Rtel1 Cas9-KO Strategy

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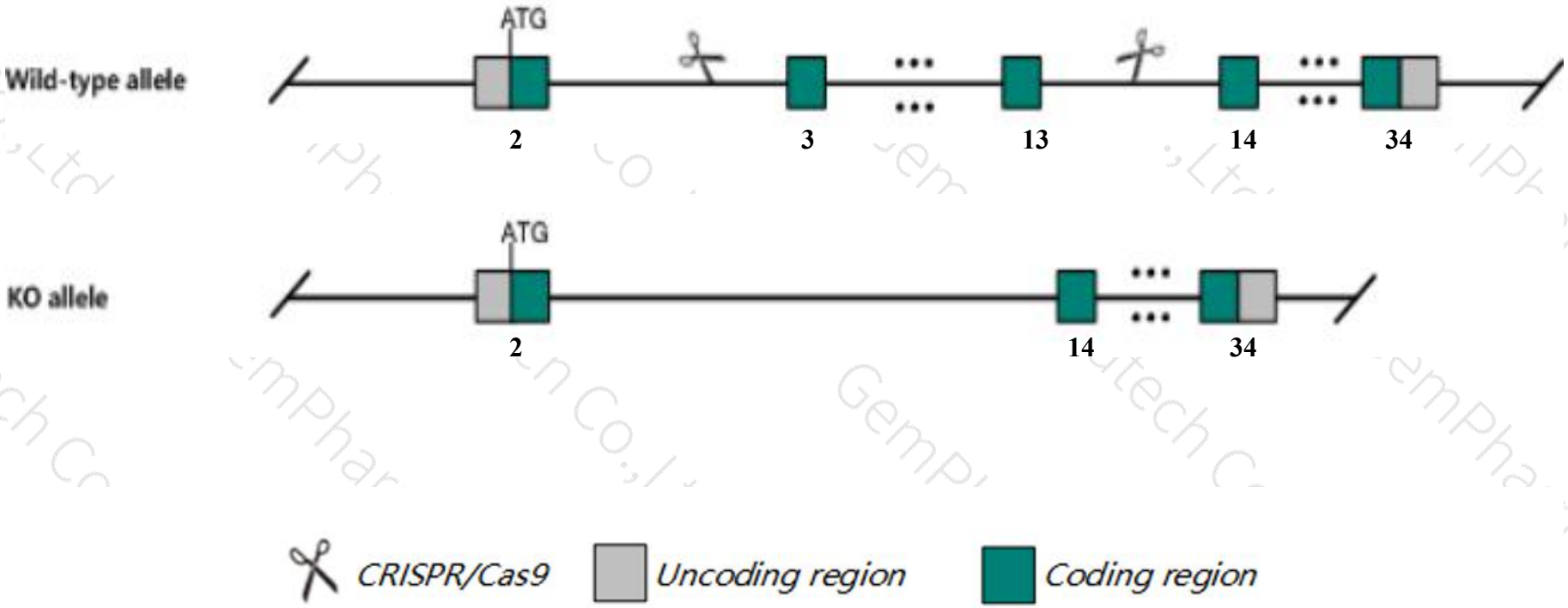
Project Overview

Project Name	***Rtel1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rtel1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rtel1* gene has 21 transcripts. According to the structure of *Rtel1* gene, exon3-exon13 of *Rtel1-202* (ENSMUST00000054622.14) transcript is recommended as the knockout region.The region contains 1033bp coding sequenc Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rtel1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,homozygous null mice display embryonic lethality with abnormal development of the neural tube, brain, heart, vasculature, placenta, and allantois and chromosomal abnormalities in differentiating cells.
- Transcripts 206,207,209,210,214,216,218 may not be affected. The effect of transcripts 211,212,213,219,220 is unknown.
- The *Rtel1* gene is located on the Chr2. 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）

集萃药康 GemPharmatech

Rtel1 regulator of telomere elongation helicase 1 [Mus musculus (house mouse)]

