Casq2 Cas9-KO Strategy

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Reviewer： Shilei Zhu

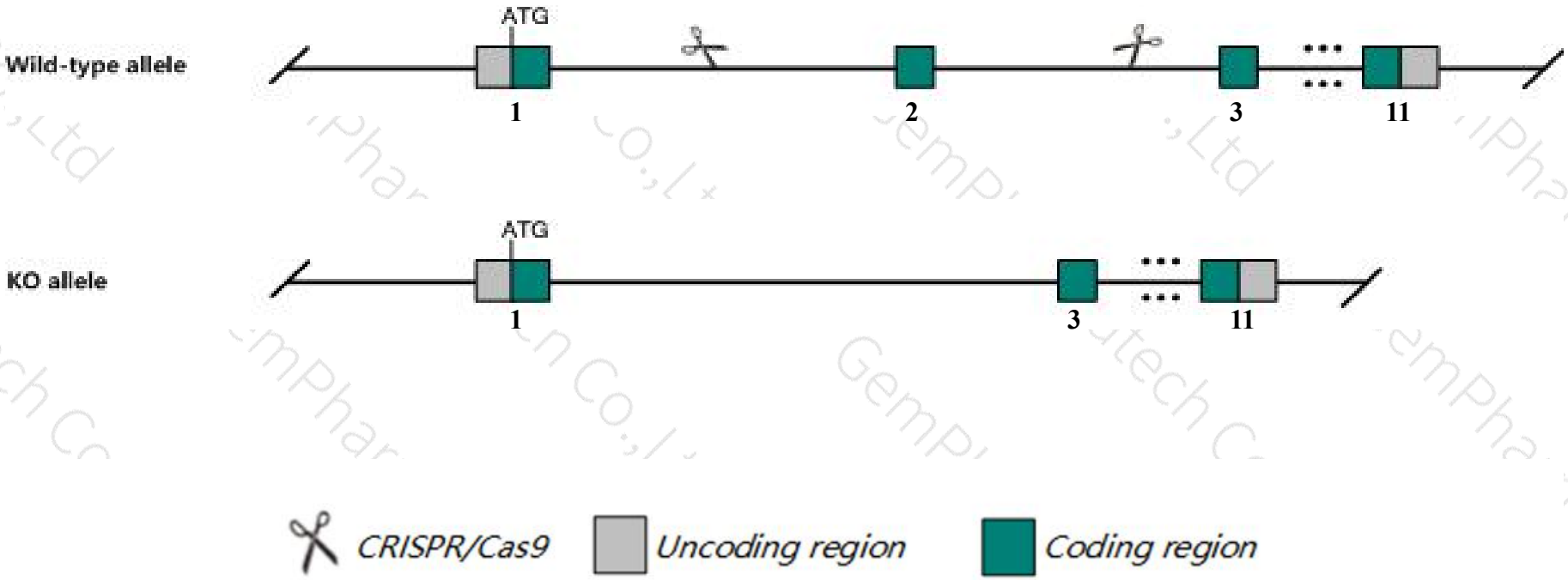
Date: 2019/11/15

Project Overview

Project Name	***Casq2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Casq2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Casq2* gene has 5 transcripts. According to the structure of *Casq2* gene, exon2 of *Casq2-201* (ENSMUST00000029454.11) transcript is recommended as the knockout region.The region contains 85bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Casq2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mutations in this gene cause impaired intracellular calcium regulation in cardiac myocytes and lead to an arrhythmogenic syndrome called catecholaminergic polymorphic ventricular tachycardia.

