Gria1 Cas9-CKO Strategy

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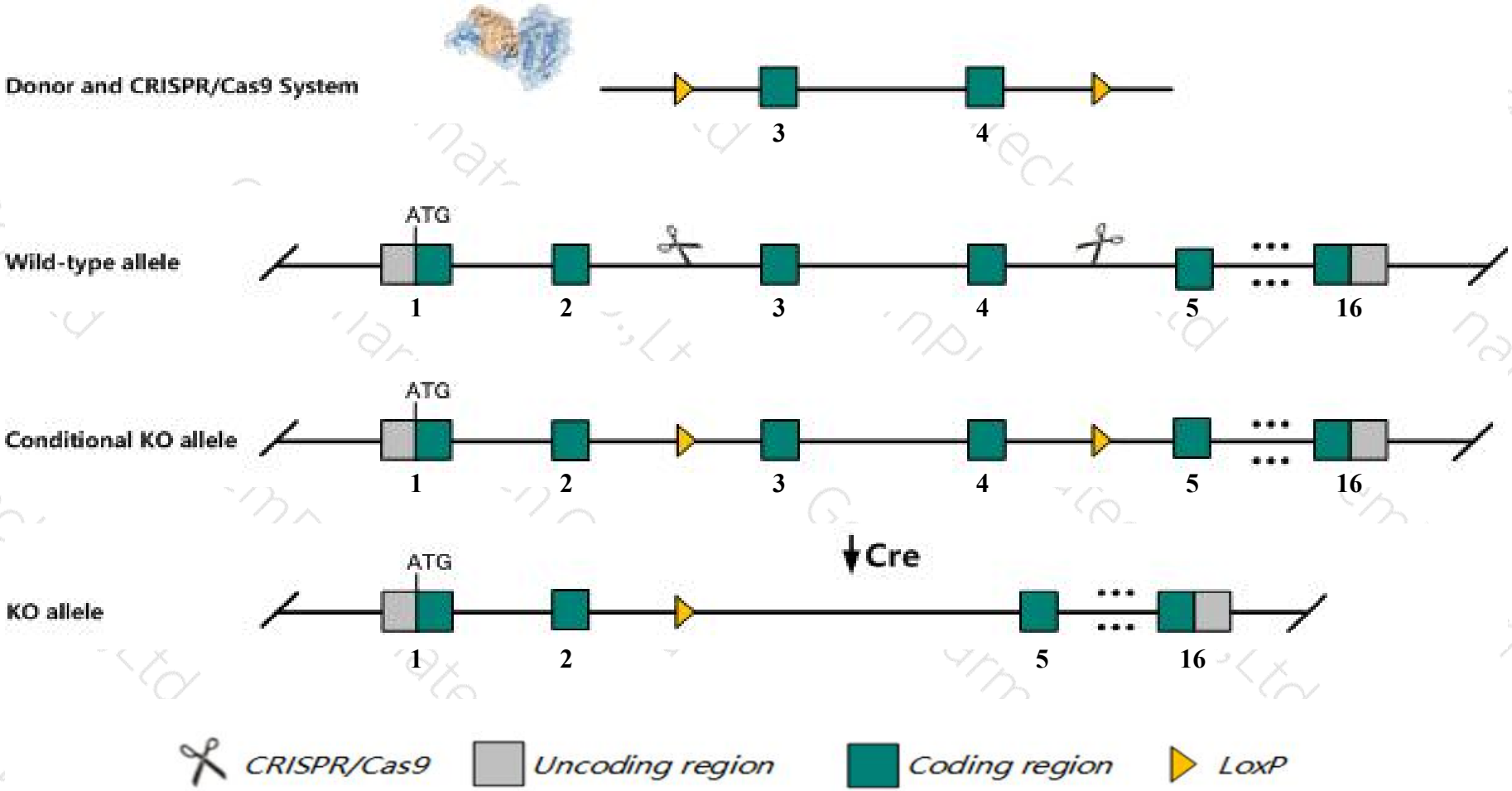
Project Overview

Project Name	***Gria1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gria1* gene. The schematic diagram is as follows:



Technical routes

- The *Gria1* gene has 5 transcripts. According to the structure of *Gria1* gene, exon3-exon4 of *Gria1-201* (ENSMUST00000036315.15) transcript is recommended as the knockout region.The region contains 425bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Gria1* 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 with mutations in phosphorylation sites have LTD and LTP deficits and spatial learning memory defects. Null homozygotes also show stimulus-reward learning deficits and increases locomotor activity and context-dependent sensitization to amphetamine.

