Grm4 Cas9-KO *Strat*

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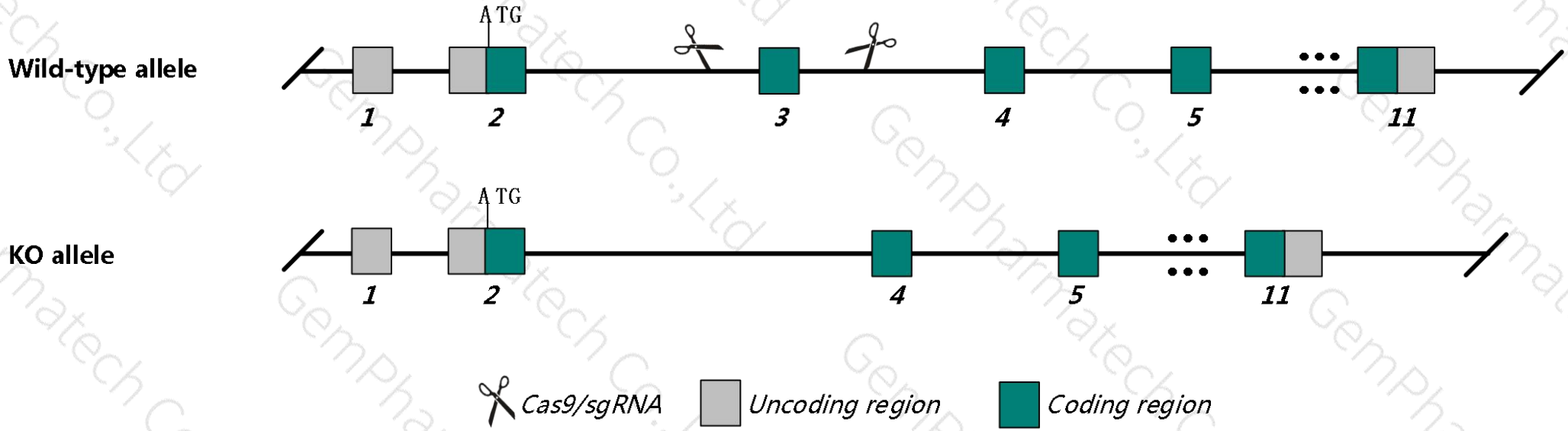
Project Overview

Project Name	***Grm4***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Grm4* gene. The schematic diagram is as follows:



Technical routes

- The *Grm4* gene has 8 transcripts.According to the structure of *Grm4* gene, exon3 of *Grm4*-201 (ENSMUST00000118161.2) transcript is recommended as the knockout region.The region contains 217bp coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Grm4* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

- According to the existing MGI data，homozygous mutation of theis gene results in impaired motor learning, and reduced paired-pulse facilitation and post-tetanic potential.
- The *Grm4* gene is located on the Chr17. 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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Grm4 glutamate receptor, metabotropic 4 [*Mus musculus* (house mouse)]

Gene ID: 268934, updated on 12-Aug-2019

Summary

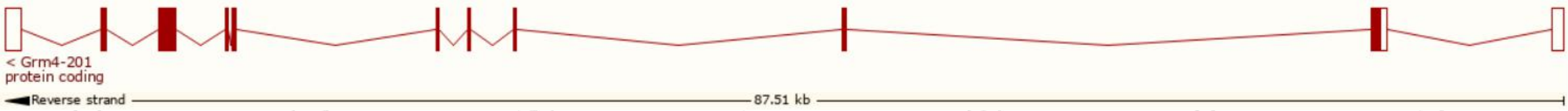
Official Symbol	Grm4 provided by MGI
Official Full Name	glutamate receptor, metabotropic 4 provided by MGI
Primary source	MGI:MGI:1351341
See related	Ensembl:ENSMUSG00000063239
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Gprc1d; mGluR4
Expression	Biased expression in cerebellum adult (RPKM 60.6), frontal lobe adult (RPKM 7.3) and 3 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

