

Grm3 Cas9-CKO Strategy

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Reviewer

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Project Overview

Project Name

Grm3

Project type

Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

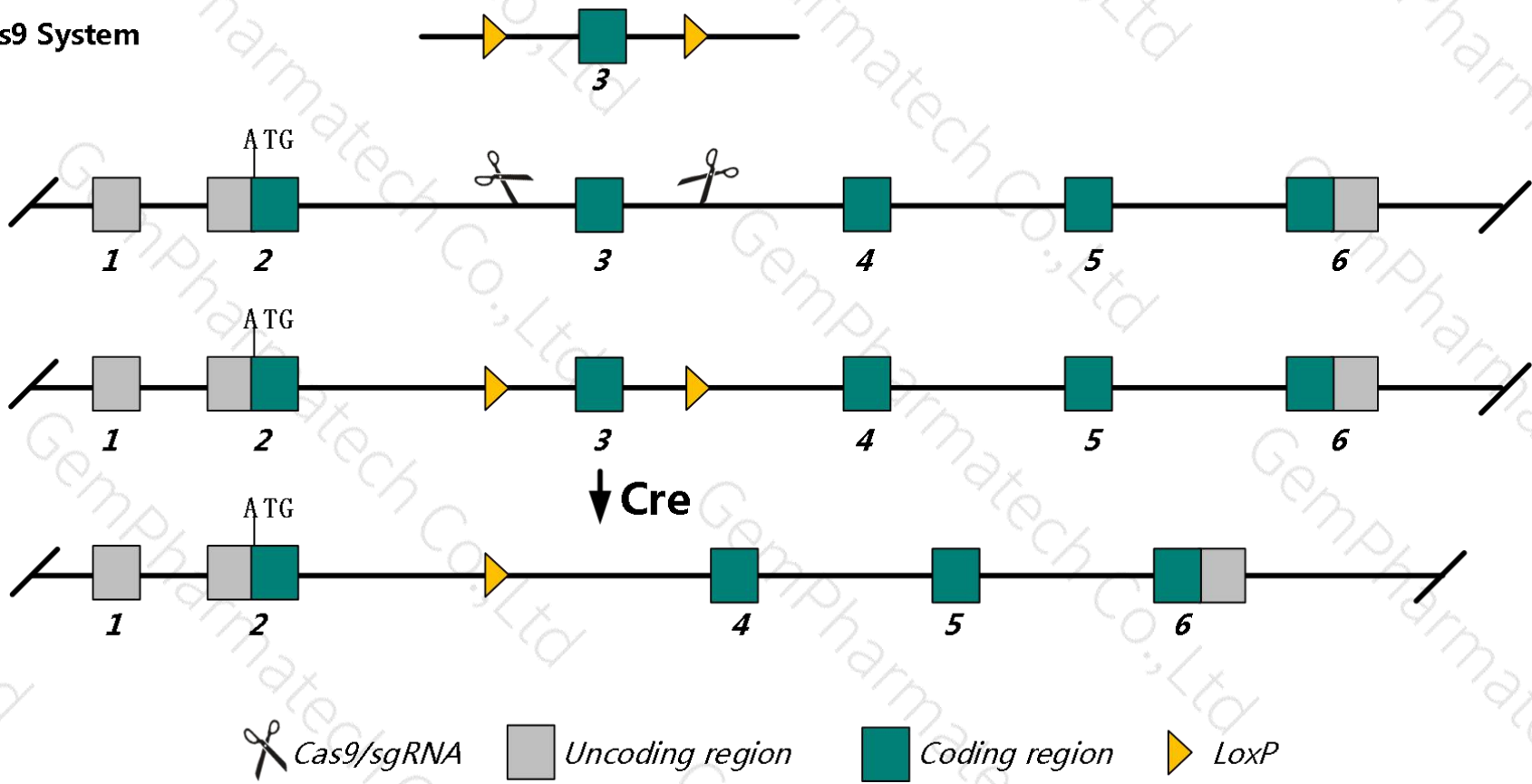
This model will use CRISPR/Cas9 technology to edit the *Grm3* gene. The schematic diagram is as follows:

Donor and CRISPR/Cas9 System

Wild-type allele

Conditional KO allele

KO allele



- The *Grm3* gene has 1 transcript. According to the structure of *Grm3* gene, exon3 of *Grm3*-201 (ENSMUST00000004076.4) transcript is recommended as the knockout region. The region contains 856bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Grm3* gene. The brief process is as follows: gRNA was transcribed in vitro, donor was constructed. Cas9, gRNA 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 or cell types.

