

Rbbp4 Cas9-CKO Strategy

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Reviewer:	Huan Fan
Design Date:	2020-5-6

Project Overview

Project Name

Rbbp4

Project type

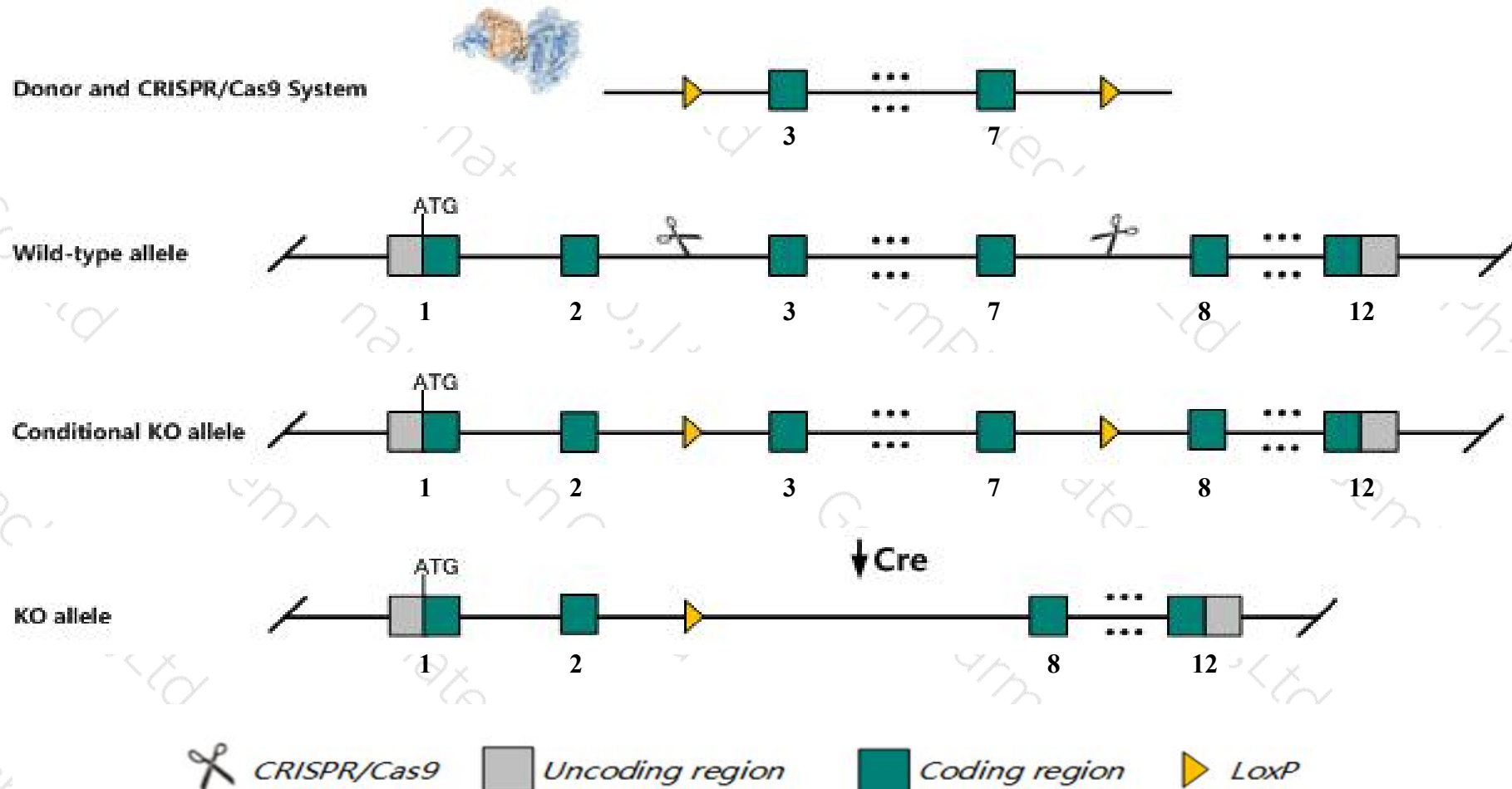
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rbbp4* gene. The schematic diagram is as follows:



- The *Rbbp4* gene has 4 transcripts. According to the structure of *Rbbp4* gene, exon3-exon7 of *Rbbp4-201* (ENSMUST00000102598.3) transcript is recommended as the knockout region. The region contains 724bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rbbp4* 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 knock-out allele show complete embryonic lethality between implantation and somite formation. cultured blastocysts fail to form typical outgrowth colonies.
- The *Rbbp4* gene is located on the Chr4. 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)

Rbbp4 retinoblastoma binding protein 4, chromatin remodeling factor [Mus musculus (house mouse)]

Gene ID: 19646, updated on 13-Mar-2020

Summary



Official Symbol Rbbp4 provided by [MGI](#)

Official Full Name retinoblastoma binding protein 4, chromatin remodeling factor provided by [MGI](#)

Primary source [MGI:MGI:1194912](#)

See related [Ensembl:ENSMUSG00000057236](#)

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 RBAP48, mRbAp48

Expression Ubiquitous expression in CNS E11.5 (RPKM 70.9), liver E14 (RPKM 42.3) and 25 other tissues [See more](#)

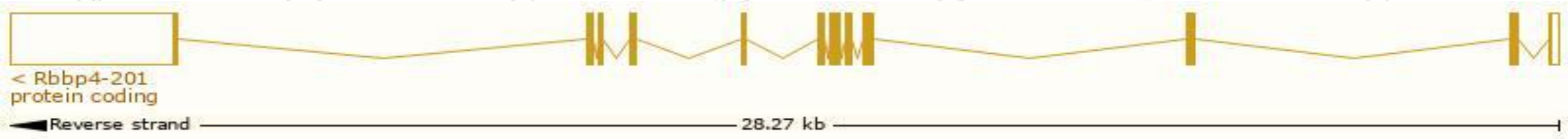
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

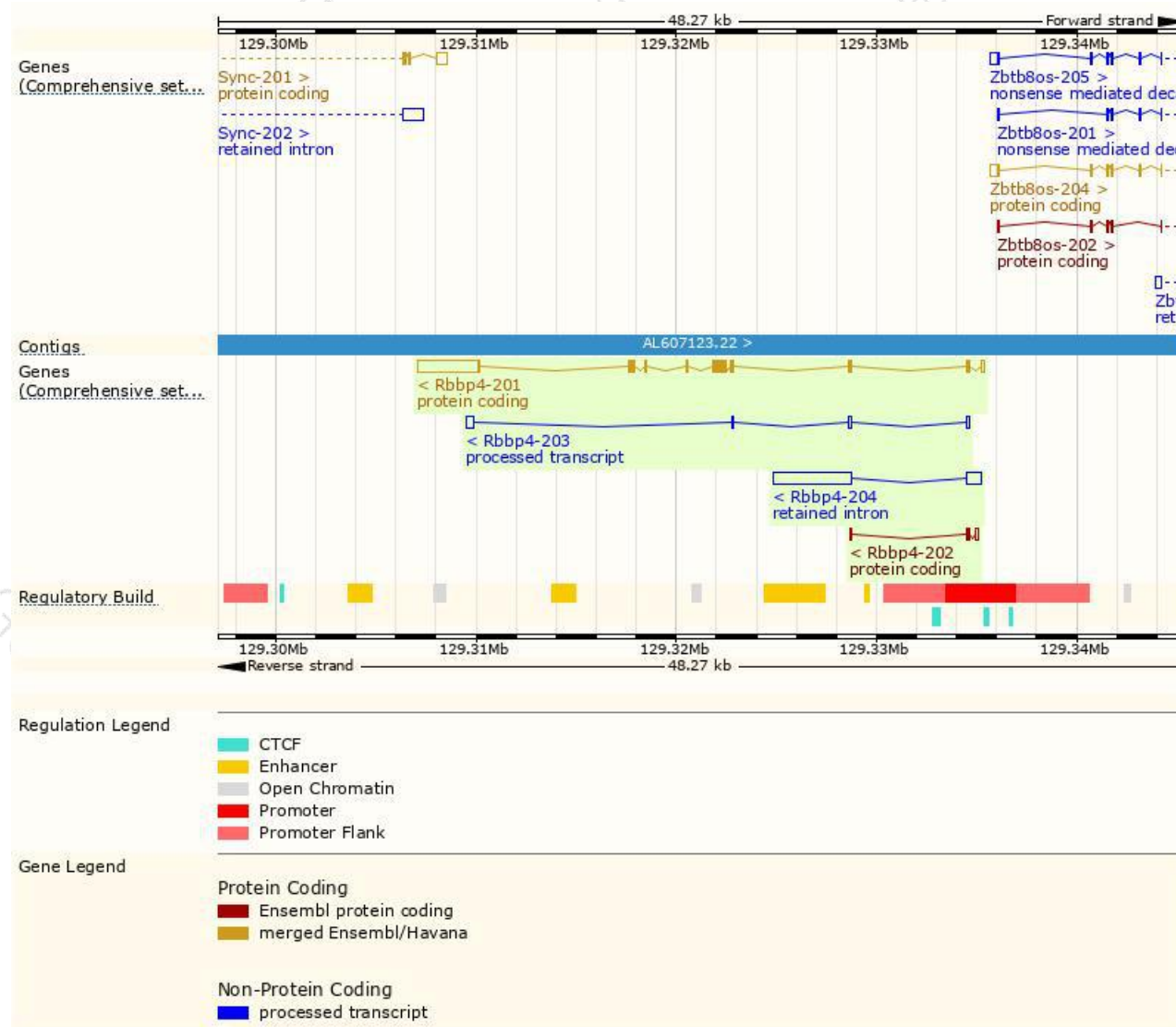
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rbbp4-201	ENSMUST00000102598.3	4407	425aa	Protein coding	CCDS18688	Q60972	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Rbbp4-202	ENSMUST00000135585.1	392	48aa	Protein coding	-	A8Y5E8	CDS 3' incomplete TSL:3
Rbbp4-203	ENSMUST00000140291.1	722	No protein	Processed transcript	-	-	TSL:5
Rbbp4-204	ENSMUST00000147183.1	4663	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Rbbp4-201* transcript,the transcription is shown below:



Genomic location distribution



Protein domain

ENSMUSP00000099...

[Superfamily](#)

[SMART](#)

[Prints](#)

[Pfam](#)

[PROSITE profiles](#)

[PROSITE patterns](#)

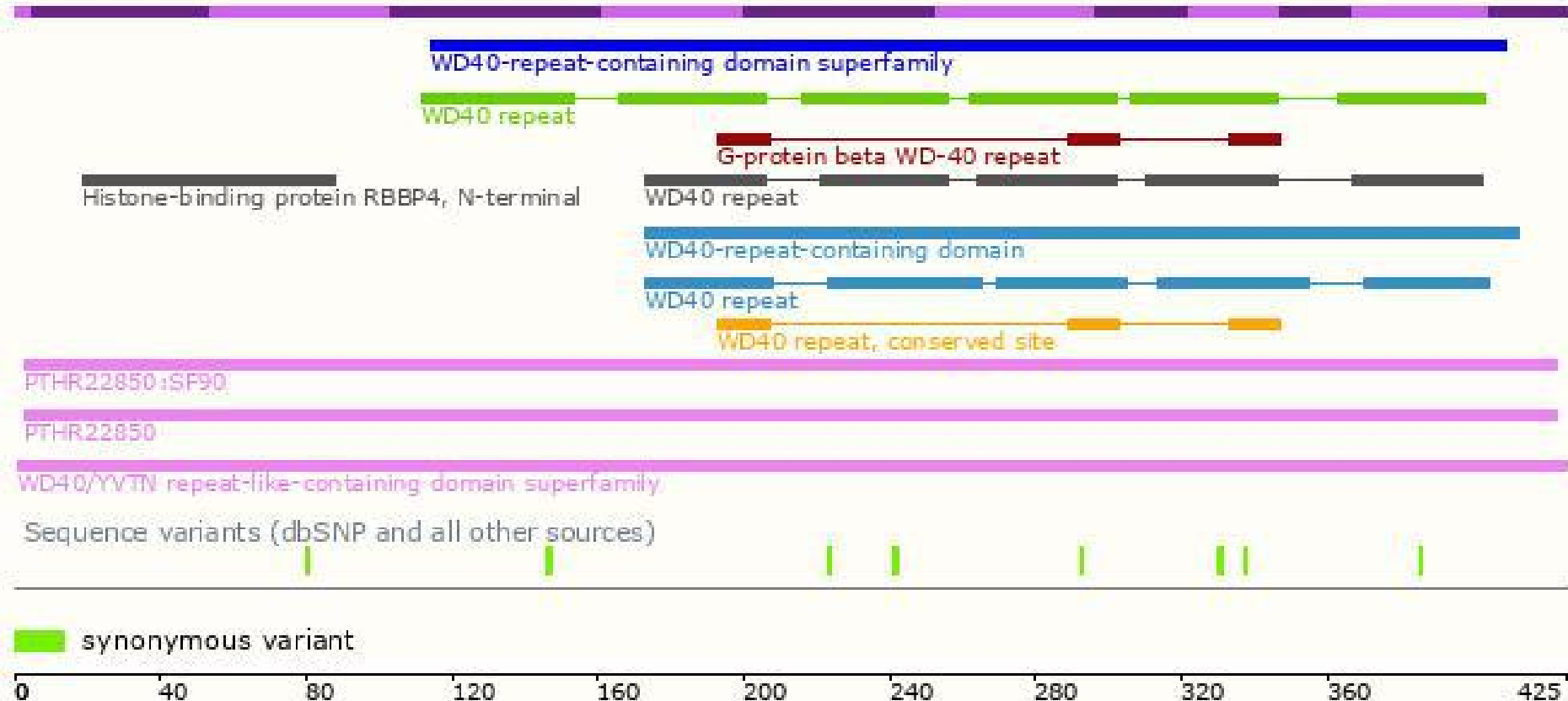
[PANTHER](#)

