Ppp2r1a Cas9-KO Strategy

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Project Overview

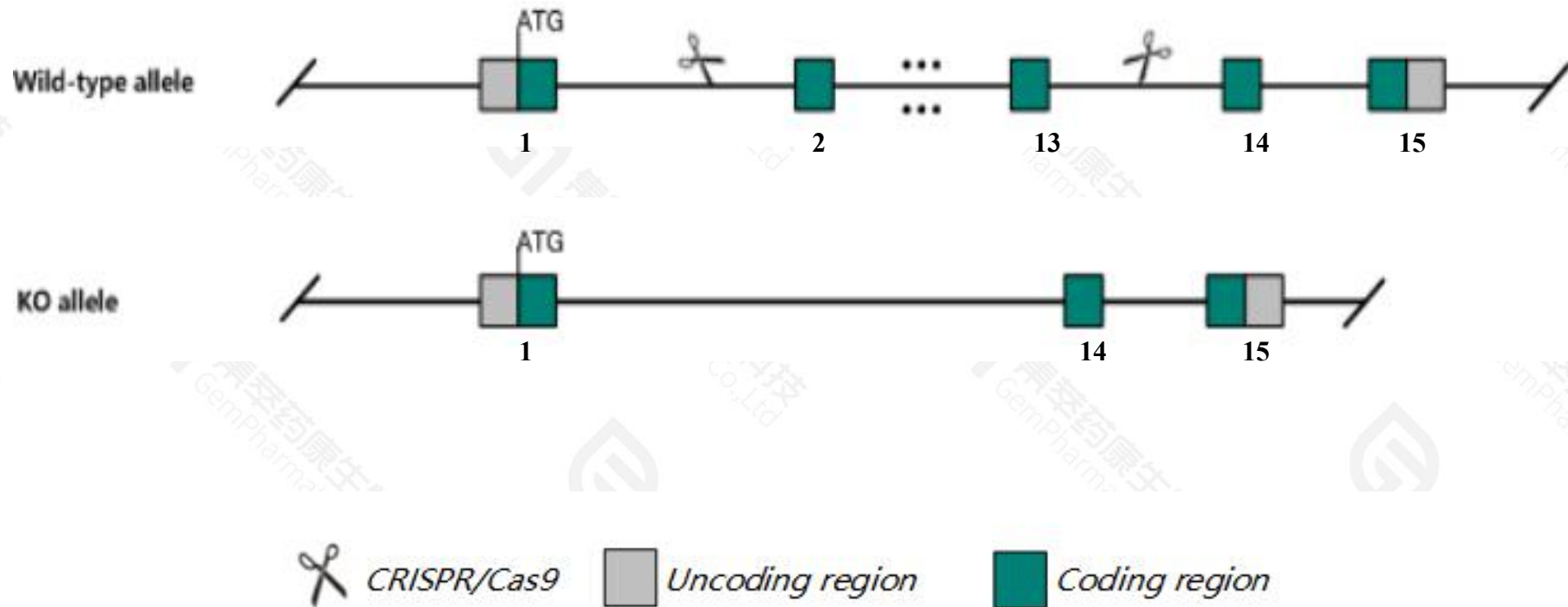|	
Project Name	***Ppp2r1a***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ppp2r1a* gene. The schematic diagram is as follows:

Technical routes

➤ The *Ppp2r1a* gene has 8 transcripts. According to the structure of *Ppp2r1a* gene, exon2-exon13 of *Ppp2r1a-201*(ENSMUST00000007708.14) transcript is recommended as the knockout region.The region contains 1583bp coding sequence. Knock out the region will result in disruption of protein function.

➤ In this project we use CRISPR/Cas9 technology to modify *Ppp2r1a* 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,mice homozygous for a targeted allele that remove exons 5 and 6 exhibit embryonic lethality. Mice heterozygous for this allele exhibit increased benzopyrene-induced lung tumors.

