

# *Flt3* Cas9-KO Strategy

**Designer: Yupeng Yang**

**Reviewer: Rui Xiong**

**Design Date: 2019-3-12**

# Project Overview



**Project Name**

***Flt3***

**Project type**

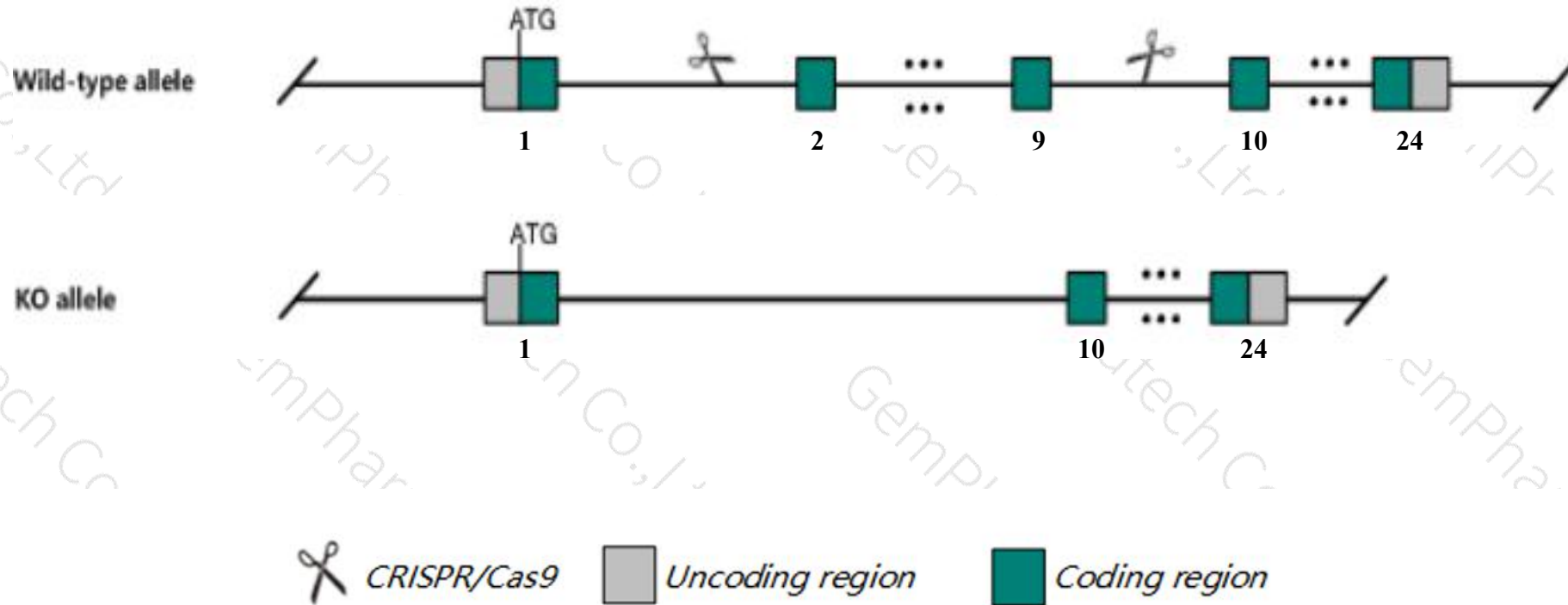
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- 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 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.

- 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

# Gene information (NCBI)

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

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

### Summary



<b>Official Symbol</b>	Flt3 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	FMS-like tyrosine kinase 3 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:95559</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000042817</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	B230315G04, CD135, Flk-2, Flk2, Flt-3, Ly72, wmf1
<b>Expression</b>	Biased expression in cerebellum adult (RPKM 4.3), spleen adult (RPKM 2.2) and 14 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

