

Irak2 Cas9-CKO Strategy

Designer: Xueting Zhang
Reviewer: Yanhua Shen
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Project Overview

Project Name

Irak2

Project type

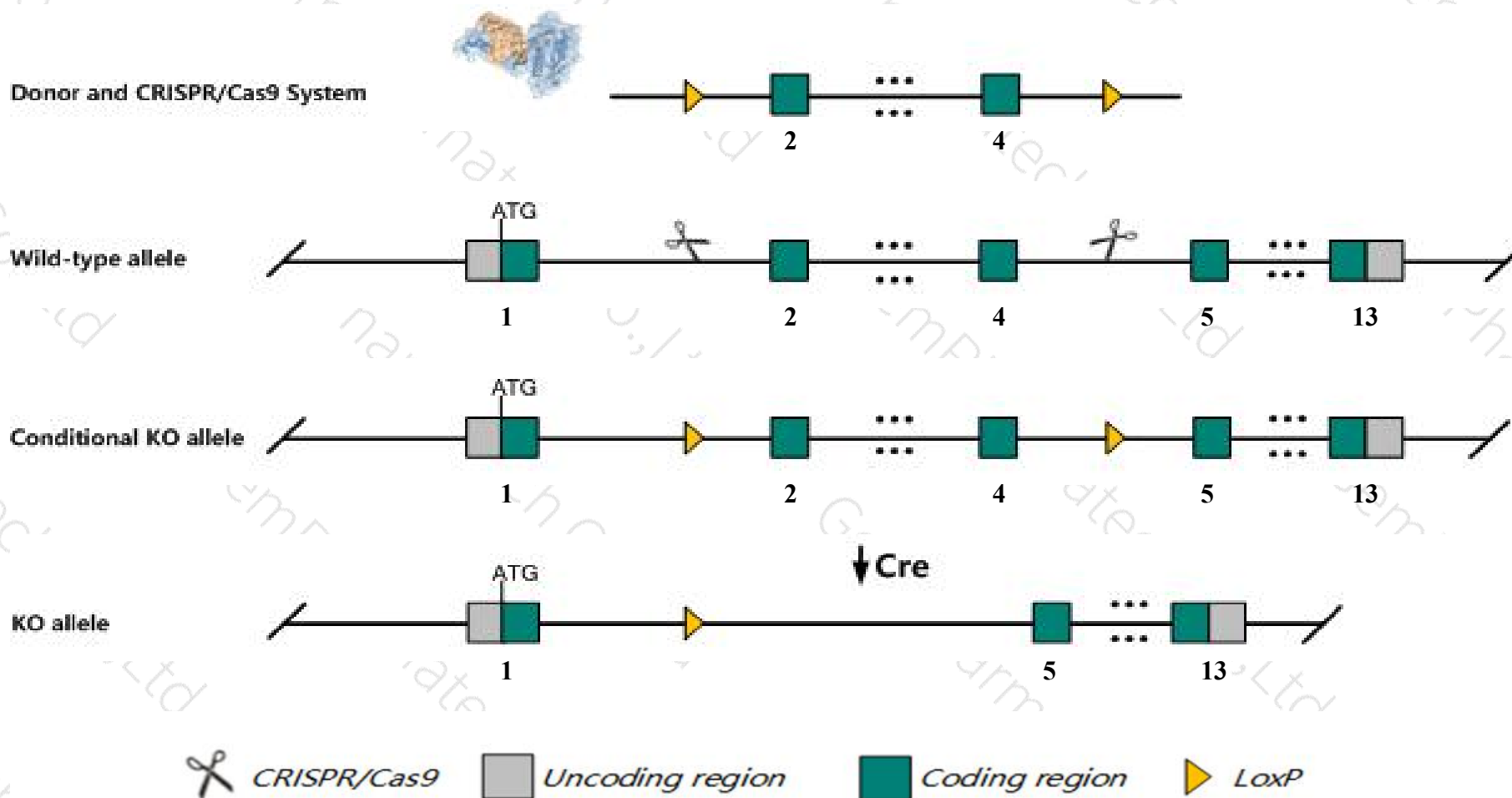
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Irak2* gene. The schematic diagram is as follows:



- The *Irak2* gene has 9 transcripts. According to the structure of *Irak2* gene, exon2-exon4 of *Irak2-201* (ENSMUST00000059286.13) transcript is recommended as the knockout region. The region contains 422bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Irak2* 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 decreased susceptibility to endotoxin shock.
- The floxed region is near to the N-terminal of *Gm43964* gene, this strategy may influence the regulatory function of the N-terminal of *Gm43964* gene.
- Transcript *Irak2-205&207* may not be affected.
- The *Irak2* gene is located on the Chr6. 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)

Irak2 interleukin-1 receptor-associated kinase 2 [Mus musculus (house mouse)]

Gene ID: 108960, updated on 19-Feb-2019

Summary



Official Symbol	Irak2 provided by MGI
Official Full Name	interleukin-1 receptor-associated kinase 2 provided by MGI
Primary source	MGI:MGI:2429603
See related	Ensembl:ENSMUSG00000060477
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	6330415L08Rik, A1649099, IRAK-2
Expression	Ubiquitous expression in small intestine adult (RPKM 18.9), large intestine adult (RPKM 18.3) and 25 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

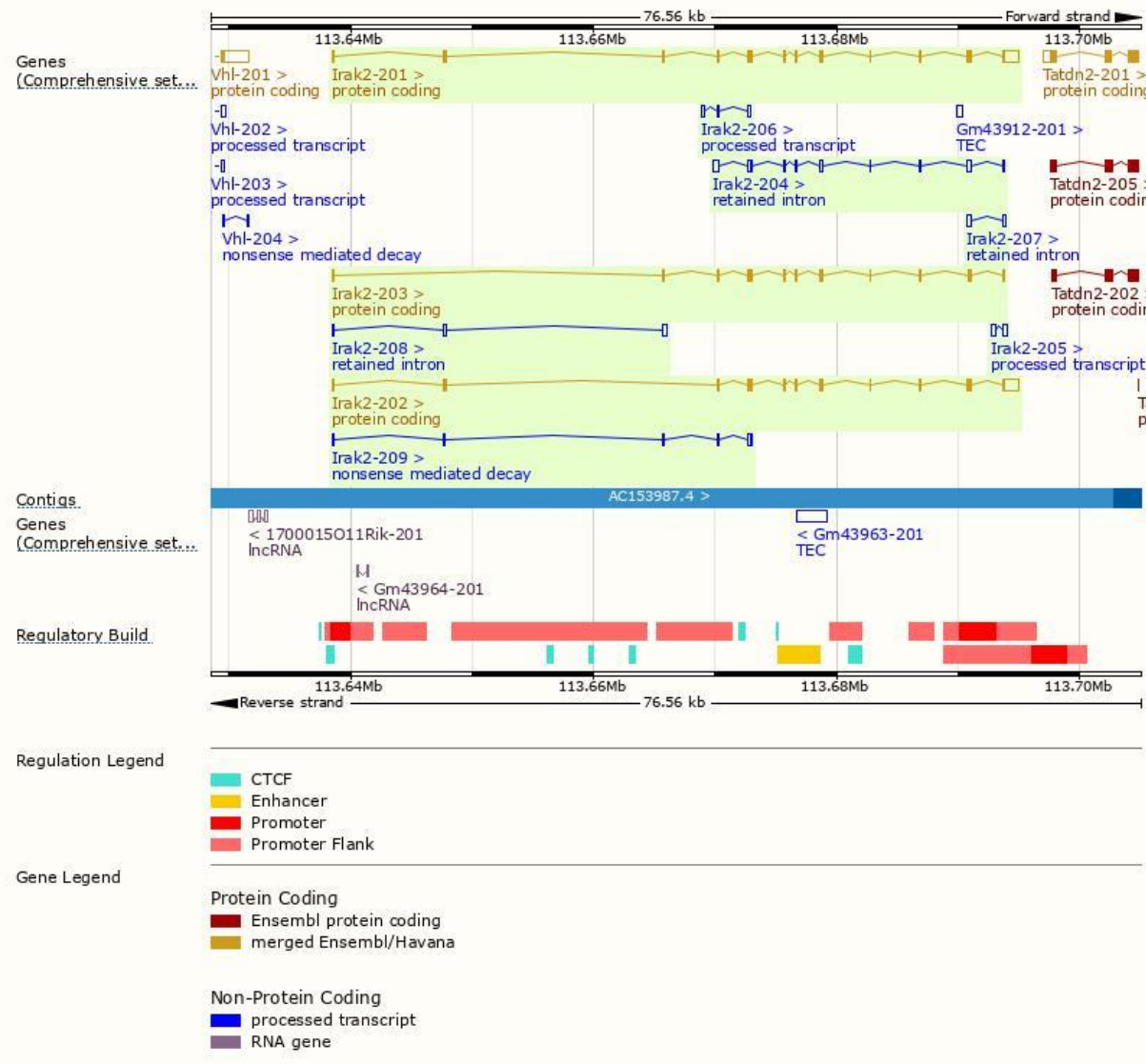
The gene has 9 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Irak2-201	ENSMUST00000059286.13	3196	622aa	Protein coding	CCDS20430	Q8CFA1	TSL:1 GENCODE basic APPRIS P3
Irak2-202	ENSMUST00000089022.8	2974	574aa	Protein coding	CCDS51873	Q8CFA1	TSL:1 GENCODE basic APPRIS ALT2
Irak2-203	ENSMUST00000089023.10	1734	551aa	Protein coding	-	Q8CFA1	TSL:1 GENCODE basic
Irak2-209	ENSMUST00000204744.2	622	70aa	Nonsense mediated decay	-	A0A0N4SUW3	TSL:3
Irak2-204	ENSMUST00000113024.2	1887	No protein	Retained intron	-	-	TSL:1
Irak2-208	ENSMUST00000204091.1	631	No protein	Retained intron	-	-	TSL:2
Irak2-207	ENSMUST00000203381.1	573	No protein	Retained intron	-	-	TSL:2
Irak2-205	ENSMUST00000143948.1	688	No protein	lncRNA	-	-	TSL:3
Irak2-206	ENSMUST00000155554.3	542	No protein	lncRNA	-	-	TSL:5