- The *Casq2* gene is located on the Chr3. 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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Casq2 calsequestrin 2 [Mus musculus (house mouse)]

Gene ID: 12373, updated on 2-Apr-2019

Summary

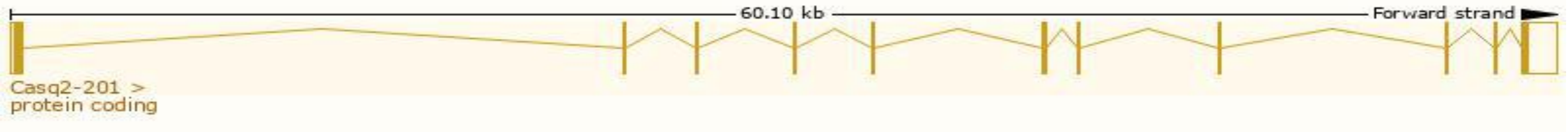
Official Symbol	Casq2 provided by MGI
Official Full Name	calsequestrin 2 provided byMGI
Primary source	MGI:MGI:1309469
See related	Ensembl:ENSMUSG00000027861
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA033488, AW146219, Csq2, ESTM52, cCSQ
Expression	Biased expression in heart adult (RPKM 170.2), bladder adult (RPKM 15.9) and 1 other tissueSee more
Orthologs	human all

Transcript information（Ensembl）

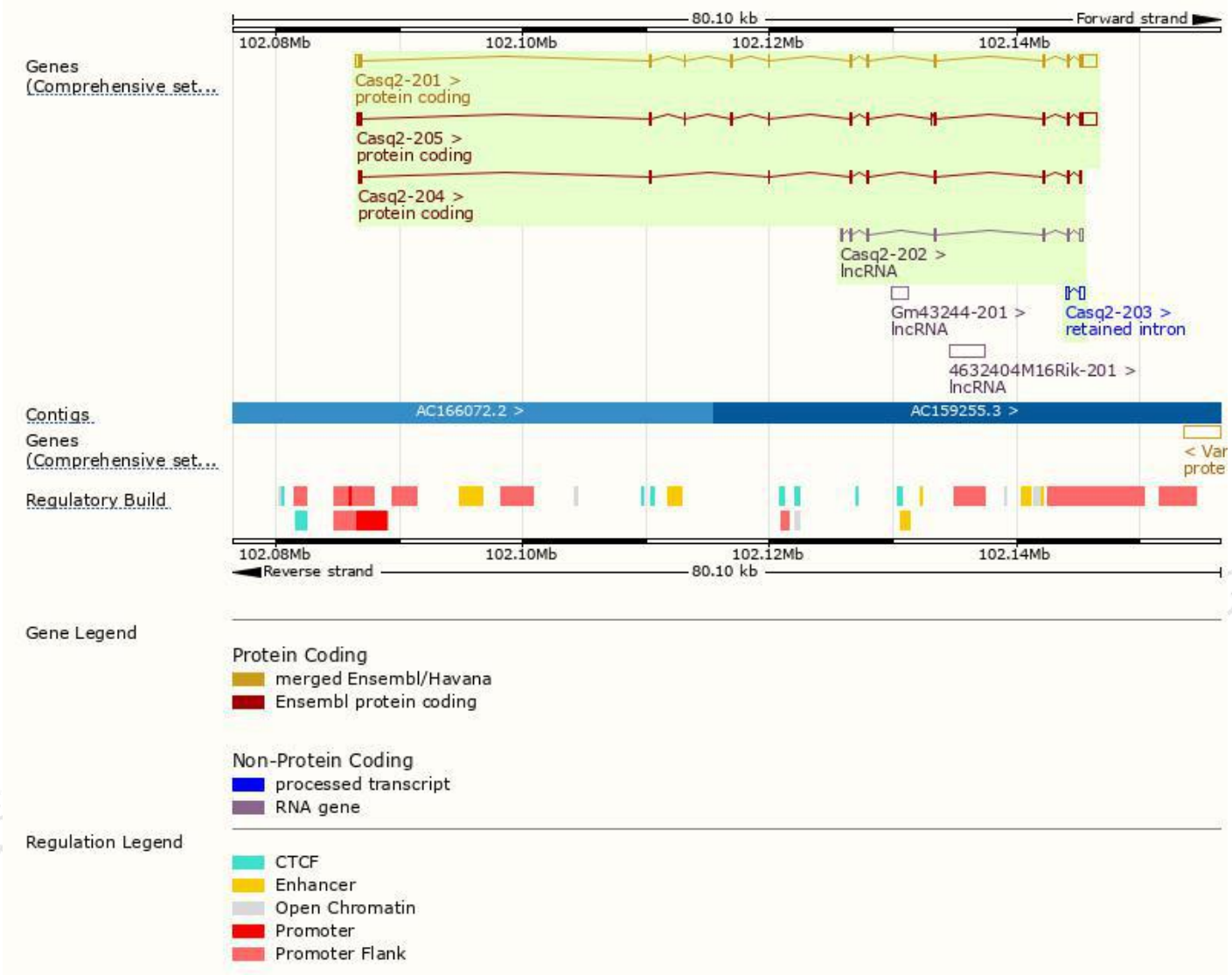
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Casq2-201	ENSMUST00000029454.11	2556	415aa	Protein coding	CCDS51023	O09161	TSL:1 GENCODE basic APPRIS P2
Casq2-205	ENSMUST00000165540.8	2434	418aa	Protein coding	-	F6QYE1	TSL:1 GENCODE basic APPRIS ALT2
Casq2-204	ENSMUST00000164123.1	936	312aa	Protein coding	-	E9PZ67	CDS 3' incomplete TSL:5
Casq2-203	ENSMUST00000159833.1	567	No protein	Retained intron	-	-	TSL:3
Casq2-202	ENSMUST00000159521.1	628	No protein	lncRNA	-	-	TSL:3

