Grm1 Cas9-CKO Strategy

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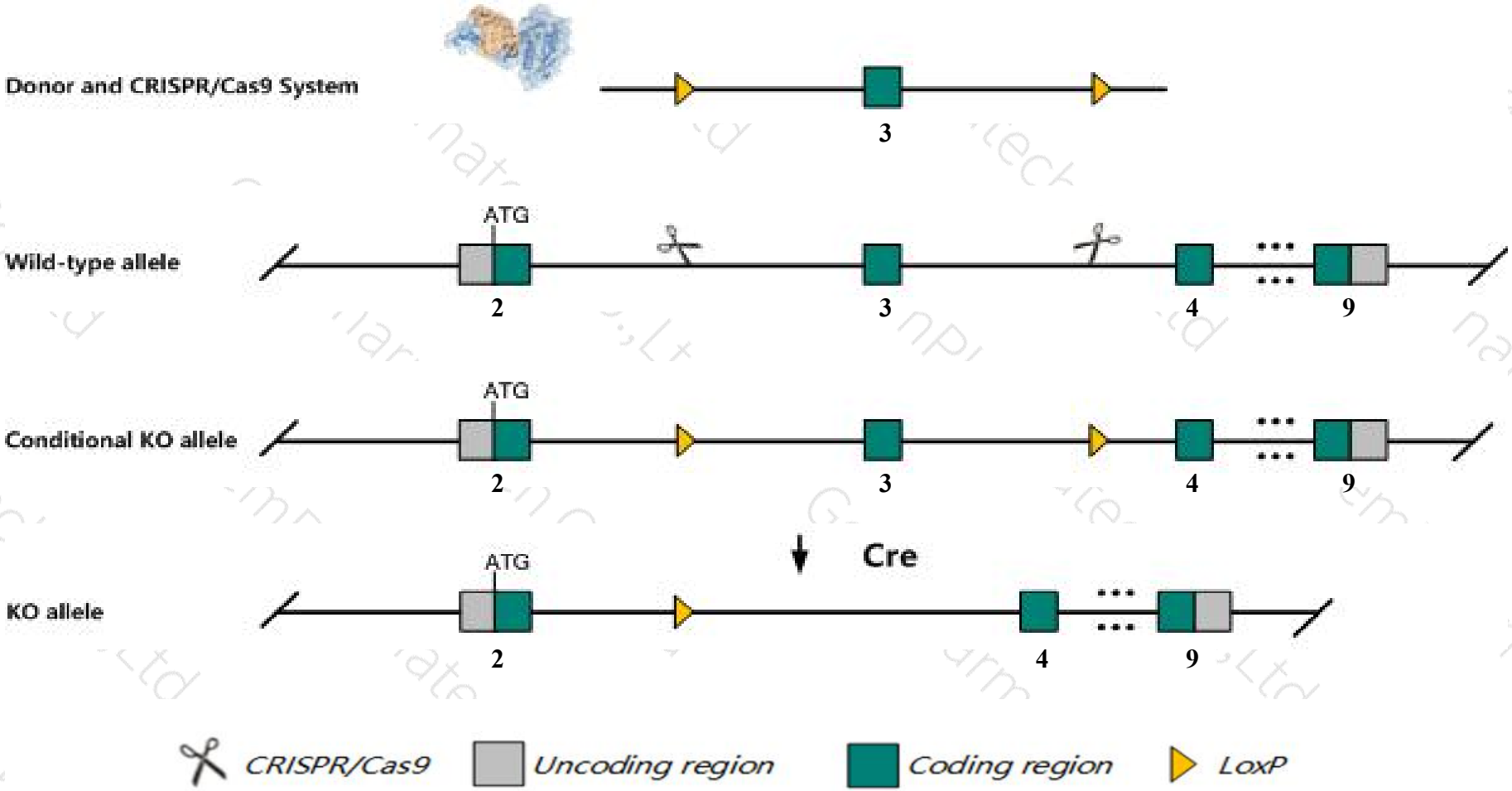
Project Overview

Project Name	***Grm1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Grm1* gene. The schematic diagram is as follows:



Technical routes

- The *Grm1* gene has 6 transcripts. According to the structure of *Grm1* gene, exon3 of *Grm1-201* (ENSMUST00000044306.12) transcript is recommended as the knockout region.The region contains 250bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Grm1* 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,mice homozygous for null mutations show impairements in motor coordination, spatial learning, hippocampal mossy fiber long-term potentiation, and cerebellar long-term depression. Homozygotes for a spontaneous mutation are small and exhibit ataxia, kyphoscoliosis, albuminuria and glomerular damage.

