

Nrxn3 Cas9-KO Strategy

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Project Overview

Project Name

Nrxn3

Project type

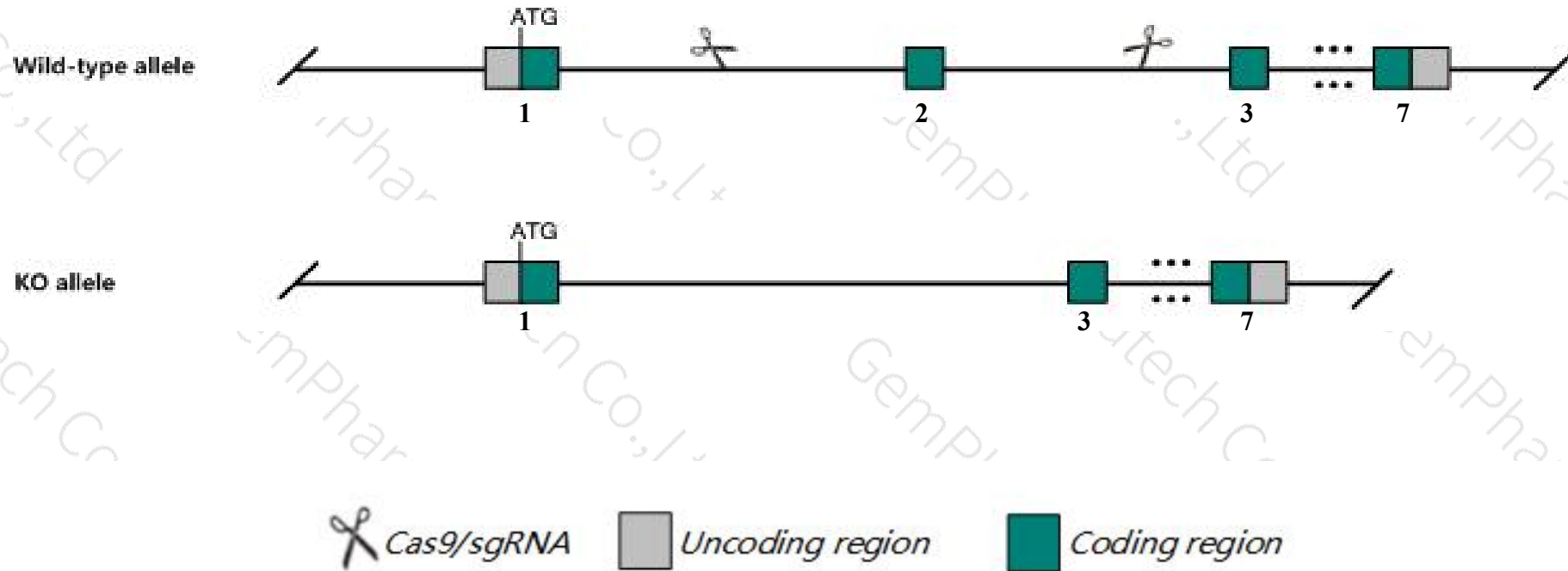
Cas9-KO

Strain background

C57BL/6J

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Nrxn3* gene. The schematic diagram is as follows:



- The *Nrxn3* gene has 13 transcripts. According to the structure of *Nrxn3* gene, exon2 of *Nrxn3-202* (ENSMUST00000110130.3) transcript is recommended as the knockout region. The region contains 182bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Nrxn3* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

- According to the existing MGI data, Twenty percent of mice homozygous for a knock-out allele die postnatally prior to 20 days of age.
- Transcript *Nrxn3*-204,206,207,209,211,212 may be unaffected.
- The α isoform of *Nrxn3* gene (transcript *Nrxn3* -205) has 1087 amino acids at the N-terminus and protein function may be partially retained.
- The *Nrxn3* gene is located on the Chr12. 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)

Nrxn3 neurexin III [Mus musculus (house mouse)]

