

Glra1 Cas9-CKO Strategy

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Overview

Target Gene Name

- Glra1

Project Type

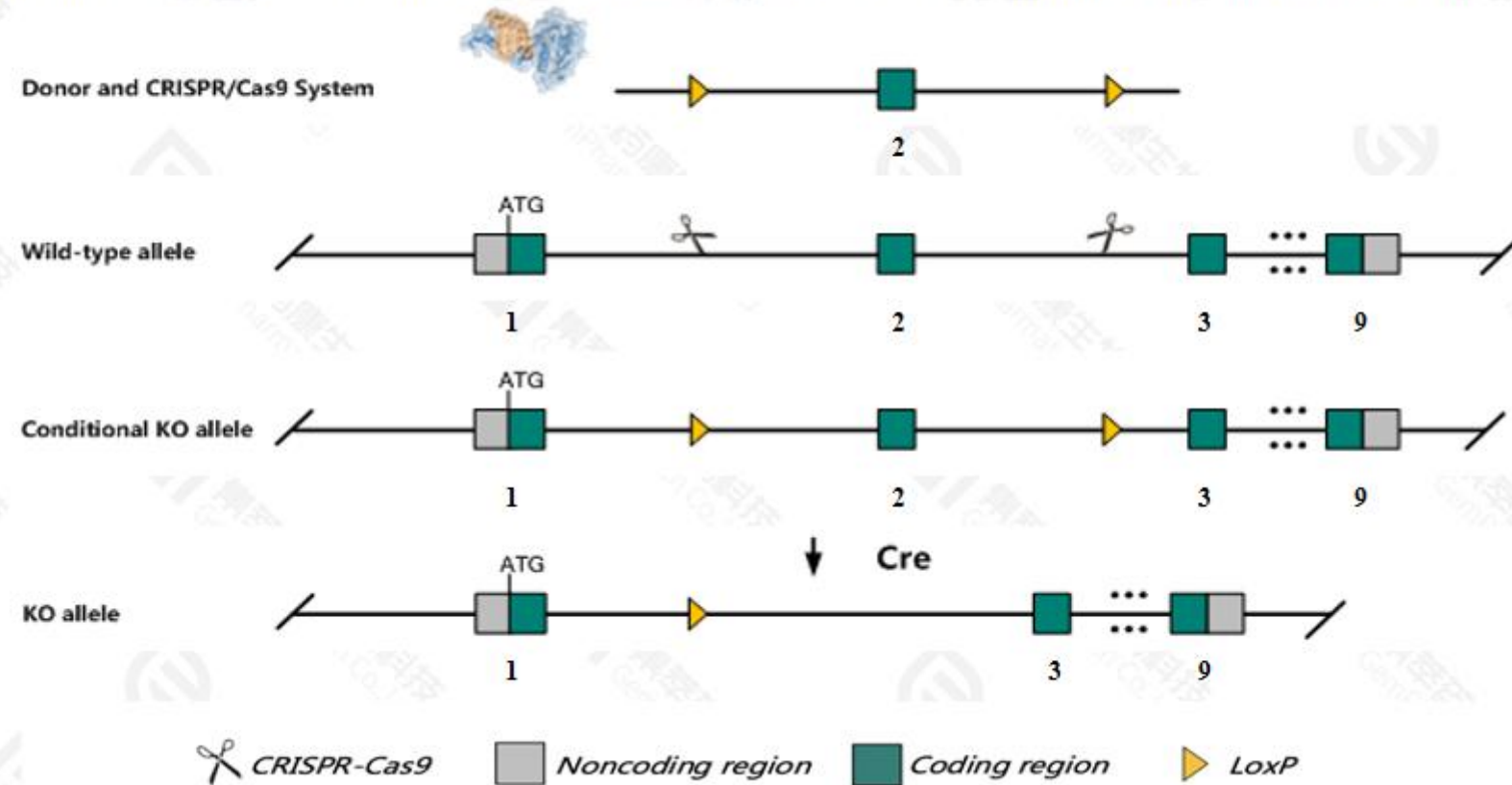
- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy

This model will use CRISPR-Cas9 technology to edit the *Glr1* gene. The schematic diagram is as follows:



Schematic representation of CRISPR-Cas9 engineering used to edit the *Glr1* gene.

