

Mapk1 Cas9-KO Strategy

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Project Overview

Project Name

Mapk1

Project type

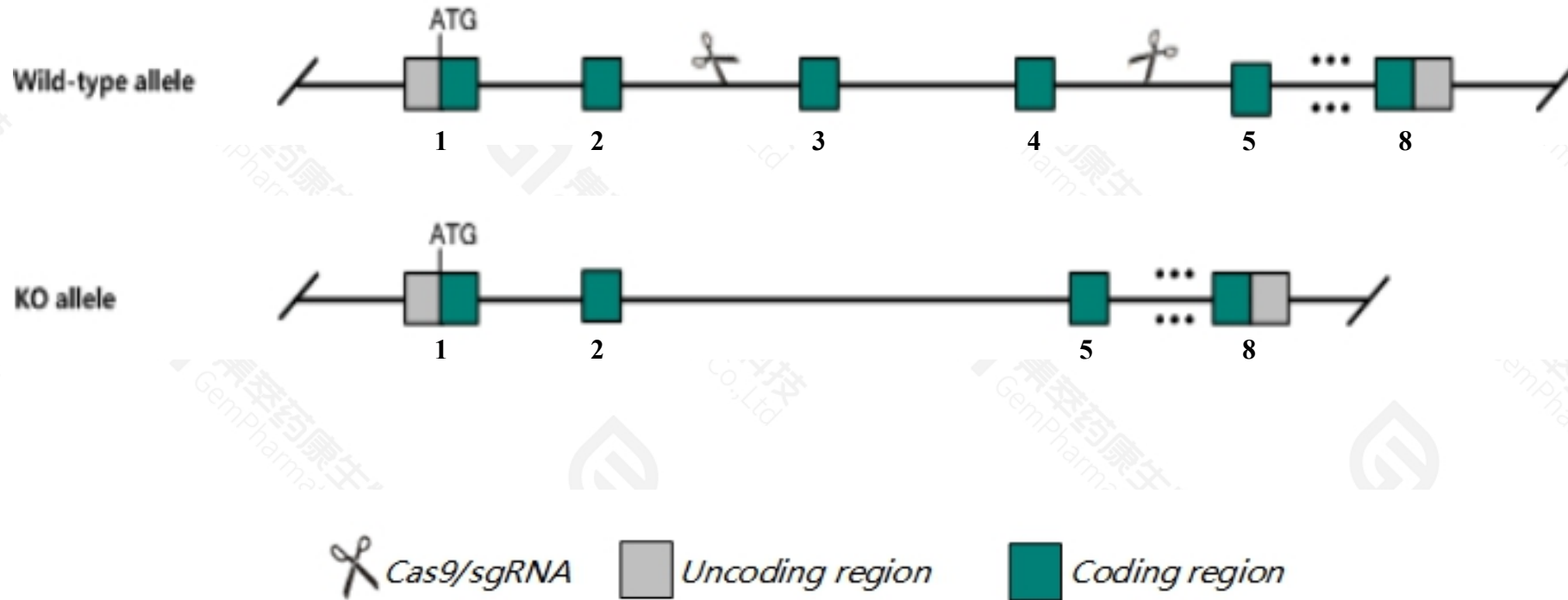
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mapk1* gene. The schematic diagram is as follows:



- The *Mapk1* gene has 9 transcripts. According to the structure of *Mapk1* gene, exon3-exon4 of *Mapk1-201*(ENSMUST00000069107.14) transcript is recommended as the knockout region. The region contains 307bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mapk1* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, homozygous mutant embryos implant in the uterus, but die shortly thereafter failing to form extraembryonic tissues.
- The *Mapk1* gene is located on the Chr16. 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.