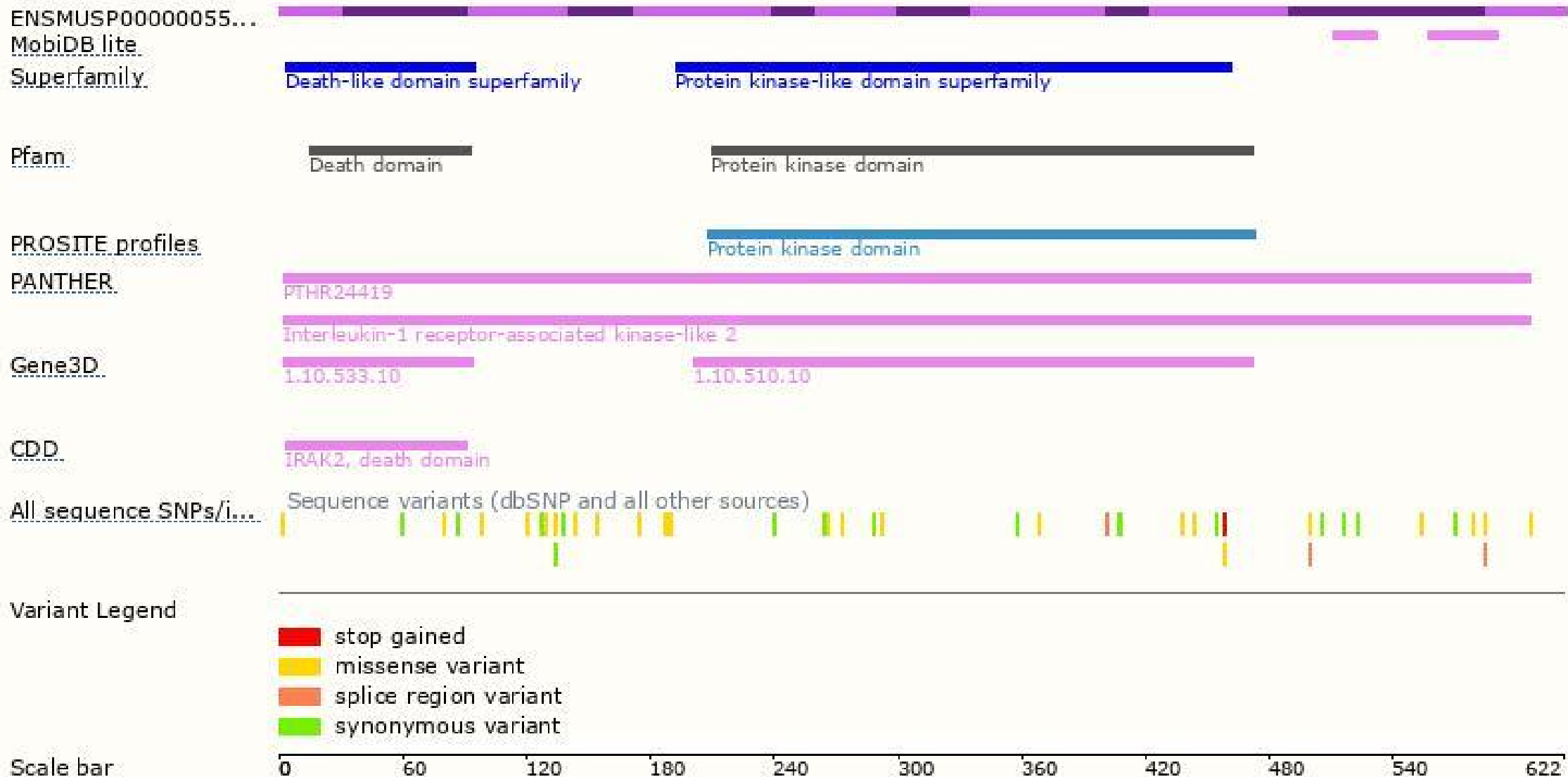
The strategy is based on the design of *Irak2-201* transcript, the transcription is shown below:



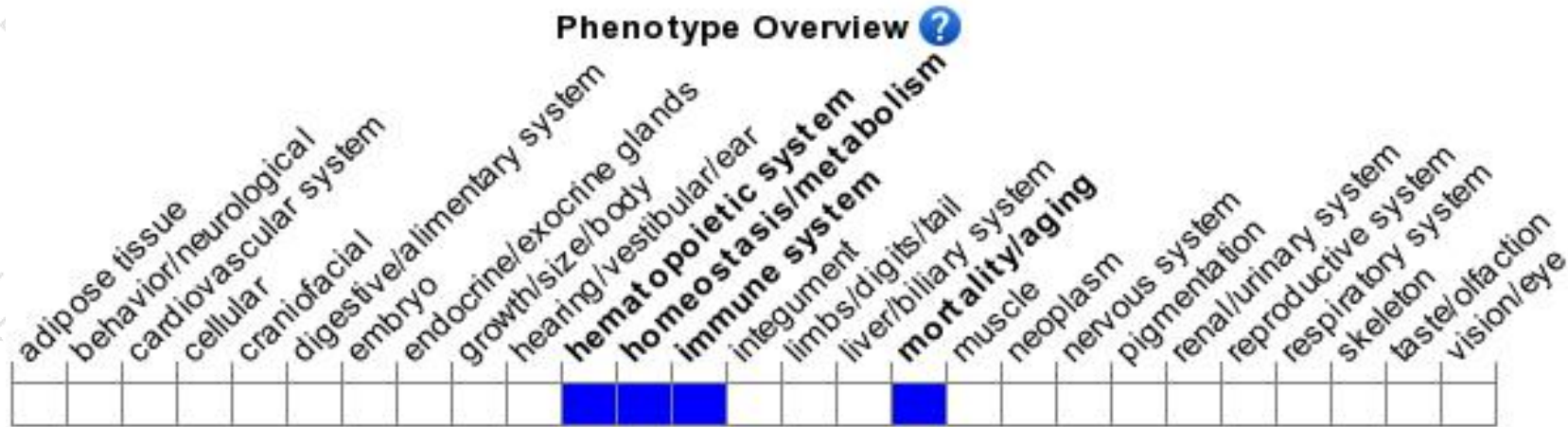
Genomic location distribution



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 decreased susceptibility to endotoxin shock.

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

Tel: 400-9660890

