

Syt1 Cas9-KO Strategy

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Project Overview

Project Name

Syt1

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Syt1* gene. The schematic diagram is as follows:



- The *Syt1* gene has 6 transcripts. According to the structure of *Syt1* gene, exon5-exon6 of *Syt1-201* (ENSMUST00000064054.13) transcript is recommended as the knockout region. The region contains 308bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Syt1* 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.

- According to the existing MGI data, Homozygous null mice do not suckle, show impaired synaptic transmission and Ca^{2+} -evoked neurotransmitter release, and die by 48 hrs of life. Knock-in mice bearing a missense mutation show enhanced synaptic depression while those carrying a point mutation show reduced synaptic release probability.
- The *Syt1* gene is located on the Chr10. 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)

Syt1 synaptotagmin I [*Mus musculus* (house mouse)]

Gene ID: 20979, updated on 14-Aug-2019

Summary

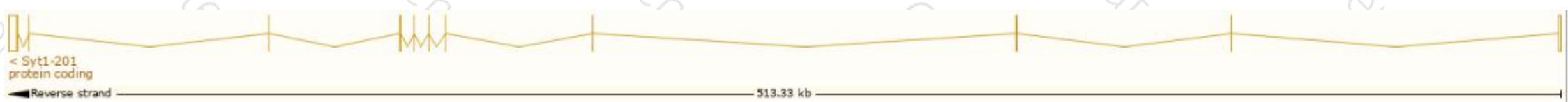
Official Symbol	Syt1 provided by MGI
Official Full Name	synaptotagmin I provided by MGI
Primary source	MGI:MGI:99667
See related	Ensembl:ENSMUSG00000035864
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Sytl; AW124717; G630098F17Rik
Expression	Biased expression in cortex adult (RPKM 49.2), frontal lobe adult (RPKM 47.7) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

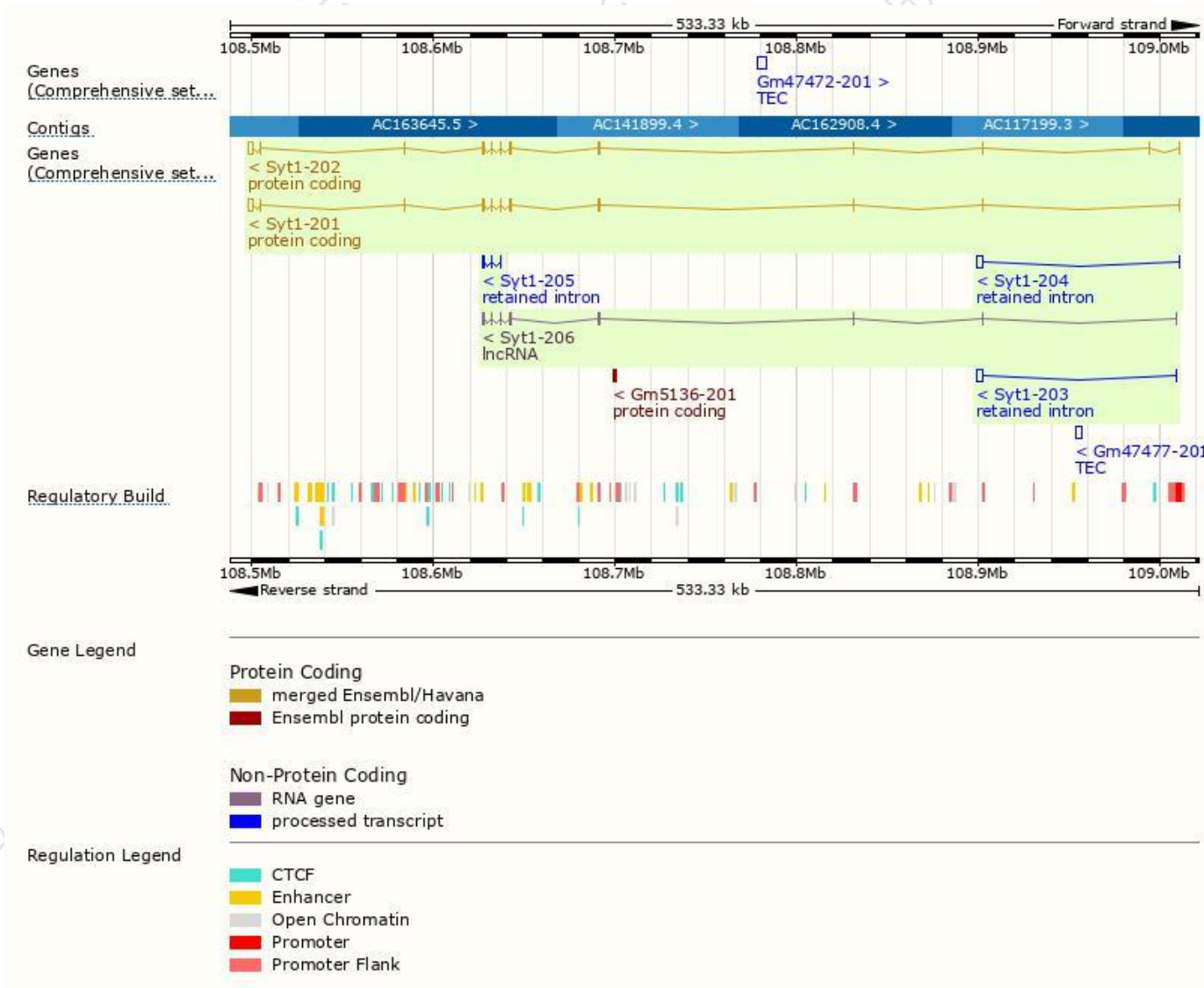
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Syt1-202	ENSMUST00000105276.7	4820	421aa	Protein coding	CCDS24163	H6RXZ1 P46096	TSL:1 GENCODE basic APPRIS P1
Syt1-201	ENSMUST00000064054.13	4745	421aa	Protein coding	CCDS24163	H6RXZ1 P46096	TSL:1 GENCODE basic APPRIS P1
Syt1-204	ENSMUST00000146618.1	3488	No protein	Retained intron	-	-	TSL:1
Syt1-203	ENSMUST00000126278.1	3093	No protein	Retained intron	-	-	TSL:1
Syt1-205	ENSMUST00000147593.1	717	No protein	Retained intron	-	-	TSL:3
Syt1-206	ENSMUST00000156979.1	1113	No protein	lncRNA	-	-	TSL:5

