Gria4 Cas9-KO Strategy

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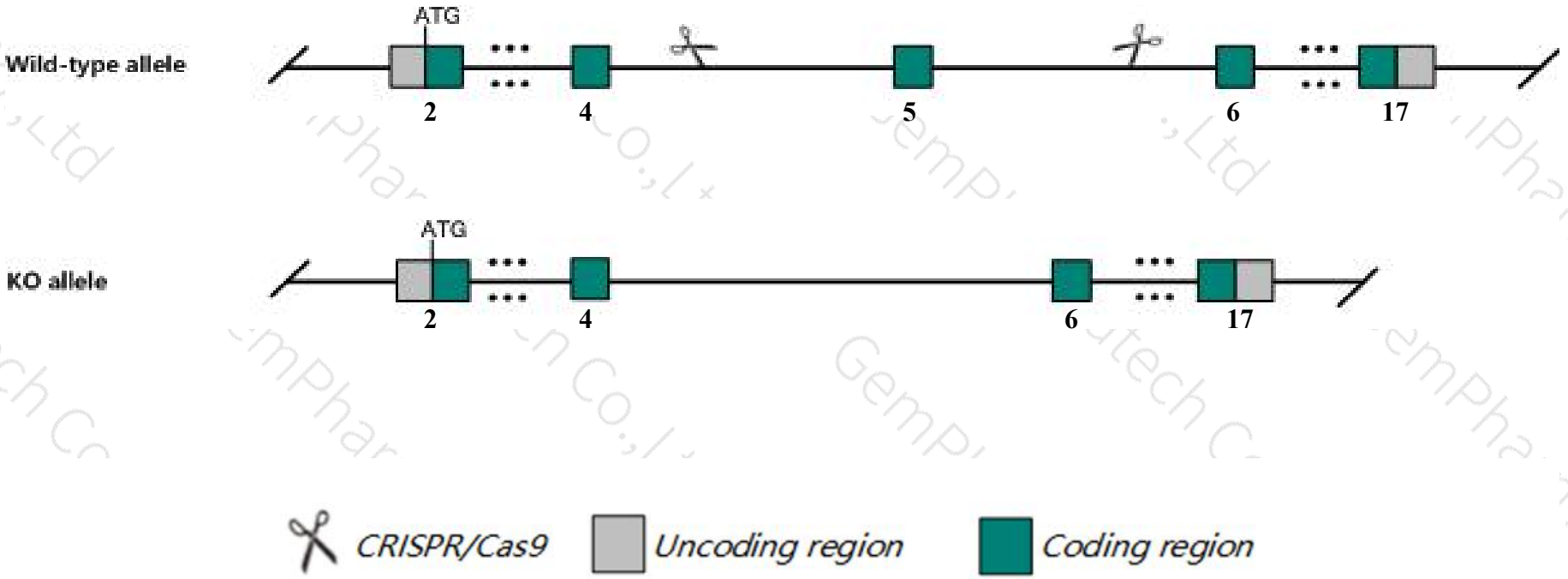
Project Overview

Project Name	***Gria4***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gria4* gene. The schematic diagram is as follows:



Technical routes

➢ The *Gria4* gene has 4 transcripts. According to the structure of *Gria4* gene, exon5 of *Gria4-201* (ENSMUST00000027020.12) transcript is recommended as the knockout region.The region contains 185bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Gria4* gene. The brief process is as follows: CRISPR/Cas9 system w

Notice

- According to the existing MGI data,Mice homozygous for a targeted mutation display hyperactivity, decreased thermal nociception, and abnormal sensitivity to pharmacologically induced seizures.