Gene ID: 18191, updated on 19-Mar-2019

Summary



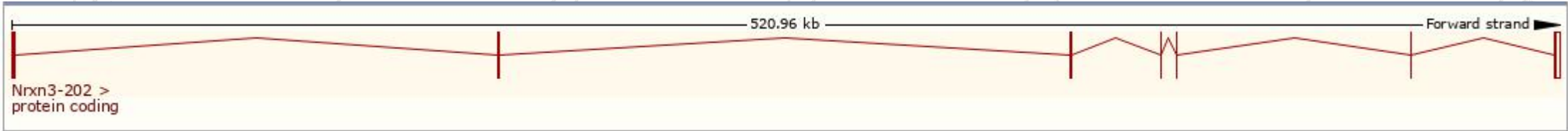
Official Symbol	Nrxn3 provided by MGI
Official Full Name	neurexin III provided by MGI
Primary source	MGI:MGI:1096389
See related	Ensembl:ENSMUSG00000066392
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Summary	This gene encodes a member of a family of proteins that function in the nervous system as receptors and cell adhesion molecules. Extensive alternative splicing and the use of alternative promoters results in multiple transcript variants for this gene, but the full-length nature of many of these variants has not been determined. Transcripts that initiate from an upstream promoter encode alpha isoforms, which contain epidermal growth factor-like (EGF-like) sequences and laminin G domains. Transcripts initiating from the downstream promoter encode beta isoforms, which lack EGF-like sequences. [provided by RefSeq, Dec 2012]
Expression	Biased expression in frontal lobe adult (RPKM 7.6), cerebellum adult (RPKM 6.7) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

