

Nprl2 Cas9-CKO Strategy

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Project Overview

Project Name

Nprl2

Project type

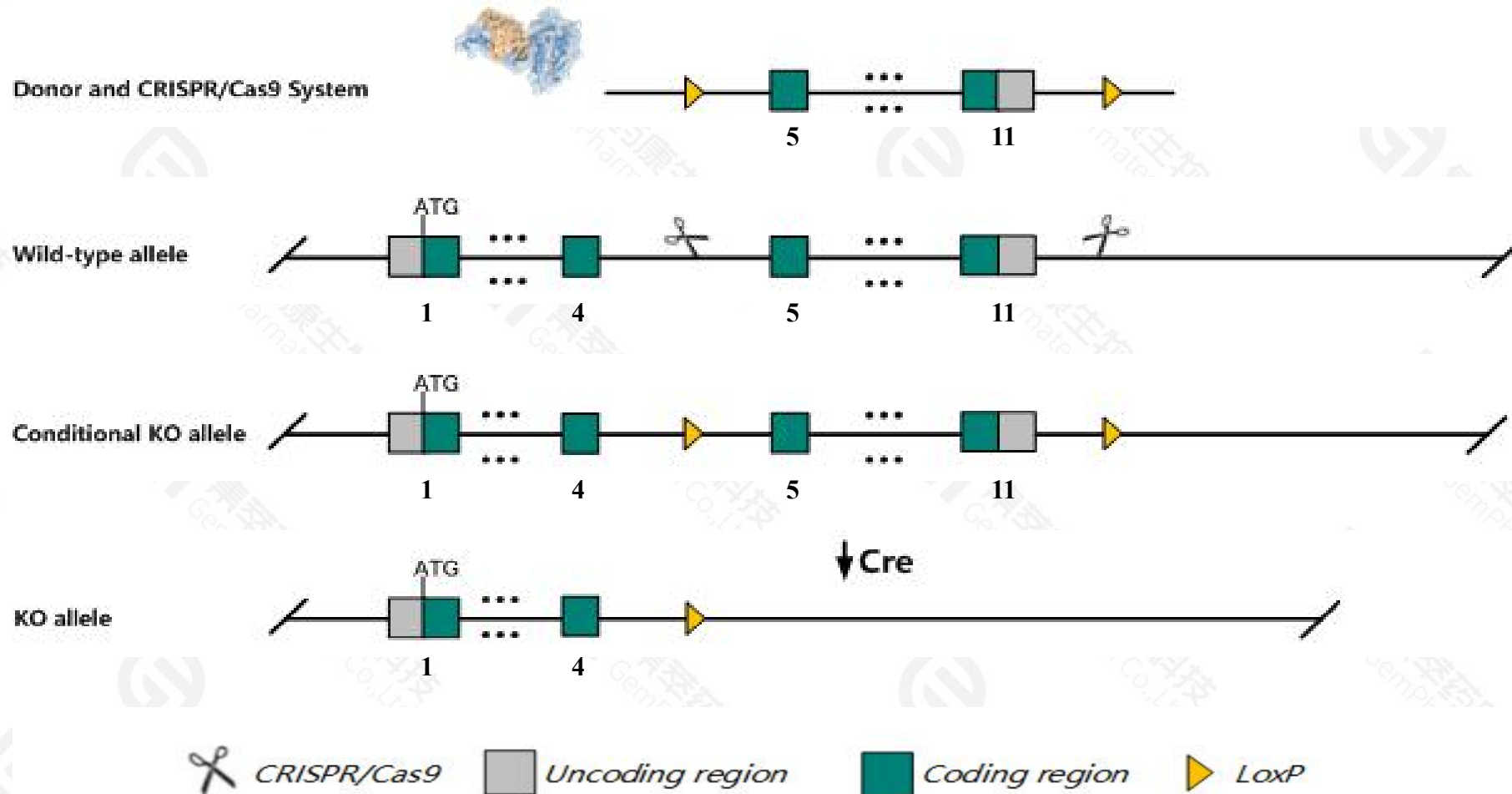
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nprl2* gene. The schematic diagram is as follows:



Technical routes

- The *Nprl2* gene has 5 transcripts. According to the structure of *Nprl2* gene, exon5-exon11 of *Nprl2-201*(ENSMUST00000010201.9) transcript is recommended as the knockout region. The region contains 695bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nprl2* 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.

