Gnb1 Cas9-CKO Strategy

Designer: Huimin Su

Reviewer: Ruirui Zhang

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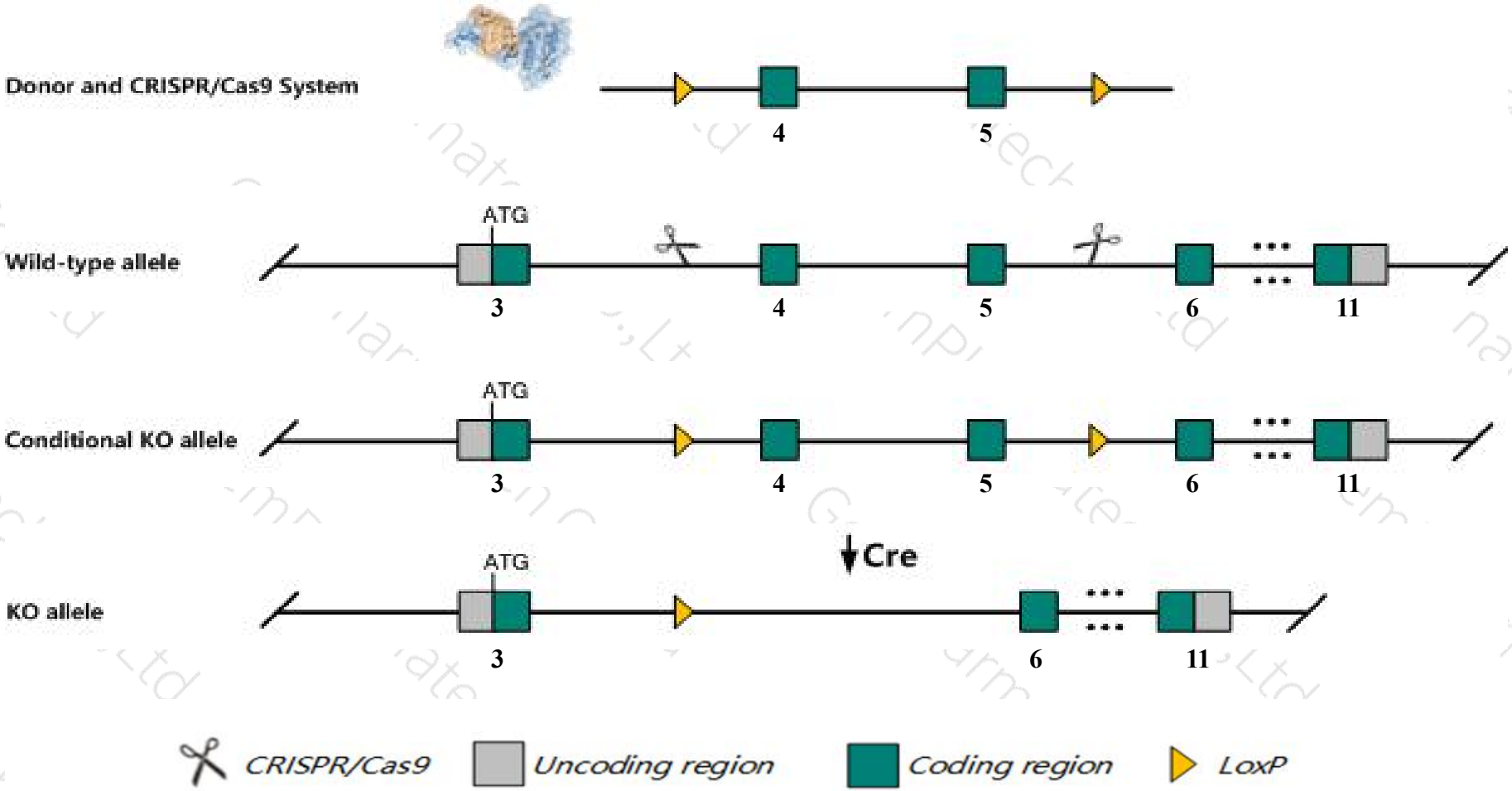
Project Overview

Project Name	***Gnb1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gnb1* gene. The schematic diagram is as follows:



Technical routes

- The *Gnb1* gene has 9 transcripts. According to the structure of *Gnb1* gene, exon4-exon5 of *Gnb1-203* (ENSMUST00000165335.7) transcript is recommended as the knockout region.The region contains 146bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Gnb1* 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.

