

Palb2 Cas9-CKO Strategy

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Project Overview

Project Name

Palb2

Project type

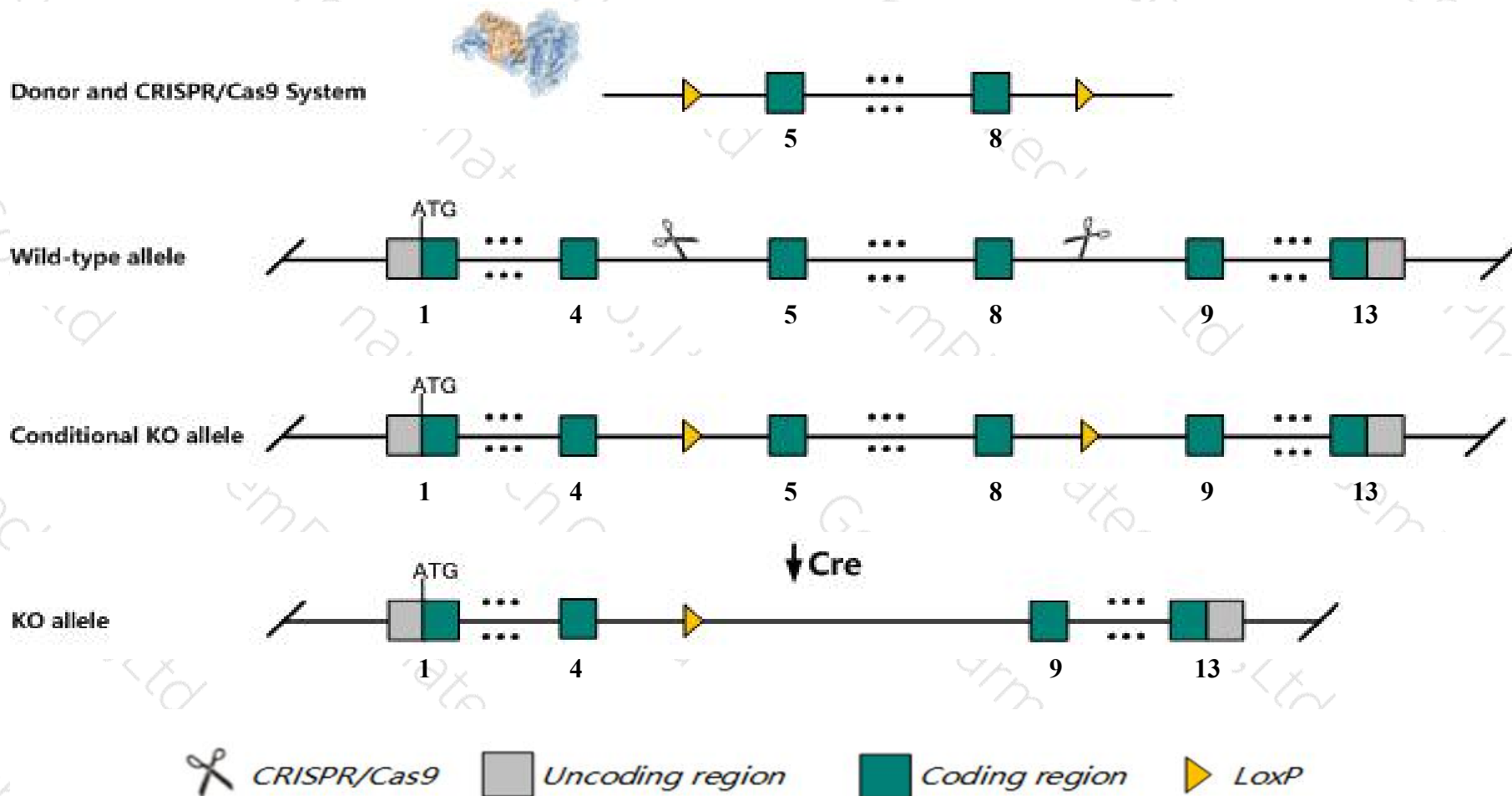
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Palb2* gene. The schematic diagram is as follows:



Technical routes

- The *Palb2* gene has 9 transcripts. According to the structure of *Palb2* gene, exon5-exon8 of *Palb2*-204 (ENSMUST00000106469.7) transcript is recommended as the knockout region. The region contains 991bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Palb2* 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 mutation display embryonic lethality with impaired inner cell mass proliferation, impaired gastrulation, absence of the amnion, somites and tail bud, and general improper organogenesis.
- The *Palb2* gene is located on the Chr7. 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)

Palb2 partner and localizer of BRCA2 [Mus musculus (house mouse)]

Gene ID: 233826, updated on 13-Mar-2020

Summary



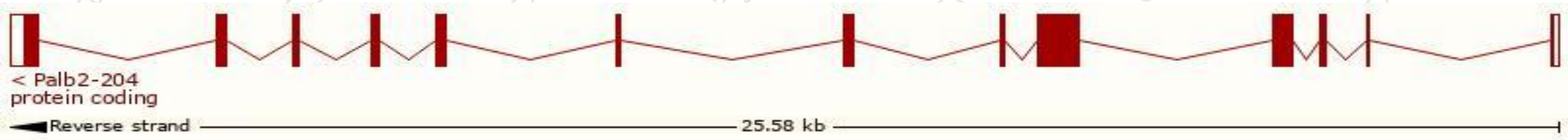
Official Symbol	Palb2 provided by MGI
Official Full Name	partner and localizer of BRCA2 provided by MGI
Primary source	MGI:MGI:3040695
See related	Ensembl:ENSMUSG00000044702
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	BC066140
Expression	Broad expression in CNS E11.5 (RPKM 3.4), liver E14 (RPKM 3.4) and 26 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

