

Cacng1 Cas9-CKO Strategy

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Reviewer:

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Design Date:

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Project Overview

Project Name

Cacng1

Project type

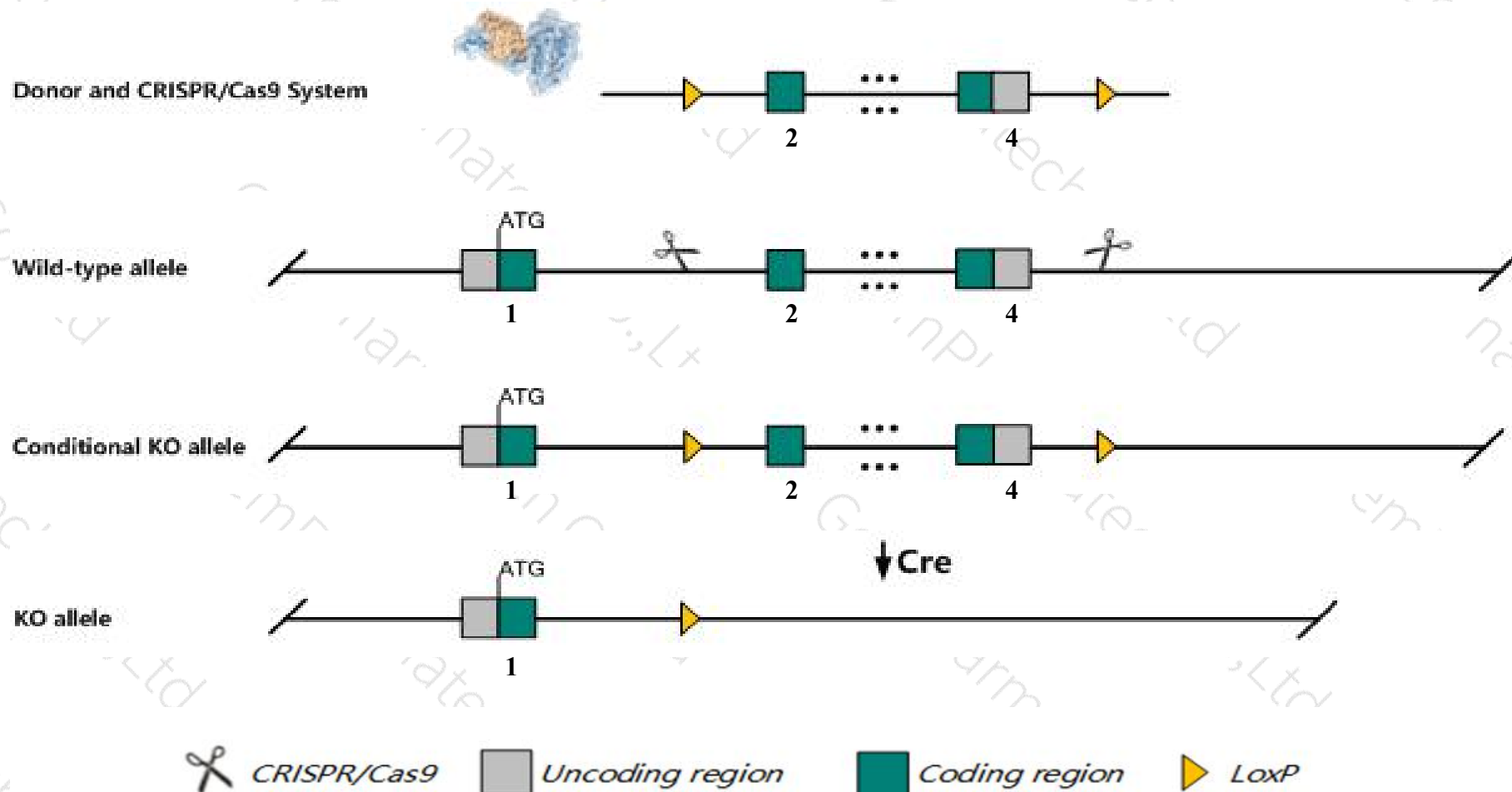
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cacng1* gene. The schematic diagram is as follows:



- The *Cacng1* gene has 1 transcript. According to the structure of *Cacng1* gene, exon2-exon4 of *Cacng1-201* (ENSMUST00000021065.5) transcript is recommended as the knockout region. The region contains most of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cacng1* 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, Mice homozygous for null mutations display abnormal muscle calcium currents.
- The *Cacng1* gene is located on the Chr11. 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)

Cacng1 calcium channel, voltage-dependent, gamma subunit 1 [*Mus musculus* (house mouse)]

