

***Kmt5a* Cas9-CKO Strategy**

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Project Overview

Project Name

Kmt5a

Project type

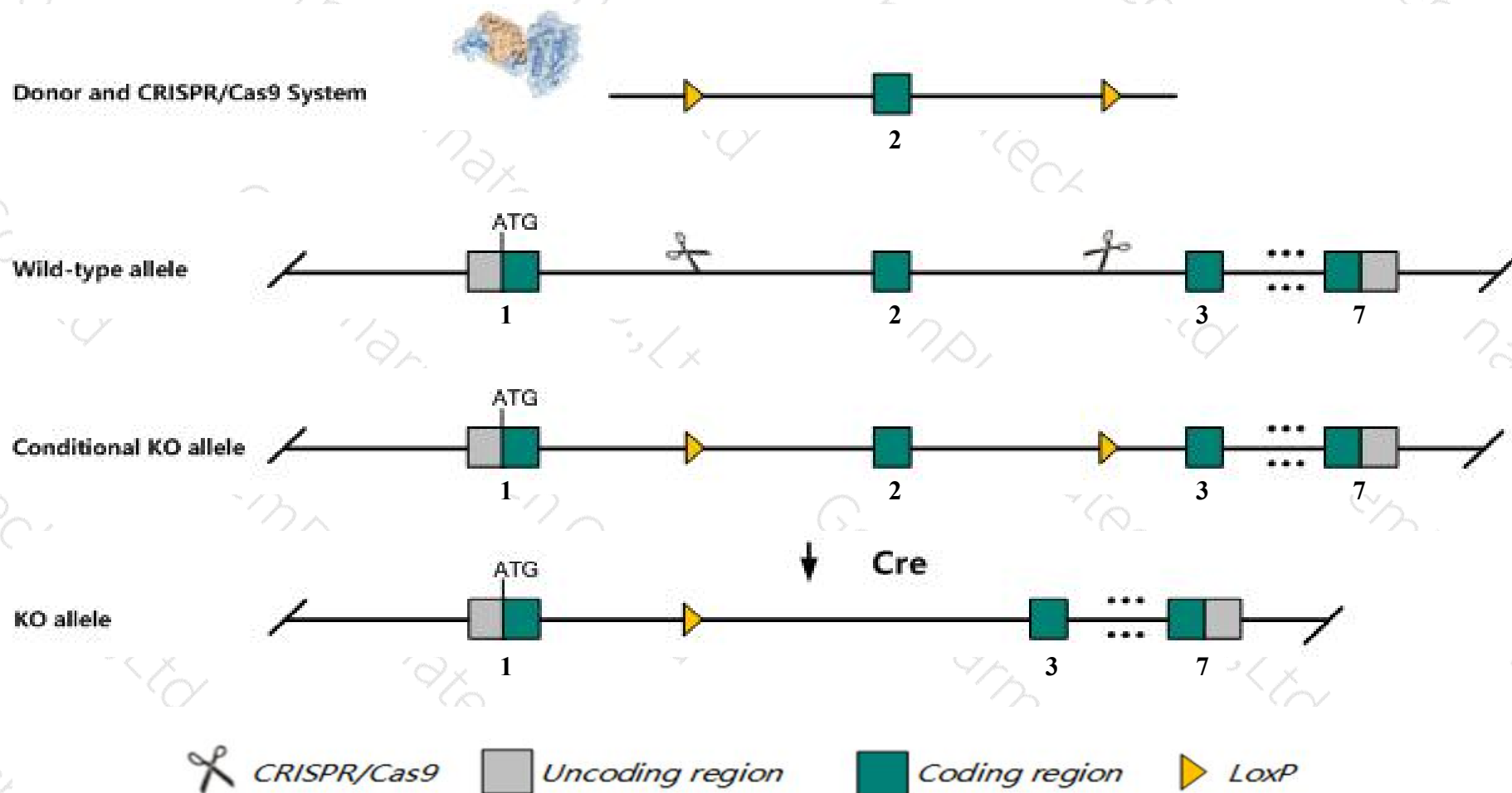
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kmt5a* gene. The schematic diagram is as follows:



Technical routes

- The *Kmt5a* gene has 13 transcripts. According to the structure of *Kmt5a* gene, exon2 of *Kmt5a-202* (ENSMUST00000100709.6) transcript is recommended as the knockout region. The region contains 157bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Kmt5a* gene. The brief process is as follows: CRISPR/Cas9 system and Donor 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.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- According to the existing MGI data, Mice homozygous for a gene trapped allele exhibit embryonic lethality. Mice homozygous for an allele lacking exon 7 die prior to implantation.
- The *Kmt5a* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Kmt5a lysine methyltransferase 5A [*Mus musculus* (house mouse)]

