

Rbbp8 Cas9-KO Strategy

Designer:

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Project Overview

Project Name

Rbbp8

Project type

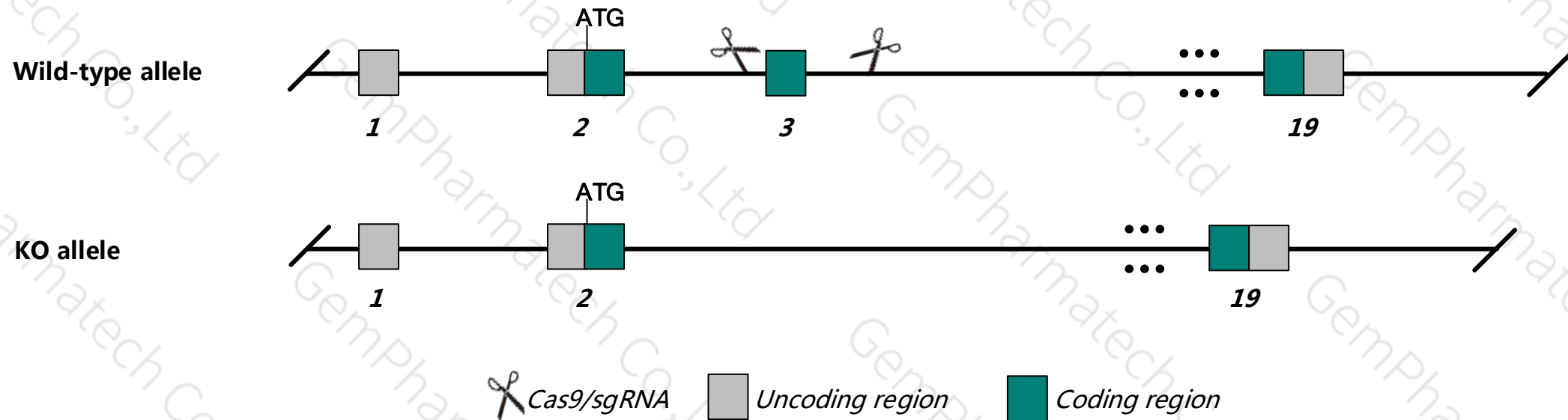
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rbbp8* gene. The schematic diagram is as follows:



Technical routes

- The *Rbbp8* gene has 11 transcripts. According to the structure of *Rbbp8* gene, exon3 of *Rbbp8*-202 transcript is recommended as the knockout region. The region contains 43bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rbbp8* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data , Embryos homozygous for a knock-out allele die at E4.0 as blastocysts fail to enter S phase and arrest at G1, leading to elevated cell death. Heterozygous mutant mice display a shortened lifespan due to formation of multiple tumors, mostly large lymphomas of both B and T cells.
- The *Rbbp8* gene is located on the Chr18. 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 gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information (NCBI)

Rbbp8 retinoblastoma binding protein 8, endonuclease [*Mus musculus* (house mouse)]

Gene ID: 225182, updated on 31-Jan-2019

Summary

Official Symbol Rbbp8 provided by [MGI](#)

Official Full Name retinoblastoma binding protein 8, endonuclease provided by [MGI](#)

Primary source [MGI:MGI:2442995](#)

See related [Ensembl:ENSMUSG00000041238](#)

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 RIM; CtIP; SAE2; RBBP-8; 9930104E21Rik

Expression Broad expression in CNS E11.5 (RPKM 6.2), placenta adult (RPKM 5.1) and 23 other tissues [See more](#)

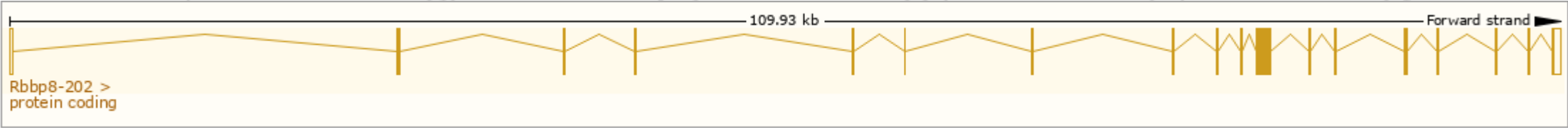
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

