Nrp1 Cas9-KO Strategy

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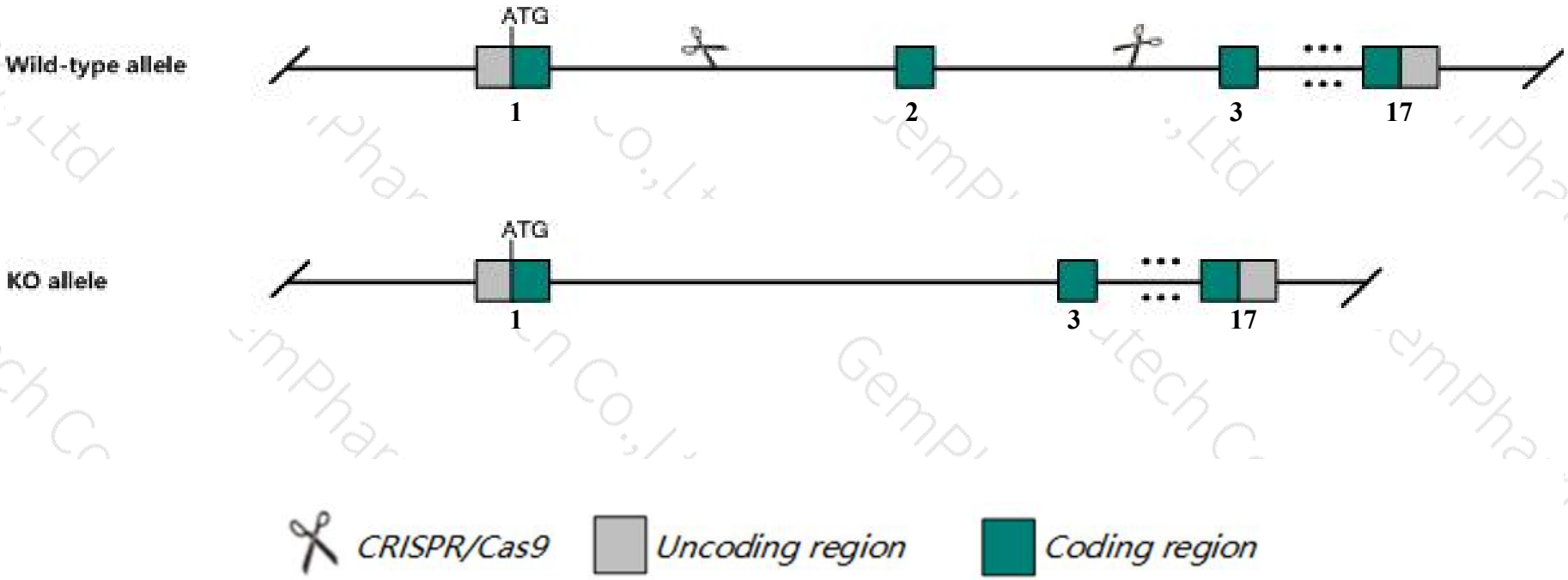
Project Overview

Project Name	***Nrp1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nrp1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Nrp1* gene has 4 transcripts. According to the structure of *Nrp1* gene, exon2 of *Nrp1-201* (ENSMUST00000026917.9) transcript is recommended as the knockout region.The region contains 175bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Nrp1* gene. The brief process is as follows: CRISPR/Cas9 system v

Notice

- According to the existing MGI data,Homozygous null mice show embryonic death, impaired neuronal migration and axon guidance, and vascular defects including a disorganized yolk sac vascular plexus, and malformed brachial arch arteries and great vessels. Mice lacking the cytoplasmic domain show altered retinal arteriovenous patterning.