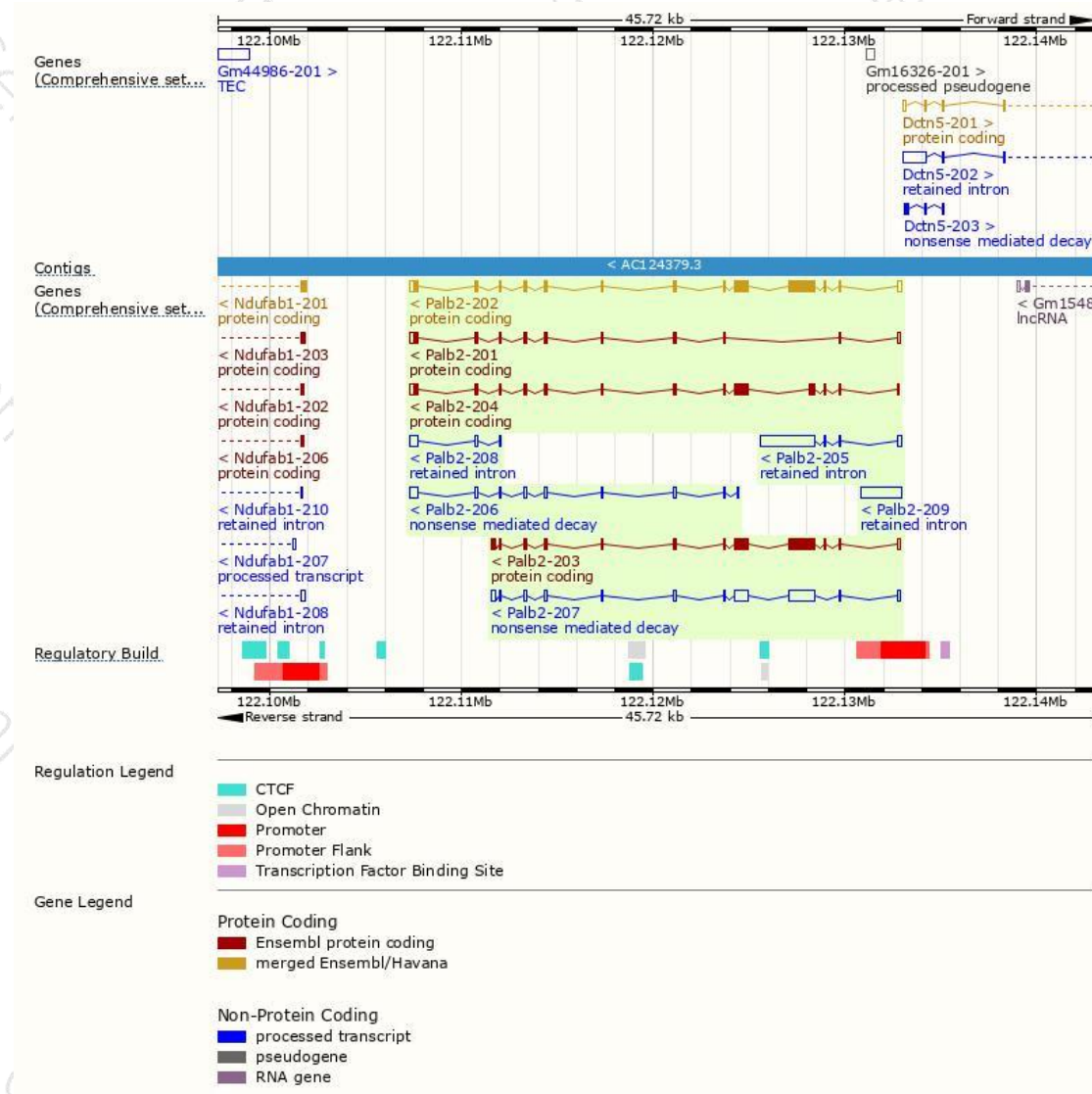
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Palb2-202	ENSMUST00000098068.9	3750	1104aa	Protein coding	CCDS40117	Q3U0P1	TSL:1 GENCODE basic APPRIS P3
Palb2-203	ENSMUST00000106468.6	3304	1030aa	Protein coding	CCDS80797	D3YVU6	TSL:1 GENCODE basic
Palb2-204	ENSMUST00000106469.7	2559	741aa	Protein coding	CCDS72035	Q3U0P1	TSL:1 GENCODE basic APPRIS ALT2
Palb2-201	ENSMUST00000063587.12	1553	384aa	Protein coding	CCDS80796	Q3U0P1	TSL:1 GENCODE basic APPRIS ALT2
Palb2-207	ENSMUST00000142952.7	3181	38aa	Nonsense mediated decay	-	D6RDD1	TSL:1
Palb2-206	ENSMUST00000131657.7	1350	18aa	Nonsense mediated decay	-	F6VTV6	CDS 5' incomplete TSL:1
Palb2-205	ENSMUST00000130149.2	3216	No protein	Retained intron	-	-	TSL:1
Palb2-209	ENSMUST00000205352.1	2145	No protein	Retained intron	-	-	TSL:NA
Palb2-208	ENSMUST00000154508.7	709	No protein	Retained intron	-	-	TSL:2

