

***Cadm1* Cas9-KO Strategy**

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Project Overview

Project Name

Cadm1

Project type

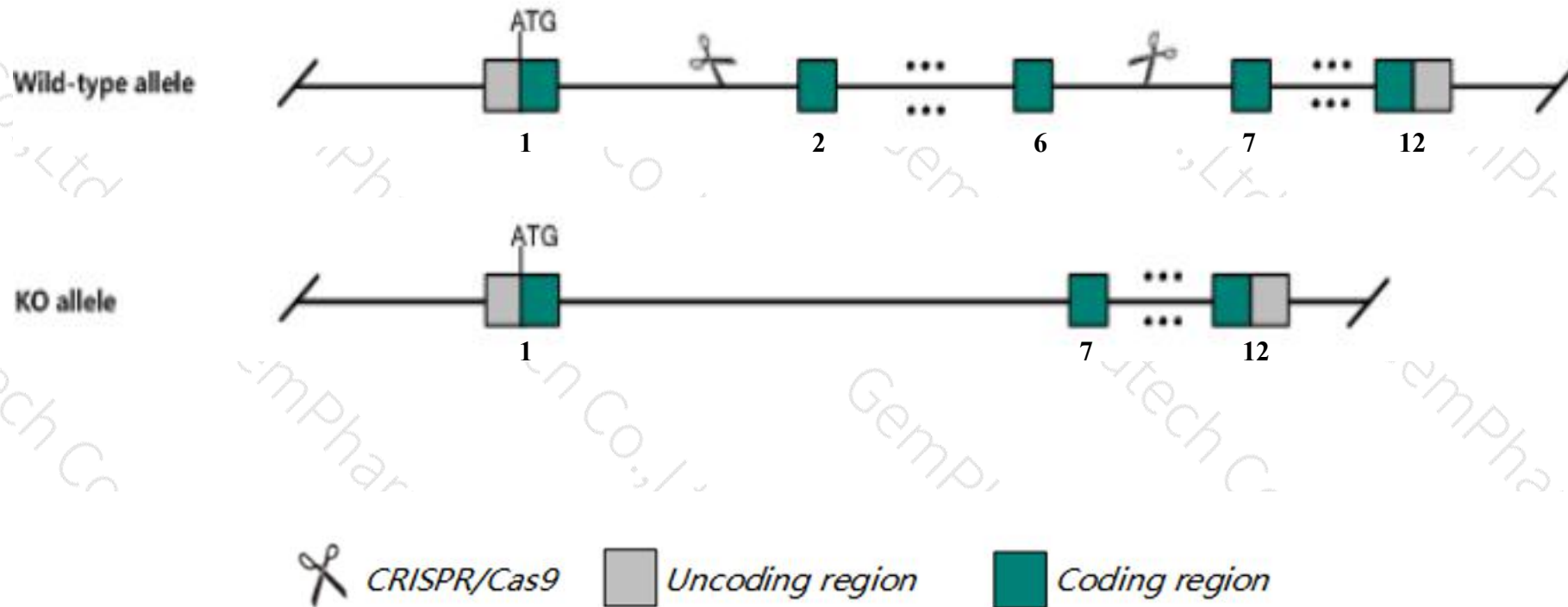
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cadm1* gene. The schematic diagram is as follows:



- The *Cadm1* gene has 11 transcripts. According to the structure of *Cadm1* gene, exon2-exon6 of *Cadm1*-209(ENSMUST00000152459.7) transcript is recommended as the knockout region. The region contains 697bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cadm1* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, homozygous mutant male show infertility due to block in maturation of spermatogenesis. Mice homozygous for a gene trap allele exhibit decreased body size, impaired T cell development, and impaired T cell response to anti-CD3/CD28 antibody stimulation.
- Transcript *Cadm1-210* may not be affected.
- The *Cadm1* 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)

Cadm1 cell adhesion molecule 1 [Mus musculus (house mouse)]

