

# *Mecp2* Cas9-KO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

*Mecp2*

**Project type**

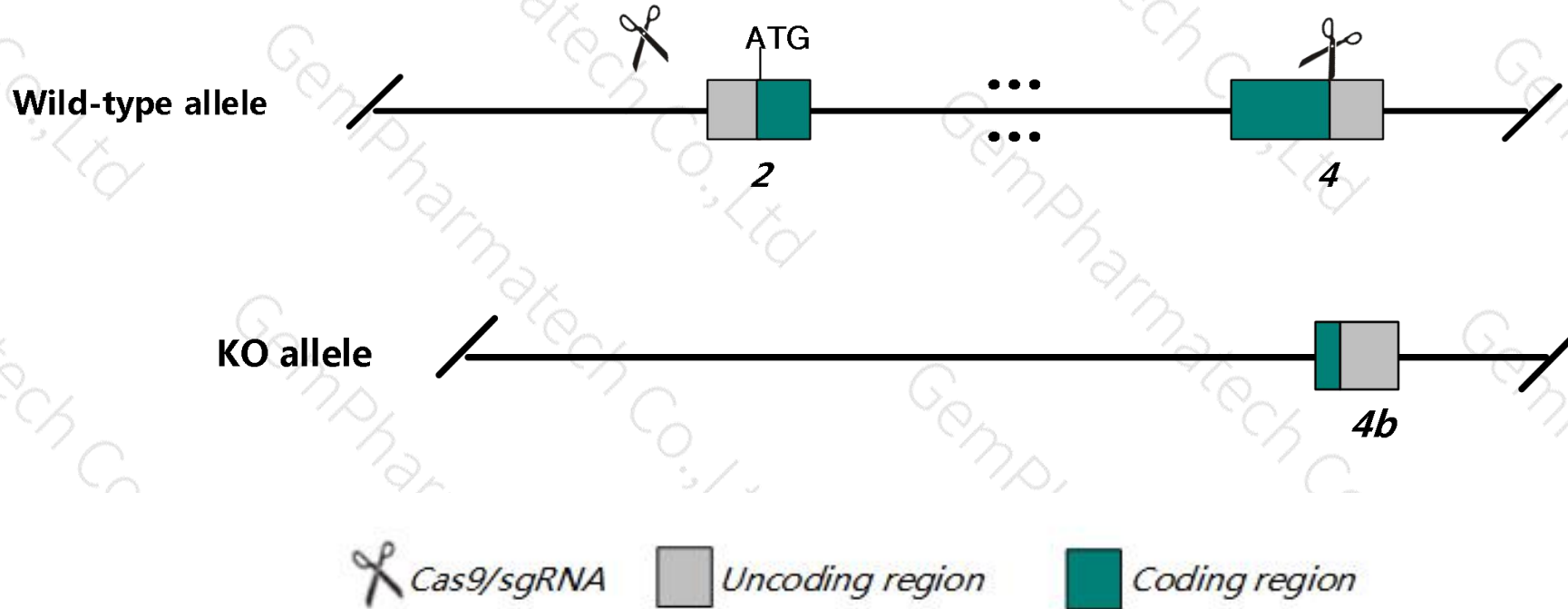
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mecp2* gene. The schematic diagram is as follows:



- The *Mecp2* gene has 6 transcripts. According to the structure of *Mecp2* gene, exon2-3、 part of exon4 of *Mecp2-202* (ENSMUST00000100750.9) transcript is the knockout region. The region contains all of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mecp2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Female mice homozygous or male mice hemizygous for a null allele exhibit premature death, behavioral and neurological abnormalities, abnormal nervous system phenotypes, abnormal breathing, and abnormal hearing. Heterozygous mice exhibit similar behavioral and neurological abnormalities.
- The *Mecp2* gene is located on the ChrX. 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)

## Mecp2 methyl CpG binding protein 2 [Mus musculus (house mouse)]

Gene ID: 17257, updated on 9-Apr-2019

### Summary



<b>Official Symbol</b>	Mecp2 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	methyl CpG binding protein 2 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:99918</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000031393</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>	1500041B07Rik, D630021H01Rik, Mbd5, WBP10
<b>Expression</b>	Ubiquitous expression in whole brain E14.5 (RPKM 8.6), CNS E18 (RPKM 7.6) and 26 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

