Grin1 Cas9-CKO Strategy

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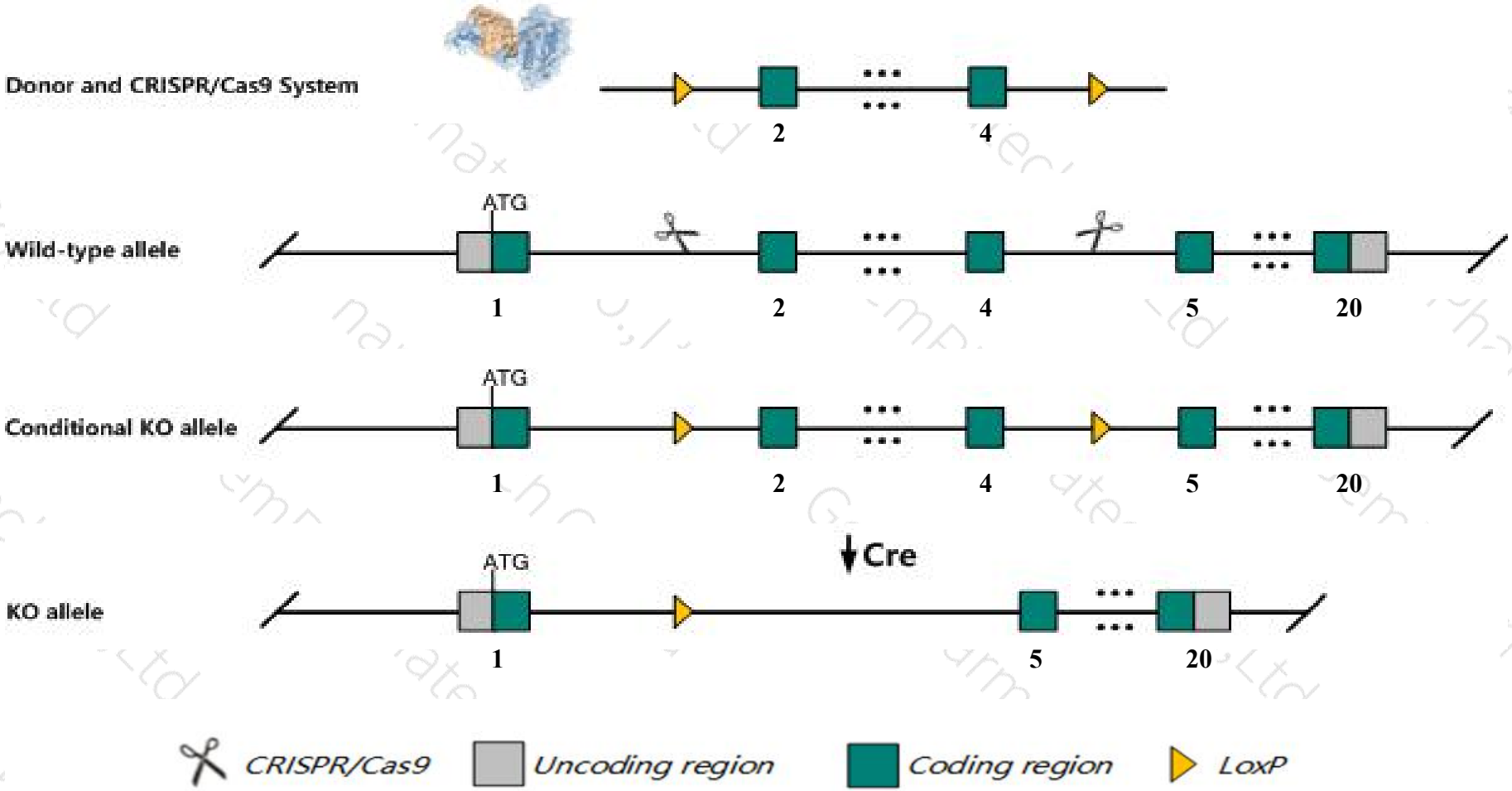
Project Overview

Project Name	***Grin1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Grin1* gene. The schematic diagram is as follows:



Technical routes

- The *Grin1* gene has 14 transcripts. According to the structure of *Grin1* gene, exon2-exon4 of *Grin1-201* (ENSMUST00000028335.12) transcript is recommended as the knockout region.The region contains 413bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Grin1* 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,Null mutants lack whisker patterns in brain cortex, are ataxic and die neonatally of respiratory failure. Hypomorph mutants exhibit hyperactivity, stereotypy, and impaired social/sexual interactions. Mice homozygous for an ENU-induced allele exhibit abnormal behavior and neuron physiology.

