

Grm7 Cas9-CKO Strategy

Designer:

Huan Wang

Design Date:

2019-7-22

Project Overview

Project Name

Grm7

Project type

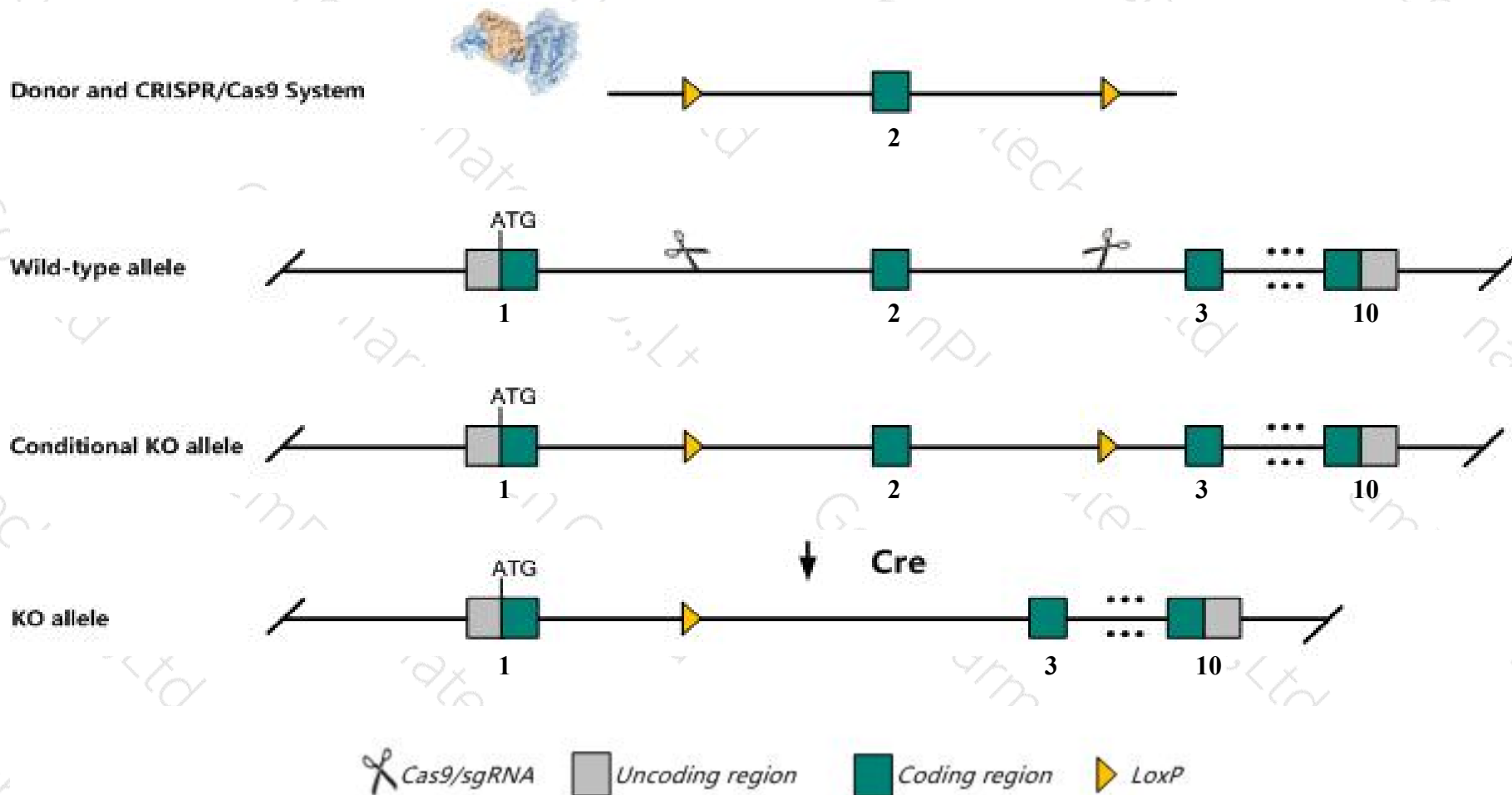
Cas9-CKO

Strain background

C57BL/6J

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Grm7* gene. The schematic diagram is as follows:



Technical routes

- The *Grm7* gene has 5 transcripts. According to the structure of *Grm7* gene, exon2 of *Grm7*-202 (ENSMUST00000172951.1) transcript is recommended as the knockout region. The region contains 217bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Grm7* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA and Donor were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.
- The flox mice was 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, Nullizygous mice exhibit epilepsy and deficits in fear response and conditioned taste aversion. Homozygotes for a knock-in allele show impaired spatial working memory and higher susceptibility to PTZ. Homozygotes for a reporter allele show impaired coordination and higher susceptibility to metrazol.
- The *Grm7* gene is located on the Chr6. 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)

Grm7 glutamate receptor, metabotropic 7 [Mus musculus (house mouse)]

Gene ID: 108073, updated on 9-Apr-2019

Summary



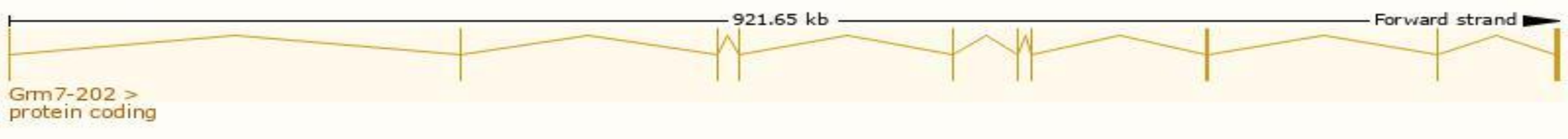
Official Symbol	Grm7 provided by MGI
Official Full Name	glutamate receptor, metabotropic 7 provided by MGI
Primary source	MGI:MGI:1351344
See related	Ensembl:ENSMUSG00000056755
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	6330570A01Rik, BB176677, C030018L03, E130018M02Rik, Gpr1g, Gprc1g, SMN2, Tg(SMN2)89Ahmb, mGluR7
Expression	Biased expression in cortex adult (RPKM 6.5), frontal lobe adult (RPKM 4.9) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

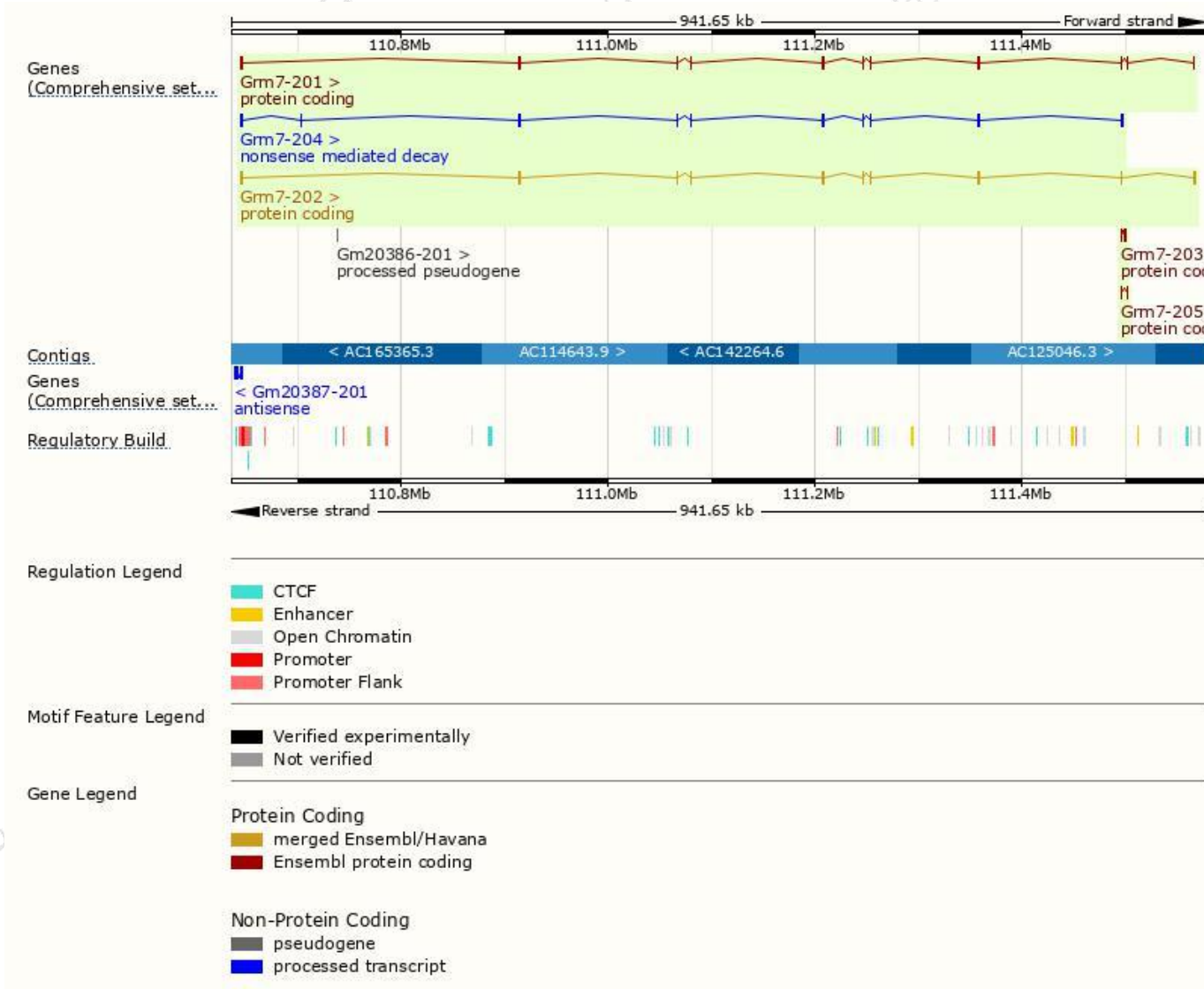
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grm7-202	ENSMUST00000172951.1	4197	915aa	Protein coding	CCDS39587	Q68ED2	TSL:1 GENCODE basic APPRIS P3
Grm7-201	ENSMUST00000071076.12	3127	922aa	Protein coding	CCDS85110	G5E8D5	TSL:5 GENCODE basic APPRIS ALT 1
Grm7-203	ENSMUST00000173001.2	418	74aa	Protein coding	-	G3UYV0	CDS 5' incomplete TSL:5
Grm7-205	ENSMUST00000174310.1	386	75aa	Protein coding	-	G3UY08	CDS 5' incomplete TSL:3
Grm7-204	ENSMUST00000174018.7	4210	188aa	Nonsense mediated decay	-	G3UZU3	TSL:1

