Pkp2 Cas9-KO Strategy

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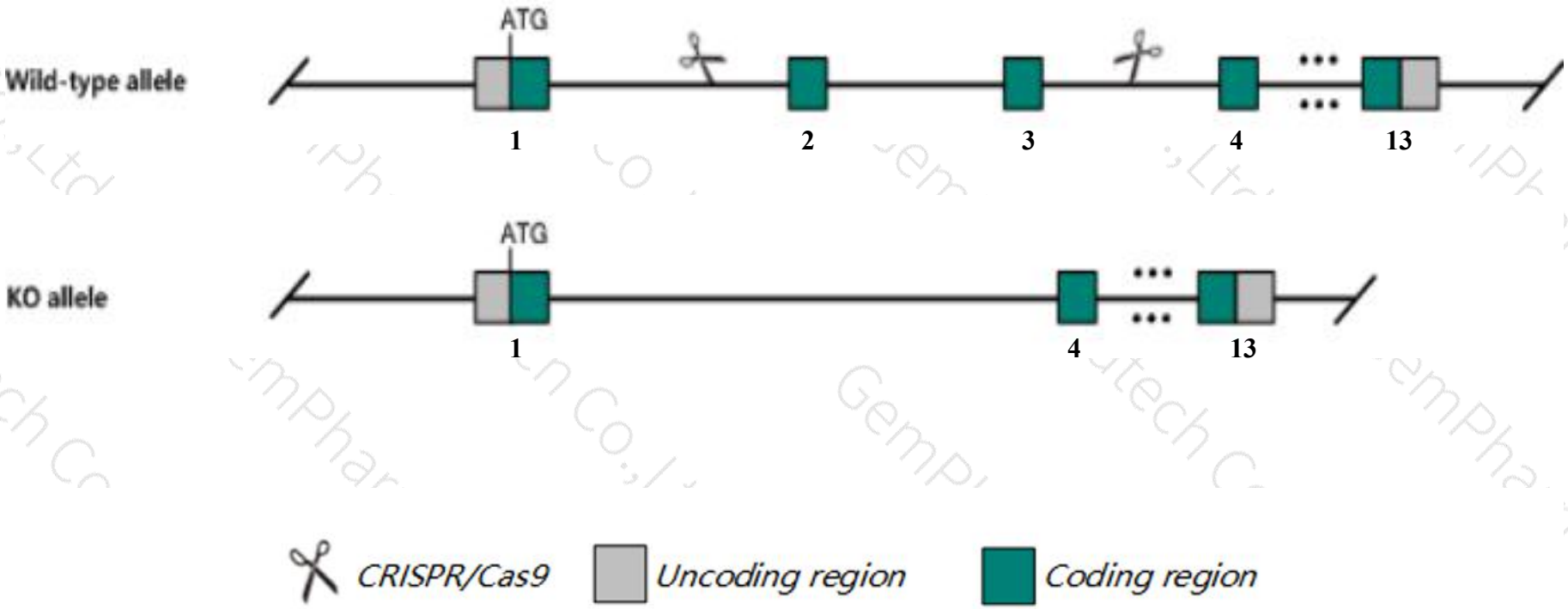
Project Overview

Project Name	***Pkp2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pkp2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Pkp2* gene has 3 transcripts. According to the structure of *Pkp2* gene, exon2-exon3 of *Pkp2-201*(ENSMUST00000039408.2) transcript is recommended as the knockout region.The region contains 685bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Pkp2* gene. The brief process is as follows: CRISPR/Cas9 system 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.

Notice

➢ According to the existing MGI data,homozygous null mice display embryonic lethality with impaired heart formation, hemopericardium, and hemoperitoneum.

➢ The *Pkp2* gene is located on the Chr16. 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）

Pkp2 plakophilin 2 [Mus musculus (house mouse)]

Gene ID: 67451, updated on 13-Mar-2020

Summary

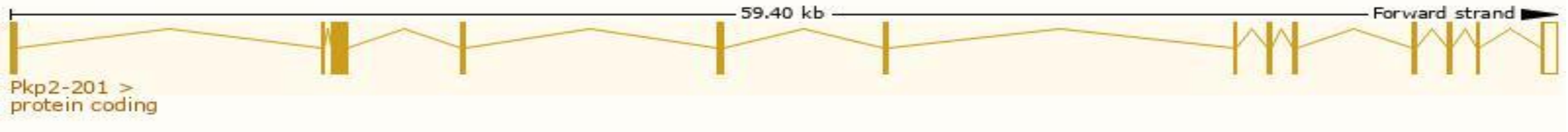
Official Symbol	Pkp2 provided by MGI
Official Full Name	plakophilin 2 provided byMGI
Primary source	MGI:MGI:1914701
See related	Ensembl:ENSMUSG00000041957
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	1200008D14Rik, 1200012P04Rik, AA516617, Pkp21
Expression	Broad expression in placenta adult (RPKM 32.2), heart adult (RPKM 24.0) and 16 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