- The *Gria4* gene is located on the Chr9. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

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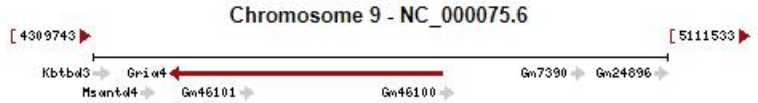
Gria4 glutamate receptor, ionotropic, AMPA4 (alpha 4) [*Mus musculus* (house mouse)]

Gene ID: 14802, updated on 29-Oct-2019

Summary

Official Symbol	Gria4 provided by MGI
Official Full Name	glutamate receptor, ionotropic, AMPA4 (alpha 4) provided by MGI
Primary source	MGI:MGI:95811
See related	Ensembl:ENSMUSG00000025892
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	GluA4; Glur4; spkw1; GluR-D; Glur-4; Gluralpha4
Summary	Glutamate receptors are the predominant excitatory neurotransmitter receptors in the mammalian brain and are activated in a variety of normal neurophysiologic processes. These receptors are heteromeric protein complexes composed of multiple subunits, arranged to form ligand-gated ion channels. The classification of glutamate receptors is based on their activation by different pharmacologic agonists. The subunit encoded by this gene belongs to a family of AMPA (alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionate)-sensitive glutamate receptors, and is subject to RNA editing (AGA->GGA; R->G). Alternative splicing of this gene results in transcript variants encoding different isoforms, which may vary in their signal transduction properties. [provided by RefSeq, Jul 2008]
Expression	Biased expression in cerebellum adult (RPKM 34.2), frontal lobe adult (RPKM 17.3) and 6 other tissues See more
Orthologs	human all