Notice

- According to the existing MGI data,Heterozygous null mice have an abnormal retina morphology with progressive degeneration. Mice homozygous for a mutation of this gene show prenatal or perinatal lethality with exencephaly and/or small brain.

- The *Gnb1* gene is located on the Chr4. 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.

Gene information （NCBI）

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Gnb1 guanine nucleotide binding protein (G protein), beta 1 [*Mus musculus* (house mouse)]

Gene ID: 14688, updated on 12-Aug-2019

Summary

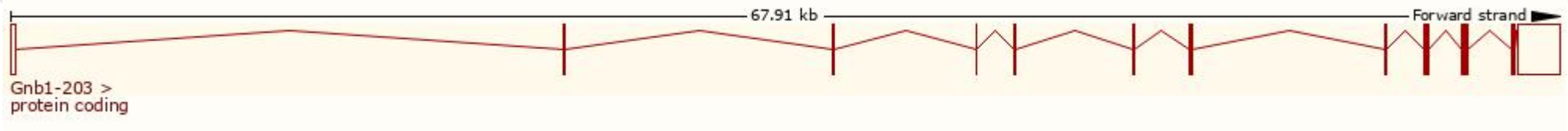
Official Symbol	Gnb1 provided by MGI
Official Full Name	guanine nucleotide binding protein (G protein), beta 1 provided by MGI
Primary source	MGI:MGI:95781
See related	Ensembl:ENSMUSG00000029064
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gnb-1; C77571; AA409223
Expression	Ubiquitous expression in CNS E18 (RPKM 188.2), large intestine adult (RPKM 186.9) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

