

Rag1 Cas9-CKO Strategy

Designer:

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Design Date:

2019-7-30

Project Overview

Project Name

Rag1

Project type

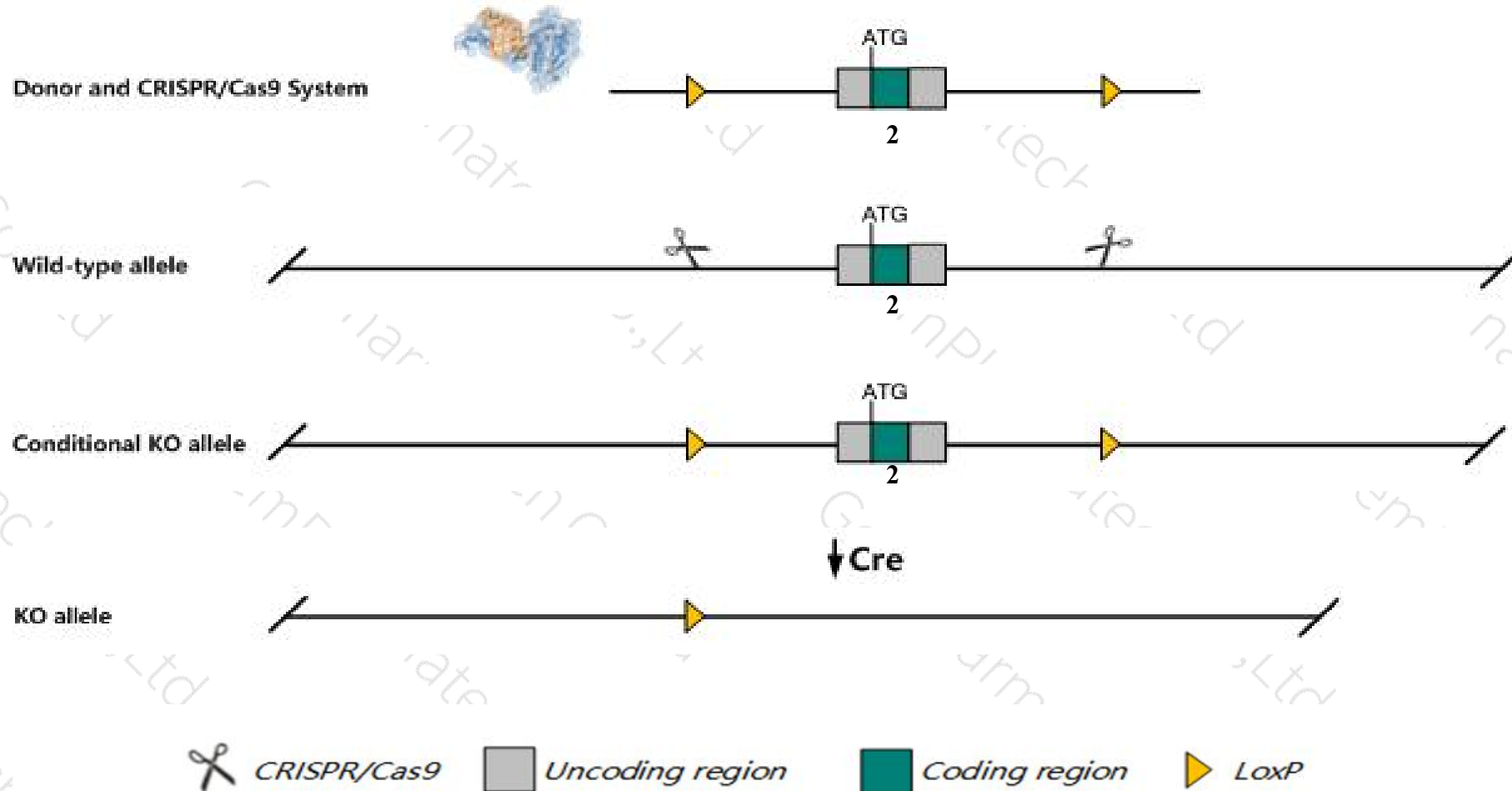
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rag1* gene. The schematic diagram is as follows:



- The *Rag1* gene has 1 transcript. According to the structure of *Rag1* gene, exon2 of *Rag1-201* (ENSMUST00000078494.5) transcript is recommended as the knockout region. The region contains all 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 *Rag1* 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, Homozygotes for targeted null mutations exhibit arrested development of T and B cell maturation at the CD4-8- thymocyte or B220+/CD43+pro-B cell stage due to inability to undergo V(D)J recombination.
- The KO region contains functional region of the *B230118H07Rik* gene. Knockout the region may affect the function of *B230118H07Rik* gene.
- The *Rag1* 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)

Rag1 recombination activating gene 1 [Mus musculus (house mouse)]

Gene ID: 19373, updated on 9-Apr-2019

Summary



Official Symbol	Rag1 provided by MGI
Official Full Name	recombination activating gene 1 provided by MGI
Primary source	MGI:MGI:97848
See related	Ensembl:ENSMUSG00000061311
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	Rag-1
Expression	Restricted expression toward thymus adult (RPKM 117.3) See more
Orthologs	human all

Transcript information (Ensembl)

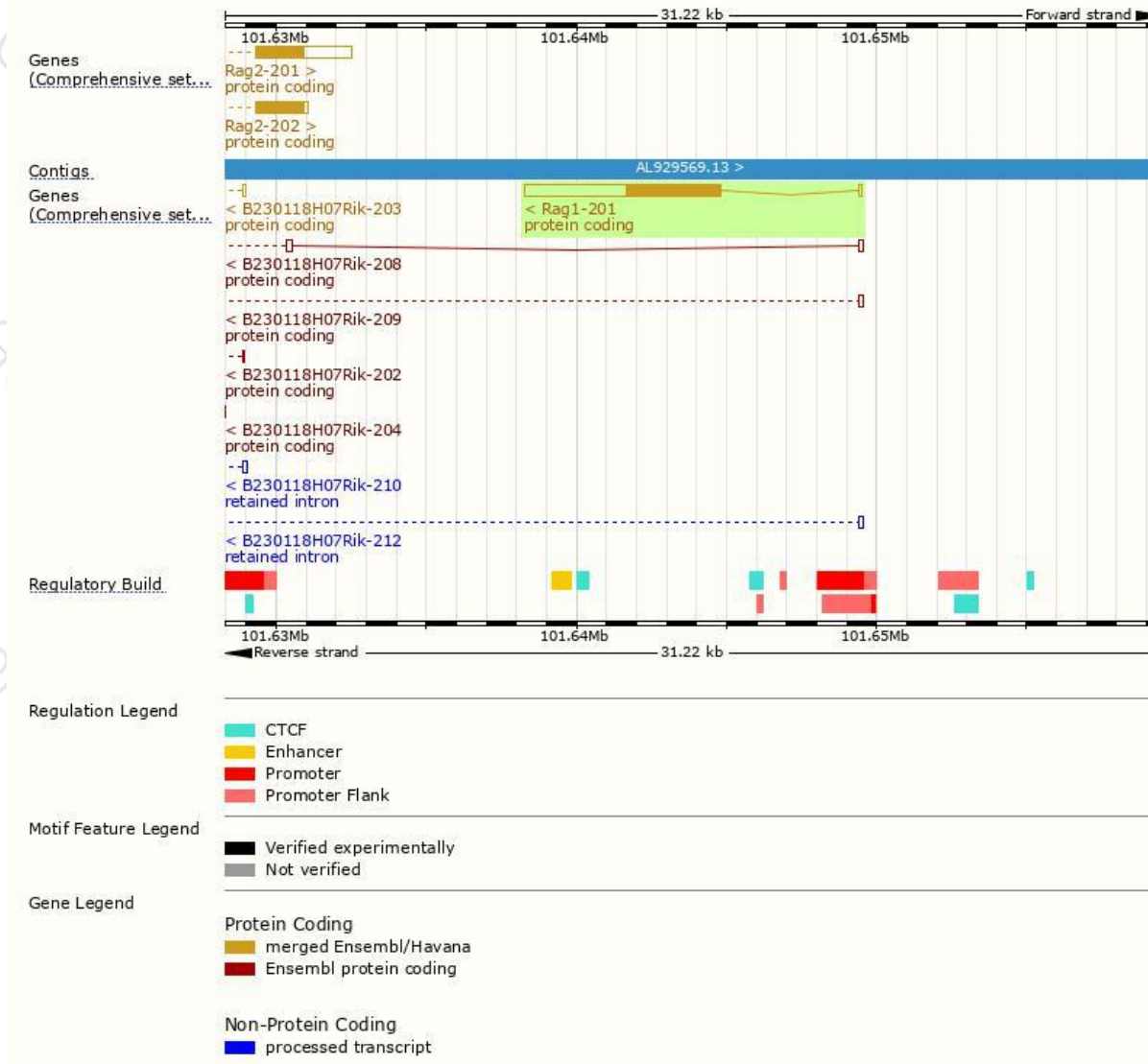
The gene has 1 transcript, and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rag1-201	ENSMUST00000078494.5	6608	1040aa	Protein coding	CCDS16463	P15919	TSL:1 GENCODE basic APPRIS P1