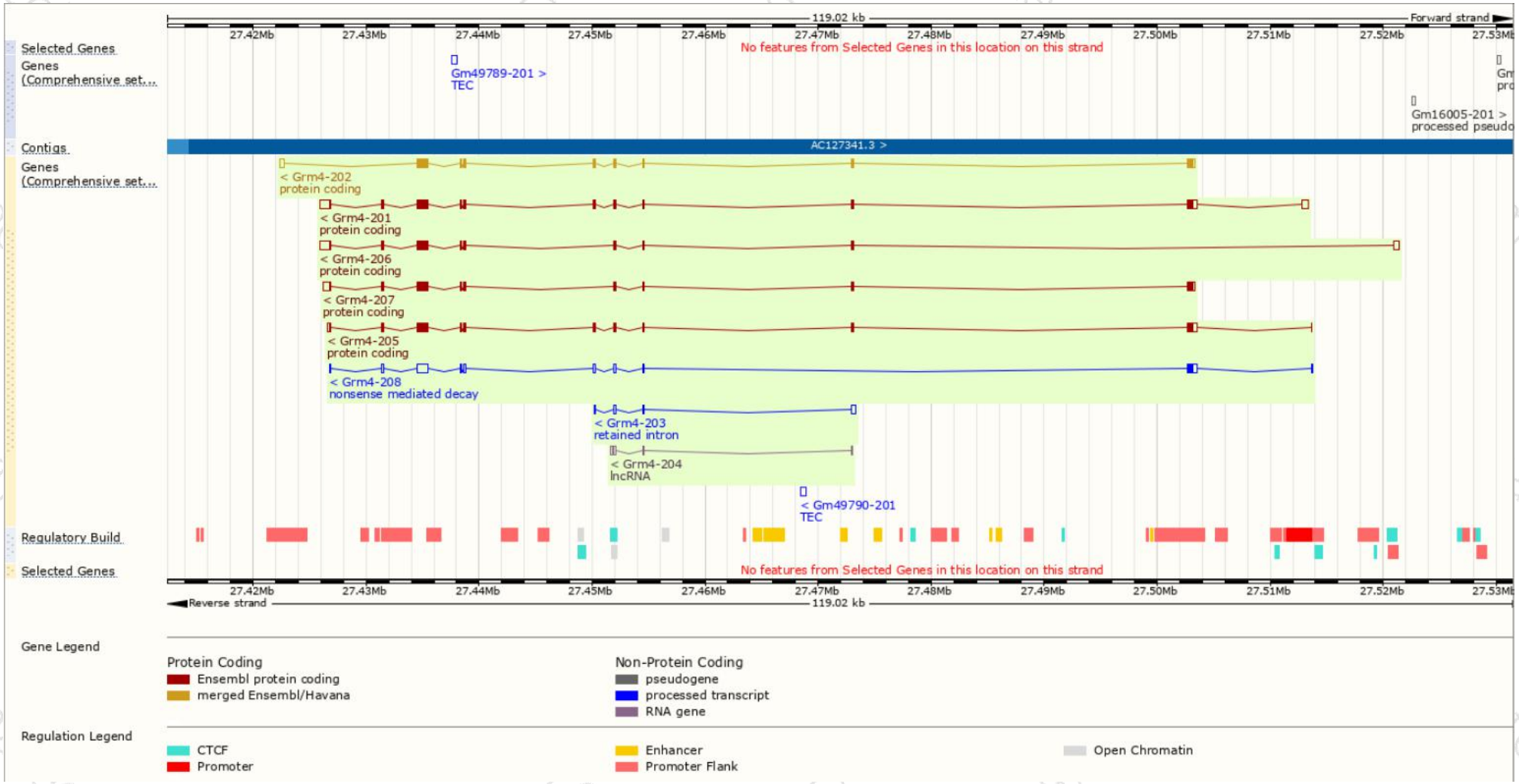
The gene has 8 transcripts, and all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Grm4-201	ENSMUST00000118161.2	4607	912aa	Protein coding	CCDS70775	G3XA00	TSL:5 GENCODE basic APPRIS P1
Grm4-205	ENSMUST00000231290.1	3417	912aa	Protein coding	CCDS70775	G3XA00	GENCODE basic APPRIS P1
Grm4-207	ENSMUST00000231809.1	3298	865aa	Protein coding	-	A0A338P7K6	GENCODE basic
Grm4-206	ENSMUST00000231416.1	3451	657aa	Protein coding	-	A0A338P783	GENCODE basic
Grm4-208	ENSMUST00000232243.1	2984	181aa	Nonsense mediated decay	-	A0A338P6S6	-
Grm4-202	ENSMUST00000118489.7	2976	832aa	Protein coding	CCDS28563	A0A140T8R6	TSL:1 GENCODE basic
Grm4-203	ENSMUST00000146277.7	810	No protein	Retained intron	-	-	TSL:2
Grm4-204	ENSMUST00000147865.1	645	No protein	lncRNA	-	-	TSL:3