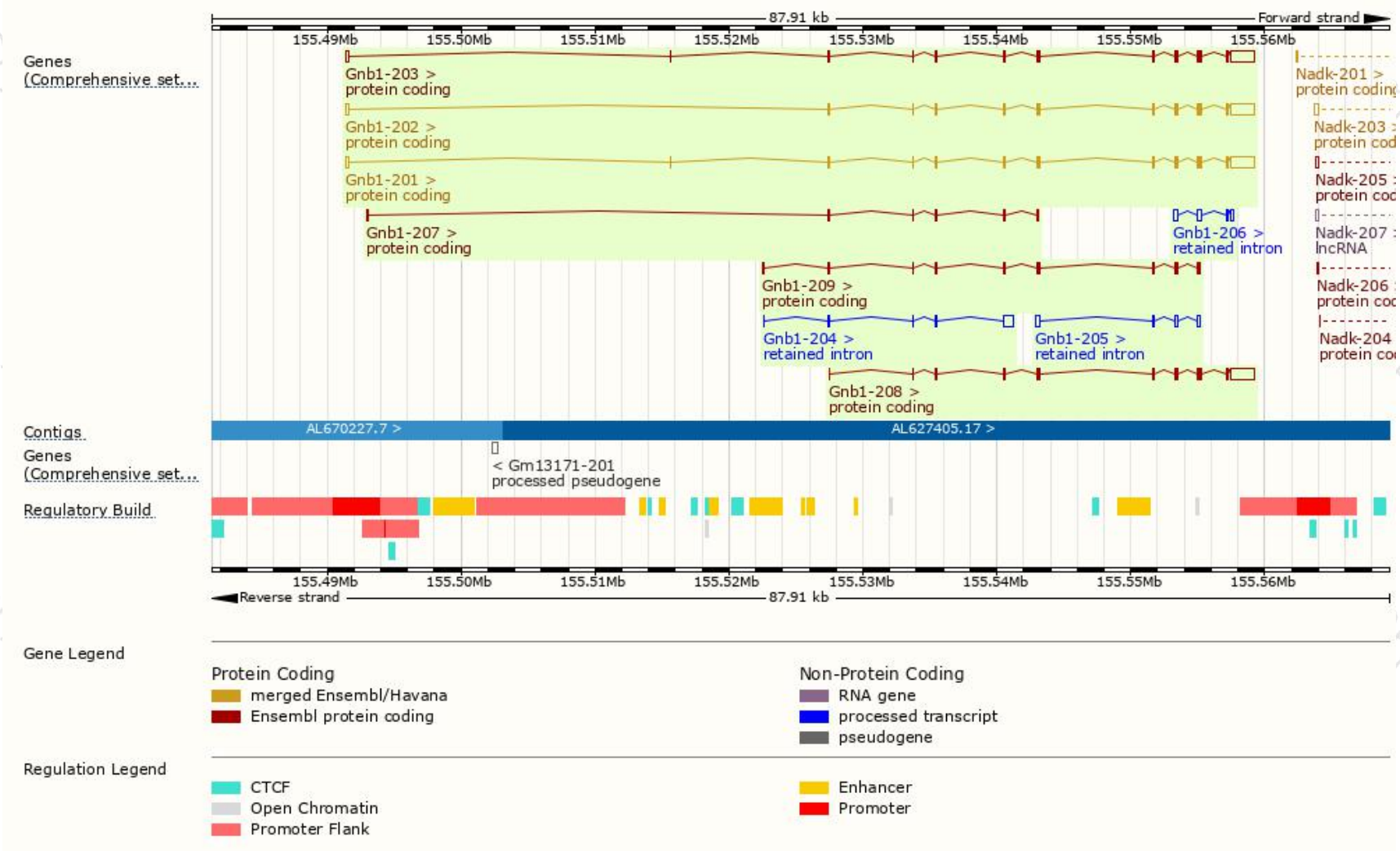
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gnb1-203	ENSMUST00000165335.7	3143	340aa	Protein coding	CCDS19030	P62874 Q3TQ70	TSL:1 GENCODE basic APPRIS P1
Gnb1-201	ENSMUST00000030940.13	3131	340aa	Protein coding	CCDS19030	P62874 Q3TQ70	TSL:1 GENCODE basic APPRIS P1
Gnb1-202	ENSMUST00000105616.9	3088	340aa	Protein coding	CCDS19030	P62874 Q3TQ70	TSL:1 GENCODE basic APPRIS P1
Gnb1-208	ENSMUST00000176637.1	2832	340aa	Protein coding	CCDS19030	P62874 Q3TQ70	TSL:1 GENCODE basic APPRIS P1
Gnb1-209	ENSMUST00000177094.7	1058	273aa	Protein coding	-	H3BKR2	CDS 3' incomplete TSL:3
Gnb1-207	ENSMUST00000176411.7	500	108aa	Protein coding	-	H3BLF7	CDS 3' incomplete TSL:3
Gnb1-204	ENSMUST00000175688.1	925	No protein	Retained intron	-	-	TSL:5
Gnb1-206	ENSMUST00000176308.1	812	No protein	Retained intron	-	-	TSL:1
Gnb1-205	ENSMUST00000175705.1	726	No protein	Retained intron	-	-	TSL:2

