

***Gnb5* Cas9-KO Strategy**

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Project Overview

Project Name

Gnb5

Project type

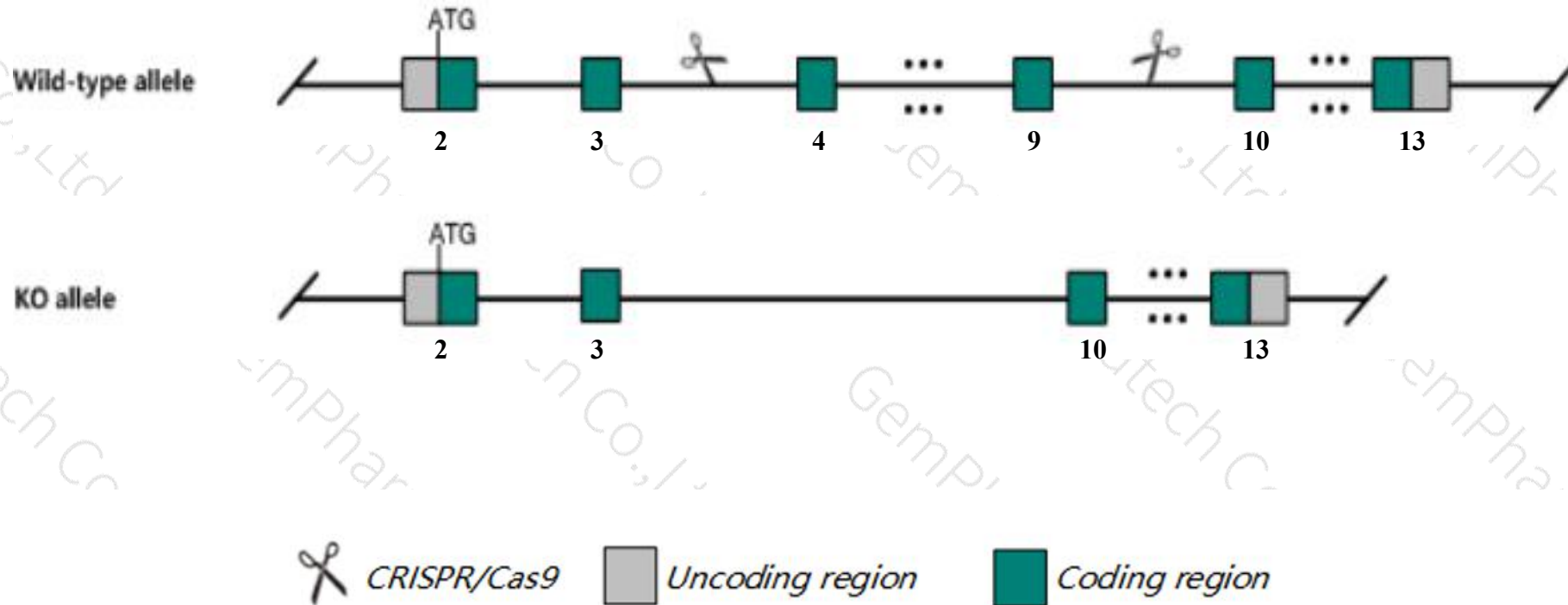
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gnb5* gene. The schematic diagram is as follows:



- The *Gnb5* gene has 8 transcripts. According to the structure of *Gnb5* gene, exon4-exon9 of *Gnb5*-202(ENSMUST00000213990.1) transcript is recommended as the knockout region. The region contains 625bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Gnb5* gene. The brief process is as follows: CRISPR/Cas9 system 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, homozygotes for a targeted null mutation are runty and exhibit high preweaning mortality. Survivors are apparently normal, but show prolonged photoresponses and defective adaptation in rod cells.
- The *Gnb5* 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.
- The deleted areas include GM48677-201.