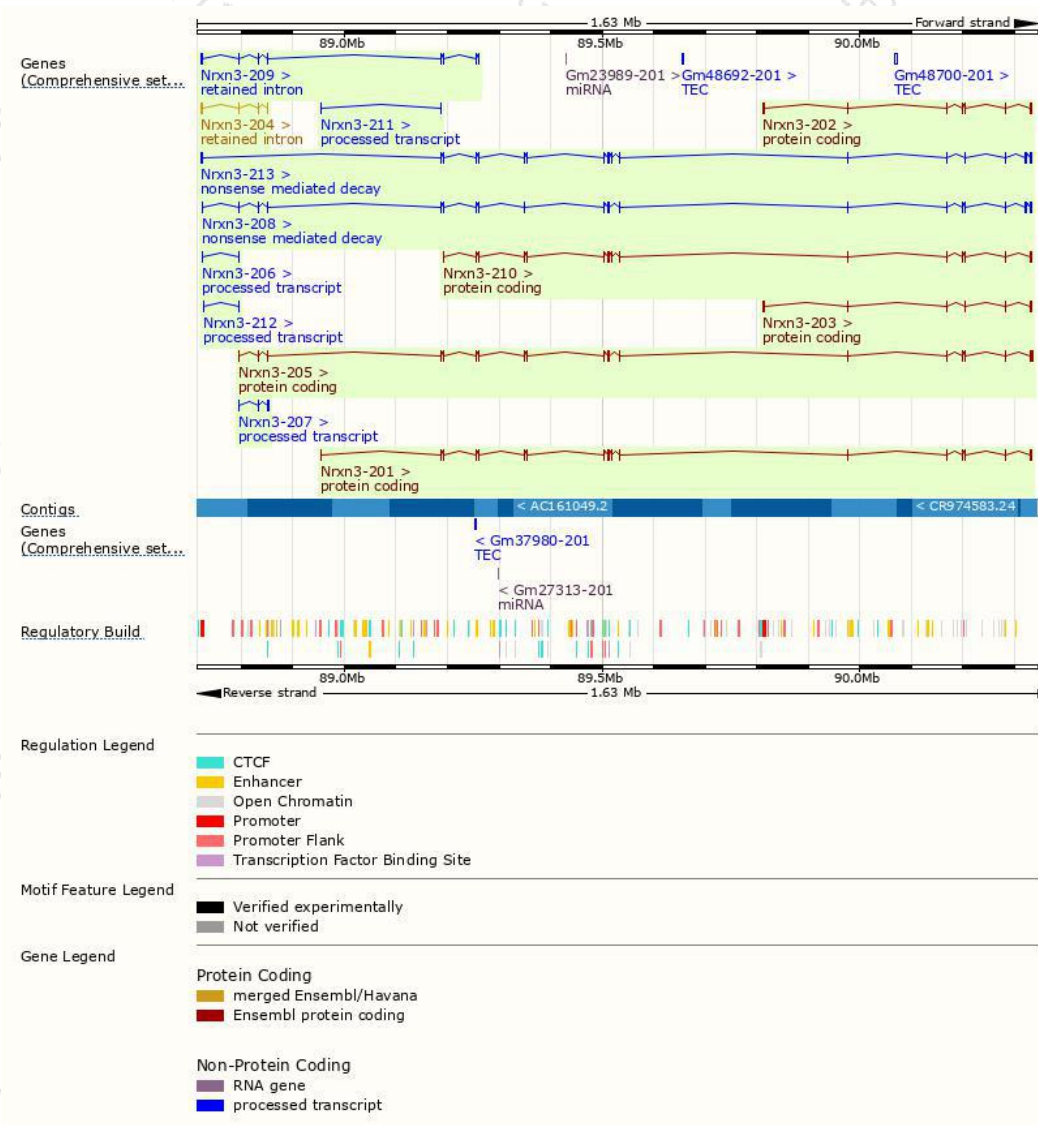
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Nrxn3-205	ENSMUST00000163134.7	7922	1571aa	Protein coding	CCDS56856	Q6P9K9	TSL:5 GENCODE basic APPRIS P1
Nrxn3-201	ENSMUST00000057634.13	4634	1100aa	Protein coding	CCDS49134	Q6P9K9	TSL:1 GENCODE basic
Nrxn3-202	ENSMUST00000110130.3	3654	567aa	Protein coding	CCDS79143	Q8C985	TSL:2 GENCODE basic
Nrxn3-210	ENSMUST00000167887.7	3303	1100aa	Protein coding	CCDS49134	Q6P9K9	TSL:5 GENCODE basic
Nrxn3-203	ENSMUST00000110133.8	2699	430aa	Protein coding	-	E9Q3Q4	TSL:5 GENCODE basic
Nrxn3-208	ENSMUST00000167103.7	6944	1391aa	Nonsense mediated decay	-	E9Q2X2	TSL:5
Nrxn3-213	ENSMUST00000190626.6	5583	1009aa	Nonsense mediated decay	-	A0A087WPQ9	TSL:1
Nrxn3-206	ENSMUST00000163944.1	673	No protein	Processed transcript	-	-	TSL:3
Nrxn3-207	ENSMUST00000164072.1	646	No protein	Processed transcript	-	-	TSL:5
Nrxn3-212	ENSMUST00000190030.1	528	No protein	Processed transcript	-	-	TSL:2
Nrxn3-211	ENSMUST00000170533.1	525	No protein	Processed transcript	-	-	TSL:2
Nrxn3-209	ENSMUST00000167734.7	4086	No protein	Retained intron	-	-	TSL:2
Nrxn3-204	ENSMUST00000110138.7	2278	No protein	Retained intron	-	-	TSL:2

