

***Kdm4d* Cas9-KO Strategy**

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-02-25

Project Overview

Project Name

Kdm4d

Project type

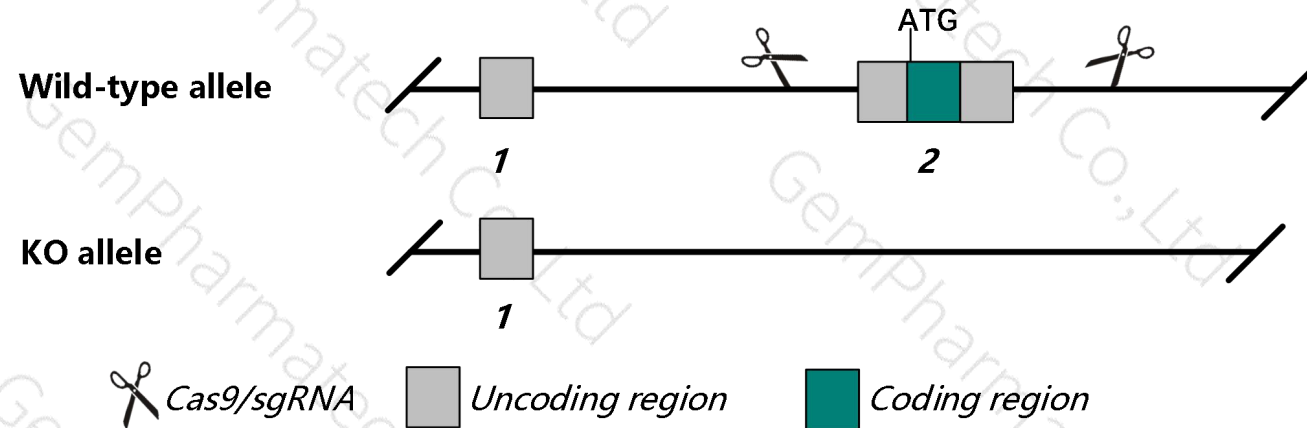
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kdm4d* gene. The schematic diagram is as follows:



- The *Kdm4d* gene has 2 transcripts. According to the structure of *Kdm4d* gene, exon2 of *Kdm4d-201* (ENSMUST00000058796.6) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Kdm4d* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit accumulation of histone 3 methylation in spermatids, a transient increase in testes size, wider tubules, occasional male germ cell apoptosis, and decreased body weight. However, fertility is normal.
- The *Kdm4d* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Kdm4d lysine (K)-specific demethylase 4D [*Mus musculus* (house mouse)]

Gene ID: 244694, updated on 16-Sep-2019

Summary

- Official Symbol** Kdm4d provided by [MGI](#)
- Official Full Name** lysine (K)-specific demethylase 4D provided by [MGI](#)
- Primary source** [MGI:MGI:3606484](#)
- See related** [Ensembl:ENSMUSG00000053914](#)
- 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** Jmjd2d; 4932416A15
- Expression** Restricted expression toward testis adult (RPKM 31.3) [See more](#)
- Orthologs** [human](#) [all](#)

Genomic context

Location: 9; 9 A2

See Kdm4d in [Genome Data Viewer](#)

Exon count: 4

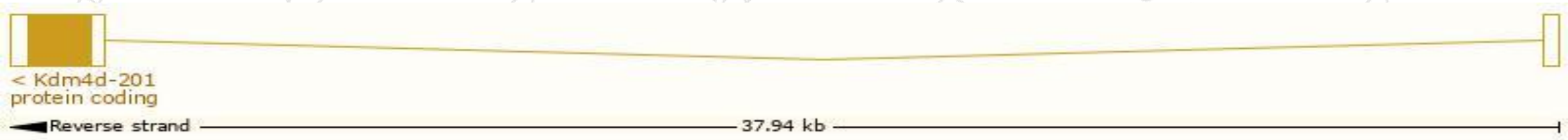
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	9	NC_000075.6 (14462548..14500522, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	9	NC_000075.5 (14267025..14304926, complement)

Transcript information (Ensembl)

