

Gpr21 Cas9-KO Strategy

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Project Overview

Project Name

Gpr21

Project type

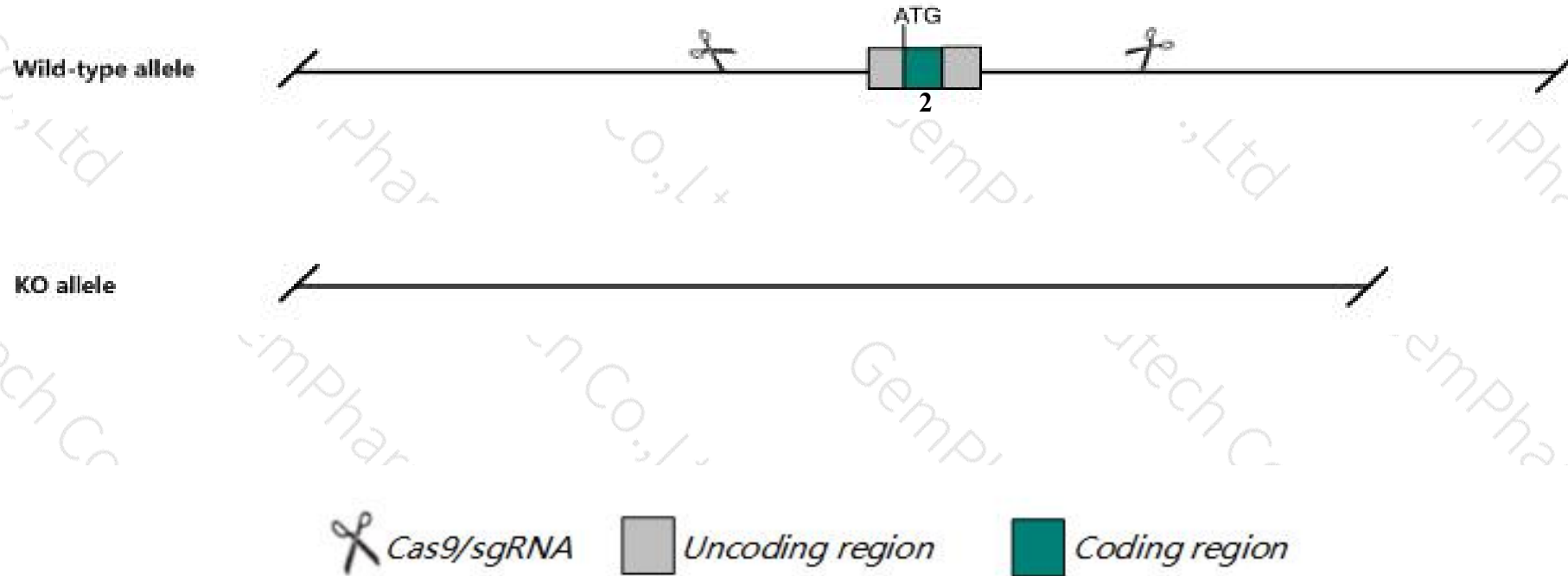
Cas9-KO

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 2 transcripts. According to the structure of *Gpr21* gene, exon2 of *Gpr21-201* (ENSMUST00000065441.6) 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 targeted allele exhibit improved glucose tolerance, insulin response and resistance to diet-induced obesity.
- The partial sequence of intron of *Rabgap1* gene will be deleted together in this strategy.
- The *Gpr21* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Gpr21 G protein-coupled receptor 21 [*Mus musculus* (house mouse)]

Gene ID: 338346, updated on 30-Jul-2019

Summary

Official Symbol Gpr21 provided by [MGI](#)
Official Full Name G protein-coupled receptor 21 provided by [MGI](#)
Primary source [MGI:MGI:2441890](#)
See related [Ensembl:ENSMUSG00000053164](#)
Gene type protein coding
RefSeq status PROVISIONAL
Organism [Mus musculus](#)
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as C230004C13Rik
Expression Biased expression in whole brain E14.5 (RPKM 2.9), CNS E18 (RPKM 2.9) and 14 other tissues [See more](#)
Orthologs [human](#) [all](#)

Genomic context

Location: 2; 2 B

[See Gpr21 in Genome Data Viewer](#)

