

Flt3 Cas9-CKO Strategy

Designer: Yupeng Yang

Reviewer: Miaomiao Cui

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Project Overview

Project Name

Flt3

Project type

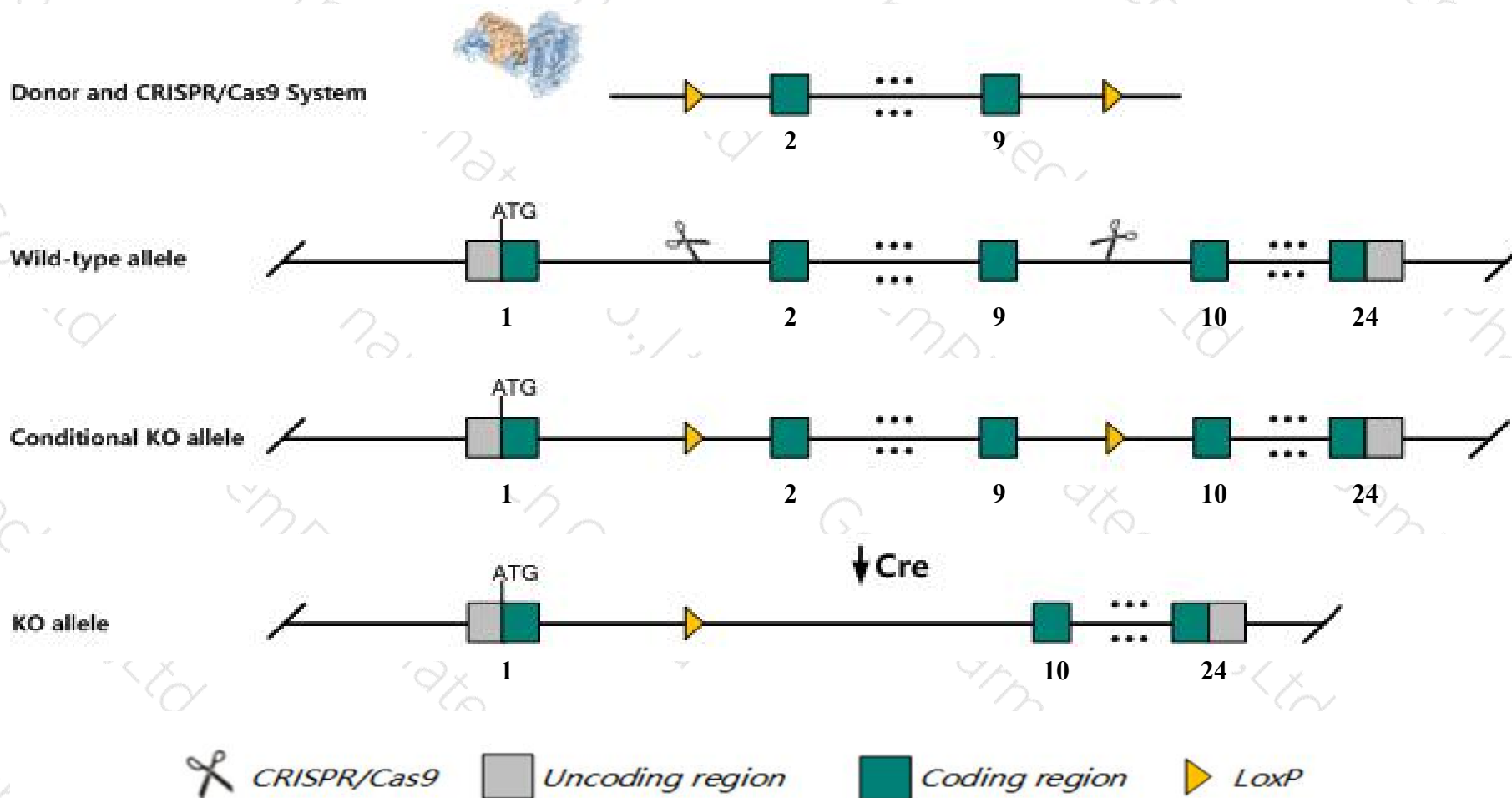
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Flt3* gene. The schematic diagram is as follows:



Technical routes

- The *Flt3* gene has 2 transcripts. According to the structure of *Flt3* gene, exon2-exon9 of *Flt3-201*(ENSMUST00000049324.12) transcript is recommended as the knockout region. The region contains 1162bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Flt3* 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 functionally null for this gene display abnormal lymphopoiesis. Homozygous ENU mutant mice are sensitive to infection by mouse cytomegalovirus.
- The *Flt3* gene is located on the Chr5. 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)

Flt3 FMS-like tyrosine kinase 3 [Mus musculus (house mouse)]

Gene ID: 14255, updated on 13-Mar-2020

Summary



Official Symbol	Flt3 provided by MGI
Official Full Name	FMS-like tyrosine kinase 3 provided by MGI
Primary source	MGI:MGI:95559
See related	Ensembl:ENSMUSG00000042817
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	B230315G04, CD135, Flk-2, Flk2, Flt-3, Ly72, wmf1
Expression	Biased expression in cerebellum adult (RPKM 4.3), spleen adult (RPKM 2.2) and 14 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

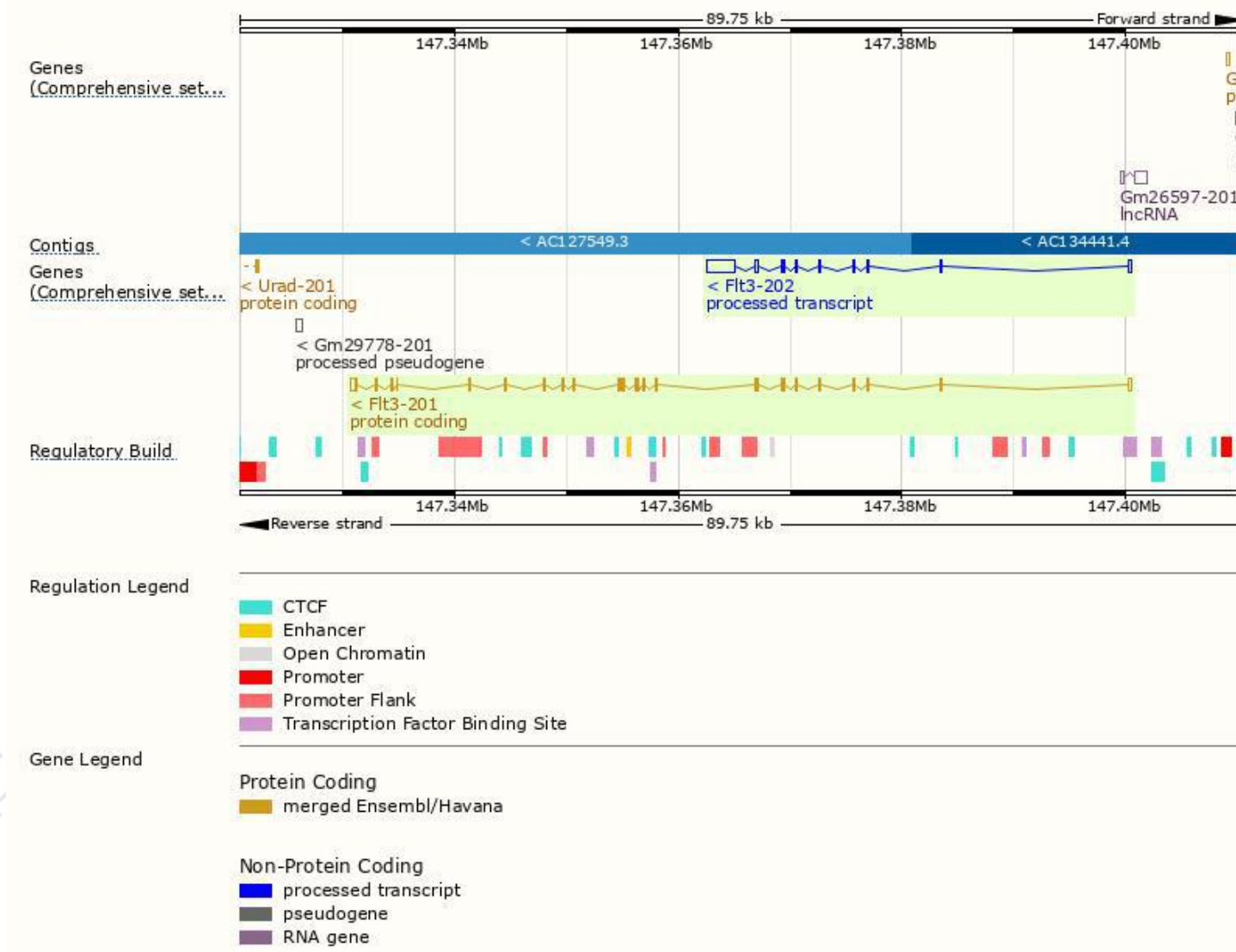
The gene has 2 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Flt3-201	ENSMUST00000049324.12	3657	1000aa	Protein coding	CCDS39400	Q3UEW6	TSL:1 GENCODE basic APPRIS P1
Flt3-202	ENSMUST00000110549.2	3951	No protein	Processed transcript	-	-	TSL:1

