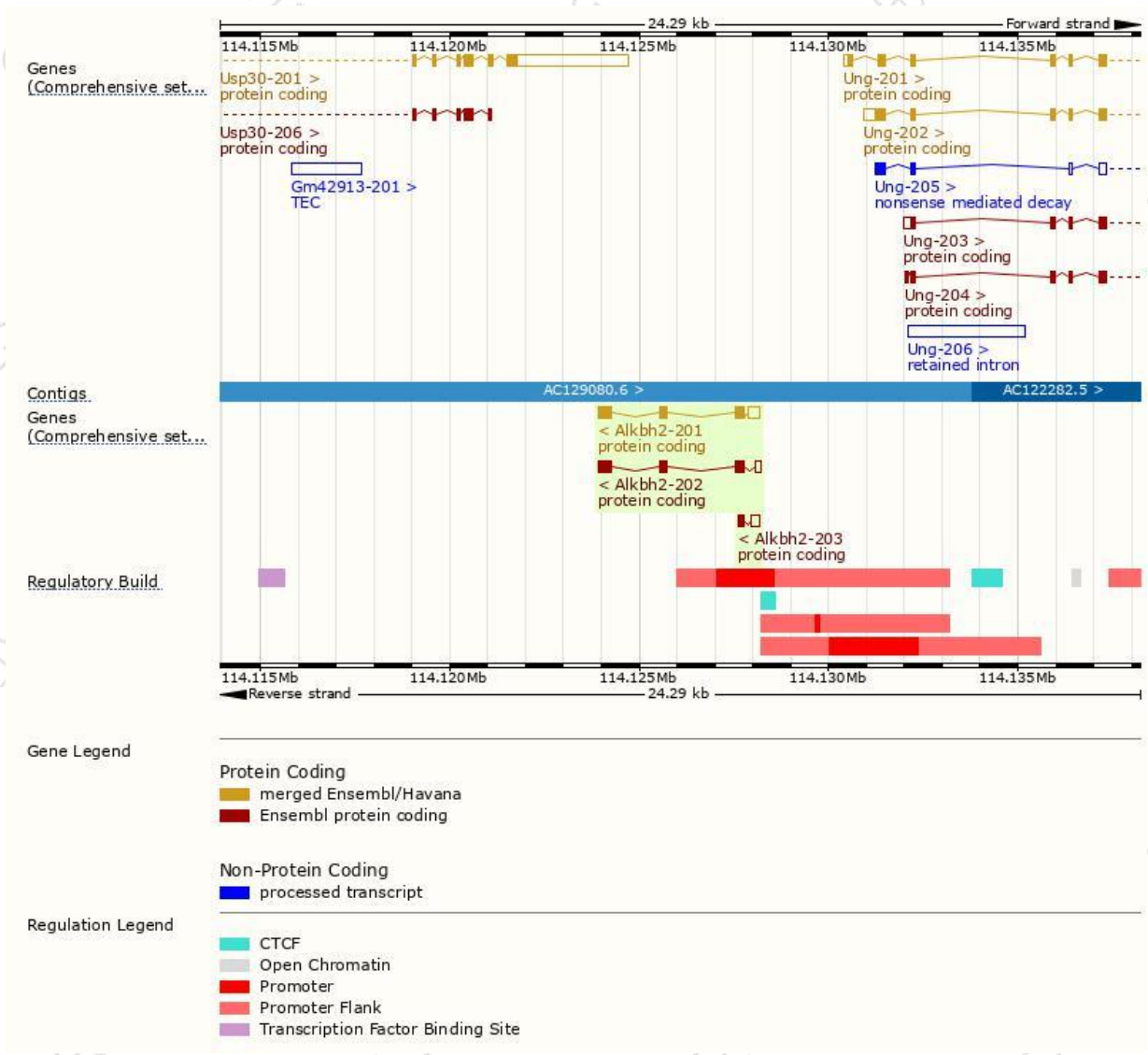
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Alkbh2-201	ENSMUST00000053657.12	1073	239aa	Protein coding	CCDS19559	Q6P6J4	TSL:1 GENCODE basic APPRIS P1
Alkbh2-202	ENSMUST00000112279.1	899	239aa	Protein coding	CCDS19559	Q6P6J4	TSL:1 GENCODE basic APPRIS P1
Alkbh2-203	ENSMUST00000149418.1	385	44aa	Protein coding	-	A0A0G2JER8	CDS 3' incomplete TSL:2