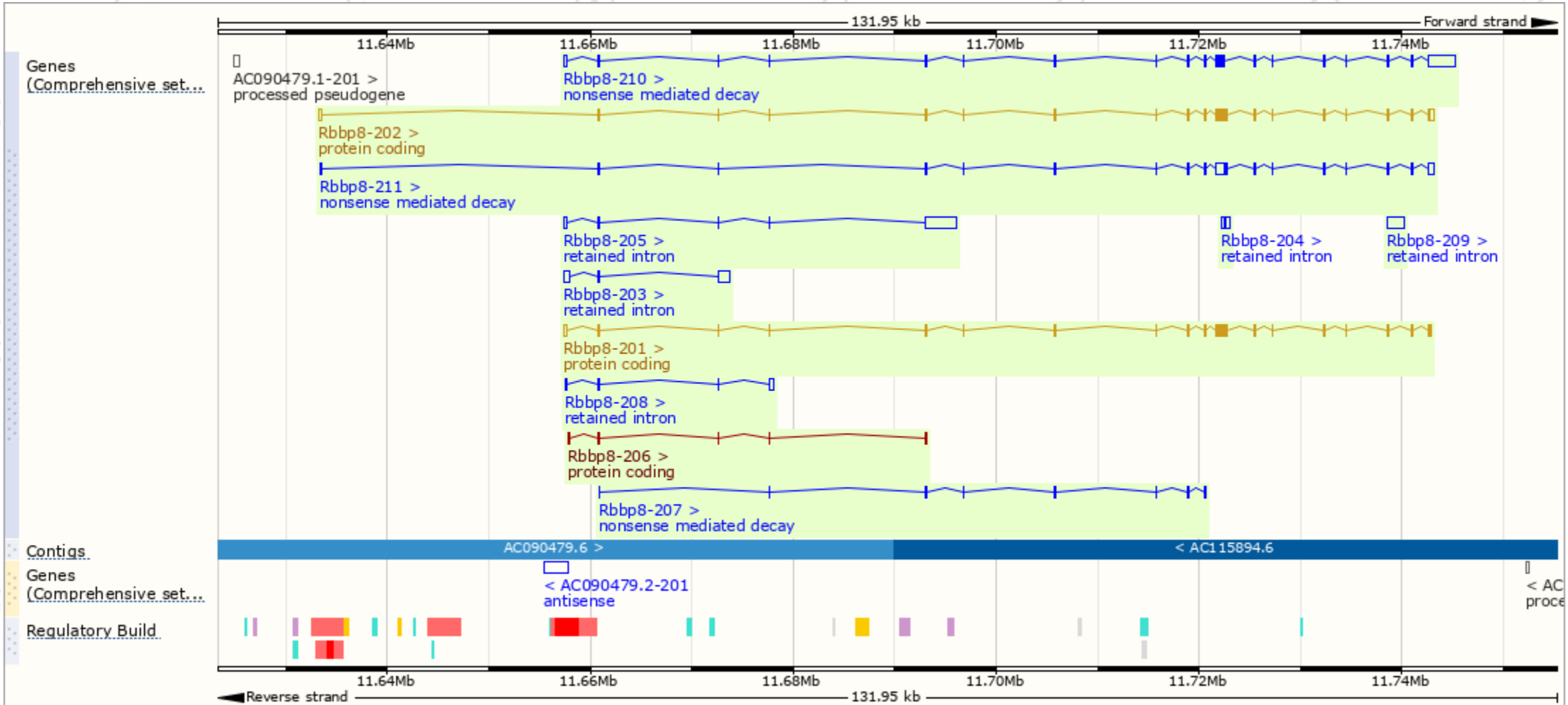
The gene has 11 transcripts, and all transcripts are shown below :

Show/hide columns (1 hidden)							Filter		
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags		
Rbbp8-202	ENSMUST00000115861.8	3523	893aa	Protein coding	CCDS37738	Q80YR6	TSL:1	GENCODE basic	APPRIS P1
Rbbp8-201	ENSMUST00000047322.7	3209	893aa	Protein coding	CCDS37738	Q80YR6	TSL:1	GENCODE basic	APPRIS P1
Rbbp8-206	ENSMUST00000234499.1	586	118aa	Protein coding	-	-	CDS 3' incomplete		
Rbbp8-210	ENSMUST00000234984.1	5471	612aa	Nonsense mediated decay	-	-	-		
Rbbp8-211	ENSMUST00000235039.1	3360	247aa	Nonsense mediated decay	-	-	-		
Rbbp8-207	ENSMUST00000234616.1	781	26aa	Nonsense mediated decay	-	-	CDS 5' incomplete		
Rbbp8-205	ENSMUST00000234184.1	3714	No protein	Retained intron	-	-	-		
Rbbp8-203	ENSMUST00000234074.1	1904	No protein	Retained intron	-	-	-		
Rbbp8-209	ENSMUST00000234766.1	1736	No protein	Retained intron	-	-	-		
Rbbp8-208	ENSMUST00000234744.1	857	No protein	Retained intron	-	-	-		
Rbbp8-204	ENSMUST00000234161.1	679	No protein	Retained intron	-	-	-		

