

Npas2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Npas2

Project type

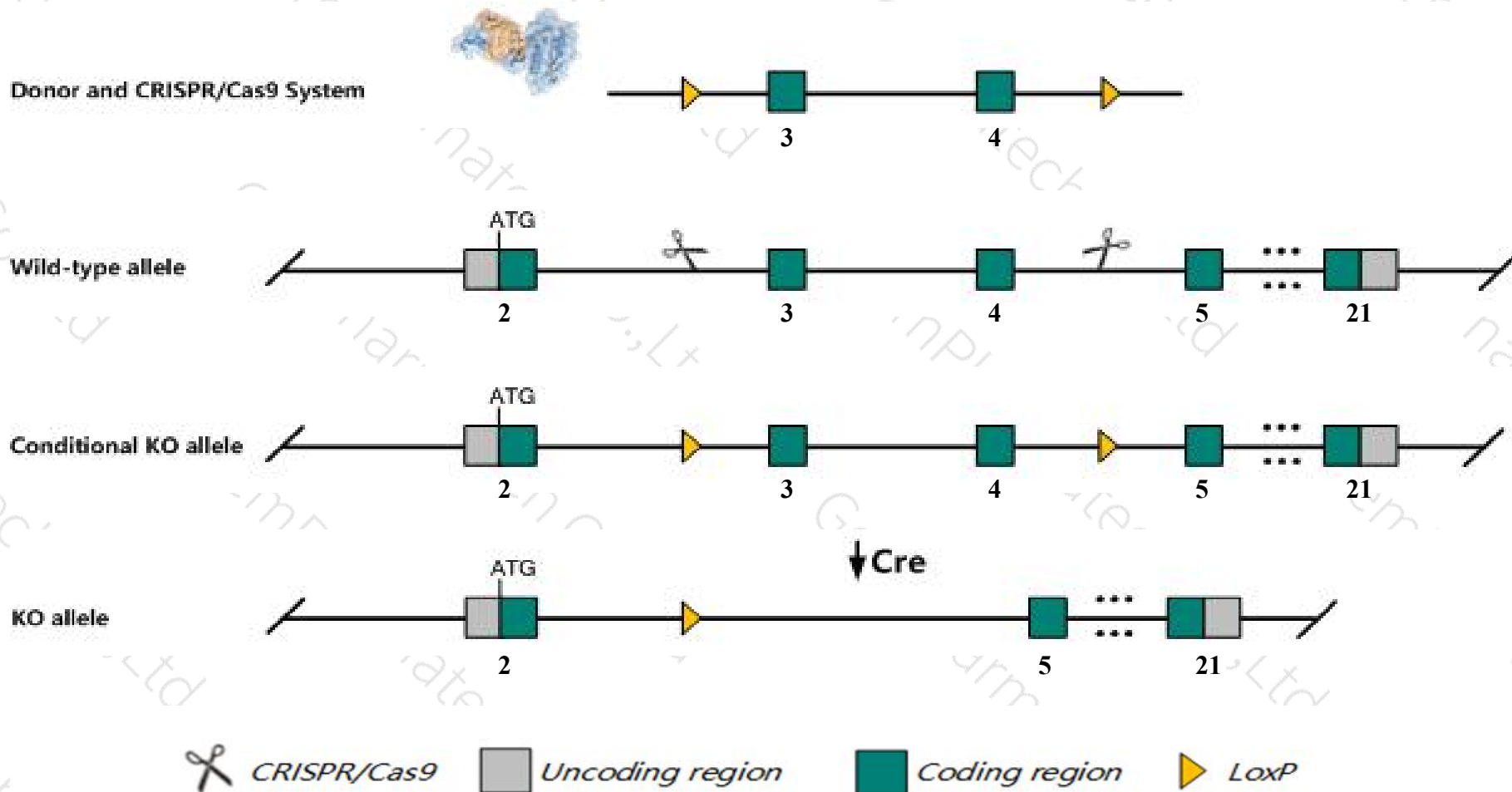
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Npas2* gene. The schematic diagram is as follows:



Technical routes

- The *Npas2* gene has 3 transcripts. According to the structure of *Npas2* gene, exon3-exon4 of *Npas2-201* (ENSMUST00000056815.8) transcript is recommended as the knockout region. The region contains 241bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Npas2* 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, Targeted mutation of this gene results in deficits in complex emotional long-term memory tasks.
- Transcript *Npas2-202* lncRNA may not be affected.
- The *Npas2* gene is located on the Chr1. 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)

