Mbd1 Cas9-CKO Strategy

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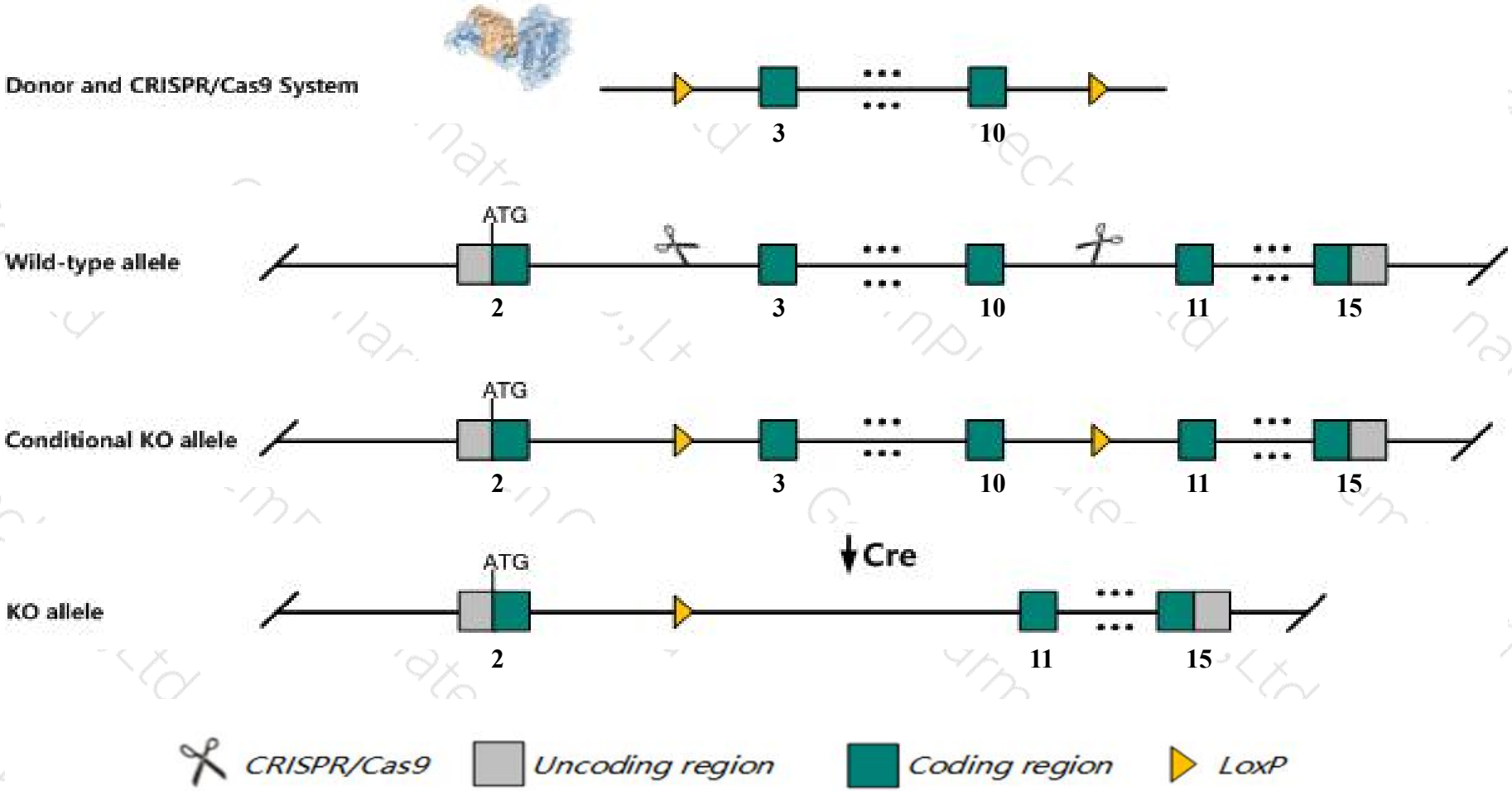
Project Overview

Project Name	***Mbd1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mbd1* gene. The schematic diagram is as follows:



Technical routes

- The *Mbd1* gene has 6 transcripts. According to the structure of *Mbd1* gene, exon3-exon10 of *Mbd1-201* (ENSMUST00000097530.4) transcript is recommended as the knockout region.The region contains 946bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Mbd1* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

- 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.