- The *Grm1* gene is located on the Chr10. 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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Grm1 glutamate receptor, metabotropic 1 [*Mus musculus* (house mouse)]

Gene ID: 14816, updated on 12-Aug-2019

Summary

Official Symbol	Grm1 provided by MGI
Official Full Name	glutamate receptor, metabotropic 1 provided by MGI
Primary source	MGI:MGI:1351338
See related	Ensembl:ENSMUSG00000019828
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	rcw; wobl; Gprc1a; mGluR1; nmf373; Gm10828; 4930455H15Rik
Expression	Biased expression in cerebellum adult (RPKM 17.4), frontal lobe adult (RPKM 5.7) and 6 other tissues See more
Orthologs	human all

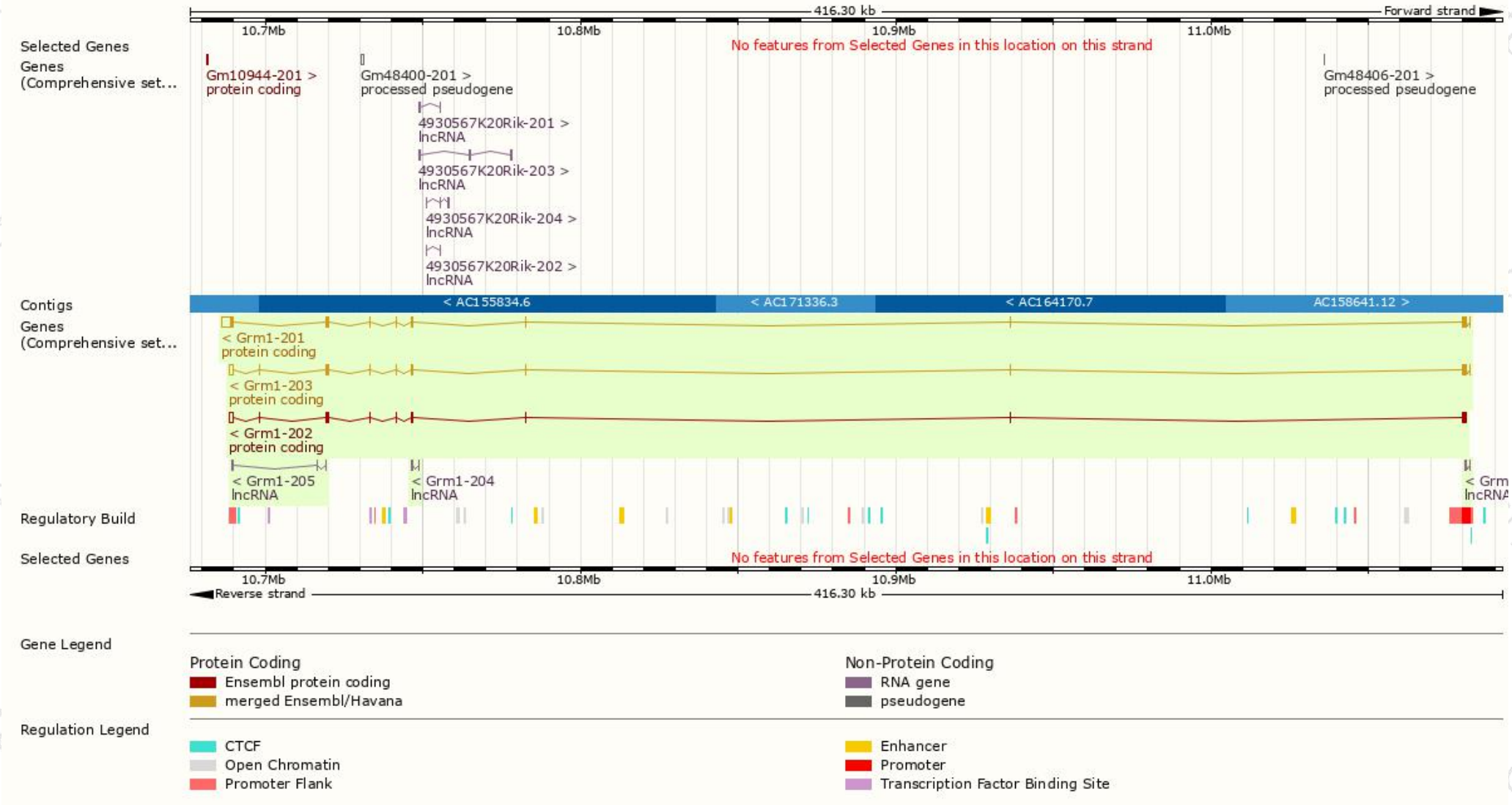
