Pacsin2 Cas9-CKO Strategy

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Project Overview

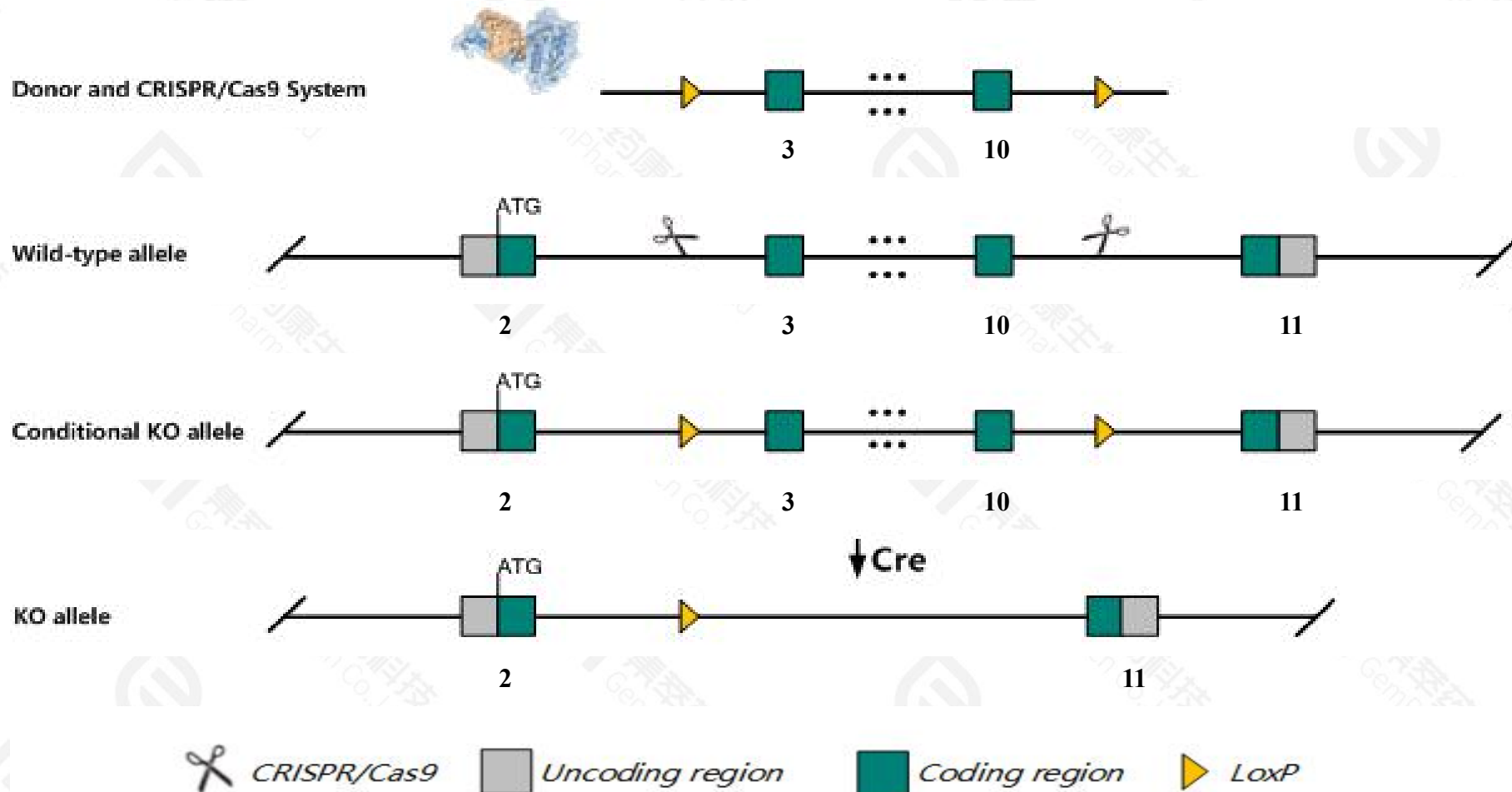|	
Project Name	*Pacsin2*
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pacsin2* gene. The schematic diagram is as follows:

Technical routes

➤ The *Pacsin2* gene has 11 transcripts. According to the structure of *Pacsin2* gene, exon3-exon10 of *Pacsin2-203*(ENSMUST00000171436.8) transcript is recommended as the knockout region.The region contains Ens 1288bp coding sequence. Knock out the region will result in disruption of protein function.