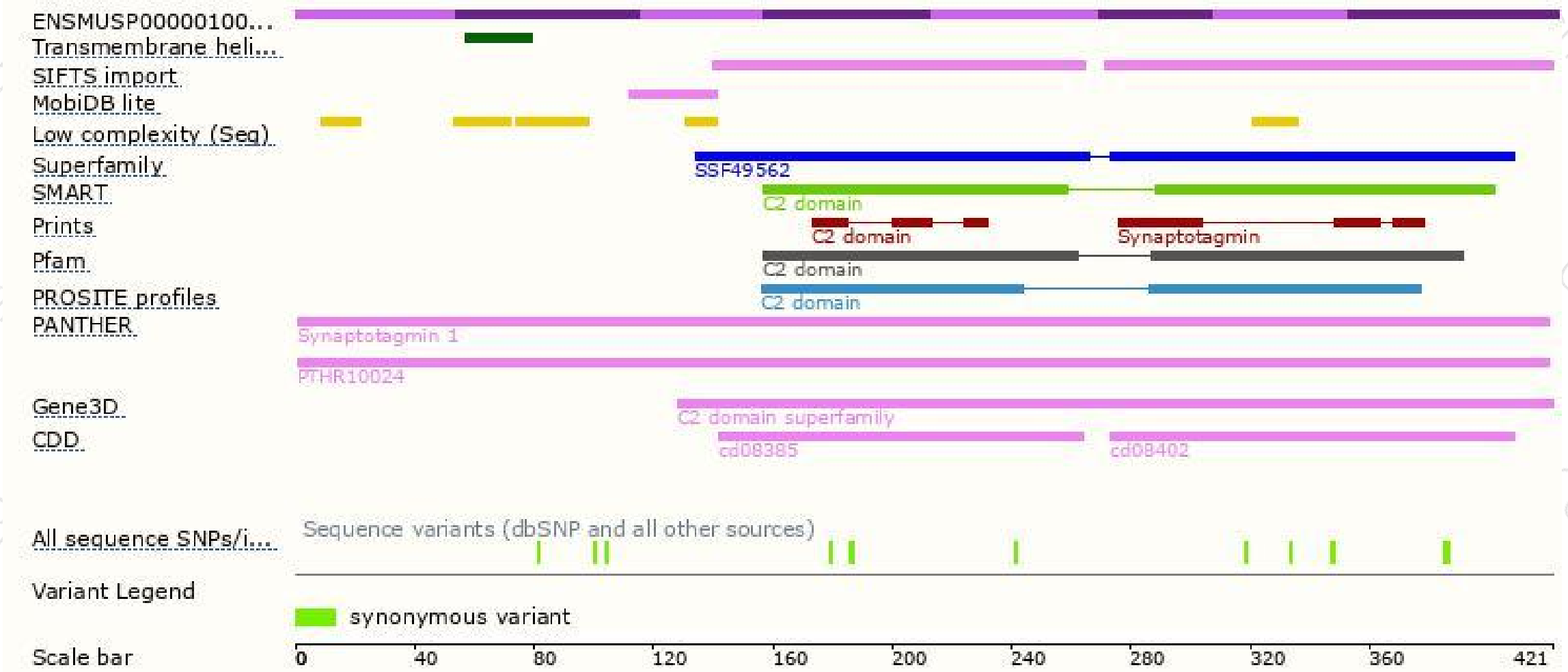
The strategy is based on the design of *Syt1-201* transcript,The transcription is shown below



