

Mknk1 Cas9-CKO Strategy

Designer:

Yang Zeng

Reviewer:

Jing Jin

Design Date:

2019-11-1

Project Overview

Project Name

Mknk1

Project type

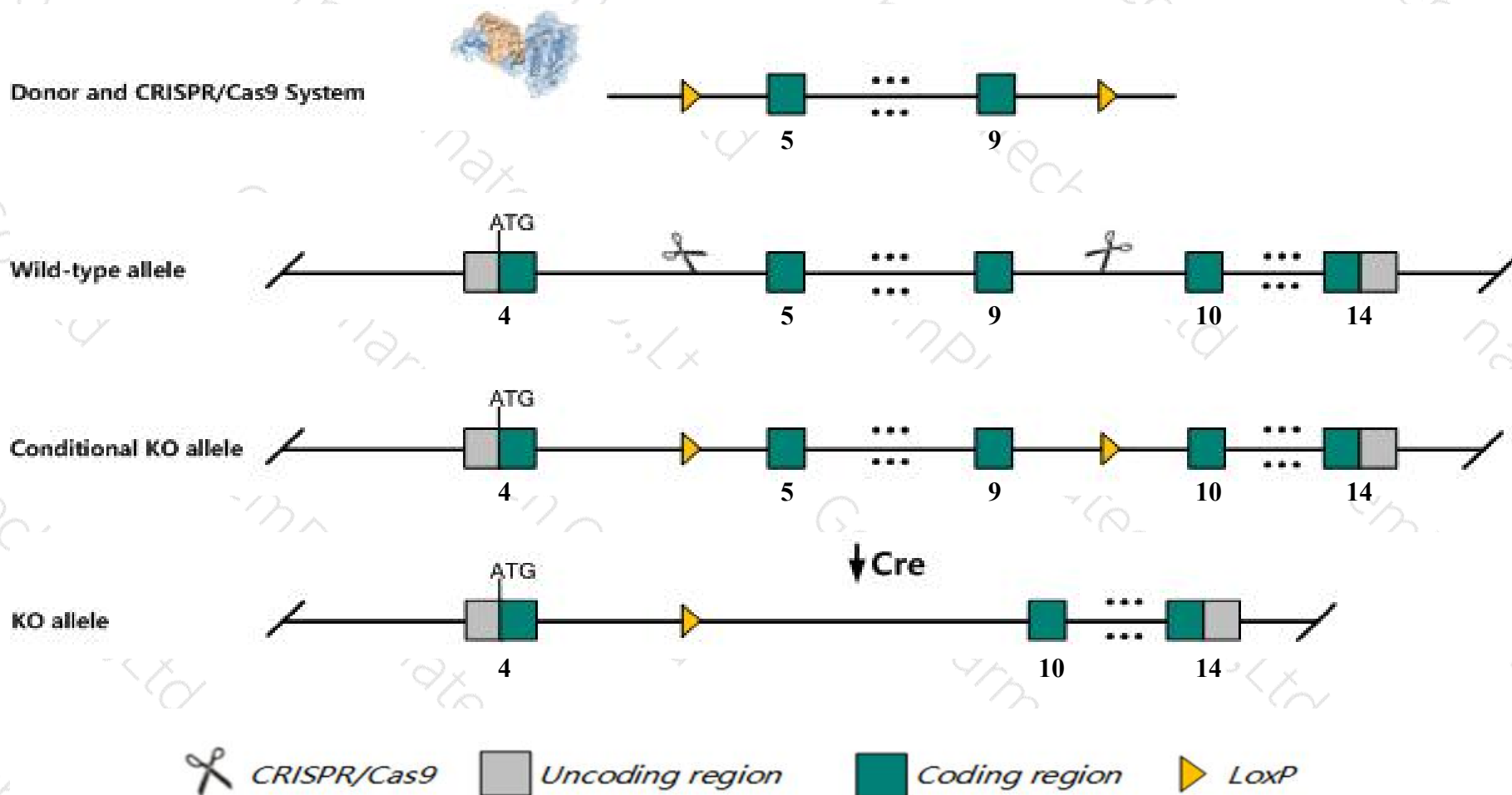
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mknk1* gene. The schematic diagram is as follows:



- The *Mknk1* gene has 14 transcripts. According to the structure of *Mknk1* gene, exon5-exon9 of *Mknk1*-202 (ENSMUST00000106513.9) transcript is recommended as the knockout region. The region contains 413bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mknk1* 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.

- According to the existing MGI data, Homozygous null mice are viable and fertile with no gross abnormalities.
- The *Mknk1* gene is located on the Chr4. 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.