Technical Information

- The *Gbra1* gene has 3 transcripts. According to the structure of *Gbra1* gene, exon2 of *Gbra1*-201(ENSMUST00000075603.5) transcript is recommended as the knockout region. The region contains 128bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Gbra1* 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.

Gene Information

Gla1 glycine receptor, alpha 1 subunit [Mus musculus (house mouse)]

Gene ID: 14654, updated on 13-Mar-2020

Summary



Official Symbol Gla1 provided by [MGI](#)

Official Full Name glycine receptor, alpha 1 subunit provided by [MGI](#)

Primary source [MGI:MGI:95747](#)

See related [Ensembl:ENSMUSG00000000263](#)

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 nmf11, oscillator, ot, spasmodic, spd

Expression Biased expression in cerebellum adult (RPKM 5.8), CNS E11.5 (RPKM 0.5) and 1 other tissue [See more](#)

Orthologs [human](#) [all](#)

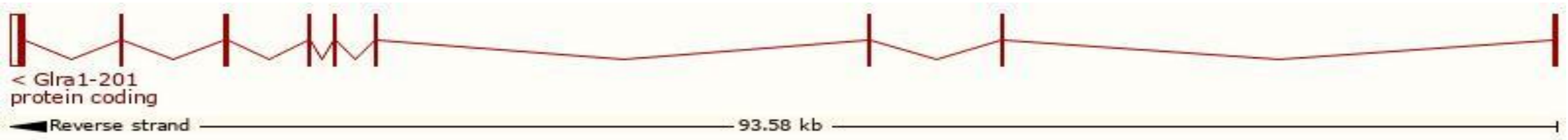
Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 3 transcripts, all transcripts are shown below:

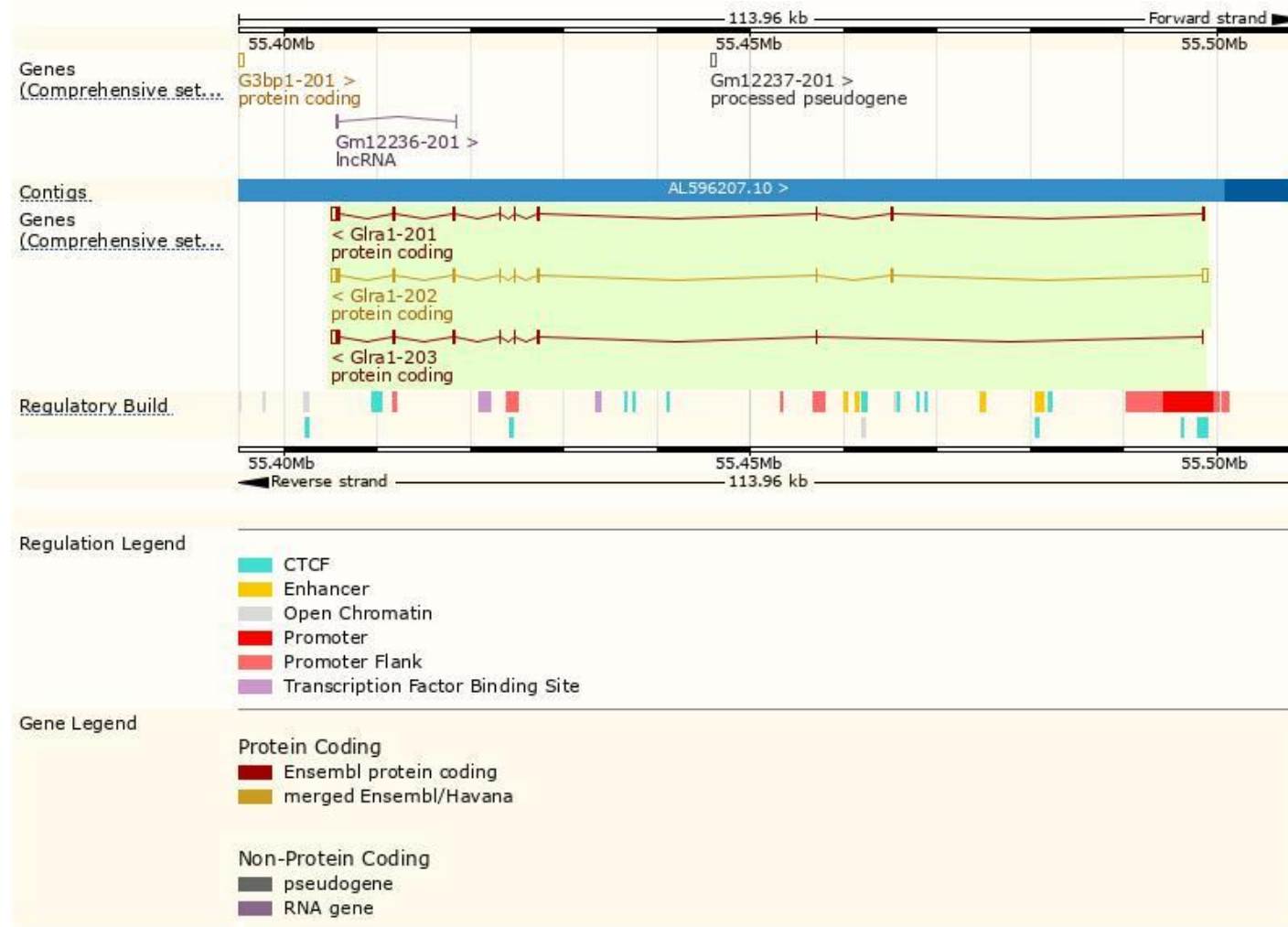
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gla1-202	ENSMUST00000102716.9	2390	449aa	Protein coding	CCDS24715	Q5NCT9 Q64018	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P3
Gla1-201	ENSMUST00000075603.4	2037	457aa	Protein coding	CCDS70190	Q64018	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS ALT1
Gla1-203	ENSMUST00000108853.7	1797	366aa	Protein coding	-	Q5NCU0	TSL:5 GENCODE basic