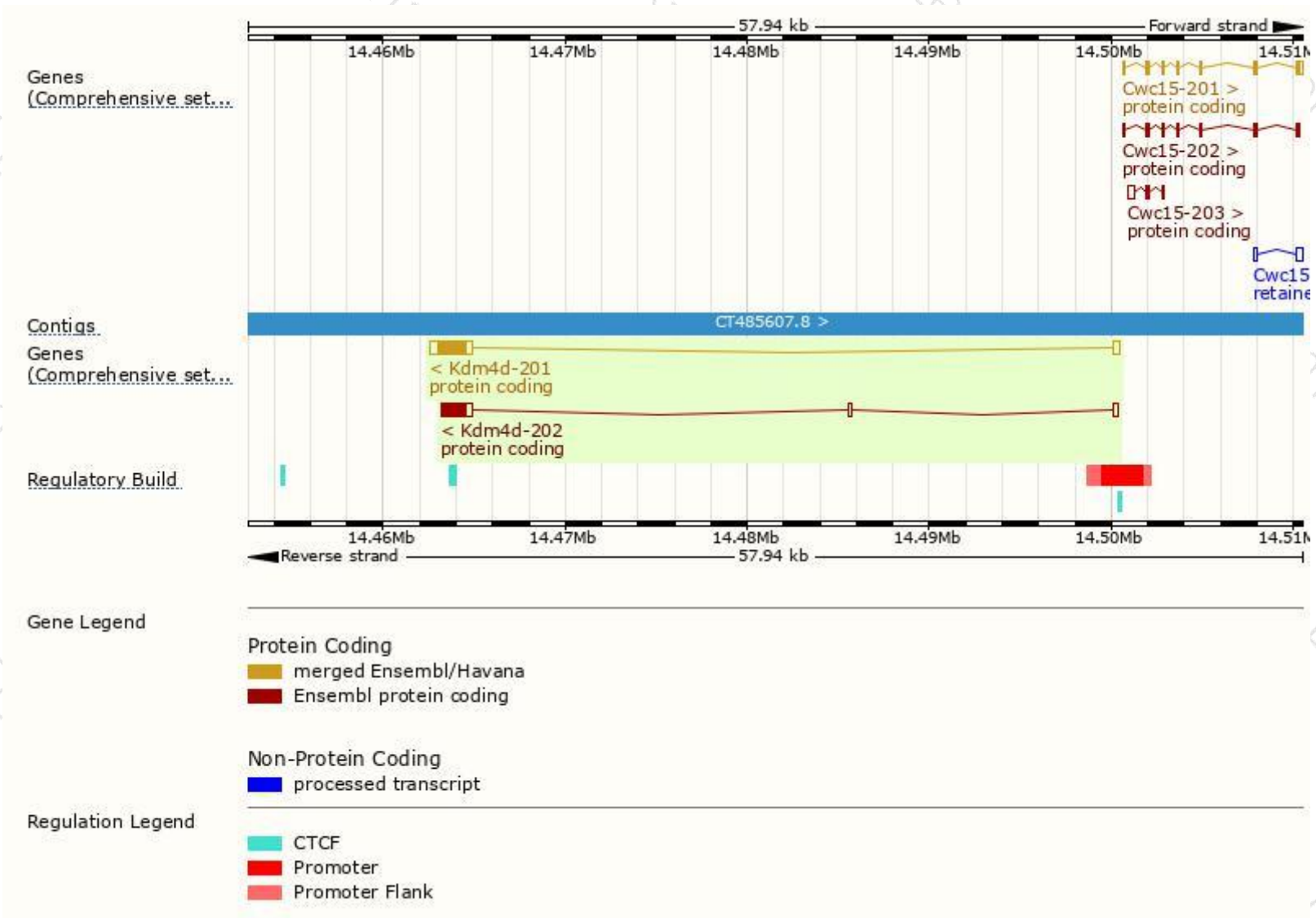
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kdm4d-201	ENSMUST00000058796.6	2695	510aa	Protein coding	CCDS22822	Q3U2K5	TSL:1 GENCODE basic APPRIS P1
Kdm4d-202	ENSMUST00000115647.2	2117	450aa	Protein coding	-	Z4YLE9	CDS 3' incomplete TSL:1