Npas2 neuronal PAS domain protein 2 [*Mus musculus* (house mouse)]

Gene ID: 18143, updated on 12-Aug-2019

Summary

Official Symbol Npas2 provided by MGI

Official Full Name neuronal PAS domain protein 2 provided by MGI

Primary source [MGI:MGI:109232](#)

See related [Ensembl:ENSMUSG00000026077](#)

Gene type protein coding

RefSeq status VALIDATED

Organism [Mus musculus](#)

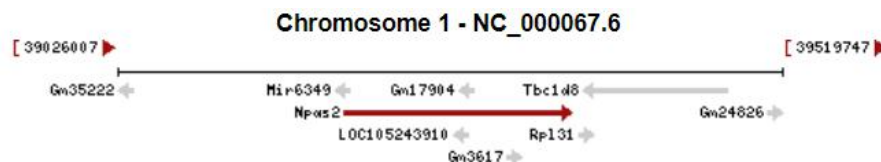
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as MOP4; bHLHe9

Summary The protein encoded by this gene is a member of the basic helix-loop-helix (bHLH)-PAS family of transcription factors. The encoded protein may play a regulatory role in the acquisition of specific types of memory. It also may function as a part of a molecular clock operative in the mammalian forebrain. [provided by RefSeq, Dec 2014]

Expression Broad expression in small intestine adult (RPKM 16.1), colon adult (RPKM 13.4) and 17 other tissues [See more](#)

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

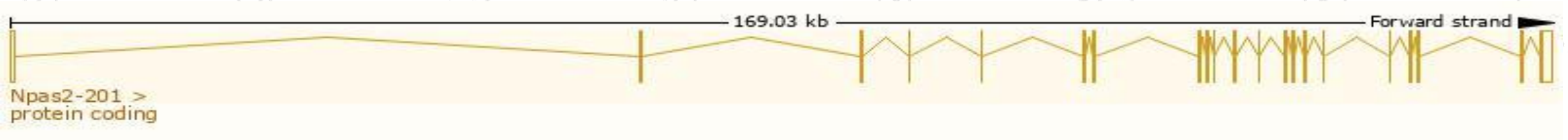


Transcript information (Ensembl)

