

Rybp Cas9-CKO Strategy

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Project Overview

Project Name

Rybp

Project type

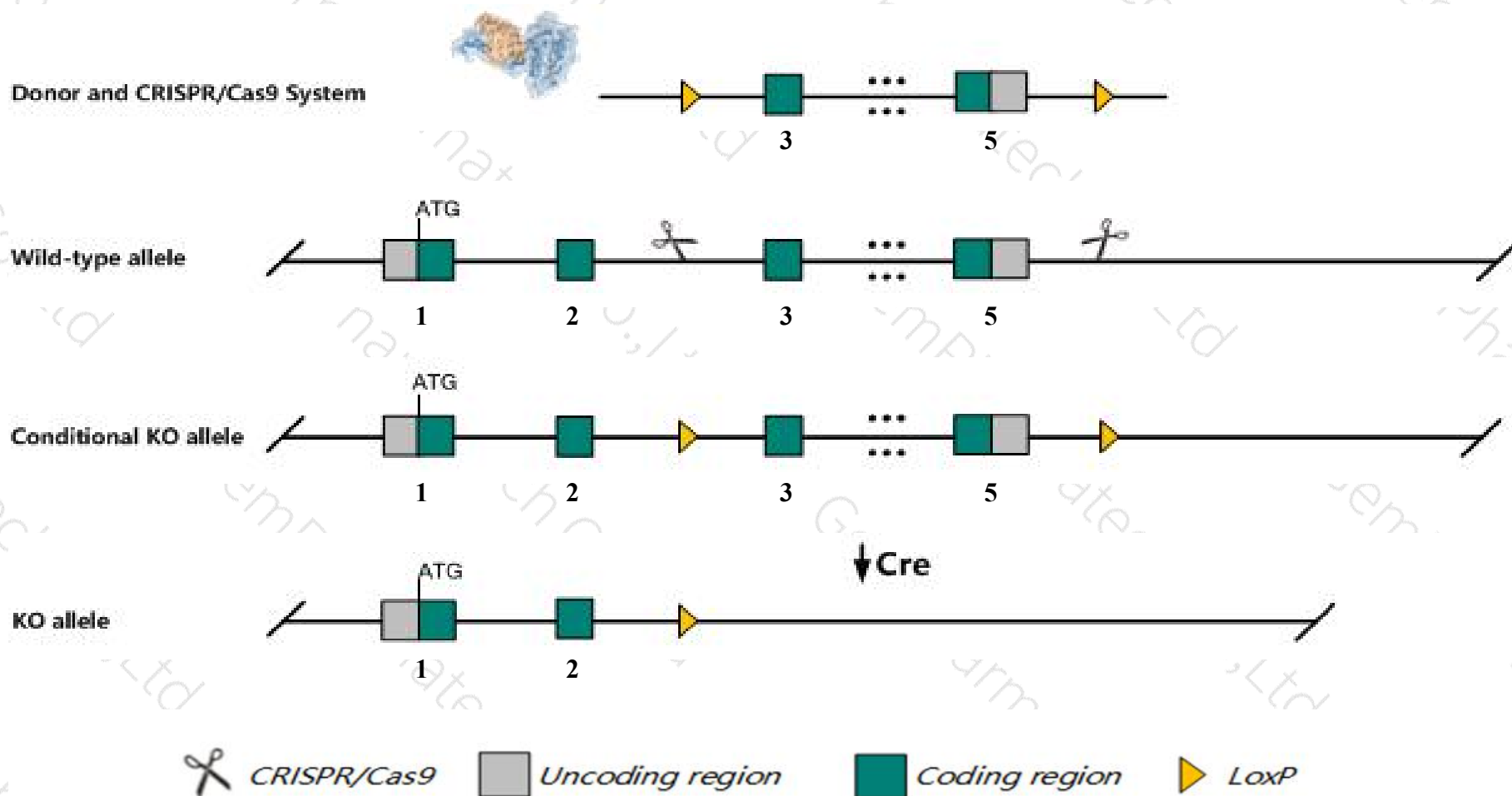
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



