Rbp2 Cas9-KO Strategy

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Reviewer: Huimin Su

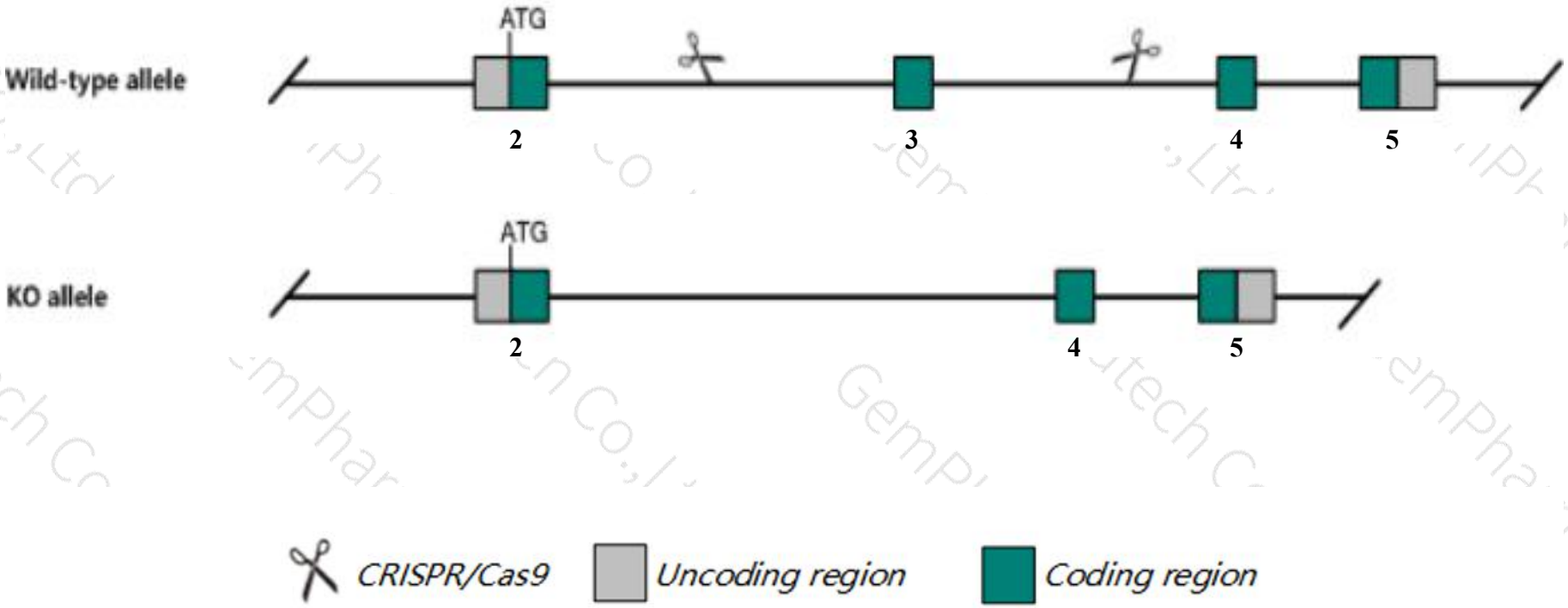
Design Date: 2020-5-26

Project Overview

Project Name	***Rbp2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rbp2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rbp2* gene has 4 transcripts. According to the structure of *Rbp2* gene, exon3 of *Rbp2-204* (ENSMUST00000189446.6) transcript is recommended as the knockout region.The region contains 179bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rbp2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,saturable vitamin a (retinol) uptake is impaired in homozygous mutant mice. serum retinol levels are unaffected when with normal dietary intake, however, pups of homozygous dams fed a marginal retinol diet show increased neonatal lethality due to inadequate retinal transport to the fetus.
- The *Rbp2* gene is located on the Chr9. 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）

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Rbp2 retinol binding protein 2, cellular [Mus musculus (house mouse)]

Gene ID: 19660, updated on 13-Mar-2020

Summary

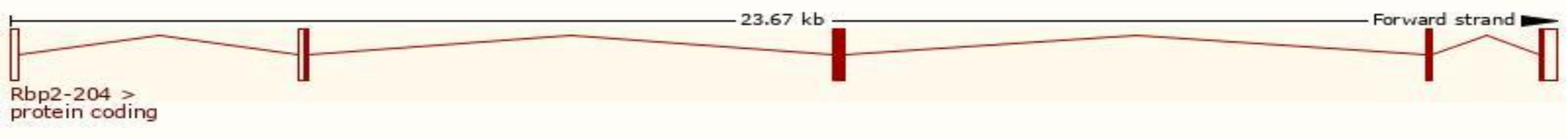
Official Symbol	Rbp2 provided by MGI
Official Full Name	retinol binding protein 2, cellular provided byMGI
Primary source	MGI:MGI:97877
See related	Ensembl:ENSMUSG00000032454
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Crbp-2, Crbpll, Rbp-2
Expression	Biased expression in liver E18 (RPKM 216.6), small intestine adult (RPKM 147.9) and 3 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