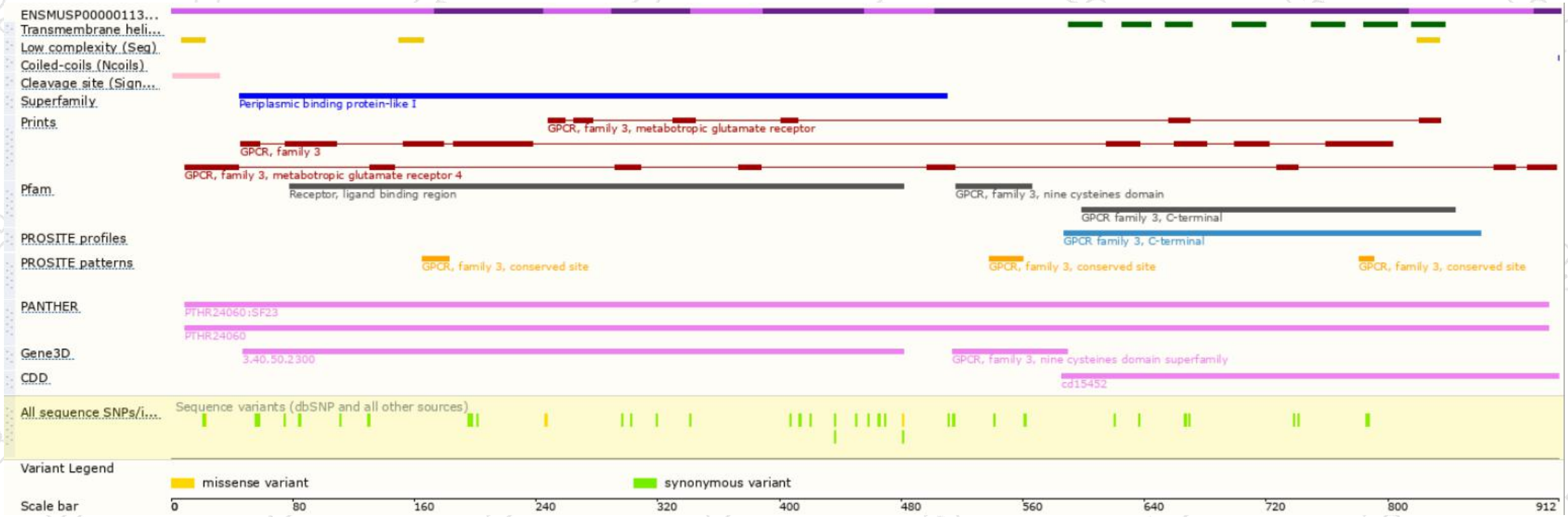
The strategy is based on the design of *Grm4-201* transcript,The transcription is shown below



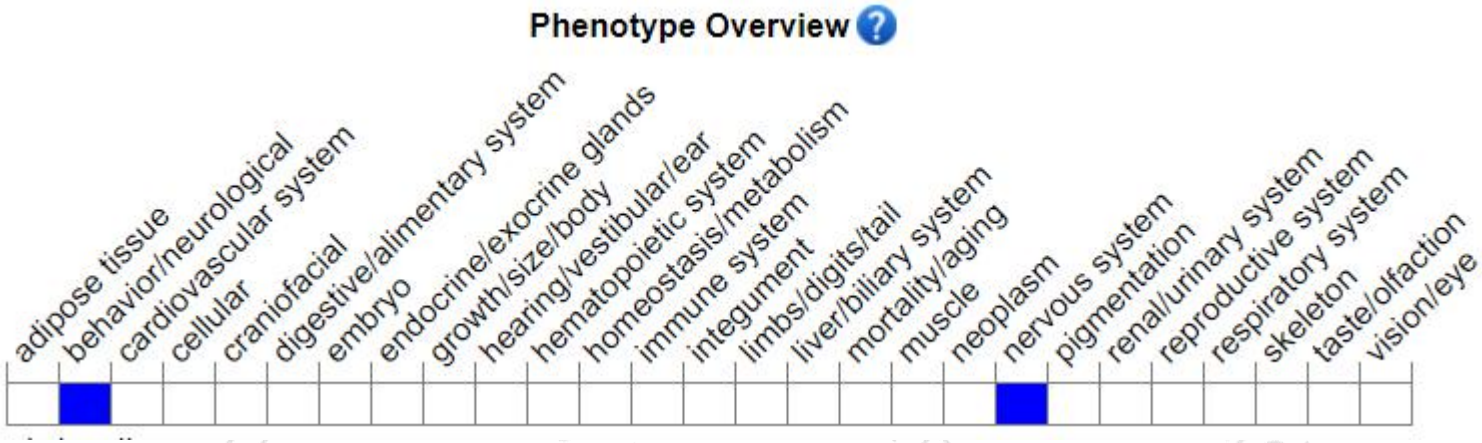
Genomic location (Ensembl)



Protein domain (Ensembl)



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue.Data quoted from MGI database(http://www.informatics.jax.org/) .

Homozygous mutation of theis gene results in impaired motor learning, and reduced paired-pulse facilitation and post-tetanic potential.

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