- The *Grin1* gene is located on the Chr2. 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）

集萃药康 GemPharmatech

Grin1 glutamate receptor, ionotropic, NMDA1 (zeta 1) [Mus musculus (house mouse)]

Gene ID: 14810, updated on 7-Apr-2019

Summary

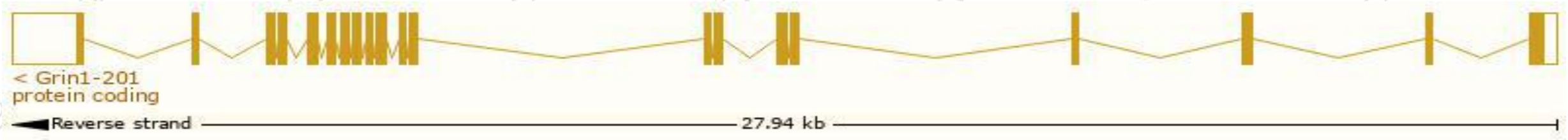
Official Symbol	Grin1 provided by MGI
Official Full Name	glutamate receptor, ionotropic, NMDA1 (zeta 1) provided by MGI
Primary source	MGI:MGI:95819
See related	Ensembl:ENSMUSG00000026959
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	GluN1, GluRdelta1, GluRzeta1, M100174, NMD-R1, NMDAR1, NR1, Nmdar, Rgsc174
Expression	Biased expression in cortex adult (RPKM 73.7), frontal lobe adult (RPKM 72.0) and 5 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

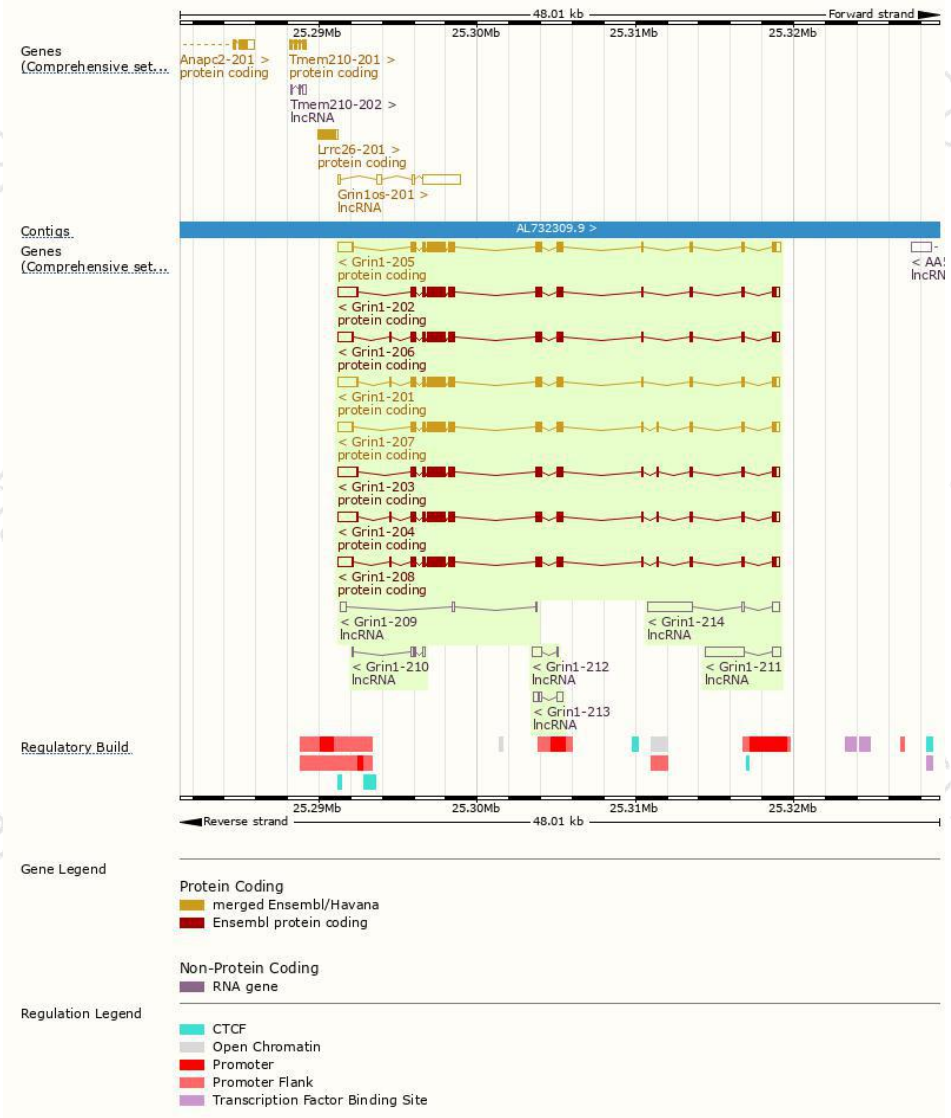
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grin1-201	ENSMUST00000028335.12	4238	938aa	Protein coding	CCDS15764	P35438	TSL:1 GENCODE basic APPRIS P3
Grin1-205	ENSMUST00000114312.1	3838	885aa	Protein coding	CCDS50528	P35438	TSL:1 GENCODE basic APPRIS ALT2
Grin1-207	ENSMUST00000114317.9	3809	906aa	Protein coding	CCDS50529	A2AI16	TSL:1 GENCODE basic APPRIS ALT2
Grin1-204	ENSMUST00000114310.9	4276	959aa	Protein coding	-	A2AI21	TSL:5 GENCODE basic APPRIS ALT2
Grin1-203	ENSMUST00000114308.9	4165	922aa	Protein coding	-	A2AI20	TSL:5 GENCODE basic
Grin1-202	ENSMUST00000114307.7	4127	901aa	Protein coding	-	A2AI19	TSL:5 GENCODE basic
Grin1-208	ENSMUST00000114318.9	3920	943aa	Protein coding	-	A2AI14	TSL:5 GENCODE basic APPRIS ALT2
Grin1-206	ENSMUST00000114314.9	3882	922aa	Protein coding	-	A2AI17	TSL:5 GENCODE basic APPRIS ALT1
Grin1-214	ENSMUST00000155627.1	3437	No protein	lncRNA	-	-	TSL:1
Grin1-211	ENSMUST00000144402.1	3024	No protein	lncRNA	-	-	TSL:2
Grin1-213	ENSMUST00000153551.1	731	No protein	lncRNA	-	-	TSL:2
Grin1-212	ENSMUST00000153465.1	634	No protein	lncRNA	-	-	TSL:3
Grin1-209	ENSMUST00000127171.1	527	No protein	lncRNA	-	-	TSL:2
Grin1-210	ENSMUST00000135426.1	456	No protein	lncRNA	-	-	TSL:3

