

***Kat14* Cas9-CKO Strategy**

Designer: JiaYu

Reviewer: Xiaojing Li

Design Date: 2020-8-4

Project Overview

Project Name

Kat14

Project type

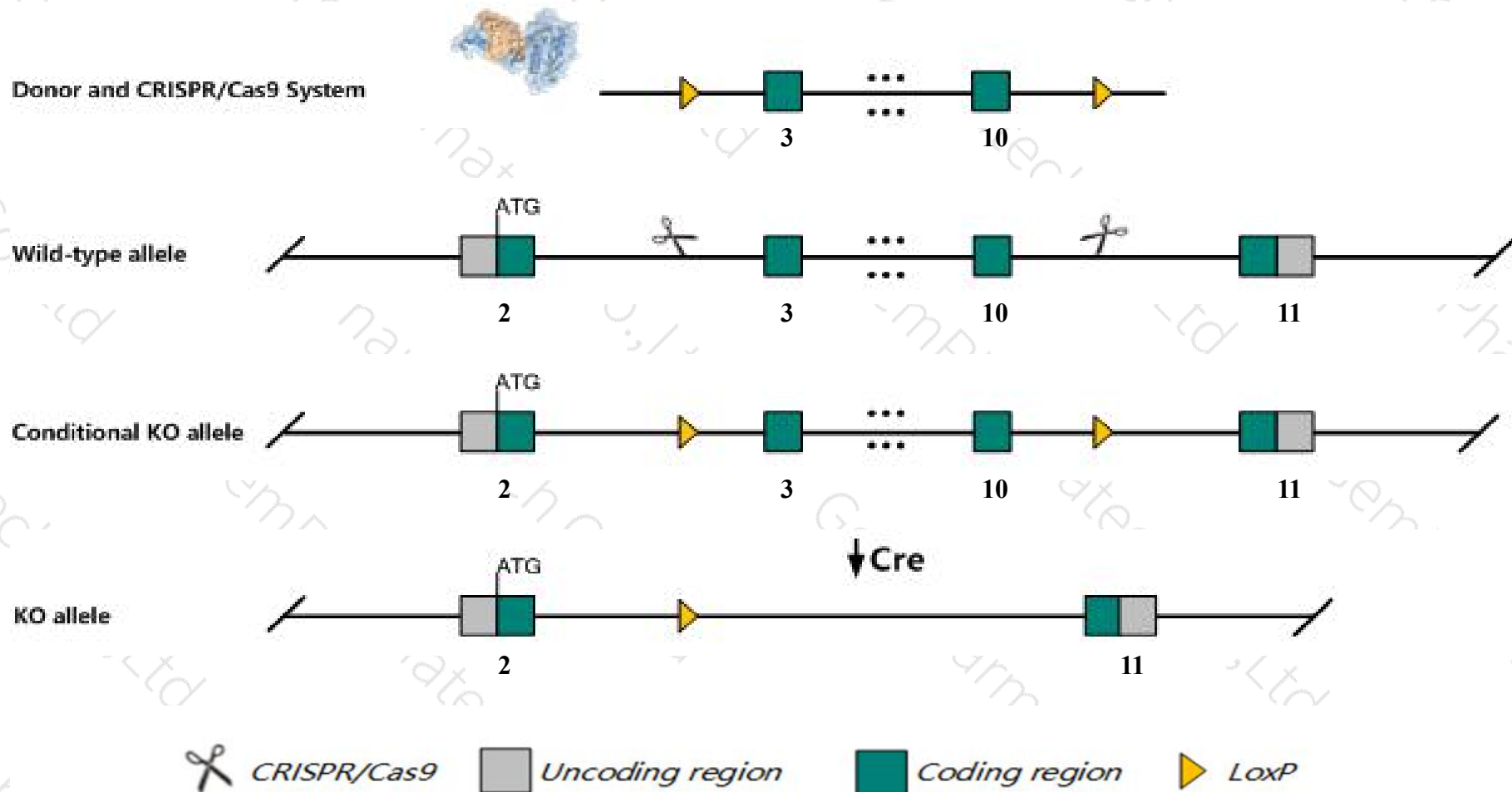
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Kat14* gene. The schematic diagram is as follows:



Technical routes

- The *Kat14* gene has 11 transcripts. According to the structure of *Kat14* gene, exon3-exon10 of *Kat14-201*(ENSMUST00000028911.14) transcript is recommended as the knockout region. The region contains 1907bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Kat14* 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 null allele exhibit embryonic lethality during organogenesis, decreased size, increased apoptosis, and disrupted cell cycling. Mice heterozygous for one targeted allele exhibit corneal opacity.
- The *Kat14* gene is located on the Chr2. 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)