- The *Rybp* gene has 3 transcripts. According to the structure of *Rybp* gene, exon3-exon5 of *Rybp-201* (ENSMUST00000101118.3) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rybp* 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, homozygous null mice initiate implantation but fail to complete decidualization and display early embryonic lethality. a subset of heterozygotes show forebrain overgrowth, delayed neural tube closure, exencephaly, failed optic fissure closure, malformed lenses, and retinal/optic nerve colobomas.
- The *Rybp* gene is located on the Chr6. 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)

Rybp RING1 and YY1 binding protein [Mus musculus (house mouse)]

Gene ID: 56353, updated on 13-Mar-2020

Summary



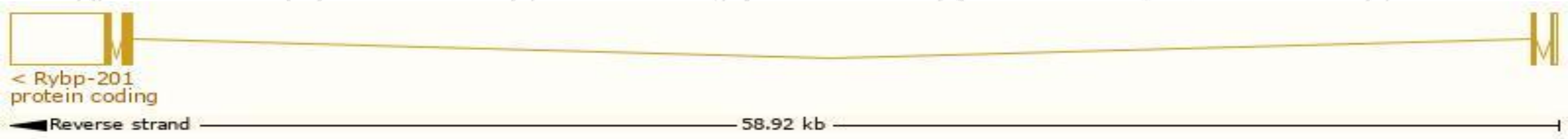
Official Symbol	Rybp provided by MGI
Official Full Name	RING1 and YY1 binding protein provided by MGI
Primary source	MGI:MGI:1929059
See related	Ensembl:ENSMUSG00000072872
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2410018J24Rik, DEDAF, YEAF1
Expression	Ubiquitous expression in placenta adult (RPKM 21.3), CNS E18 (RPKM 18.2) and 27 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

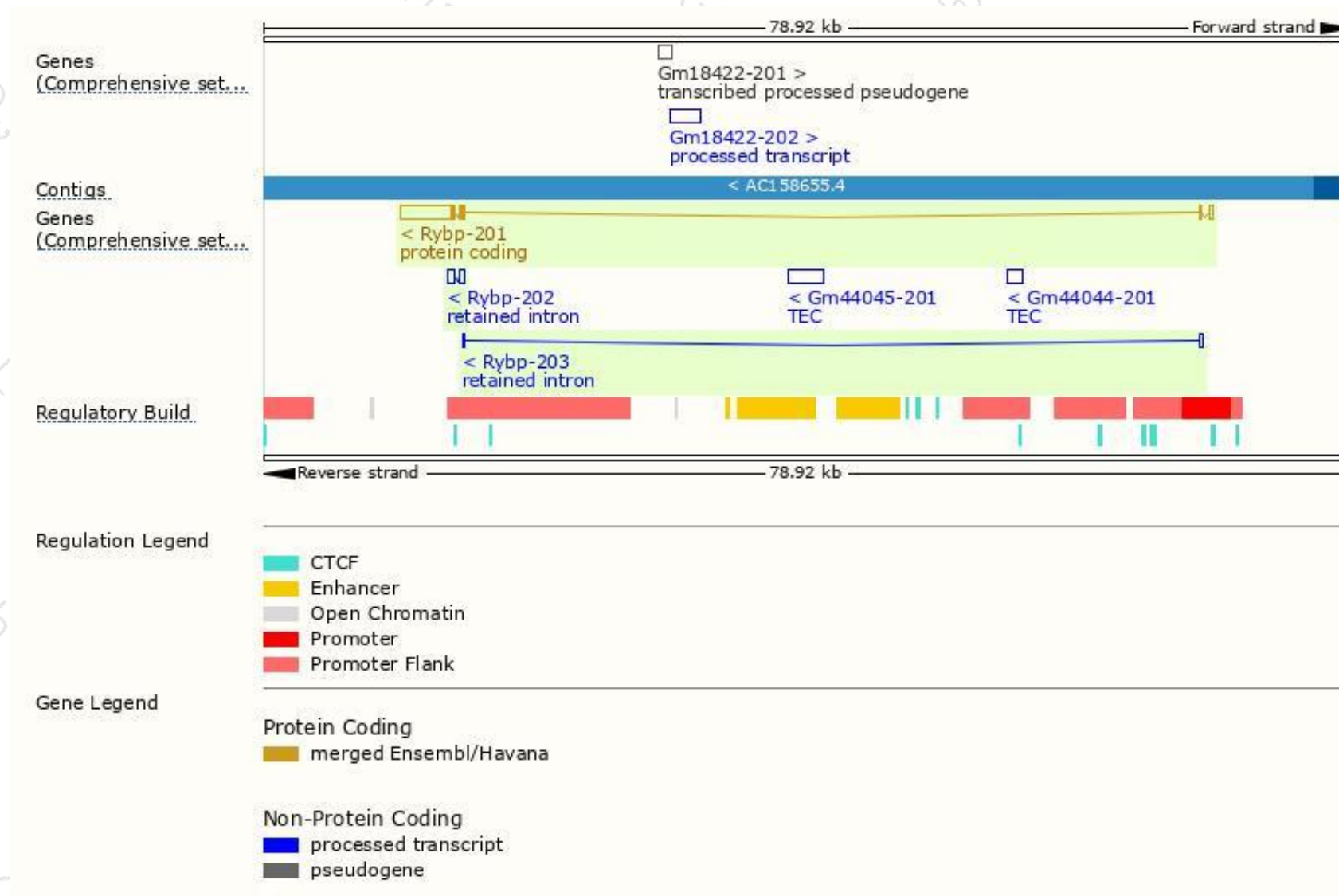
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rybp-201	ENSMUST00000101118.3	4503	228aa	Protein coding	CCDS39579	Q8CCI5	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
Rybp-202	ENSMUST00000203410.1	680	No protein	Retained intron	-	-	TSL:2
Rybp-203	ENSMUST00000205164.1	412	No protein	Retained intron	-	-	TSL:2

