

***Chrnb2* Cas9-CKO Strategy**

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Project Overview

Project Name

Chrnb2

Project type

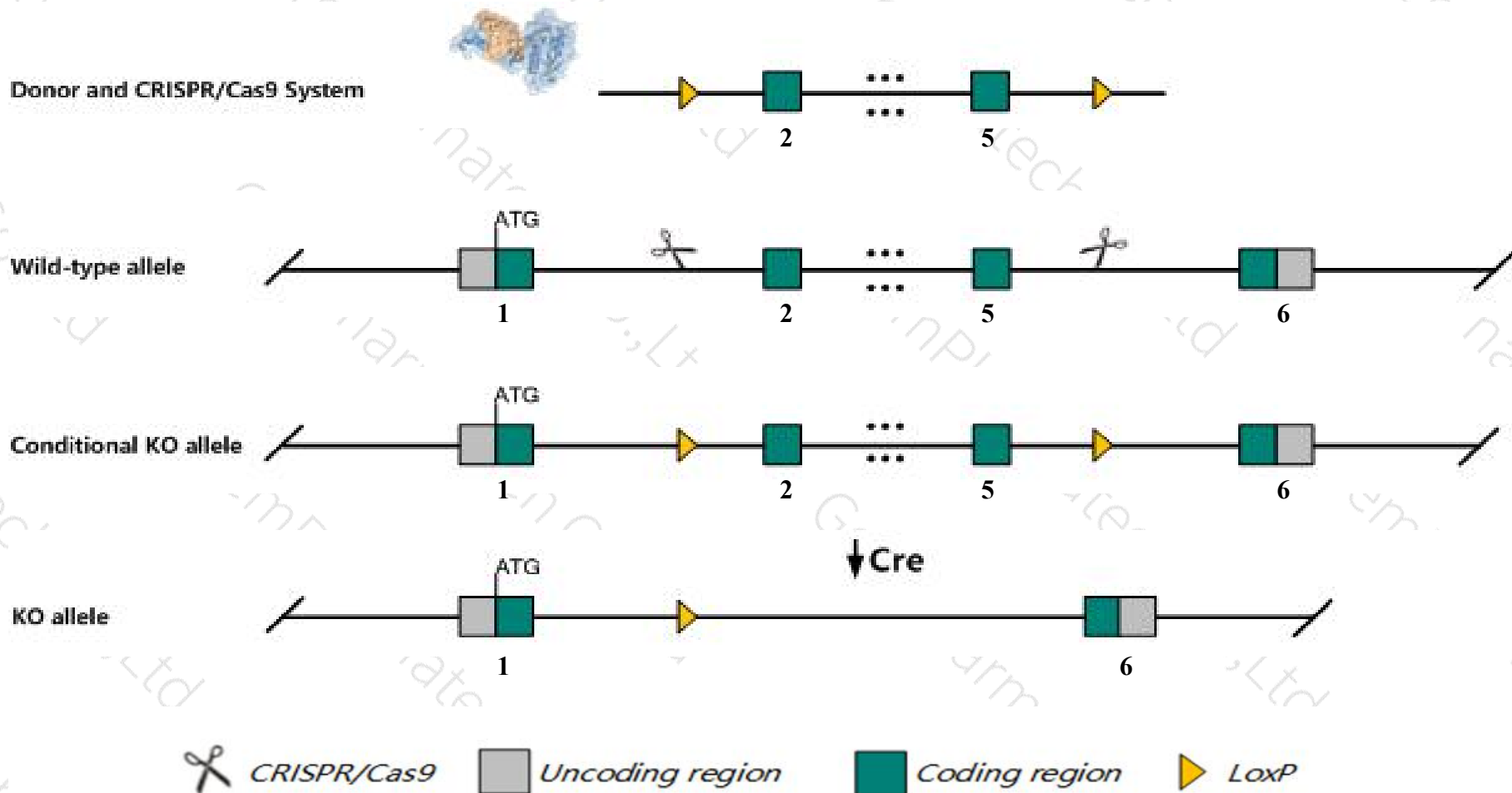
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Chrnb2* gene. The schematic diagram is as follows:



