

# ***Kmt5a* Cas9-KO Strategy**

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**Reviewer:**

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# Project Overview

**Project Name**

***Kmt5a***

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- 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

- 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology 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 <a href="#">See more</a>                                                |
| Orthologs          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                 |

# Transcript information (Ensembl)

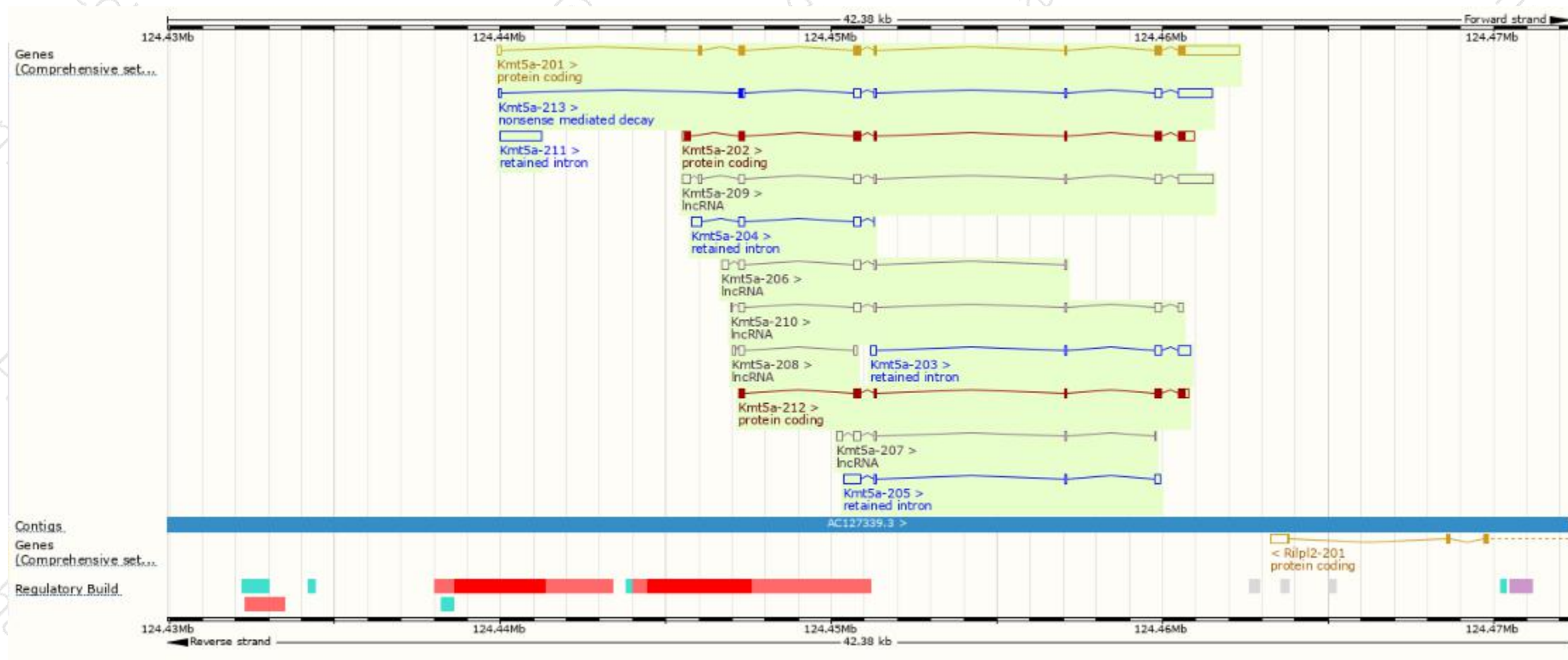
The gene has 13 transcripts,all transcripts are shown below:

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

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

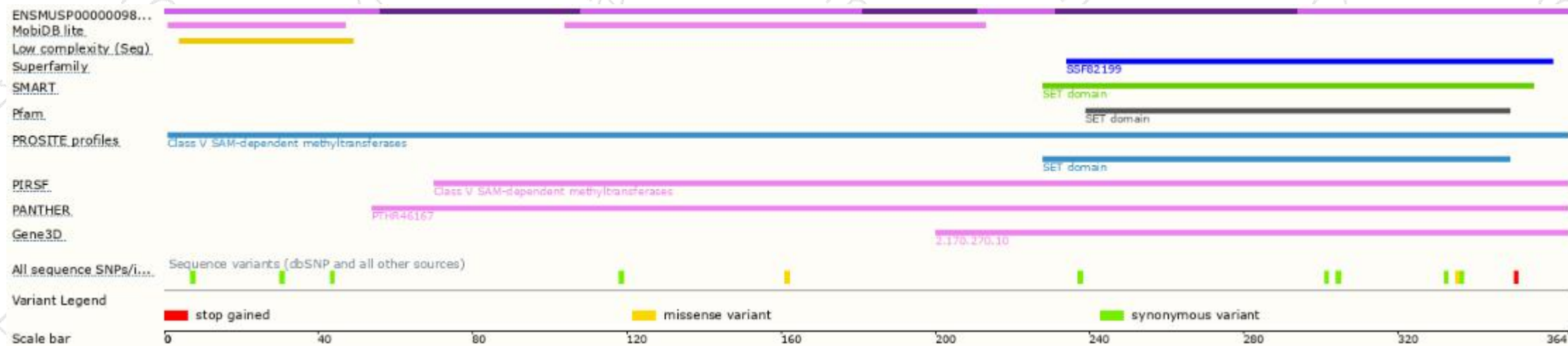


# Genomic location distribution

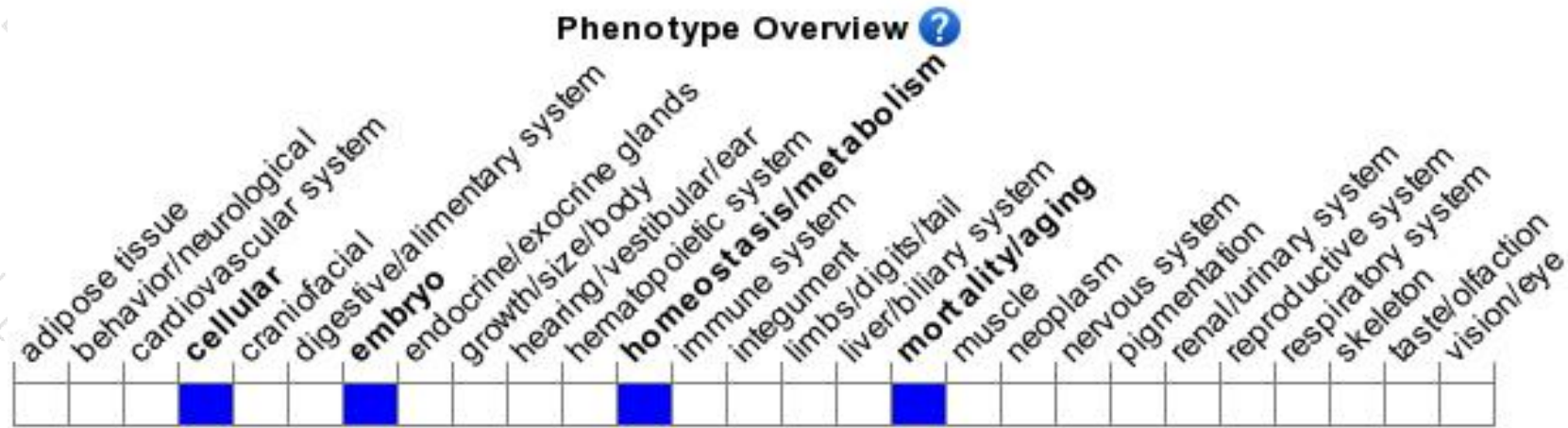




# Protein domain



# 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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