Gene ID: 12299, updated on 12-Aug-2019

Summary

Official Symbol	Cacng1 provided by MGI
Official Full Name	calcium channel, voltage-dependent, gamma subunit 1 provided by MGI
Primary source	MGI:MGI:1206582
See related	Ensembl:ENSMUSG00000020722
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
Expression	Biased expression in mammary gland adult (RPKM 16.8), limb E14.5 (RPKM 4.7) and 3 other tissues See more
Orthologs	human all

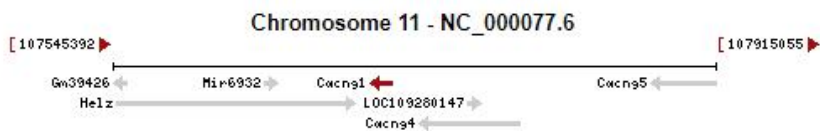
Genomic context

Location: 11; 11 E1

See Cacng1 in [Genome Data Viewer](#)

Exon count: 4

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	11	NC_000077.6 (107703218..107716476, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	11	NC_000077.5 (107564532..107577790, complement)

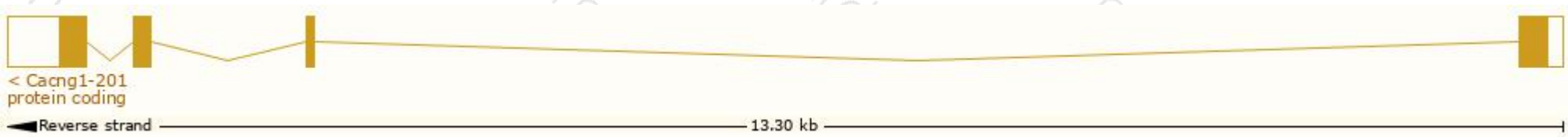


Transcript information (Ensembl)

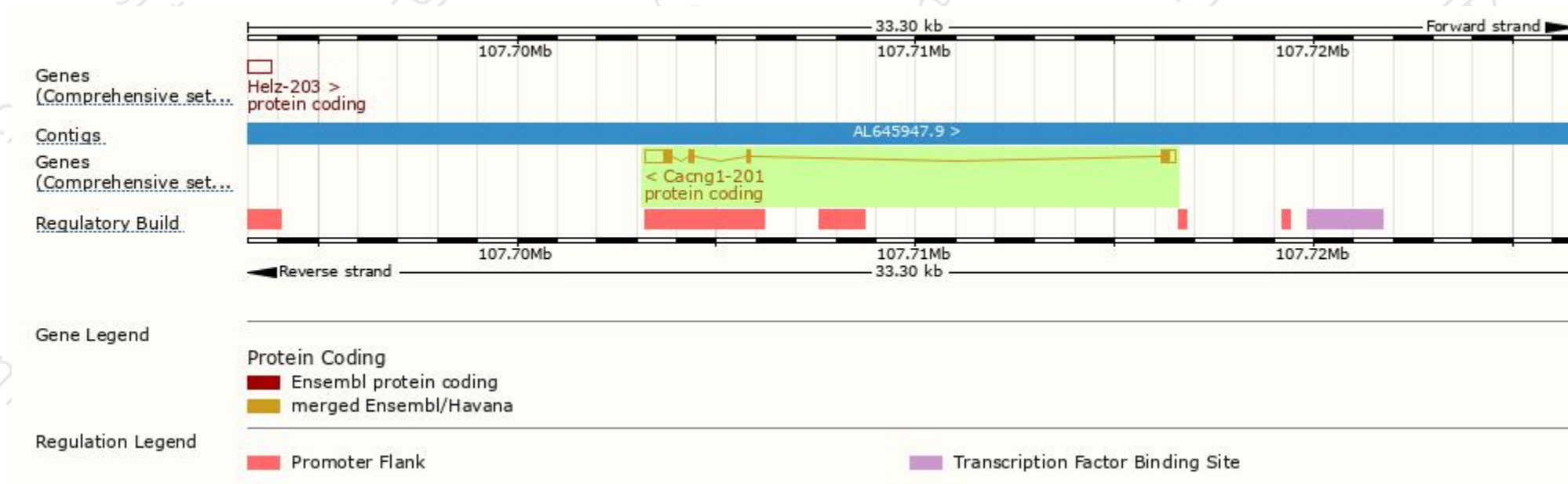
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cacng1-201	ENSMUST00000021065.5	1249	223aa	Protein coding	CCDS25570	O70578 Q4KL26	TSL:1 Gencode basic APPRIS P1

