

# *Mbd2* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

*Mbd2*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mbd2* gene. The schematic diagram is as follows:



- The *Mbd2* gene has 5 transcripts. According to the structure of *Mbd2* gene, exon2 of *Mbd2-201* (ENSMUST00000074058.10) transcript is recommended as the knockout region. The region contains 160bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mbd2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for disruption in this gene are grossly normal. Maternal nurturing problems exist however and they are somewhat resistant to tumor development.
- The *Mbd2* gene is located on the Chr18. 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)

## Mbd2 methyl-CpG binding domain protein 2 [Mus musculus (house mouse)]

Gene ID: 17191, updated on 31-Jan-2019

### Summary



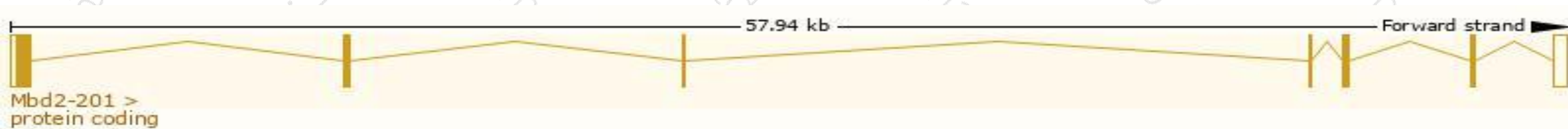
<b>Official Symbol</b>	Mbd2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	methyl-CpG binding domain protein 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1333813</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000024513</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	MBD2a
<b>Expression</b>	Ubiquitous expression in bladder adult (RPKM 26.7), liver E14 (RPKM 24.5) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

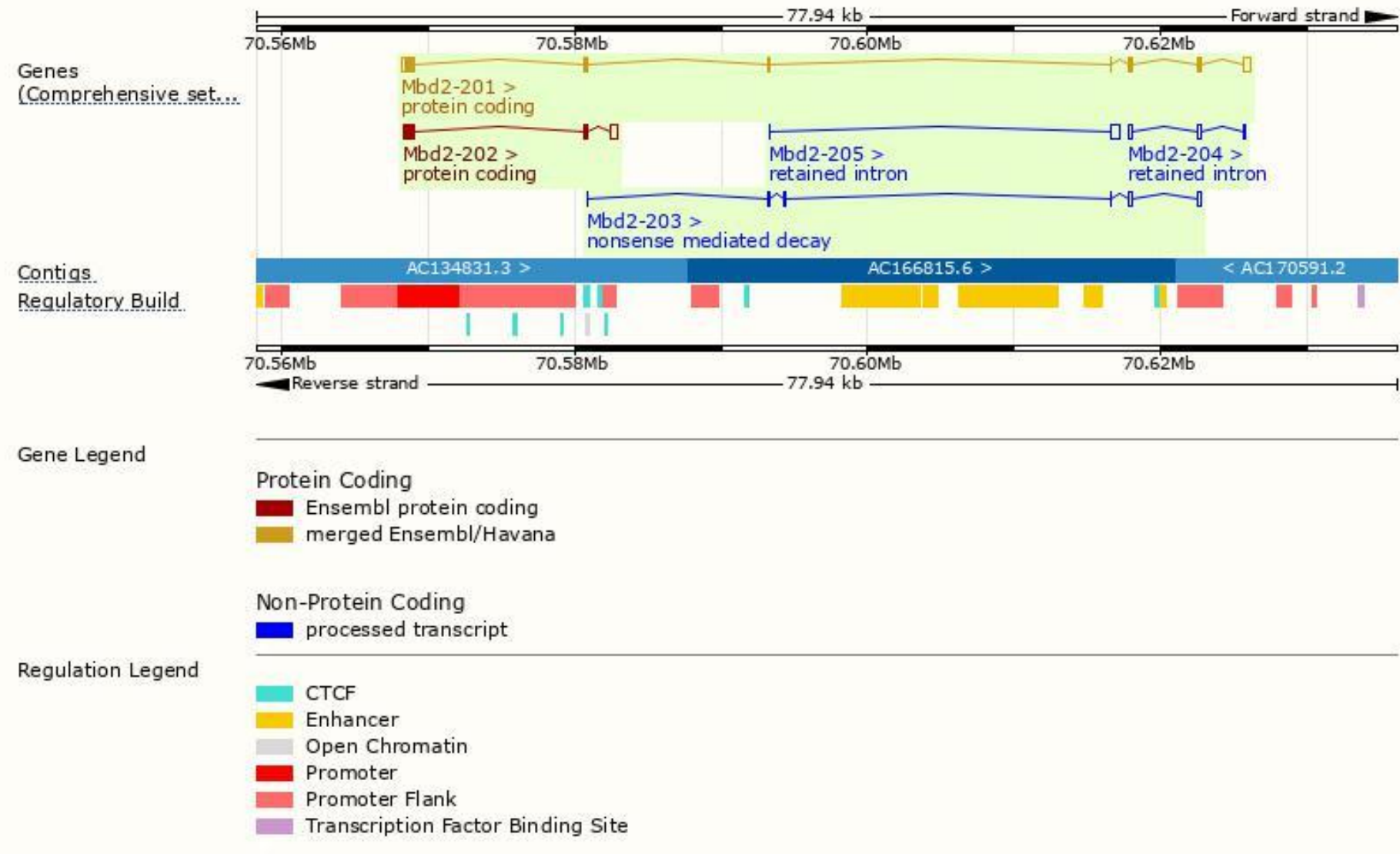
The gene has 5 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mbd2-201	<a href="#">ENSMUST00000074058.10</a>	1953	<a href="#">414aa</a>	Protein coding	<a href="#">CCDS29335</a>	<a href="#">Q9Z2E1</a>	TSL:1 GENCODE basic APPRIS P1
Mbd2-202	<a href="#">ENSMUST00000114946.3</a>	1290	<a href="#">249aa</a>	Protein coding	<a href="#">CCDS79661</a>	<a href="#">Q9Z2E1</a>	TSL:1 GENCODE basic
Mbd2-203	<a href="#">ENSMUST00000127260.7</a>	694	<a href="#">72aa</a>	Nonsense mediated decay	-	<a href="#">F6UPR7</a>	CDS 5' incomplete TSL:3
Mbd2-205	<a href="#">ENSMUST00000133889.1</a>	755	No protein	Retained intron	-	-	TSL:2
Mbd2-204	<a href="#">ENSMUST00000128555.1</a>	494	No protein	Retained intron	-	-	TSL:2