Transcript information（Ensembl）

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

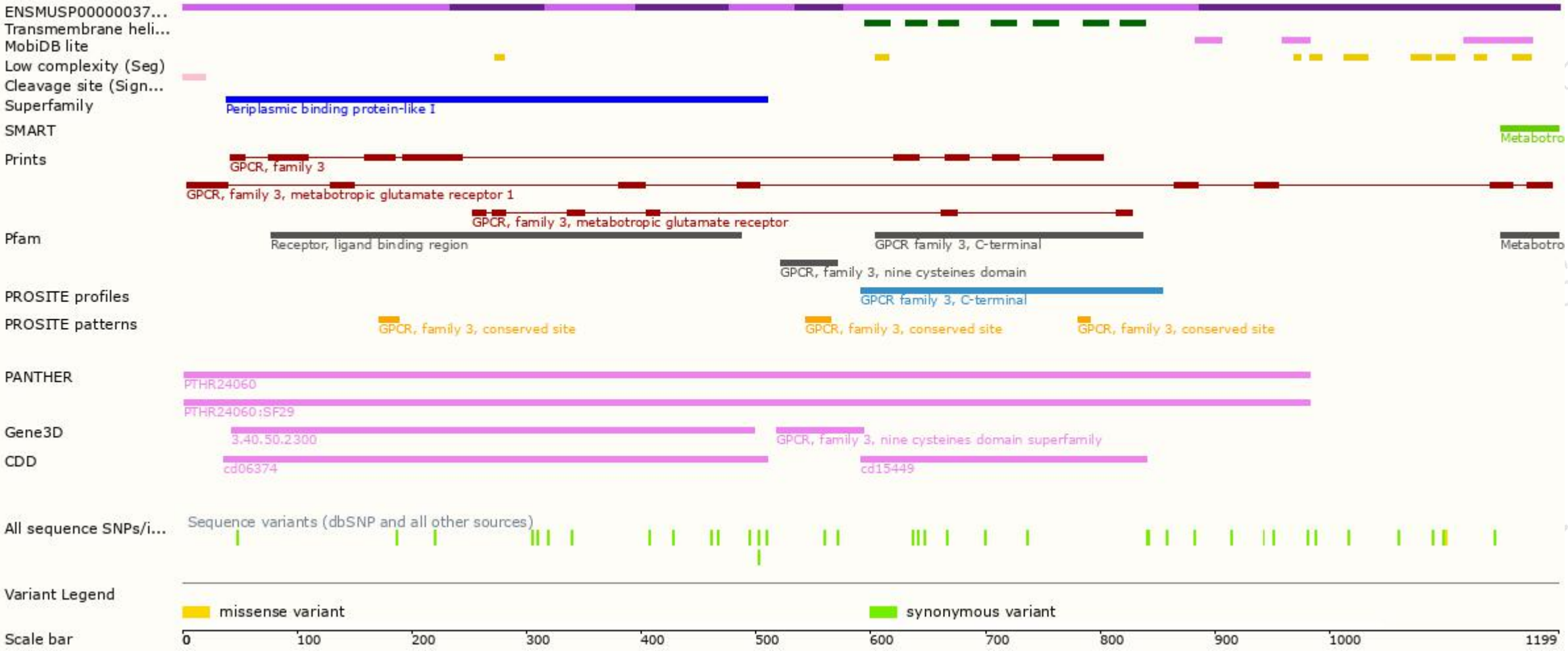
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grm1-201	ENSMUST00000044306.12	6930	1199aa	Protein coding	CCDS23696	P97772	TSL:1 GENCODE basic
Grm1-203	ENSMUST00000105561.8	4435	906aa	Protein coding	CCDS48499	P97772	TSL:1 GENCODE basic APPRIS P1
Grm1-202	ENSMUST00000105560.1	4265	906aa	Protein coding	CCDS48499	P97772	TSL:1 GENCODE basic APPRIS P1
Grm1-204	ENSMUST00000135120.1	598	No protein	Processed transcript	-	-	TSL:1
Grm1-205	ENSMUST00000155772.1	586	No protein	Processed transcript	-	-	TSL:3
Grm1-206	ENSMUST00000156826.1	450	No protein	Processed transcript	-	-	TSL:3