Notice

- According to the existing MGI data,Homozygous null exhibited defects in adult hippocampal neurogenesis and function. Spatial learning was also impaired in mutant mice.

- The *Mbd1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Mbd1 methyl-CpG binding domain protein 1 [Mus musculus (house mouse)]

Gene ID: 17190, updated on 31-Jan-2019

Summary

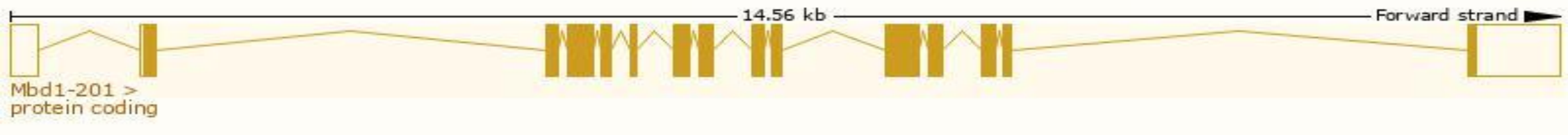
Official Symbol	Mbd1 provided by MGI
Official Full Name	methyl-CpG binding domain protein 1 provided by MGI
Primary source	MGI:MGI:1333811
See related	Ensembl:ENSMUSG00000024561
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Cxxc3, PCM1
Expression	Ubiquitous expression in thymus adult (RPKM 15.4), genital fat pad adult (RPKM 13.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

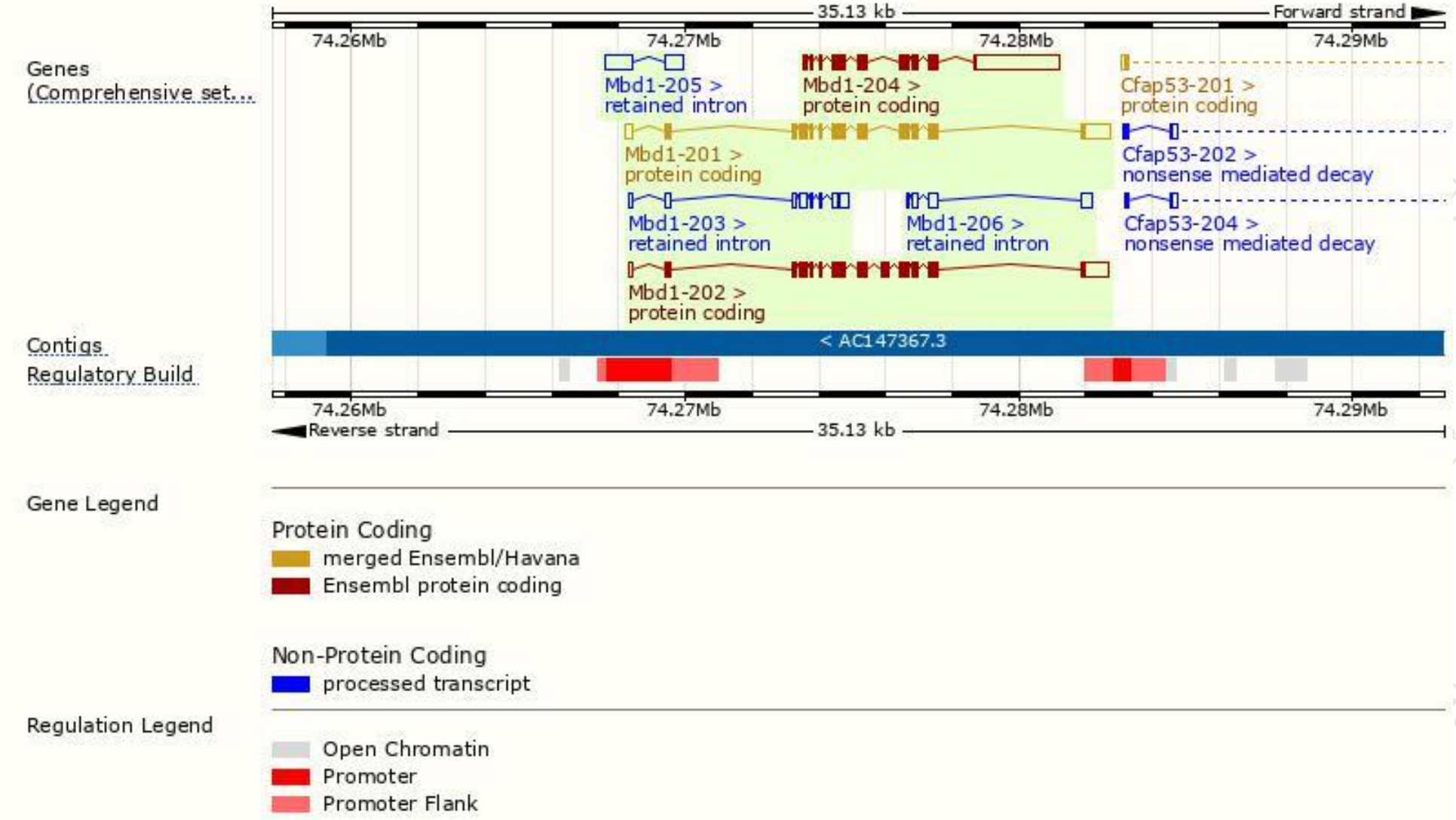
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mbd1-201	ENSMUST00000097530.4	2833	588aa	Protein coding	CCDS50321	A0A0R4J159	TSL:1 GENCODE basic
Mbd1-204	ENSMUST00000224332.1	3920	467aa	Protein coding	-	A0A286YCP6	CDS 5' incomplete
Mbd1-202	ENSMUST00000224047.1	2838	644aa	Protein coding	-	A0A286YDI1	GENCODE basic APPRIS P1
Mbd1-205	ENSMUST00000224907.1	1349	No protein	Retained intron	-	-	
Mbd1-203	ENSMUST00000224159.1	1145	No protein	Retained intron	-	-	
Mbd1-206	ENSMUST00000237568.1	796	No protein	Retained intron	-	-	