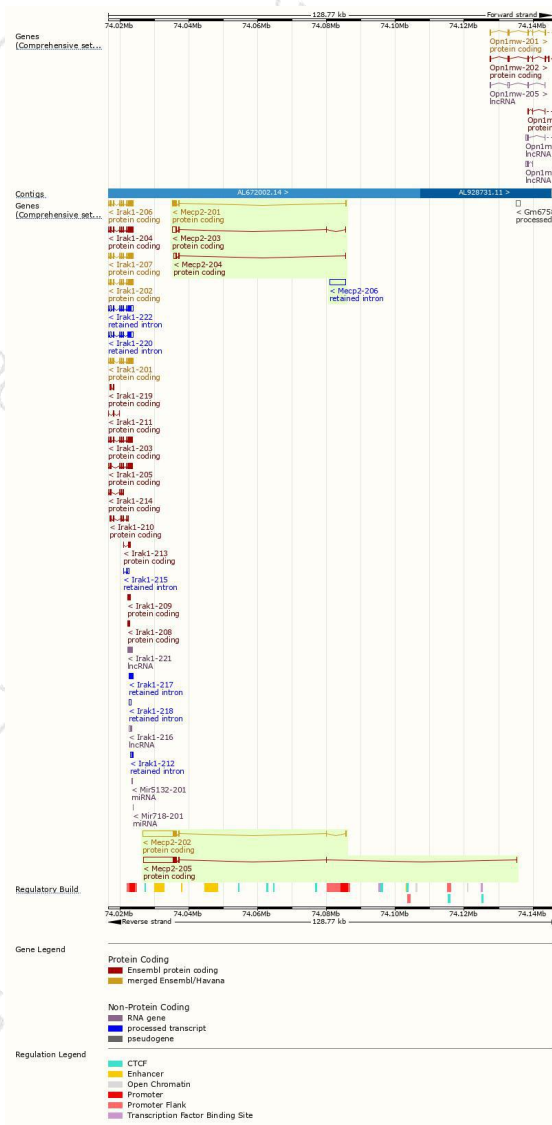
The gene has 6 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mecp2-202	<a href="#">ENSMUST00000100750.9</a>	10538	<a href="#">484aa</a>	Protein coding	<a href="#">CCDS41017</a>	<a href="#">Q9Z2D6</a>	TSL:1 GENCODE basic APPRIS ALT2
Mecp2-205	<a href="#">ENSMUST00000170481.8</a>	10175	<a href="#">484aa</a>	Protein coding	<a href="#">CCDS41017</a>	<a href="#">Q9Z2D6</a>	TSL:5 GENCODE basic APPRIS ALT2
Mecp2-201	<a href="#">ENSMUST00000033770.12</a>	1739	<a href="#">501aa</a>	Protein coding	<a href="#">CCDS41016</a>	<a href="#">Q9Z2D6</a>	TSL:1 GENCODE basic APPRIS P4
Mecp2-203	<a href="#">ENSMUST00000123362.7</a>	1675	<a href="#">172aa</a>	Protein coding	-	<a href="#">D3YY81</a>	TSL:5 GENCODE basic
Mecp2-204	<a href="#">ENSMUST00000140399.2</a>	1168	<a href="#">189aa</a>	Protein coding	-	<a href="#">D3Z7U4</a>	TSL:5 GENCODE basic
Mecp2-206	<a href="#">ENSMUST00000198358.1</a>	4563	No protein	Retained intron	-	-	TSL:NA