➢ The *Gria1* gene is located on the Chr11. 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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Gria1 glutamate receptor, ionotropic, AMPA1 (alpha 1) [*Mus musculus* (house mouse)]

Gene ID: 14799, updated on 21-Aug-2019

Summary

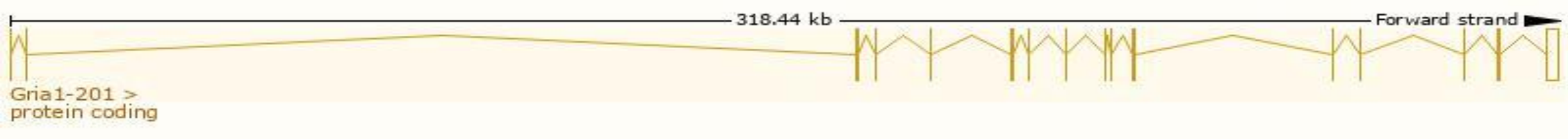
Official Symbol	Gria1 provided by MGI
Official Full Name	glutamate receptor, ionotropic, AMPA1 (alpha 1) provided by MGI
Primary source	MGI:MGI:95808
See related	Ensembl:ENSMUSG00000020524
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Glr1; Glr-1; GluA1; GluRA; Glur1; HIPA1; GluR-A; Glur-1; gluR-K1; 2900051M01Rik
Expression	Biased expression in frontal lobe adult (RPKM 40.2), cerebellum adult (RPKM 32.5) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

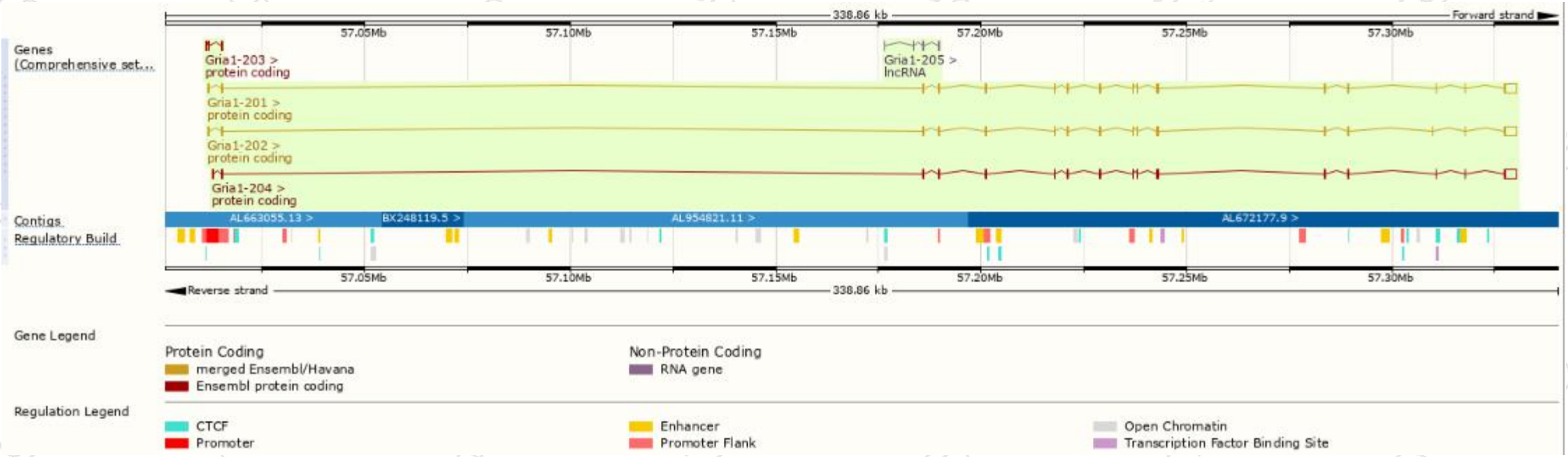
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gria1-201	ENSMUST00000036315.15	5546	907aa	Protein coding	CCDS48800	P23818	TSL:1 GENCODE basic APPRIS ALT2
Gria1-202	ENSMUST00000094179.10	5399	907aa	Protein coding	CCDS36159	Q7TNB5	TSL:1 GENCODE basic APPRIS P3
Gria1-204	ENSMUST00000151045.2	5361	838aa	Protein coding	CCDS56770	F6YNQ1	TSL:1 GENCODE basic APPRIS ALT2
Gria1-203	ENSMUST00000125292.1	287	4aa	Protein coding	-	-	CDS 3' incomplete TSL:5
Gria1-205	ENSMUST00000173531.1	531	No protein	lncRNA	-	-	TSL:3