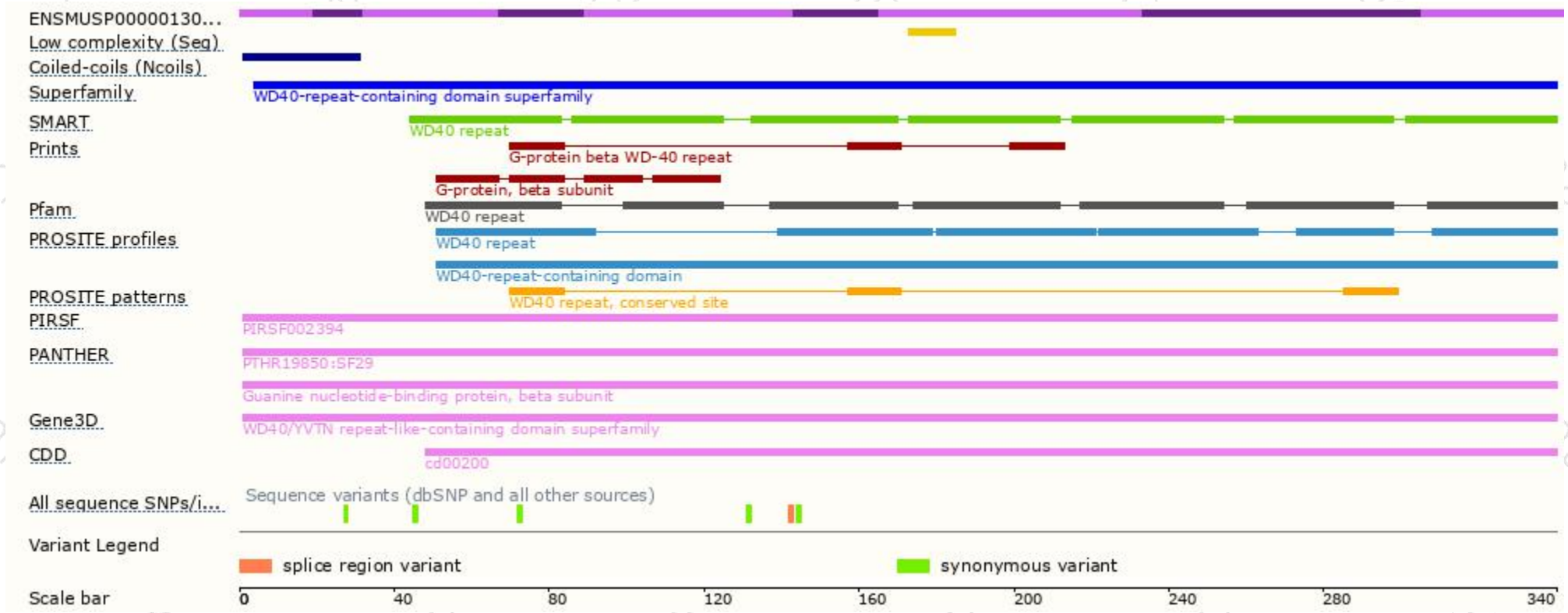
The strategy is based on the design of *Gnb1-203* transcript,The transcription is shown below



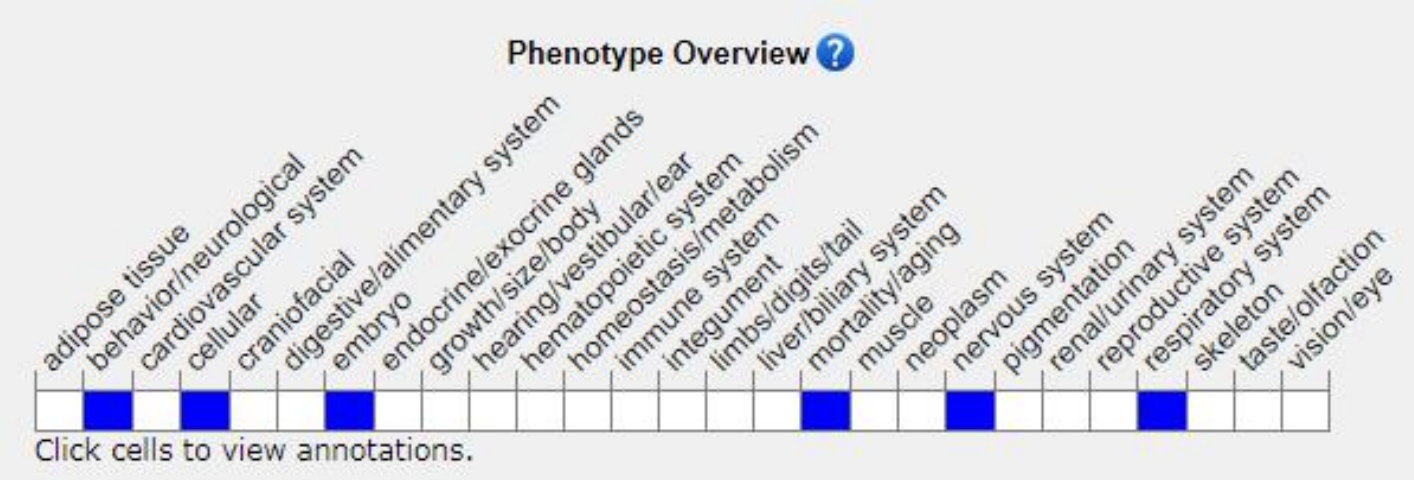
Genomic location distribution



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.

Tel: 400-9660890

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GemPharmatech Co.,Ltd