

***Prmt1* Cas9-CKO Strategy**

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Reviewer: Yanhua Shen

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Project Overview

Project Name

Prmt1

Project type

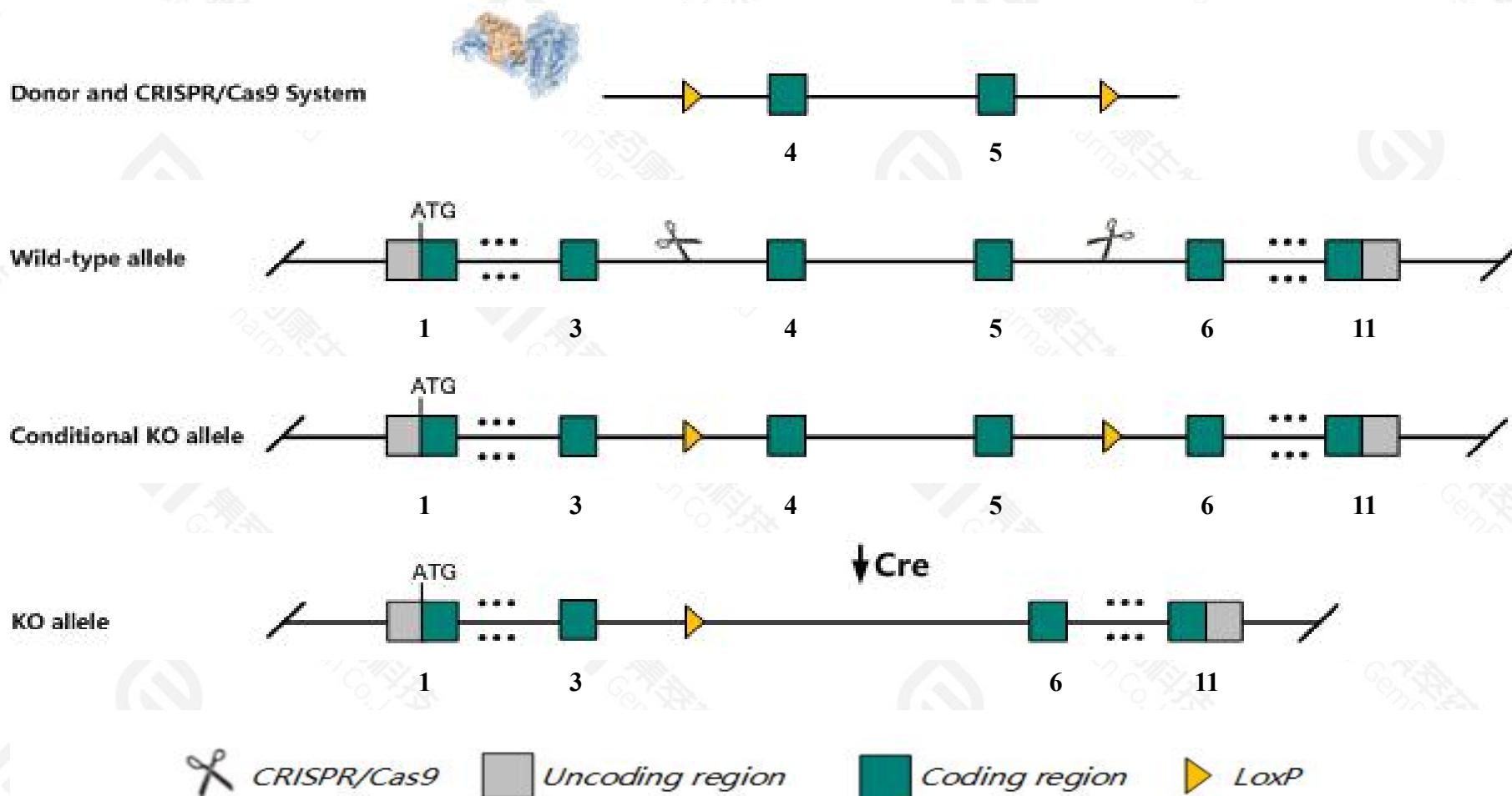
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prmt1* gene. The schematic diagram is as follows:



- The *Prmt1* gene has 14 transcripts. According to the structure of *Prmt1* gene, exon4-exon5 of *Prmt1*-202(ENSMUST00000107843.11) transcript is recommended as the knockout region. The region contains 220bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prmt1* 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, embryos homozygous for a null mutation die before E6.5 and exhibit abnormal embryonic tissue morphology.
- The *Prmt1* gene is located on the Chr7. 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)

Prmt1 protein arginine N-methyltransferase 1 [*Mus musculus* (house mouse)]

[Download Datasets](#)

Gene ID: 15469, updated on 20-Dec-2021

Summary

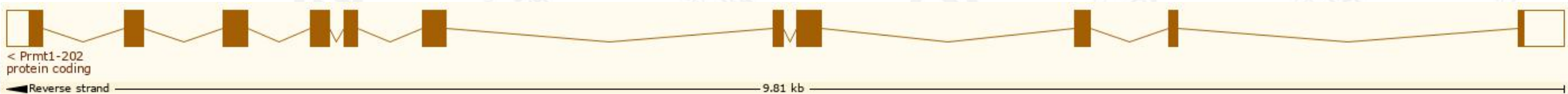
Official Symbol Prmt1 provided by [MGI](#)
Official Full Name protein arginine N-methyltransferase 1 provided by [MGI](#)
Primary source [MGI:MGI:107846](#)
See related [Ensembl:ENSMUSG00000109324](#)
Gene type protein coding
RefSeq status VALIDATED
Organism [Mus musculus](#)
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as Mrmt1; Hrmt1l2; AW214366; 6720434D09Rik
Expression Ubiquitous expression in CNS E11.5 (RPKM 124.9), CNS E18 (RPKM 124.2) and 27 other tissues [See more](#)
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

