

Nphp3 Cas9-KO Strategy

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Design Date: 2020-7-20

Project Overview

Project Name

Nphp3

Project type

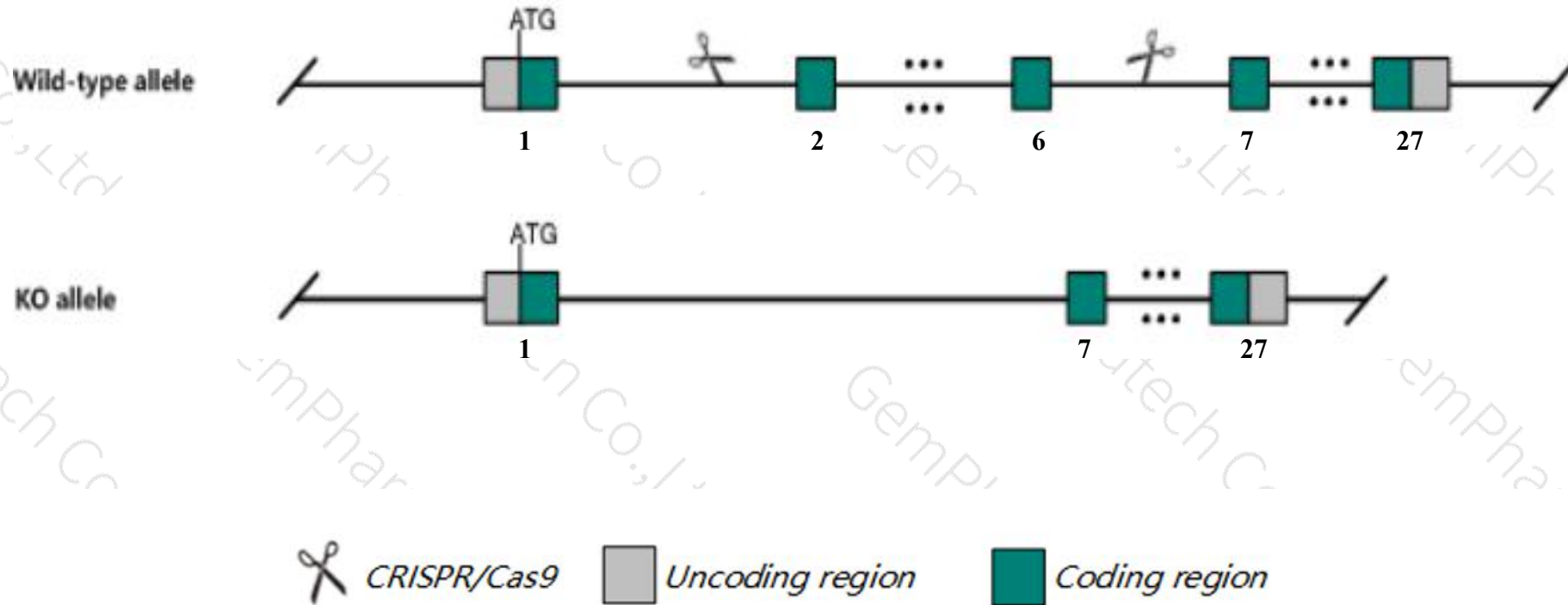
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nphp3* gene. The schematic diagram is as follows:



- The *Nphp3* gene has 8 transcripts. According to the structure of *Nphp3* gene, exon2-exon6 of *Nphp3-201*(ENSMUST00000035167.14) transcript is recommended as the knockout region. The region contains 725bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nphp3* 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, homozygous hypomorphic mice display slowly progressing kidney cysts, enlarged kidneys, increased blood urea nitrogen, kidney inflammation and associated fibrosis, and premature death. Homozygous null mice display mid gestational lethality with partial penetrance of situs inversus.
- The effect on transcript *Nphp3*-206&208 is unknown.
- Transcript *Nphp3*-203 may not be affected.
- The knockout region is near to the C-terminal of *Gm233054* gene, this strategy may influence the regulatory function of the C-terminal of *Gm233054* gene.
- The *Nphp3* 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.

