Rnf17 Cas9-KO Strategy

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Reviewer: Xiaojing Li

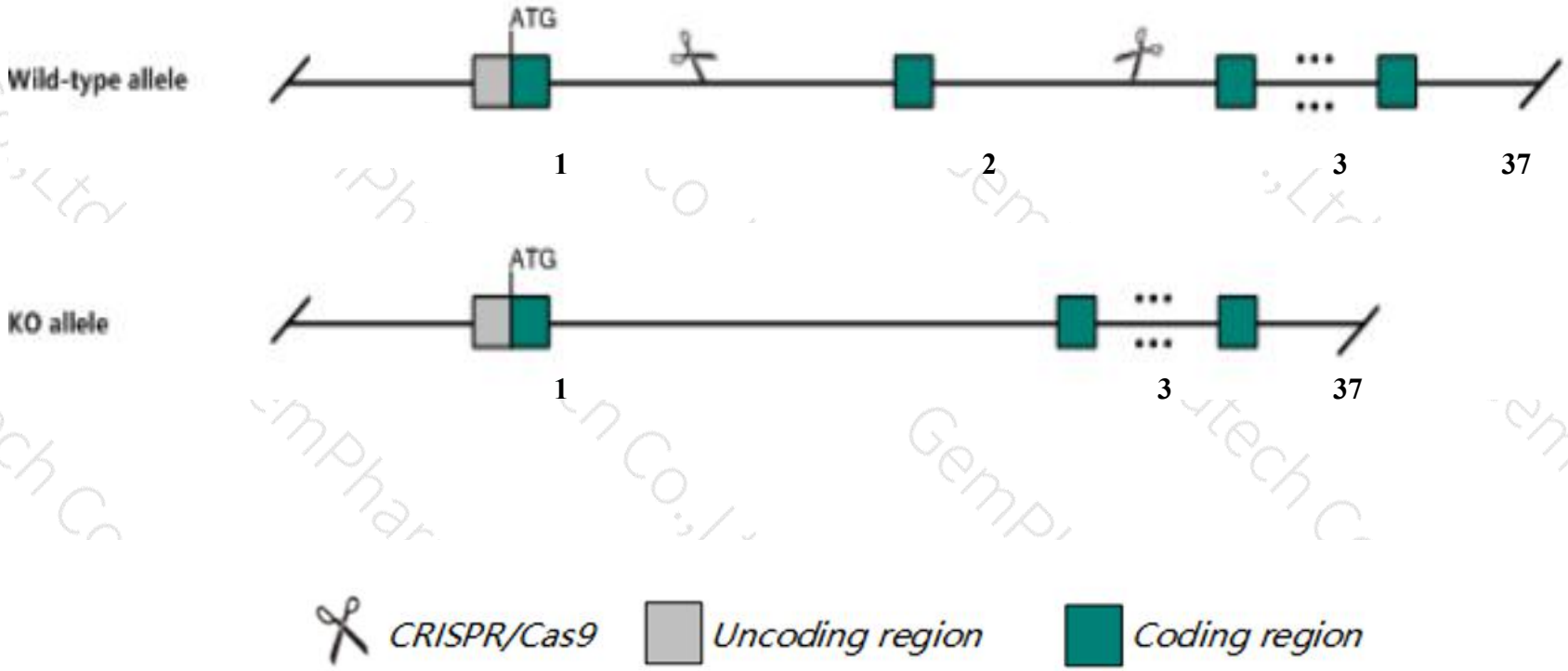
Design Date: 2020-8-13

Project Overview

Project Name	***Rnf17***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rnf17* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rnf17* gene has 6 transcripts. According to the structure of *Rnf17* gene, exon2 of *Rnf17-201*(ENSMUST00000095793.2) transcript is recommended as the knockout region.The region contains 95bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rnf17* 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,homozygous null mice display male infertility, azoospermia, arrest of spermatogenesis, and small testis.