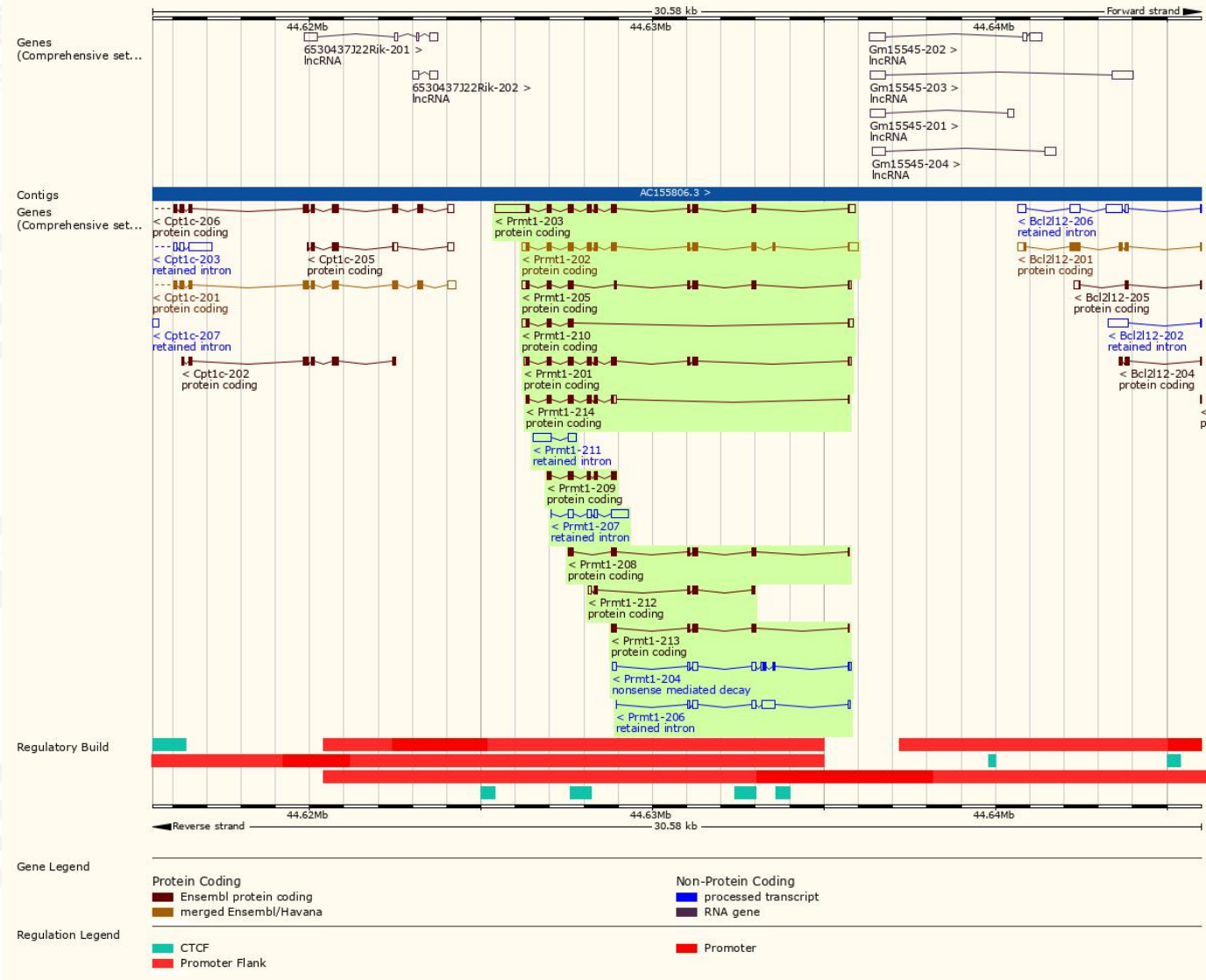
The gene has 14 transcripts,all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000209124.2	Prmt1-214	741	208aa	Protein coding	-	A0A140LHF7	GENCODE basic TSL:5
ENSMUST00000208312.2	Prmt1-208	659	217aa	Protein coding	-	A0A140LHS4	TSL:5 CDS 3' incomplete
ENSMUST00000209056.3	Prmt1-213	490	164aa	Protein coding	-	A0A140LI33	TSL:5 CDS 5' and 3' incomplete
ENSMUST00000208938.2	Prmt1-212	467	113aa	Protein coding	-	A0A140LIF7	TSL:3 CDS 5' incomplete
ENSMUST00000208829.2	Prmt1-210	621	122aa	Protein coding	-	A0A140LJ68	GENCODE basic TSL:5
ENSMUST00000207659.2	Prmt1-205	945	254aa	Protein coding	CCDS85293	A0A140LJ70	GENCODE basic TSL:5
ENSMUST00000208778.2	Prmt1-209	578	193aa	Protein coding	-	A0A140LJF4	TSL:5 CDS 5' and 3' incomplete
ENSMUST00000207522.2	Prmt1-204	724	55aa	Nonsense mediated decay	-	A0A140LJG1	TSL:5
ENSMUST00000045325.14	Prmt1-201	1071	318aa	Protein coding	-	A0A171KXD3	GENCODE basic TSL:5
ENSMUST00000107843.11	Prmt1-202	1508	371aa	Protein coding	CCDS21222	Q9JIF0-1	GENCODE basic APPRIS P3 TSL:1
ENSMUST00000207370.2	Prmt1-203	2147	353aa	Protein coding	CCDS57547	Q9JIF0-2	GENCODE basic APPRIS ALT1 TSL:1
ENSMUST00000207735.2	Prmt1-207	834	No protein	Retained intron	-	-	TSL:2
ENSMUST00000207702.2	Prmt1-206	758	No protein	Retained intron	-	-	TSL:3
ENSMUST00000208897.2	Prmt1-211	742	No protein	Retained intron	-	-	TSL:2

