

# *Creb1* Cas9-KO Strategy

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**Design Date:** 2019-7-17

# Project Overview



**Project Name**

***Creb1***

**Project type**

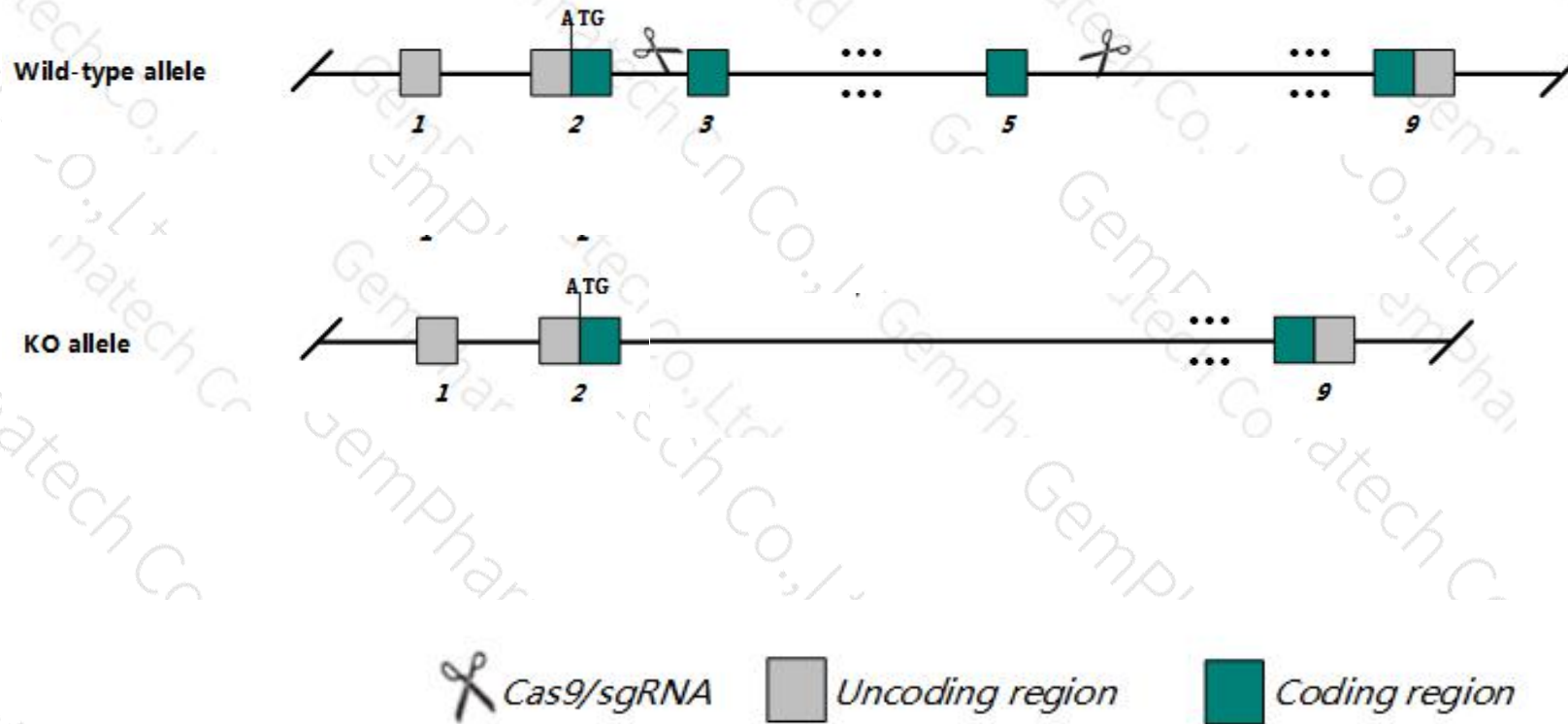
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Creb1* gene. The schematic diagram is as follows:



- The *Creb1* gene has 11 transcripts. According to the structure of *Creb1* gene, exon3-exon4 of *Creb1-201* (ENSMUST00000049932.11) transcript is recommended as the knockout region. The region contains 248bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Creb1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for alleles lacking some or all isotypes exhibit a range of defects involving circadian rhythms, axonal growth, sensory neuron survival, long-term memory, fear conditioning, body size, respiration, and neonatal viability.
- The *Creb1* gene is located on the Chr1. 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)