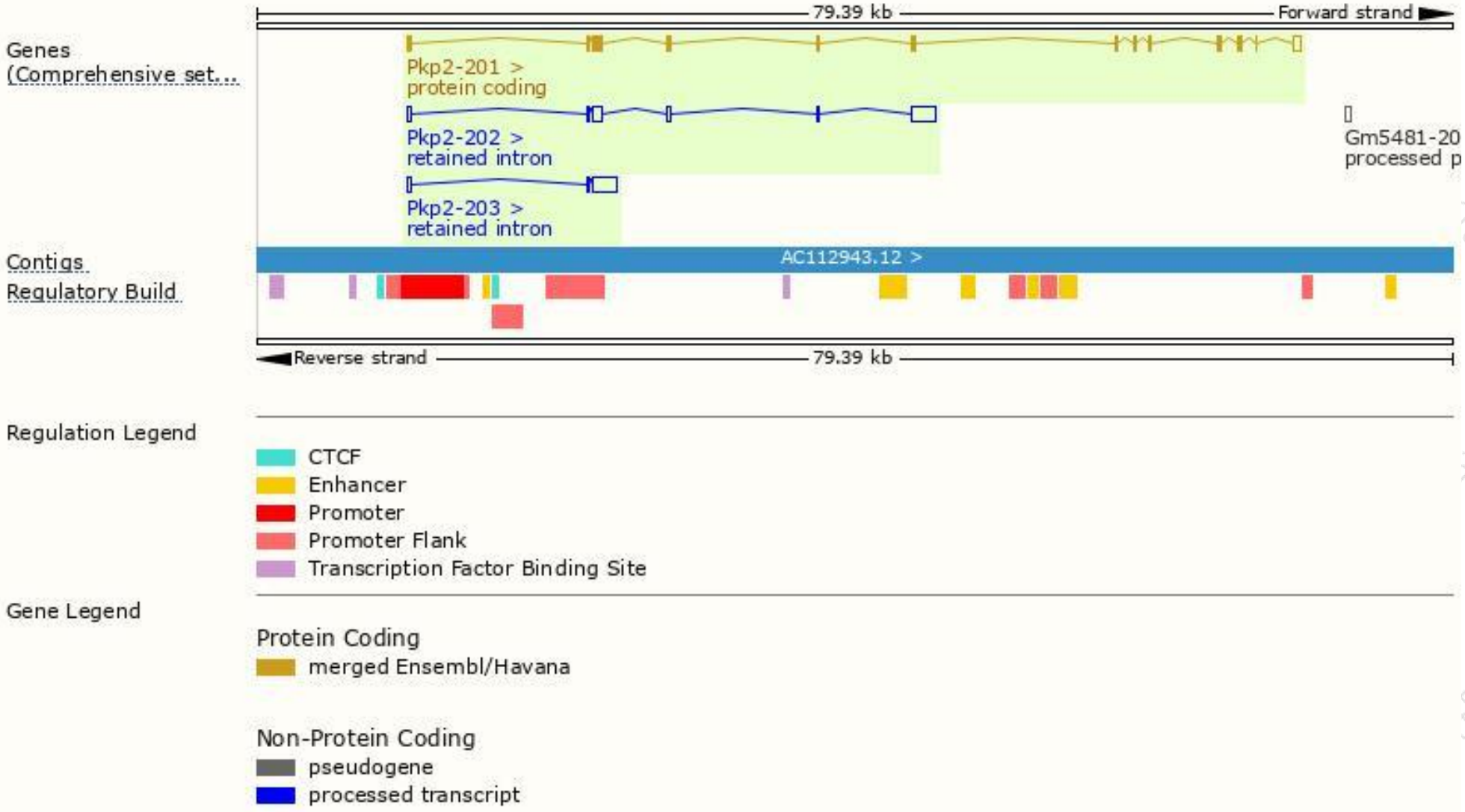
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pkp2-201	ENSMUST00000039408.2	2918	795aa	Protein coding	CCDS27981	Q9CQ73	TSL:1 GENCODE basic APPRIS P1
Pkp2-202	ENSMUST00000161342.7	2931	No protein	Retained intron	-	-	TSL:1
Pkp2-203	ENSMUST00000162150.7	1959	No protein	Retained intron	-	-	TSL:1