Gene information (NCBI)



Nphp3 nephronophthisis 3 (adolescent) [Mus musculus (house mouse)]

Gene ID: 74025, updated on 20-Mar-2020

Summary



Official Symbol Nphp3 provided by [MGI](#)

Official Full Name nephronophthisis 3 (adolescent) provided by [MGI](#)

Primary source [MGI:MGI:1921275](#)

See related [Ensembl:ENSMUSG00000032558](#)

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 3632410F03Rik, AI550417, C230078J01, D330020E01Rik, pcy

Expression Ubiquitous expression in limb E14.5 (RPKM 5.9), bladder adult (RPKM 3.2) and 28 other tissues [See more](#)

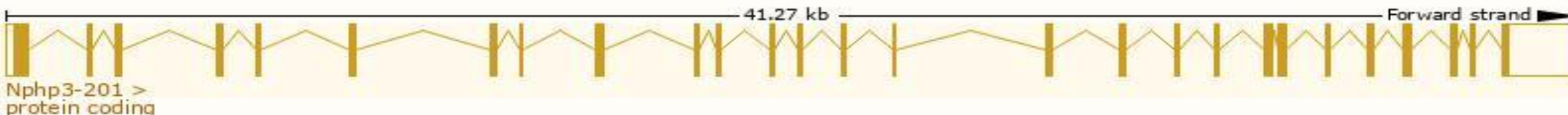
Orthologs [human all](#)

Transcript information (Ensembl)

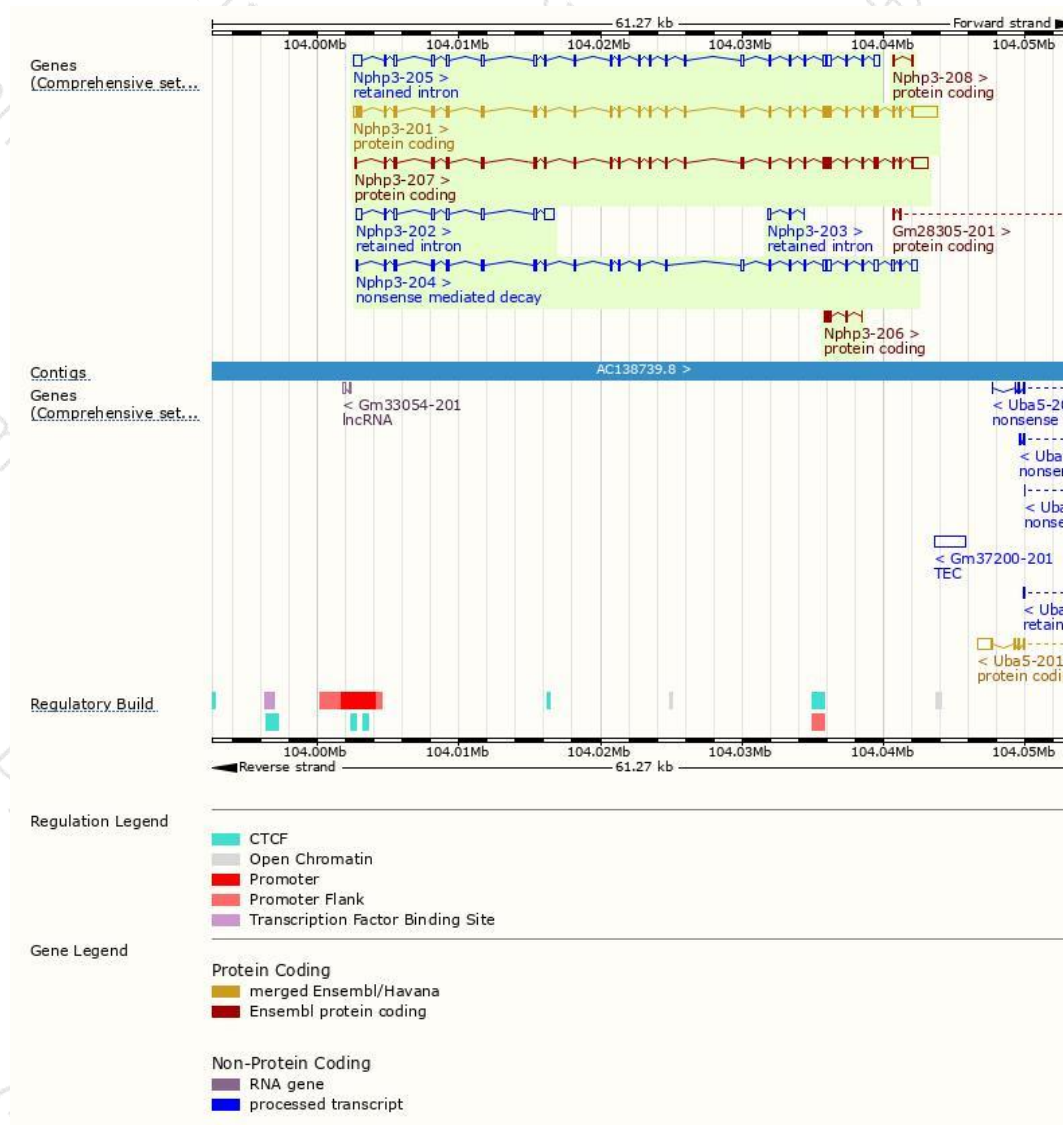
The gene has 8 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nphp3-201	ENSMUST00000035167.14	5899	1325aa	Protein coding	CCDS40749	Q7TNH6	TSL:1 GENCODE basic APPRIS P2
Nphp3-207	ENSMUST00000194774.5	4722	1205aa	Protein coding	-	H9KV07	TSL:1 GENCODE basic APPRIS ALT2
Nphp3-206	ENSMUST00000194183.1	418	136aa	Protein coding	-	A0A0A6YXM1	CDS 5' incomplete TSL:3
Nphp3-208	ENSMUST00000216593.1	279	43aa	Protein coding	-	A0A1L1STK5	CDS 5' incomplete TSL:5
Nphp3-204	ENSMUST00000193439.5	3761	538aa	Nonsense mediated decay	-	A0A0A6YWG5	TSL:5
Nphp3-205	ENSMUST00000193642.5	3925	No protein	Retained intron	-	-	TSL:1
Nphp3-202	ENSMUST00000191919.1	1893	No protein	Retained intron	-	-	TSL:1
Nphp3-203	ENSMUST00000192485.1	336	No protein	Retained intron	-	-	TSL:3