➤ In this project we use CRISPR/Cas9 technology to modify *Pacsin2* 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 a null allele exhibit reduced running endurance, distance, and speed with impaired fetal cardiomyocyte electrophysiology.

➢ The *Pacsin2* gene is located on the Chr15. 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）

Pacsin2 protein kinase C and casein kinase substrate in neurons 2 [Mus musculus (house mouse)]

Gene ID: 23970, updated on 17-Dec-2020

### ▲ Summary

|	
Official Symbol	Pacsin2 provided by MGI
Official Full Name	protein kinase C and casein kinase substrate in neurons 2 provided byMGI
Primary source	MGI:MGI:1345153
See related	Ensembl:ENSMUSG00000016664
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	AI197433, SdpII
Expression	Ubiquitous expression in heart adult (RPKM 34.6), kidney adult (RPKM 33.9) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pacsin2-203	ENSMUST00000171436.8	3693	486aa	Protein coding	CCDS27701		TSL:5 , GENCODE basic , APPRIS P1 ,
Pacsin2-202	ENSMUST00000165095.9	3186	486aa	Protein coding	CCDS27701		TSL:1 , GENCODE basic , APPRIS P1 ,
Pacsin2-210	ENSMUST00000231184.2	3103	486aa	Protein coding	CCDS27701		GENCODE basic , APPRIS P1 ,
Pacsin2-206	ENSMUST0000230679.2	3083	486aa	Protein coding	CCDS27701		GENCODE basic , APPRIS P1 ,
Pacsin2-201	ENSMUST00000056177.7	2795	486aa	Protein coding	CCDS27701		TSL:1 , GENCODE basic , APPRIS P1 ,
Pacsin2-205	ENSMUST0000230030.2	857	272aa	Protein coding	-		CDS 5' incomplete ,
Pacsin2-211	ENSMUST0000231946.2	823	180aa	Protein coding	-		CDS 5' incomplete ,
Pacsin2-207	ENSMUST0000230816.2	765	191aa	Protein coding	-		CDS 3' incomplete ,
Pacsin2-204	ENSMUST0000229337.2	640	124aa	Protein coding	-		CDS 3' incomplete ,
Pacsin2-209	ENSMUST0000231043.2	635	No protein	Processed transcript	-		
Pacsin2-208	ENSMUST0000230960.2	639	No protein	Retained intron	-		

The strategy is based on the design of *Pacsin2-203* transcript,the transcription is shown below:

< Pacsin2-203
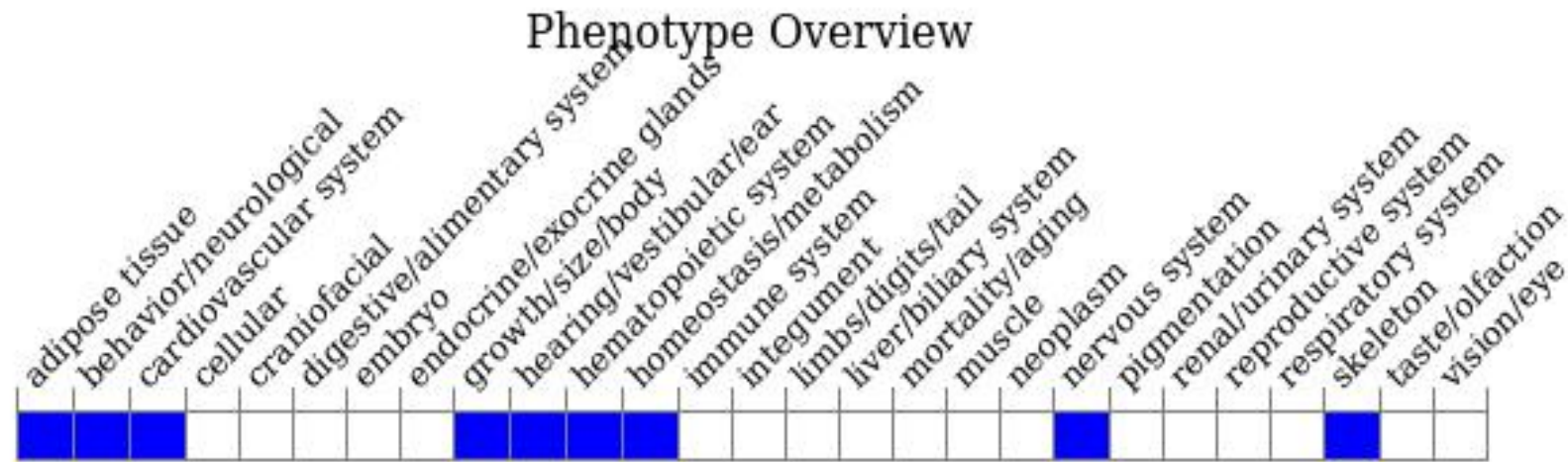protein coding

◄— Reverse strand

— 89.00 kb —
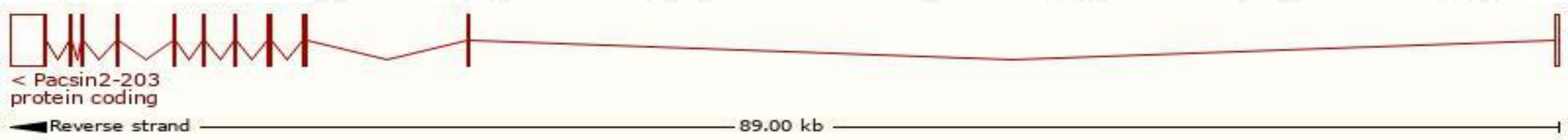
Genomic location distribution
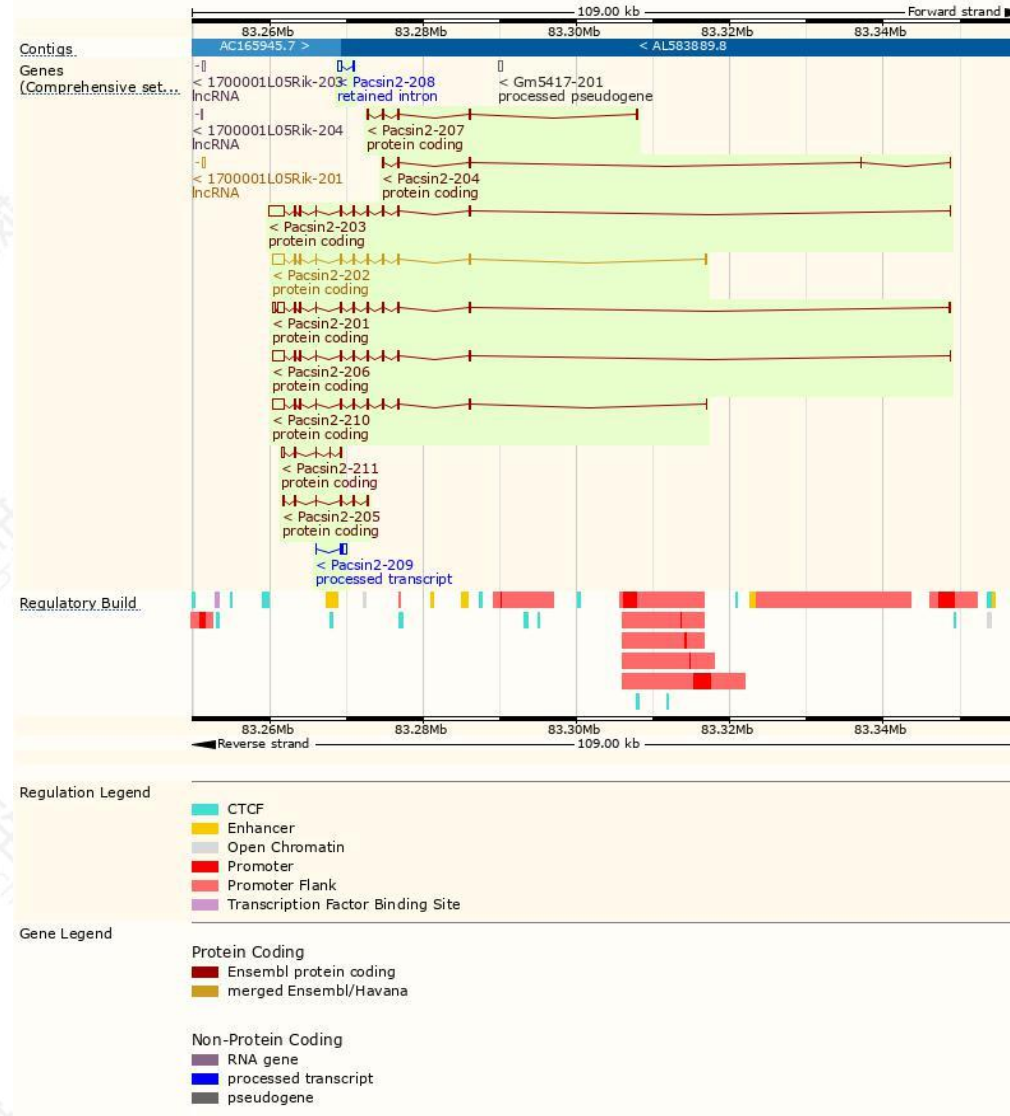
Protein domain
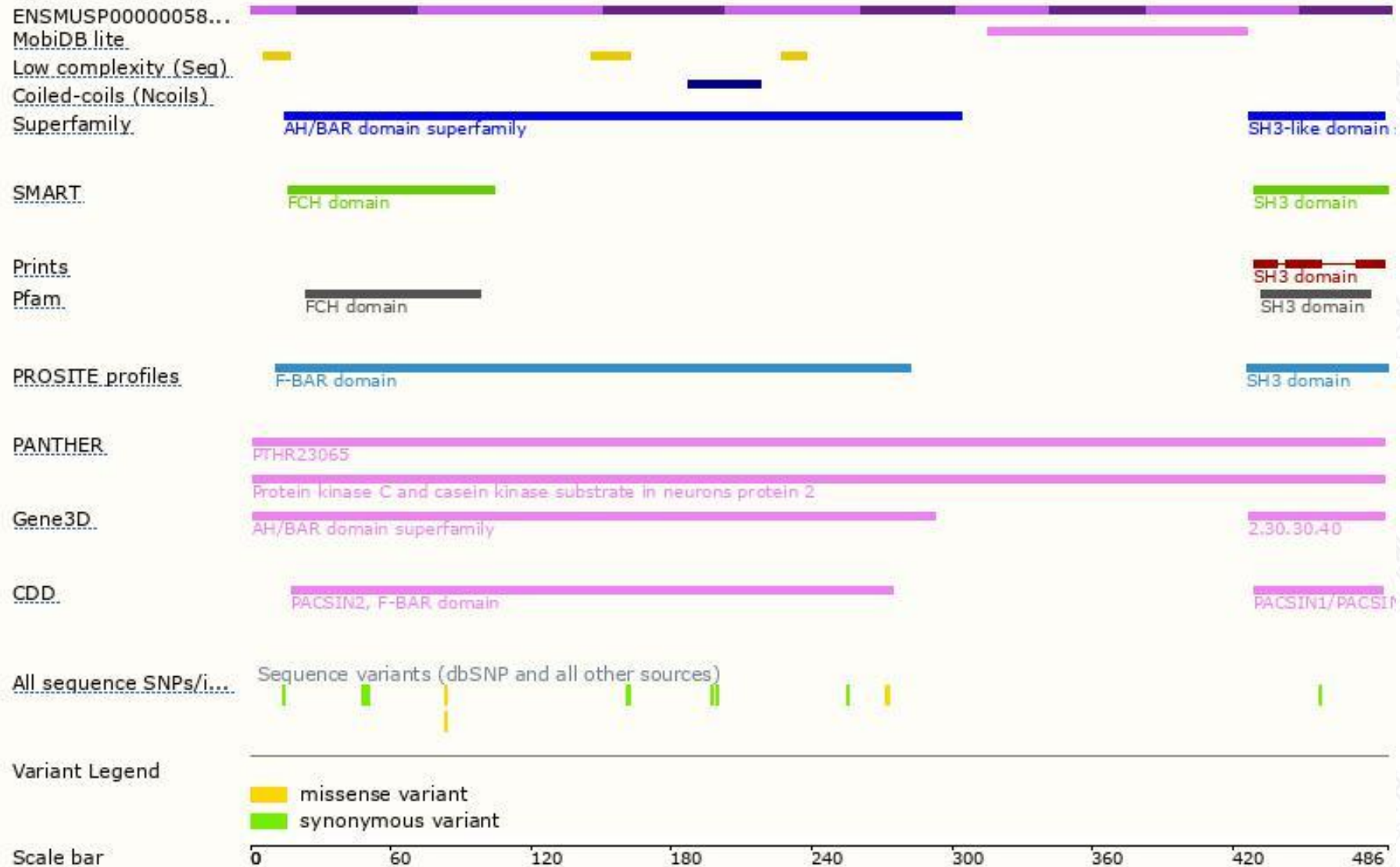
Mouse phenotype description(MGI)

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 a null allele exhibit reduced running endurance, distance, and speed with impaired fetal cardiomyocyte electrophysiology.

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