Rnpc3 Cas9-KO Strategy

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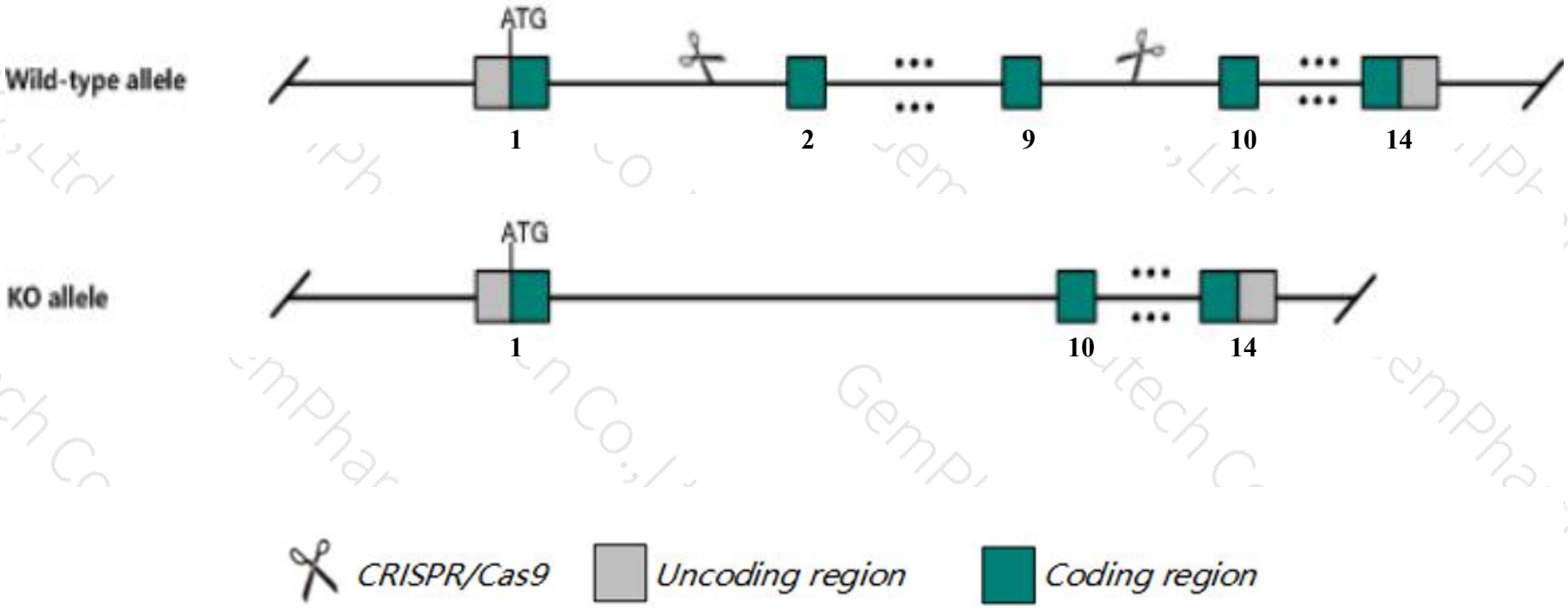
Design Date: 2020-8-4

Project Overview

Project Name	***Rnpc3***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rnpc3* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rnpc3* gene has 8 transcripts. According to the structure of *Rnpc3* gene, exon2-exon9 of *Rnpc3-201*(ENSMUST00000092154.9) transcript is recommended as the knockout region.The region contains 850bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rnpc3* gene. The brief process is as follows: CRISPR/Cas9 system 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.

Notice

➢ According to the existing MGI data,embryos homozygous for a knock-out allele fail to develop beyond the morula stage and die before implantation.

