

Gpr21 Cas9-KO Strategy

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Project Overview

Project Name

Gpr21

Project type

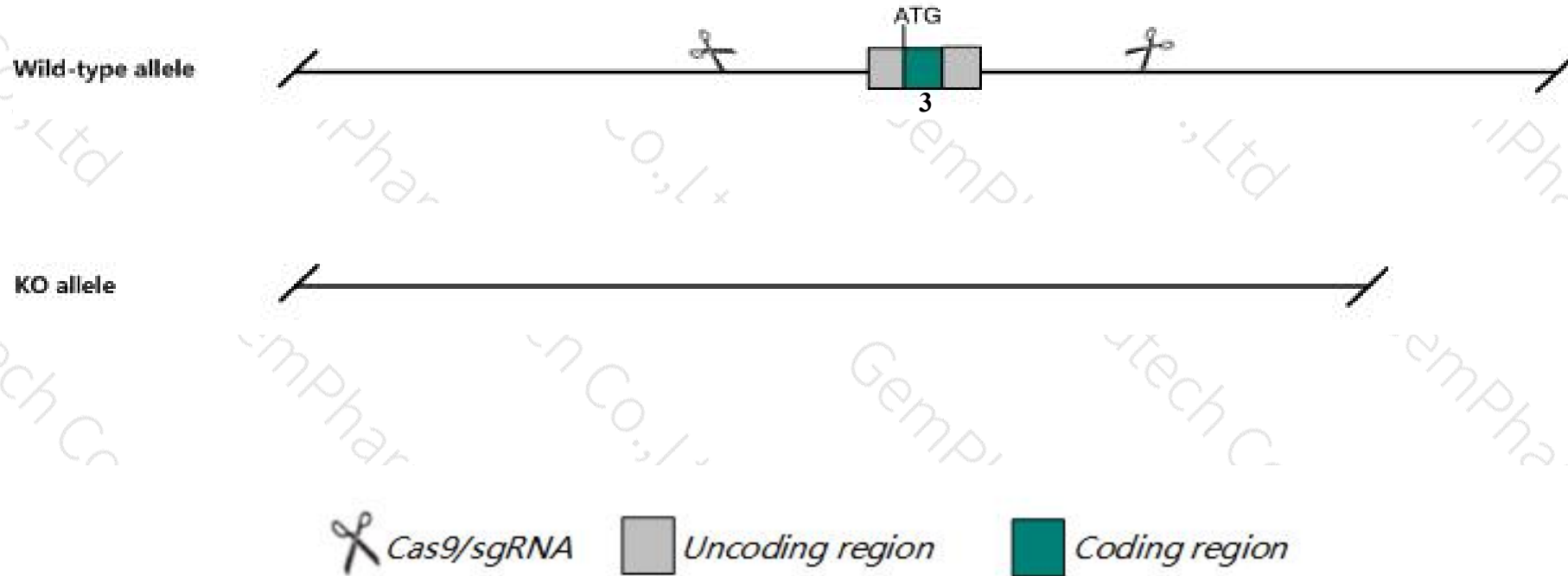
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gpr21* gene. The schematic diagram is as follows:



- The *Gpr21* gene has 4 transcripts. According to the structure of *Gpr21* gene, exon3 of *Gpr21-201* (ENSMUST00000057783.5) transcript is recommended as the knockout region. The region contains all the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gpr21* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Mice homozygous for a null allele exhibit increased response to aortic banding including decreased fractional shortening and decompensated heart failure.
- The partial sequence of intron of *Cog5* gene will be deleted together in this strategy.
- The *Gpr21* gene is located on the Chr12. 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)

Gpr22 G protein-coupled receptor 22 [*Mus musculus* (house mouse)]

Gene ID: 73010, updated on 15-Apr-2019

Summary

Official Symbol Gpr22 provided by [MGI](#)
Official Full Name G protein-coupled receptor 22 provided by [MGI](#)
Primary source [MGI:MGI:1920260](#)
See related [Ensembl:ENSMUSG00000044067](#)
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 AW061316; 2900068K05Rik
Expression Biased expression in cerebellum adult (RPKM 7.8), cortex adult (RPKM 4.9) and 6 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 12; 12 A3

See Gpr22 in [Genome Data Viewer](#)

Exon count: 3

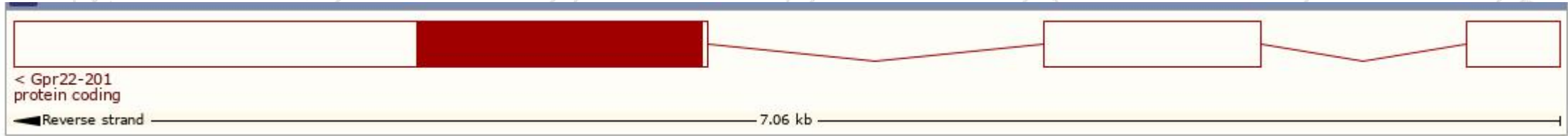
Annotation release	Status	Assembly	Chr	Location
106	current	GRCm38.p4 (GCF_000001635.24)	12	NC_000078.6 (31706867..31713926, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	12	NC_000078.5 (32391732..32398791, complement)