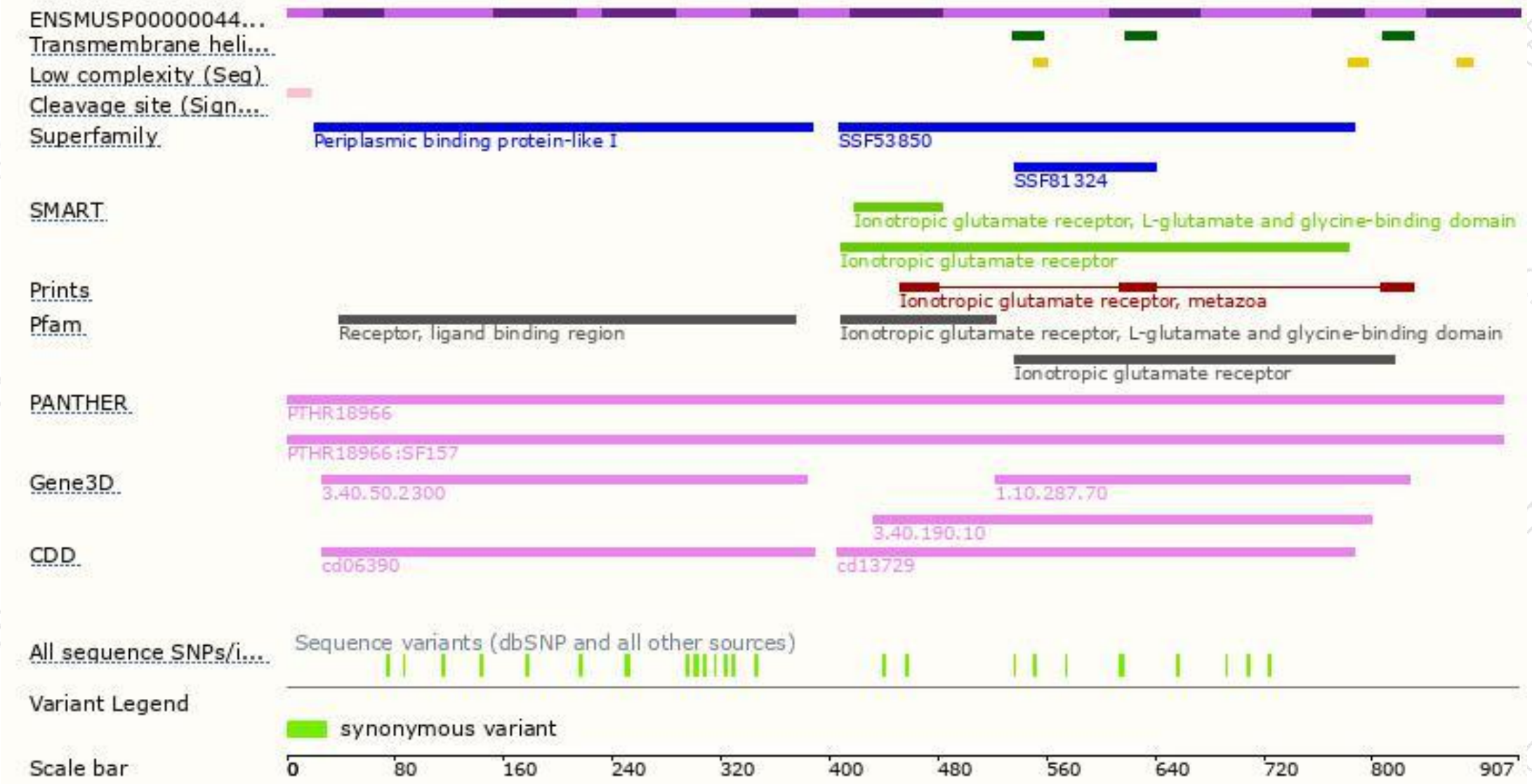
The strategy is based on the design of *Gria1-201* transcript,The transcription is shown below



