Mknk2 Cas9-KO Strategy

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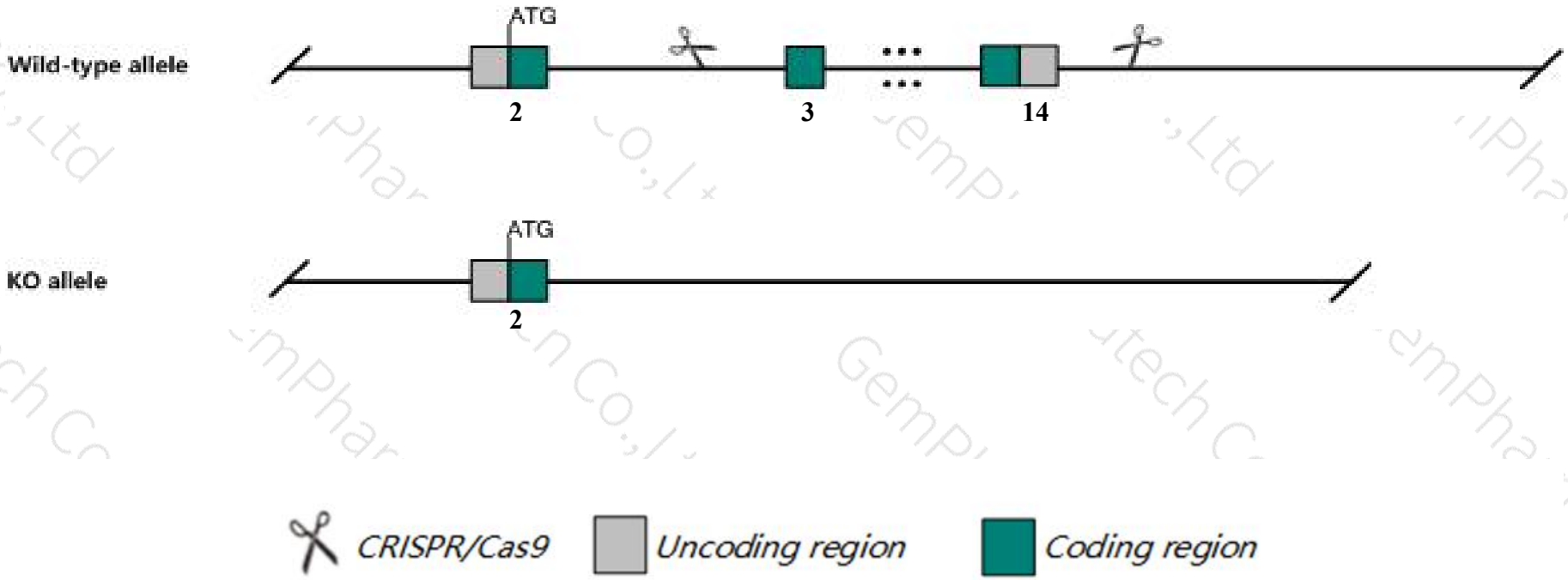
Project Overview

Project Name	***Mknk2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mknk2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Mknk2* gene has 5 transcripts. According to the structure of *Mknk2* gene, exon3-exon14 of *Mknk2-205* (ENSMUST00000200082.4) transcript is recommended as the knockout region.The region contains most of the coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mknk2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

➢ According to the existing MGI data,Homozygous null mice are viable and fertile with no gross abnormalities.

➢ The *Mknk2* gene is located on the Chr10. 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）

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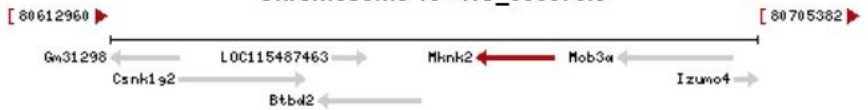
Mknk2 MAP kinase-interacting serine/threonine kinase 2 [*Mus musculus* (house mouse)]

