

Il2ra **Cas9-CKO Strategy**

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Project Overview

Project Name

Il2ra

Project type

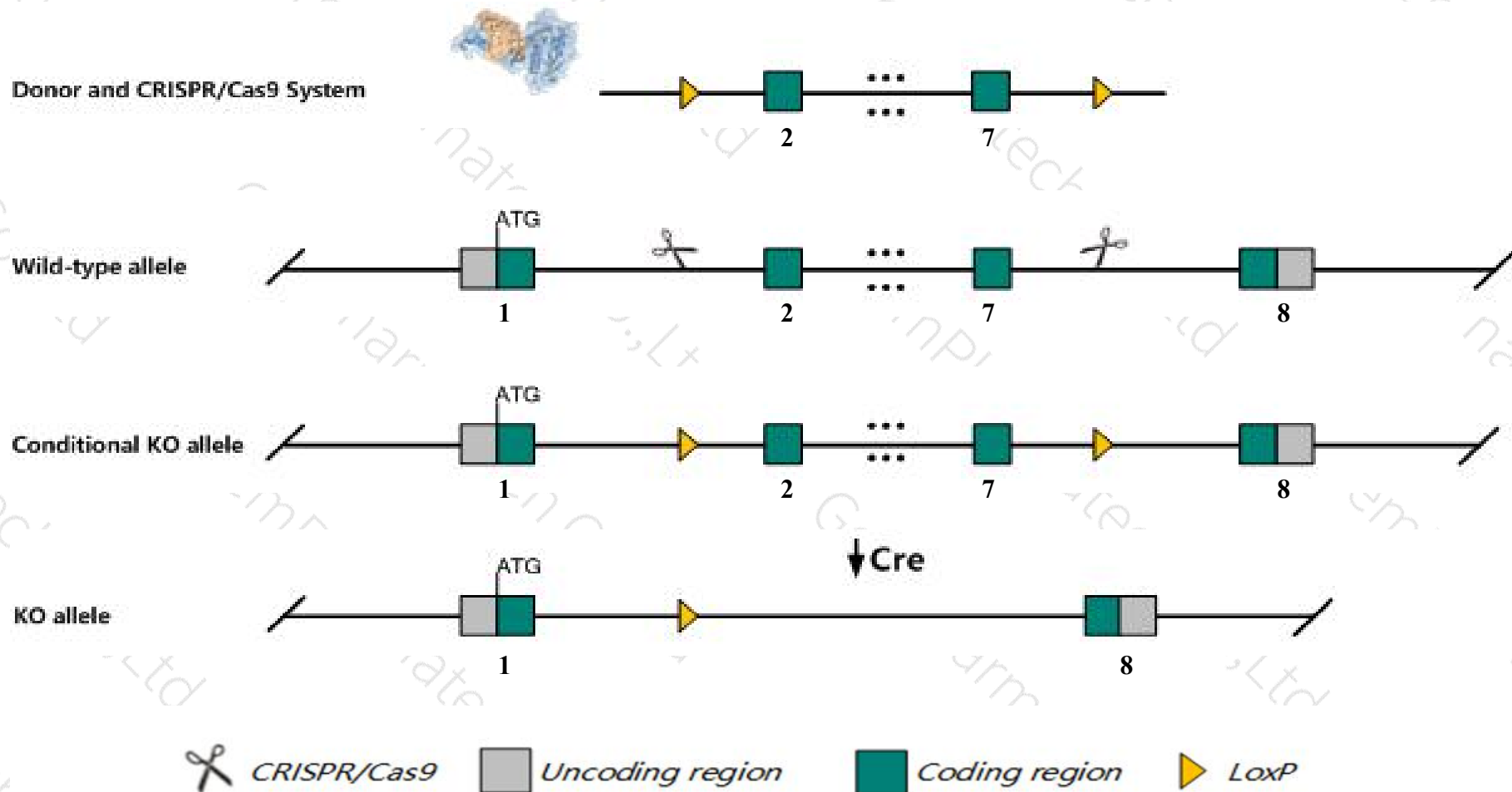
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il2ra* gene. The schematic diagram is as follows:



- The *Il2ra* gene has 3 transcripts. According to the structure of *Il2ra* gene, exon2-exon7 of *Il2ra-201* (ENSMUST00000028111.5) transcript is recommended as the knockout region. The region contains 718bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il2ra* 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 a targeted null mutation exhibit massive proliferation of polyclonal T and B cells as adults and develop autoimmune disorders including inflammatory bowel disease and hemolytic anemia with age.
- The *Il2ra* 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)

Il2ra interleukin 2 receptor, alpha chain [Mus musculus (house mouse)]

Gene ID: 16184, updated on 2-Apr-2019

Summary



Official Symbol	Il2ra provided by MGI
Official Full Name	interleukin 2 receptor, alpha chain provided by MGI
Primary source	MGI:MGI:96549
See related	Ensembl:ENSMUSG00000026770
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	CD25, Il2r, Ly-43
Expression	Biased expression in thymus adult (RPKM 5.6), mammary gland adult (RPKM 1.1) and 2 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Il2ra-201	ENSMUST00000028111.5	4412	268aa	Protein coding	CCDS15685	P01590 Q544I2	TSL:1 GENCODE basic APPRIS P1
Il2ra-202	ENSMUST00000150890.2	1013	44aa	Protein coding	-	Q3THW2	TSL:1 GENCODE basic
Il2ra-203	ENSMUST00000195427.1	502	No protein	Retained intron	-	-	TSL:NA

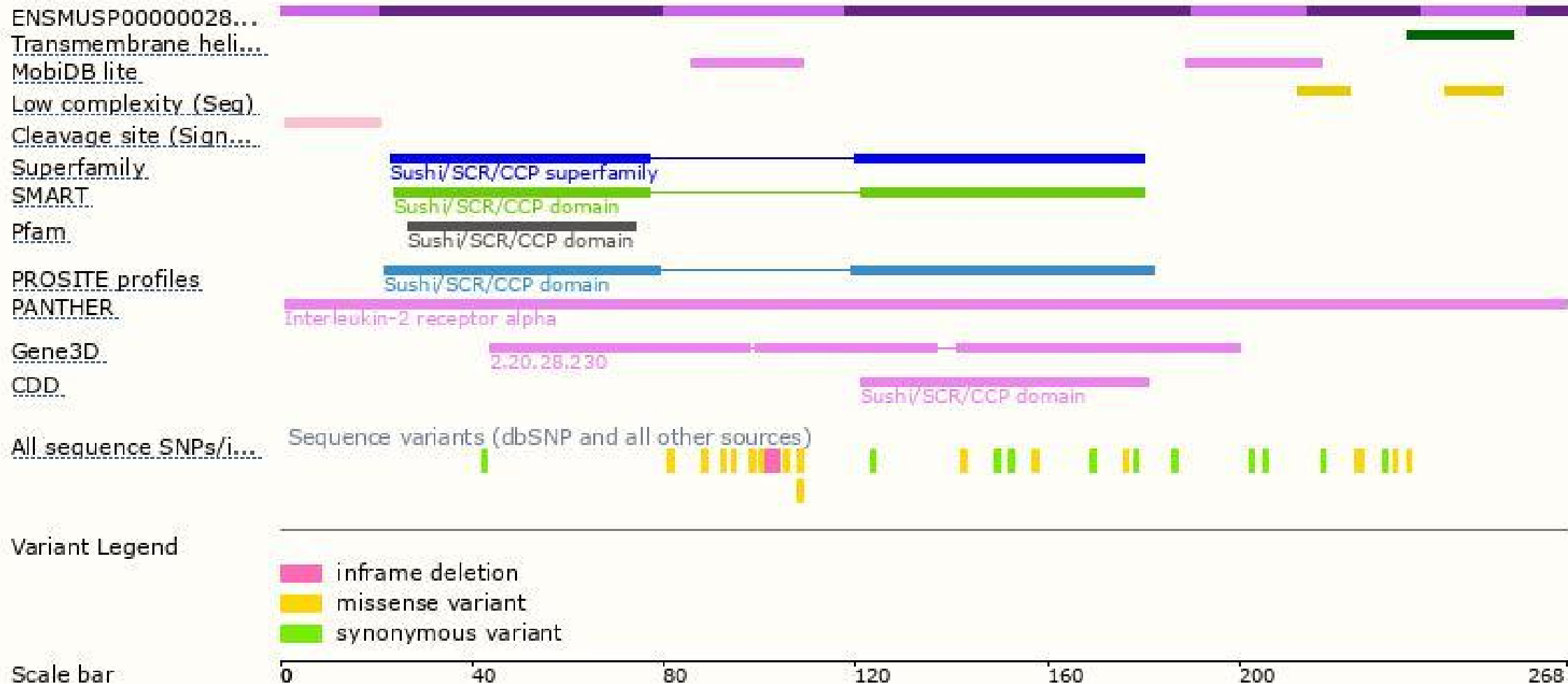
The strategy is based on the design of *Il2ra-201* transcript,The transcription is shown below