The strategy is based on the design of *Gla1*-201 transcript, the transcription is shown below:

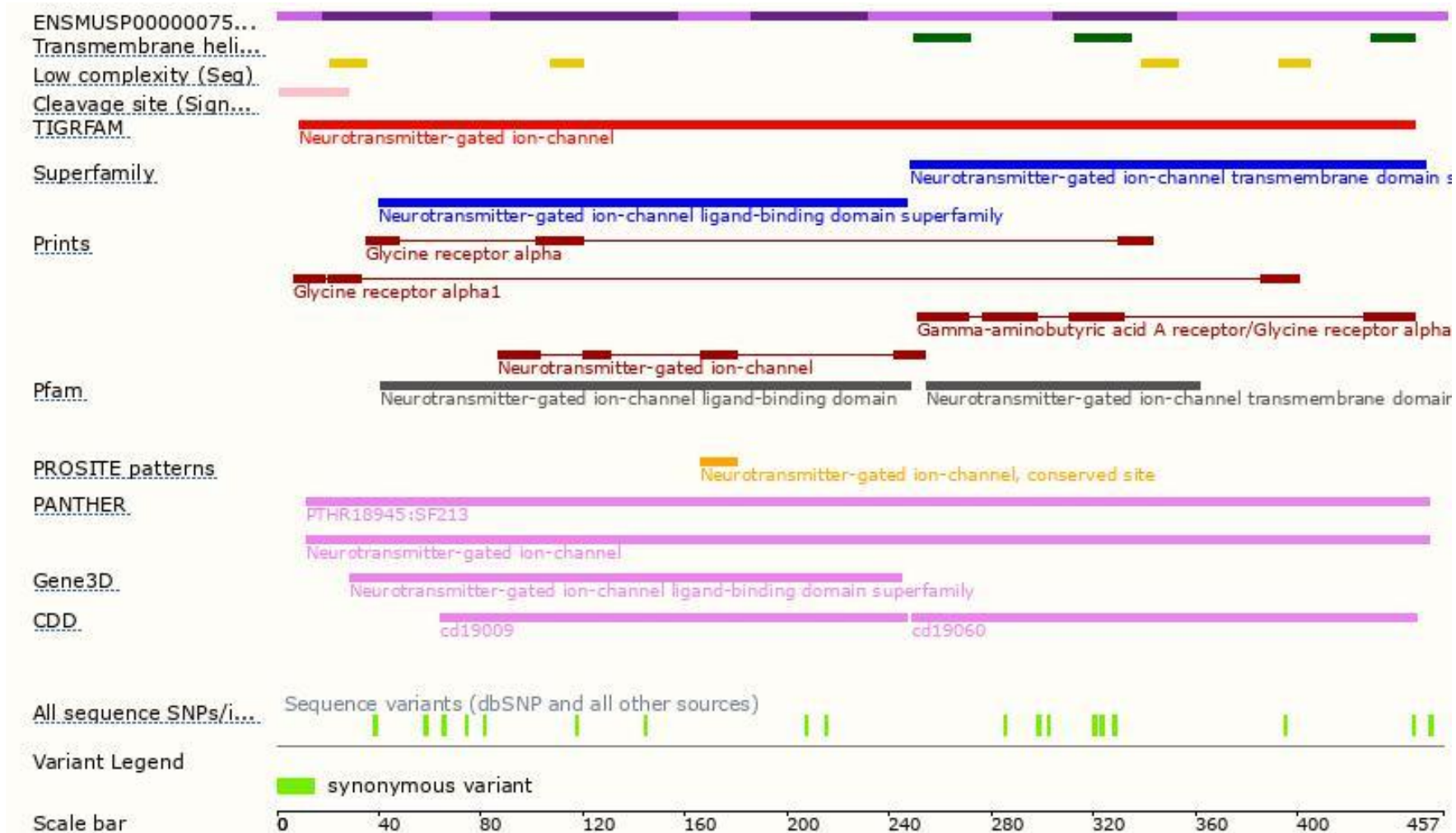


Source: <https://www.ensembl.org>

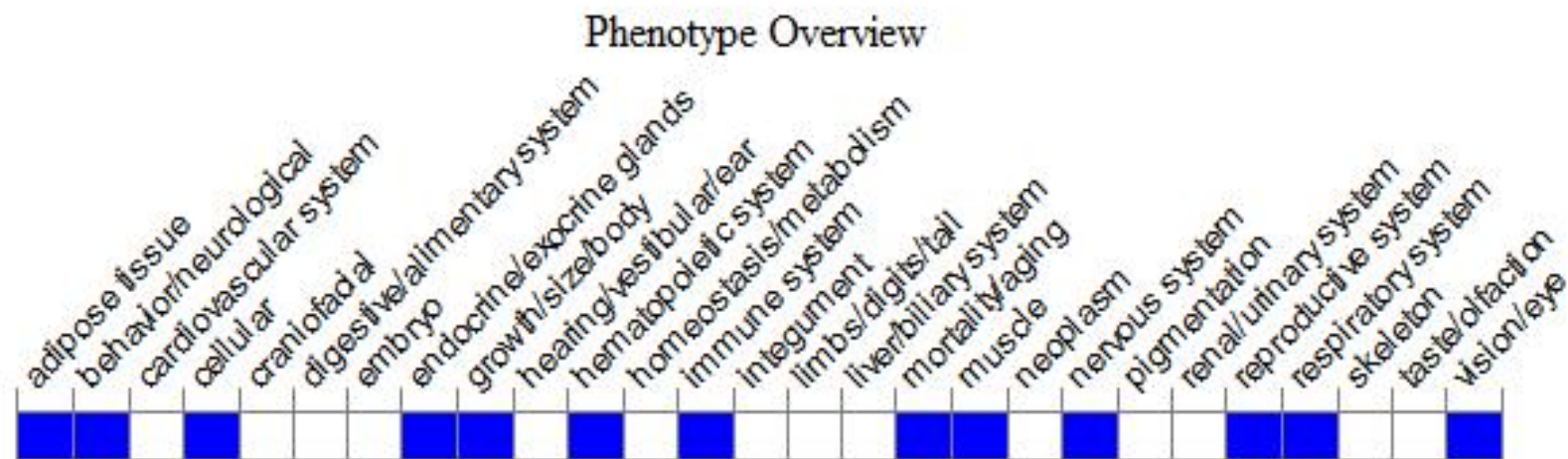
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



- Phenotypes affected by the mutations of *Glra1* gene are marked in blue. According to the existing MGI data, mutations in this gene result in neurological defects for all alleles reported. Specific alleles also show affects on viability, reproductive performance, and/or eye and respiratory physiology.

Important Information

- Transcript *Gbra1*-203 may not be affected.
- The *Gbra1* 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.