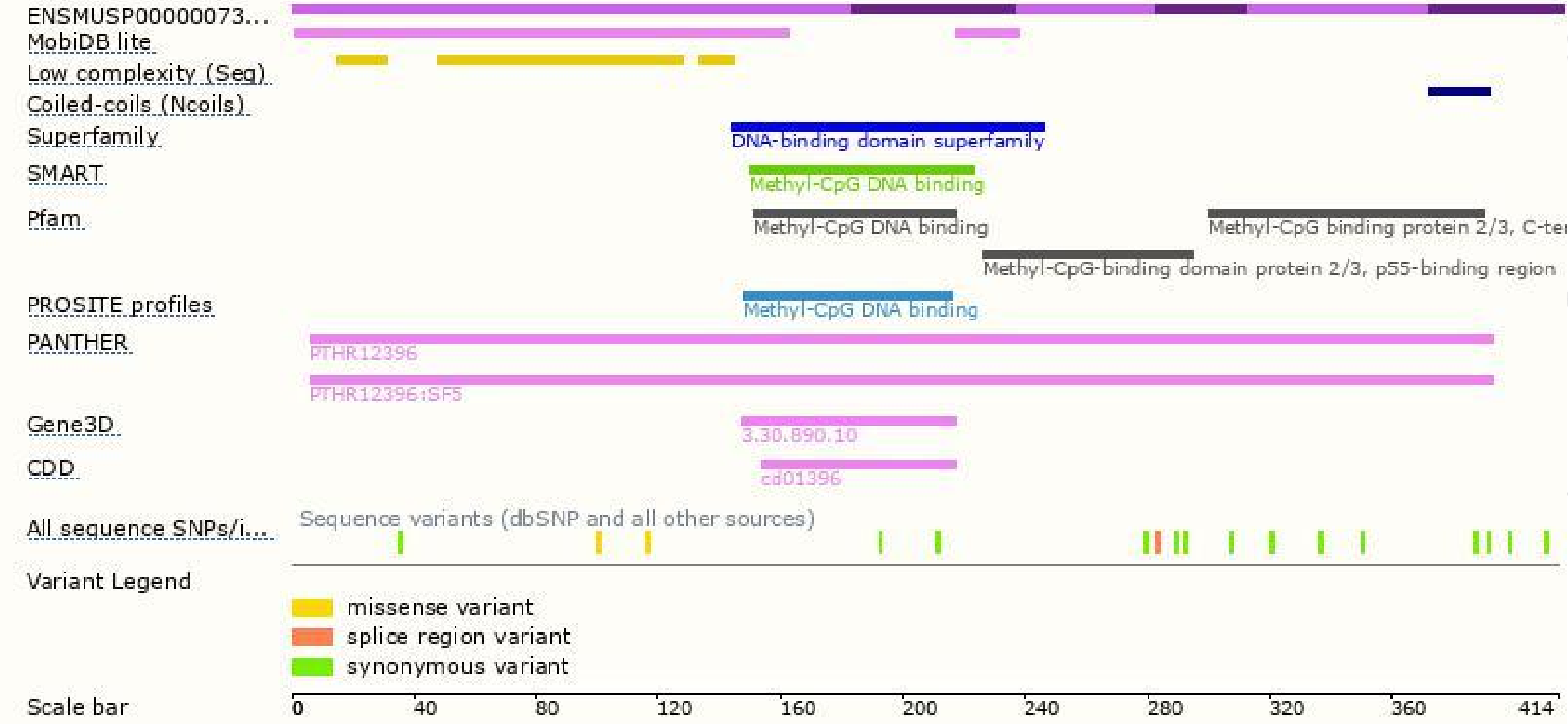
The strategy is based on the design of *Mbd2-201* transcript, The transcription is shown below



