Syt14 Cas9-CKO Strategy

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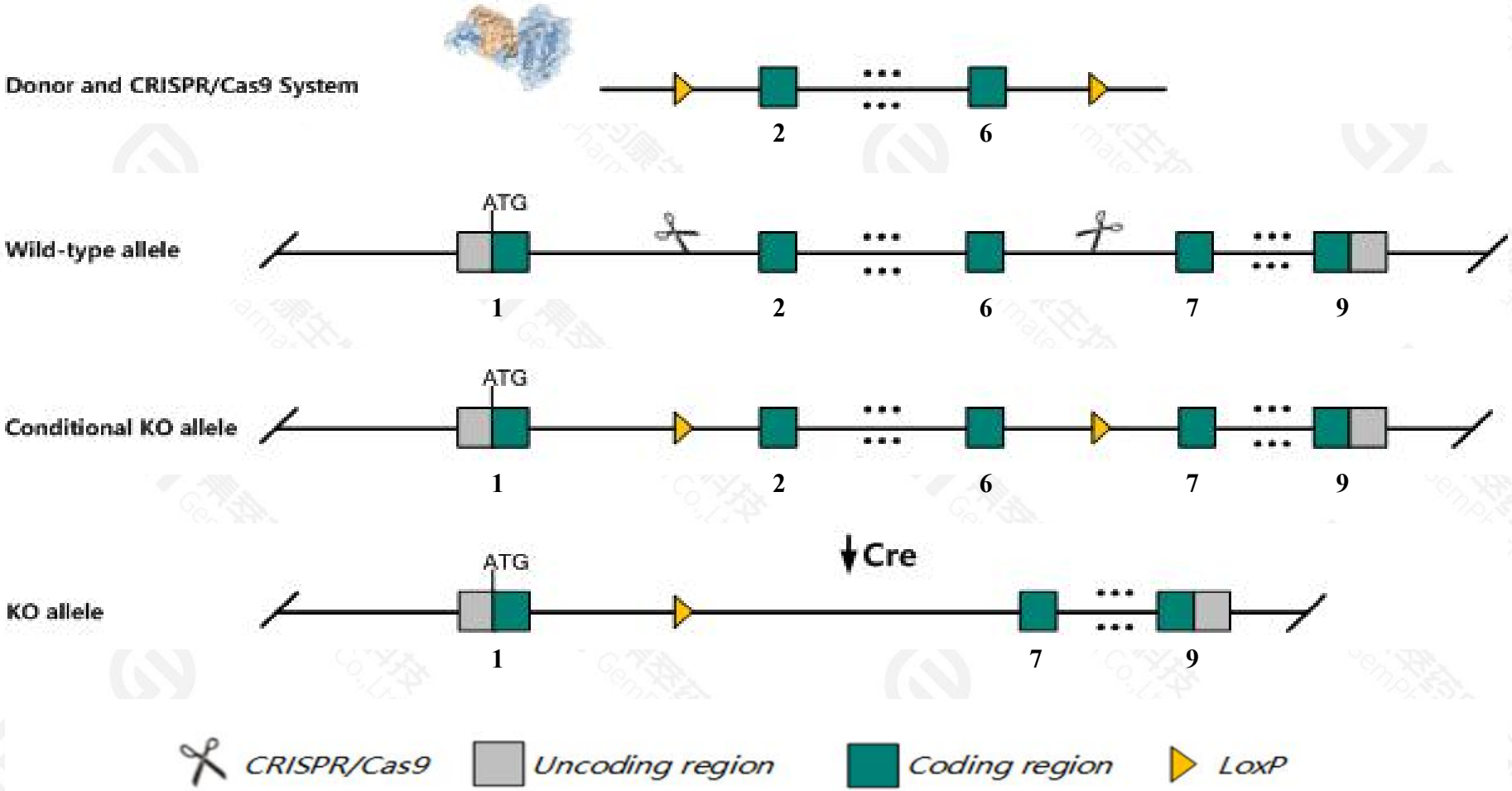
Project Overview

Project Name	***Syt14***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Syt14* gene. The schematic diagram is as follows:



Technical routes

The *Syt14* gene has 5 transcripts. According to the structure of *Syt14* gene, exon2-exon6 of *Syt14-201*(ENSMUST00000016344.9) transcript is recommended as the knockout region.The region contains 1151bp coding sequence. Knock out the region will result in disruption of protein function.

In this project we use CRISPR/Cas9 technology to modify *Syt14* 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.