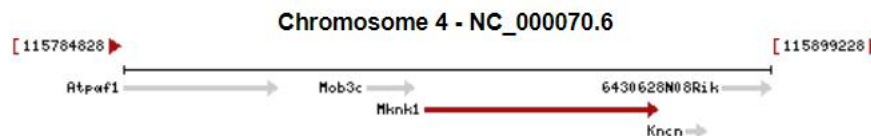
Gene information (NCBI)

Mknk1 MAP kinase-interacting serine/threonine kinase 1 [*Mus musculus* (house mouse)]

Gene ID: 17346, updated on 22-Oct-2019

Summary

Official Symbol	Mknk1 provided by MGI
Official Full Name	MAP kinase-interacting serine/threonine kinase 1 provided by MGI
Primary source	MGI:MGI:894316
See related	Ensembl:ENSMUSG00000028708
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Mnk1; 2410048M24Rik
Summary	This gene encodes a serine-threonine protein kinase that is activated by extracellular signal-regulated kinase or p38 mitogen-activated protein kinases, and it may function in cytokine and environmental stress responses. This kinase is required for phosphorylation of eukaryotic translation initiation factor 4E but it is not required for cell growth during development. Alternative splicing of this gene results in multiple transcript variants. [provided by RefSeq, Oct 2013]
Expression	Ubiquitous expression in thymus adult (RPKM 21.1), lung adult (RPKM 18.5) and 28 other tissues See more
Orthologs	human all

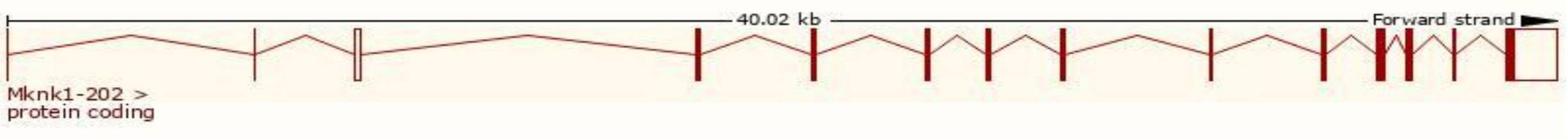


Transcript information (Ensembl)

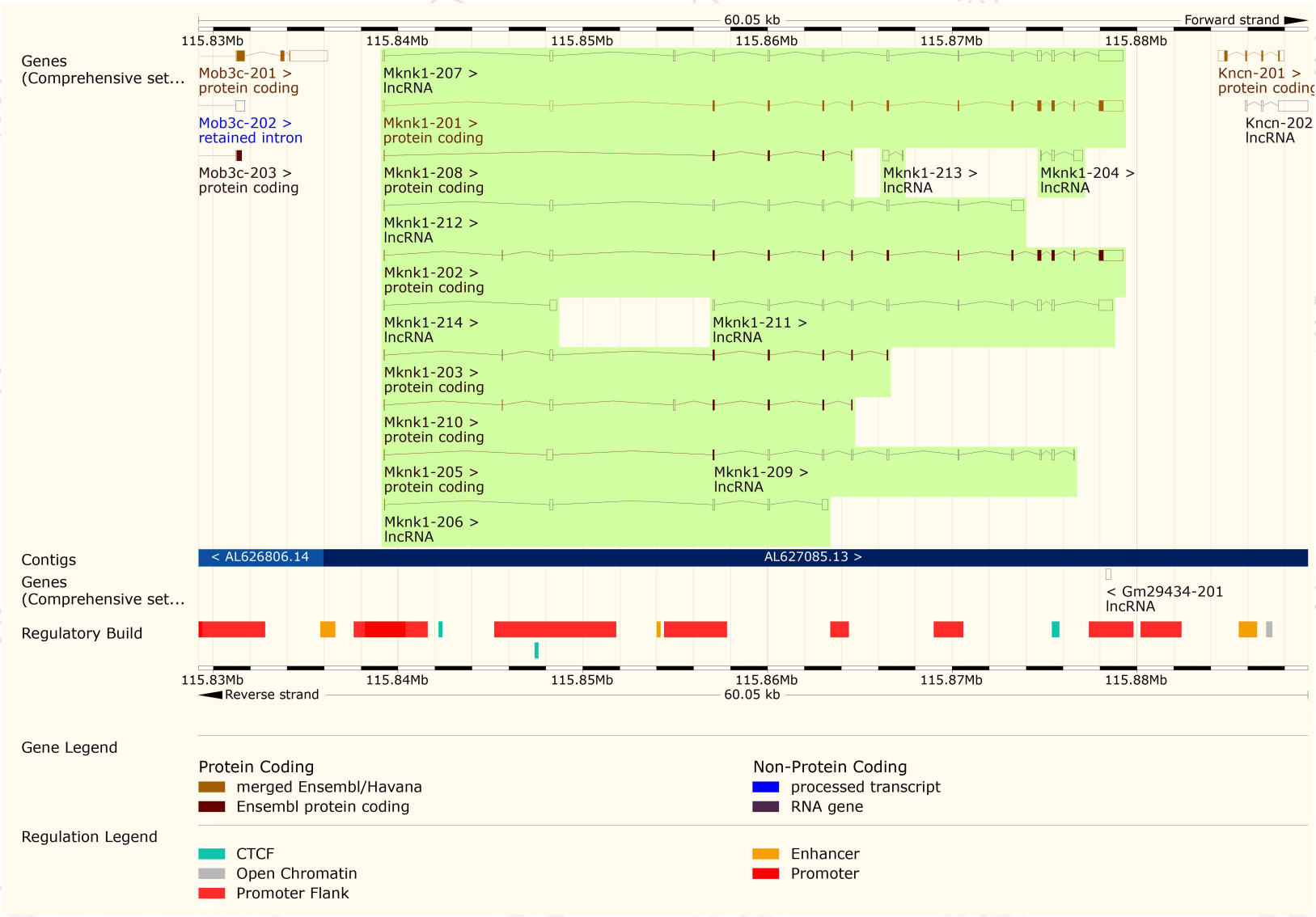
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mknk1-202	ENSMUST00000106513.9	2552	415aa	Protein coding	CCDS18498	A2A8W8	TSL:1 GENCODE basic APPRIS P1
Mknk1-201	ENSMUST0000019677.11	2543	415aa	Protein coding	CCDS18498	A2A8W8	TSL:1 GENCODE basic APPRIS P1
Mknk1-210	ENSMUST00000151203.7	679	114aa	Protein coding	-	F6YIU3	CDS 3' incomplete TSL:3
Mknk1-203	ENSMUST00000130819.7	659	141aa	Protein coding	-	F6VT22	CDS 3' incomplete TSL:3
Mknk1-205	ENSMUST00000140315.1	415	21aa	Protein coding	-	F7B478	CDS 3' incomplete TSL:2
Mknk1-208	ENSMUST00000144427.7	366	101aa	Protein coding	-	F6Y5U1	CDS 3' incomplete TSL:5
Mknk1-207	ENSMUST00000144235.7	2575	No protein	lncRNA	-	-	TSL:5
Mknk1-211	ENSMUST00000152888.7	1686	No protein	lncRNA	-	-	TSL:5
Mknk1-212	ENSMUST00000153766.7	1377	No protein	lncRNA	-	-	TSL:1
Mknk1-209	ENSMUST00000150201.7	788	No protein	lncRNA	-	-	TSL:5
Mknk1-204	ENSMUST00000135209.1	681	No protein	lncRNA	-	-	TSL:3
Mknk1-206	ENSMUST00000140585.7	650	No protein	lncRNA	-	-	TSL:2
Mknk1-214	ENSMUST00000155412.7	409	No protein	lncRNA	-	-	TSL:1
Mknk1-213	ENSMUST00000154957.1	332	No protein	lncRNA	-	-	TSL:3