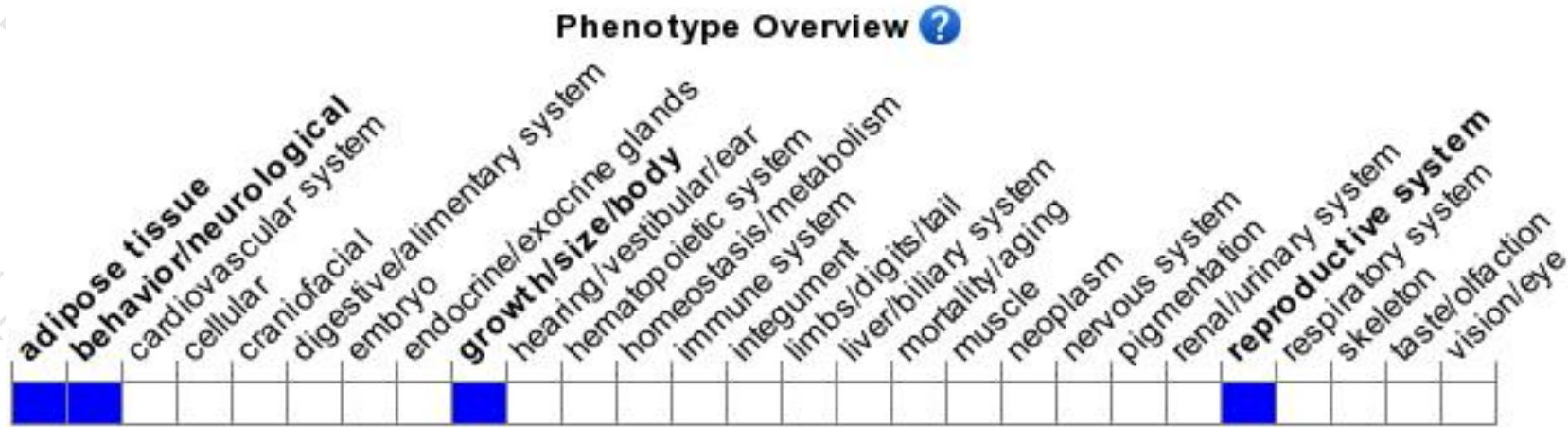
# Genomic location distribution



# 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 disruption in this gene are grossly normal. Maternal nurturing problems exist however and they are somewhat resistant to tumor development.

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

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