[Gene3D](#)

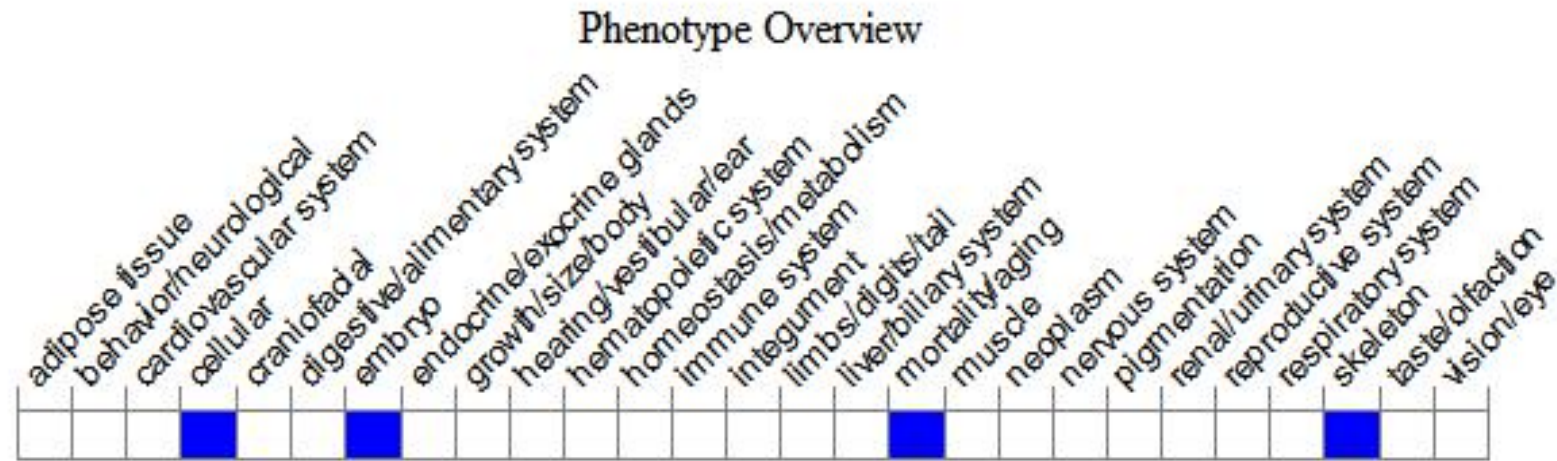
[All sequence SNPs/i...](#)

[Variant Legend](#)

[Scale bar](#)



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 knock-out allele show complete embryonic lethality between implantation and somite formation. Cultured blastocysts fail to form typical outgrowth colonies.

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

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