- The *Nrp1* gene is located on the Chr8. 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）

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Nrp1 neuropilin 1 [*Mus musculus* (house mouse)]

Gene ID: 18186, updated on 12-Nov-2019

Summary

Official Symbol	Nrp1 provided by MGI
Official Full Name	neuropilin 1 provided by MGI
Primary source	MGI:MGI:106206
See related	Ensembl:ENSMUSG00000025810
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	Nrp; NP-1; Npn1; NPN-1; C530029I03
Expression	Broad expression in lung adult (RPKM 39.3), subcutaneous fat pad adult (RPKM 21.5) and 24 other tissues See more
Orthologs	human all

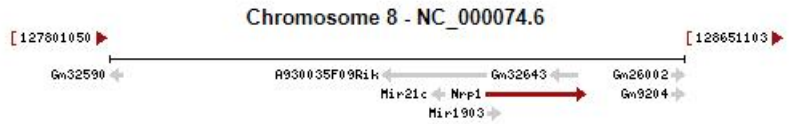
Genomic context

Location: 8 E2; 8 75.78 cM

See Nrp1 in Genome Data Viewer

Exon count: 20

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	8	NC_000074.6 (128358591..128505476)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	8	NC_000074.5 (130882973..131029376)

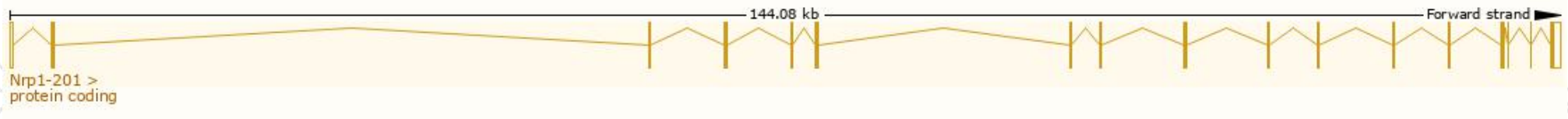


Transcript information（Ensembl）

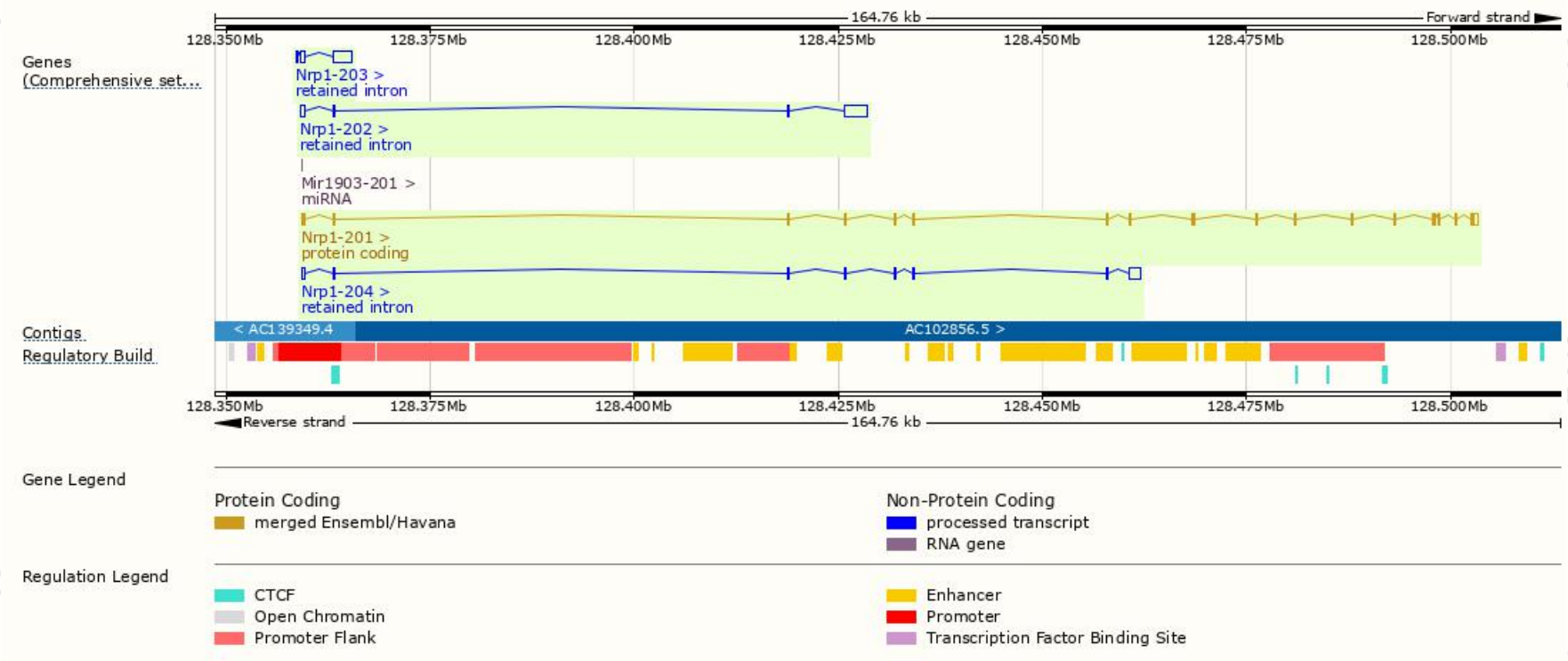
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nrp1-201	ENSMUST00000026917.9	3597	923aa	Protein coding	CCDS22790	P97333	TSL:1 GENCODE basic APPRIS P1
Nrp1-202	ENSMUST00000212746.1	3645	No protein	Retained intron	-	-	TSL:1
Nrp1-203	ENSMUST00000212833.1	2861	No protein	Retained intron	-	-	TSL:1
Nrp1-204	ENSMUST00000212933.1	2770	No protein	Retained intron	-	-	TSL:1