Technical routes

- The *Chrnb2* gene has 3 transcripts. According to the structure of *Chrnb2* gene, exon2-exon5 of *Chrnb2-201* (ENSMUST00000029562.4) transcript is recommended as the knockout region. The region contains 1271bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Chrnb2* 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, Homozygotes for targeted null mutations have impaired responses to nicotine, but show improved passive avoidance behavior. With age, mutants show more neurodegeneration and alterations of the visual system, with decreased cortical visual acuity.
- The *Chrn2* gene is located on the Chr3. 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)

Chrn2 cholinergic receptor, nicotinic, beta polypeptide 2 (neuronal) [Mus musculus (house mouse)]

Gene ID: 11444, updated on 19-Feb-2019

Summary



Official Symbol	Chrn2 provided by MGI
Official Full Name	cholinergic receptor, nicotinic, beta polypeptide 2 (neuronal) provided by MGI
Primary source	MGI:MGI:87891
See related	Ensembl:ENSMUSG00000027950
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	Acrb-2, Acrb2, C030030P04Rik, [b]2-nAChR
Expression	Biased expression in whole brain E14.5 (RPKM 17.9), cerebellum adult (RPKM 14.9) and 8 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

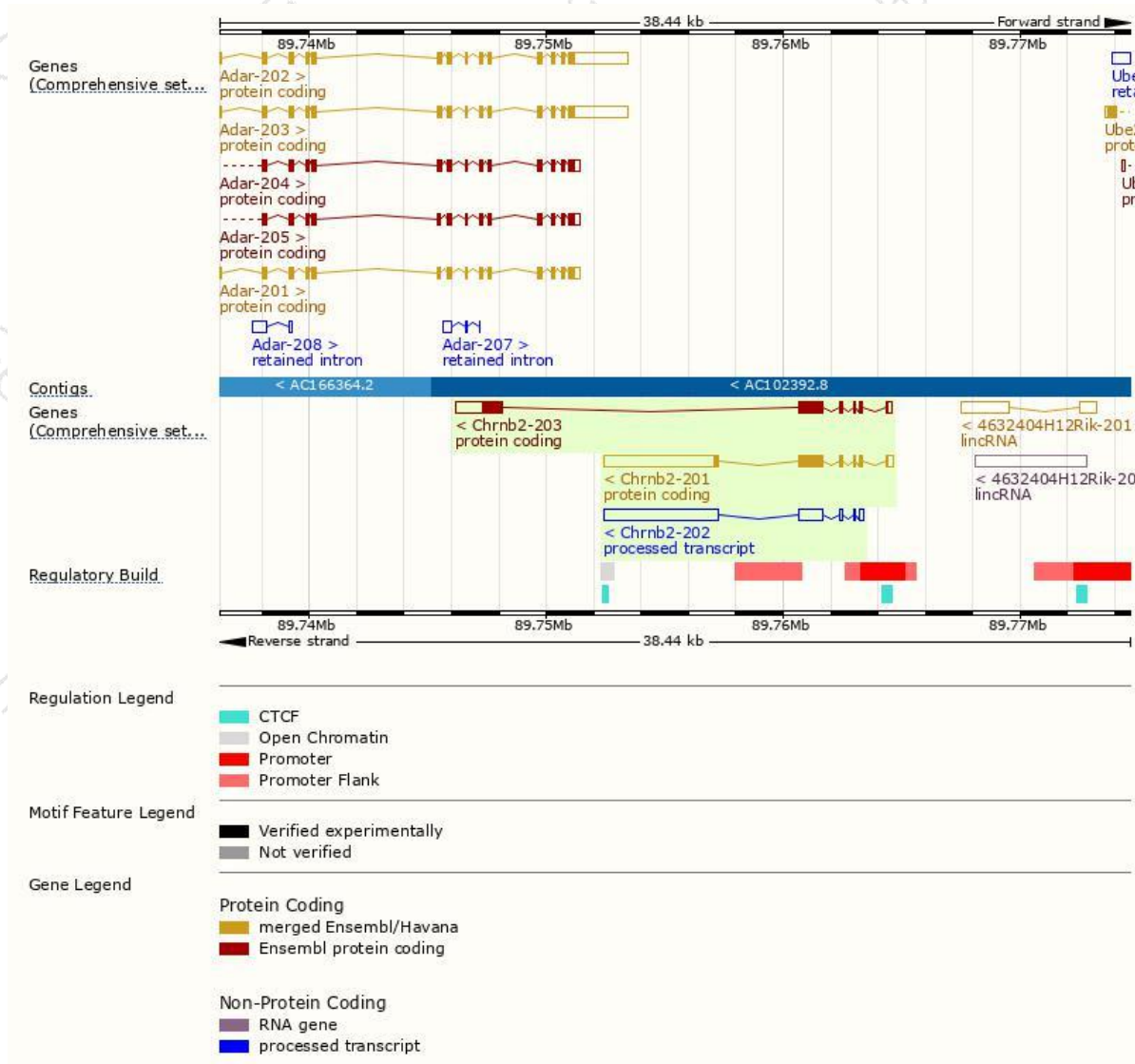
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Chrnb2-201	ENSMUST00000029562.4	6399	501aa	Protein coding	CCDS17515	Q9ERK7	TSL:1 GENCODE basic APPRIS P1
Chrnb2-203	ENSMUST00000200558.4	3482	727aa	Protein coding	-	A0A0G2JG64	TSL:1 GENCODE basic
Chrnb2-202	ENSMUST00000199372.1	6145	No protein	Processed transcript	-	-	TSL:5

