

***Rbfox2* Cas9-CKO Strategy**

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Date: 2020-1-13

Project Overview

Project Name

Rbfox2

Project type

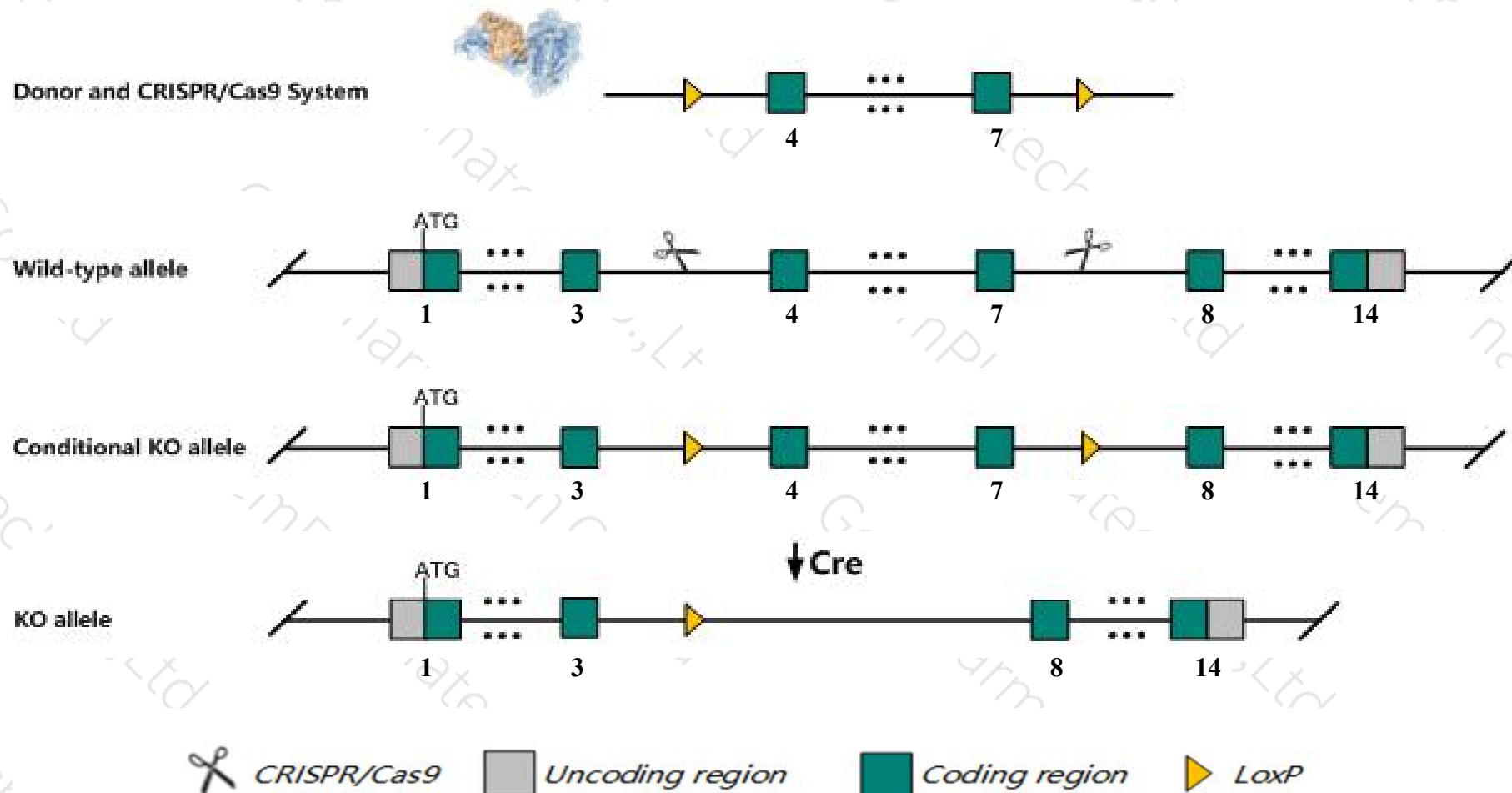
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rbfox2* gene. The schematic diagram is as follows:



- The *Rbfox2* gene has 15 transcripts. According to the structure of *Rbfox2* gene, exon4-exon7 of *Rbfox2*-204 (ENSMUST00000171751.9) transcript is recommended as the knockout region. The region contains 355bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rbfox2* 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 conditional allele activated in the brain exhibit normal spontaneous and kainic acid-induced seizures.
- Transcript *Rbfox2*-211&215 may not be affected.
- The N-terminal of *Rbfox2* gene will remain several amino acids, it may remain the partial function of *Rbfox2* gene.
- The *Rbfox2* 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)