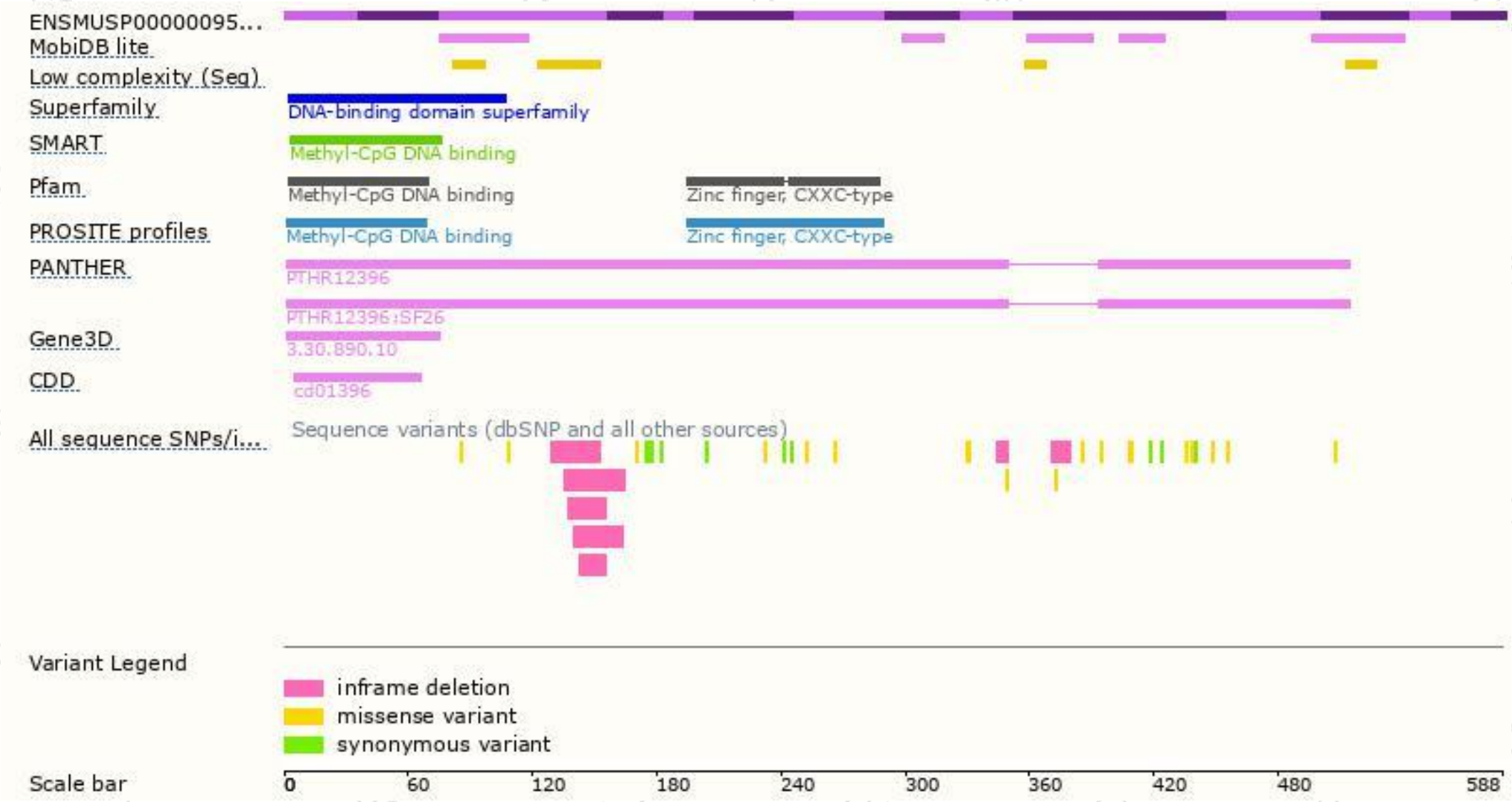
The strategy is based on the design of *Mbd1-201* transcript,The transcription is shown below



