

Mbd6 Cas9-CKO Strategy

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Overview

Target Gene Name

- *Mbd6*

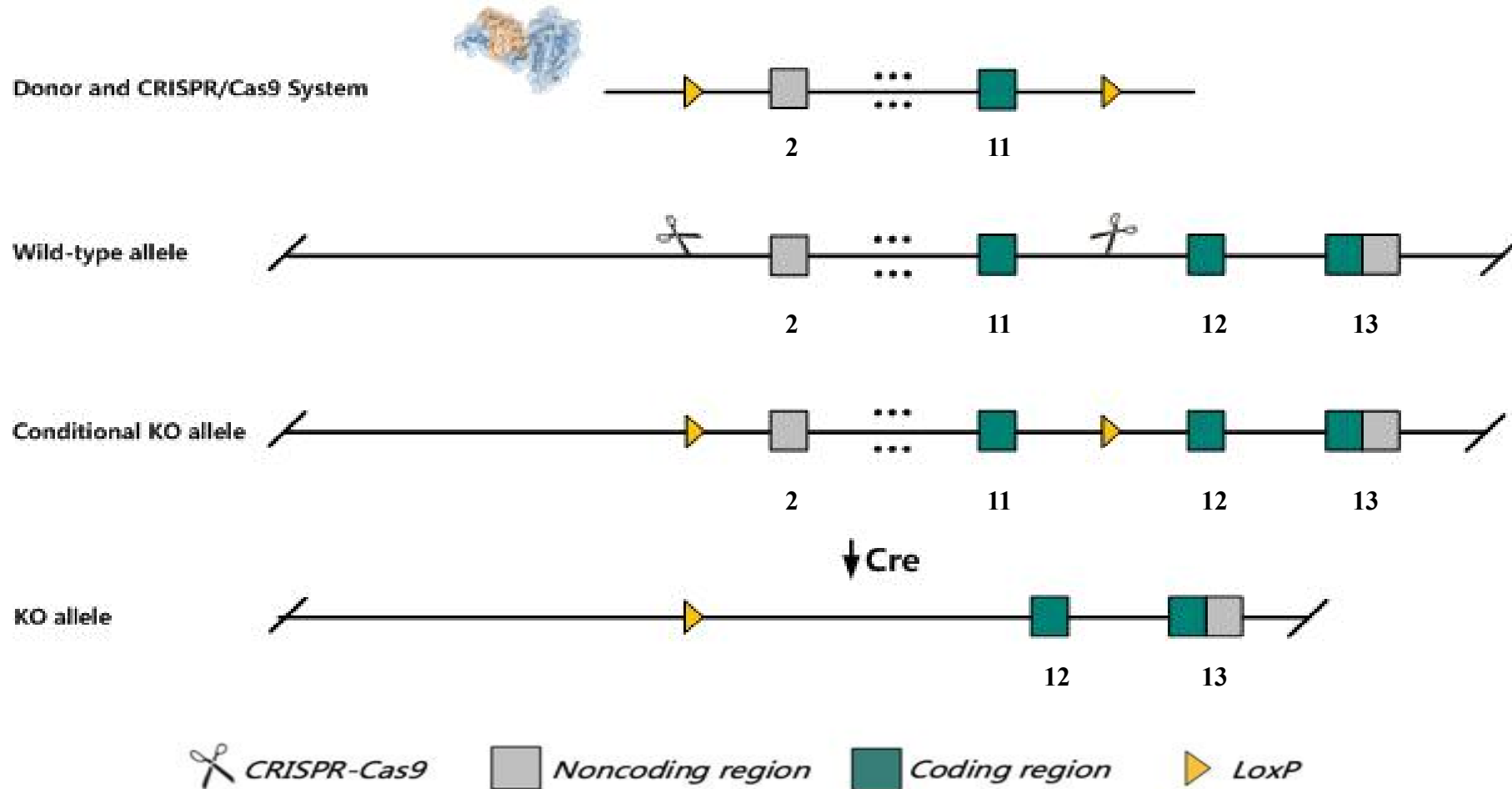
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Mbd6* gene.