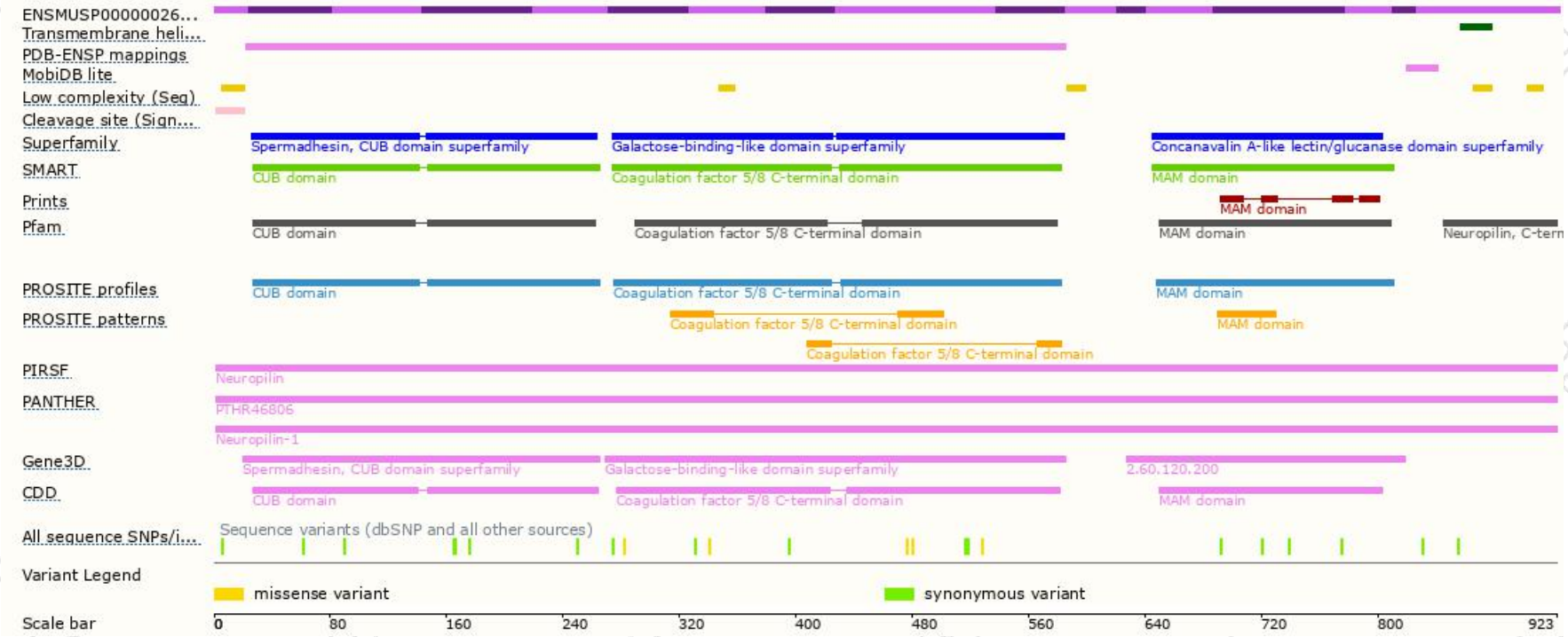
The strategy is based on the design of *Nrp1-201* transcript,The transcription is shown below