## Creb1 cAMP responsive element binding protein 1 [Mus musculus (house mouse)]

Gene ID: 12912, updated on 7-Apr-2019

### Summary



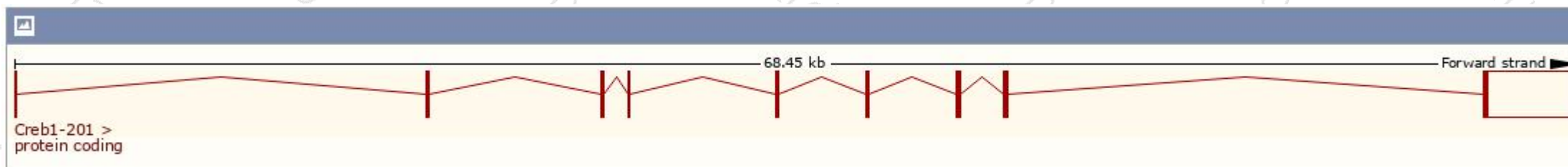
<b>Official Symbol</b>	Creb1 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	cAMP responsive element binding protein 1 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:88494</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000025958</a>
<b>Gene type</b>	protein coding
<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>	2310001E10Rik, 3526402H21Rik, AV083133, Creb, Creb-1
<b>Expression</b>	Ubiquitous expression in CNS E11.5 (RPKM 5.1), thymus adult (RPKM 4.9) and 28 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