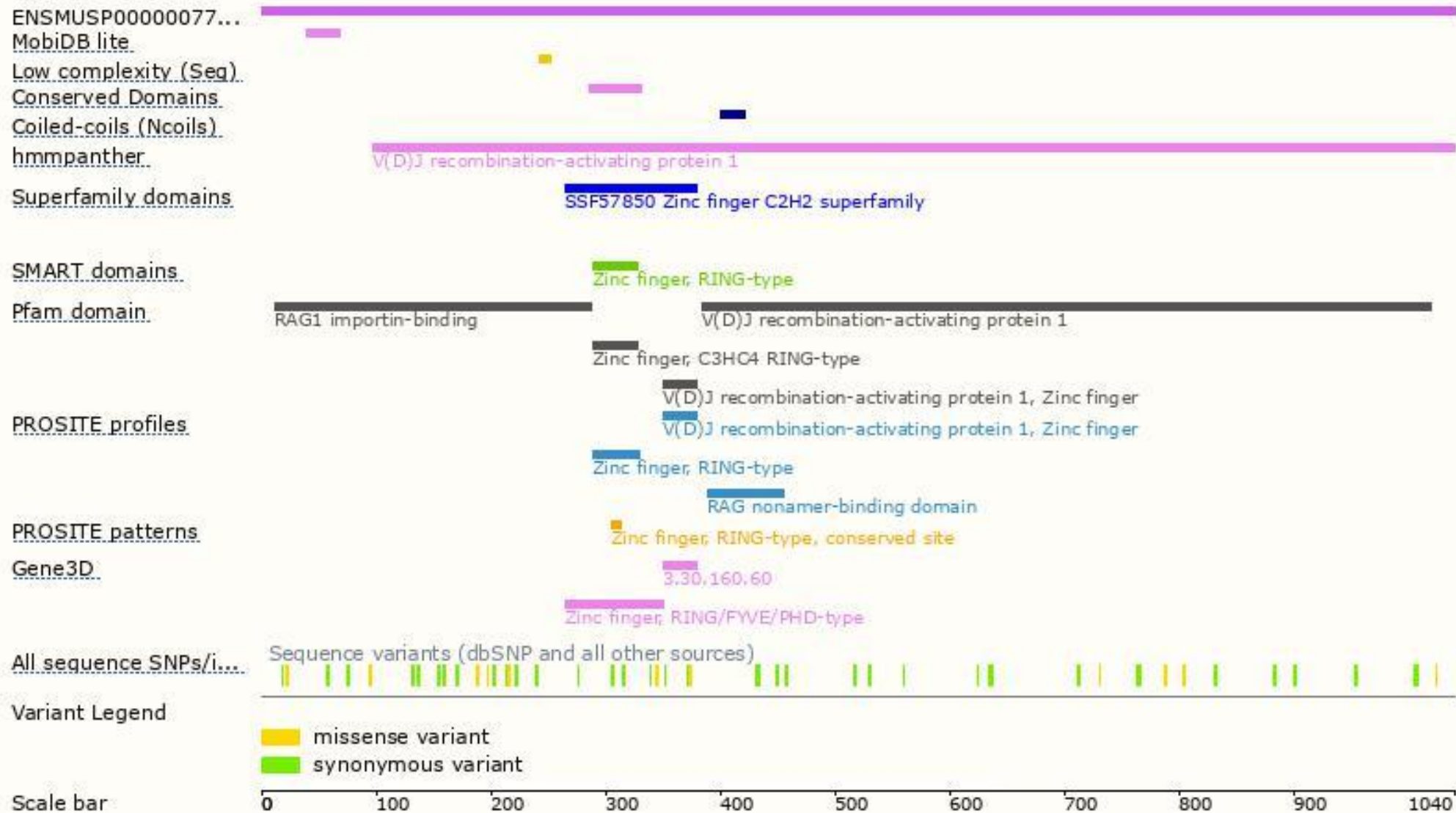
The strategy is based on the design of *Rag1-201* transcript, The transcription is shown below