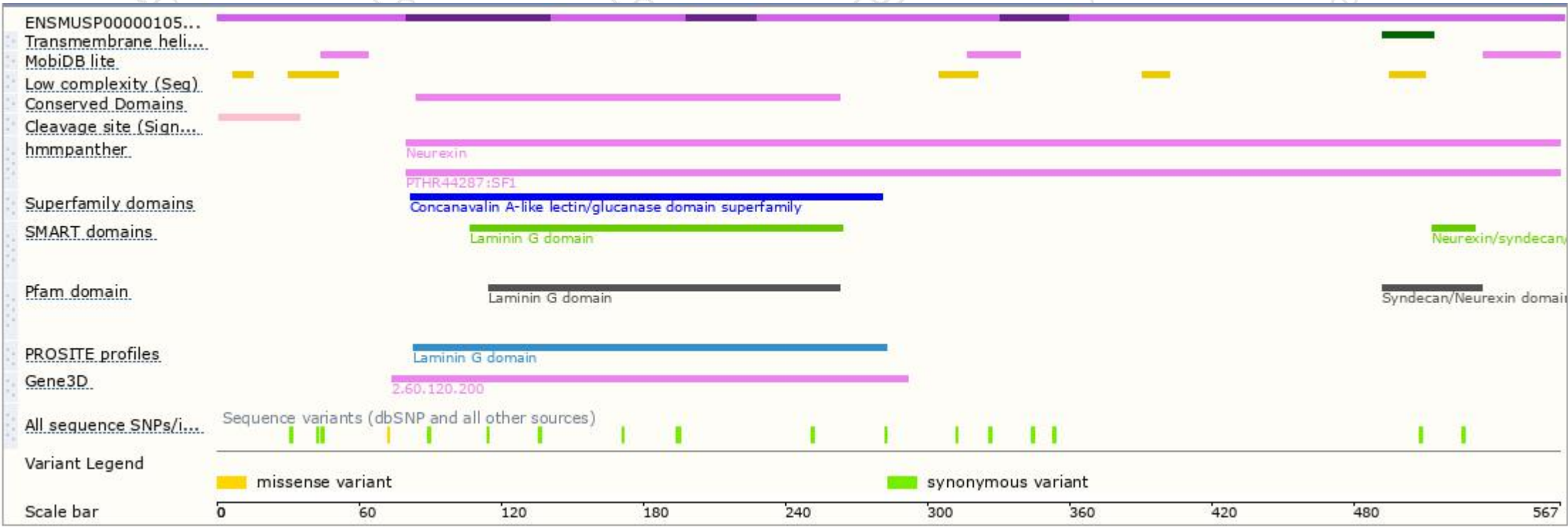
The strategy is based on the design of *Nrxn3-202* transcript,The transcription is shown below



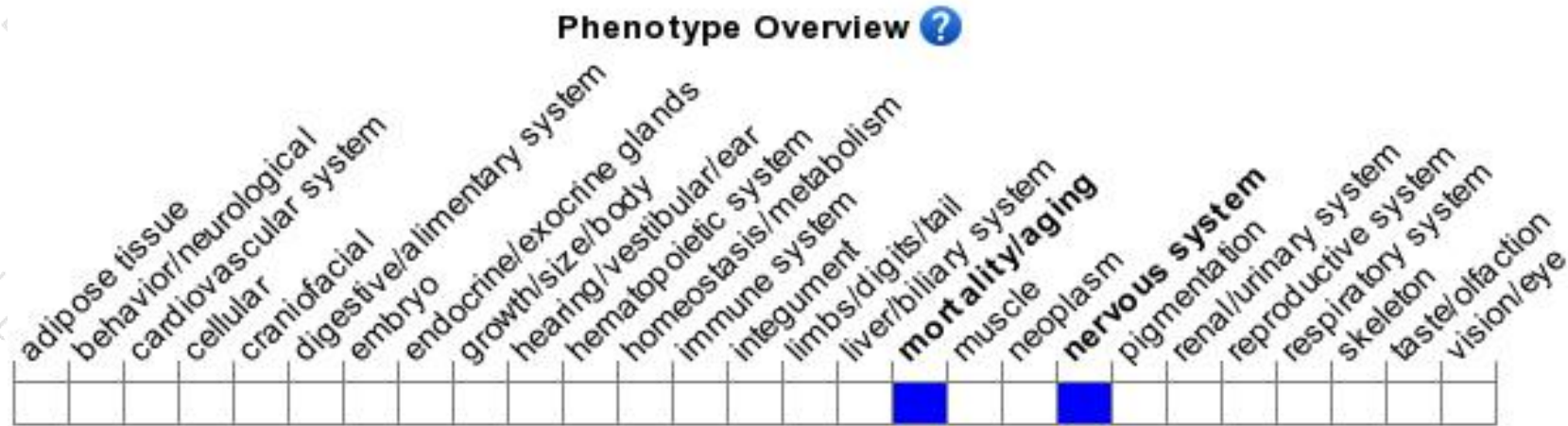
Genomic location distribution



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, Twenty percent of mice homozygous for a knock-out allele die postnatally prior to 20 days of age.

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

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