Gpn1 Cas9-CKO Strategy

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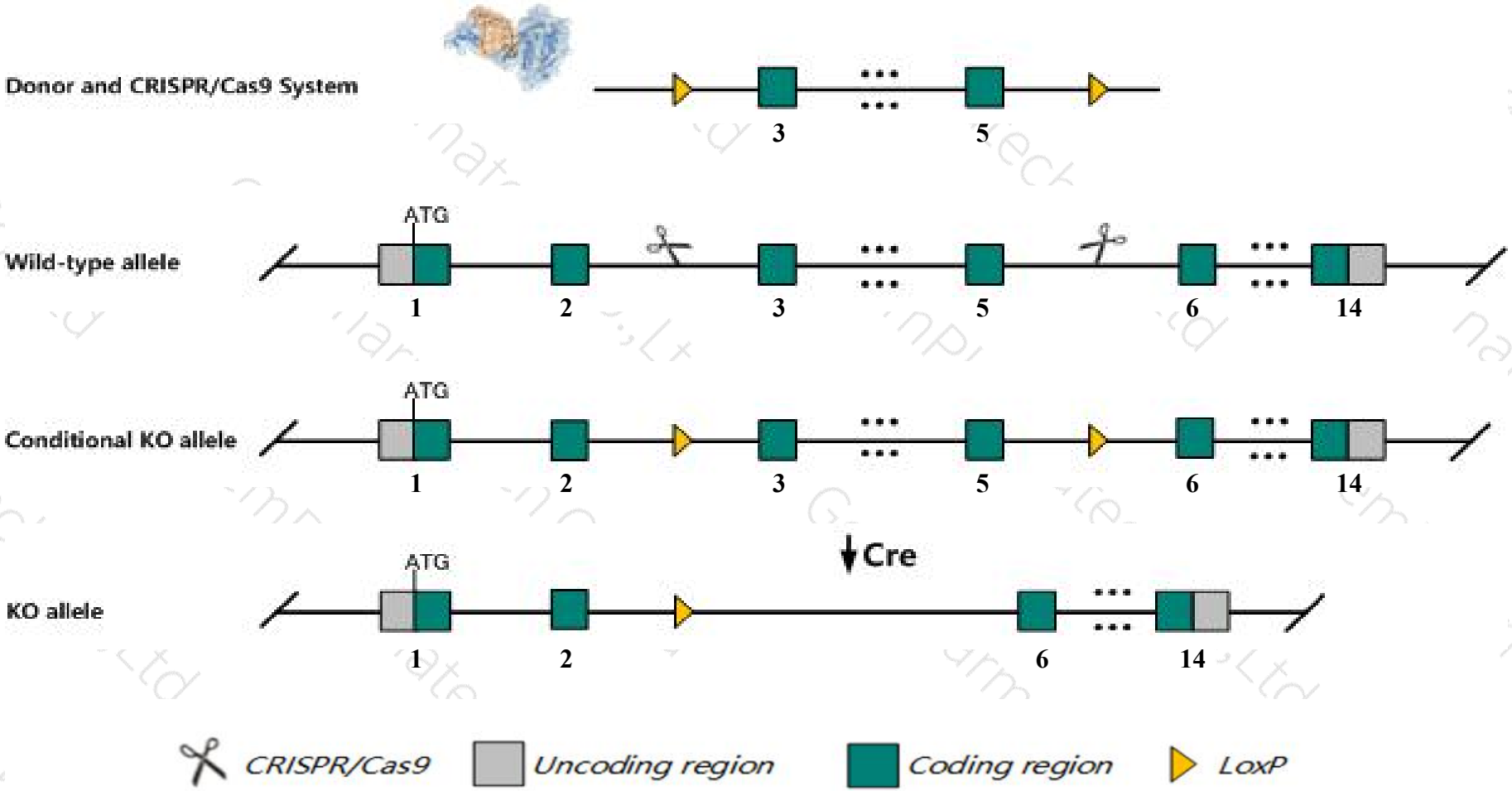
Project Overview

Project Name	***Gpn1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gpn1* gene. The schematic diagram is as follows:



Technical routes

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- The *Gpn1* gene has 7 transcripts. According to the structure of *Gpn1* gene, exon3-exon5 of *Gpn1-201* (ENSMUST00000076949.12) transcript is recommended as the knockout region.The region contains 145bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Gpn1* 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

➢The effect of transcript 207 is unknown.

➢Some amino acids will remain at the N-terminus and some functions may be retained.

➢The effect of *4930566F21Rik* is unknown.