Gene ID: 269400, updated on 20-Mar-2020

Summary

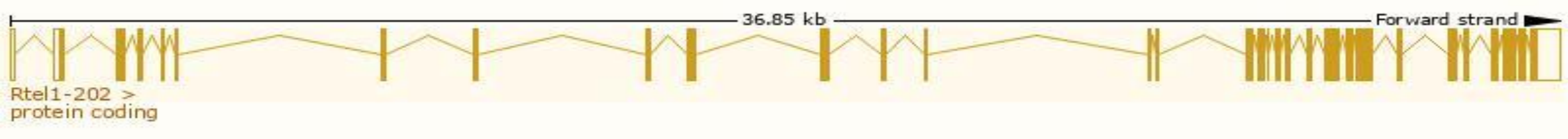
Official Symbol	Rtel1 provided by MGI
Official Full Name	regulator of telomere elongation helicase 1 provided by MGI
Primary source	MGI:MGI:2139369
See related	Ensembl:ENSMUSG00000038685
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI451565, AW540478, Rtel
Expression	Ubiquitous expression in limb E14.5 (RPKM 9.4), CNS E14 (RPKM 9.2) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

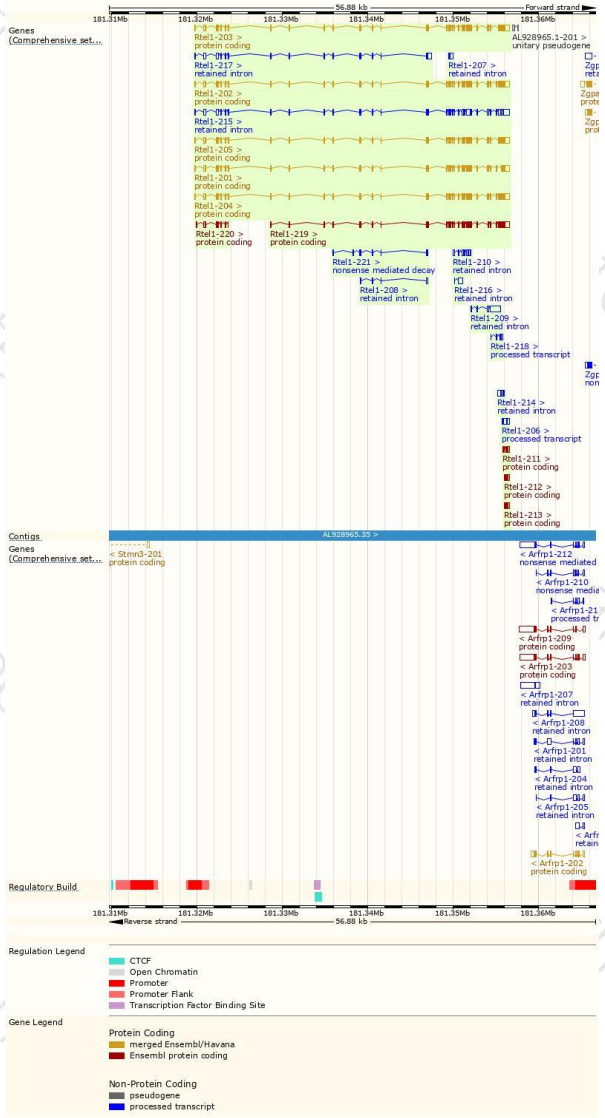
The gene has 21 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rtel1-202	ENSMUST00000054622.14	4401	1209aa	Protein coding	CCDS17208	Q0VGM9	TSL:1 GENCODE basic APPRIS P3
Rtel1-204	ENSMUST00000108814.7	4322	1203aa	Protein coding	CCDS50849	Q0VGM9	TSL:1 GENCODE basic APPRIS ALT2
Rtel1-203	ENSMUST00000098971.10	4307	1170aa	Protein coding	CCDS50851	Q0VGM9	TSL:1 GENCODE basic APPRIS ALT2
Rtel1-205	ENSMUST00000108815.7	4243	1164aa	Protein coding	CCDS50852	Q0VGM9	TSL:1 GENCODE basic APPRIS ALT2
Rtel1-201	ENSMUST00000048608.15	4135	1128aa	Protein coding	CCDS50850	Q0VGM9	TSL:1 GENCODE basic APPRIS ALT2
Rtel1-219	ENSMUST00000148252.1	3505	992aa	Protein coding	-	Z4YLW7	CDS 5' incomplete TSL:1
Rtel1-220	ENSMUST00000153112.1	719	162aa	Protein coding	-	A2AU08	CDS 3' incomplete TSL:3
Rtel1-213	ENSMUST00000137700.7	482	101aa	Protein coding	-	F6RDU0	CDS 5' incomplete TSL:3
Rtel1-212	ENSMUST00000134651.1	470	97aa	Protein coding	-	F6UWJ0	CDS 5' incomplete TSL:2
Rtel1-211	ENSMUST00000133856.7	442	88aa	Protein coding	-	F6X1P9	CDS 5' incomplete TSL:3
Rtel1-221	ENSMUST00000184751.7	614	52aa	Nonsense mediated decay	-	V9GX41	CDS 5' incomplete TSL:3
Rtel1-206	ENSMUST00000124149.1	712	No protein	Processed transcript	-	-	TSL:2
Rtel1-218	ENSMUST00000147266.1	459	No protein	Processed transcript	-	-	TSL:3
Rtel1-215	ENSMUST00000139608.7	4448	No protein	Retained intron	-	-	TSL:2
Rtel1-217	ENSMUST00000146273.7	1966	No protein	Retained intron	-	-	TSL:2
Rtel1-209	ENSMUST00000130772.1	1594	No protein	Retained intron	-	-	TSL:3
Rtel1-210	ENSMUST00000130935.1	825	No protein	Retained intron	-	-	TSL:3
Rtel1-214	ENSMUST00000139601.1	606	No protein	Retained intron	-	-	TSL:2
Rtel1-216	ENSMUST00000144648.1	597	No protein	Retained intron	-	-	TSL:3
Rtel1-208	ENSMUST00000126842.1	485	No protein	Retained intron	-	-	TSL:3
Rtel1-207	ENSMUST00000125233.1	409	No protein	Retained intron	-	-	TSL:3