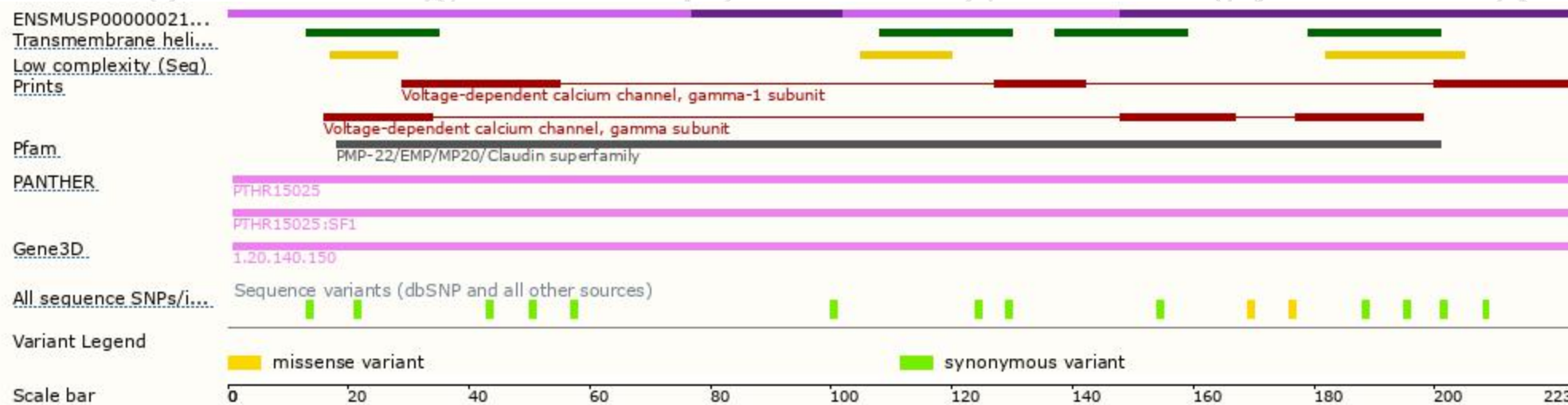
The strategy is based on the design of *Cacng1-201* transcript, The transcription is shown below



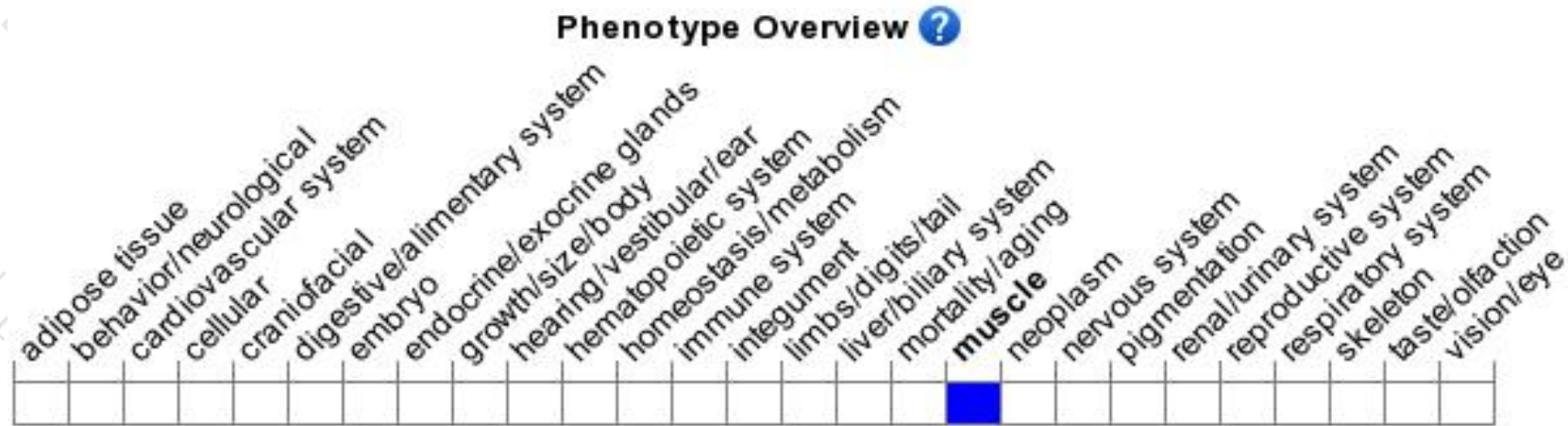
Genomic location distribution



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, Mice homozygous for null mutations display abnormal muscle calcium currents.

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

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