Kat14 lysine acetyltransferase 14 [Mus musculus (house mouse)]

Gene ID: 228714, updated on 13-Mar-2020

Summary



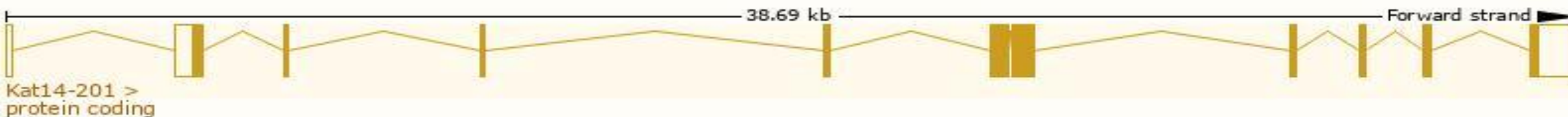
Official Symbol	Kat14 provided by MGI
Official Full Name	lysine acetyltransferase 14 provided by MGI
Primary source	MGI:MGI:1917264
See related	Ensembl:ENSMUSG00000027425
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2510008M08Rik, ATAC2, AU023459, Csrp2bp, D2Ert473e, D2Wsu131e, E430020F17
Expression	Ubiquitous expression in CNS E11.5 (RPKM 11.4), placenta adult (RPKM 8.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

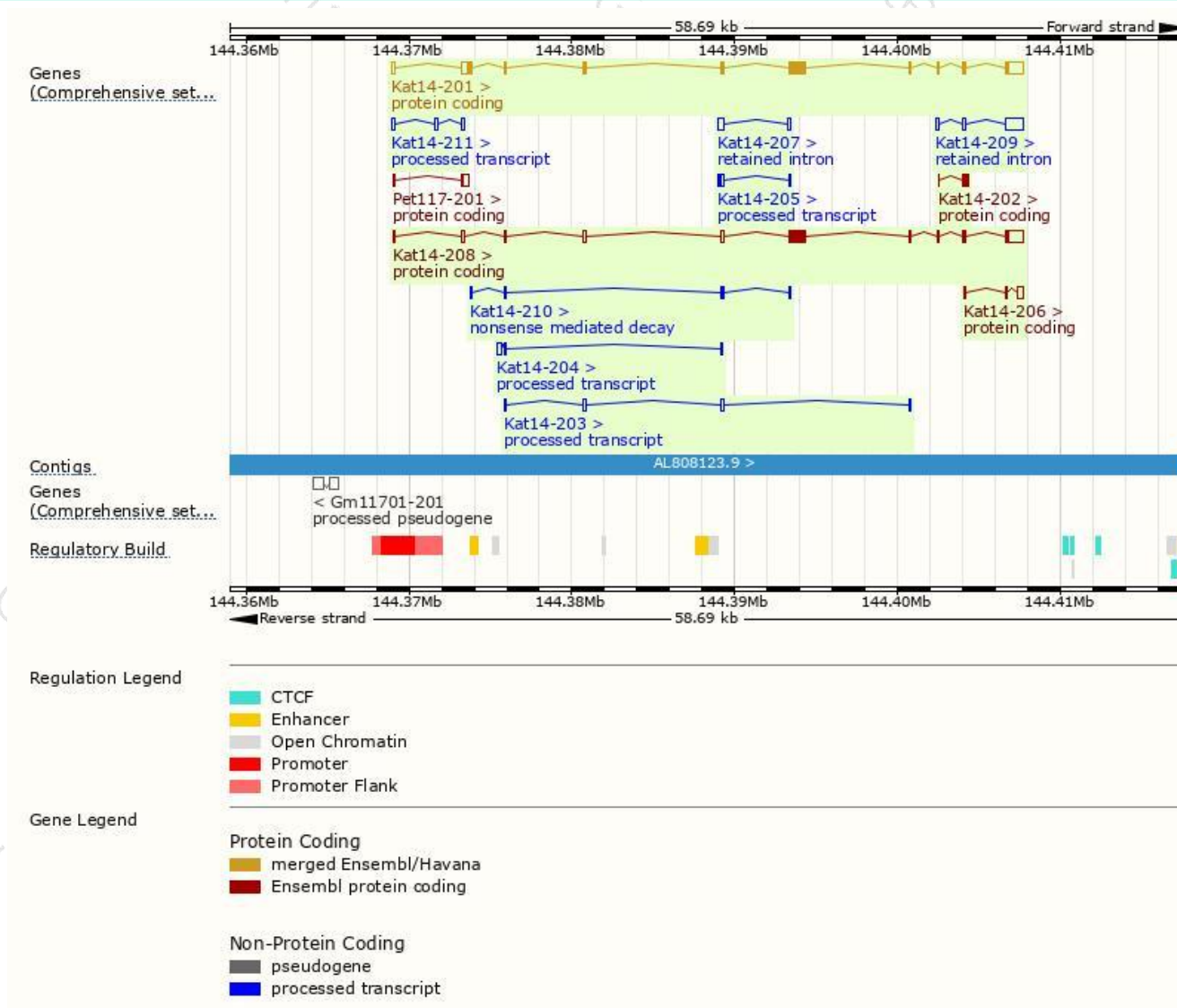
The gene has 11 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Kat14-201	ENSMUST00000028911.14	3801	779aa	Protein coding	CCDS16819	Q8CID0	TSL:1 GENCODE basic APPRIS P1
Kat14-208	ENSMUST00000147747.7	3299	568aa	Protein coding	-	E9QA90	TSL:1 GENCODE basic
Kat14-206	ENSMUST00000139812.1	566	92aa	Protein coding	-	F7C4S8	CDS 5' incomplete TSL:3
Kat14-202	ENSMUST00000125398.2	379	83aa	Protein coding	-	E9Q3Q5	CDS 5' incomplete TSL:3
Kat14-210	ENSMUST00000156410.1	453	97aa	Nonsense mediated decay	-	F6S6Z2	CDS 5' incomplete TSL:3
Kat14-211	ENSMUST00000171261.1	562	No protein	Processed transcript	-	-	TSL:3
Kat14-203	ENSMUST00000130654.7	504	No protein	Processed transcript	-	-	TSL:3
Kat14-204	ENSMUST00000131836.1	478	No protein	Processed transcript	-	-	TSL:3
Kat14-205	ENSMUST00000137611.1	435	No protein	Processed transcript	-	-	TSL:3
Kat14-209	ENSMUST00000148500.1	1468	No protein	Retained intron	-	-	TSL:1
Kat14-207	ENSMUST00000143318.1	567	No protein	Retained intron	-	-	TSL:5