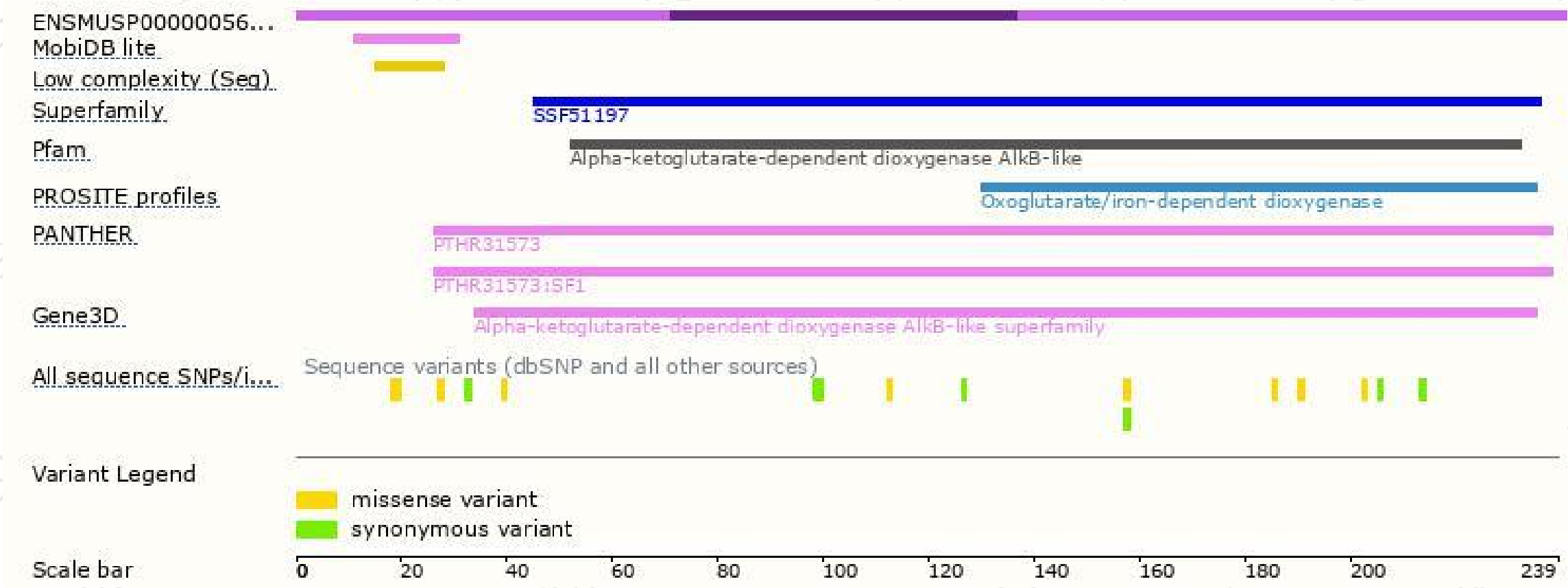
The strategy is based on the design of *Alkbh2-201* transcript,The transcription is shown below



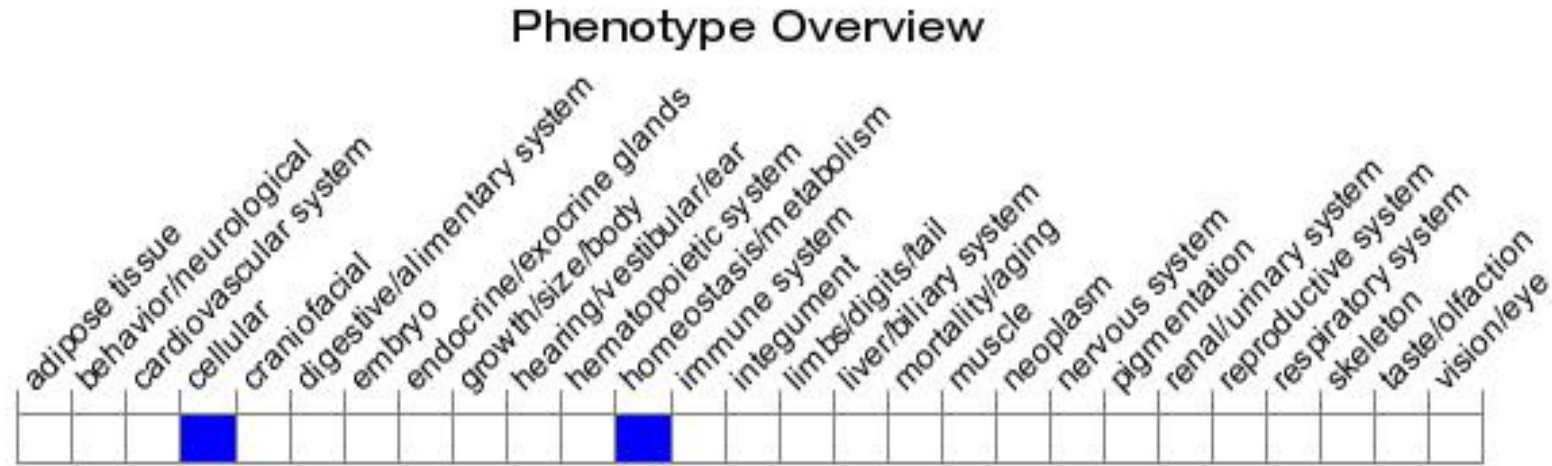
Genomic location distribution



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, Homozygous null mice are viable and overtly normal but show progressive accumulation of 1-methyladenine (1meA) in their genomic DNA due to impaired DNA repair. Mutant MEFs fail to remove methyl methane sulfate (MMS)-induced 1meA from genomic DNA and show increased cytotoxicity after MMS exposure.

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

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