➢ The *Rnf17* gene is located on the Chr14. 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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Rnf17 ring finger protein 17 [Mus musculus (house mouse)]

Gene ID: 30054, updated on 13-Mar-2020

Summary

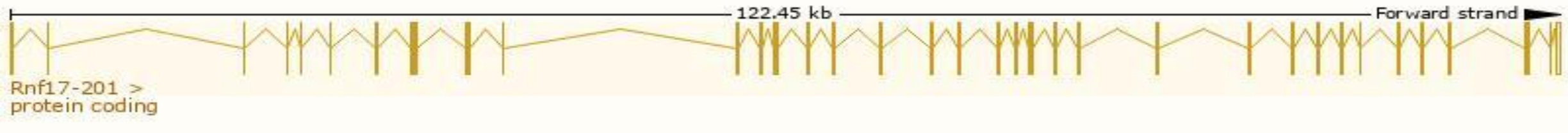
Official Symbol	Rnf17 provided by MGI
Official Full Name	ring finger protein 17 provided by MGI
Primary source	MGI:MGI:1353419
See related	Ensembl:ENSMUSG00000000365
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	MMIP-2, Mmip2, TDRD4
Expression	Biased expression in testis adult (RPKM 6.8) and placenta adult (RPKM 0.9) See more
Orthologs	human all

Transcript information（Ensembl）

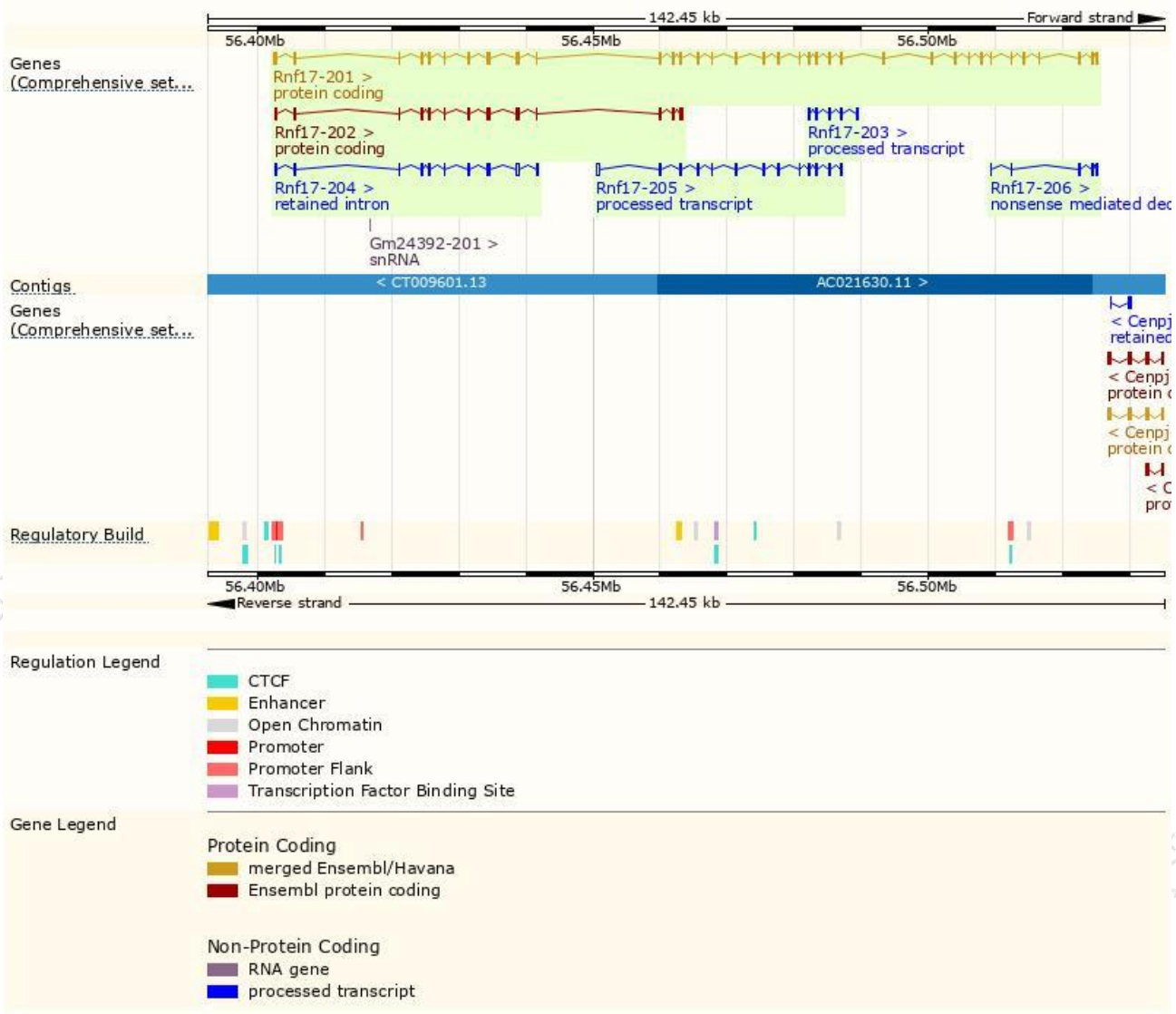
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rnf17-201	ENSMUST00000095793.2	5264	1640aa	Protein coding	CCDS27149	Q99MV7	TSL:1 GENCODE basic APPRIS P1
Rnf17-202	ENSMUST00000223627.1	2077	626aa	Protein coding	-	Q99MV7	GENCODE basic
Rnf17-206	ENSMUST00000225737.1	680	80aa	Nonsense mediated decay	-	A0A286YDU5	CDS 5' incomplete
Rnf17-205	ENSMUST00000225621.1	2180	No protein	Processed transcript	-	-	
Rnf17-203	ENSMUST00000223646.1	621	No protein	Processed transcript	-	-	
Rnf17-204	ENSMUST00000225361.1	1609	No protein	Retained intron	-	-	