The strategy is based on the design of *Flt3-201* transcript, the transcription is shown below:



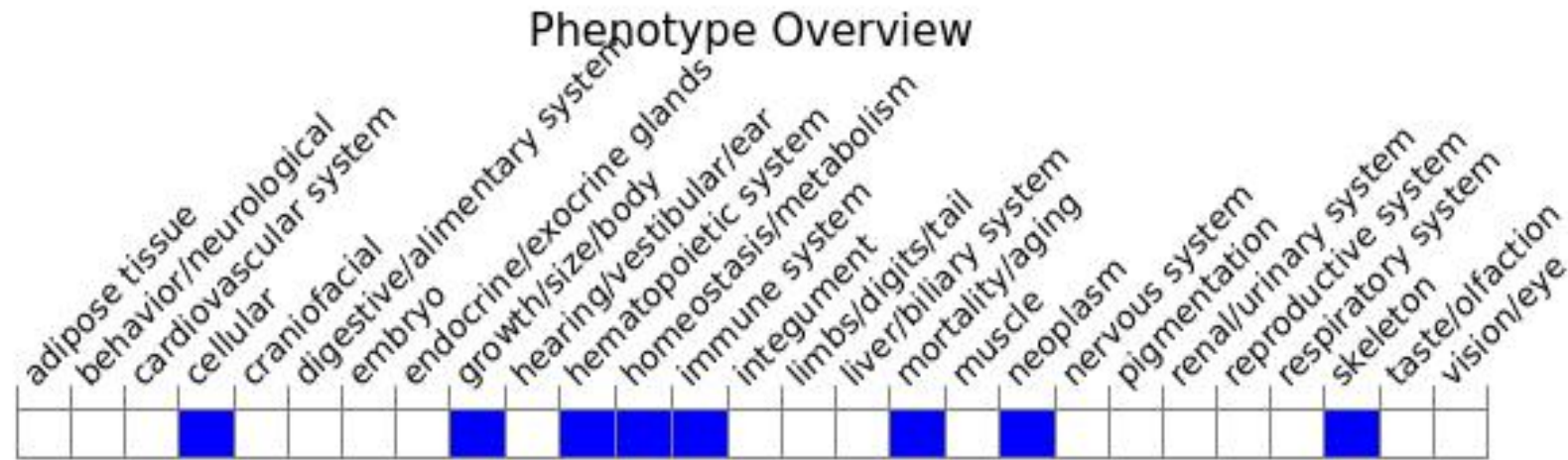
Genomic location distribution



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 functionally null for this gene display abnormal lymphopoiesis.

Homozygous ENU mutant mice are sensitive to infection by mouse cytomegalovirus.

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

Tel: 400-9660890

