Kdm2a Cas9-KO Strategy

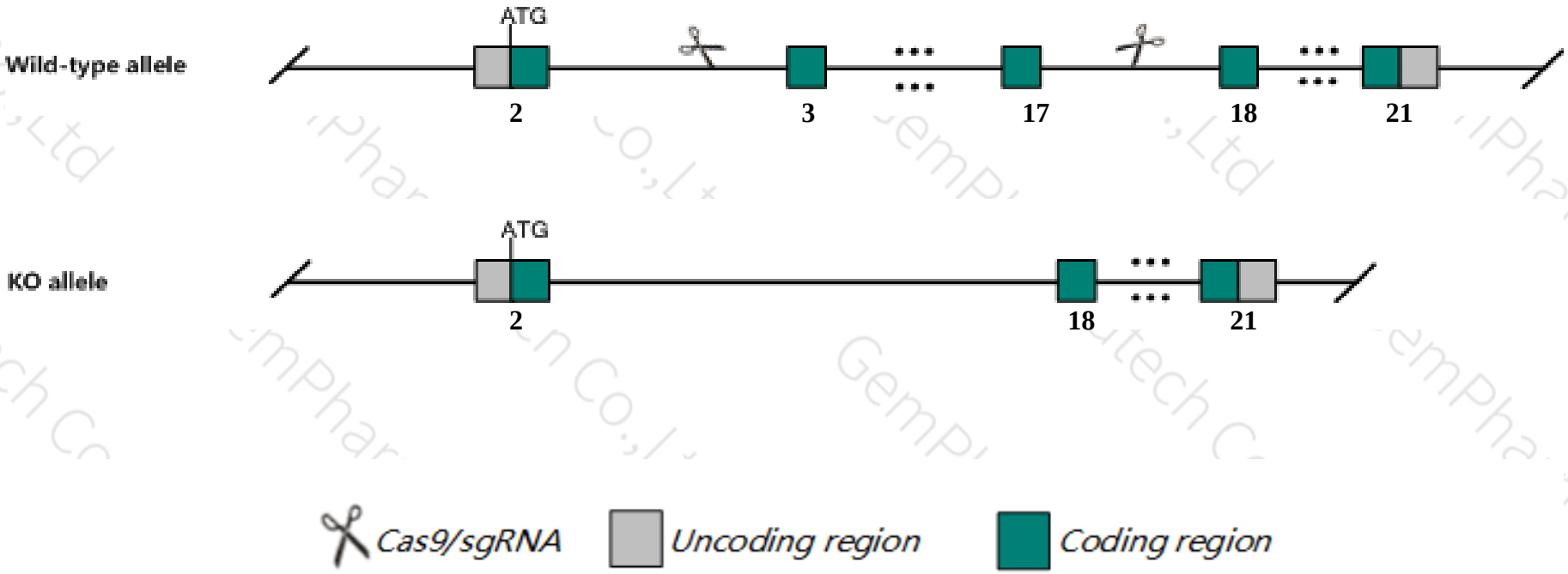
Designer: Yanhua Shen
Design Date: 2019-08-05

Project Overview

Project Name	***Kdm2a***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kdm2a* gene. The schematic diagram is as follows:



Technical routes

➢ The *Kdm2a* gene has 14 transcripts. According to the structure of *Kdm2a* gene, exon3-exon17 of *Kdm2a-201* (ENSMUST00000047898.13) transcript is recommended as the knockout region.The region contains 2723bp coding sequenc Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Kdm2a* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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.

Notice

- According to the existing MGI data,Mice homozygous for a null allele show embryonic lethality, severe growth retardation, reduced neuron proliferation, increased neuron apoptosis, impaired neuron differentiation, small hearts, abnormal cardiac looping and, in some cases, incomplete embryonic turning and neural tube closure defects.