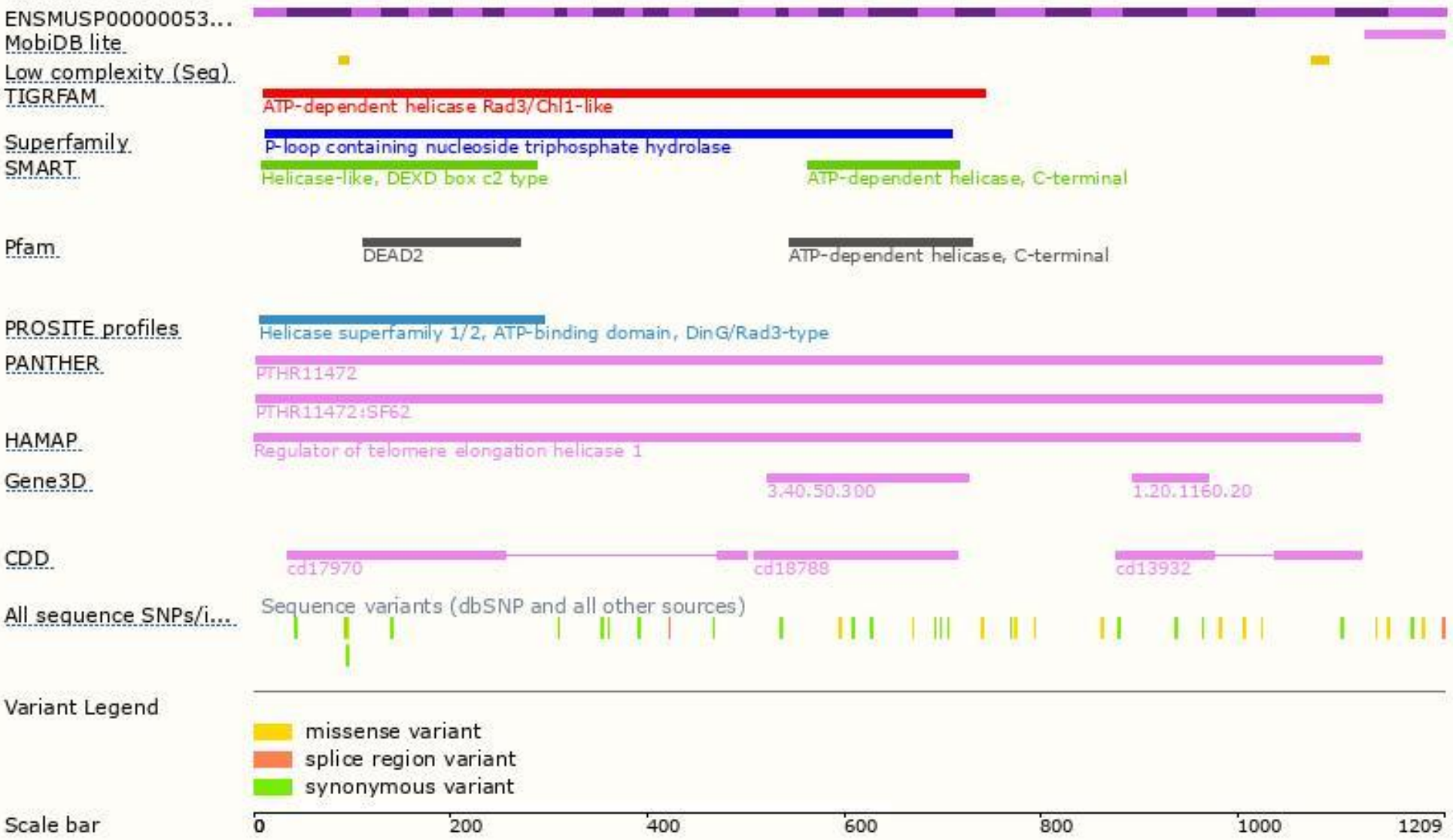
The strategy is based on the design of *Rtel1-202* transcript,The transcription is shown below