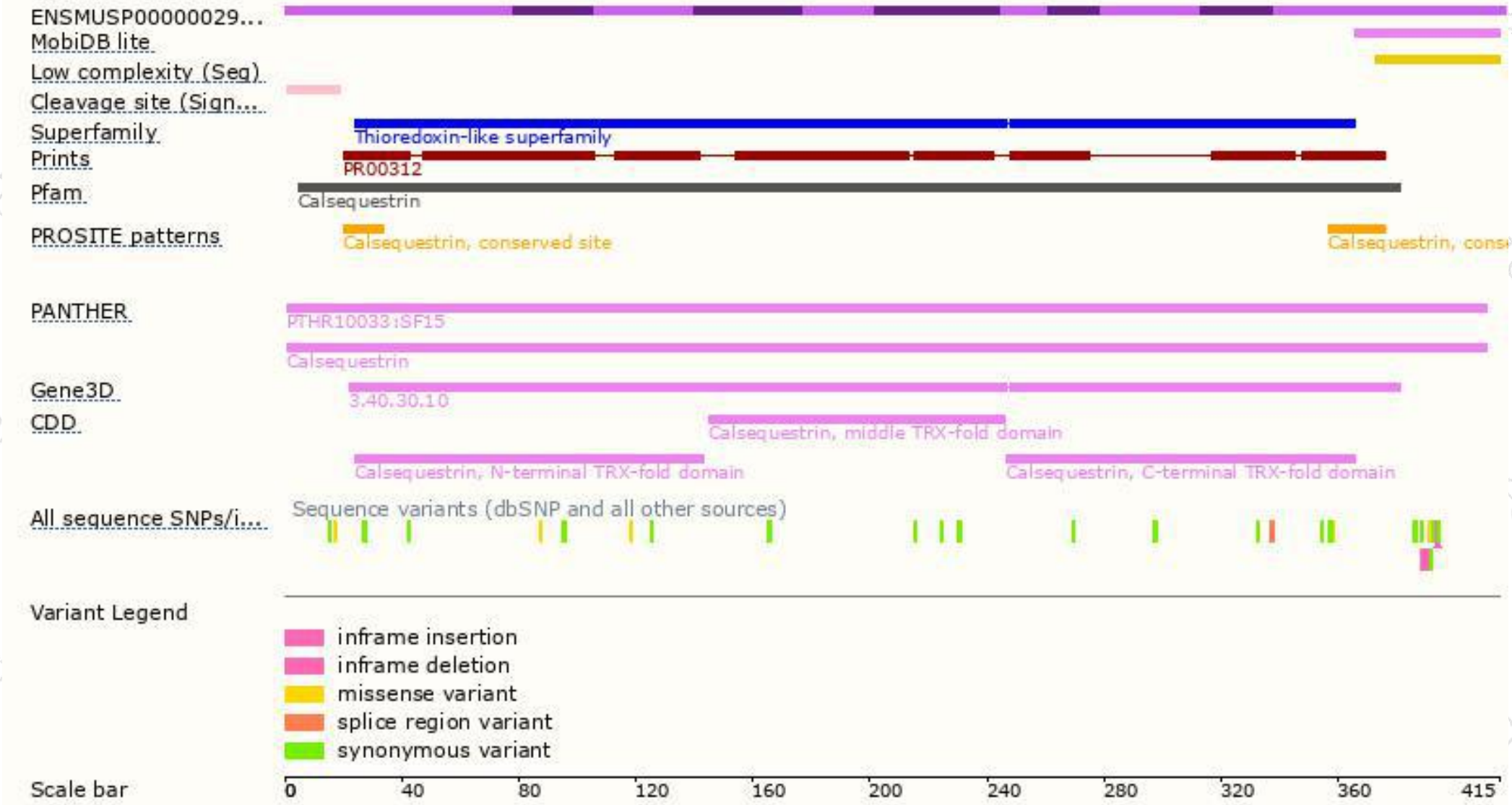
The strategy is based on the design of *Casq2-201* transcript,The transcription is shown below