Rbfox2 RNA binding protein, fox-1 homolog (C. elegans) 2 [*Mus musculus* (house mouse)]

Gene ID: 93686, updated on 16-Dec-2019

Summary

- Official Symbol

Rbfox2 provided by MGI
- Official Full Name

RNA binding protein, fox-1 homolog (C. elegans) 2 provided by MGI
- Primary source

MGI:MGI:1933973
- See related

Ensembl:ENSMUSG00000033565
- 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

Fxh; Fbm2; Rbm9; Hrnbp2
- Expression

Broad expression in CNS E18 (RPKM 47.2), whole brain E14.5 (RPKM 43.2) and 25 other tissues [See more](#)
- Orthologs

[human](#) [all](#)

Genomic context

Location: 15; 15 D3

See Rbfox2 in [Genome Data Viewer](#)

Exon count: 22

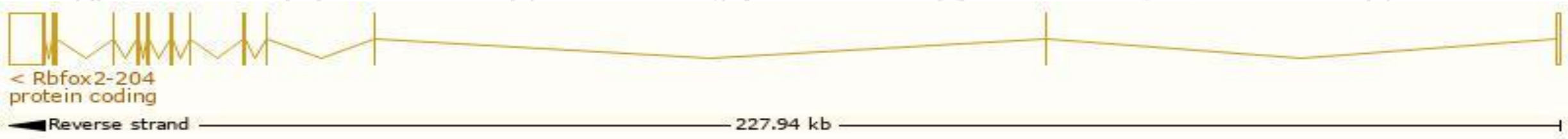
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	15	NC_000081.6 (77078990..77308434, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	15	NC_000081.5 (76909420..77137483, complement)

Transcript information (Ensembl)