Gene ID: 54725, updated on 13-Mar-2020

Summary



Official Symbol	Cadm1 provided by MGI
Official Full Name	cell adhesion molecule 1 provided by MGI
Primary source	MGI:MGI:1889272
See related	Ensembl:ENSMUSG00000032076
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	2900073G06Rik, 3100001I08Rik, AI987920, Bl2, Igsf4, Igsf4a, Necl2, RA175, RA175A, RA175B, RA175C, RA175N, ST17, SgIGSF, SynCam, Tslc1
Expression	Broad expression in CNS E18 (RPKM 13.0), CNS E14 (RPKM 8.1) and 15 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

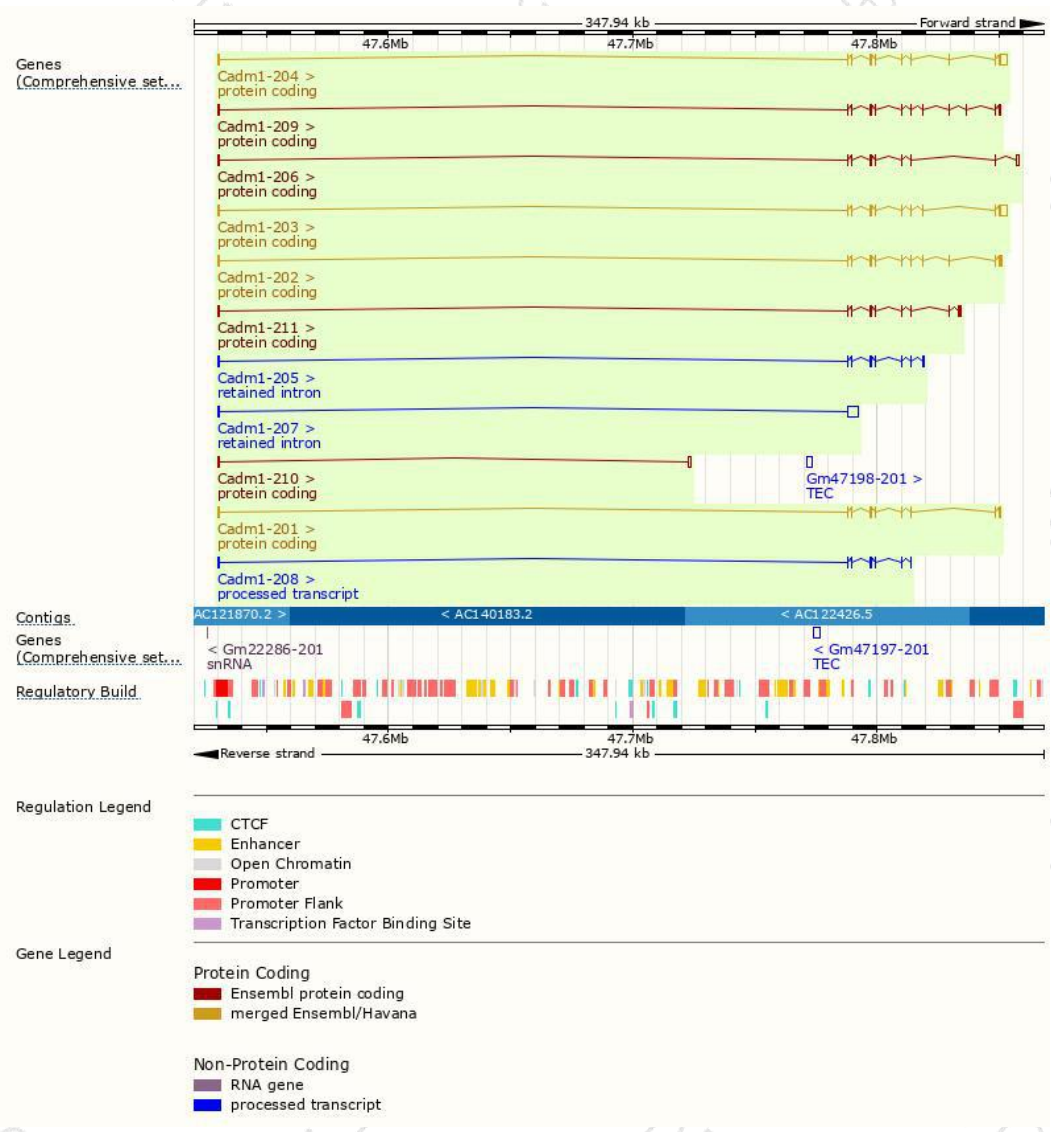
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cadm1-204	ENSMUST00000114548.7	4482	428aa	Protein coding	CCDS23150	Q8R5M8	TSL:1 GENCODE basic APPRIS ALT1
Cadm1-203	ENSMUST00000114547.7	4444	445aa	Protein coding	CCDS23148	Q8R5M8	TSL:1 GENCODE basic APPRIS ALT1
Cadm1-202	ENSMUST00000085909.8	2126	456aa	Protein coding	CCDS23149	Q8R5M8	TSL:1 GENCODE basic APPRIS P4
Cadm1-209	ENSMUST00000152459.7	1784	474aa	Protein coding	CCDS80990	E9PYN1	TSL:1 GENCODE basic APPRIS ALT1
Cadm1-201	ENSMUST00000034581.3	1254	417aa	Protein coding	CCDS23147	Q8R5M8	TSL:1 GENCODE basic APPRIS ALT1
Cadm1-206	ENSMUST00000143026.8	2121	390aa	Protein coding	-	E0CY16	TSL:5 GENCODE basic
Cadm1-211	ENSMUST00000239368.1	1937	361aa	Protein coding	-	-	GENCODE basic
Cadm1-210	ENSMUST00000214542.1	899	63aa	Protein coding	-	A0A1L1SS08	TSL:1 GENCODE basic
Cadm1-208	ENSMUST00000151624.1	1112	No protein	Processed transcript	-	-	TSL:1
Cadm1-207	ENSMUST00000148925.1	4767	No protein	Retained intron	-	-	TSL:1
Cadm1-205	ENSMUST00000124073.7	1371	No protein	Retained intron	-	-	TSL:1