- The *Kdm2a* gene is located on the Chr19. 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）

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Kdm2a lysine (K)-specific demethylase 2A [Mus musculus (house mouse)]

Gene ID: 225876, updated on 31-Jan-2019

Summary

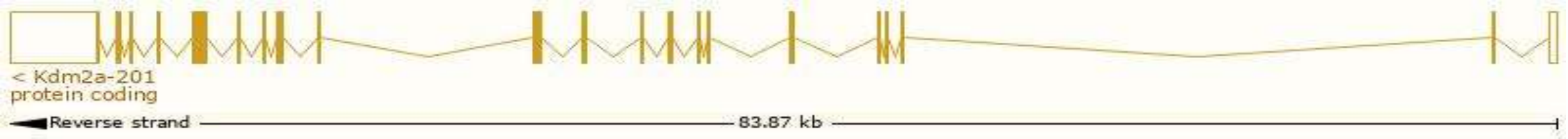
Official Symbol	Kdm2a provided by MGI
Official Full Name	lysine (K)-specific demethylase 2A provided by MGI
Primary source	MGI:MGI:1354736
See related	Ensembl:ENSMUSG00000054611
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	100043628, 5530401A10Rik, AA589516, AW536790, Cxxc8, Fbl11, Fbl7, Fbxl11, Gm4560, Jhdm1, Jhdm1a, lalina
Expression	Ubiquitous expression in thymus adult (RPKM 17.5), limb E14.5 (RPKM 16.0) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

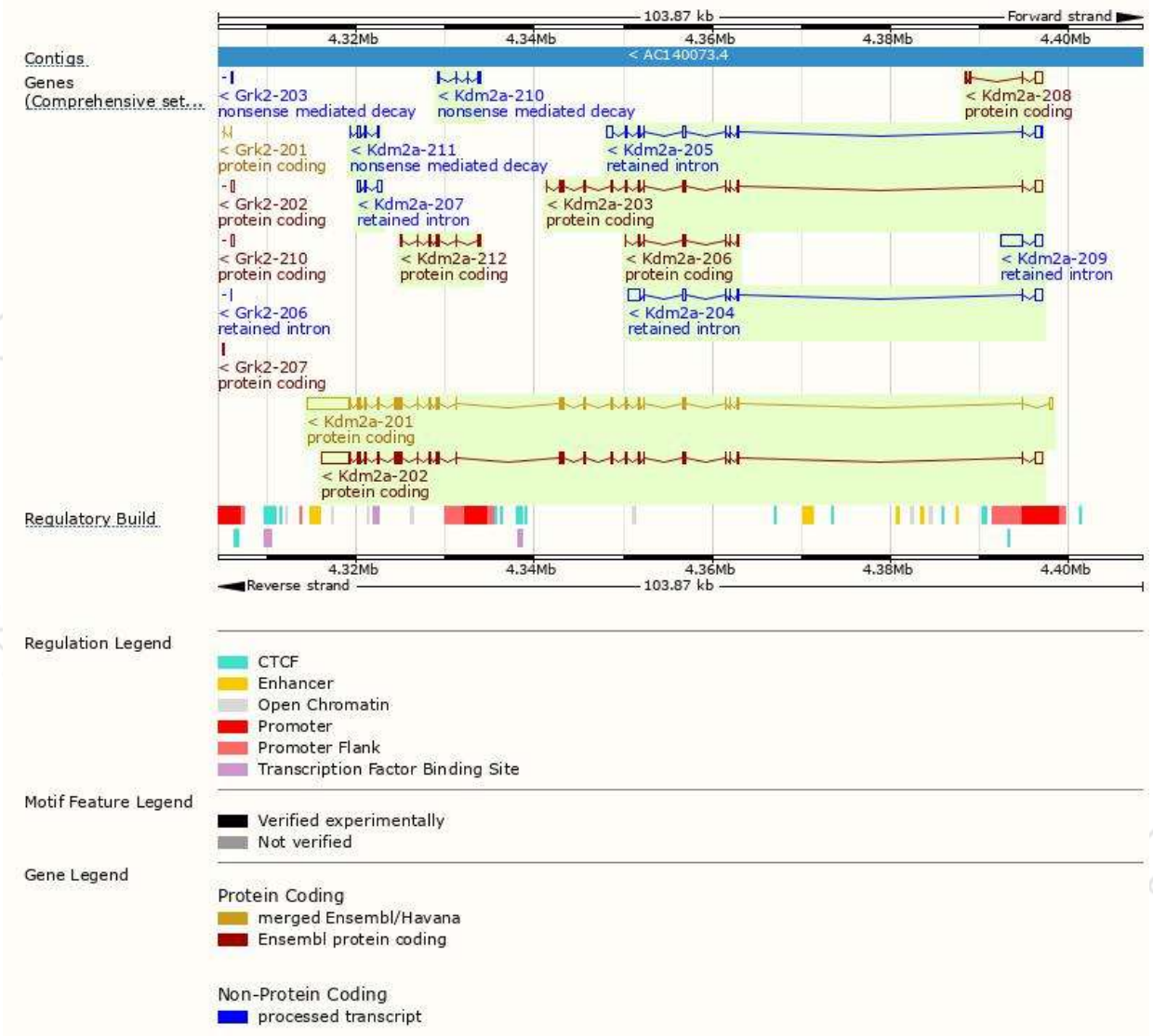
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kdm2a-201	ENSMUST00000047898.13	8578	1161aa	Protein coding	CCDS37886	F6YRW4	TSL:1 GENCODE basic APPRIS P1
Kdm2a-202	ENSMUST00000075856.10	7242	1161aa	Protein coding	CCDS37886	F6YRW4	TSL:5 GENCODE basic APPRIS P1
Kdm2a-203	ENSMUST00000116571.8	2413	494aa	Protein coding	-	A0A087WP68	TSL:1 GENCODE basic
Kdm2a-204	ENSMUST00000175682.1	2638	No protein	Retained intron	-	-	TSL:1
Kdm2a-205	ENSMUST00000175777.8	2073	No protein	Retained intron	-	-	TSL:5
Kdm2a-206	ENSMUST00000175959.1	738	246aa	Protein coding	-	H3BL82	CDS 5' and 3' incomplete TSL:3
Kdm2a-207	ENSMUST00000175978.1	767	No protein	Retained intron	-	-	TSL:2
Kdm2a-208	ENSMUST00000176483.2	1128	35aa	Protein coding	-	A0A087WQL9	TSL:1 GENCODE basic
Kdm2a-209	ENSMUST00000176495.1	3207	No protein	Retained intron	-	-	TSL:1
Kdm2a-210	ENSMUST00000176497.1	438	No protein	lncRNA	-	-	TSL:3
Kdm2a-211	ENSMUST00000176532.1	570	84aa	Nonsense mediated decay	-	H3BKJ9	CDS 5' incomplete TSL:3
Kdm2a-212	ENSMUST00000176653.1	1076	292aa	Protein coding	-	H3BLD4	CDS 3' incomplete TSL:3
Kdm2a-213	ENSMUST00000235335.1	2195	29aa	Nonsense mediated decay	-	-	CDS 5' incomplete
Kdm2a-214	ENSMUST00000237268.1	894	No protein	Retained intron	-	-	-