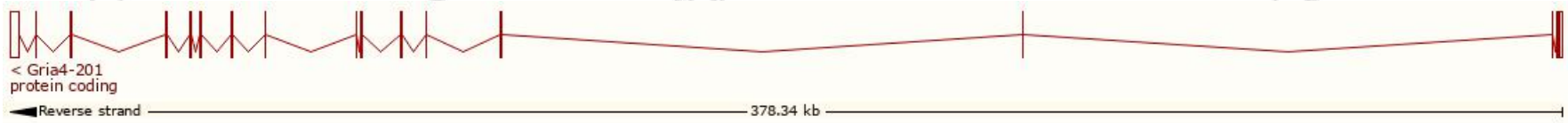


Transcript information（Ensembl）

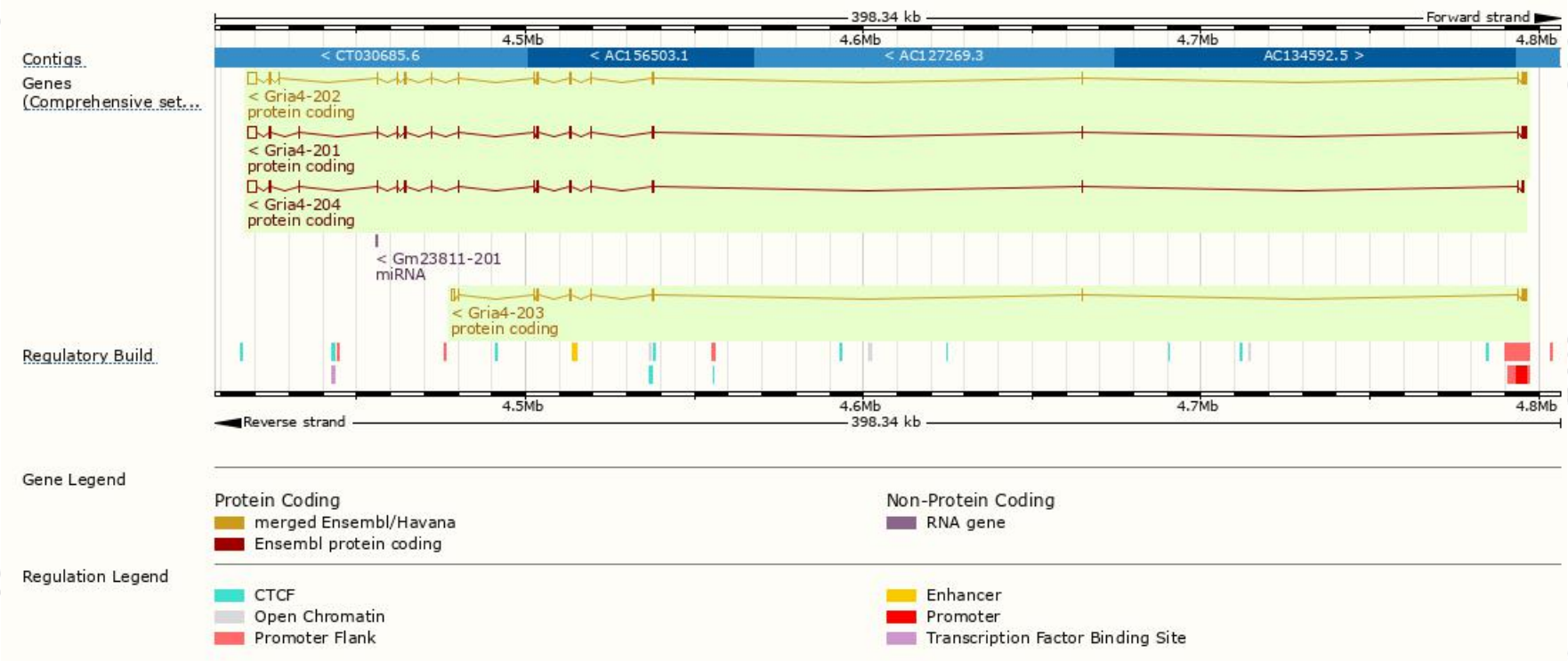
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gria4-201	ENSMUST00000027020.12	5441	902aa	Protein coding	CCDS52715	G5E863	TSL:5 GENCODE basic APPRIS ALT1
Gria4-202	ENSMUST00000063508.14	5352	902aa	Protein coding	CCDS22797	Q9Z2W8	TSL:1 GENCODE basic APPRIS P3
Gria4-204	ENSMUST00000212533.1	5207	902aa	Protein coding	CCDS52715	G5E863	TSL:1 GENCODE basic APPRIS ALT1
Gria4-203	ENSMUST00000163309.1	2338	433aa	Protein coding	CCDS52716	E9PX01	TSL:1 GENCODE basic