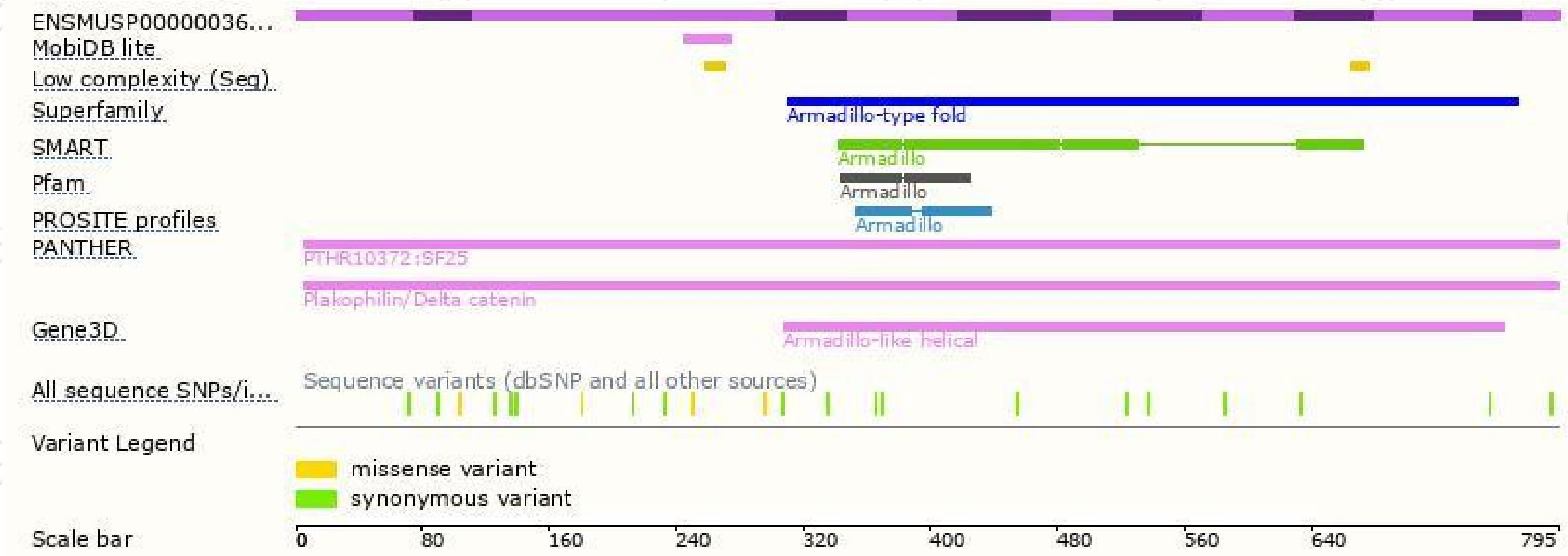
The strategy is based on the design of *Pkp2-201* transcript,the transcription is shown below:



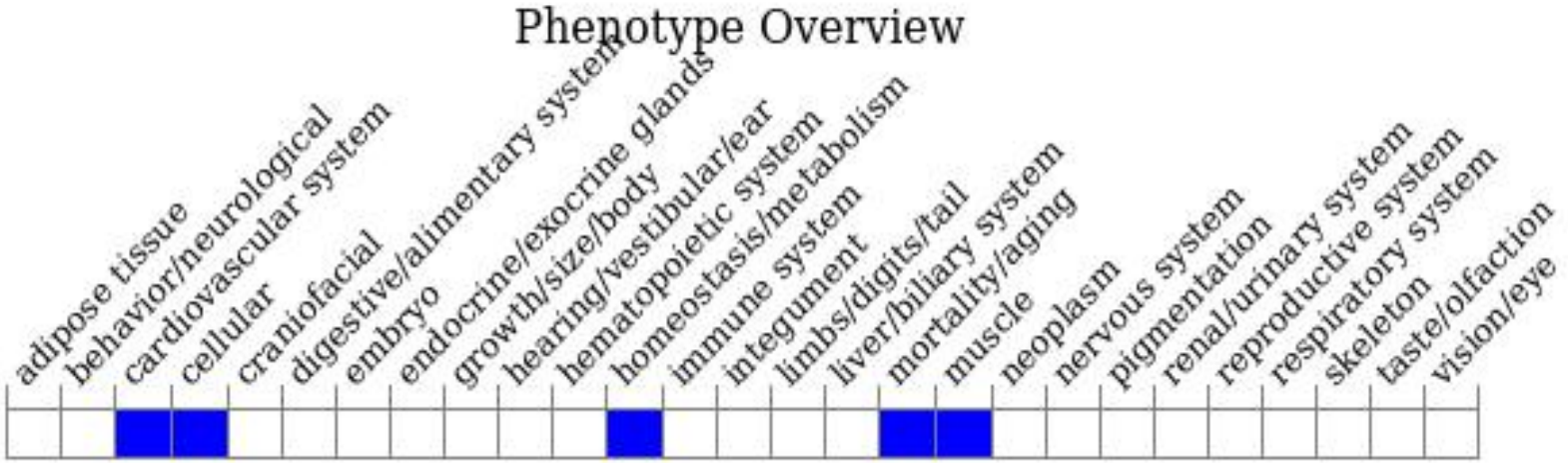
Genomic location distribution



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 display embryonic lethality with impaired heart formation, hemopericardium, and hemoperitoneum.

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

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