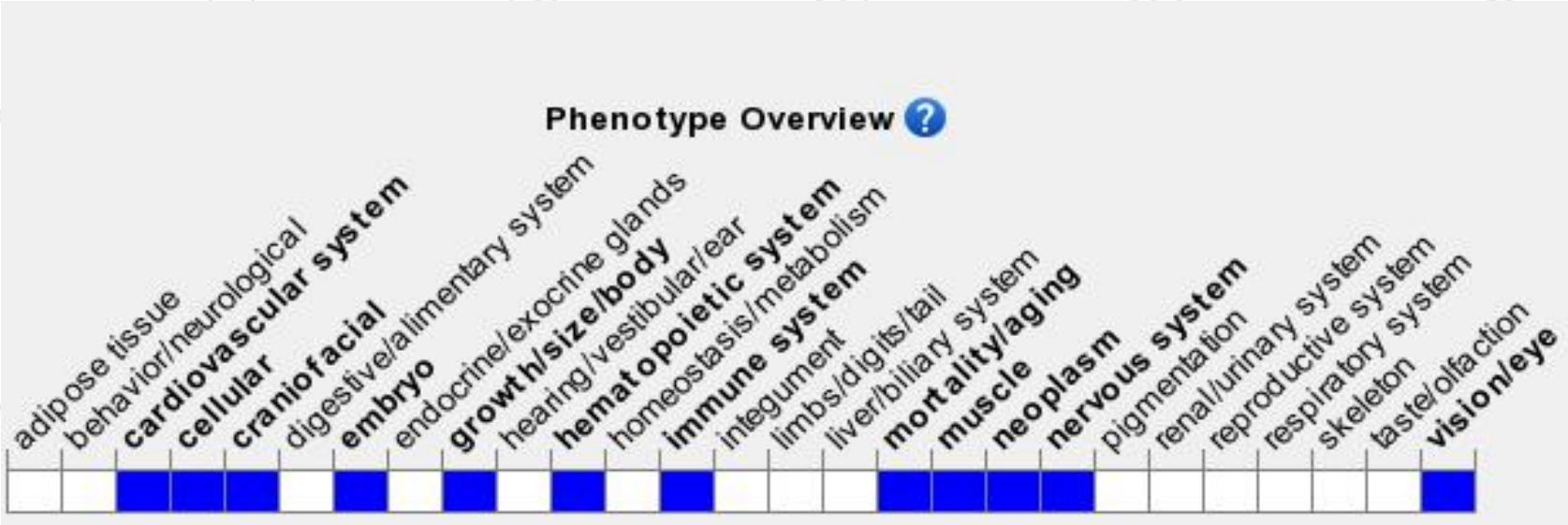
Genomic location distribution



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,Homozygous null mice show embryonic death, impaired neuronal migration and axon guidance, and vascular defects including a disorganized yolk sac vascular plexus, and malformed brachial arch arteries and great vessels. Mice lacking the cytoplasmic domain show altered retinal arteriovenous patterning.

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

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