Notice

The *Syt14* 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

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Syt14 synaptotagmin XIV [Mus musculus (house mouse)]

Gene ID: 329324, updated on 17-Dec-2020

Summary

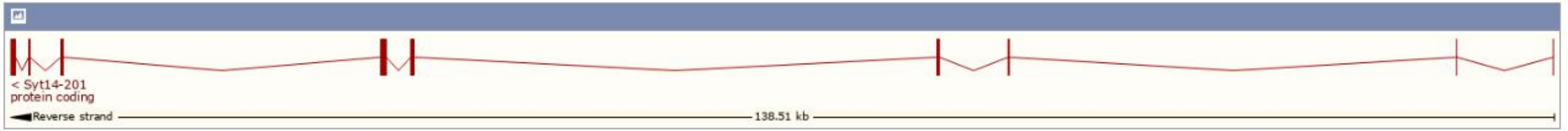
Official Symbol	Syt14 provided by MGI
Official Full Name	synaptotagmin XIV provided byMGI
Primary source	MGI:MGI:2444490
See related	Ensembl:ENSMUSG00000016200
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	B230320I09Rik, sytXIV
Summary	This gene encodes a member of the synaptotagmin family. The encoded protein may be involved in membrane trafficking. Disruption of a similar gene in human has been associated with autosomal recessive spinocerebellar ataxia. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Aug 2014]
Expression	Broad expression in liver E14 (RPKM 2.1), liver E14.5 (RPKM 1.9) and 16 other tissuesSee more
Orthologs	human all

Transcript information Ensembl

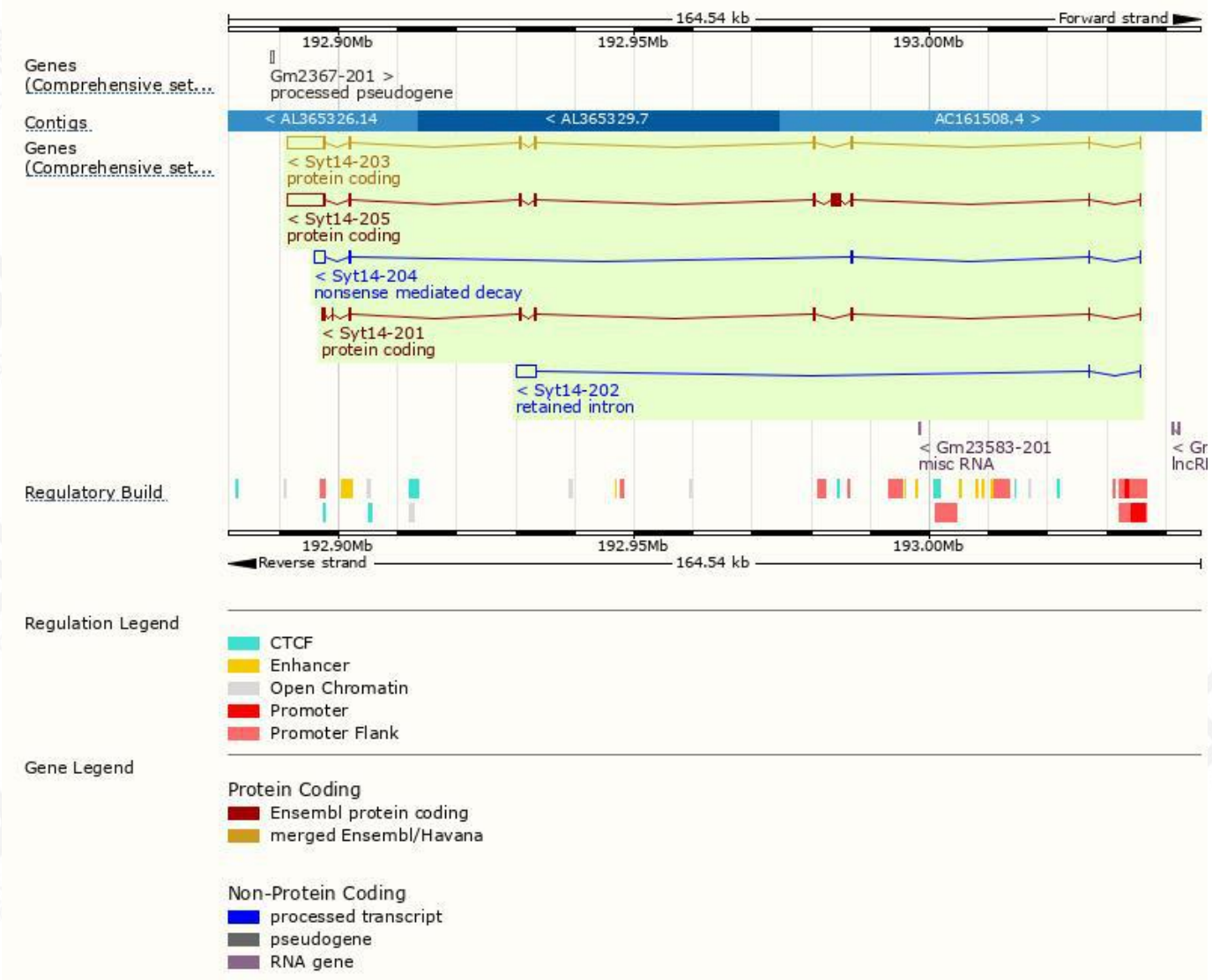
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Syt14-203	ENSMUST00000195354.6	7882	555aa	Protein coding	CCDS48489		TSL:1 , GENCODE basic , APPRIS P1 ,
Syt14-201	ENSMUST00000016344.9	1904	574aa	Protein coding	CCDS78780		TSL:1 , GENCODE basic ,
Syt14-205	ENSMUST00000215093.2	9274	838aa	Protein coding	-		TSL:5 , GENCODE basic ,
Syt14-204	ENSMUST00000195530.6	2078	77aa	Nonsense mediated decay	-		TSL:5 ,
Syt14-202	ENSMUST00000191907.2	3393	No protein	Retained intron	-		TSL:1 ,