Exon count: 2

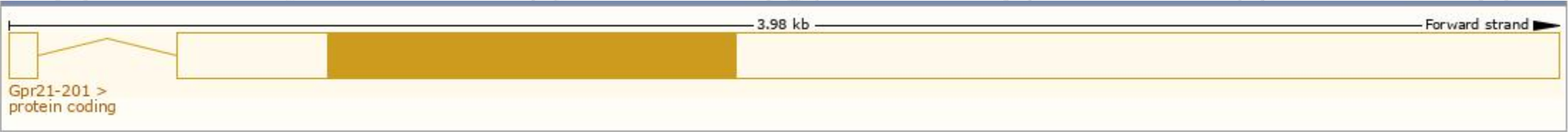
Annotation release	Status	Assembly	Chr	Location
106	current	GRCm38.p4 (GCF_000001635.24)	2	NC_000068.7 (37516626..37519281)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	2	NC_000068.6 (37372146..37374801)

Transcript information (Ensembl)

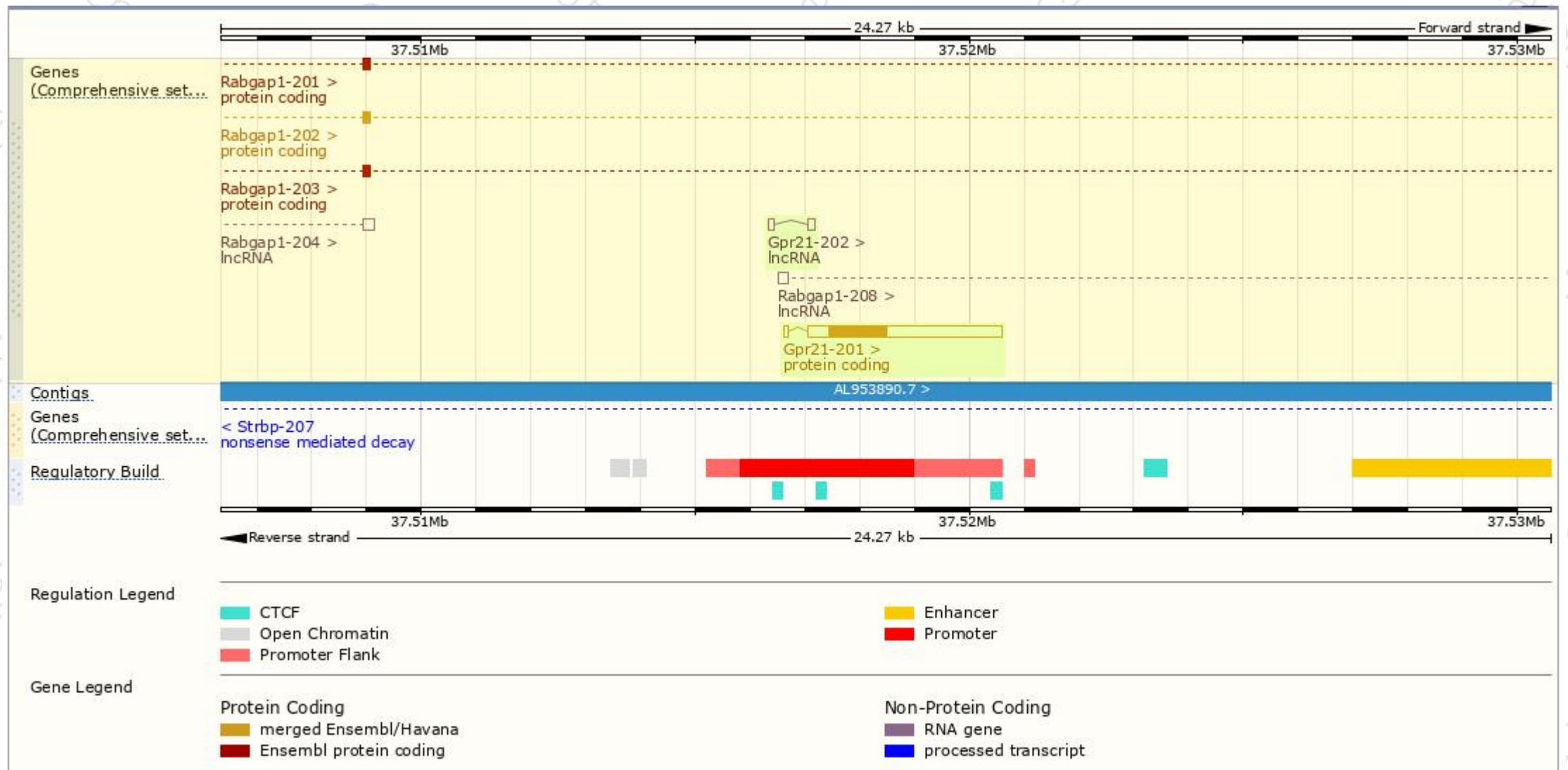
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpr21-201	ENSMUST00000065441.6	3619	349aa	Protein coding	CCDS16004	Q8BX79	TSL:1 Gencode basic APPRIS P1
Gpr21-202	ENSMUST00000159737.1	227	No protein	lncRNA	-	-	TSL:3