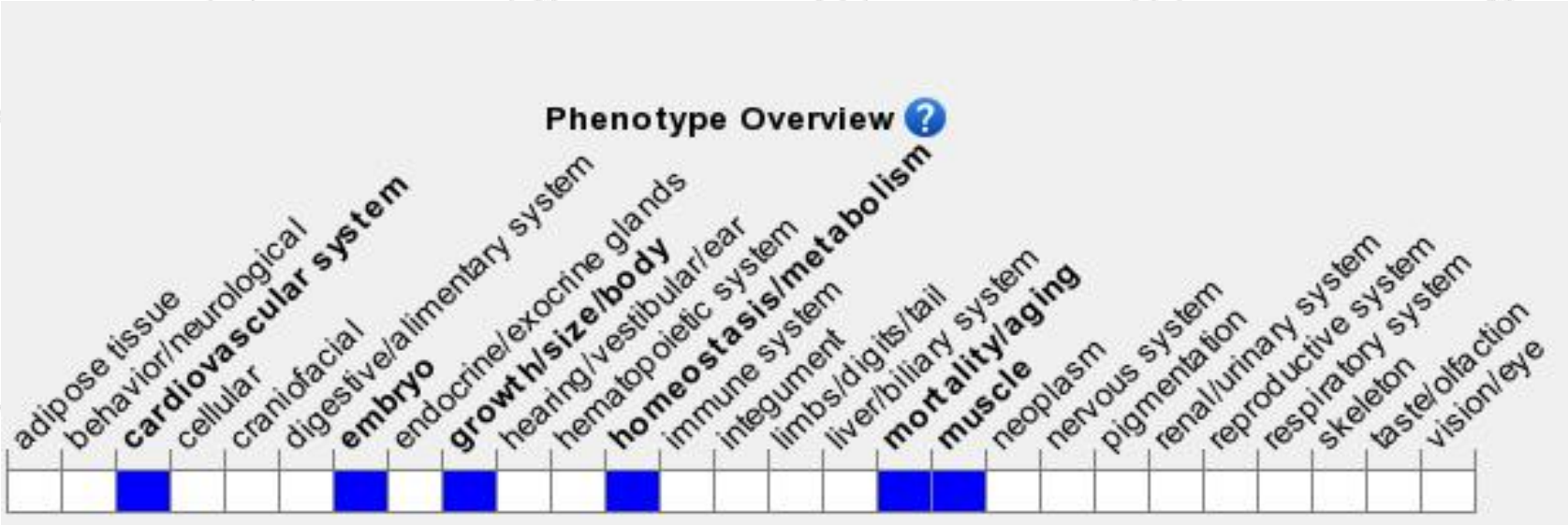
Genomic location distribution



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/).

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

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