

Pi4ka Cas9-CKO Strategy

Designer:

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Design Date:

2019-8-19

Project Overview

Project Name

Pi4ka

Project type

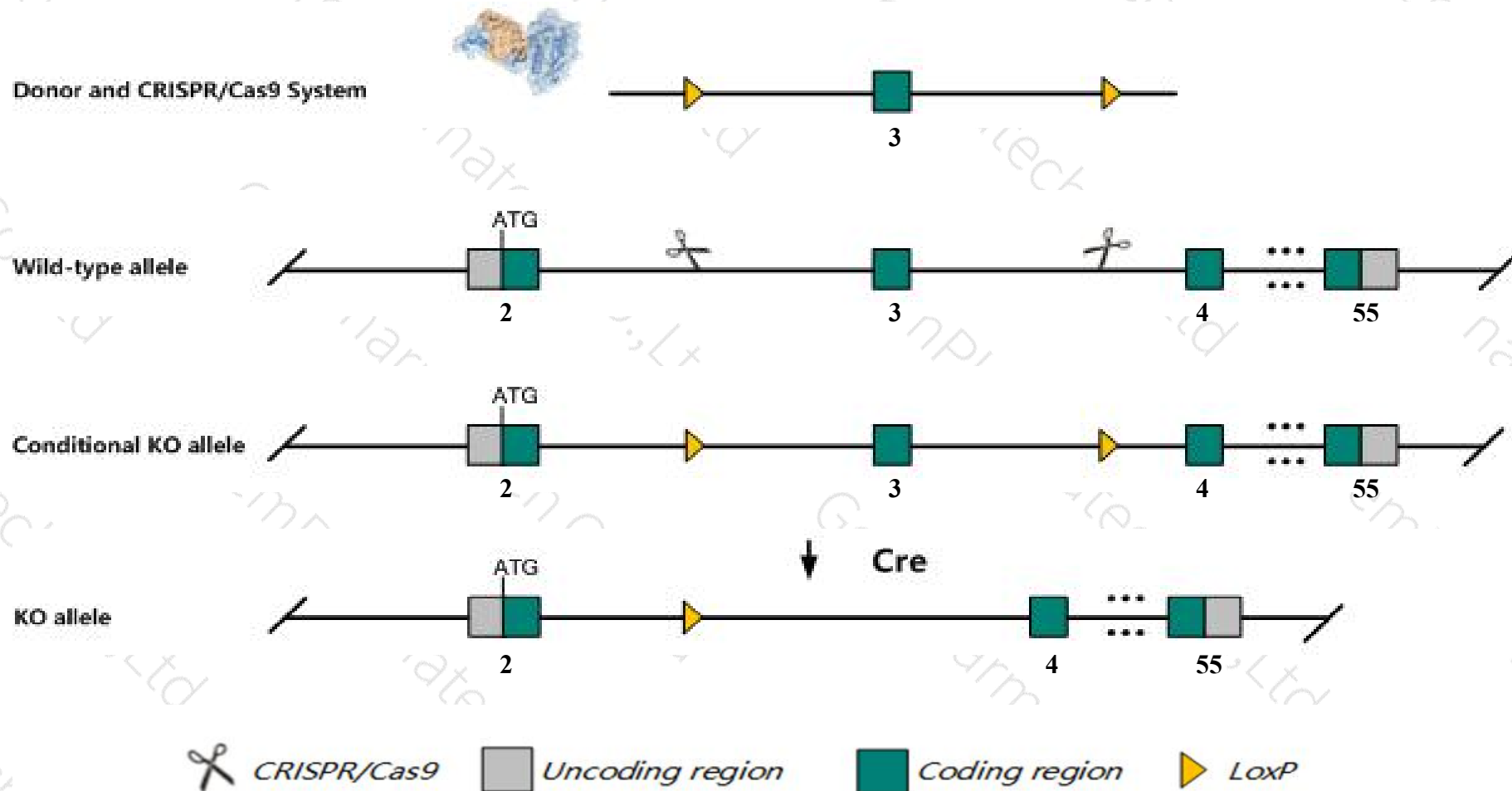
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pi4ka* gene. The schematic diagram is as follows:



- The *Pi4ka* gene has 11 transcripts. According to the structure of *Pi4ka* gene, exon3 of *Pi4ka-209* (ENSMUST00000232232.1) transcript is recommended as the knockout region. The region contains 94bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Pi4ka* 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, Mice homozygous for a targeted knock-out or knock-in conditionally activated exhibit premature death associated with degeneration of mucosal cells in the stomach and intestines. Mice homozygous for a knock-out allele exhibit early embryonic lethality.
- Transcript *Pi4ka-210* may not be affected.
- The *Pi4ka* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Pi4ka phosphatidylinositol 4-kinase alpha [Mus musculus (house mouse)]