➢The *Gpn1* gene is located on the Chr5. 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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Gpn1 GPN-loop GTPase 1 [*Mus musculus* (house mouse)]

Gene ID: 74254, updated on 12-Aug-2019

Summary

Official Symbol	Gpn1 provided by MGI
Official Full Name	GPN-loop GTPase 1 provided by MGI
Primary source	MGI:MGI:1921504
See related	Ensembl:ENSMUSG00000064037
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	Xab1; MBDIN; NTPBP; AI449615; 2410004J02Rik
Expression	Ubiquitous expression in CNS E11.5 (RPKM 11.8), CNS E14 (RPKM 10.6) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 5; 5 B1

See Gpn1 in Genome Data Viewer

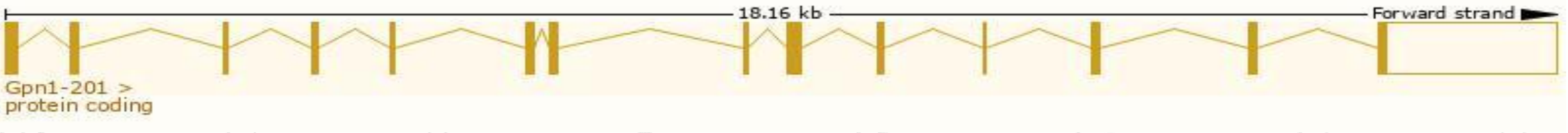
Exon count: 15

Transcript information（Ensembl）

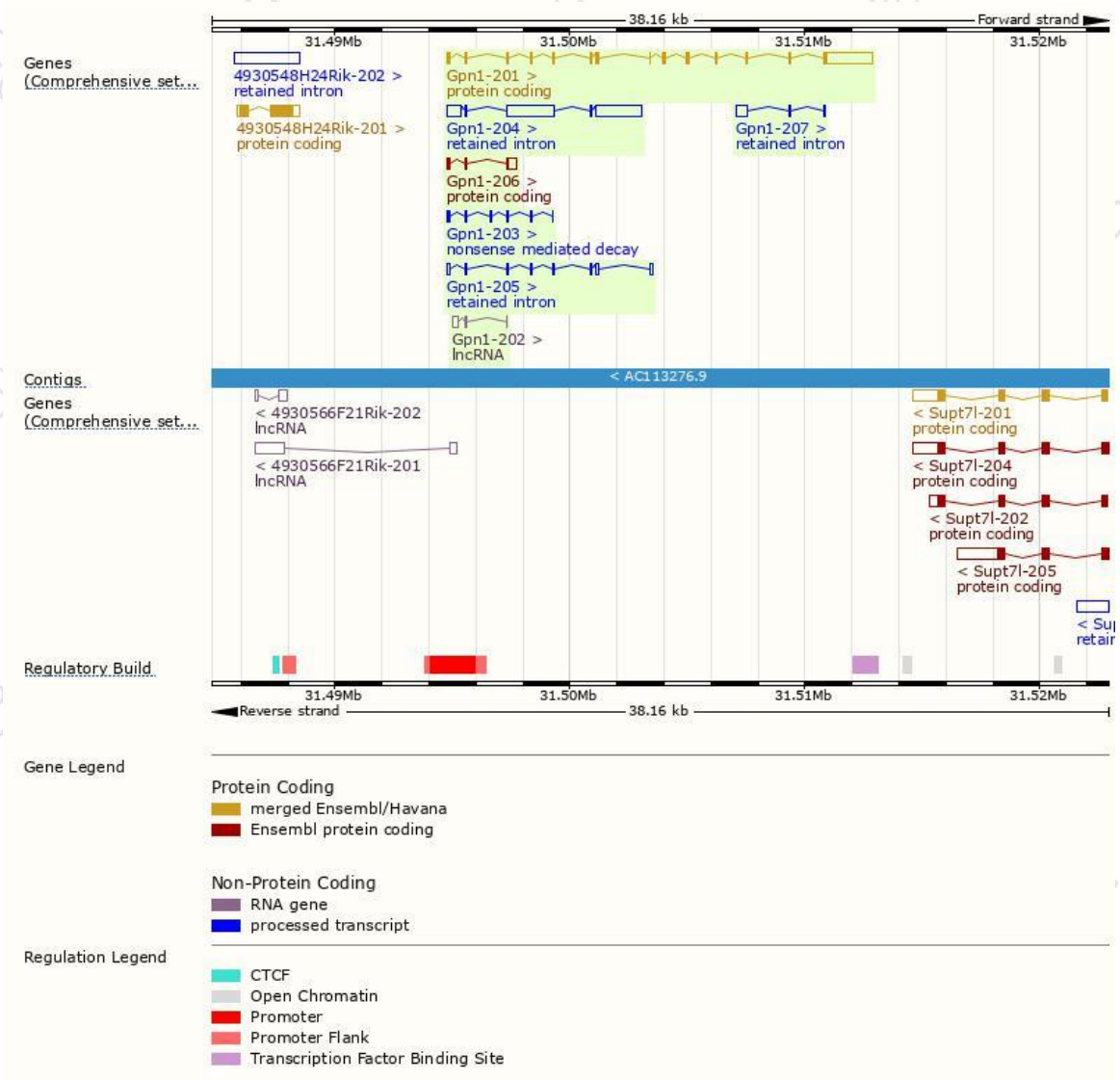
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gpn1-201	ENSMUST00000076949.12	3144	372aa	Protein coding	CCDS19185	Q4VAB2 Q8VCE2	TSL:1 GENCODE basic APPRIS P1
Gpn1-206	ENSMUST00000202394.3	631	91aa	Protein coding	-	D3Z3X7	TSL:1 GENCODE basic
Gpn1-203	ENSMUST00000201053.3	395	85aa	Nonsense mediated decay	-	D6RCY0	TSL:5
Gpn1-204	ENSMUST00000201881.3	4679	No protein	Retained intron	-	-	TSL:1
Gpn1-205	ENSMUST00000201942.3	643	No protein	Retained intron	-	-	TSL:2
Gpn1-207	ENSMUST00000202515.1	640	No protein	Retained intron	-	-	TSL:2
Gpn1-202	ENSMUST00000200870.1	373	No protein	lncRNA	-	-	TSL:5