➤ The *Ppp2r1a* gene is located on the Chr17. 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）

Ppp2r1a protein phosphatase 2, regulatory subunit A, alpha [Mus musculus (house mouse)]
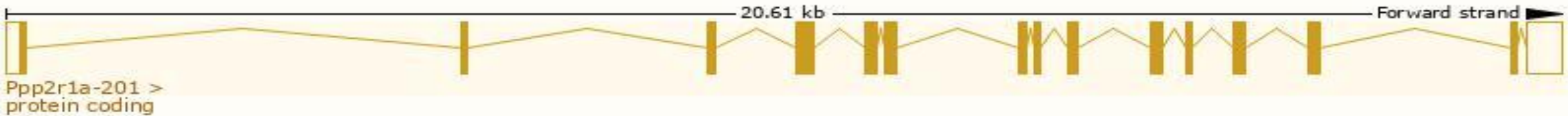
Gene ID: 51792, updated on 13-Mar-2020

▲ Summary

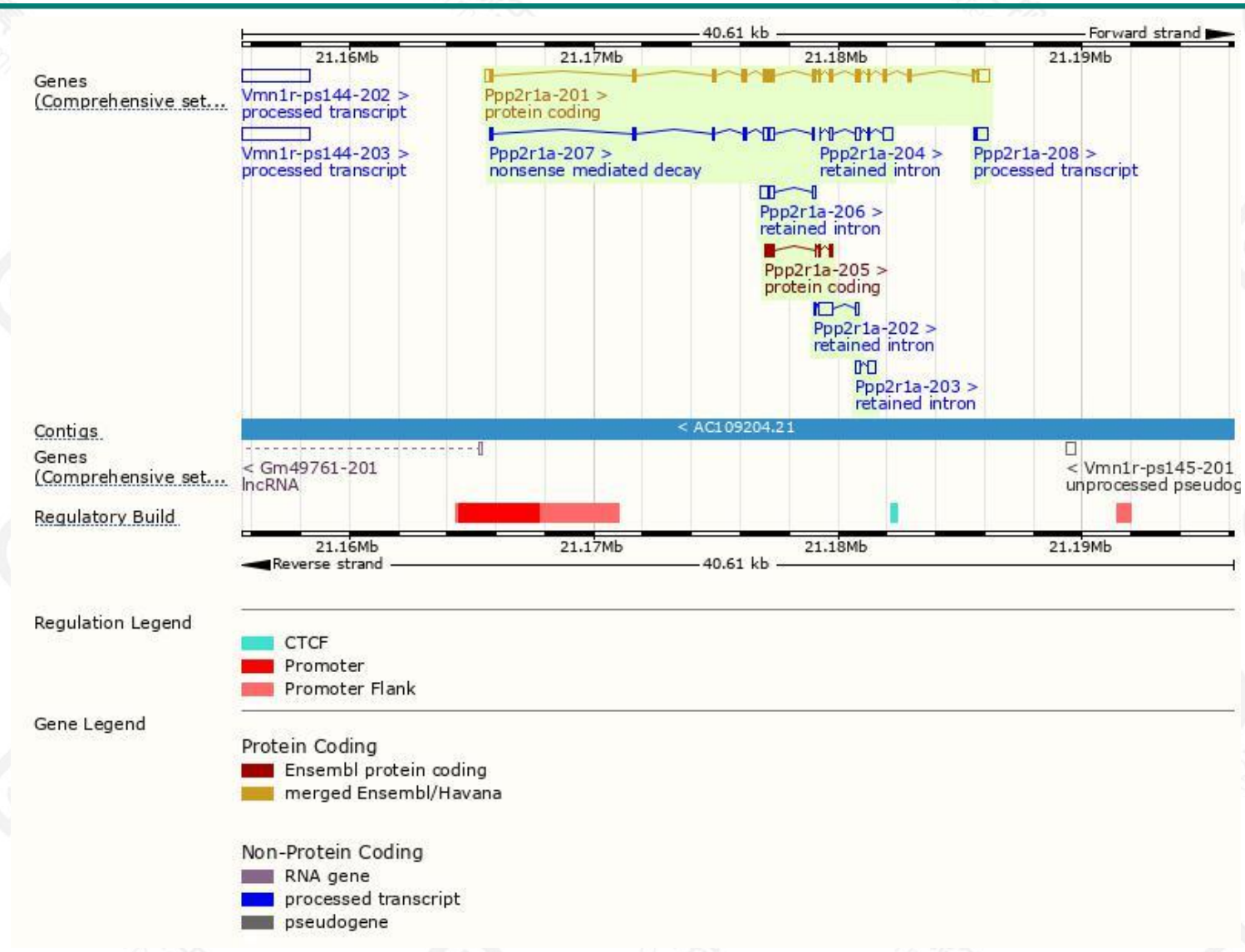|	
Official Symbol	Ppp2r1a provided by MGI
Official Full Name	protein phosphatase 2, regulatory subunit A, alpha provided by MGI
Primary source	MGI:MGI:1926334
See related	Ensembl:ENSMUSG00000007564
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	6330556D22Rik, PP2A, PR65
Expression	Ubiquitous expression in whole brain E14.5 (RPKM 147.1), CNS E18 (RPKM 140.4) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