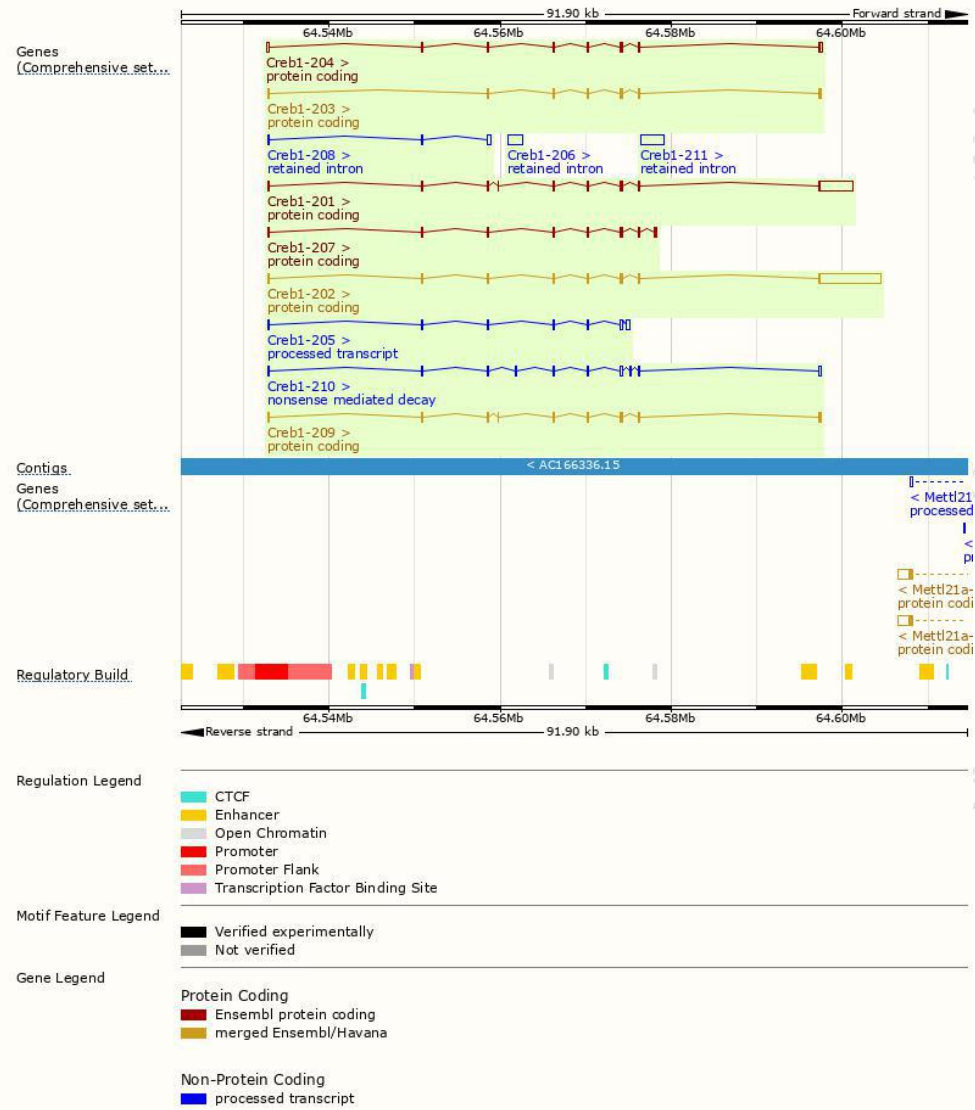
The gene has 11 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Creb1-202	<a href="#">ENSMUST00000087366.10</a>	8364	<a href="#">327aa</a>	Protein coding	<a href="#">CCDS15005</a>	<a href="#">Q01147 Q543W0</a>	TSL:1 GENCODE basic APPRIS ALT1
Creb1-201	<a href="#">ENSMUST00000049932.11</a>	5009	<a href="#">341aa</a>	Protein coding	<a href="#">CCDS15004</a>	<a href="#">Q01147 Q547S9</a>	TSL:5 GENCODE basic APPRIS P4
Creb1-204	<a href="#">ENSMUST00000185594.6</a>	1569	<a href="#">327aa</a>	Protein coding	<a href="#">CCDS15005</a>	<a href="#">Q01147 Q543W0</a>	TSL:5 GENCODE basic APPRIS ALT1
Creb1-203	<a href="#">ENSMUST00000171164.7</a>	1287	<a href="#">287aa</a>	Protein coding	<a href="#">CCDS48280</a>	<a href="#">Q62347</a>	TSL:1 GENCODE basic
Creb1-209	<a href="#">ENSMUST00000190348.1</a>	1260	<a href="#">341aa</a>	Protein coding	<a href="#">CCDS15004</a>	<a href="#">Q01147 Q547S9</a>	TSL:1 GENCODE basic APPRIS P4
Creb1-207	<a href="#">ENSMUST00000187811.6</a>	1255	<a href="#">317aa</a>	Protein coding	-	<a href="#">A0A087WR16</a>	TSL:1 GENCODE basic
Creb1-210	<a href="#">ENSMUST00000190876.6</a>	1420	<a href="#">90aa</a>	Nonsense mediated decay	-	<a href="#">Q61441</a>	TSL:5
Creb1-205	<a href="#">ENSMUST00000186335.6</a>	1288	No protein	Processed transcript	-	-	TSL:1
Creb1-211	<a href="#">ENSMUST00000190979.1</a>	2763	No protein	Retained intron	-	-	TSL:NA
Creb1-206	<a href="#">ENSMUST00000187035.1</a>	1642	No protein	Retained intron	-	-	TSL:NA
Creb1-208	<a href="#">ENSMUST00000188855.6</a>	660	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Creb1-201* transcript, The transcription is shown below