Gene ID: 224020, updated on 19-Feb-2019

Summary



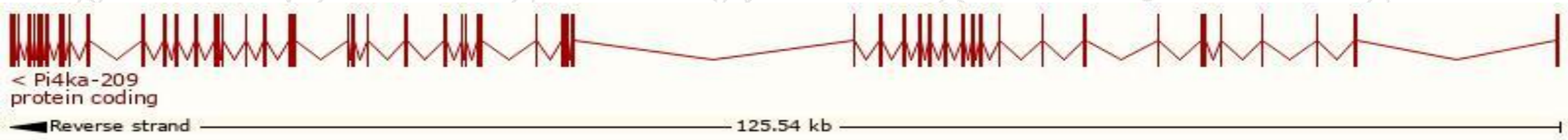
Official Symbol	Pi4ka provided by MGI
Official Full Name	phosphatidylinositol 4-kinase alpha provided by MGI
Primary source	MGI:MGI:2448506
See related	Ensembl:ENSMUSG00000041720
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Pik4ca
Expression	Ubiquitous expression in cortex adult (RPKM 25.4), frontal lobe adult (RPKM 25.2) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

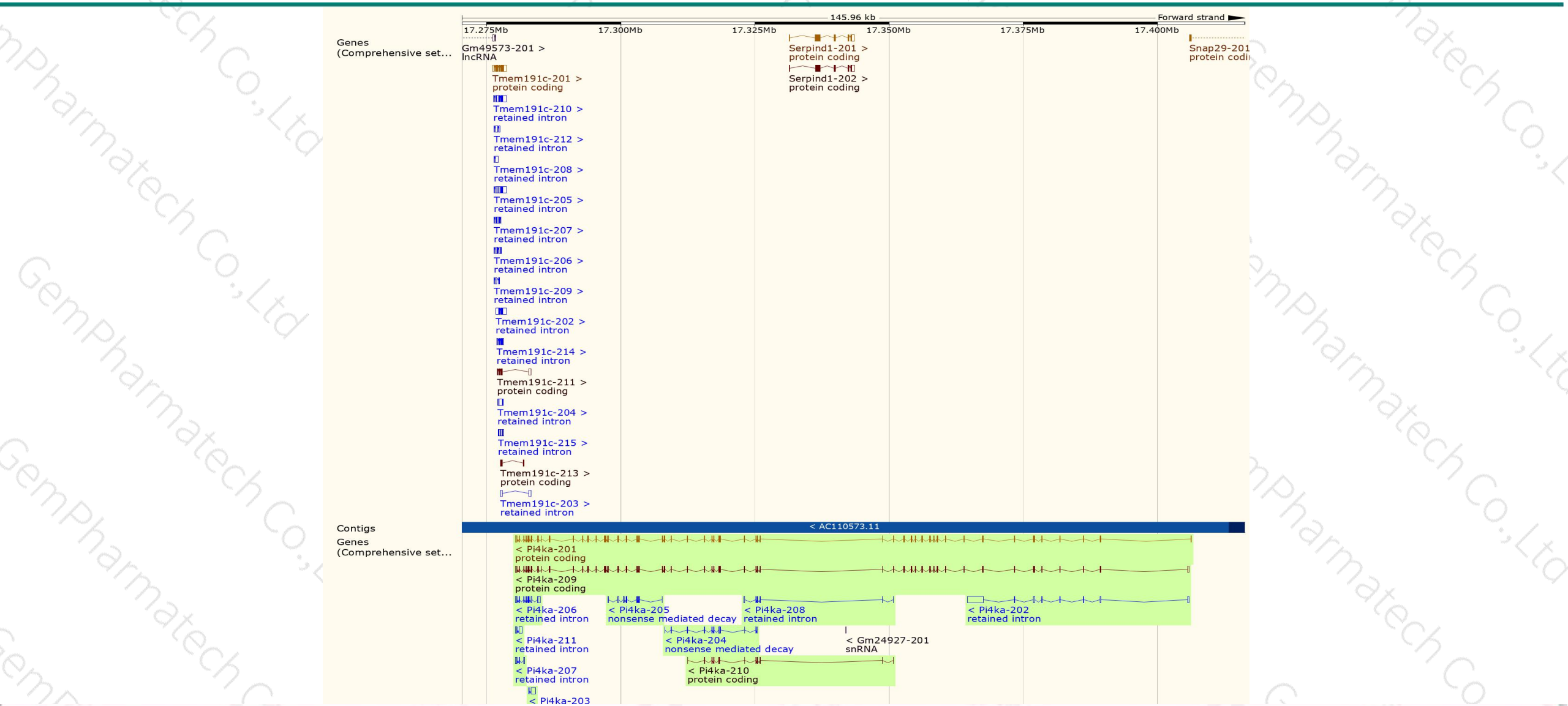
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pi4ka-209	ENSMUST00000232232.1	6630	2044aa	Protein coding	CCDS37271	A0A140T8I9	GENCODE basic APPRIS P1
Pi4ka-201	ENSMUST0000036161.11	6431	2044aa	Protein coding	CCDS37271	A0A140T8I9	TSL:1 GENCODE basic APPRIS P1
Pi4ka-210	ENSMUST00000232404.1	958	319aa	Protein coding	-	A0A338P7D3	CDS 5' and 3' incomplete
Pi4ka-204	ENSMUST00000231651.1	888	74aa	Nonsense mediated decay	-	A0A338P6F9	CDS 5' incomplete
Pi4ka-205	ENSMUST00000231683.1	803	153aa	Nonsense mediated decay	-	A0A338P6S0	CDS 5' incomplete
Pi4ka-202	ENSMUST00000231419.1	3855	No protein	Retained intron	-	-	-
Pi4ka-206	ENSMUST00000231914.1	1504	No protein	Retained intron	-	-	-
Pi4ka-211	ENSMUST00000232631.1	979	No protein	Retained intron	-	-	-
Pi4ka-203	ENSMUST00000231529.1	932	No protein	Retained intron	-	-	-
Pi4ka-207	ENSMUST00000231917.1	669	No protein	Retained intron	-	-	-
Pi4ka-208	ENSMUST00000231961.1	608	No protein	Retained intron	-	-	-

