

Rnf19a Cas9-CKO Strategy

Designer:

Daohua Xu

Reviewer:

Huimin Su

Design Date:

2020-2-20

Project Overview

Project Name

Rnf19a

Project type

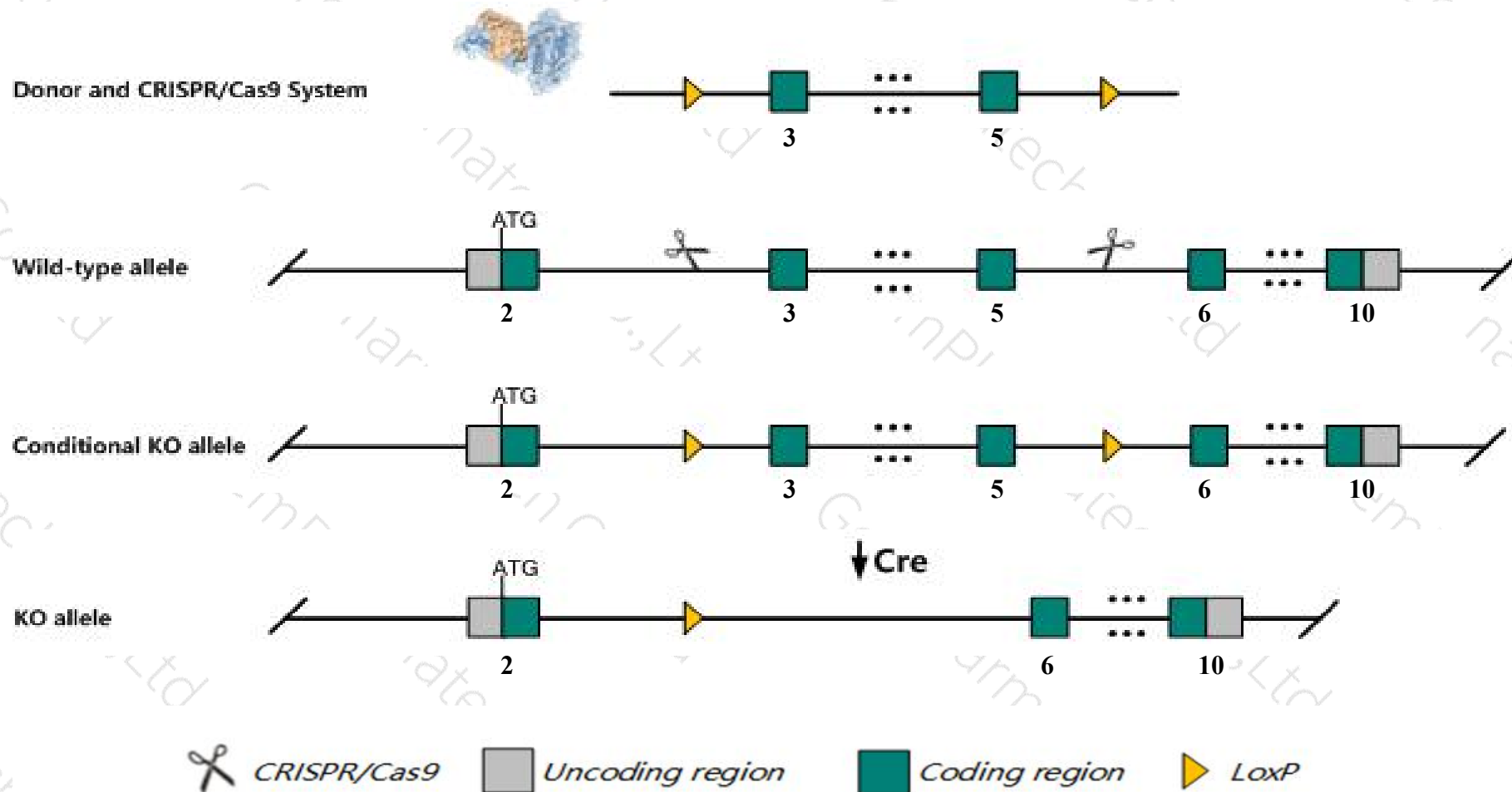
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rnfl9a* gene. The schematic diagram is as follows:



Technical routes

- The *Rnf19a* gene has 3 transcripts. According to the structure of *Rnf19a* gene, exon3-exon5 of *Rnf19a-201* (ENSMUST00000022890.9) transcript is recommended as the knockout region. The region contains 517bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rnf19a* 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, Mice homozygous for a gene-trapped allele exhibit decreased adult neurogenesis and enhanced long-term potentiation in the hippocampal dentate gyrus region, hyperactivity in a familiar environment, and a specific deficit in contextual fear conditioning, but not in other types of learning and memory.
- The *Rnfl9a* gene is located on the Chr15. 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)

Rnf19a ring finger protein 19A [Mus musculus (house mouse)]

Gene ID: 30945, updated on 19-Mar-2019

Summary



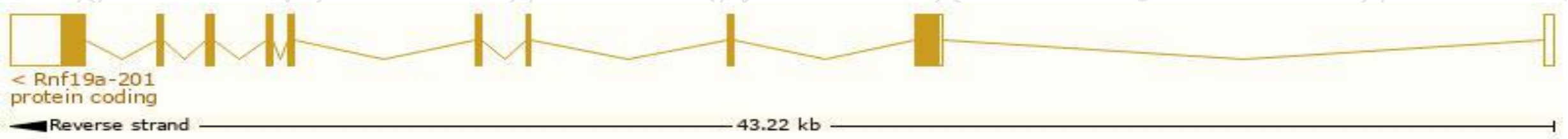
Official Symbol	Rnf19a provided by MGI
Official Full Name	ring finger protein 19A provided by MGI
Primary source	MGI:MGI:1353623
See related	Ensembl:ENSMUSG00000022280
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA032313, Dorfin, Rnf19, UIP117, Ubce7ip2, XYbp
Expression	Broad expression in testis adult (RPKM 56.1), liver E18 (RPKM 11.4) and 20 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

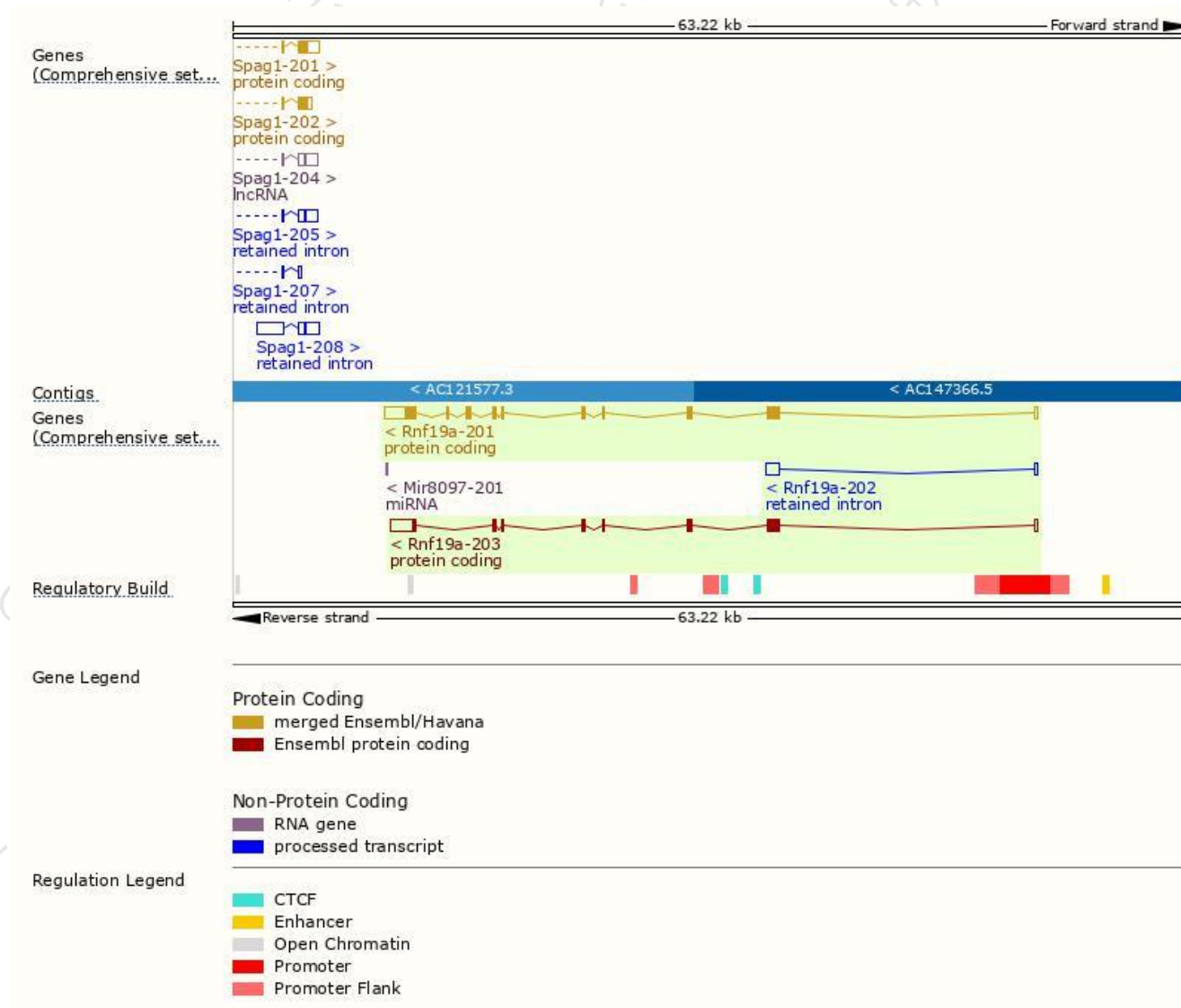
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rnf19a-201	ENSMUST00000022890.9	4277	840aa	Protein coding	CCDS27427	P50636	TSL:1 GENCODE basic APPRIS P1
Rnf19a-203	ENSMUST00000228358.1	3452	558aa	Protein coding	-	A0A2I3BRK4	GENCODE basic
Rnf19a-202	ENSMUST00000227735.1	1136	No protein	Retained intron	-	-	