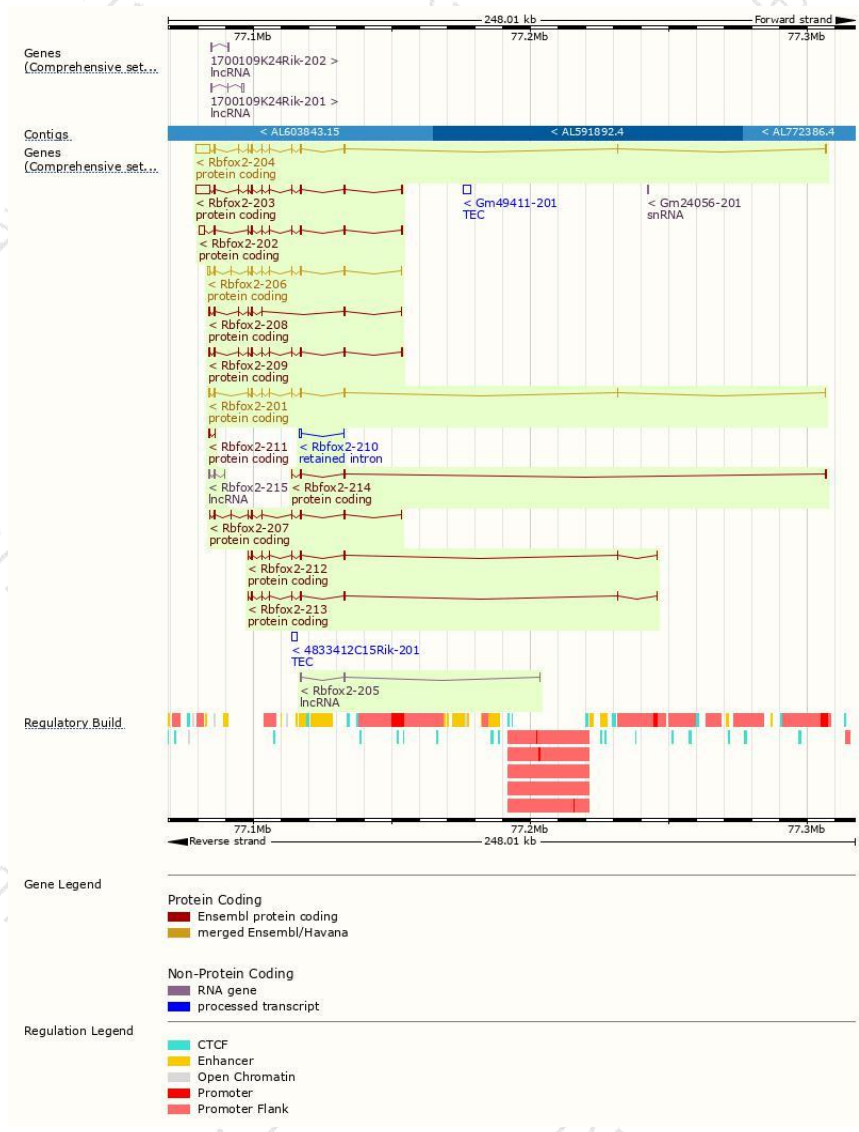
The gene has 15 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rbfox2-204	ENSMUST00000171751.9	6907	449aa	Protein coding	CCDS49659	Q8BP71	TSL:1 GENCODE basic APPRIS P4
Rbfox2-203	ENSMUST00000166610.7	6573	381aa	Protein coding	CCDS49658	Q8BP71	TSL:1 GENCODE basic APPRIS ALT2
Rbfox2-206	ENSMUST00000227314.1	1810	378aa	Protein coding	CCDS49657	Q8BP71	GENCODE basic
Rbfox2-201	ENSMUST00000048145.12	1720	435aa	Protein coding	CCDS27598	Q8BP71	TSL:1 GENCODE basic
Rbfox2-202	ENSMUST00000111581.3	3072	349aa	Protein coding	-	A0A2K6EDK7	TSL:1 GENCODE basic
Rbfox2-209	ENSMUST00000228087.1	1694	377aa	Protein coding	-	Q8BP71	GENCODE basic APPRIS ALT2
Rbfox2-208	ENSMUST00000227930.1	1218	283aa	Protein coding	-	Q8BP71	GENCODE basic
Rbfox2-214	ENSMUST00000228582.1	1066	201aa	Protein coding	-	A0A2I3BR20	CDS 3' incomplete
Rbfox2-207	ENSMUST00000227533.1	1041	346aa	Protein coding	-	Q8BP71	GENCODE basic
Rbfox2-212	ENSMUST00000228361.1	899	300aa	Protein coding	-	A0A2I3BRU6	5' and 3' truncations in transcript evidence prevent annotation of the start and the end of the CDS. CDS 5' and 3' incomplete
Rbfox2-213	ENSMUST00000228558.1	882	275aa	Protein coding	-	A0A2I3BRA9	CDS 3' incomplete
Rbfox2-211	ENSMUST00000228253.1	482	47aa	Protein coding	-	A0A2I3BQD1	CDS 5' incomplete
Rbfox2-210	ENSMUST00000228190.1	762	No protein	Retained intron	-	-	
Rbfox2-215	ENSMUST00000230194.1	569	No protein	lncRNA	-	-	
Rbfox2-205	ENSMUST00000226877.1	417	No protein	lncRNA	-	-	

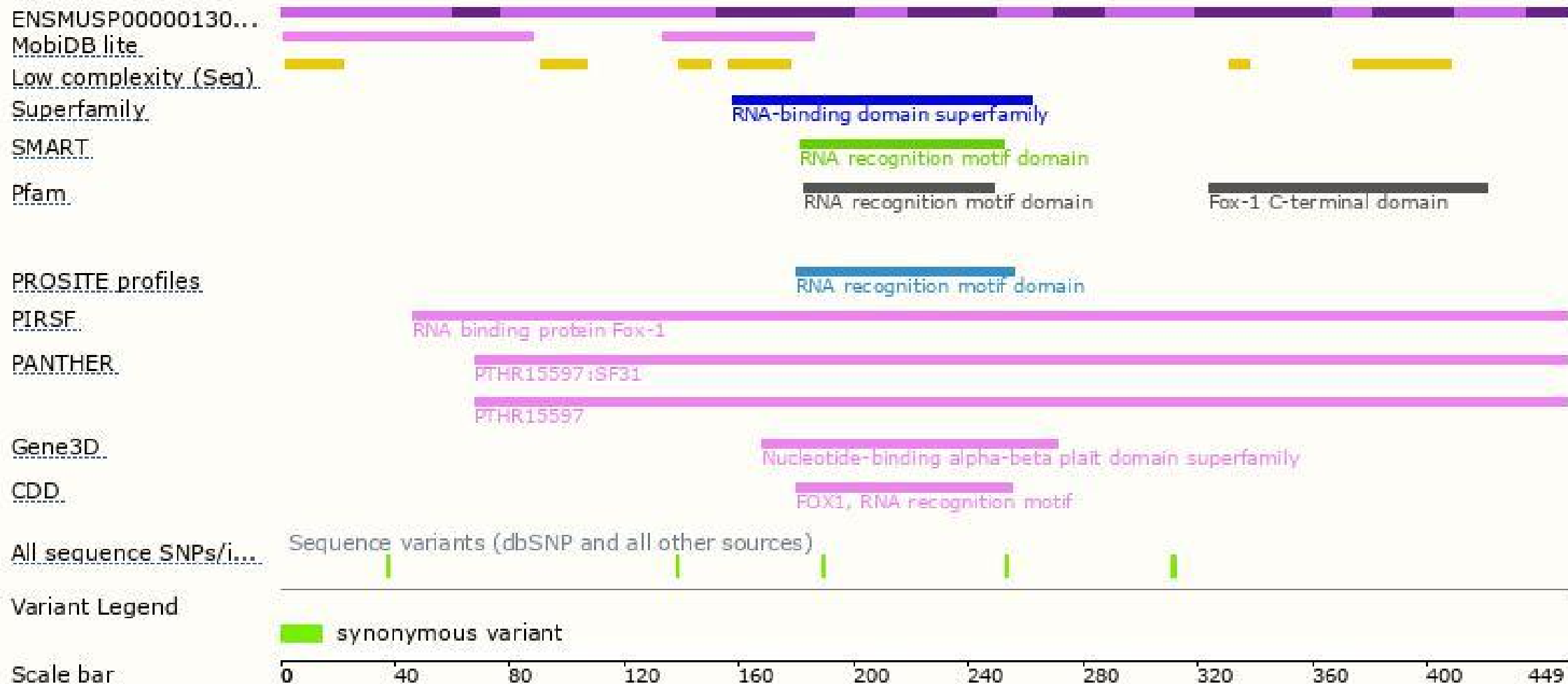
The strategy is based on the design of *Rbfox2-204* transcript,The transcription is shown below