The strategy is based on the design of *Kat14-201* transcript, the transcription is shown below:



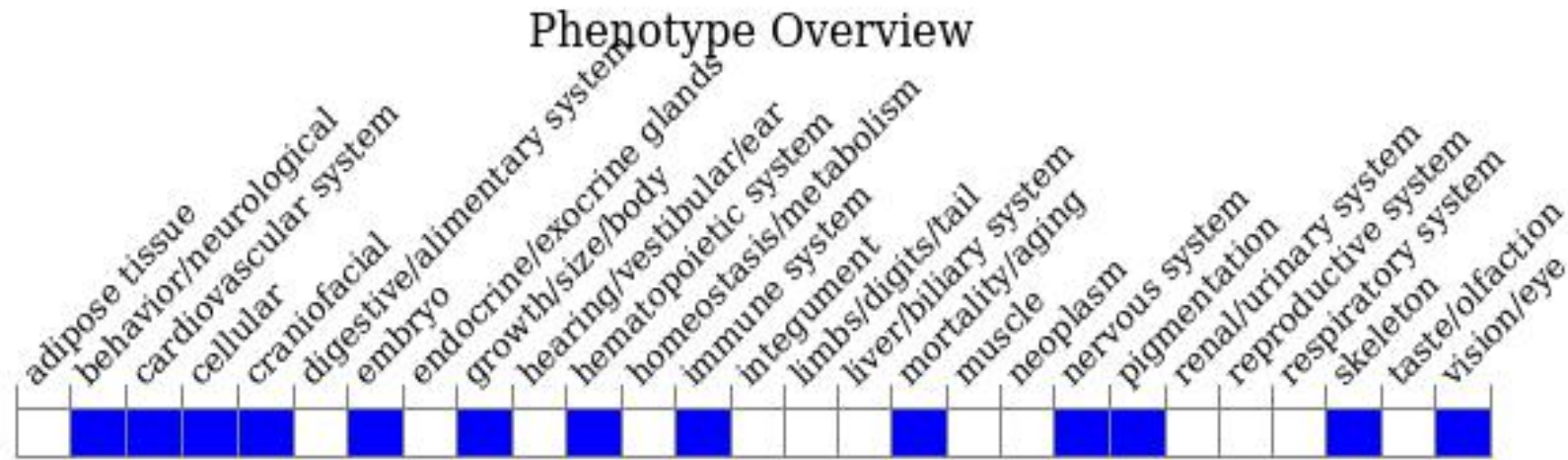
Genomic location distribution



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, mice homozygous for a null allele exhibit embryonic lethality during organogenesis, decreased size, increased apoptosis, and disrupted cell cycling. Mice heterozygous for one targeted allele exhibit corneal opacity.

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

Tel: 400-9660890