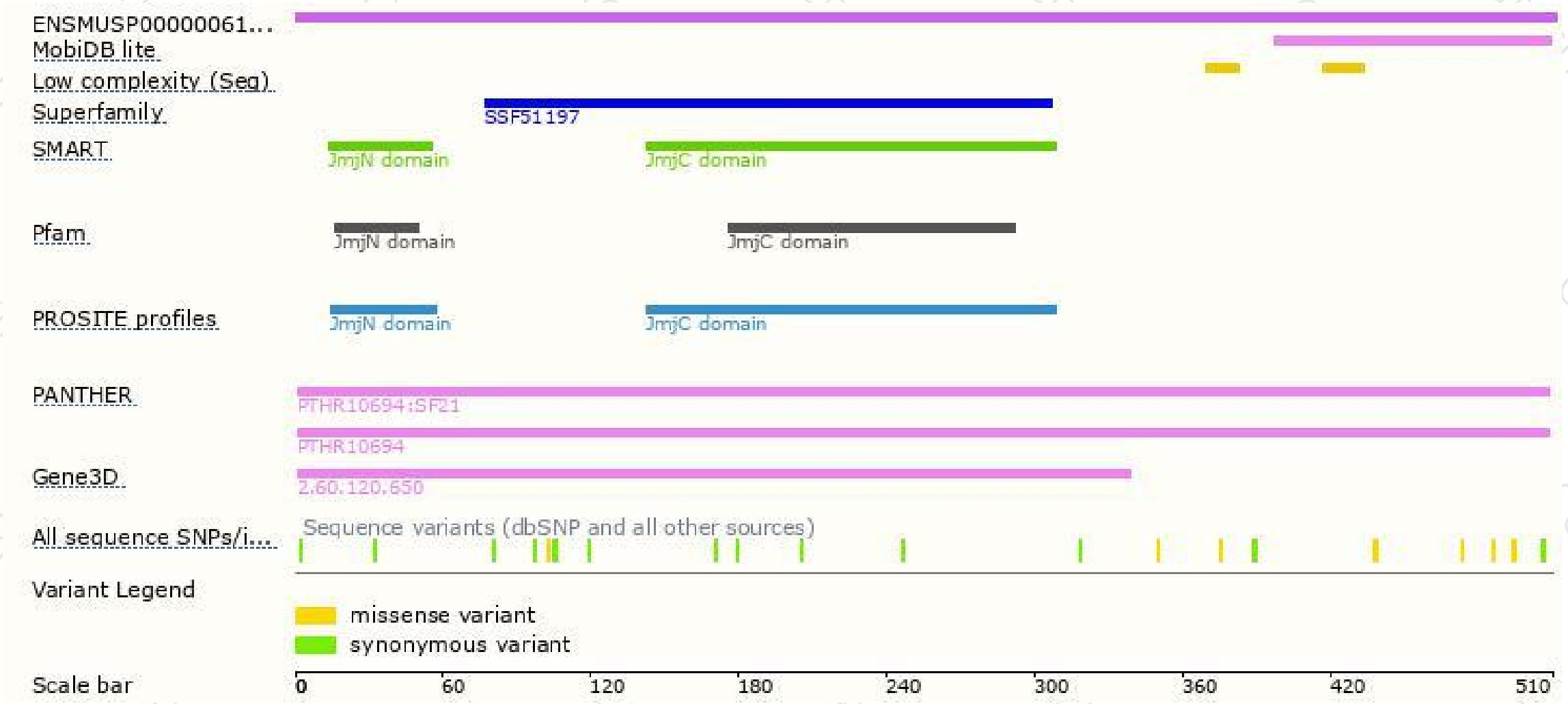
The strategy is based on the design of *Kdm4d-201* transcript,The transcription is shown below



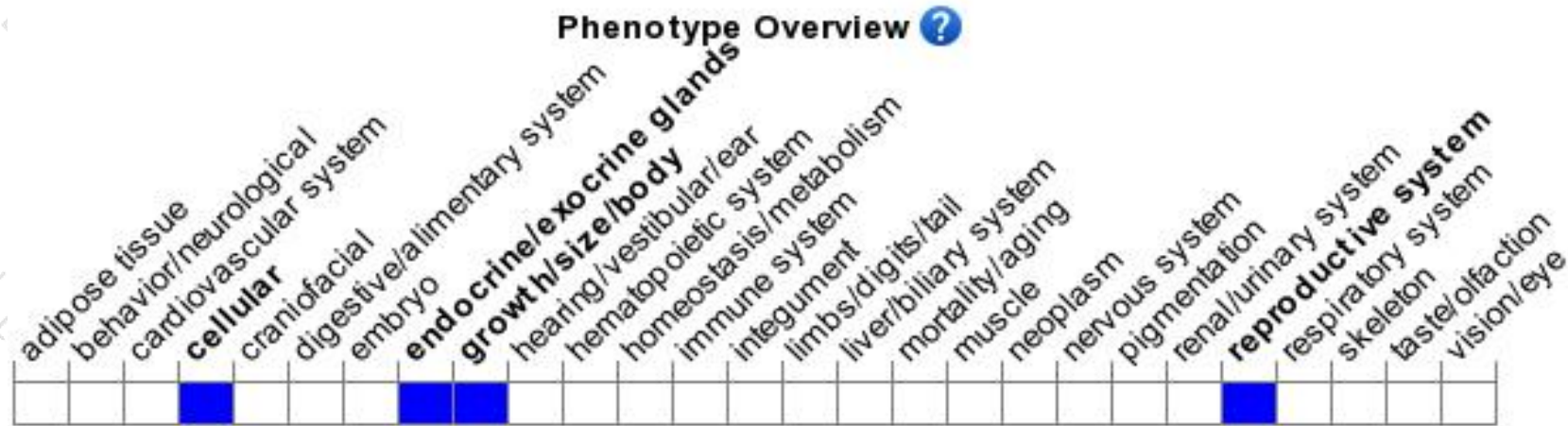
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit accumulation of histone 3 methylation in spermatids, a transient increase in testes size, wider tubules, occasional male germ cell apoptosis, and decreased body weight. However, fertility is normal.

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

Tel: 400-9660890