Transcript information (Ensembl)

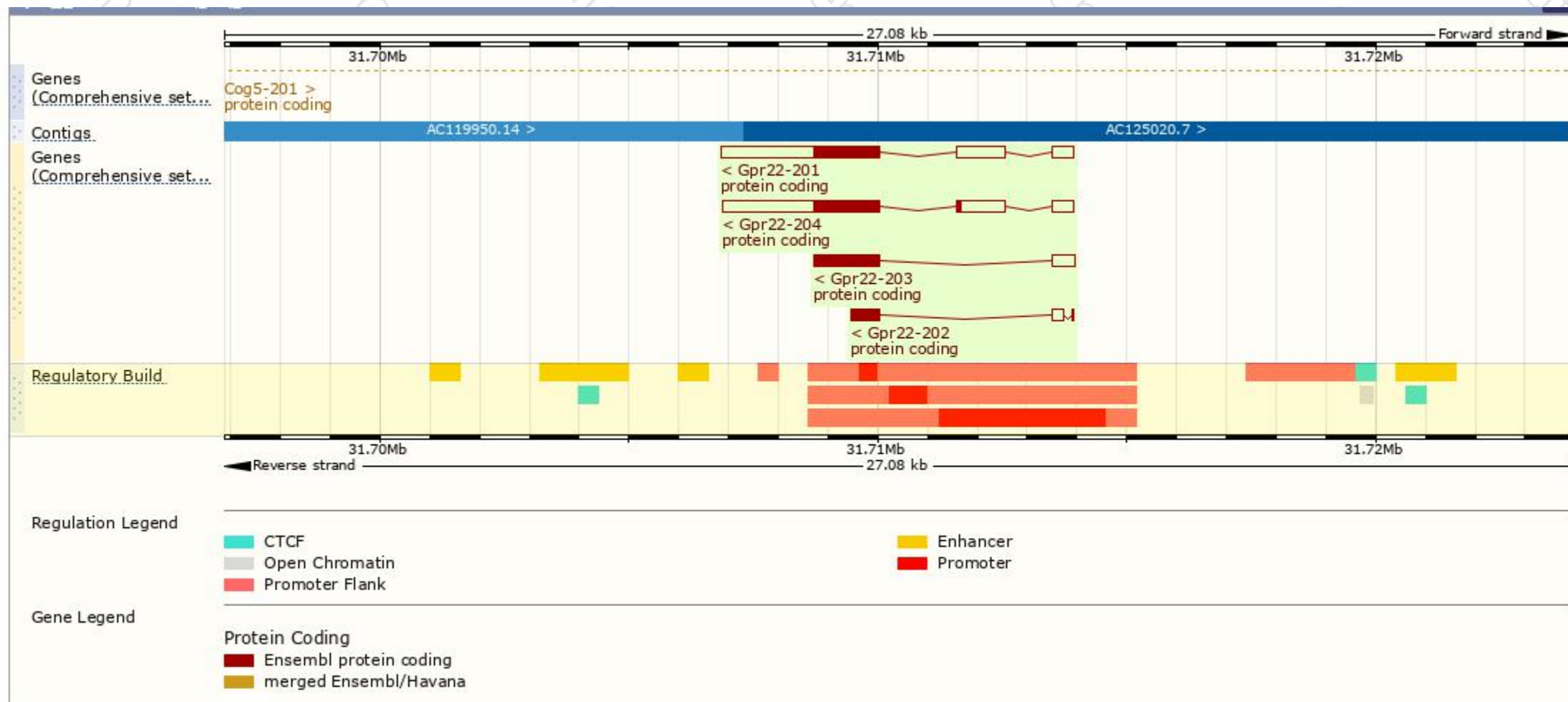
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpr22-201	ENSMUST00000057783.5	4587	432aa	Protein coding	-	G3X9C3	TSL:1 GENCODE basic APPRIS P1
Gpr22-202	ENSMUST00000174480.2	874	187aa	Protein coding	-	G3UZX5	CDS 3' incomplete TSL:5
Gpr22-203	ENSMUST00000176710.1	1772	432aa	Protein coding	-	Q8BZL4	TSL:5 GENCODE basic APPRIS P1
Gpr22-204	ENSMUST00000236002.1	4581	469aa	Protein coding	CCDS25866	-	GENCODE basic