Mapk1 mitogen-activated protein kinase 1 [Mus musculus (house mouse)]

Gene ID: 26413, updated on 7-Apr-2019

Summary



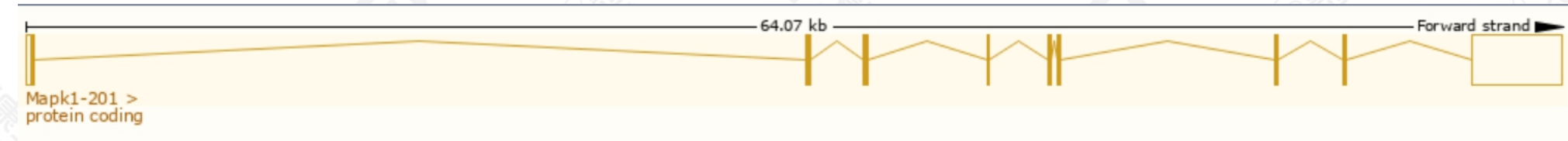
Official Symbol	Mapk1 provided by MGI
Official Full Name	mitogen-activated protein kinase 1 provided by MGI
Primary source	MGI:MGI:1346858
See related	Ensembl:ENSMUSG00000063358
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	9030612K14Rik, AA407128, AU018647, C78273, ERK, Erk2, MAPK2, PRKM2, Prkm1, p41mapk, p42mapk
Expression	Ubiquitous expression in frontal lobe adult (RPKM 69.7), cortex adult (RPKM 53.9) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

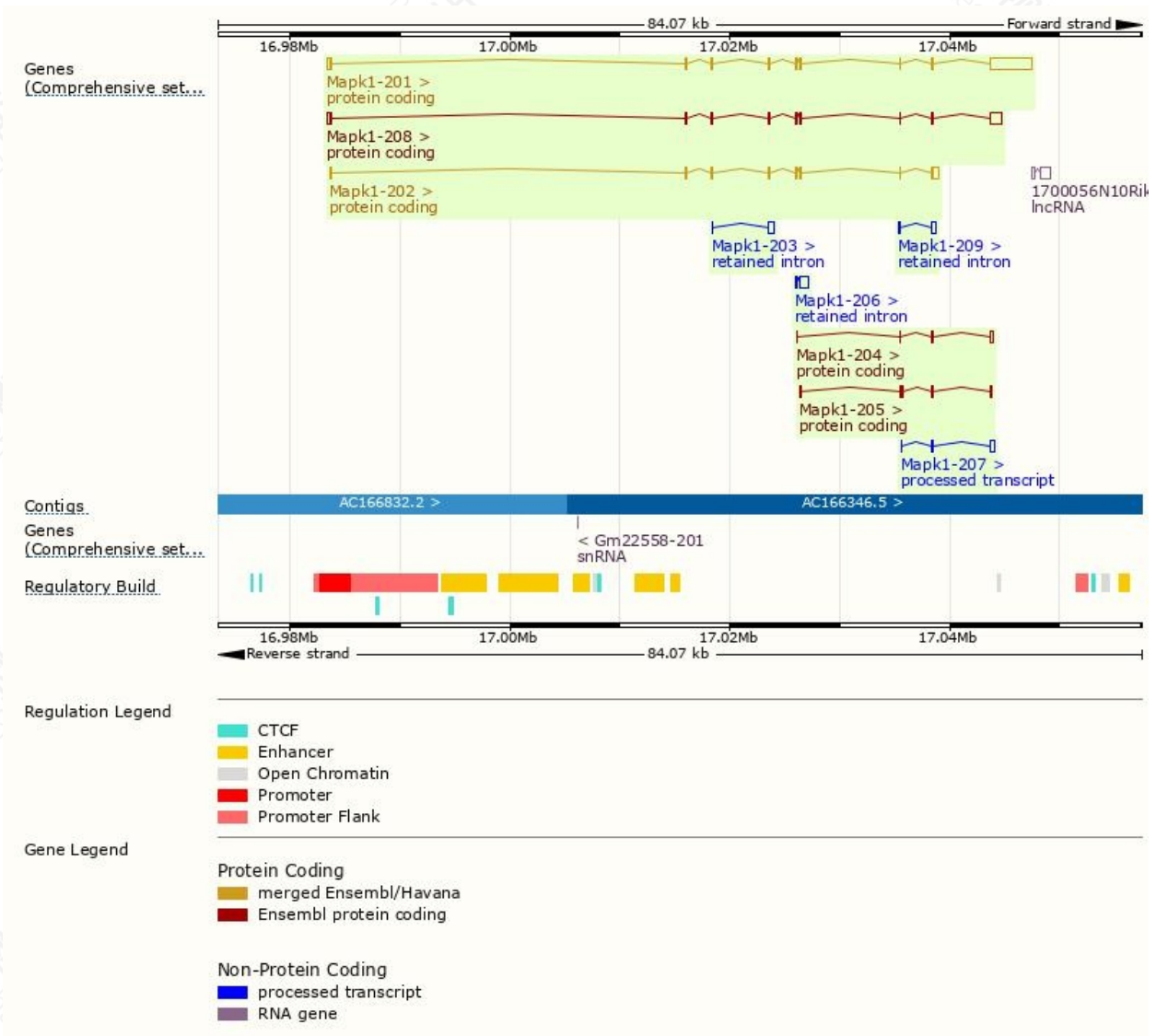
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mapk1-201	ENSMUST00000069107.13	5099	358aa	Protein coding	CCDS27992	P63085	TSL:1 GENCODE basic APPRIS P1
Mapk1-208	ENSMUST00000232611.1	2390	358aa	Protein coding	CCDS27992	P63085	GENCODE basic APPRIS P1
Mapk1-202	ENSMUST00000115731.9	1747	358aa	Protein coding	CCDS27992	P63085	TSL:1 GENCODE basic APPRIS P1
Mapk1-204	ENSMUST00000231821.1	659	108aa	Protein coding	-	A0A338P781	CDS 5' incomplete
Mapk1-205	ENSMUST00000232067.1	592	134aa	Protein coding	-	A0A338P736	CDS 5' incomplete
Mapk1-206	ENSMUST00000232281.1	952	No protein	Retained intron	-	-	
Mapk1-203	ENSMUST00000231420.1	667	No protein	Retained intron	-	-	
Mapk1-209	ENSMUST00000232630.1	606	No protein	Retained intron	-	-	
Mapk1-207	ENSMUST00000232480.1	637	No protein	lncRNA	-	-	

