

Prkacb Cas9-CKO Strategy

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Reviewer:

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Design Date:

2019-12-17

Project Overview

Project Name

Prkacb

Project type

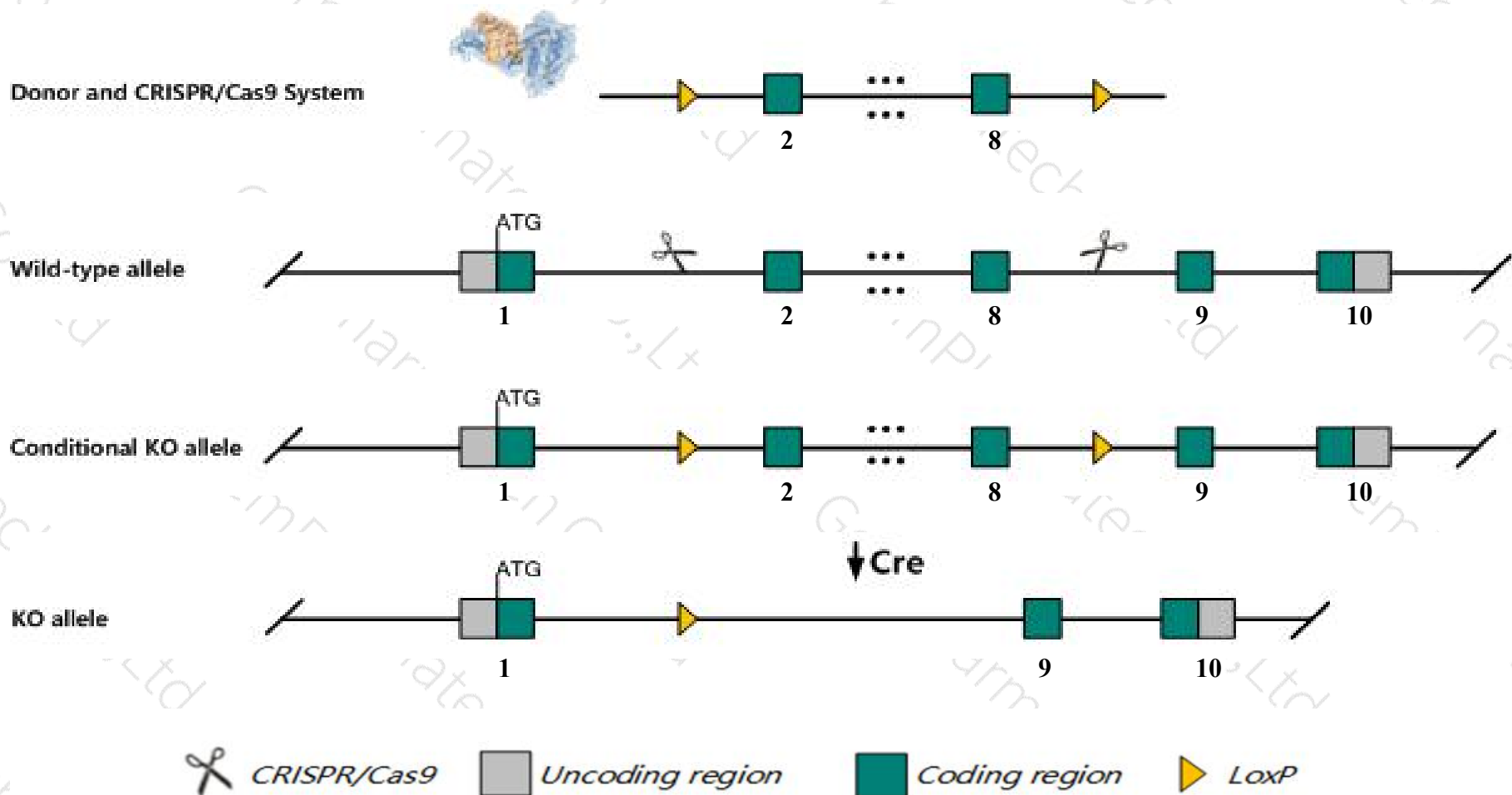
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Prkacb* gene has 8 transcripts. According to the structure of *Prkacb* gene, exon2-exon8 of *Prkacb*-202 (ENSMUST00000102515.9) transcript is recommended as the knockout region. The region contains 719bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prkacb* 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.