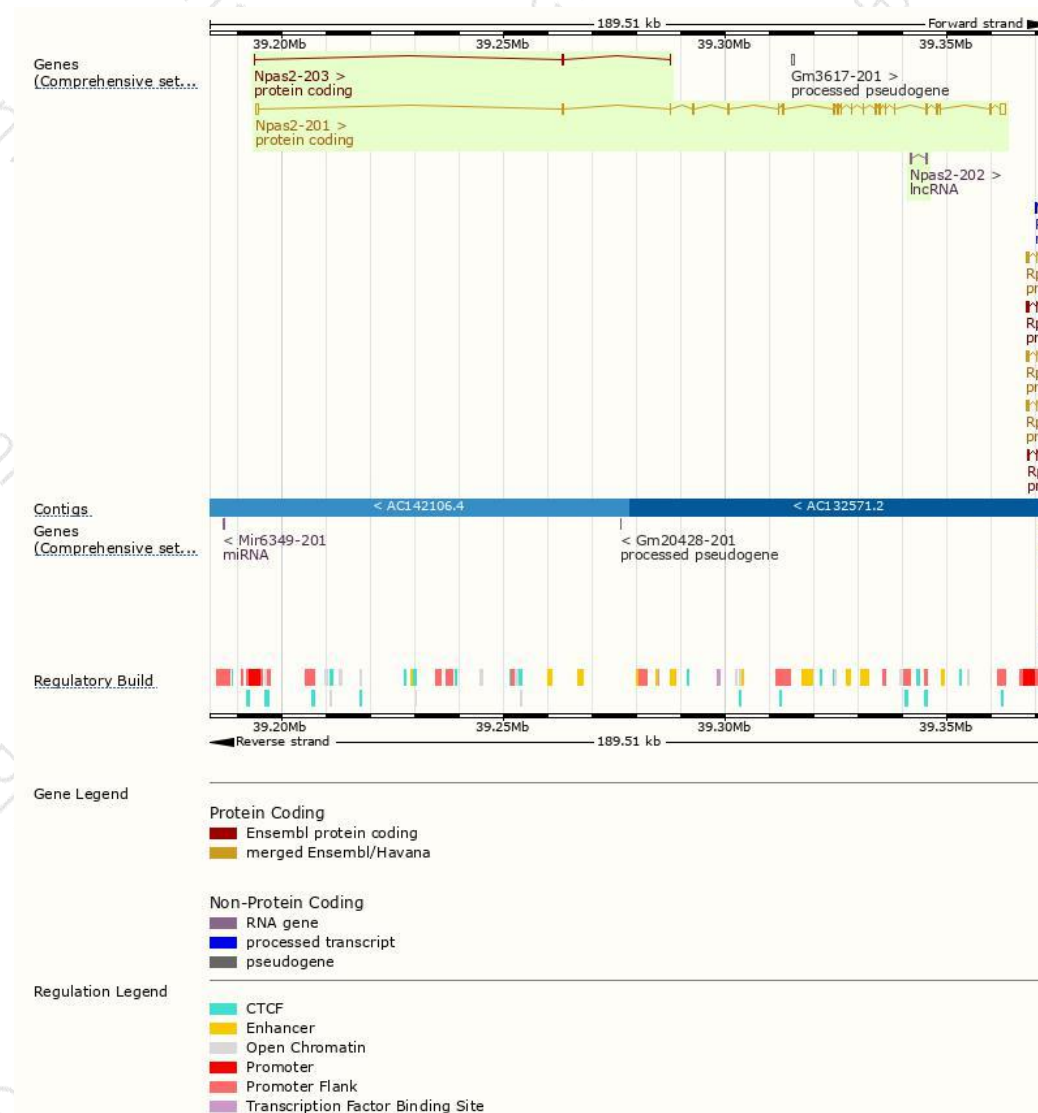
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Npas2-201	ENSMUST00000056815.8	4236	816aa	ENSMUSP00000054719.7	Protein coding	CCDS48244	G3X9B7	TSL:1 GENCODE basic APPRIS P1
Npas2-203	ENSMUST00000173050.7	484	60aa	ENSMUSP00000134241.1	Protein coding	-	G3UYV8	CDS 3' incomplete TSL:2
Npas2-202	ENSMUST00000172825.1	474	No protein	-	lncRNA	-	-	TSL:2