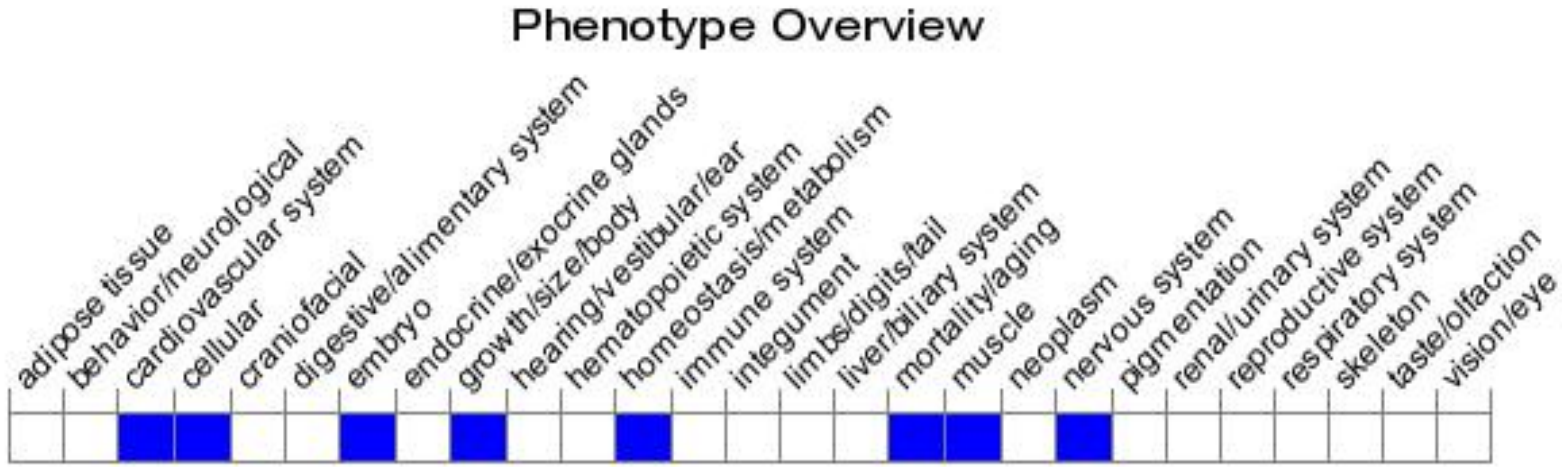
Genomic location distribution



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/).

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

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