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

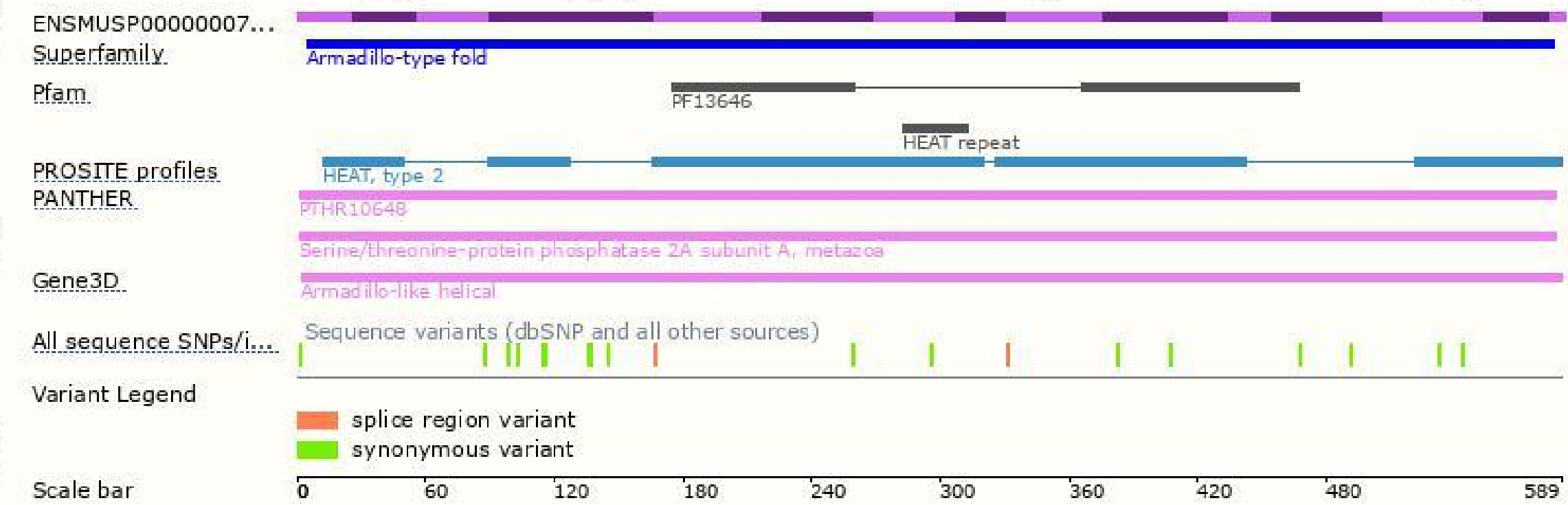| Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ppp2r1a-201	ENSMUST00000007708.13	2410	589aa	Protein coding	CCDS28432	Q76MZ3	TSL:1 GENCODE basic APPRIS P1
Ppp2r1a-205	ENSMUST00000147983.2	430	143aa	Protein coding	-	G3UWL2	CDS 5' and 3' incomplete TSL:5
Ppp2r1a-207	ENSMUST00000173658.7	761	88aa	Nonsense mediated decay	-	G3UXQ1	TSL:5
Ppp2r1a-208	ENSMUST00000231928.1	524	No protein	Processed transcript	-	-	-
Ppp2r1a-202	ENSMUST00000136975.1	811	No protein	Retained intron	-	-	TSL:3
Ppp2r1a-204	ENSMUST00000139293.1	750	No protein	Retained intron	-	-	TSL:2
Ppp2r1a-206	ENSMUST00000173359.1	550	No protein	Retained intron	-	-	TSL:2
Ppp2r1a-203	ENSMUST00000138971.1	464	No protein	Retained intron	-	-	TSL:3