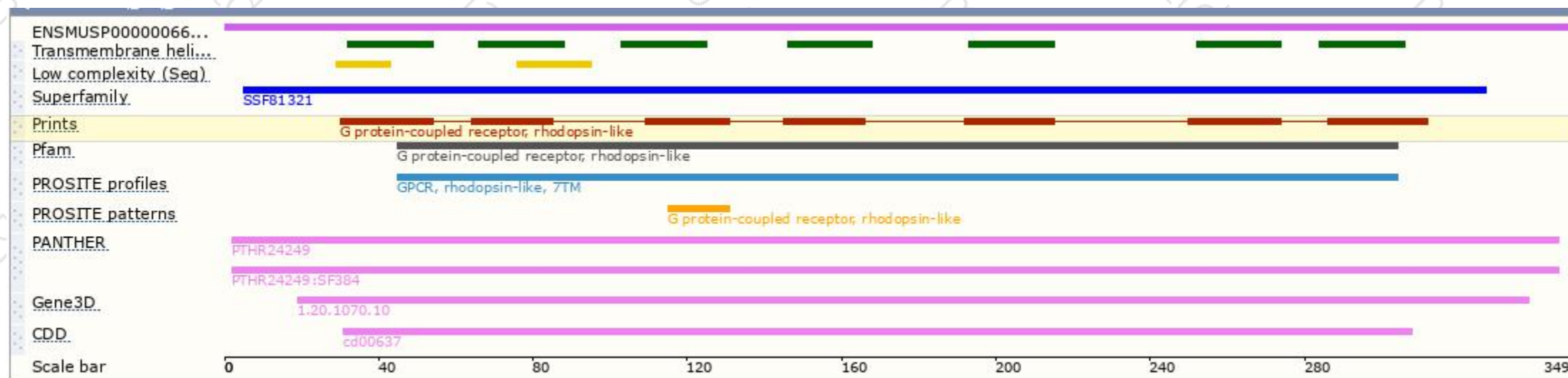
The strategy is based on the design of *Gpr21-201* transcript,The transcription is shown below



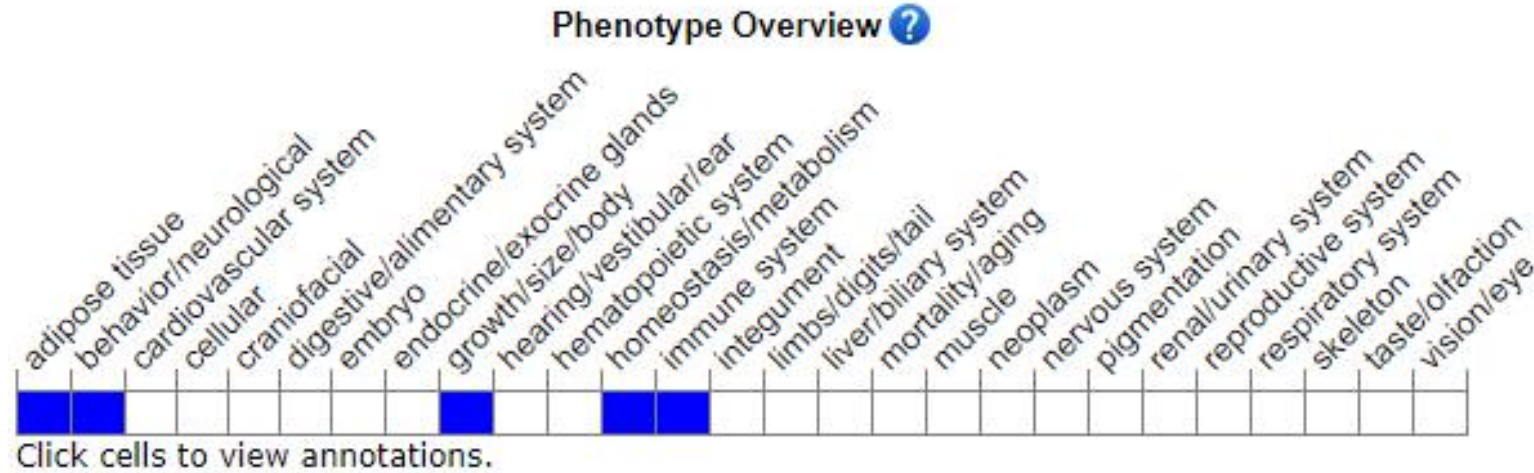
Genomic location distribution



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 targeted allele exhibit improved glucose tolerance, insulin response and resistance to diet-induced obesity.

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

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