Technical Information

- The *Mbd6* gene has 7 transcripts. According to the structure of *Mbd6* gene, exon2-exon11 of *Mbd6*-201 (ENSMUST00000026476.13) transcript is recommended as the knockout region. The region contains the most coding sequence of *Mbd6*-201. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Mbd6* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.

Gene Information

Mbd6 methyl-CpG binding domain protein 6 [*Mus musculus* (house mouse)]

[Download Datasets](#)

Gene ID: 110962, updated on 17-Aug-2024

Summary

Official Symbol	Mbd6 <small>provided by MGI</small>
Official Full Name	methyl-CpG binding domain protein 6 <small>provided by MGI</small>
Primary source	MGI:MGI:106378
See related	Ensembl:ENSMUSG00000025409 AllianceGenome:MGI:106378
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	D10Wsu93e
Summary	Predicted to enable chromatin binding activity. Predicted to be located in fibrillar center and nucleoplasm. Predicted to be active in chromocenter and nucleus. Is expressed in several structures, including adipose tissue; alimentary system; immune system; nervous system; and reproductive system. Human ortholog(s) of this gene implicated in autism spectrum disorder. Orthologous to human MBD6 (methyl-CpG binding domain protein 6). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in adrenal adult (RPKM 36.9), thymus adult (RPKM 30.4) and 28 other tissues See more
Orthologs	human all
NEW	Try the new Gene table Try the new Transcript table

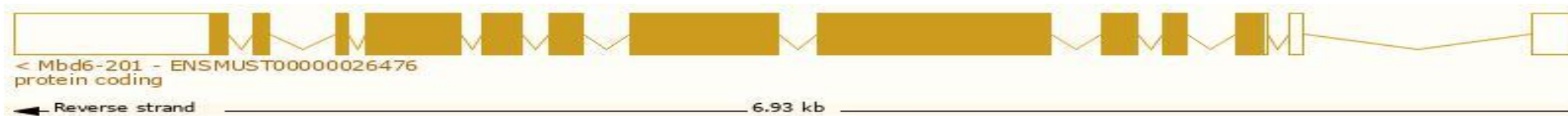
Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 7 transcripts, all transcripts are shown below:

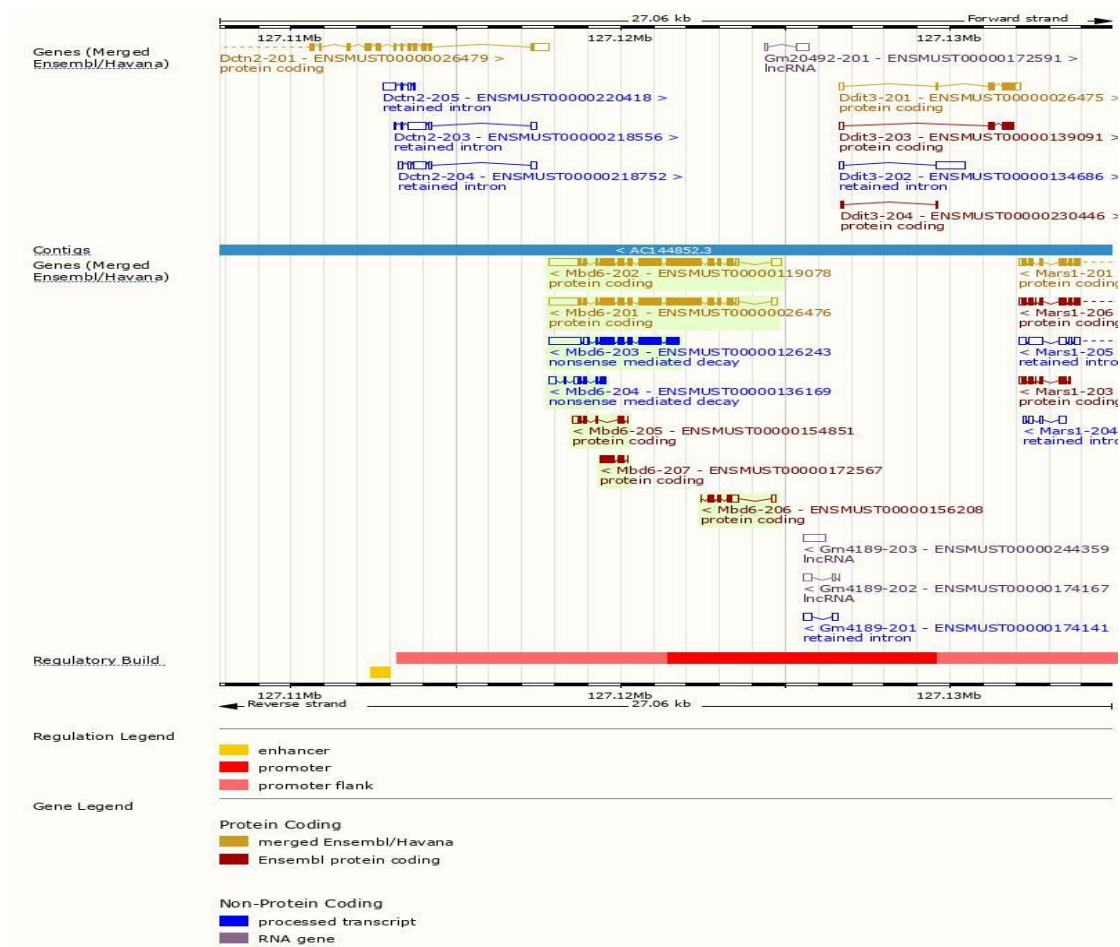
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000026476.13	Mbd6-201	4165	1005aa	Protein coding	CCDS24235	E9Q572	Ensembl Canonical Gencode basic APPRIS ALT1 TSL:5
ENSMUST000000119078.8	Mbd6-202	4287	1003aa	Protein coding	CCDS83762	Q3TY92	Gencode basic APPRIS P4 TSL:1
ENSMUST000000156208.2	Mbd6-206	711	130aa	Protein coding		D3YV97	TSL:3 CDS 3' incomplete
ENSMUST000000172567.3	Mbd6-207	624	208aa	Protein coding		G3UZJ8	TSL:2 CDS 5' and 3' incomplete
ENSMUST000000154851.2	Mbd6-205	543	128aa	Protein coding		G3UXV1	TSL:3 CDS 5' incomplete
ENSMUST000000126243.9	Mbd6-203	2909	613aa	Nonsense mediated decay		F6S711	TSL:5 CDS 5' incomplete
ENSMUST000000136169.8	Mbd6-204	717	111aa	Nonsense mediated decay		F7CV40	TSL:1 CDS 5' incomplete

The strategy is based on the design of *Mbd6-201* transcript, the transcription is shown below:

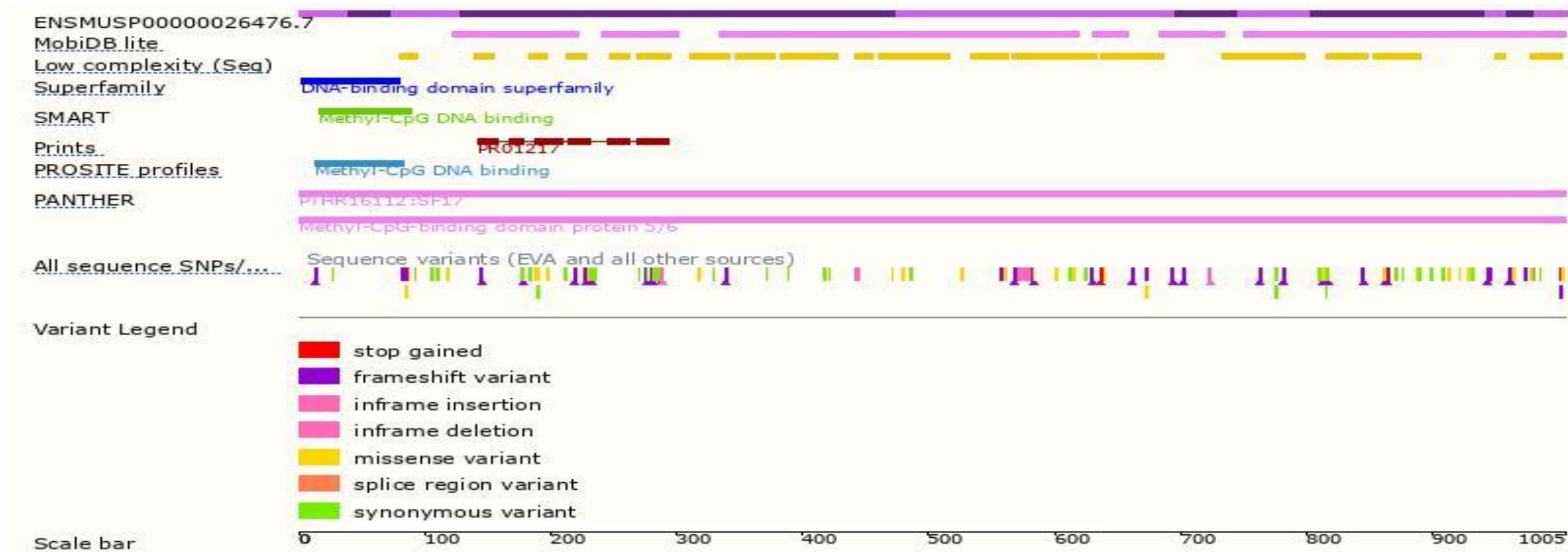


Source: <https://www.ensembl.org>

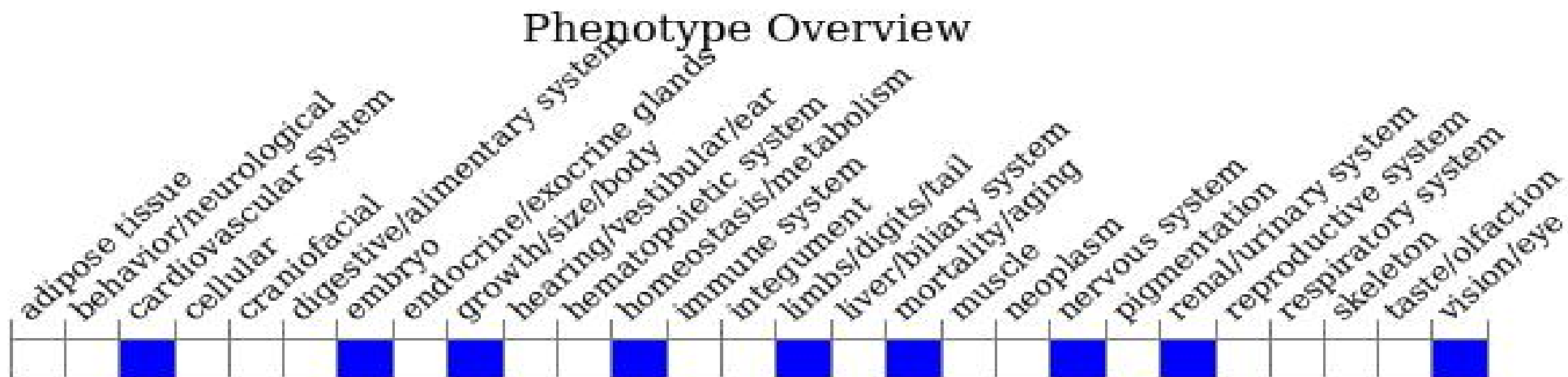
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



Important Information

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit preweaning lethality.
- The intron 11-12 of *Mbd6-201* is 303 bp, the loxp insertion may affect the regulation of this gene.
- The knockout region is about 1.6 kb away from the 3' of the *Gm4189* gene and is about 0.5 kb away from the 5' of the *Gm20492-201* gene, which may affect the regulation of these gene.
- The The knockout region is about 2.8 kb away from the 5' of the *Ddit3* gene and is 1.3 kb away from the 3' of the *Dctn2-201*, which may affect the regulation of these gene.
- *Mbd6* is located on Chr10. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 the existing technology level.