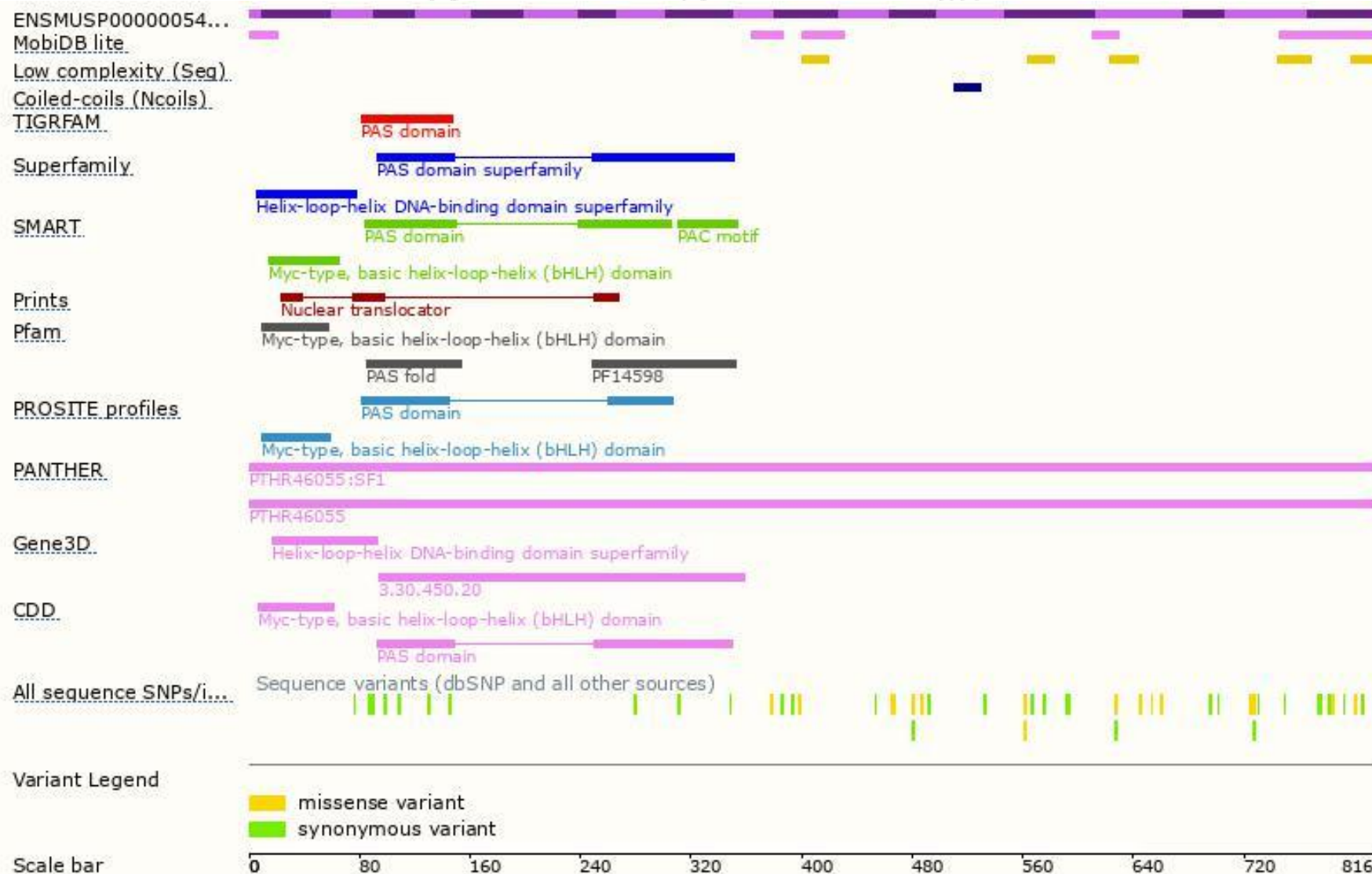
The strategy is based on the design of *Npas2-201* transcript,The transcription is shown below



Genomic location distribution

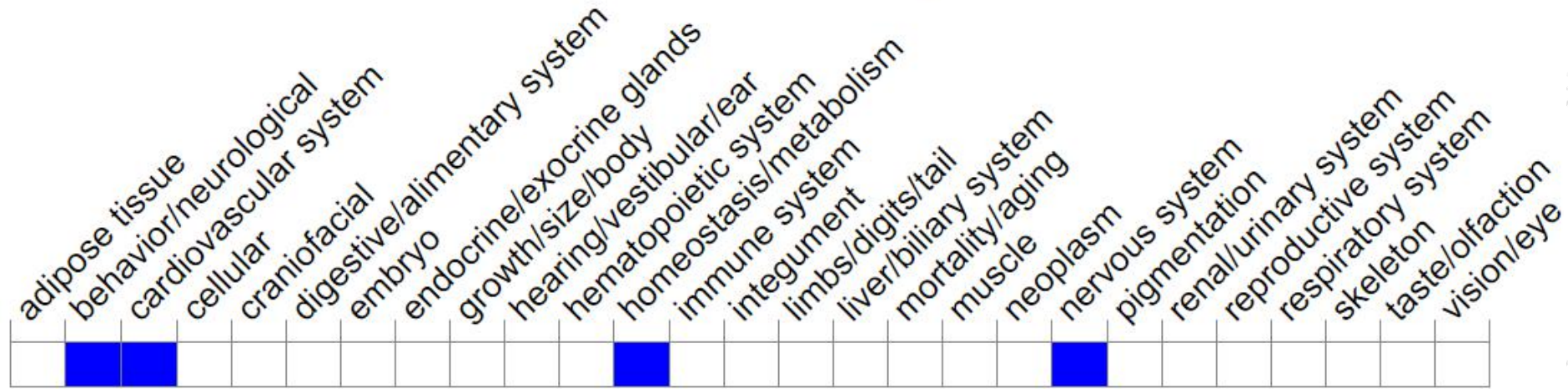


Protein domain



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/>).

According to the existing MGI data, Targeted mutation of this gene results in deficits in complex emotional long-term memory tasks

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

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