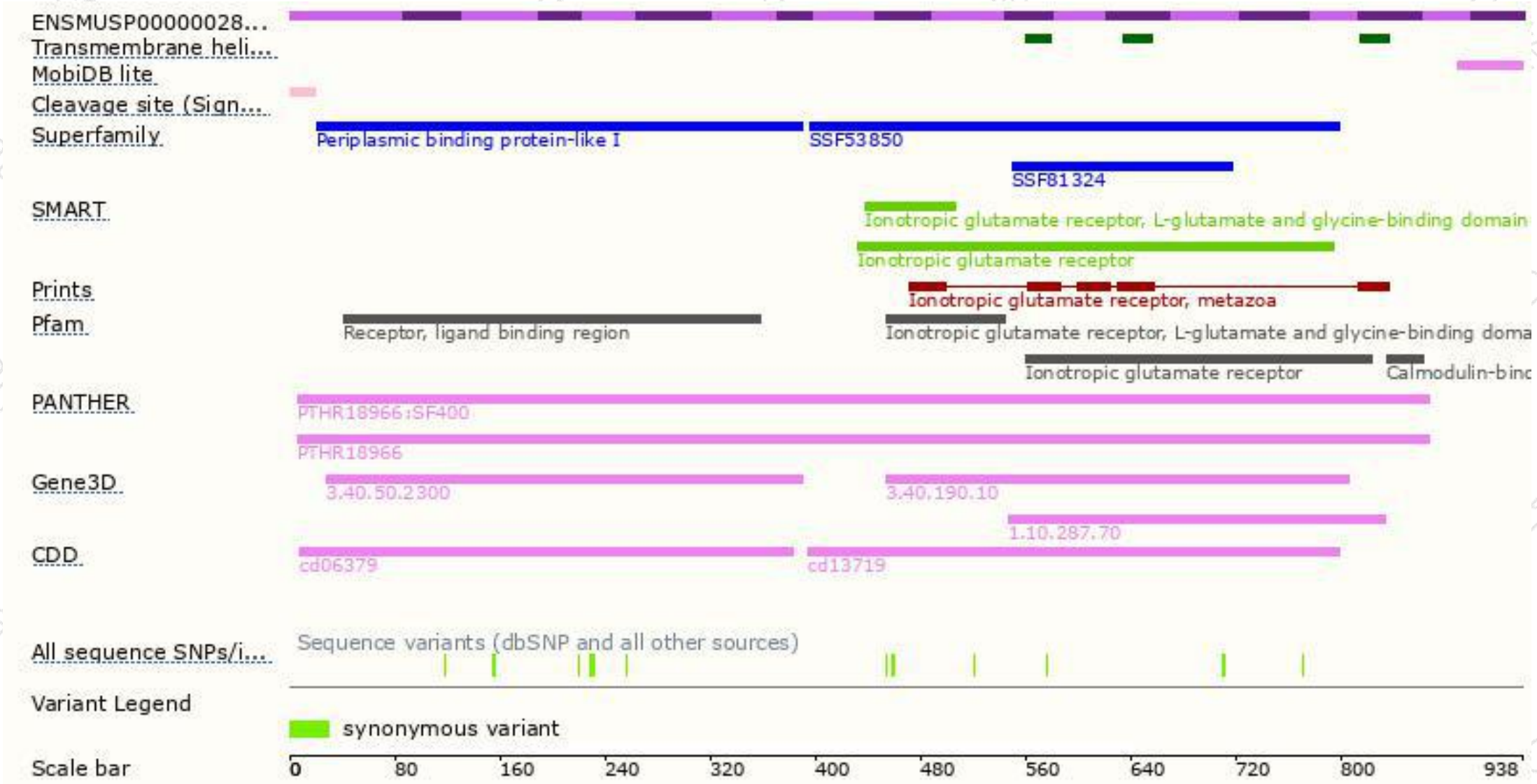
The strategy is based on the design of *Grin1-201* transcript,The transcription is shown below