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



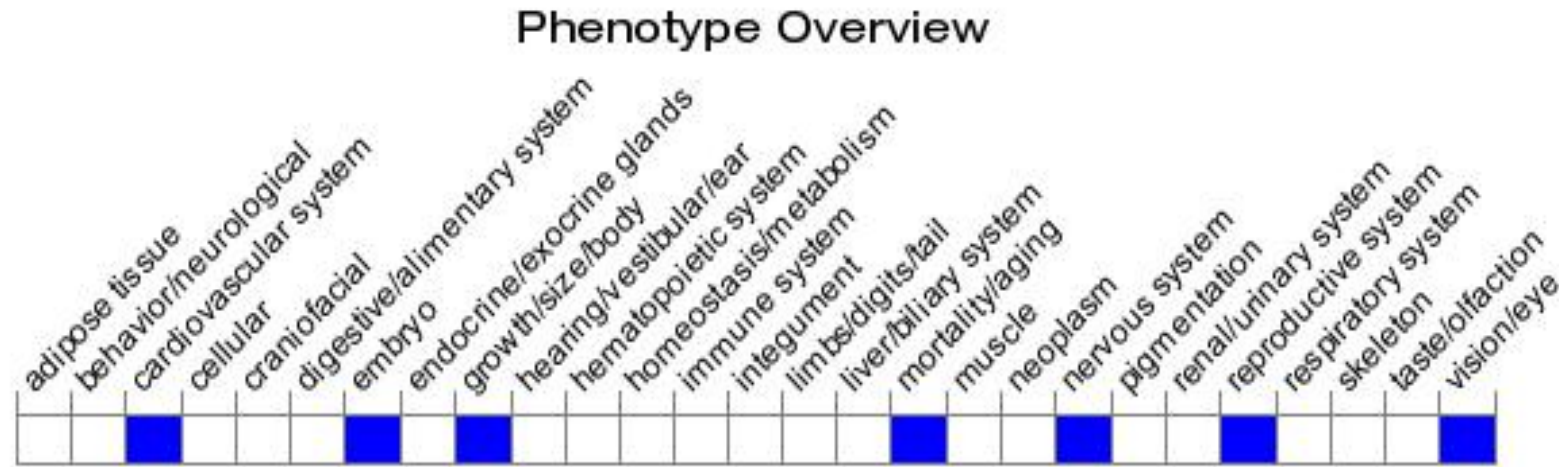
Genomic location distribution



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 initiate implantation but fail to complete decidualization and display early embryonic lethality. A subset of heterozygotes show forebrain overgrowth, delayed neural tube closure, exencephaly, failed optic fissure closure, malformed lenses, and retinal/optic nerve colobomas.

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

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