Gene ID: 17347, updated on 12-Aug-2019

Summary

Official Symbol	Mknk2 provided by MGI
Official Full Name	MAP kinase-interacting serine/threonine kinase 2 provided by MGI
Primary source	MGI:MGI:894279
See related	Ensembl:ENSMUSG00000020190
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	Mnk2; Gprk7; 2010016G11Rik
Summary	The protein encoded by this gene is a serine/threonine-protein kinase, which is targeted by both the extracellular signal-regulated kinase and p38 mitogen-activated protein kinase pathways. This enzyme targets several substrates including eukaryotic translation initiation factor 4E and mammalian target of rapamycin, which are negatively regulated by its phosphorylation. Null mutant mice do not exhibit developmental or reproductive defects. However, mice null for both this protein and mitogen-activated protein kinase-interacting serine/threonine protein kinase 1 have delayed tumor development in phosphatase and tensin homolog mutant mice, indicating an oncogenic function for this gene in tumor development. [provided by RefSeq, Oct 2014]
Expression	Broad expression in mammary gland adult (RPKM 326.2), subcutaneous fat pad adult (RPKM 252.6) and 25 other tissues See more
Orthologs	human all

Chromosome 10 - NC_000076.6

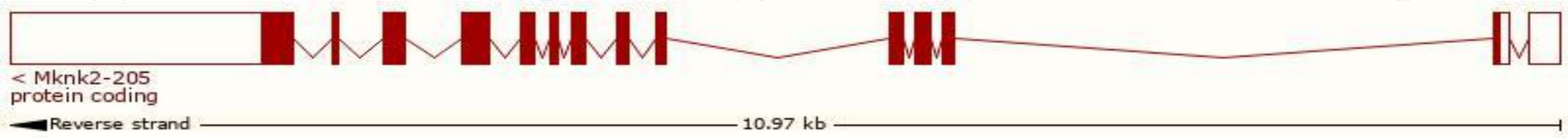


Transcript information（Ensembl）

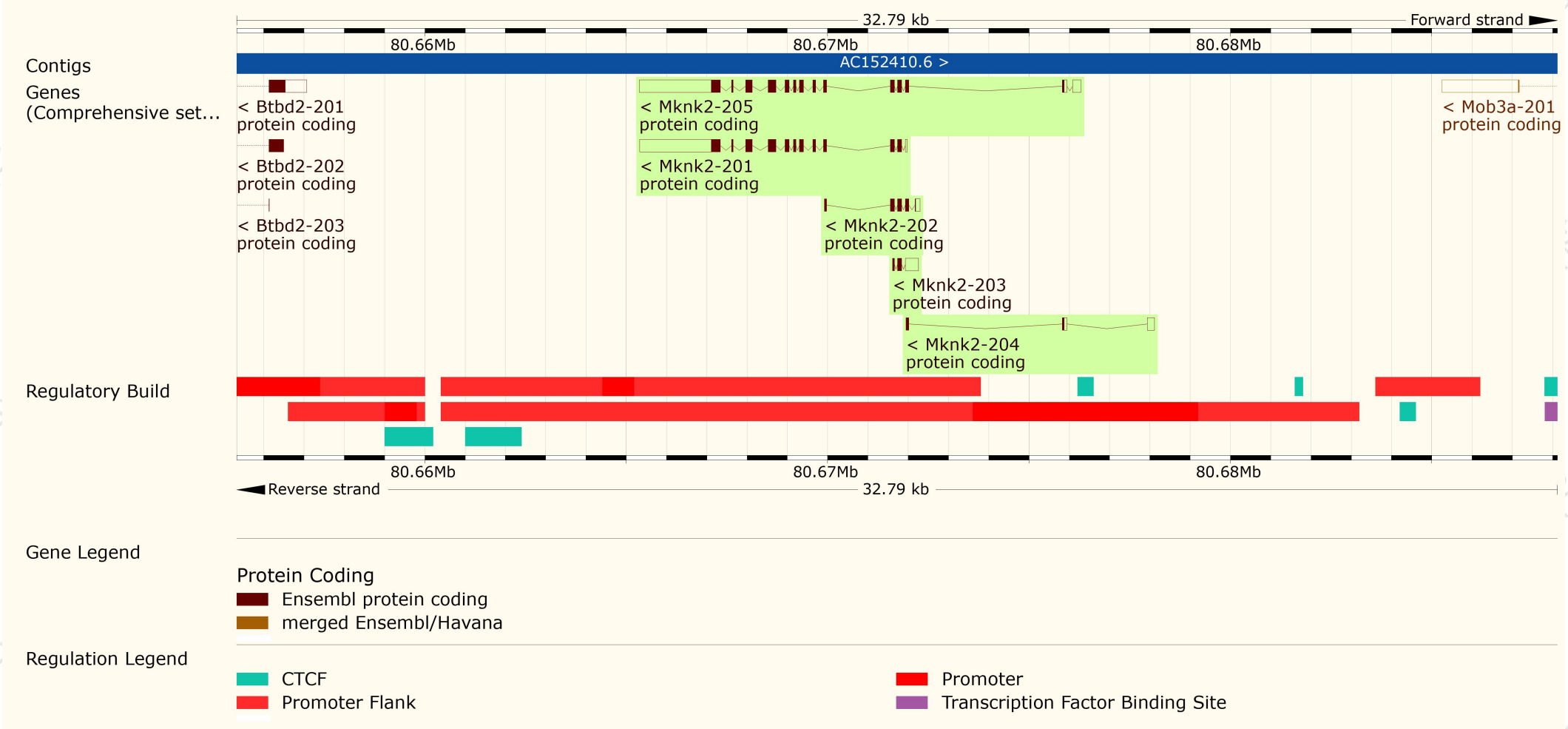
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Mknk2-205	ENSMUST00000200082.4	3439	459aa	ENSMUSP00000143508.1	Protein coding	CCDS24030	Q8CDB0	TSL:1 GENCODE basic APPRIS P2
Mknk2-201	ENSMUST00000003433.10	3065	412aa	ENSMUSP00000003433.6	Protein coding	-	A0A0R4IZX7	TSL:1 GENCODE basic APPRIS ALT2
Mknk2-203	ENSMUST00000198819.1	473	49aa	ENSMUSP00000142388.1	Protein coding	-	A0A0G2JDJ0	CDS 3' incomplete TSL:5
Mknk2-202	ENSMUST00000197276.1	463	118aa	ENSMUSP00000143679.1	Protein coding	-	A0A0G2JGS6	CDS 3' incomplete TSL:3
Mknk2-204	ENSMUST00000199949.1	364	40aa	ENSMUSP00000143655.1	Protein coding	-	A0A0G2JGQ2	CDS 3' incomplete TSL:3