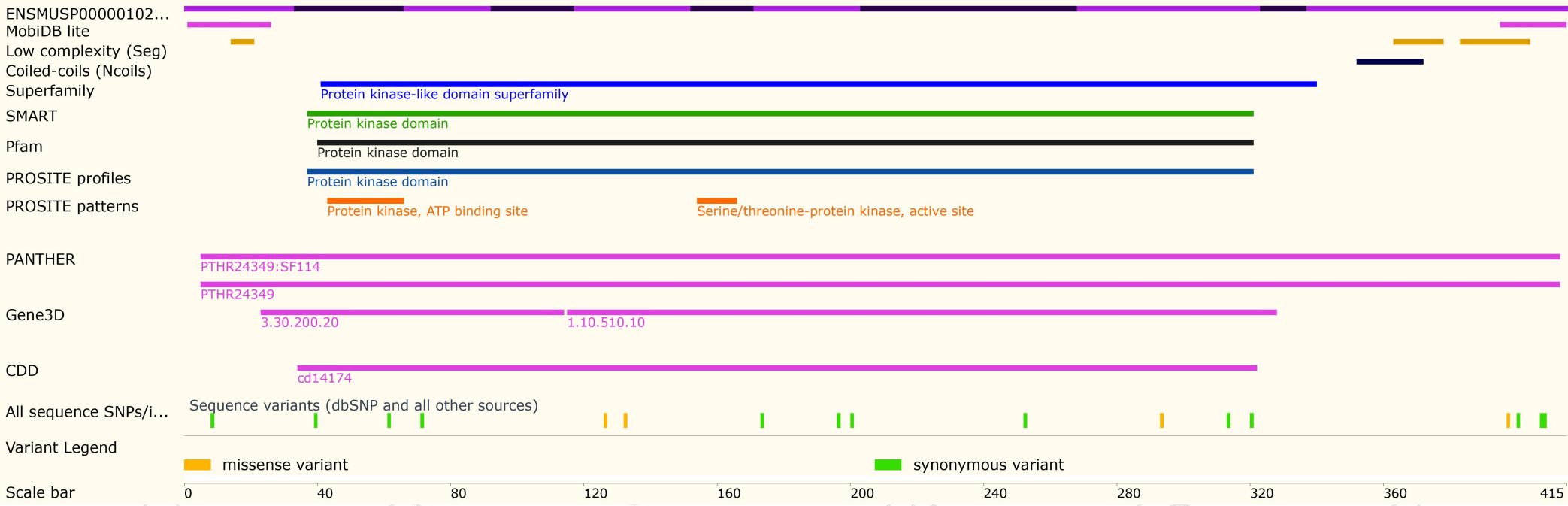
The strategy is based on the design of *Mknk1-202* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

Tel: 400-9660890