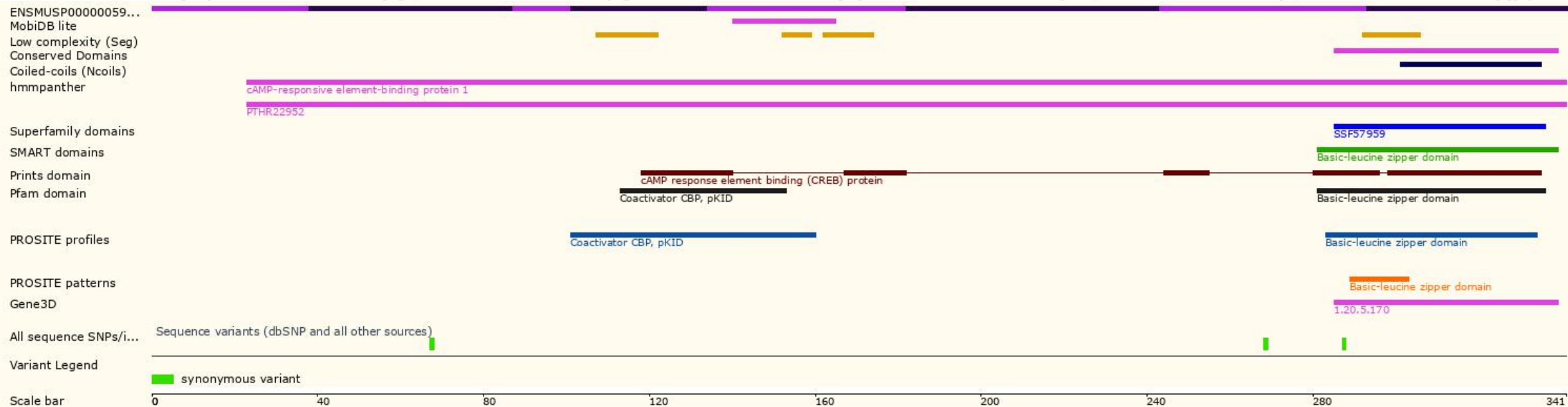


# Genomic location distribution

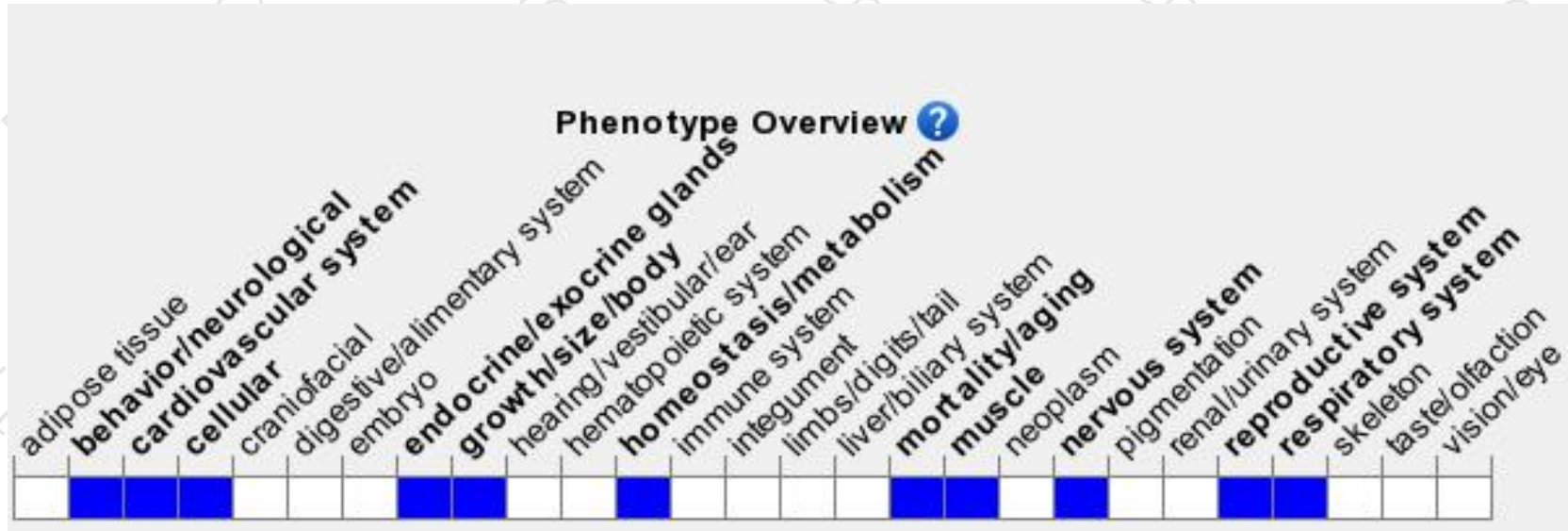




# Protein domain



# 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 alleles lacking some or all isotypes exhibit a range of defects involving circadian rhythms, axonal growth, sensory neuron survival, long-term memory, fear conditioning, body size respiration, and neonatal viability.

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

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