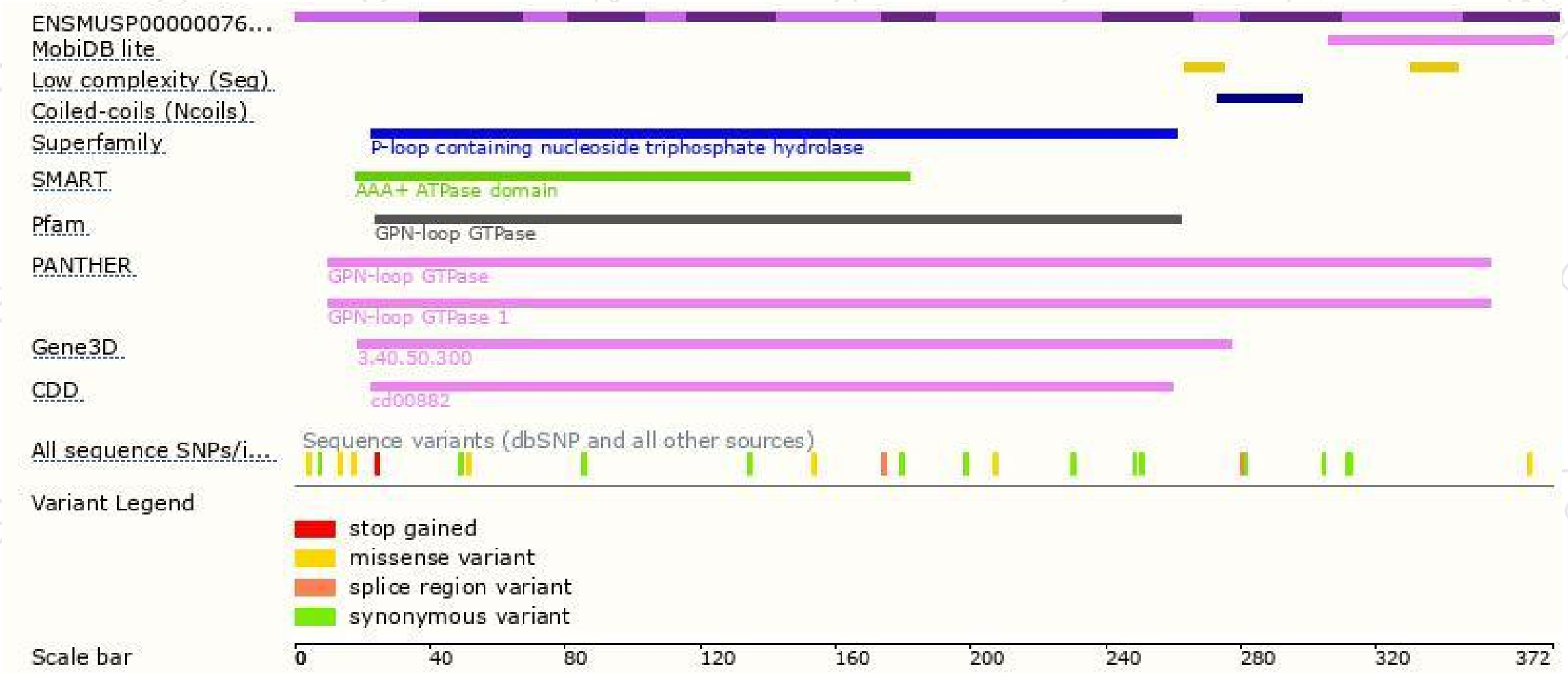
The strategy is based on the design of *Gpn1-201* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

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