➢ The *Rnpc3* gene is located on the Chr3. 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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Rnpc3 RNA-binding region (RNP1, RRM) containing 3 [Mus musculus (house mouse)]

Gene ID: 67225, updated on 13-Mar-2020

Summary

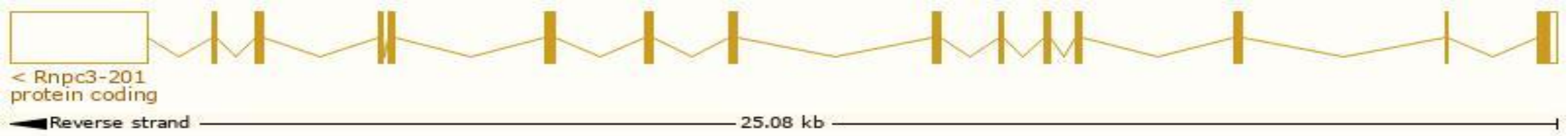
Official Symbol	Rnpc3 provided by MGI
Official Full Name	RNA-binding region (RNP1, RRM) containing 3 provided byMGI
Primary source	MGI:MGI:1914475
See related	Ensembl:ENSMUSG00000027981
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2810441O16Rik, AI447568, C030014B17Rik
Expression	Broad expression in CNS E18 (RPKM 16.8), CNS E14 (RPKM 13.4) and 24 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

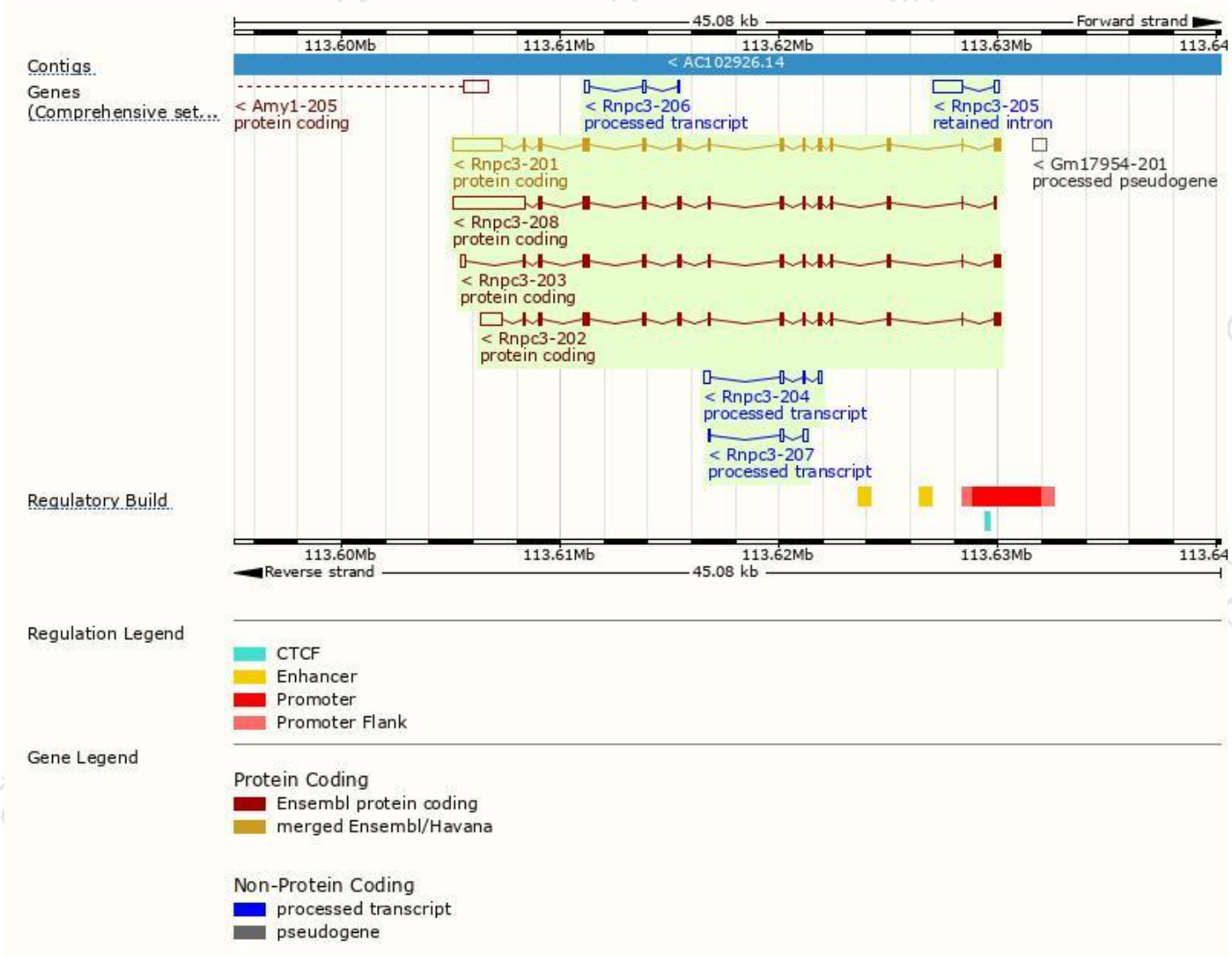
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rnpc3-201	ENSMUST00000092154.9	3888	514aa	Protein coding	CCDS17777	Q3UZ01	TSL:1 GENCODE basic APPRIS P3
Rnpc3-202	ENSMUST00000106535.1	2616	513aa	Protein coding	CCDS71308	Q3UZ01	TSL:1 GENCODE basic APPRIS ALT1
Rnpc3-203	ENSMUST00000106536.7	1839	514aa	Protein coding	CCDS17777	Q3UZ01	TSL:1 GENCODE basic APPRIS P3
Rnpc3-208	ENSMUST00000153853.7	4679	463aa	Protein coding	-	F6TN13	CDS 5' incomplete TSL:2
Rnpc3-204	ENSMUST00000123232.7	667	No protein	Processed transcript	-	-	TSL:3
Rnpc3-207	ENSMUST00000135712.1	423	No protein	Processed transcript	-	-	TSL:2
Rnpc3-206	ENSMUST00000132220.1	408	No protein	Processed transcript	-	-	TSL:3
Rnpc3-205	ENSMUST00000127068.1	1532	No protein	Retained intron	-	-	TSL:1