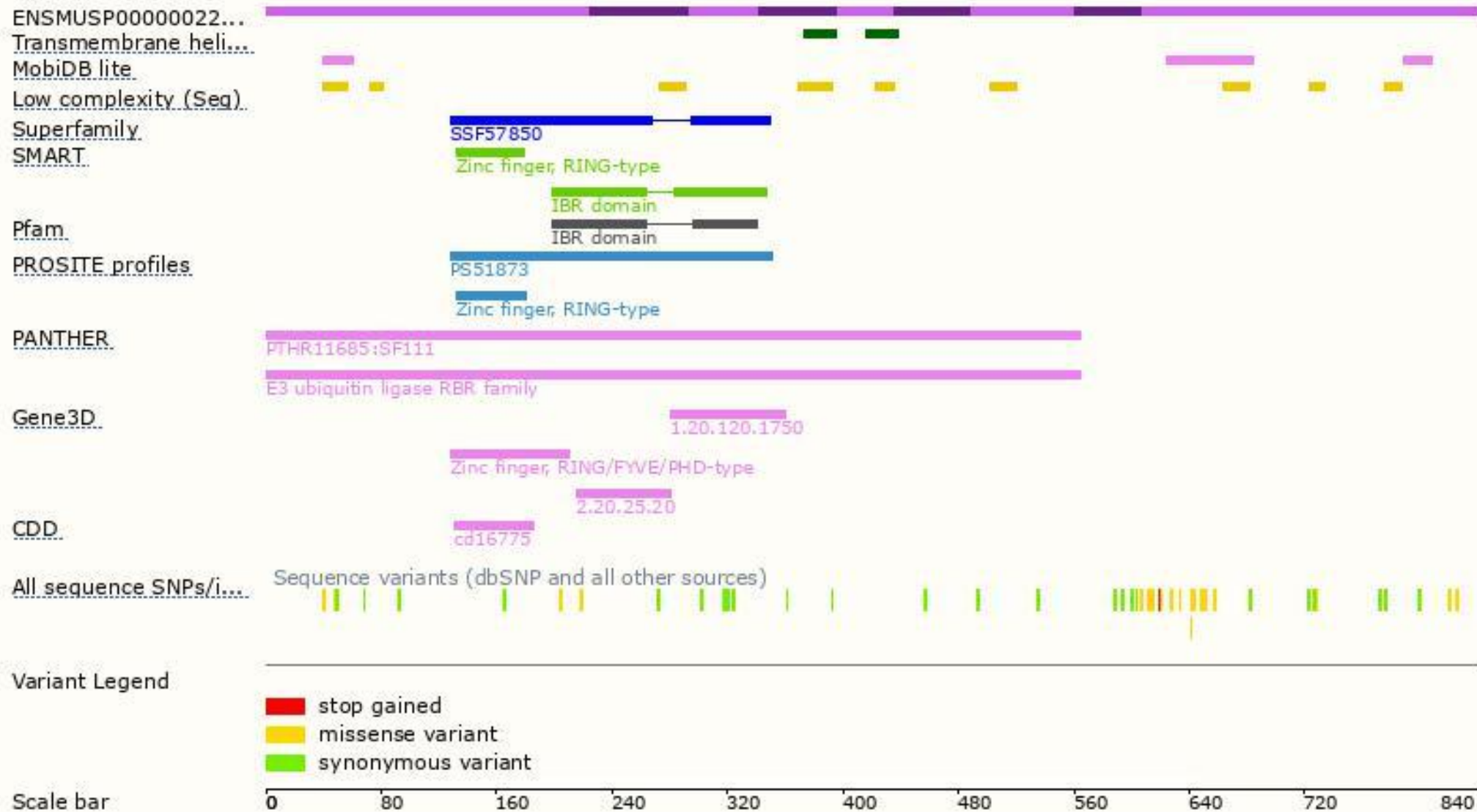
The strategy is based on the design of *Rnf19a-201* transcript,The transcription is shown below