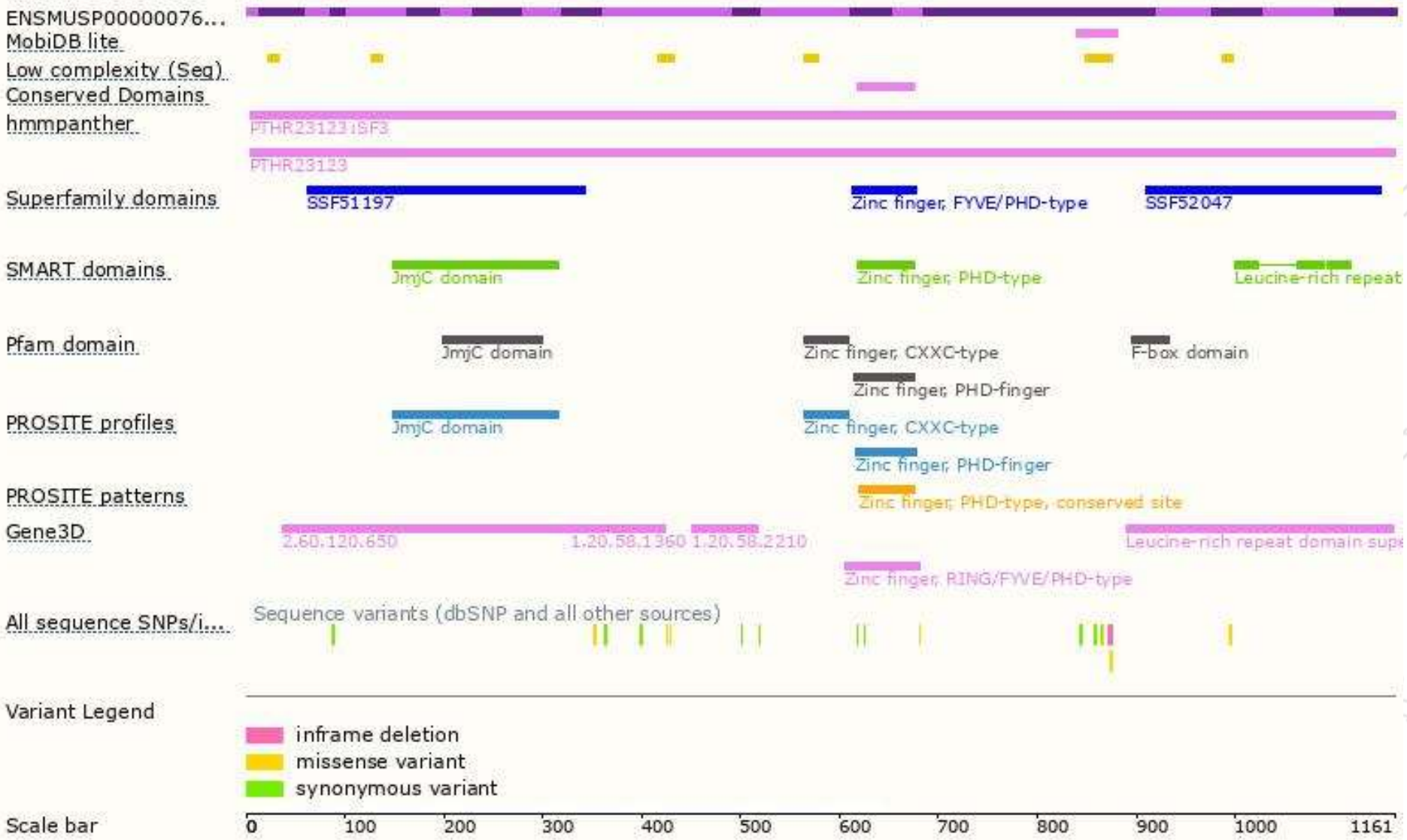
The strategy is based on the design of *Kdm2a-201* transcript,The transcription is shown below