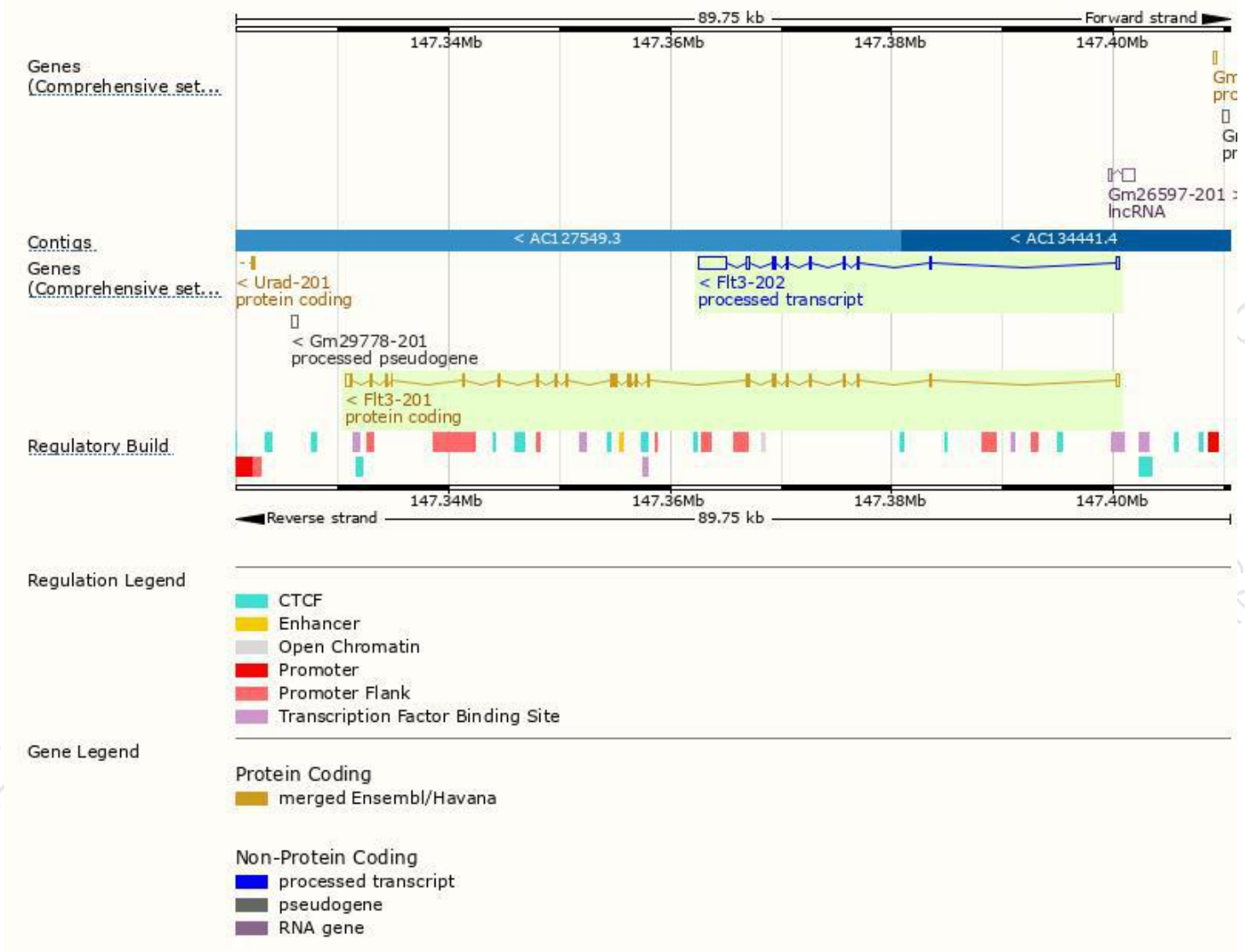
The gene has 2 transcripts, all transcripts are shown below:

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

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



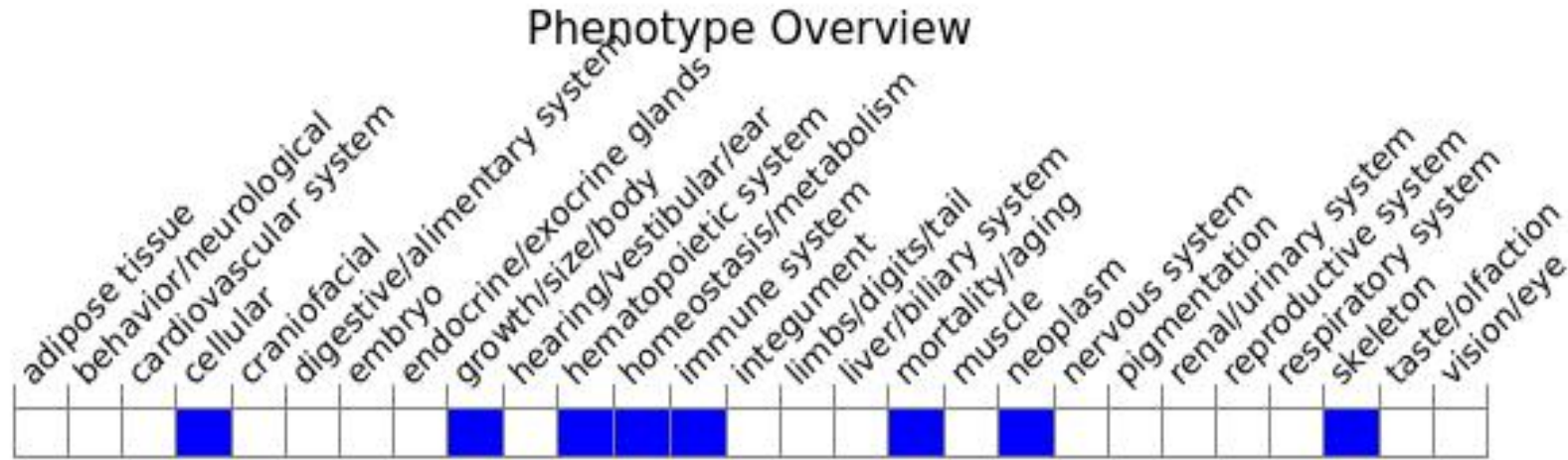
# Genomic location distribution



# 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