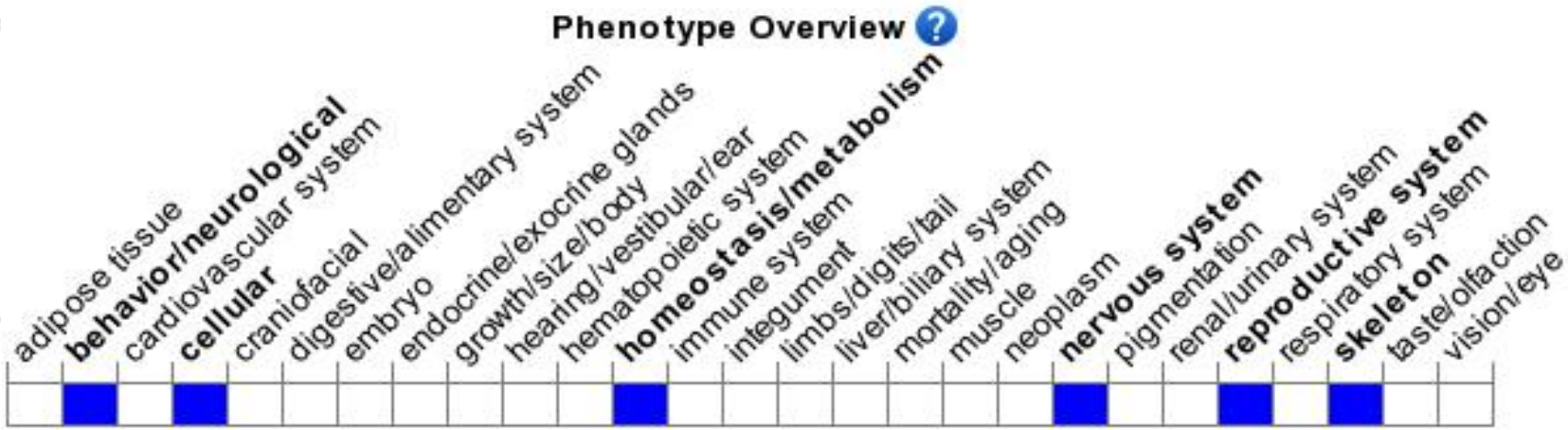
Genomic location distribution



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/).

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

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