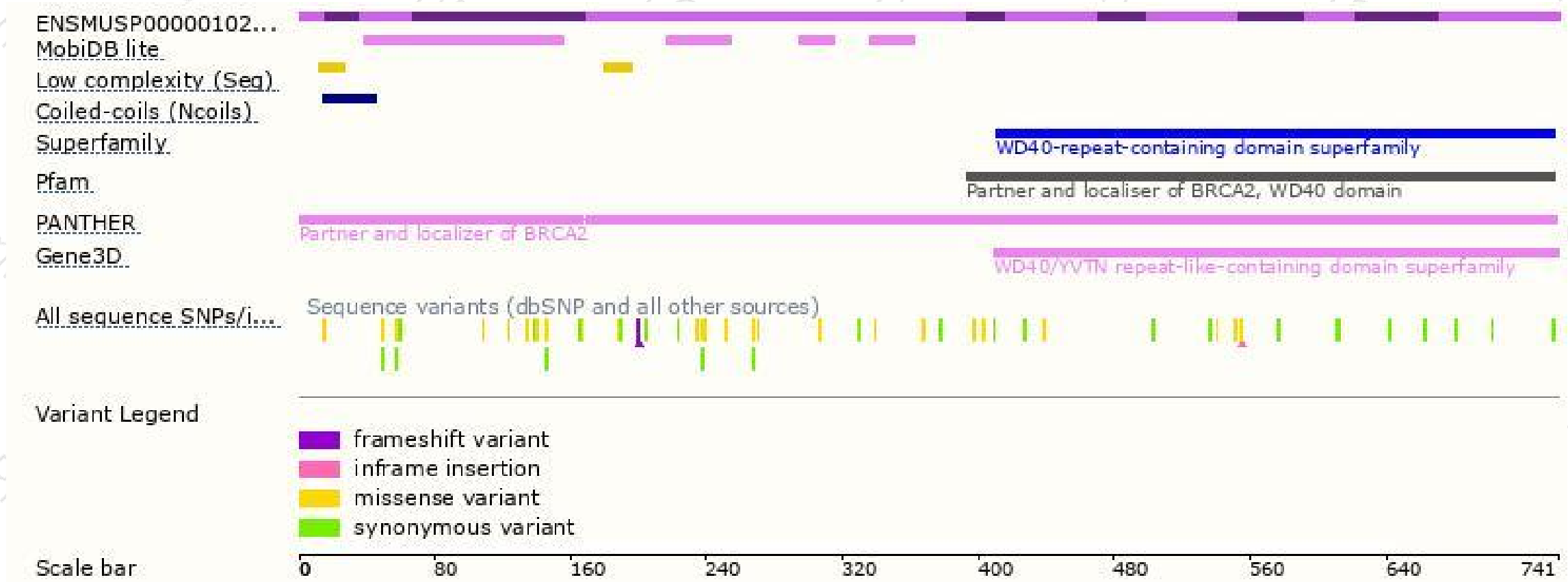
The strategy is based on the design of *Palb2-204* transcript,the transcription is shown below:



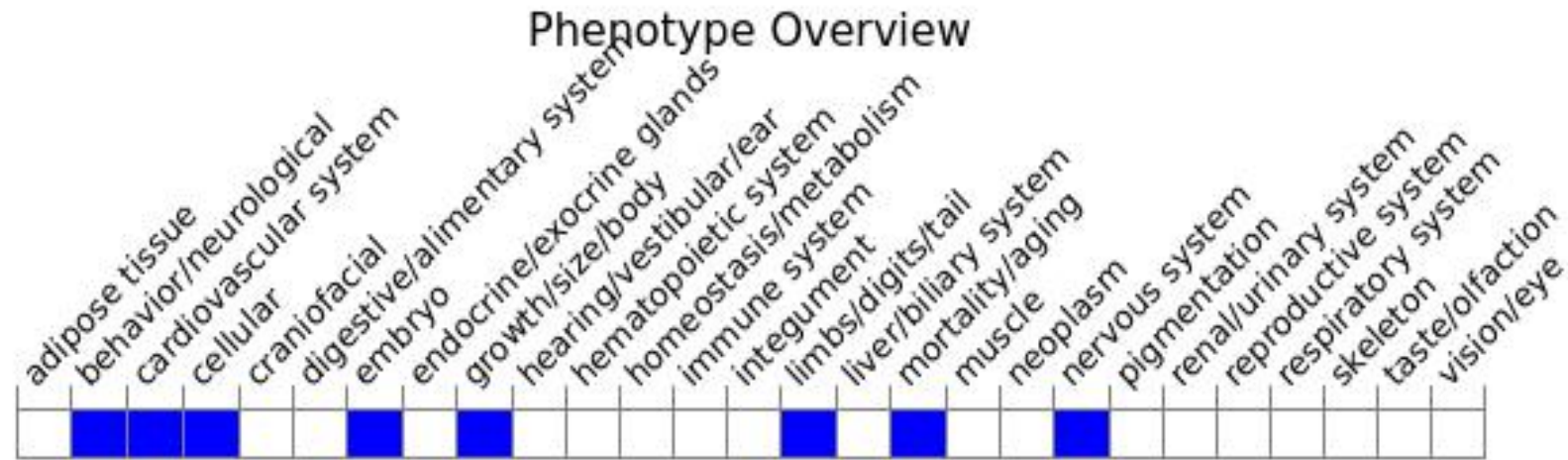
Genomic location distribution



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 a null mutation display embryonic lethality with impaired inner cell mass proliferation, impaired gastrulation, absence of the amnion, somites and tail bud, and general improper organogenesis.

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

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