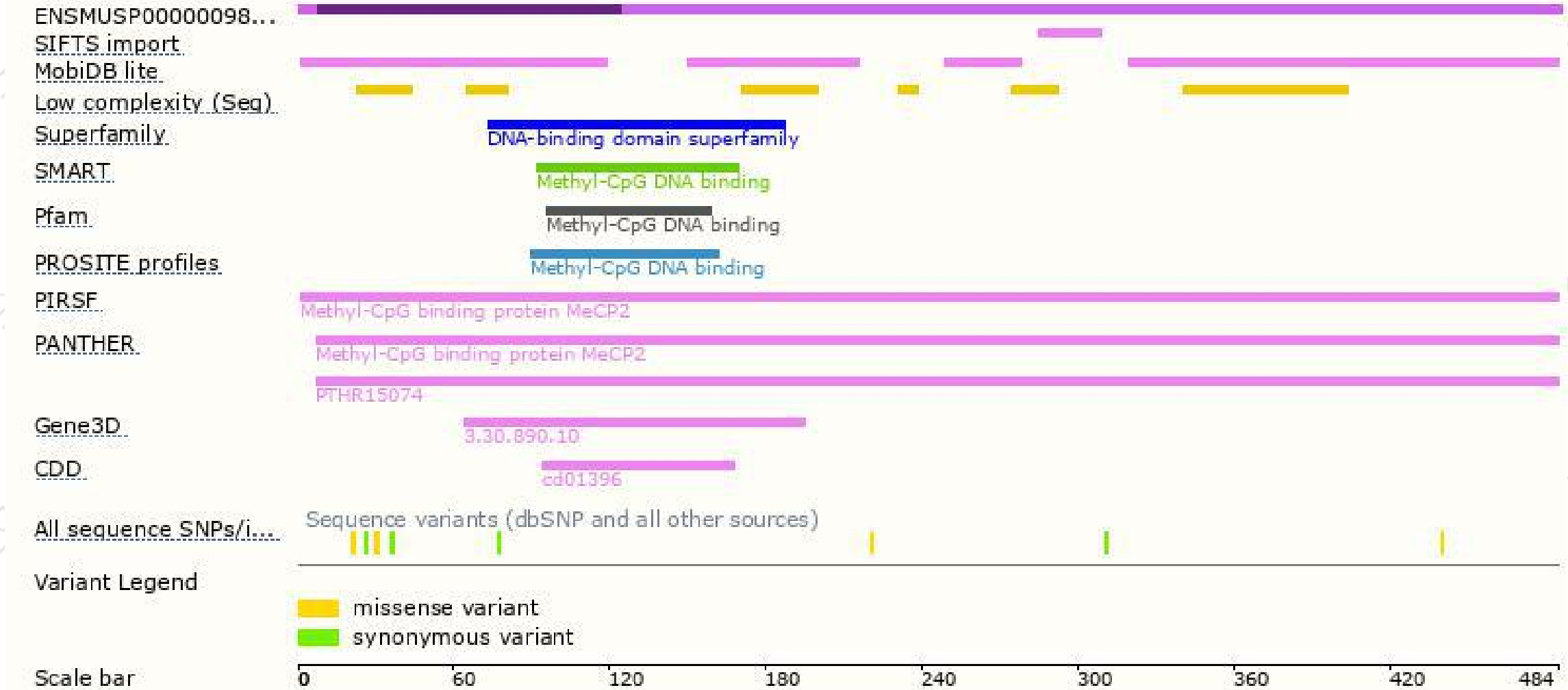
The strategy is based on the design of *Mecp2-202* transcript, The transcription is shown below



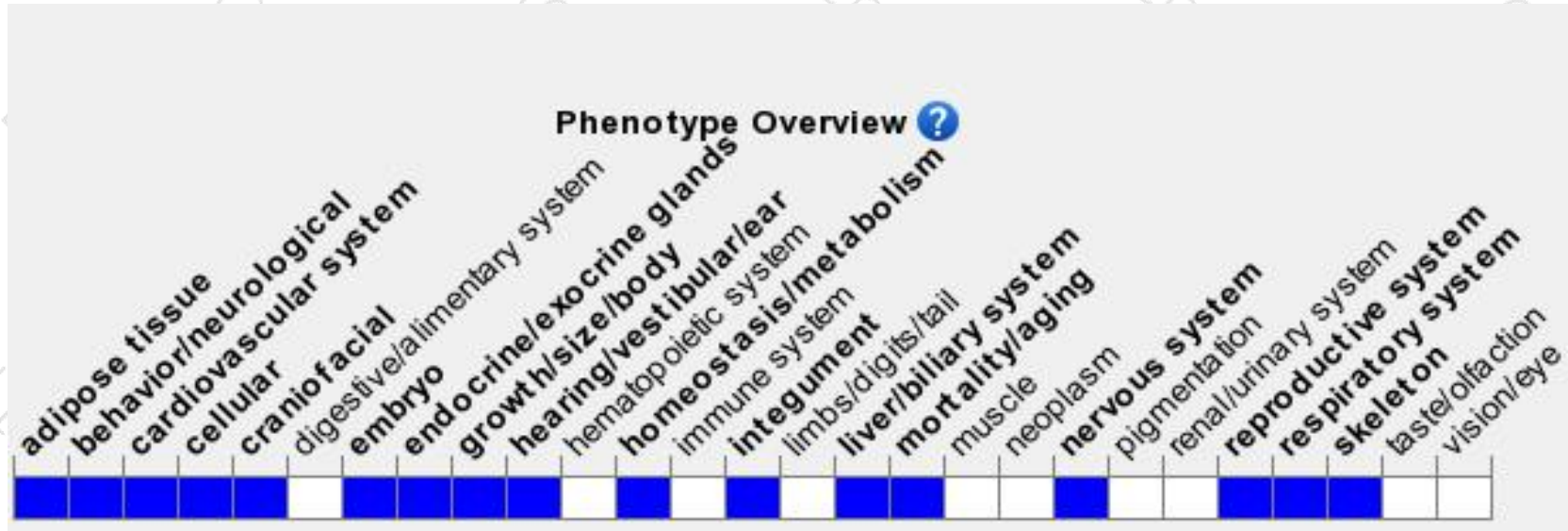
# Genomic location distribution



# 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, Female mice homozygous or male mice hemizygous for a null allele exhibit premature death, behavioral and neurological abnormalities, abnormal nervous system phenotypes, abnormal breathing, and abnormal hearing. Heterozygous mice exhibit similar behavioral and neurological abnormalities.