- According to the existing MGI data, Homozygotes for a targeted null mutation eliminating the Cbeta1 subunit exhibit impaired hippocampal plasticity, including failure of low frequency stimulation to produce lasting depression and the elimination of mossy fiber long term potentiation.
- The *Prkacb* gene is located on the Chr3. 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)

Prkacb protein kinase, cAMP dependent, catalytic, beta [Mus musculus (house mouse)]

Gene ID: 18749, updated on 7-Apr-2019

Summary



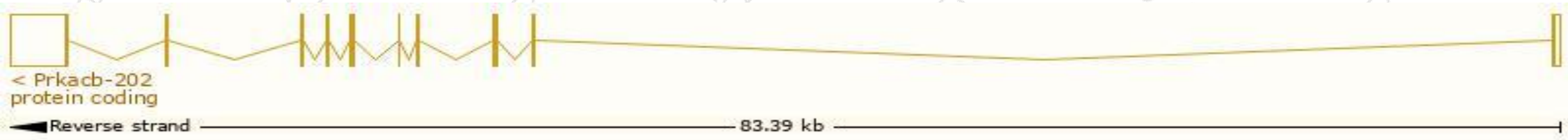
Official Symbol	Prkacb provided by MGI
Official Full Name	protein kinase, cAMP dependent, catalytic, beta provided by MGI
Primary source	MGI:MGI:97594
See related	Ensembl:ENSMUSG00000005034
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	CbPKA, Pkacb
Expression	Broad expression in cortex adult (RPKM 53.9), CNS E18 (RPKM 48.1) and 25 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

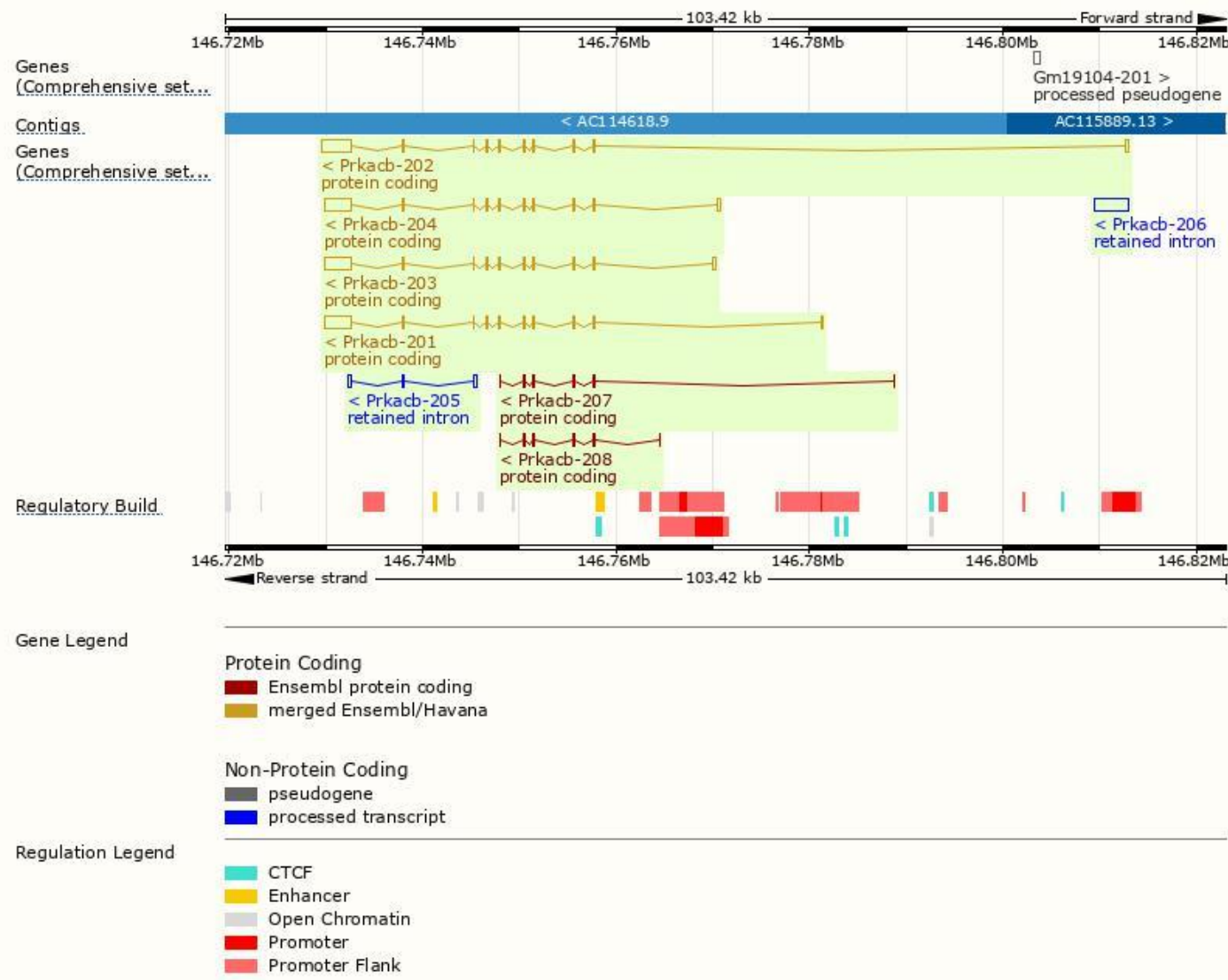
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prkacb-202	ENSMUST00000102515.9	4347	351aa	Protein coding	CCDS17906	P68181	TSL:1 GENCODE basic APPRIS P1
Prkacb-203	ENSMUST00000106137.7	4061	338aa	Protein coding	CCDS51090	P68181	TSL:1 GENCODE basic
Prkacb-201	ENSMUST00000005164.11	4001	398aa	Protein coding	CCDS51092	P68181	TSL:1 GENCODE basic
Prkacb-204	ENSMUST00000106138.7	3999	339aa	Protein coding	CCDS51091	P68181	TSL:1 GENCODE basic
Prkacb-207	ENSMUST00000197616.1	569	189aa	Protein coding	-	H6TMF5	CDS 3' incomplete TSL:1
Prkacb-208	ENSMUST00000199722.4	493	106aa	Protein coding	-	A0A0G2JFT9	CDS 3' incomplete TSL:1
Prkacb-206	ENSMUST00000196344.1	3473	No protein	Retained intron	-	-	TSL:NA
Prkacb-205	ENSMUST00000144369.1	919	No protein	Retained intron	-	-	TSL:1