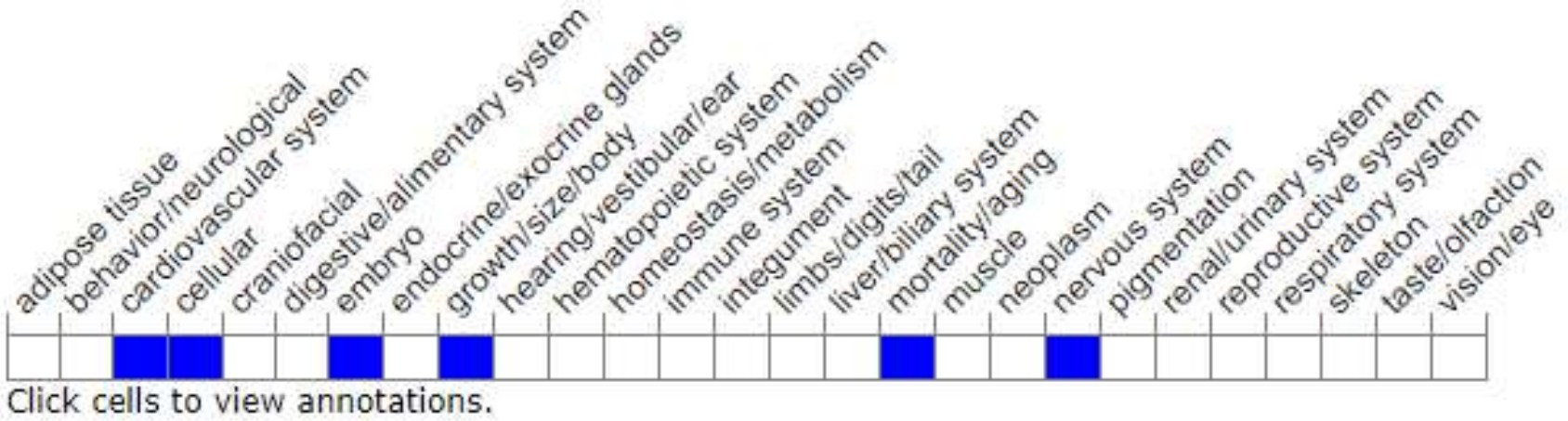
Genomic location distribution



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/).

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集萃药康
GemPharmatech

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

Tel: 025-5864 1534

集萃药康生物科技
GemPharmatech Co.,Ltd