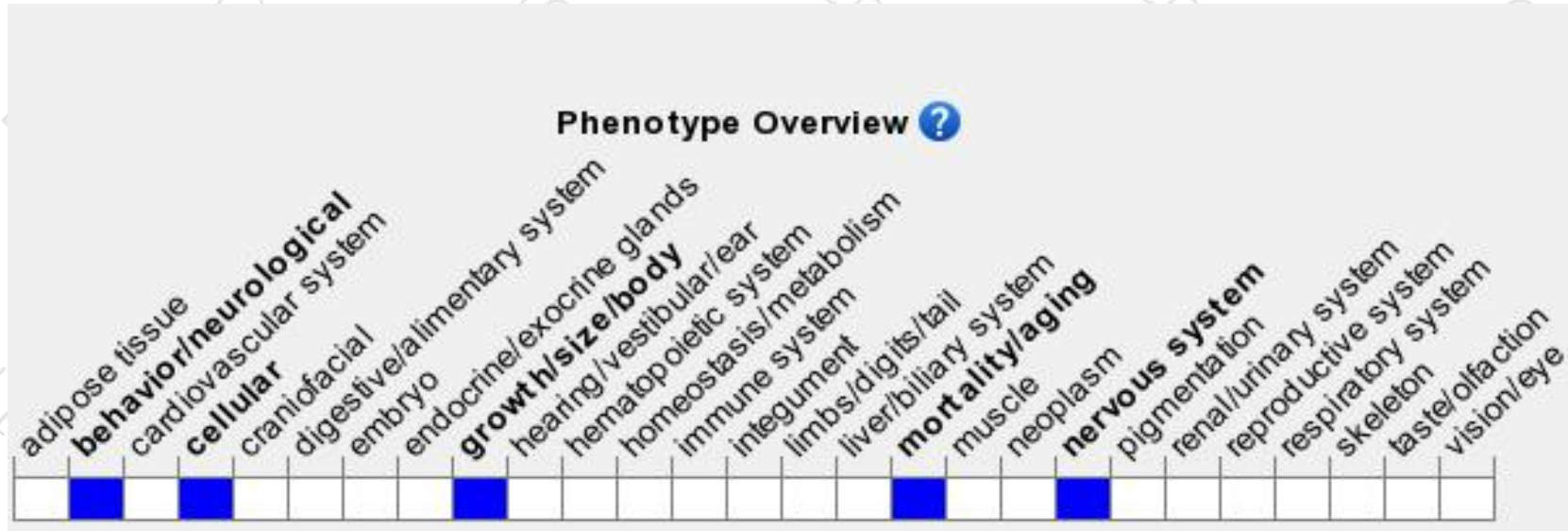
Genomic location distribution



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 conditional allele activated in the brain exhibit normal spontaneous and kainic acid-induced seizures.

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

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