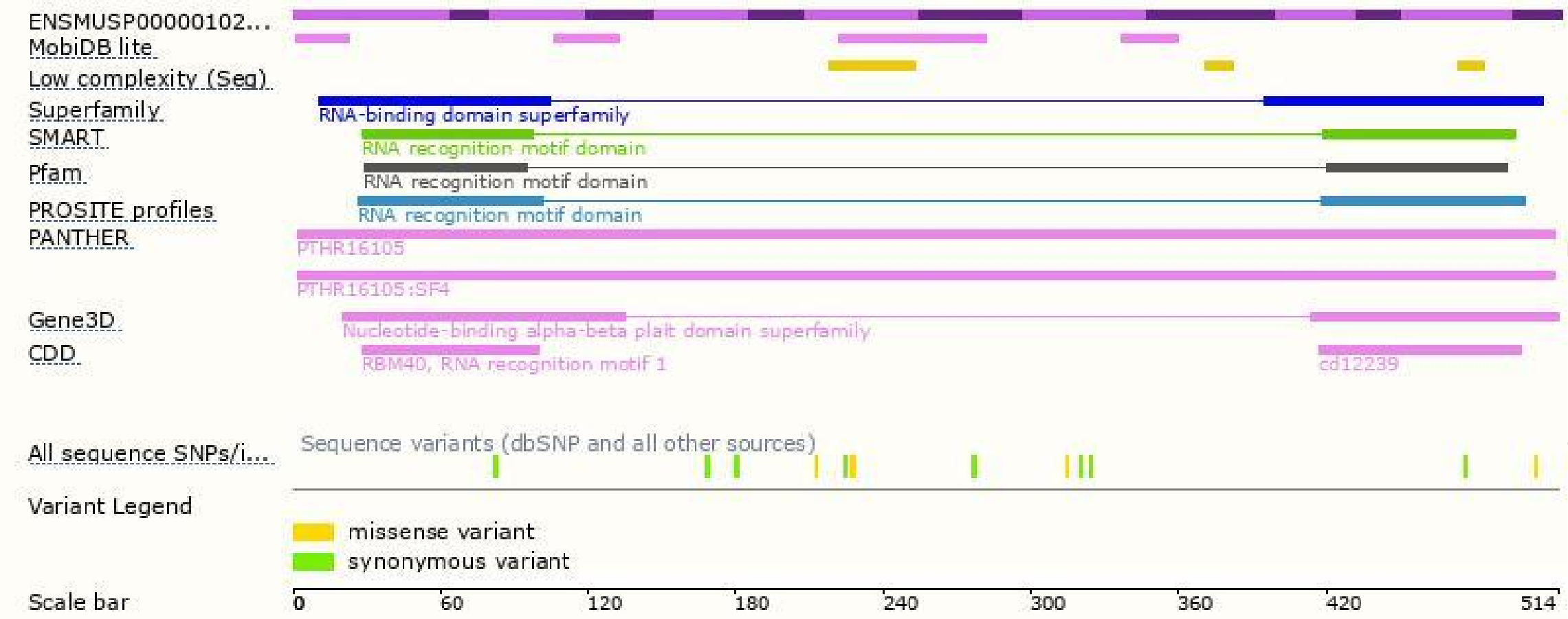
The strategy is based on the design of *Rnpc3-201* transcript,the transcription is shown below:



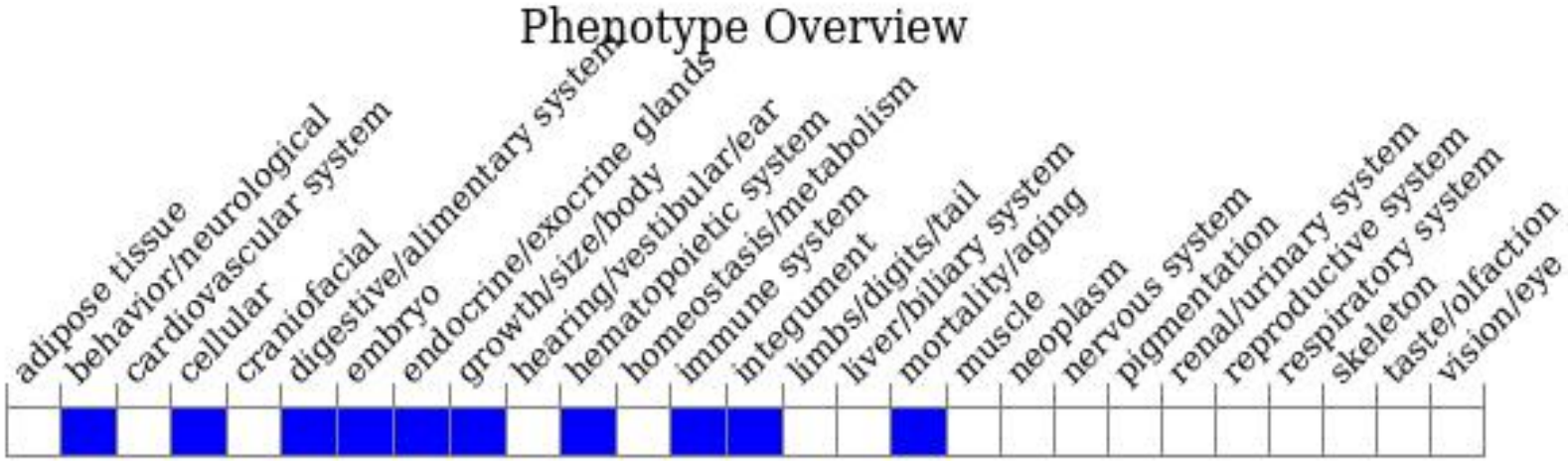
Genomic location distribution



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,embryos homozygous for a knock-out allele fail to develop beyond the morula stage and die before implantation.

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

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