- According to the existing MGI data , mice homozygous for a targeted mutation display normal morphology, clinical chemistry, hematology, and behavior. Mice homozygous for a knock-out allele exhibit altered neuroprotection.
- The *Grm3* gene is located on the Chr5. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Grm3 glutamate receptor, metabotropic 3 [*Mus musculus* (house mouse)]

Gene ID: 108069, updated on 12-Aug-2019

Summary



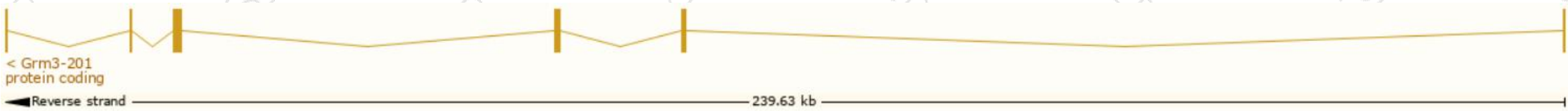
Official Symbol	Grm3 provided by MGI
Official Full Name	glutamate receptor, metabotropic 3 provided by MGI
Primary source	MGI:MGI:1351340
See related	Ensembl:ENSMUSG00000003974
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	mGlu3; Gprc1c; mGluR3; 0710001G23Rik
Expression	Biased expression in cortex adult (RPKM 11.5), frontal lobe adult (RPKM 9.3) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

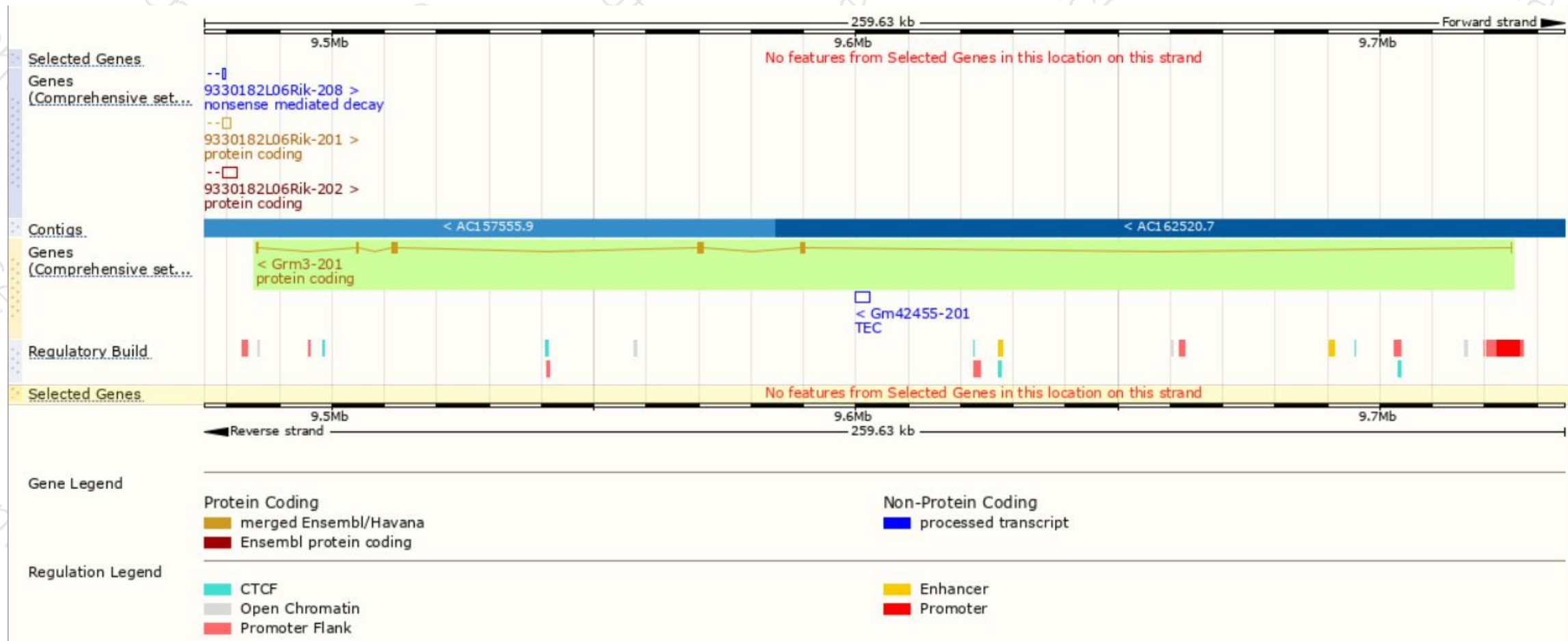
The gene has 1 transcript, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grm3-201	ENSMUST000000004076.4	3049	879aa	Protein coding	CCDS19090	Q9QYS2	TSL:1 Gencode basic APPRIS P1