The strategy is based on the design of *Ppp2r1a-201* transcript,the transcription is shown below:
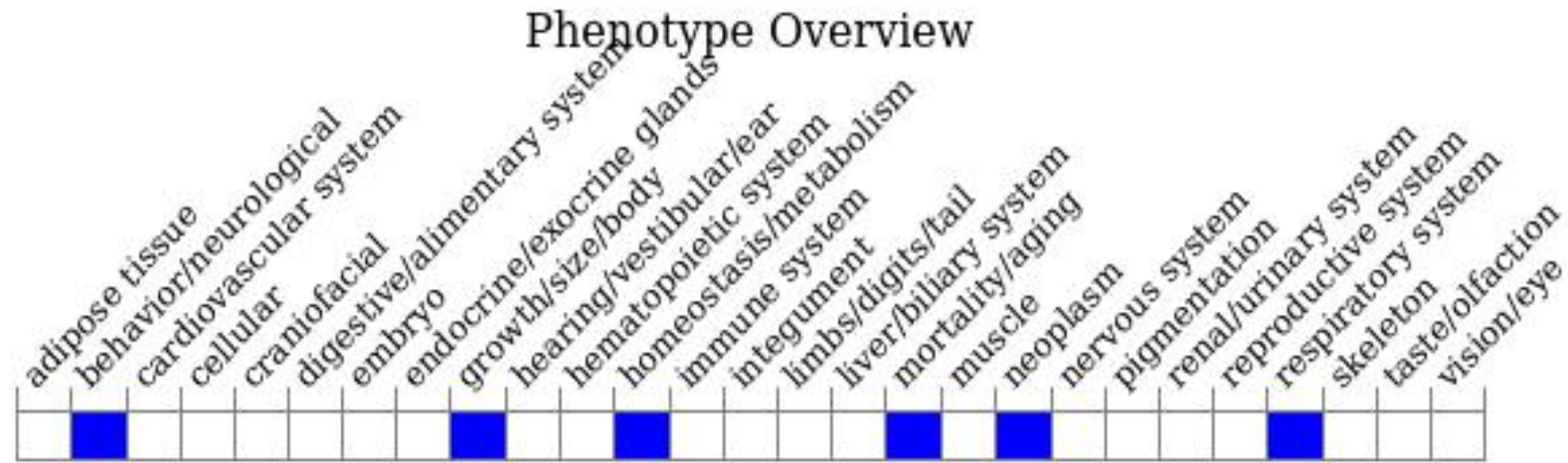
Genomic location distribution

Protein domain

Mouse phenotype description(MGI)

Phenotype Overview

adipose tissue · behavior/neurological · cardiovascular system · cellular · craniofacial · digestive/alimentary system · embryo · endocrine/exocrine glands · growth/size/body · hearing/vestibular/ear · hematopoietic system · homeostasis/metabolism · immune system · integument · limbs/digits/tail · liver/biliary system · mortality/aging · muscle · neoplasm · nervous system · pigmentation · renal/urinary system · reproductive system · respiratory system · skeleton · taste/olfaction · vision/eye

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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