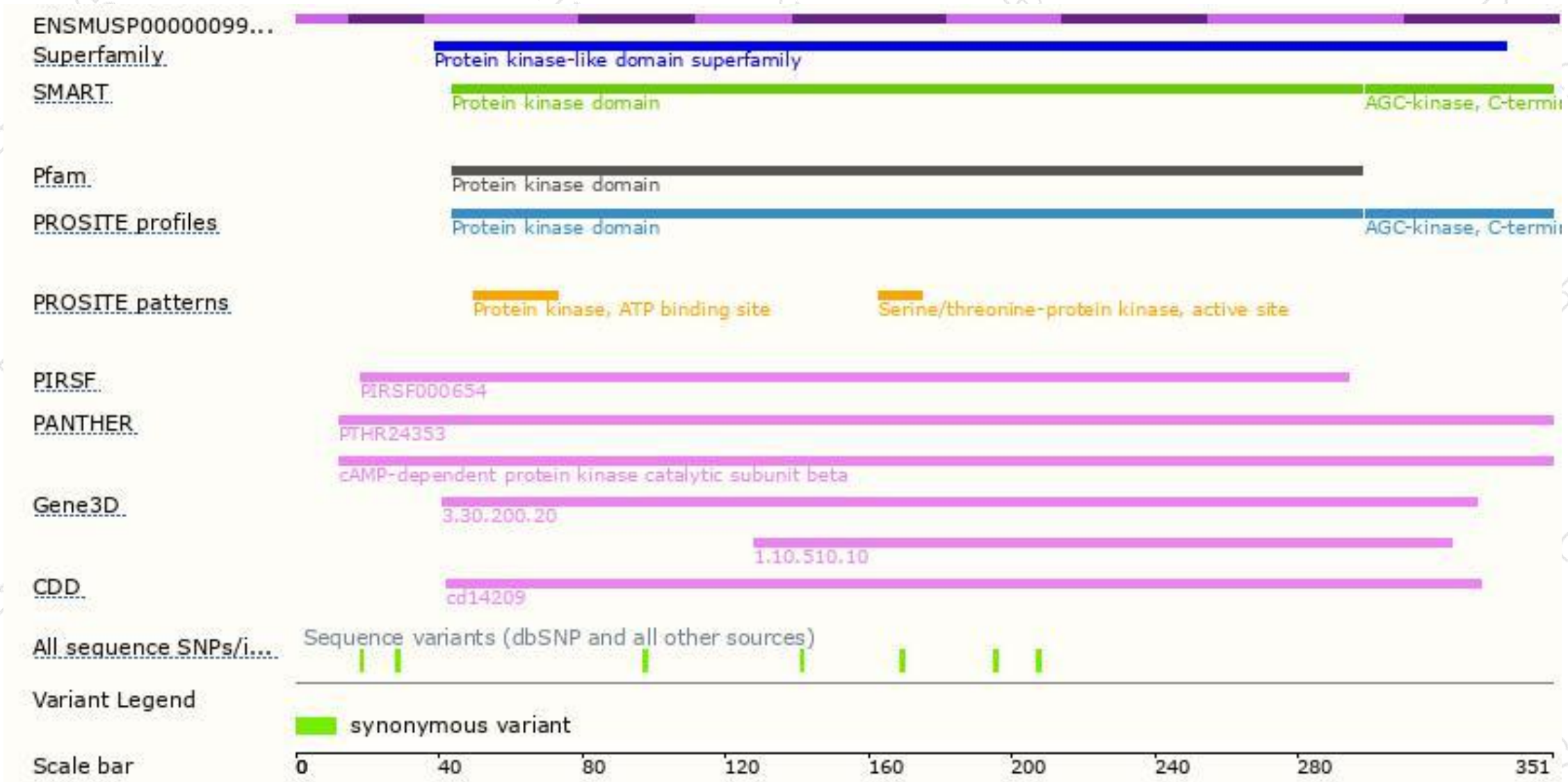
The strategy is based on the design of *Prkacb-202* transcript,The transcription is shown below