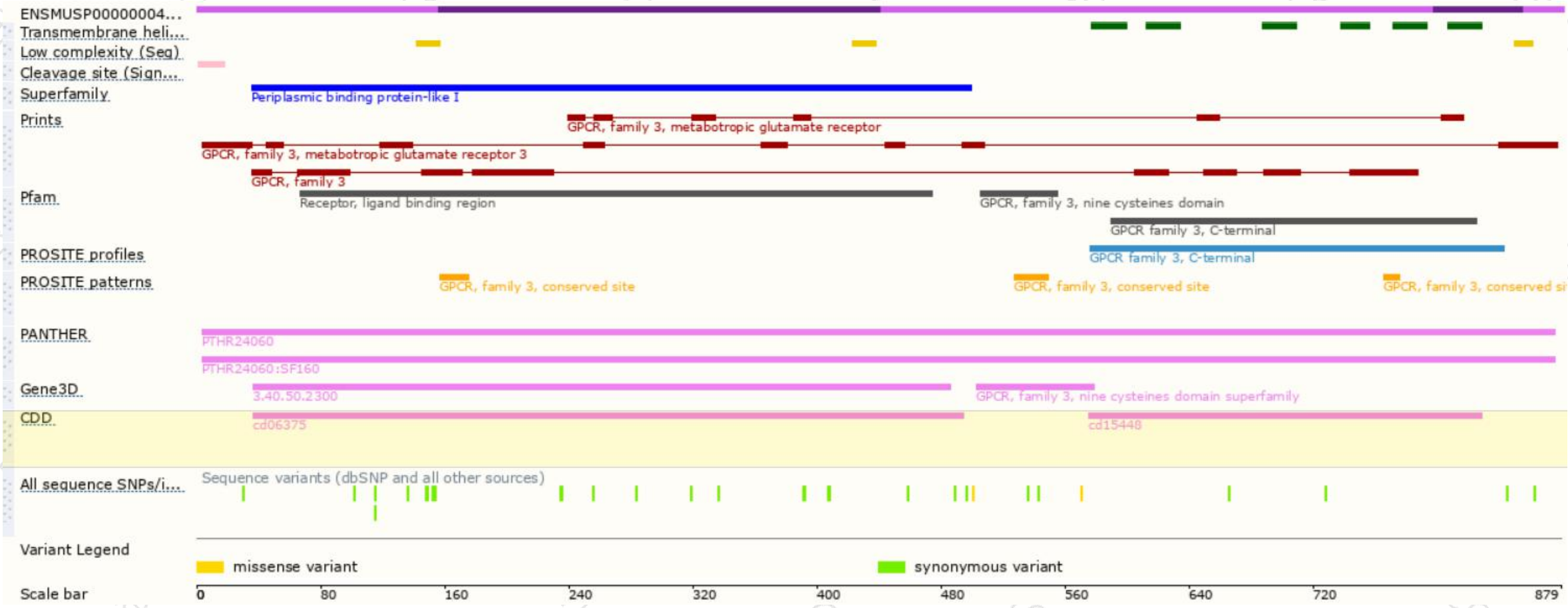
The strategy is based on the design of *Grm3-201* transcript, The transcription is shown below:



Genomic location distribution

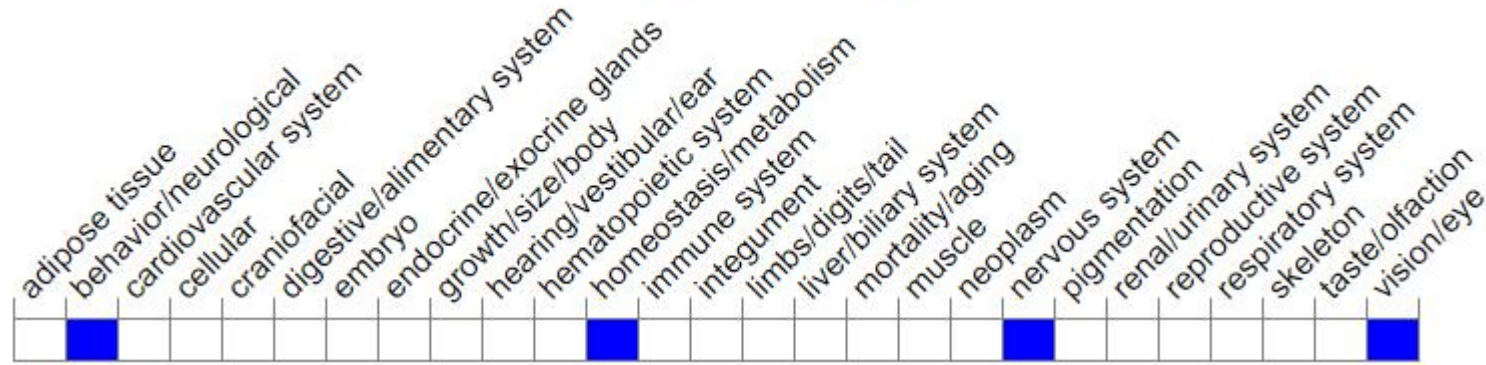


Protein domain



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/>) .

Mice homozygous for a targeted mutation display normal morphology, clinical chemistry, hematology, and behavior.

Mice homozygous for a knock-out allele exhibit altered neuroprotection.

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