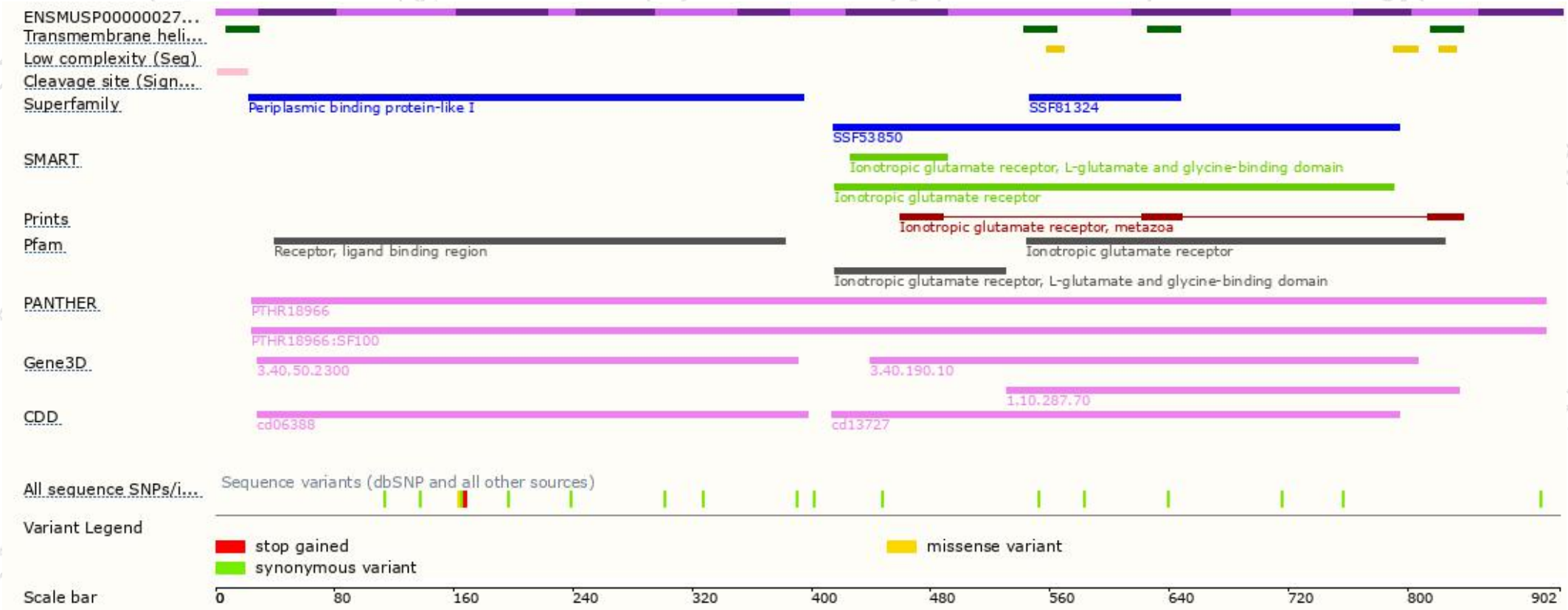
The strategy is based on the design of *Gria4-201* transcript,The transcription is shown below



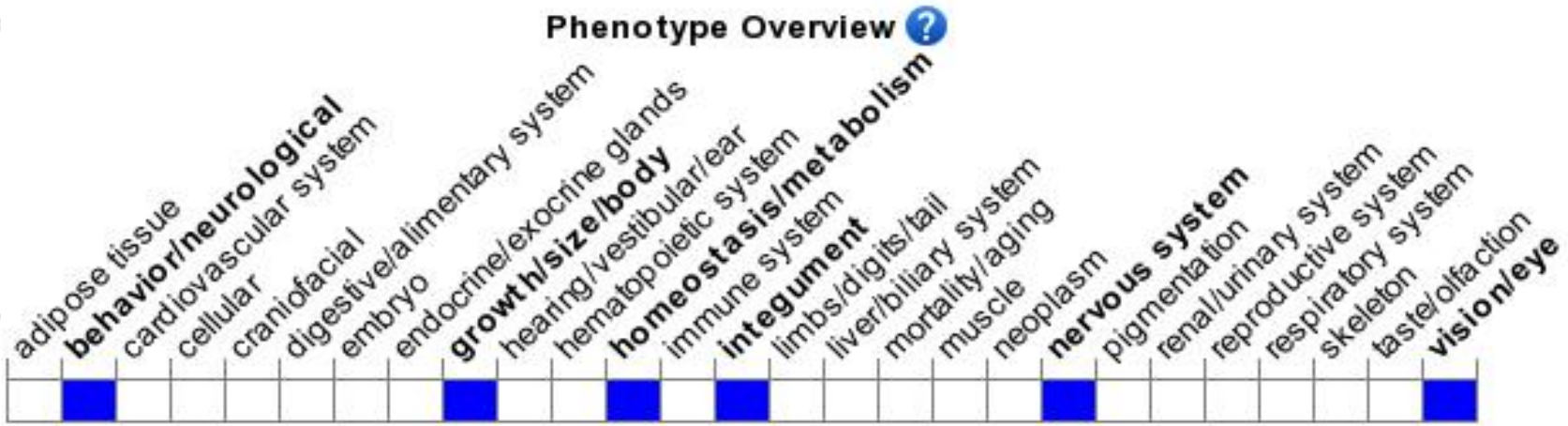
Genomic location distribution



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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