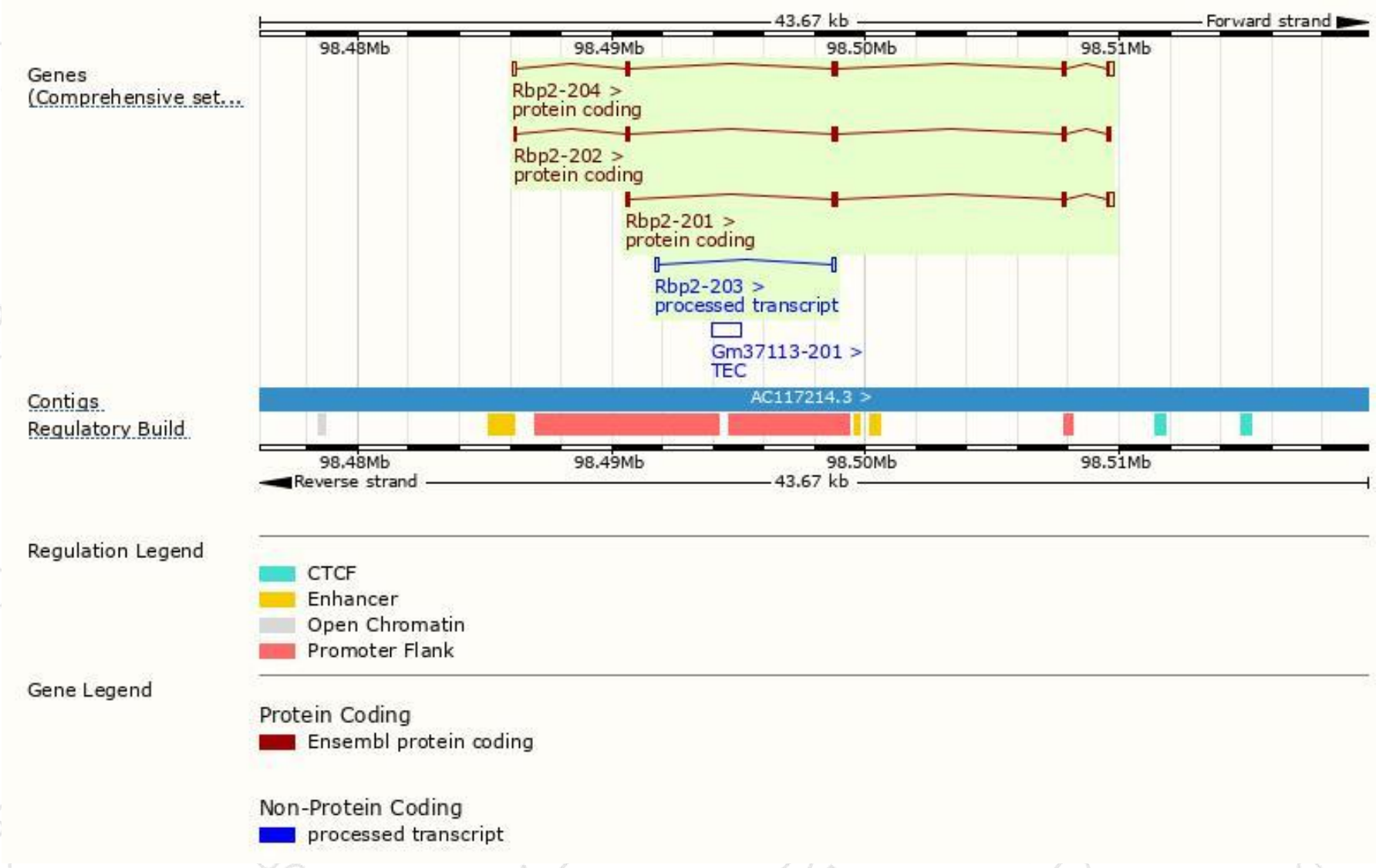
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rbp2-204	ENSMUST00000189446.6	803	134aa	Protein coding	CCDS23425	Q059R7 Q08652	TSL:3 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
Rbp2-201	ENSMUST00000035029.2	672	134aa	Protein coding	CCDS23425	Q059R7 Q08652	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
Rbp2-202	ENSMUST00000187905.6	611	134aa	Protein coding	CCDS23425	Q059R7 Q08652	TSL:3 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
Rbp2-203	ENSMUST00000188779.1	291	No protein	Processed transcript	-	-	TSL:1