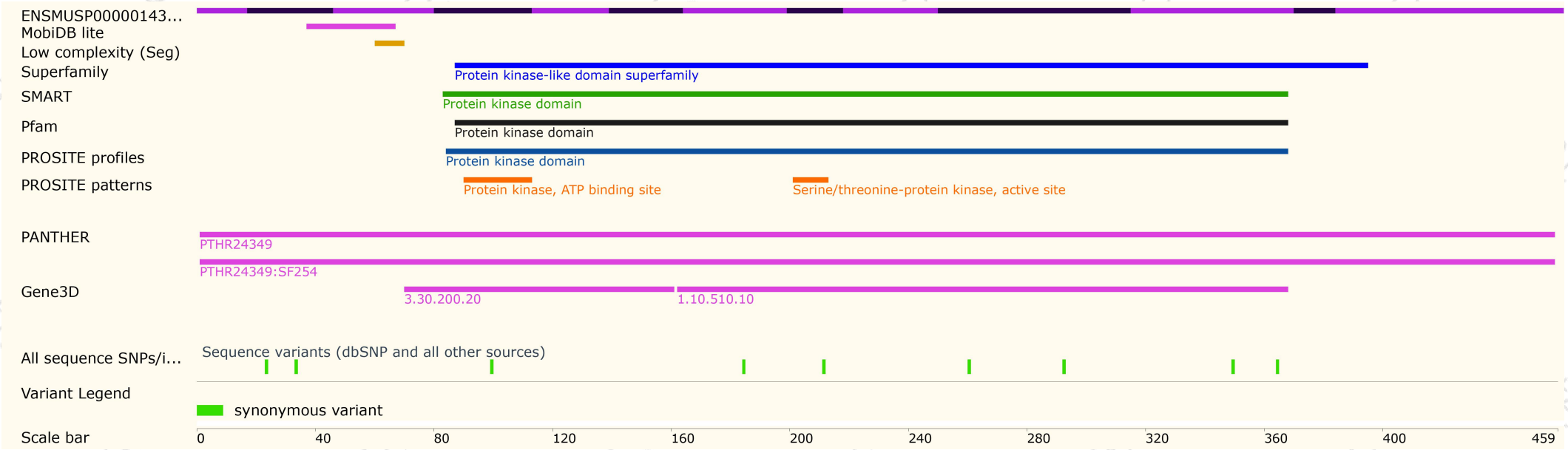
The strategy is based on the design of *Mknk2-205* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

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