

Tpra1 Cas9-CKO Strategy

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Design Date: 2019-8-15

Project Overview

Project Name

Tpra1

Project type

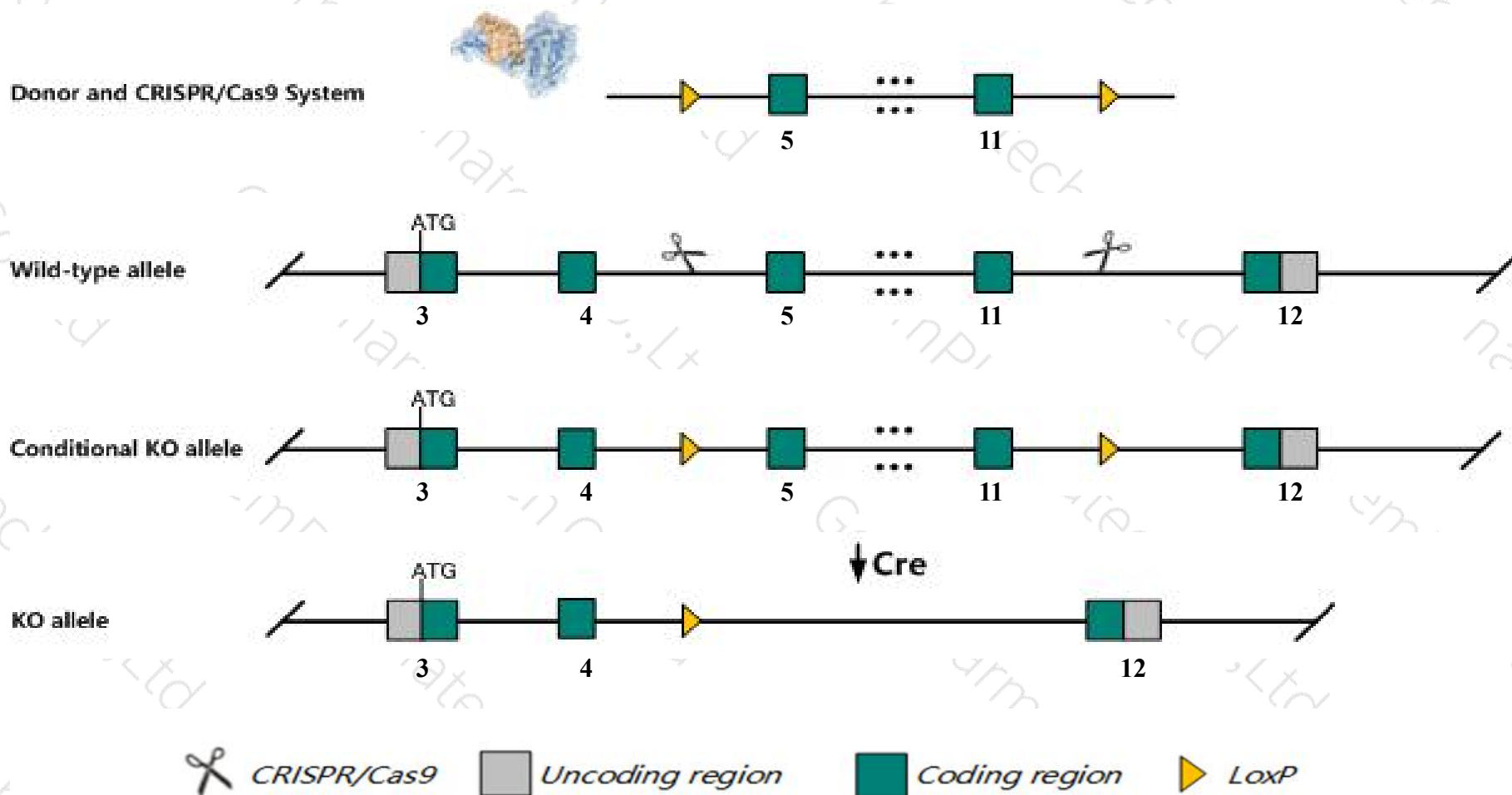
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



Technical routes

- The *Tpral* gene has 23 transcripts. According to the structure of *Tpral* gene, exon5-exon11 of *Tpral*-201 (ENSMUST00000055022.14) transcript is recommended as the knockout region. The region contains 596bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tpral* gene. The brief process is as follows: CRISPR/Cas9 system and Donor 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.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