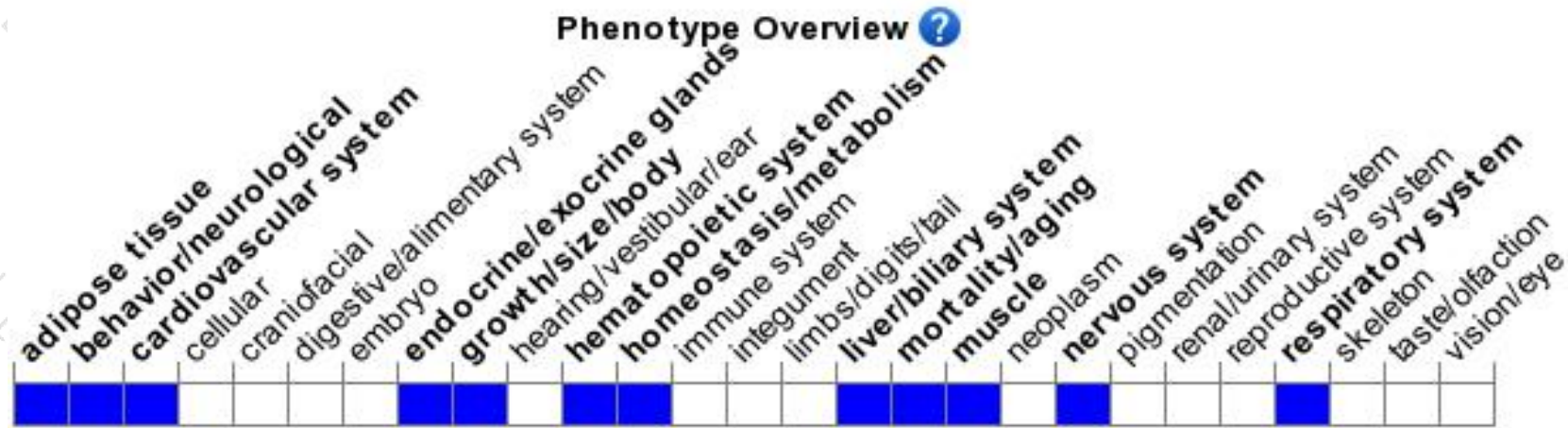
Genomic location distribution



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/>).

According to the existing MGI data, Homozygous null mice do not suckle, show impaired synaptic transmission and Ca^{2+} -evoked neurotransmitter release, and die by 48 hrs of life. Knock-in mice bearing a missense mutation show enhanced synaptic depression while those carrying a point mutation show reduced synaptic release probability.

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

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