Gene information (NCBI)

Gnb5 guanine nucleotide binding protein (G protein), beta 5 [Mus musculus (house mouse)]

Gene ID: 14697, updated on 13-Mar-2020

Summary



Official Symbol	Gnb5 provided by MGI
Official Full Name	guanine nucleotide binding protein (G protein), beta 5 provided by MGI
Primary source	MGI:MGI:101848
See related	Ensembl:ENSMUSG00000032192
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	GBS, Gbeta5, flr
Expression	Broad expression in cerebellum adult (RPKM 36.1), frontal lobe adult (RPKM 31.3) and 19 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

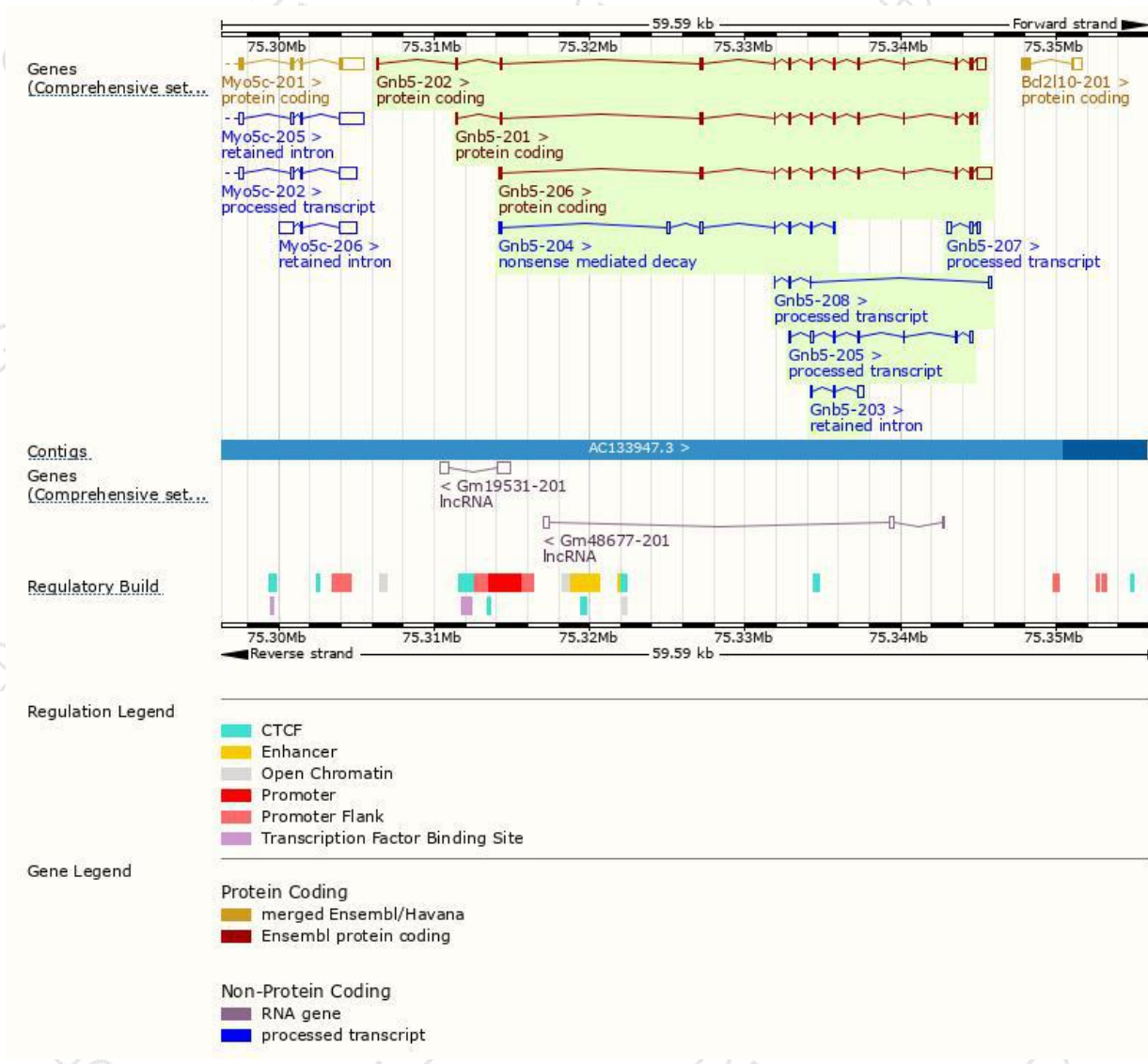
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gnb5-202	ENSMUST00000213990.1	1803	395aa	Protein coding	CCDS40692	P62881	TSL:1 GENCODE basic APPRIS P2
Gnb5-201	ENSMUST00000076889.6	1188	395aa	Protein coding	CCDS40692	P62881	TSL:1 GENCODE basic APPRIS P2
Gnb5-206	ENSMUST00000215875.1	2105	353aa	Protein coding	-	P62881 Q3UG14	TSL:1 GENCODE basic APPRIS ALT1
Gnb5-204	ENSMUST00000215002.1	952	46aa	Nonsense mediated decay	-	A0A1L1STC5	TSL:5
Gnb5-205	ENSMUST00000215346.1	823	No protein	Processed transcript	-	-	TSL:3
Gnb5-207	ENSMUST00000215891.1	540	No protein	Processed transcript	-	-	TSL:1
Gnb5-208	ENSMUST00000216290.1	407	No protein	Processed transcript	-	-	TSL:5
Gnb5-203	ENSMUST00000214744.1	633	No protein	Retained intron	-	-	TSL:3