Gene ID: 67956, updated on 12-Aug-2019

Summary

Official Symbol	Kmt5a provided by MGI
Official Full Name	lysine methyltransferase 5A provided by MGI
Primary source	MGI:MGI:1915206
See related	Ensembl:ENSMUSG00000049327
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<i>Mus musculus</i>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Setd8; PR-SET7; AA617402; AW536475; PR/SET07; 2410195B05Rik
Expression	Ubiquitous expression in placenta adult (RPKM 32.5), heart adult (RPKM 26.1) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

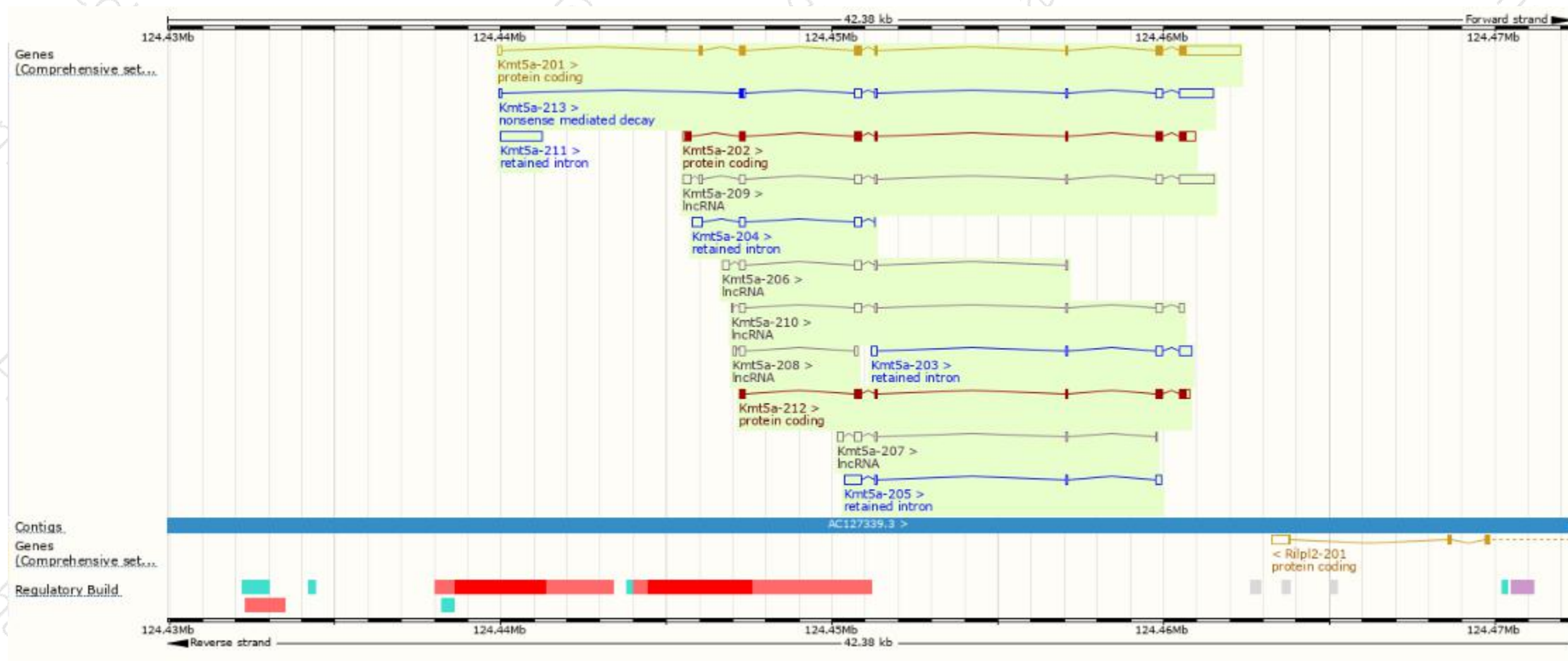
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kmt5a-201	ENSMUST00000059580.10	2739	350aa	Protein coding	CCDS19675	E9QNB8	TSL:1 GENCODE basic APPRIS P3
Kmt5a-202	ENSMUST000000100709.6	1425	364aa	Protein coding	CCDS80410	D3YXI6	TSL:1 GENCODE basic
Kmt5a-212	ENSMUST000000198451.1	1032	295aa	Protein coding	CCDS80411	A0A0G2JFK5	TSL:3 GENCODE basic APPRIS ALT1
Kmt5a-213	ENSMUST000000199798.4	1789	38aa	Nonsense mediated decay	-	A0A0G2JGZ8	TSL:1
Kmt5a-211	ENSMUST000000196860.1	1271	No protein	Retained intron	-	-	TSL:NA
Kmt5a-205	ENSMUST000000135667.7	814	No protein	Retained intron	-	-	TSL:2
Kmt5a-203	ENSMUST000000125588.1	804	No protein	Retained intron	-	-	TSL:2
Kmt5a-204	ENSMUST000000134826.7	696	No protein	Retained intron	-	-	TSL:3
Kmt5a-209	ENSMUST000000147969.7	2112	No protein	lncRNA	-	-	TSL:5
Kmt5a-210	ENSMUST000000154031.7	903	No protein	lncRNA	-	-	TSL:5
Kmt5a-206	ENSMUST000000138766.7	731	No protein	lncRNA	-	-	TSL:3
Kmt5a-207	ENSMUST000000143722.7	548	No protein	lncRNA	-	-	TSL:5
Kmt5a-208	ENSMUST000000147692.1	370	No protein	lncRNA	-	-	TSL:3