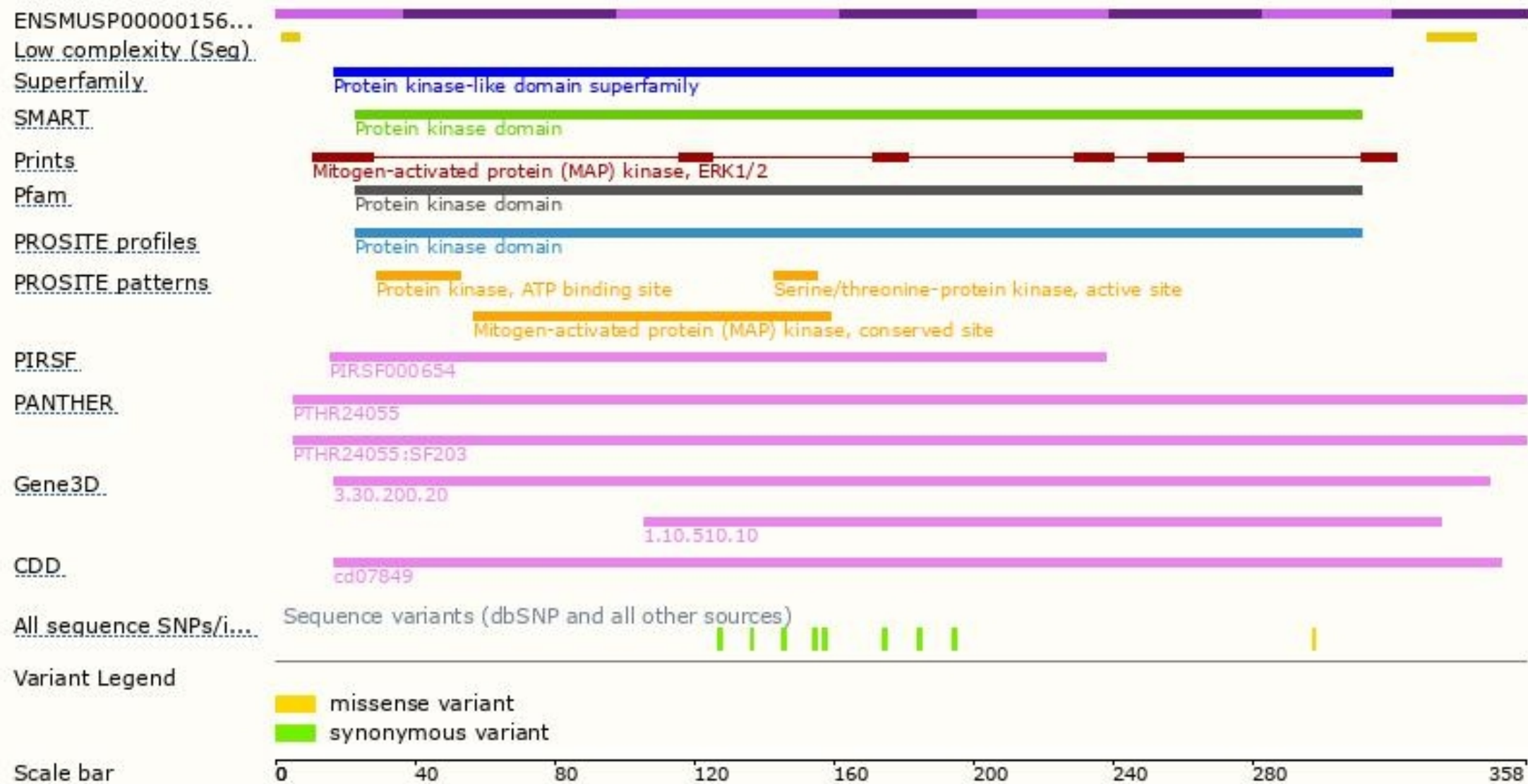
The strategy is based on the design of *Mapk1-201* transcript,the transcription is shown below:



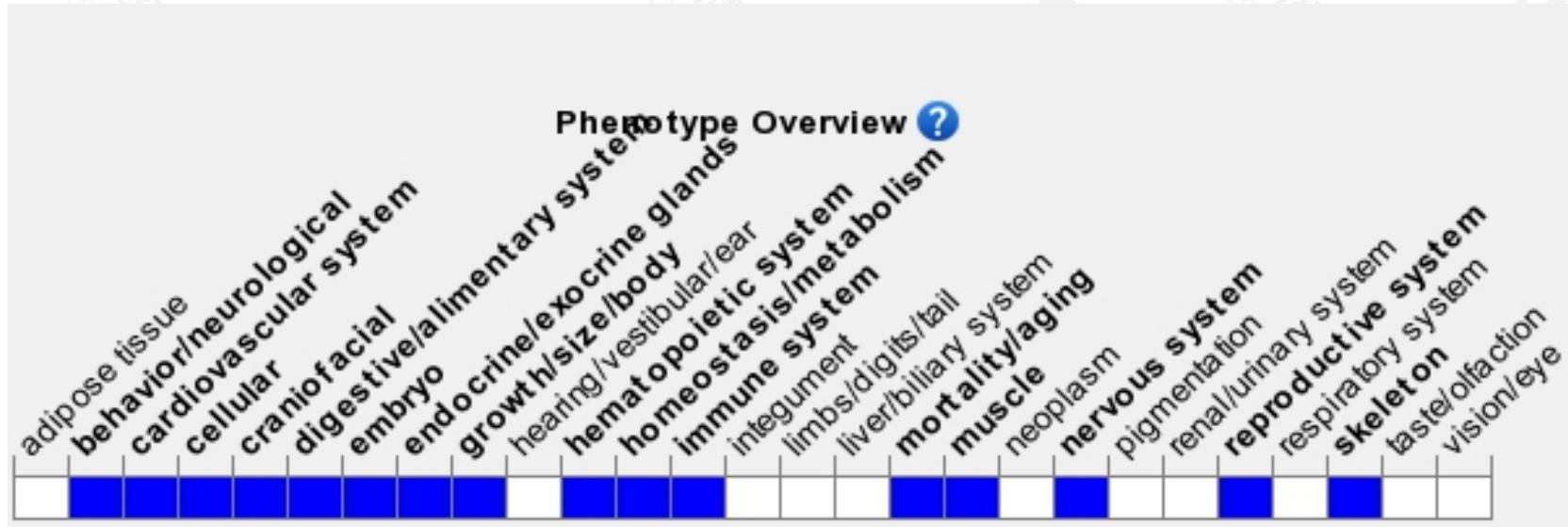
Genomic location distribution



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 mutant embryos implant in the uterus, but die shortly thereafter failing to form extraembryonic tissues.

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

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