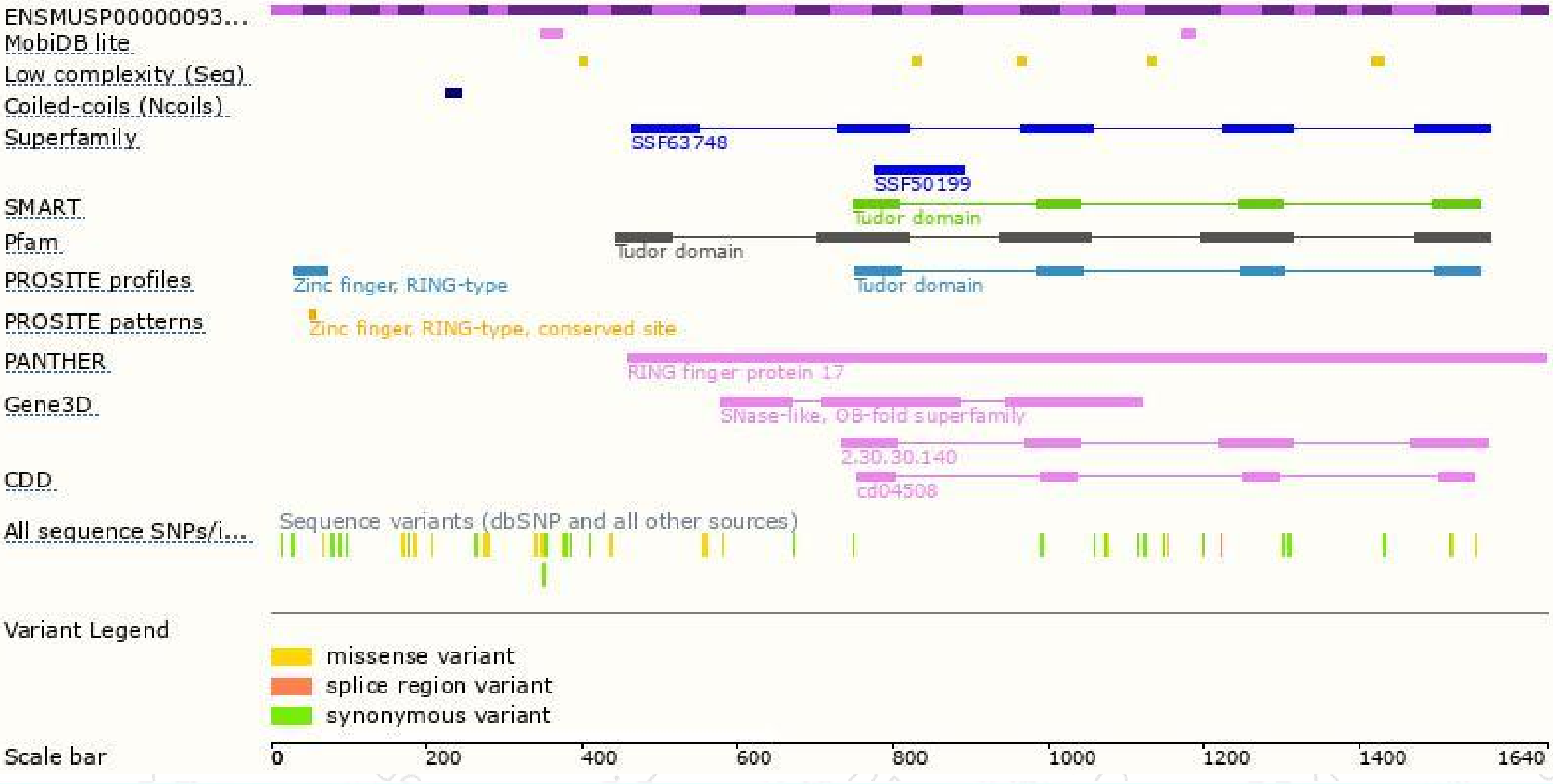
The strategy is based on the design of *Rnf17-201* transcript,the transcription is shown below:



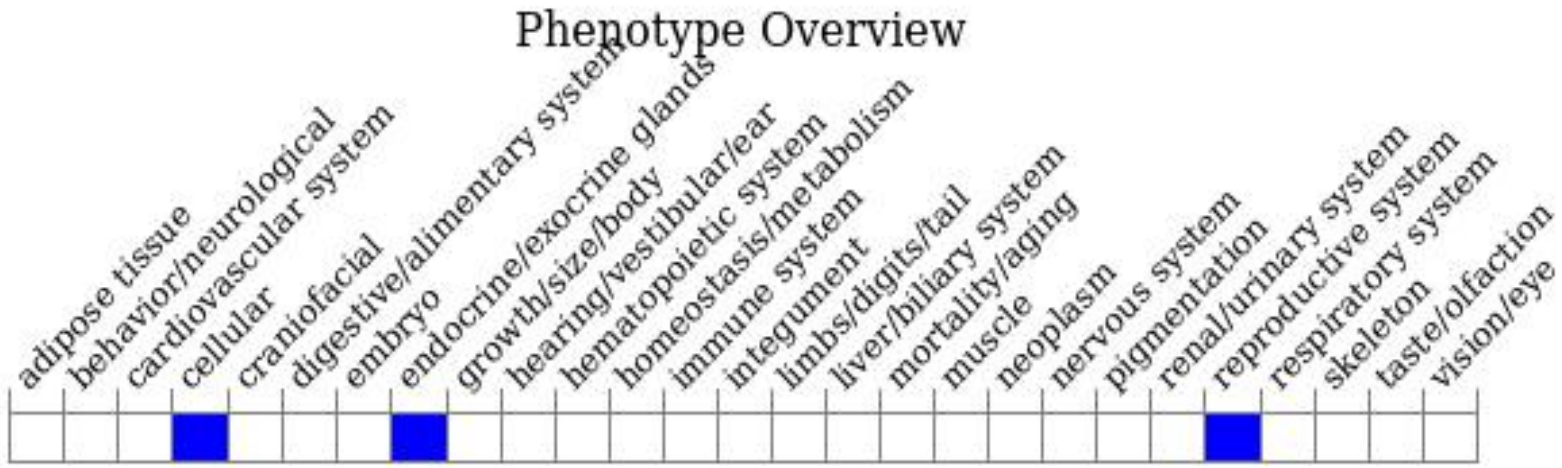
Genomic location distribution



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 display male infertility, azoospermia, arrest of spermatogenesis, and small testis.

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

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