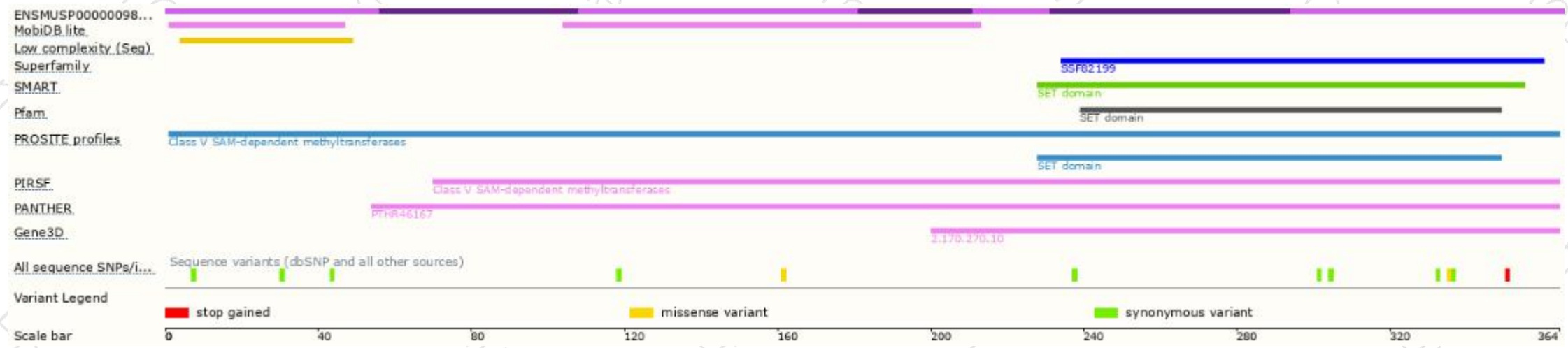
The strategy is based on the design of *Kmt5a-202* transcript,The transcription is shown below



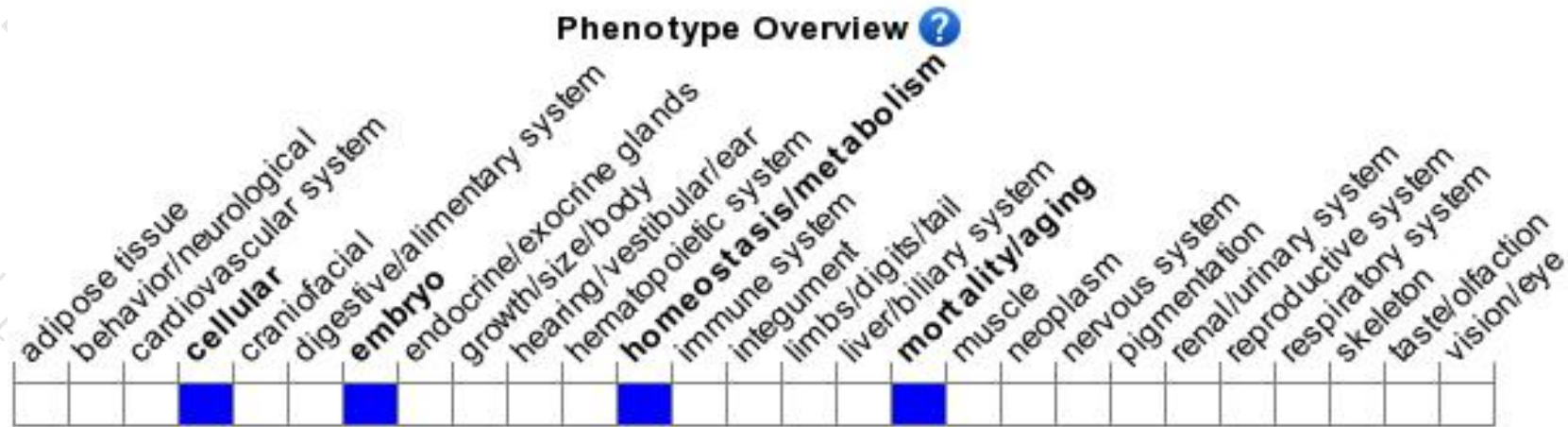
Genomic location distribution



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 gene trapped allele exhibit embryonic lethality. Mice homozygous for an allele lacking exon 7 die prior to implantation.

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

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