The strategy is based on the design of *Grm1-201* transcript,The transcription is shown below

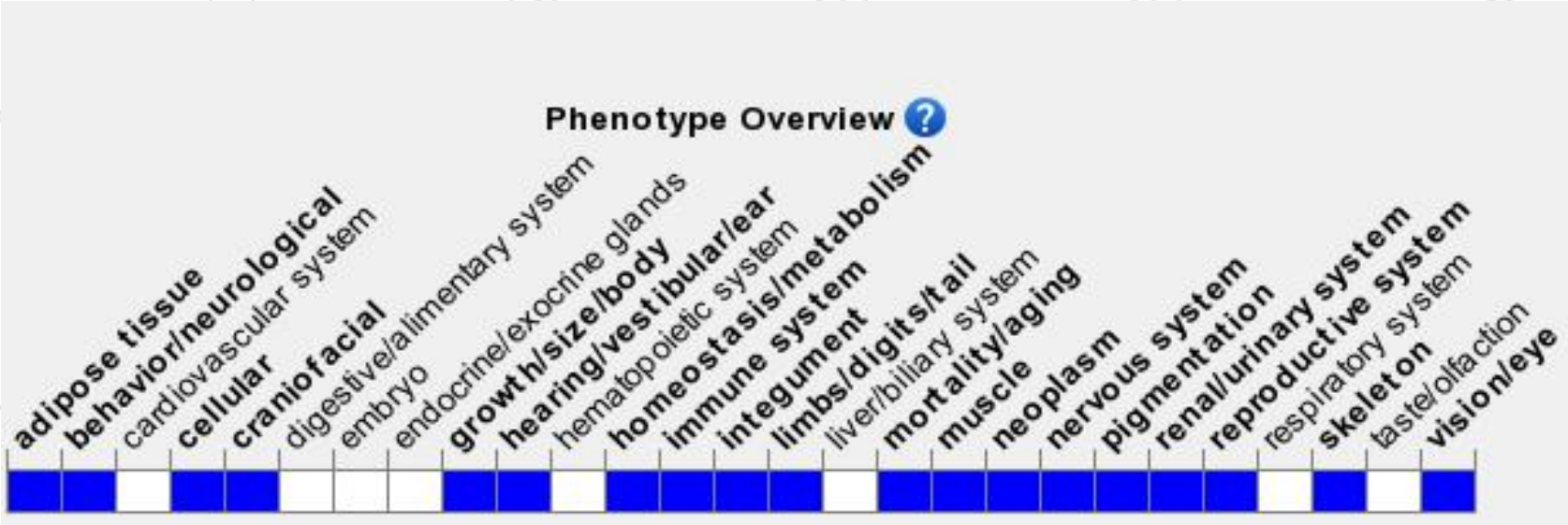
Genomic location distribution



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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