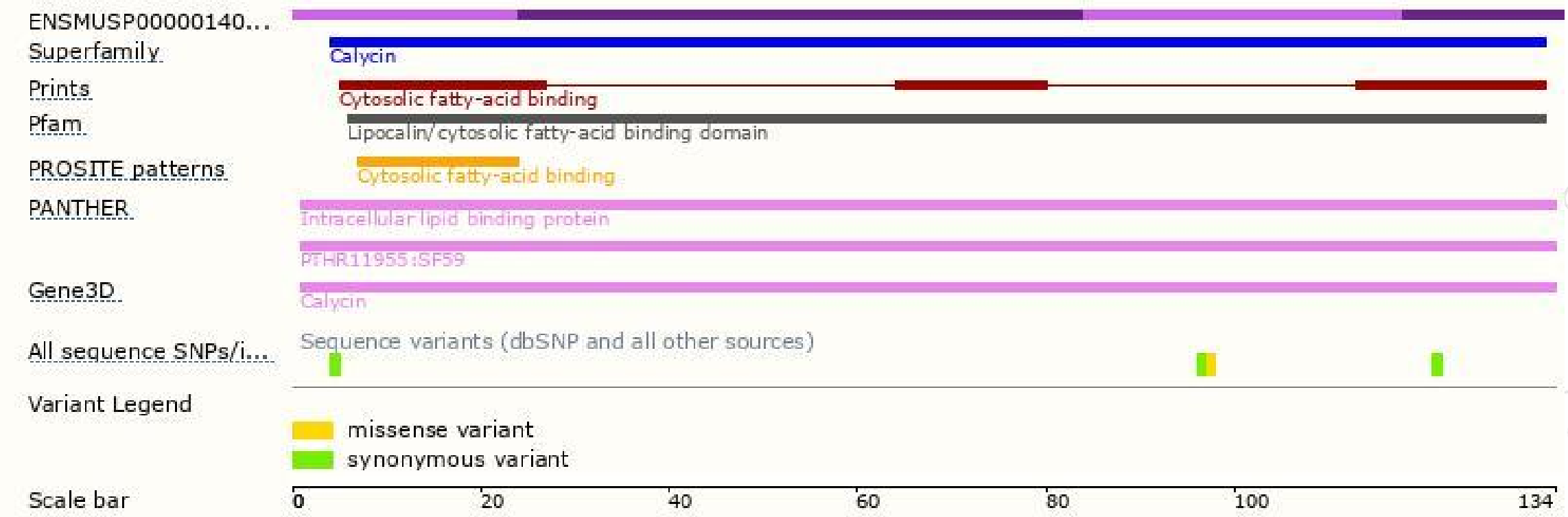
The strategy is based on the design of *Rbp2-204* transcript,the transcription is shown below:



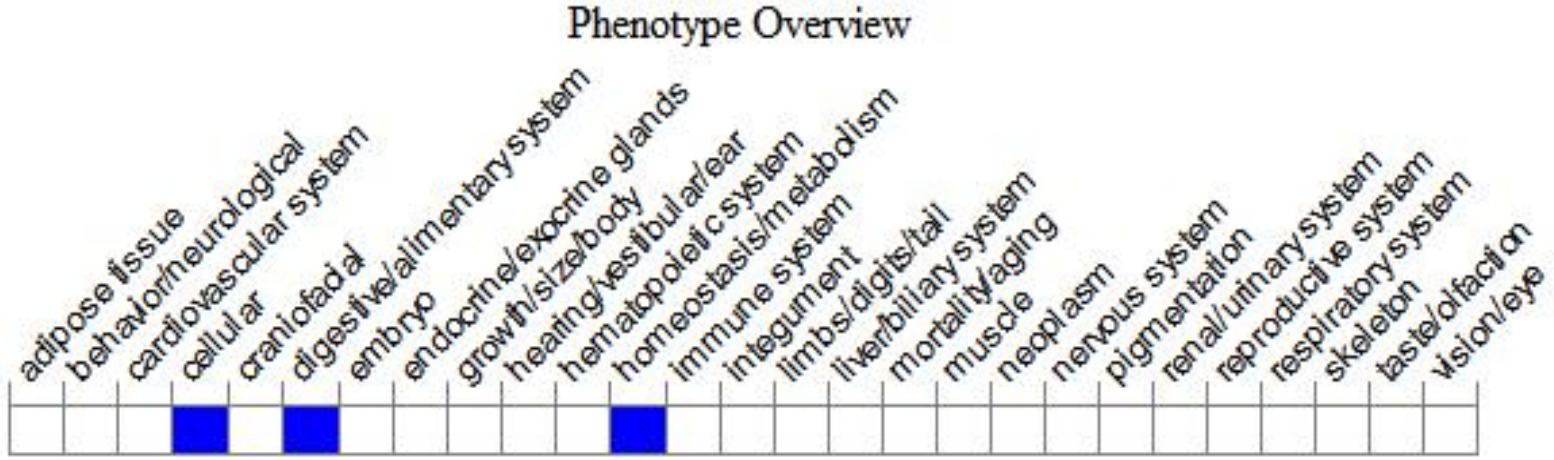
Genomic location distribution



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,saturable vitamin A (retinol) uptake is impaired in homozygous mutant mice. Serum retinol levels are unaffected when with normal dietary intake, however, pups of homozygous dams fed a marginal retinol diet show increased neonatal lethality due to inadequate retinal transport to the fetus.

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

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