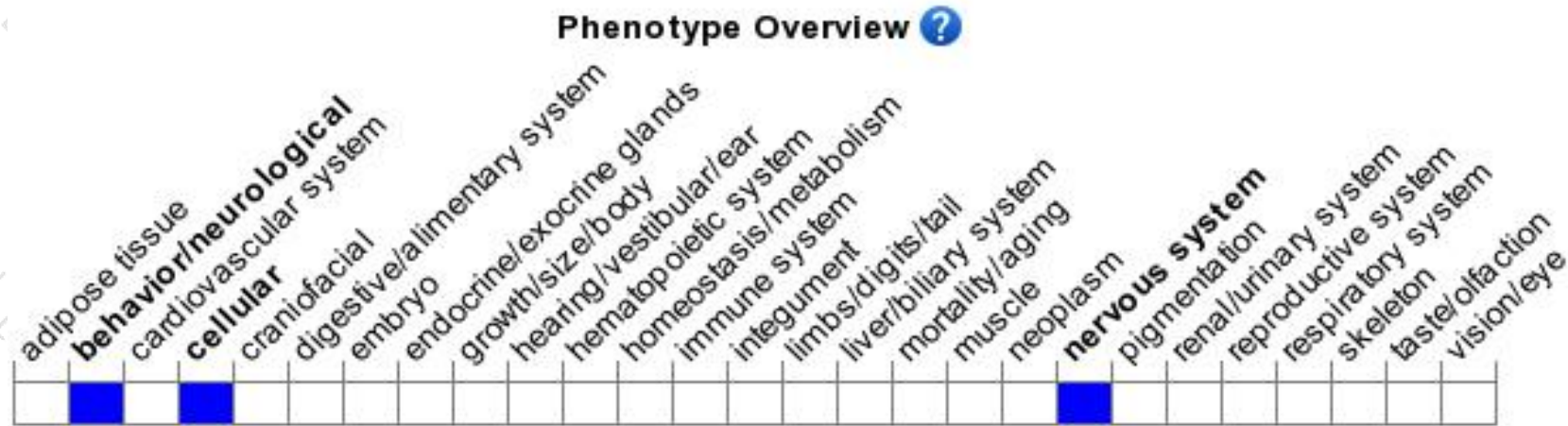
Genomic location distribution



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 a gene-trapped allele exhibit decreased adult neurogenesis and enhanced long-term potentiation in the hippocampal dentate gyrus region, hyperactivity in a familiar environment, and a specific deficit in contextual fear conditioning, but not in other types of learning and memory.

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

Tel: 400-9660890