- According to the existing MGI data, mice homozygous for a knock-out allele exhibit reduced embryo size, microphthalmia, occasional anophthalmia, pale liver, reduced fetal liver hematopoiesis, impaired erythropoiesis and reduced methionine synthesis.
- The flox region is about 1.6kb away from the 5th end of the *Cyb561d2*, *Zmynd10* gene separately, which may affect the regulation of their gene.
- The Intron4 is only 535bp, loxp insertion may affect mRNA splicing.
- The *Nprl2* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Nprl2 NPR2 like, GATOR1 complex subunit [Mus musculus (house mouse)]

Gene ID: 56032, updated on 17-Feb-2021

Summary



Official Symbol Nprl2 provided by [MGI](#)

Official Full Name NPR2 like, GATOR1 complex subunit provided by [MGI](#)

Primary source [MGI:MGI:1914482](#)

See related [Ensembl:ENSMUSG00000010057](#)

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 2810446G01Rik, G21, N, NPR2L, Tusc, Tusc4

Expression Ubiquitous expression in CNS E18 (RPKM 22.0), whole brain E14.5 (RPKM 21.6) and 28 other tissues [See more](#)

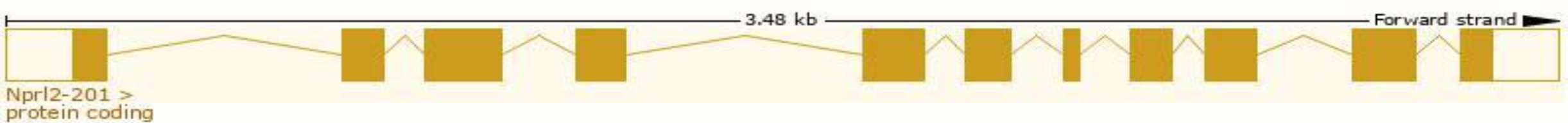
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

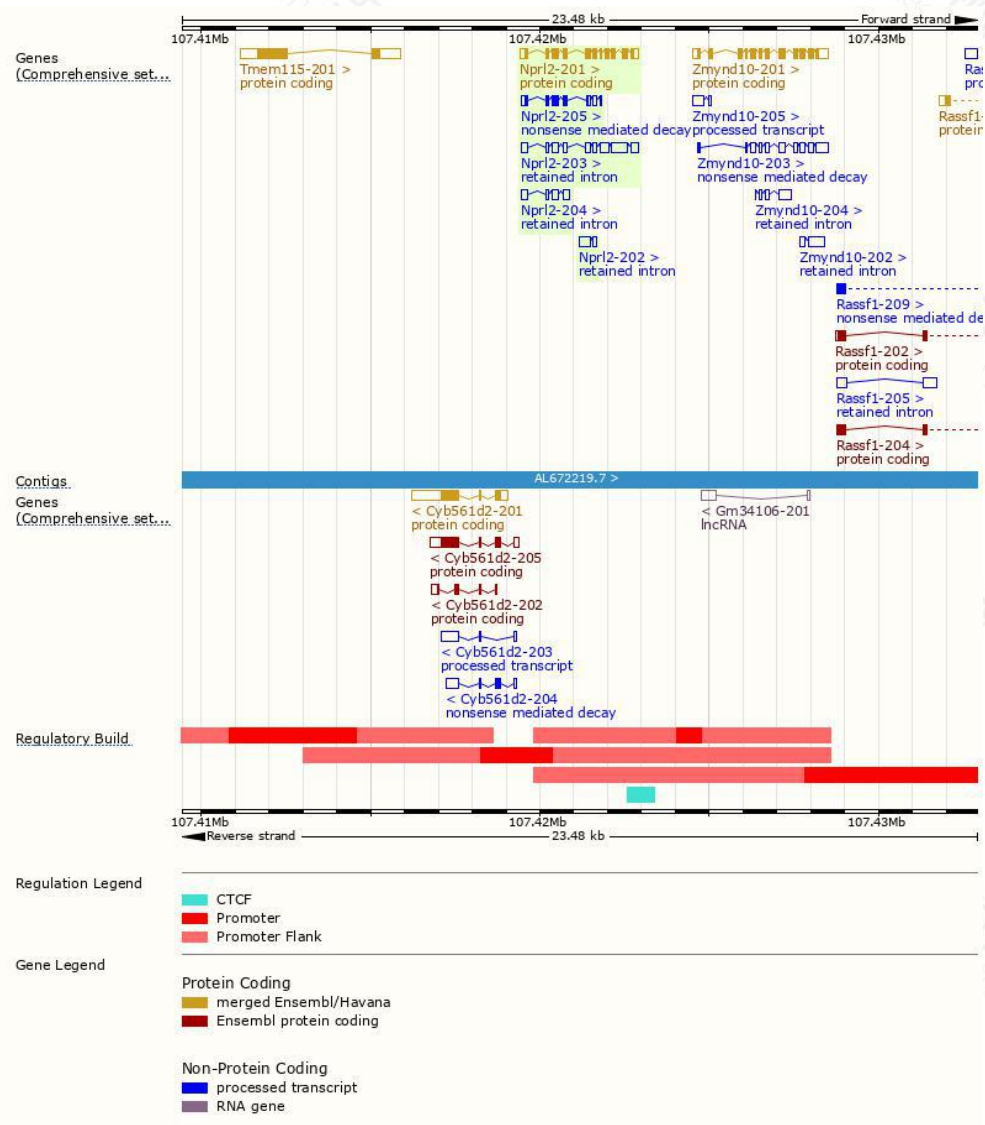
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nprl2-201	ENSMUST00000010201.9	1441	380aa	Protein coding	CCDS23492		TSL:1 , GENCODE basic , APPRIS P1 ,
Nprl2-205	ENSMUST000000195370.6	829	163aa	Nonsense mediated decay	-		TSL:3 ,
Nprl2-203	ENSMUST000000193628.6	1736	No protein	Retained intron	-		TSL:2 ,
Nprl2-204	ENSMUST000000194848.2	637	No protein	Retained intron	-		TSL:2 ,
Nprl2-202	ENSMUST000000192951.2	391	No protein	Retained intron	-		TSL:3 ,