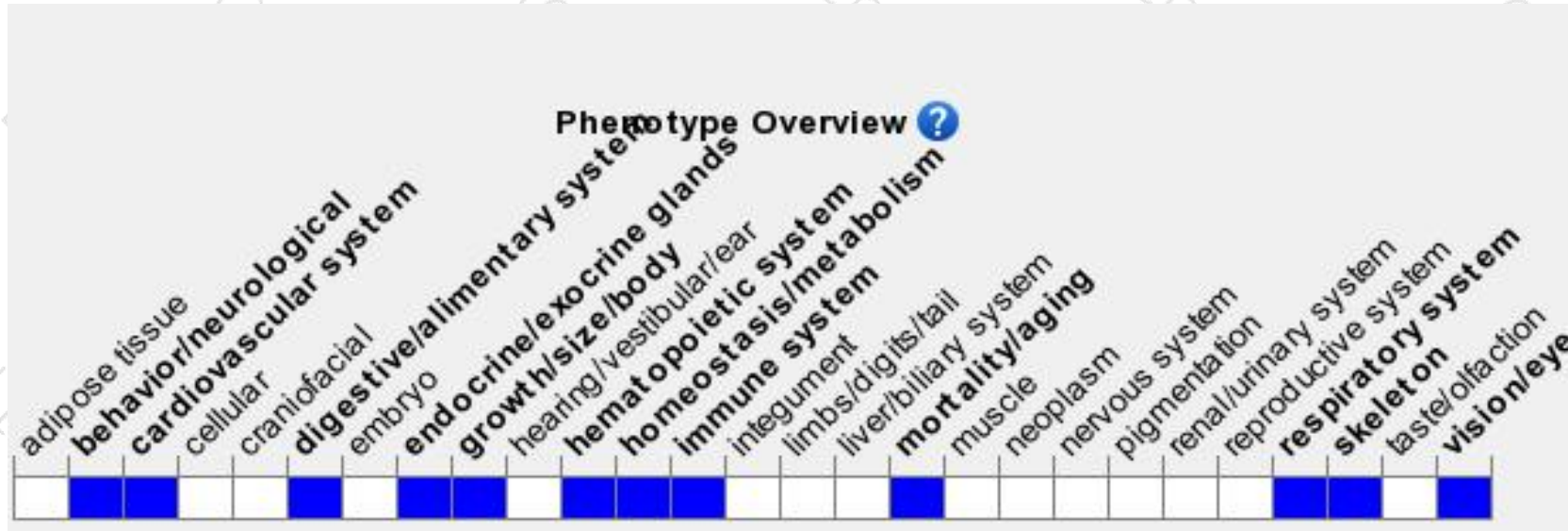
Genomic location distribution



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 a targeted null mutation exhibit massive proliferation of polyclonal T and B cells as adults and develop autoimmune disorders including inflammatory bowel disease and hemolytic anemia with age.

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

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