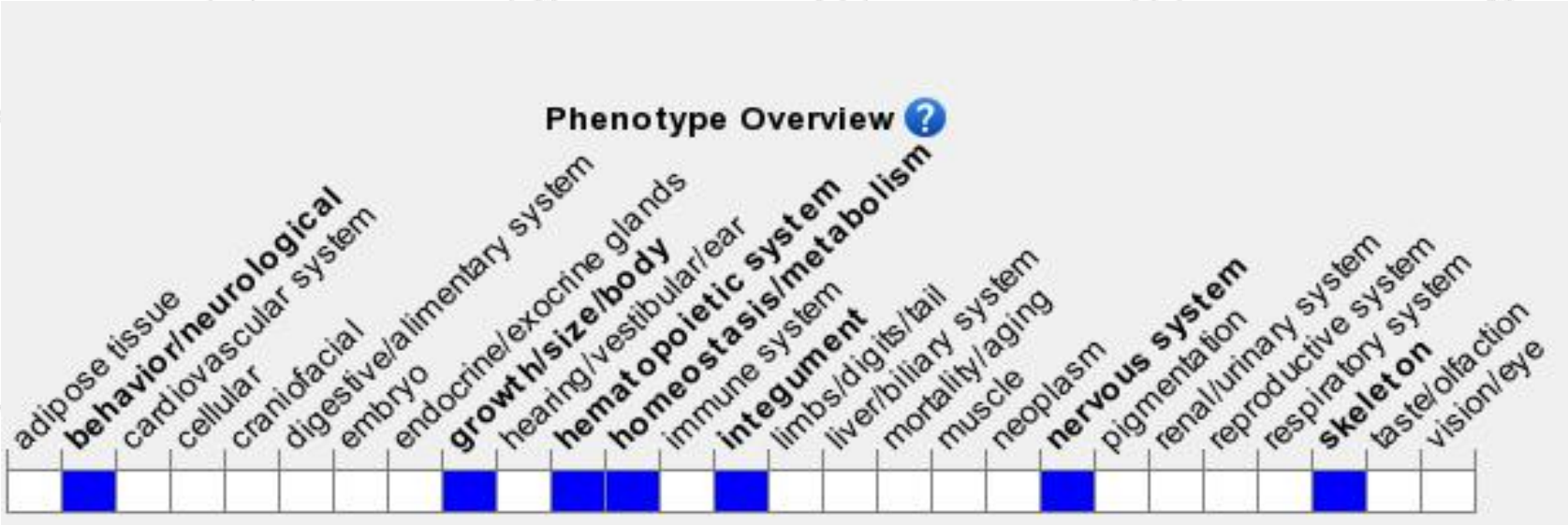
Genomic location distribution



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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