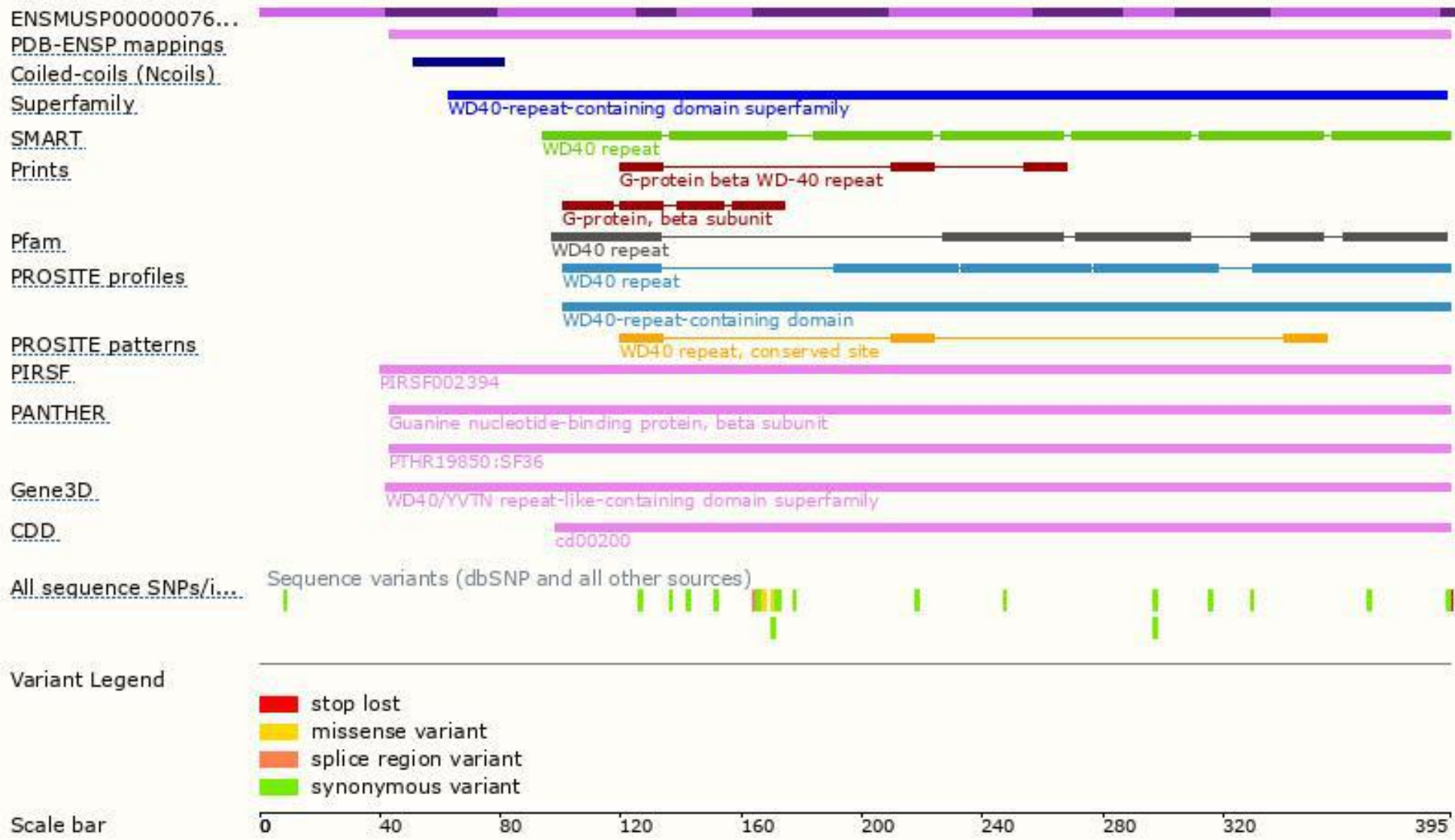
The strategy is based on the design of *Gnb5-202* transcript,the transcription is shown below:



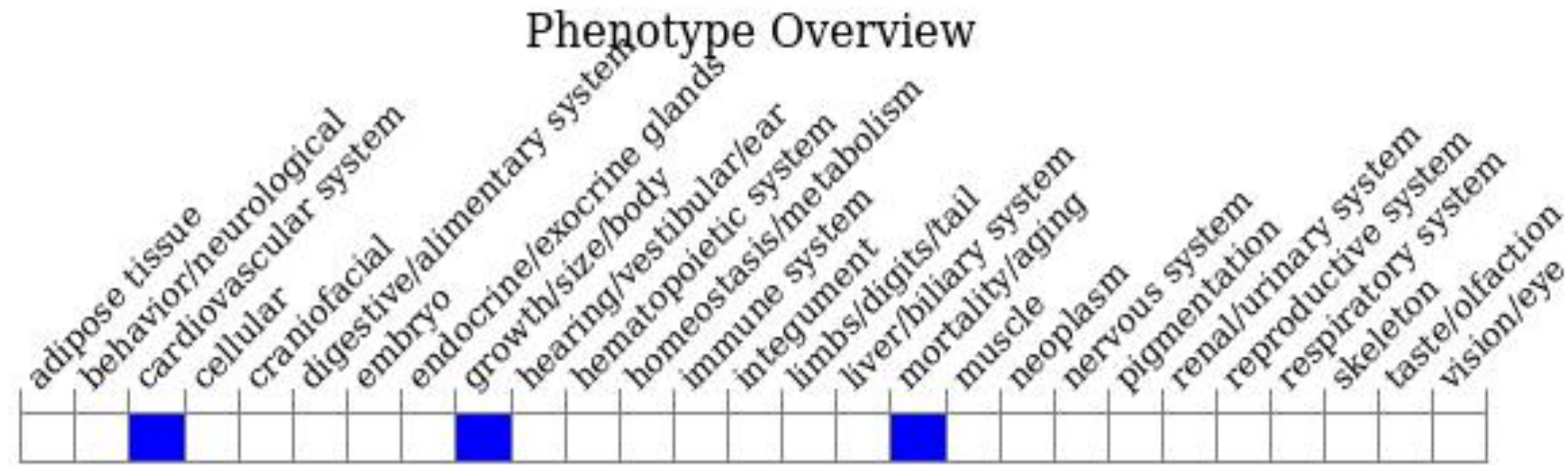
Genomic location distribution



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/>).

According to the existing MGI data, homozygotes for a targeted null mutation are runty and exhibit high preweaning mortality. Survivors are apparently normal, but show prolonged photoresponses and defective adaptation in rod cells.

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

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