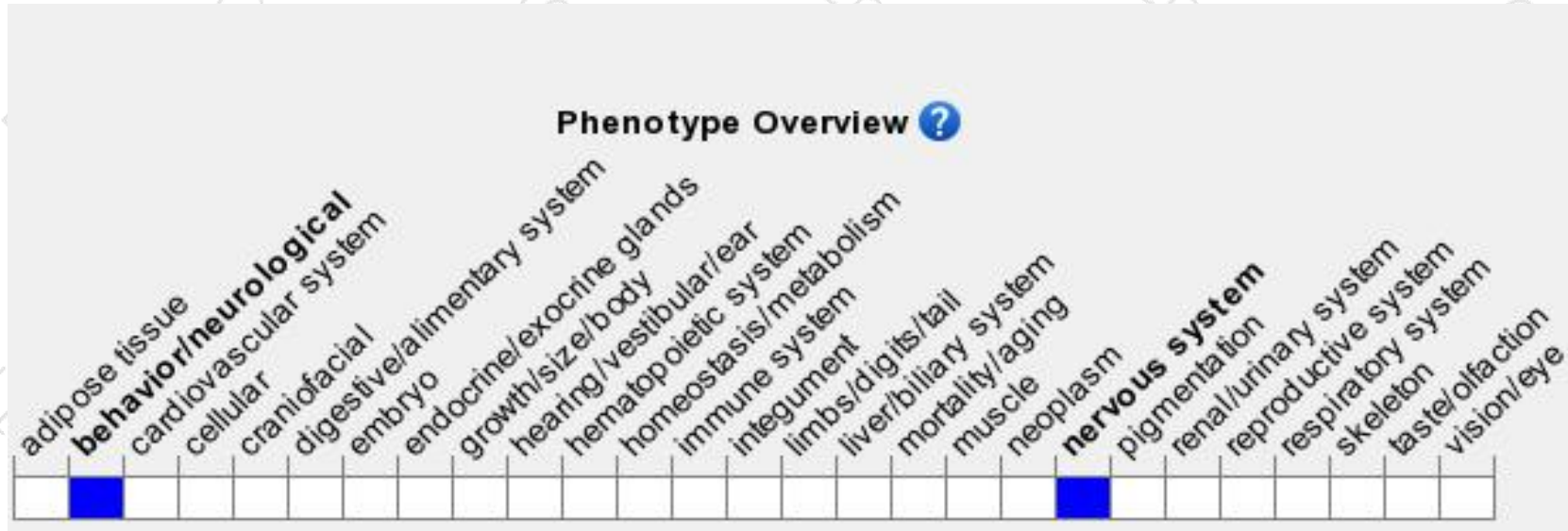
Genomic location distribution



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, Homozygotes for a targeted null mutation eliminating the C β 1 subunit exhibit impaired hippocampal plasticity, including failure of low frequency stimulation to produce lasting depression and the elimination of mossy fiber long term potentiation.

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

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