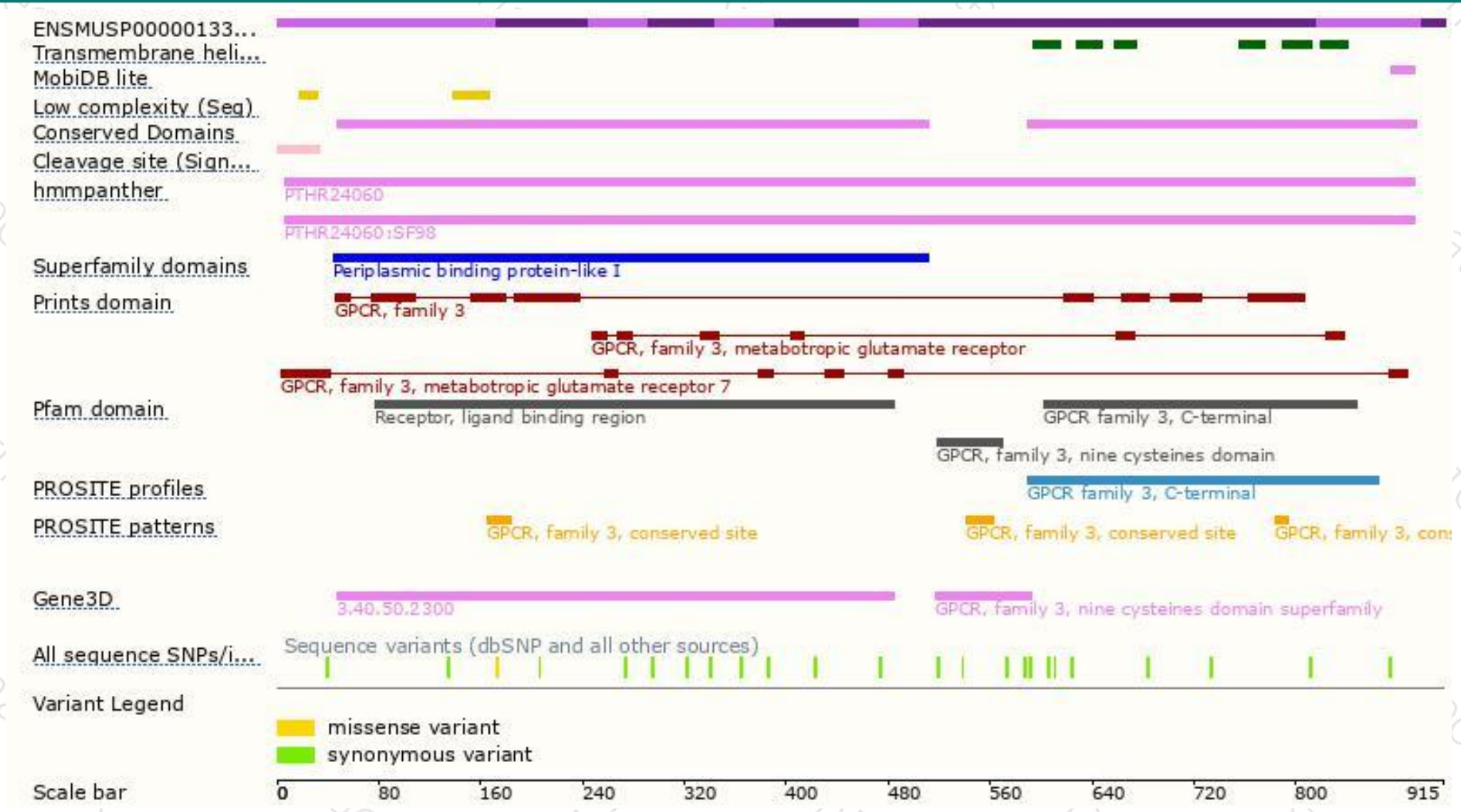
The strategy is based on the design of *Grm7-202* transcript,The transcription is shown below