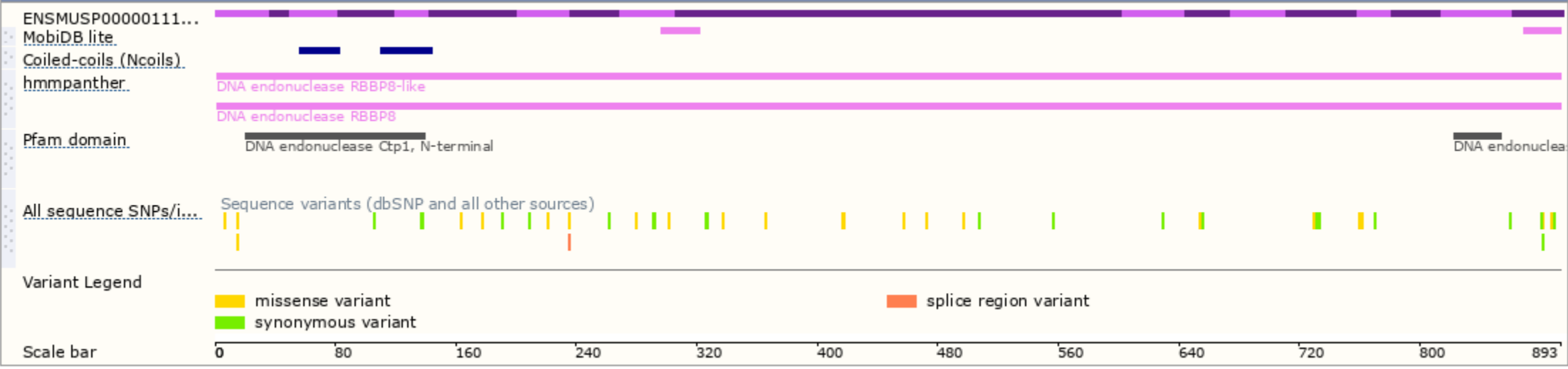
The strategy is based on the design of *Rbbp8*-202 transcript, The transcription is shown below



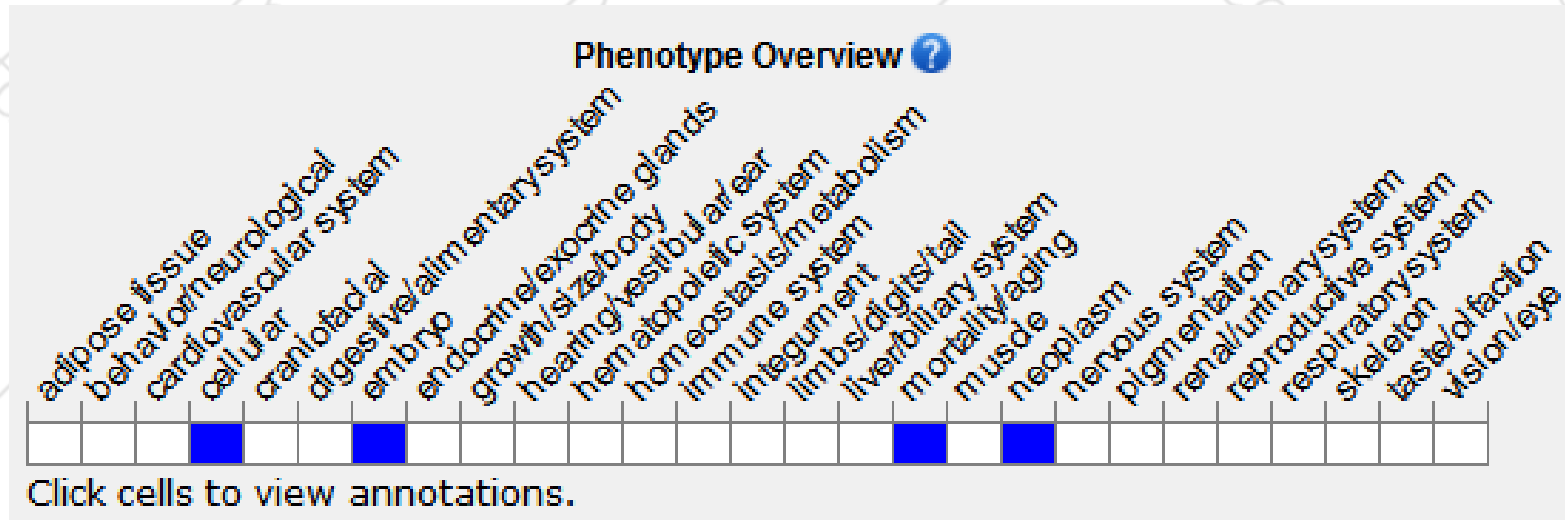
Genomic location distribution



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, Embryos homozygous for a knock-out allele die at E4.0 as blastocysts fail to enter S phase and arrest at G1, leading to elevated cell death. Heterozygous mutant mice display a shortened lifespan due to formation of multiple tumors, mostly large lymphomas of both B and T cells.

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