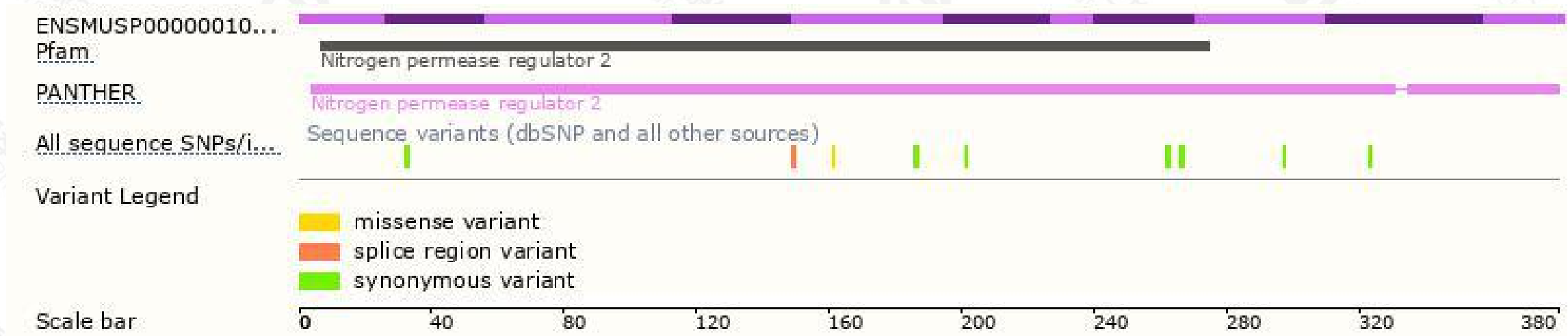
The strategy is based on the design of *Nprl2-201* transcript,the transcription is shown below:



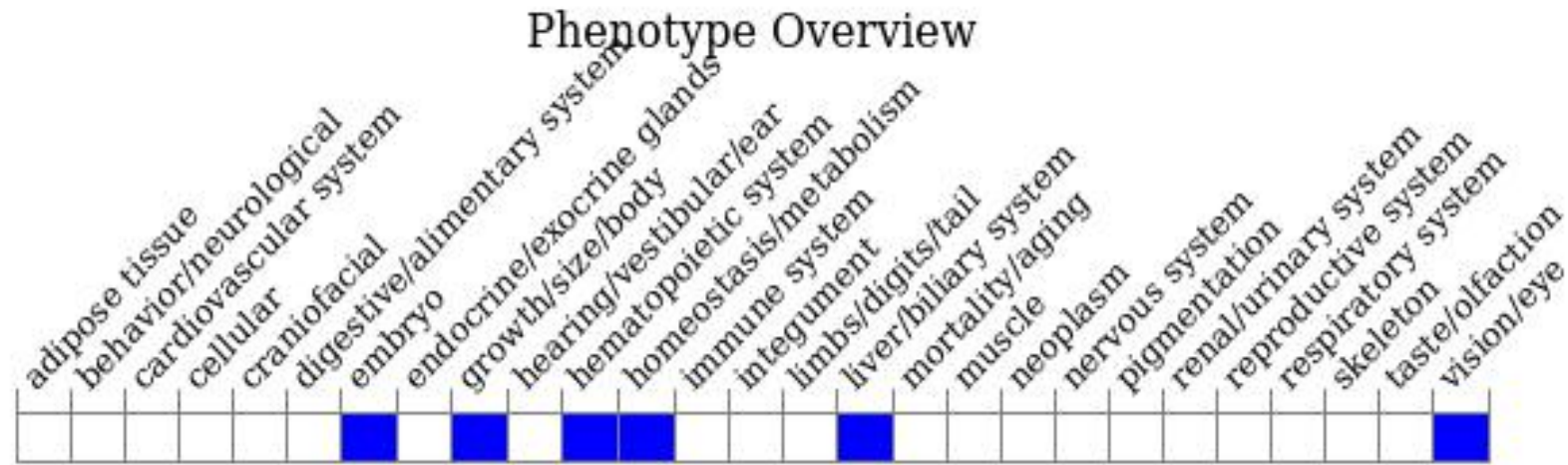
Genomic location distribution



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/>).

According to the existing MGI data, mice homozygous for a knock-out allele exhibit reduced embryo size, microphthalmia, occasional anophthalmia, pale liver, reduced fetal liver hematopoiesis, impaired erythropoiesis and reduced methionine synthesis.

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