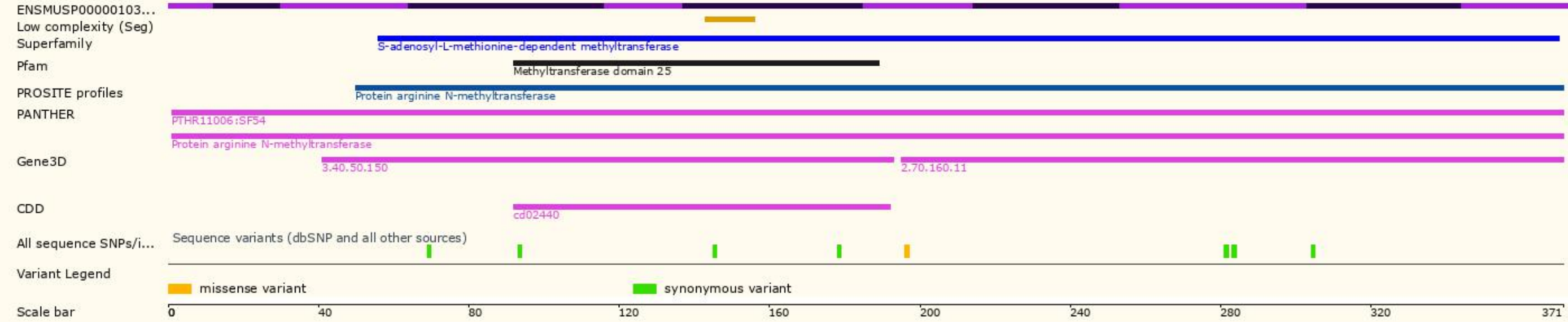
The strategy is based on the design of *Prmt1-202* transcript,the transcription is shown below:



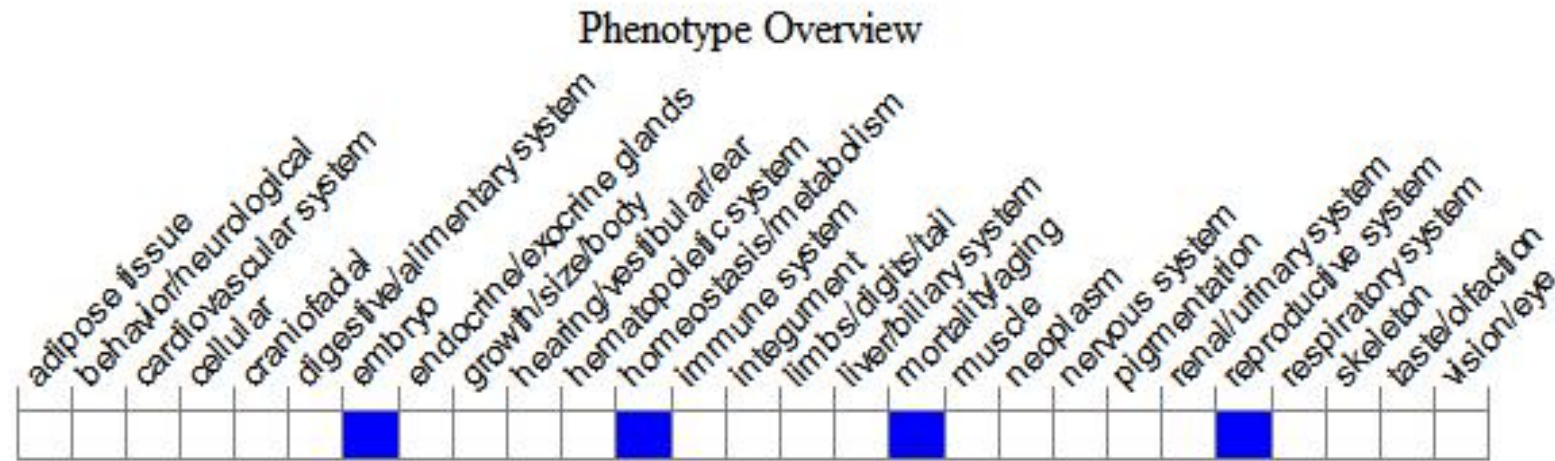
Genomic location distribution



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, embryos homozygous for a null mutation die before E6.5 and exhibit abnormal embryonic tissue morphology.

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