The strategy is based on the design of *Chrnb2-201* transcript,The transcription is shown below



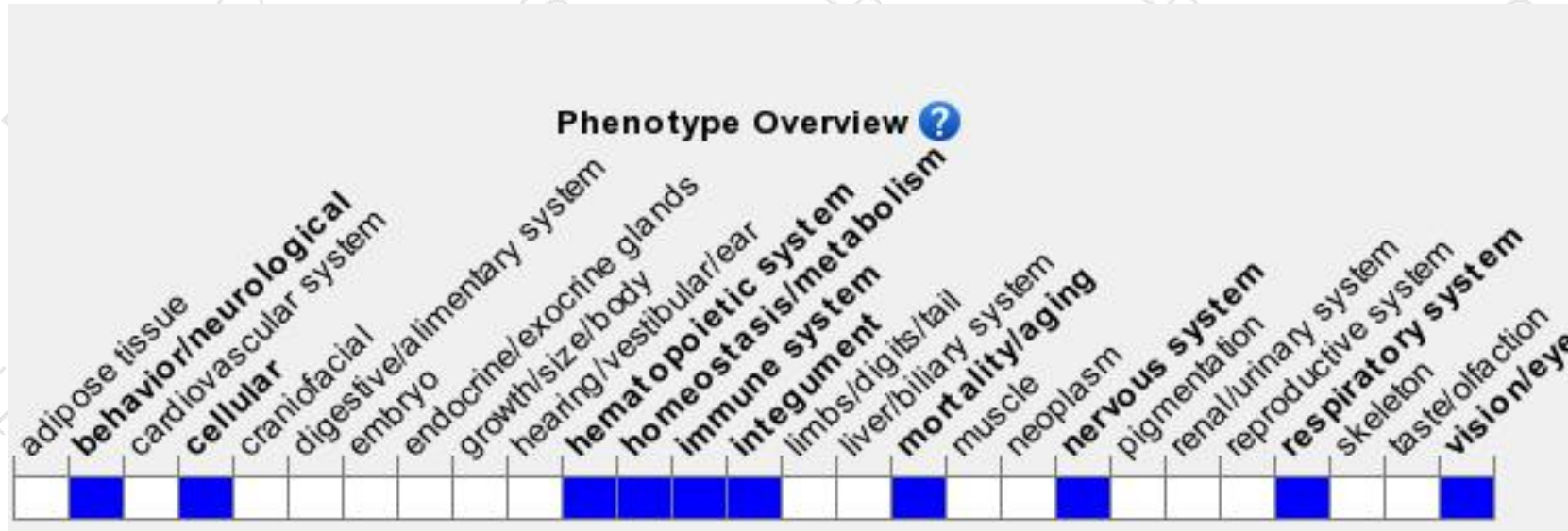
Genomic location distribution



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/>).

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

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