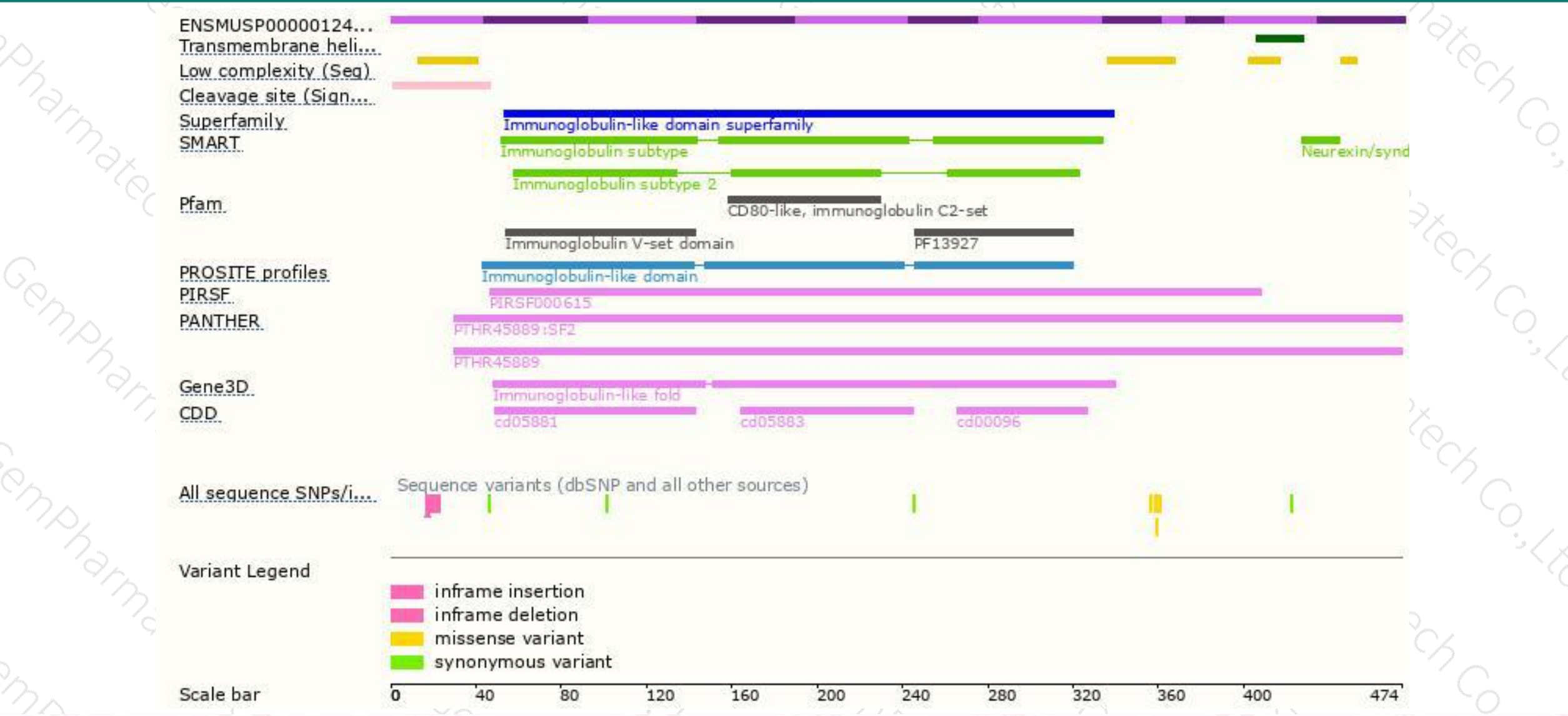
The strategy is based on the design of *Cadm1-209* transcript,the transcription is shown below:



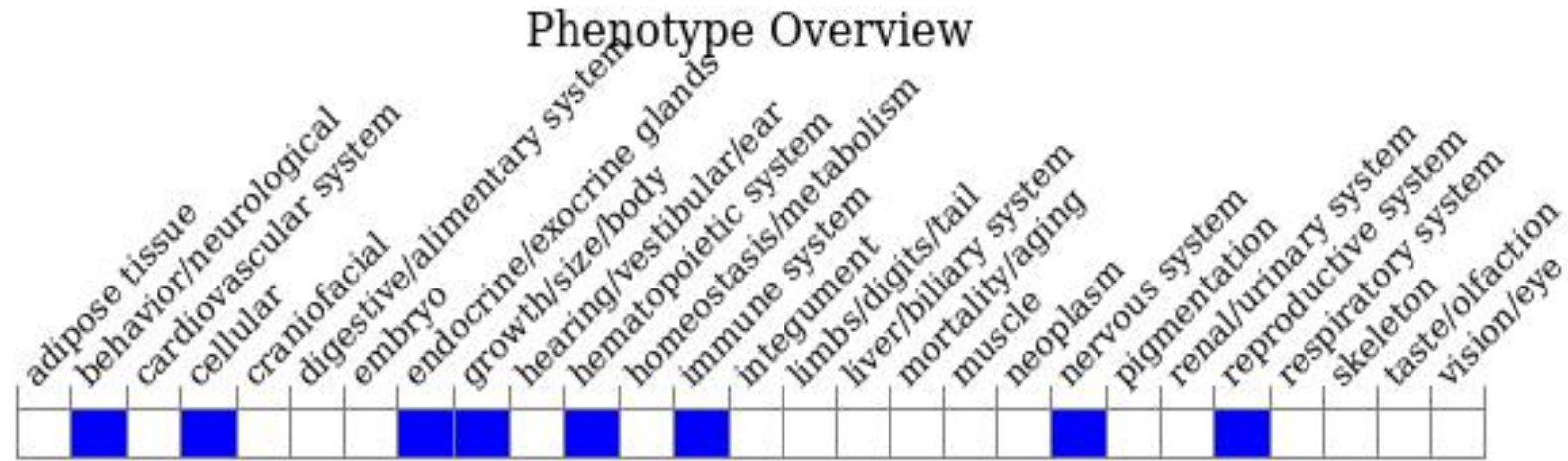
Genomic location distribution



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, homozygous mutant male show infertility due to block in maturation of spermatogenesis. Mice homozygous for a gene trap allele exhibit decreased body size, impaired T cell development, and impaired T cell response to anti-CD3/CD28 antibody stimulation.

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

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