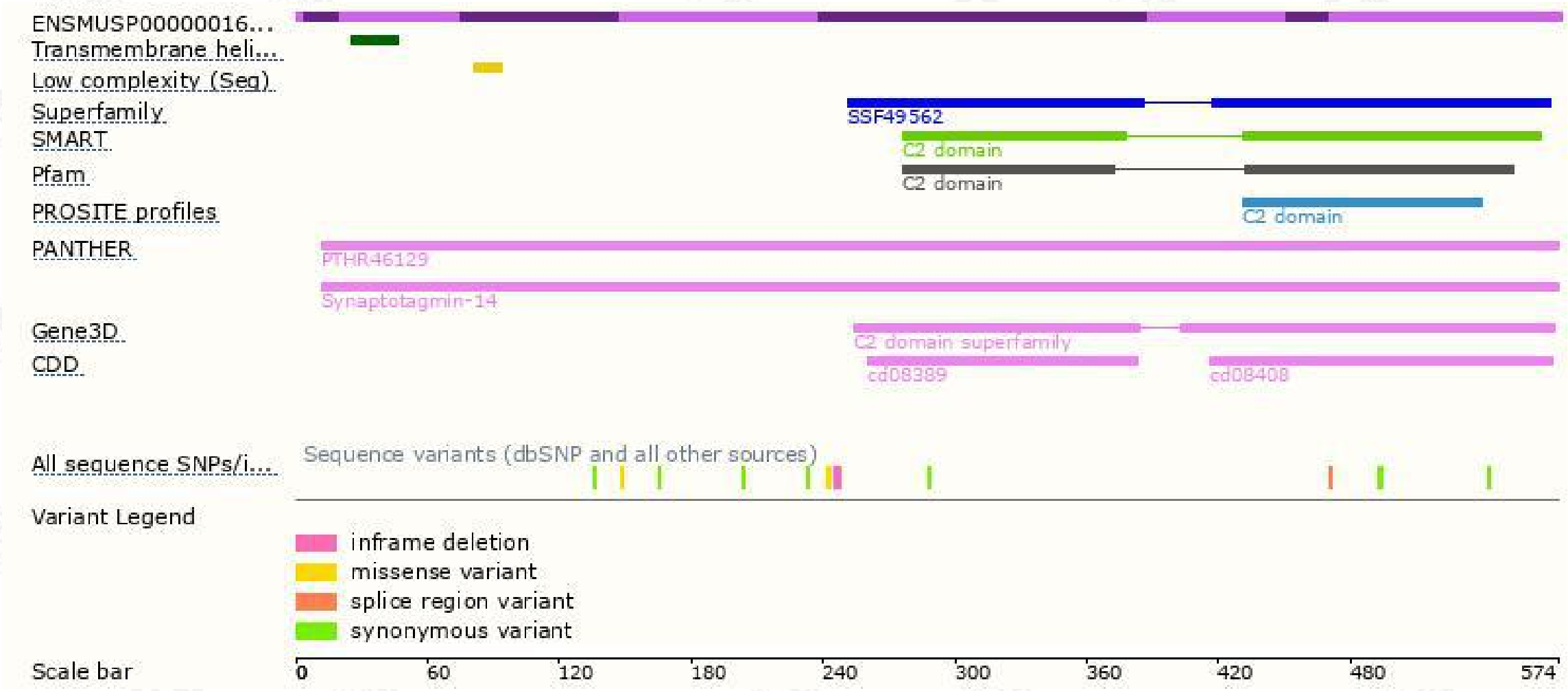
The strategy is based on the design of *Syt14-201* transcript,the transcription is shown below:



Genomic location distribution



Protein domain



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