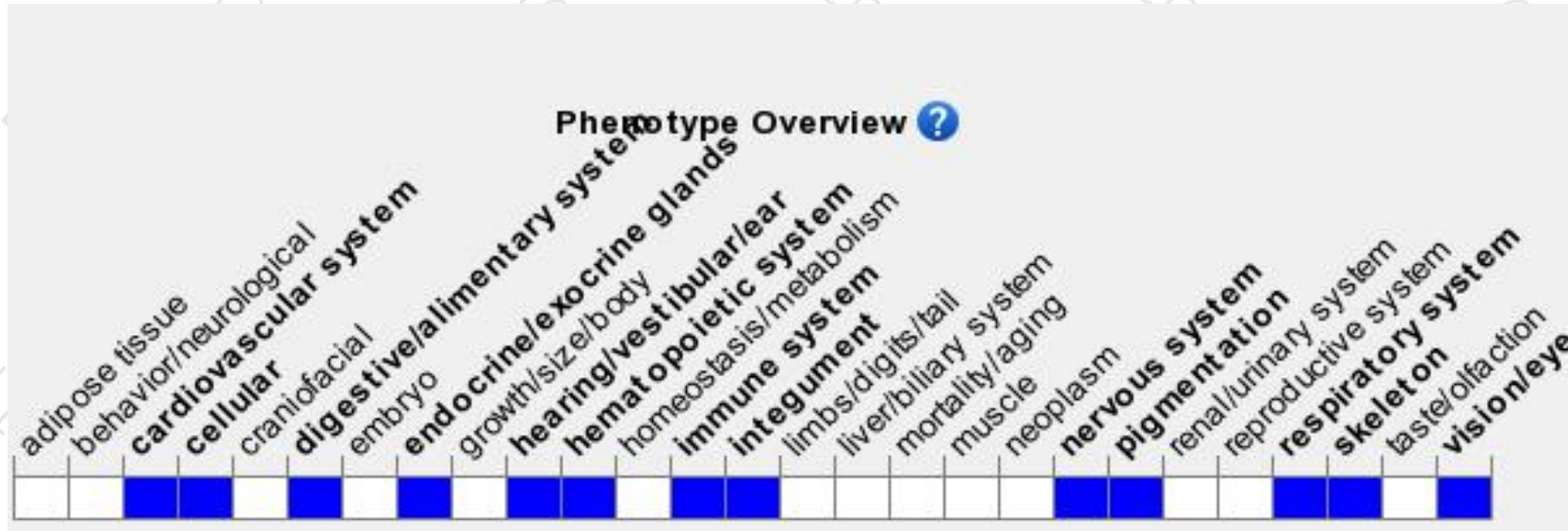
Genomic location distribution



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, Homozygotes for targeted null mutations exhibit arrested development of T and B cell maturation at the CD4-8- thymocyte or B220+/CD43+pro-B cell stage due to inability to undergo V(D)J recombination.

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

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