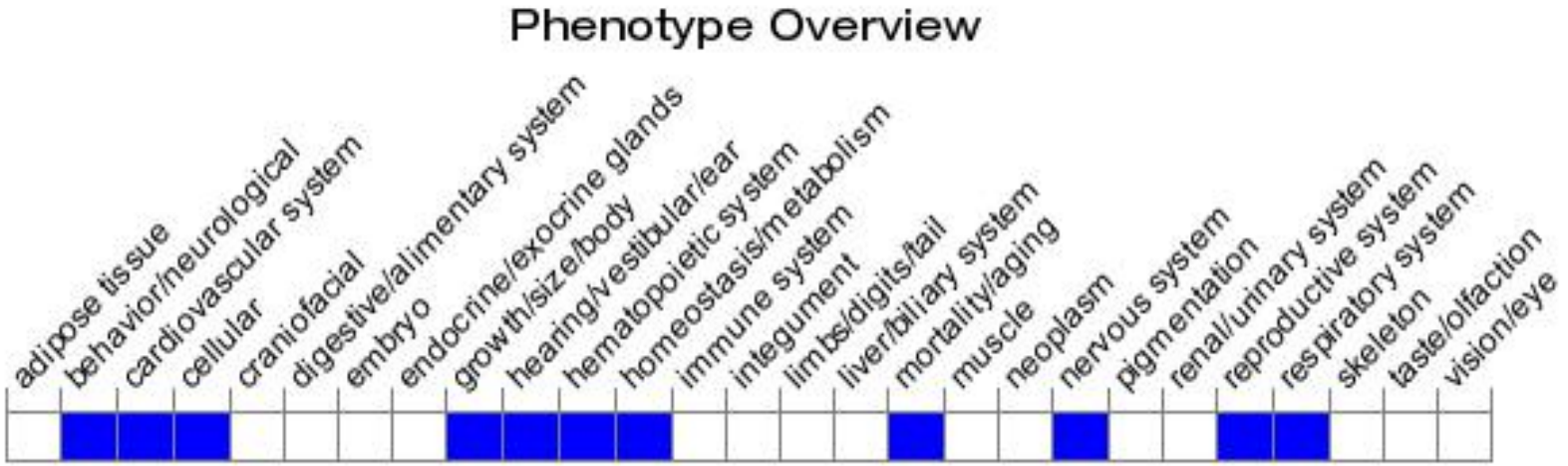
Genomic location distribution



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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