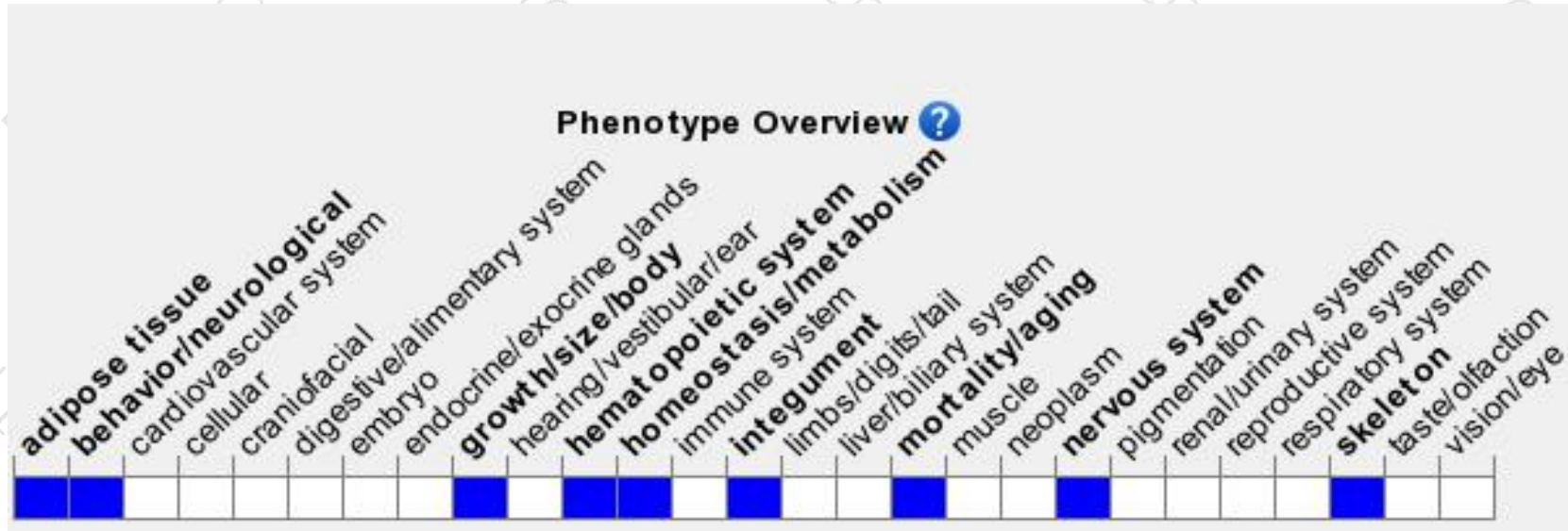
Genomic location distribution



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, Nullizygous mice exhibit epilepsy and deficits in fear response and conditioned taste aversion. Homozygotes for a knock-in allele show impaired spatial working memory and higher susceptibility to PTZ. Homozygotes for a reporter allele show impaired coordination and higher susceptibility to metrazol.

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

Tel: 025-5864 1534