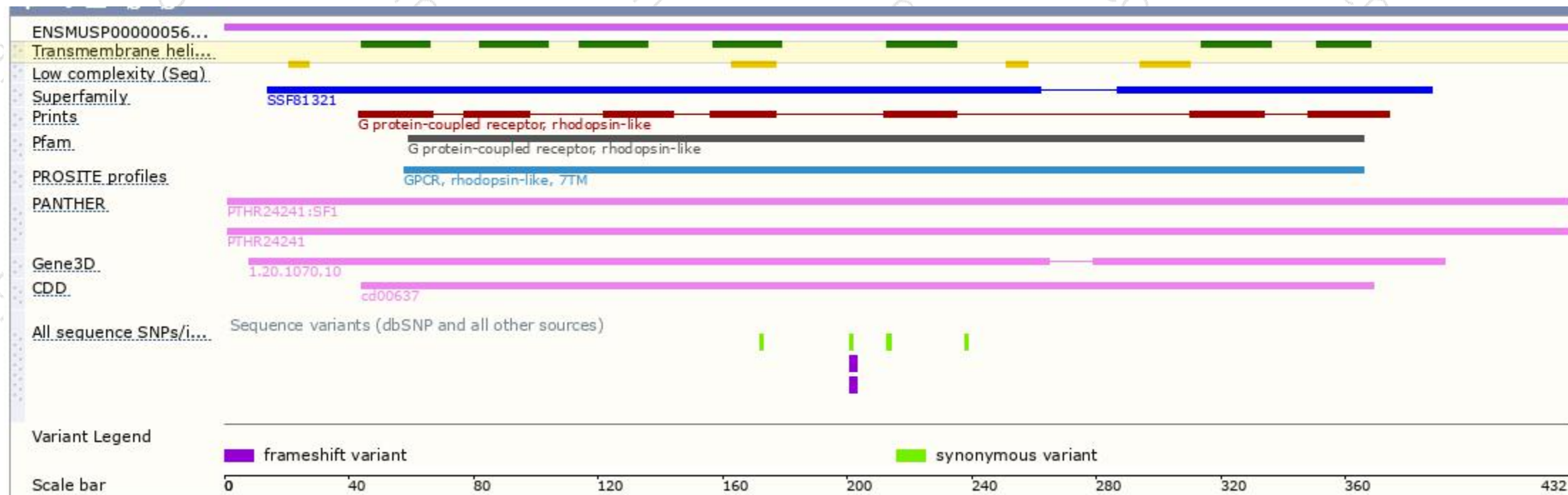
The strategy is based on the design of *Gpr22-201* transcript,The transcription is shown below



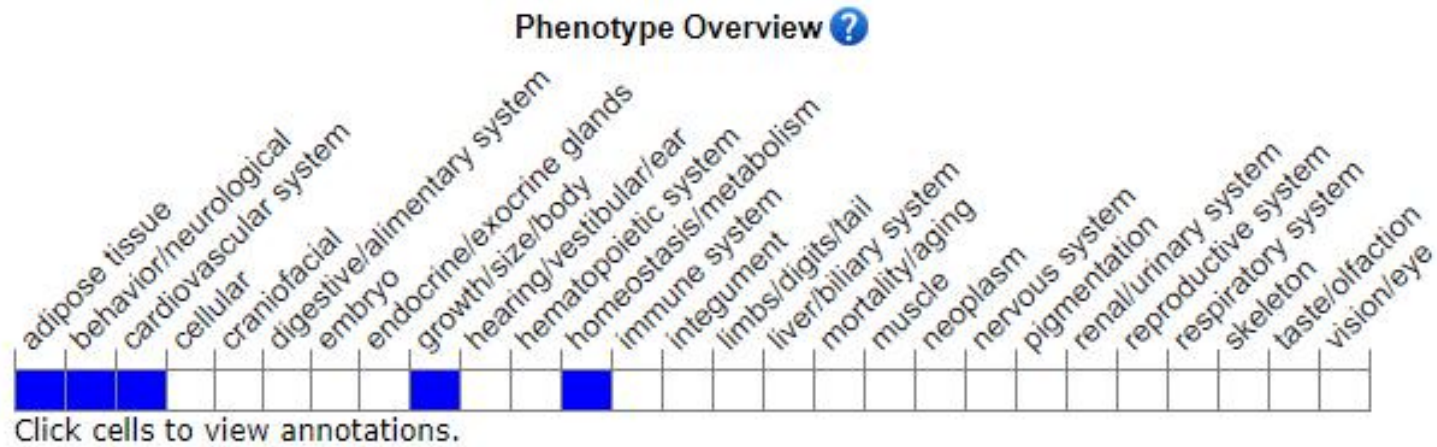
Genomic location distribution



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/>).

Mice homozygous for a null allele exhibit increased response to aortic banding including decreased fractional shortening and decompensated heart failure.

If you have any questions, you are welcome to inquire.

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