The strategy is based on the design of *Pi4ka-209* transcript,The transcription is shown below



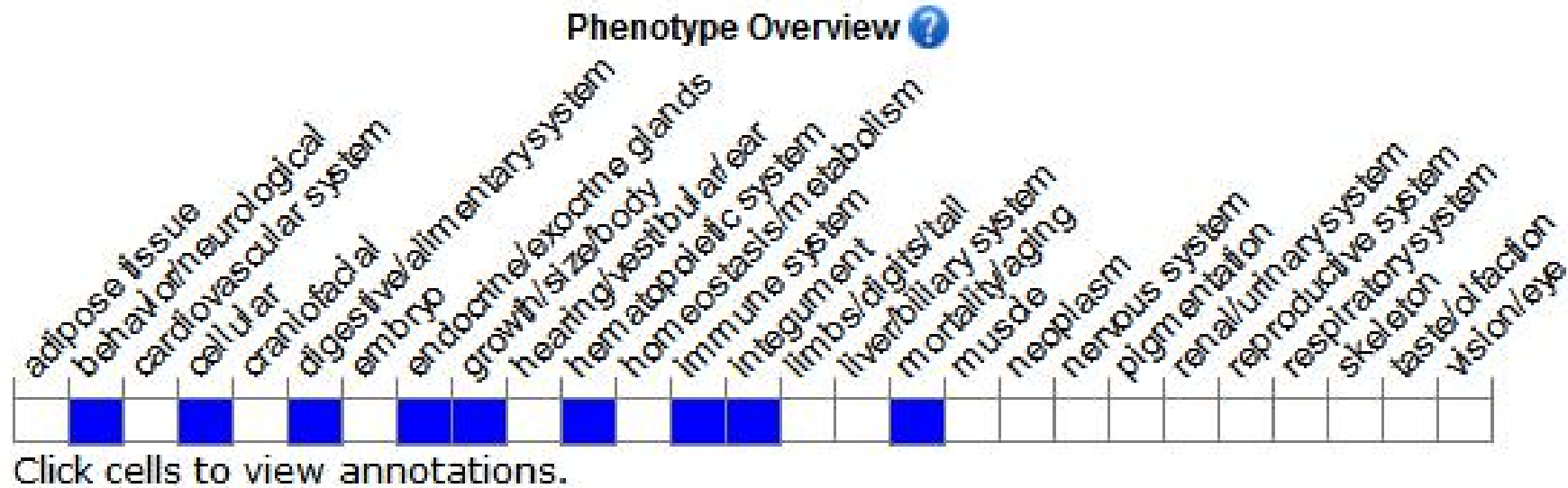
Genomic location distribution



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, Mice homozygous for a targeted knock-out or knock-in conditionally activated exhibit premature death associated with degeneration of mucosal cells in the stomach and intestines. Mice homozygous for a knock-out allele exhibit early embryonic lethality.

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

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