- The *Tpral* gene is located on the Chr6. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Tpra1 transmembrane protein, adipocyte associated 1 [Mus musculus (house mouse)]

Gene ID: 24100, updated on 31-Jan-2019

Summary



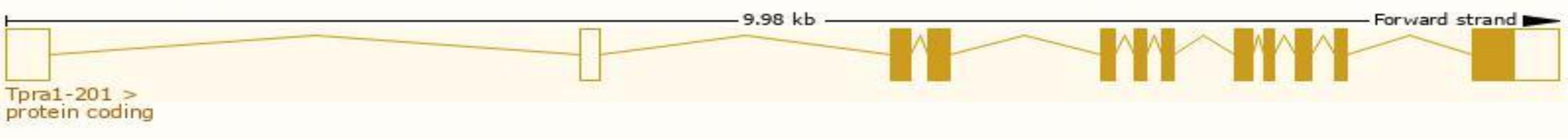
Official Symbol	Tpra1 provided by MGI
Official Full Name	transmembrane protein, adipocyte associated 1 provided by MGI
Primary source	MGI:MGI:1345190
See related	Ensembl:ENSMUSG000000002871
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	40kDa, Gpr175, Tpra40
Expression	Ubiquitous expression in adrenal adult (RPKM 50.6), ovary adult (RPKM 24.2) and 27 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

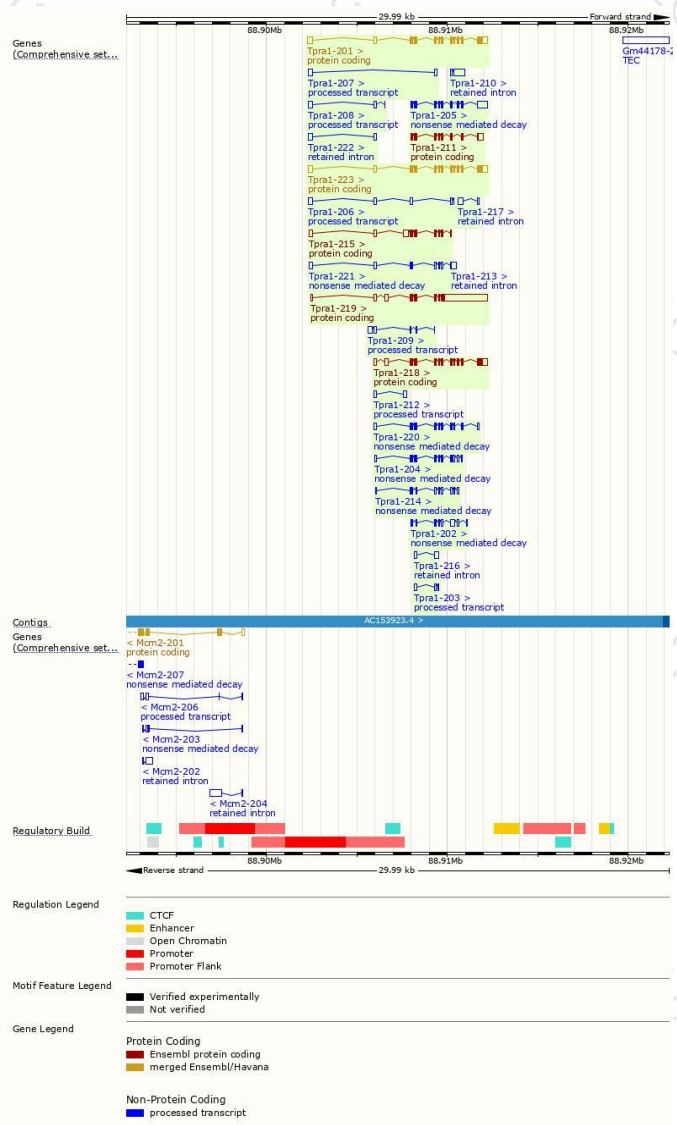
The gene has 23 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tpra1-201	ENSMUST0000055022.14	1820	369aa	Protein coding	CCDS39555	Q99MU1	TSL:1 GENCODE basic APPRIS P1
Tpra1-223	ENSMUST00000204765.2	1738	369aa	Protein coding	CCDS39555	Q99MU1	TSL:1 GENCODE basic APPRIS P1
Tpra1-218	ENSMUST00000203185.2	1718	369aa	Protein coding	CCDS39555	Q99MU1	TSL:5 GENCODE basic APPRIS P1
Tpra1-219	ENSMUST00000203345.2	3359	192aa	Protein coding	-	A0A0N4SUW2	TSL:5 GENCODE basic
Tpra1-215	ENSMUST00000153874.7	1152	188aa	Protein coding	-	D3Z018	CDS 3' incomplete TSL:5
Tpra1-211	ENSMUST00000150236.7	965	222aa	Protein coding	-	A0A0N4SVH0	CDS 5' incomplete TSL:5
Tpra1-205	ENSMUST00000129979.6	1322	230aa	Nonsense mediated decay	-	A0A0N4SW46	CDS 5' incomplete TSL:5
Tpra1-204	ENSMUST00000128790.7	987	210aa	Nonsense mediated decay	-	A0A0N4SVI2	TSL:5
Tpra1-220	ENSMUST00000203648.2	945	222aa	Nonsense mediated decay	-	A0A0N4SW75	TSL:5
Tpra1-202	ENSMUST00000123257.6	766	71aa	Nonsense mediated decay	-	A0A0N4SVI3	CDS 5' incomplete TSL:5
Tpra1-214	ENSMUST00000152585.7	749	41aa	Nonsense mediated decay	-	A0A0N4SUT1	TSL:5
Tpra1-221	ENSMUST00000203694.2	742	42aa	Nonsense mediated decay	-	A0A0N4SV31	TSL:3
Tpra1-206	ENSMUST00000135778.7	578	No protein	Processed transcript	-	-	TSL:5
Tpra1-209	ENSMUST00000144405.2	427	No protein	Processed transcript	-	-	TSL:5
Tpra1-208	ENSMUST00000141183.7	368	No protein	Processed transcript	-	-	TSL:3
Tpra1-207	ENSMUST00000138415.1	357	No protein	Processed transcript	-	-	TSL:3
Tpra1-212	ENSMUST00000151379.1	315	No protein	Processed transcript	-	-	TSL:2
Tpra1-203	ENSMUST00000128171.3	263	No protein	Processed transcript	-	-	TSL:1
Tpra1-210	ENSMUST00000148874.2	713	No protein	Retained intron	-	-	TSL:5
Tpra1-216	ENSMUST00000153885.2	383	No protein	Retained intron	-	-	TSL:1
Tpra1-222	ENSMUST00000204584.2	363	No protein	Retained intron	-	-	TSL:2
Tpra1-217	ENSMUST00000203155.1	352	No protein	Retained intron	-	-	TSL:1
Tpra1-213	ENSMUST00000152045.2	276	No protein	Retained intron	-	-	TSL:NA