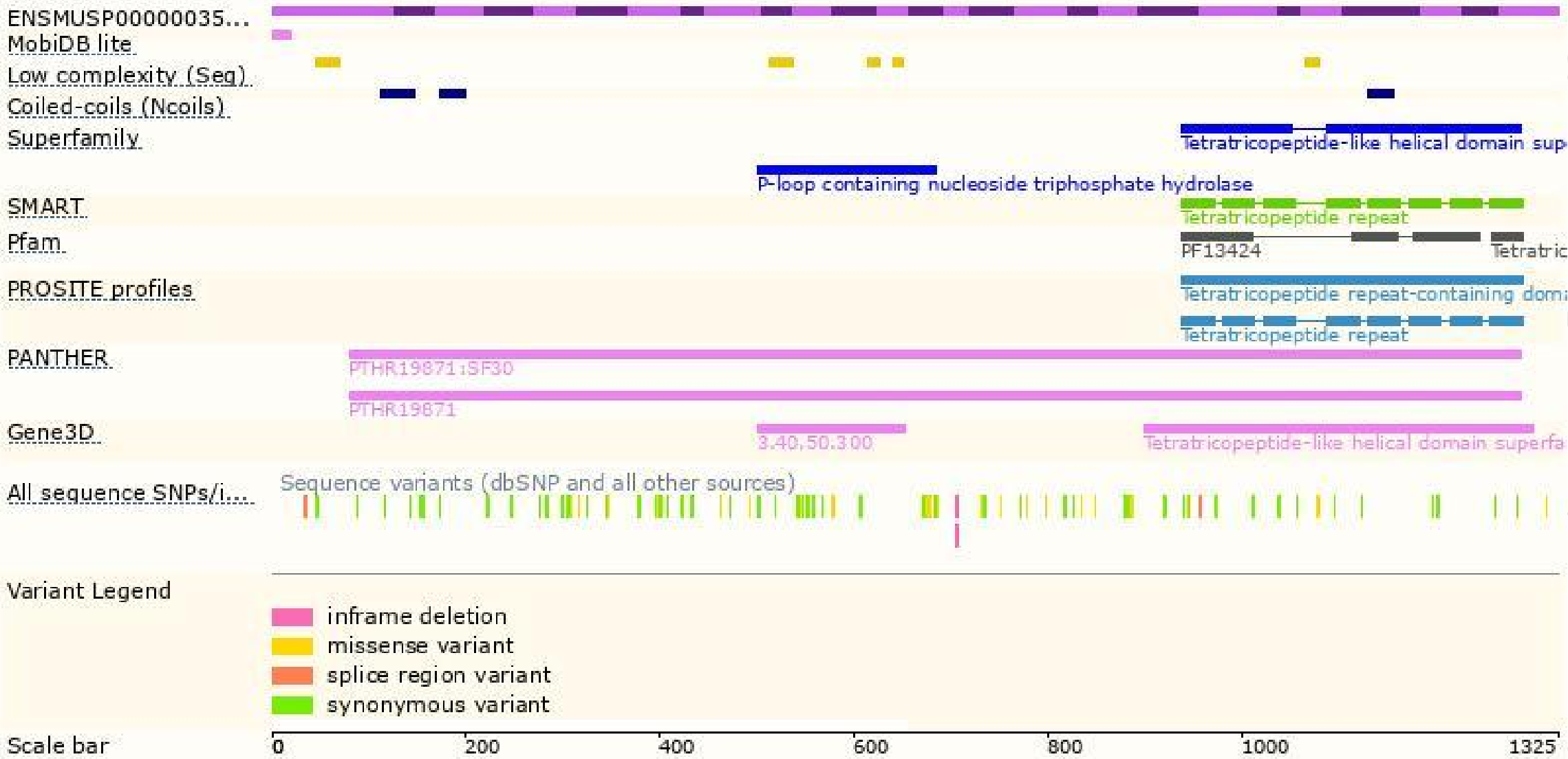
The strategy is based on the design of *Nphp3-201* transcript, the transcription is shown below:



Genomic location distribution

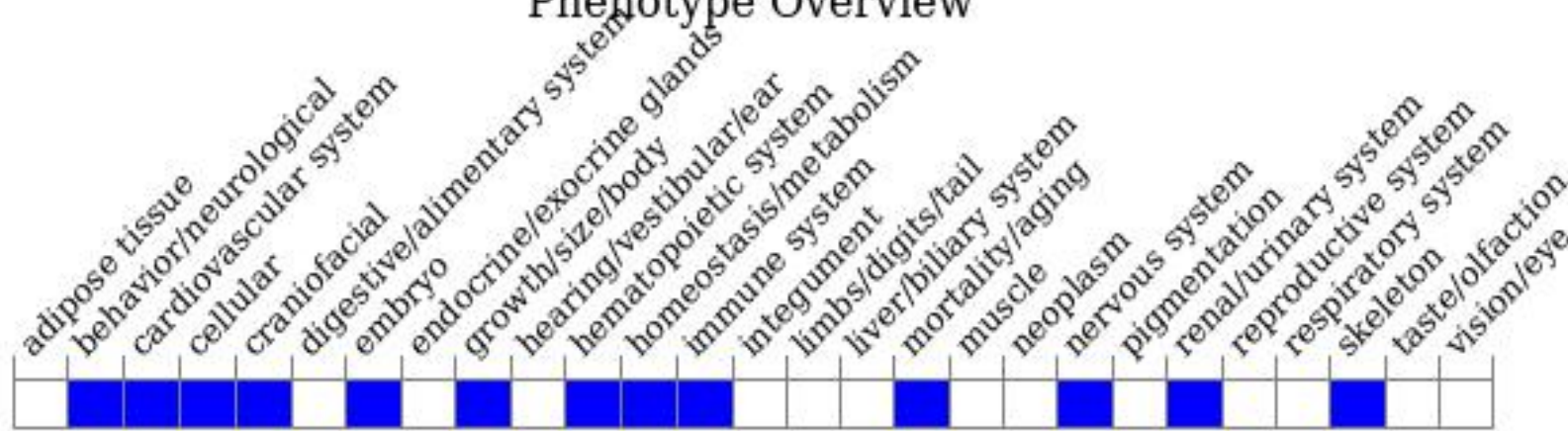


Protein domain



Mouse phenotype description(MGI)

Phenotype Overview



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.

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