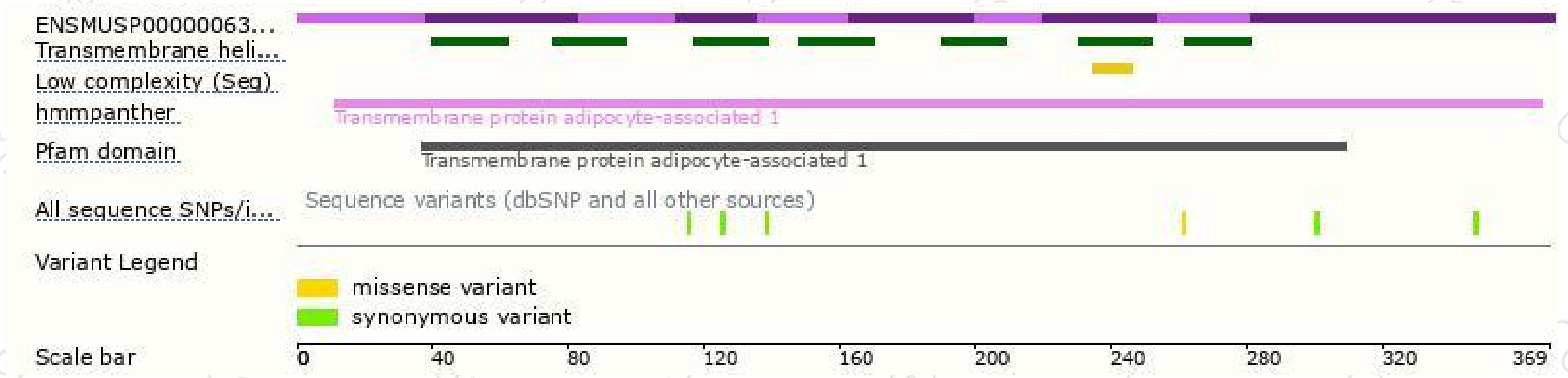
The strategy is based on the design of *Tpra1-201* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

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