Mllt1 Cas9-KO Strategy

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Reviewer: Xiaojing Li

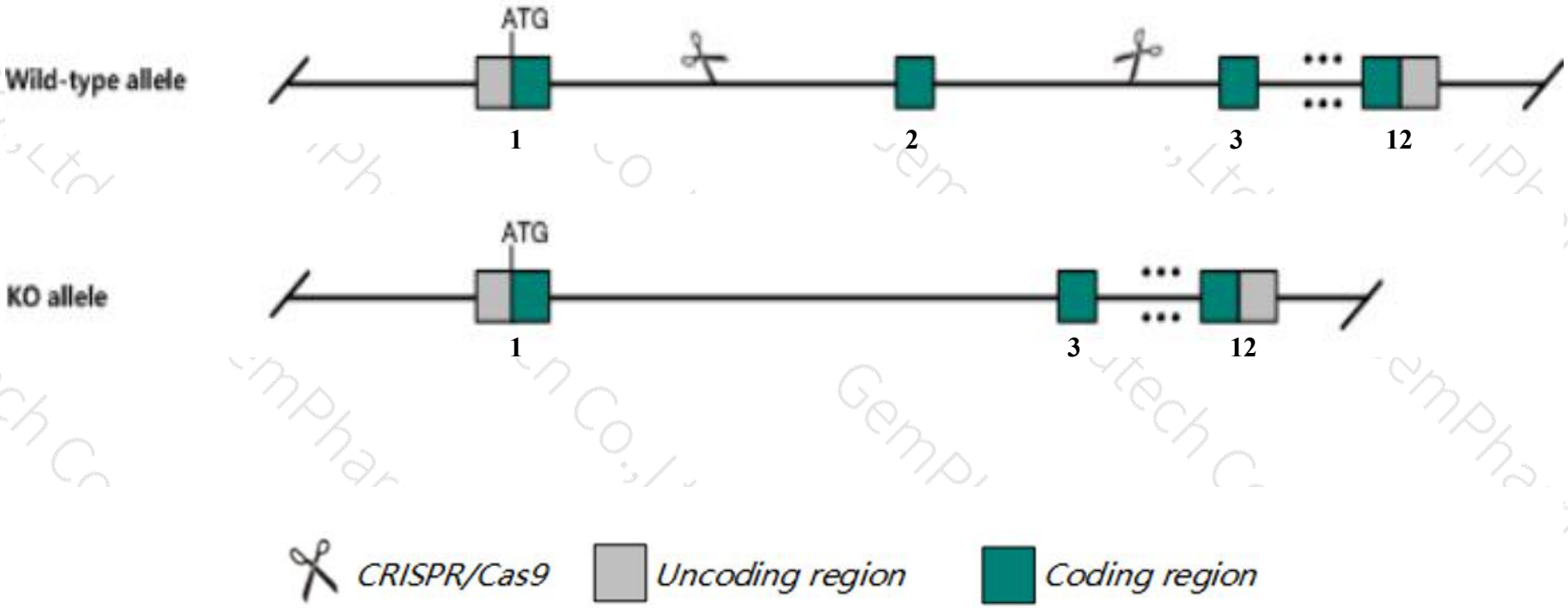
Design Date: 2020-7-22

Project Overview

Project Name	***Mllt1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mllt1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Mllt1* gene has 4 transcripts. According to the structure of *Mllt1* gene, exon2 of *Mllt1-201*(ENSMUST00000025053.9) transcript is recommended as the knockout region.The region contains 181bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Mllt1* 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.

Notice

➢ According to the existing MGI data,embryos homozygous for a knock-out allele die prior to E8.5.

➢ The *Mllt1* gene is located on the Chr17. 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）

Mllt1 myeloid/lymphoid or mixed-lineage leukemia; translocated to, 1 [Mus musculus (house mouse)]

Gene ID: 64144, updated on 13-Mar-2020

Summary

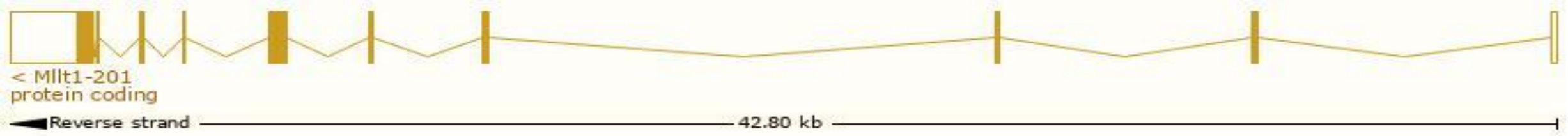
Official Symbol	Mllt1 provided by MGI
Official Full Name	myeloid/lymphoid or mixed-lineage leukemia; translocated to, 1 provided byMGI
Primary source	MGI:MGI:1927238
See related	Ensembl:ENSMUSG00000024212
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA407901, BAM11, ENL, LTG19
Expression	Ubiquitous expression in thymus adult (RPKM 43.0), ovary adult (RPKM 41.6) and 28 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

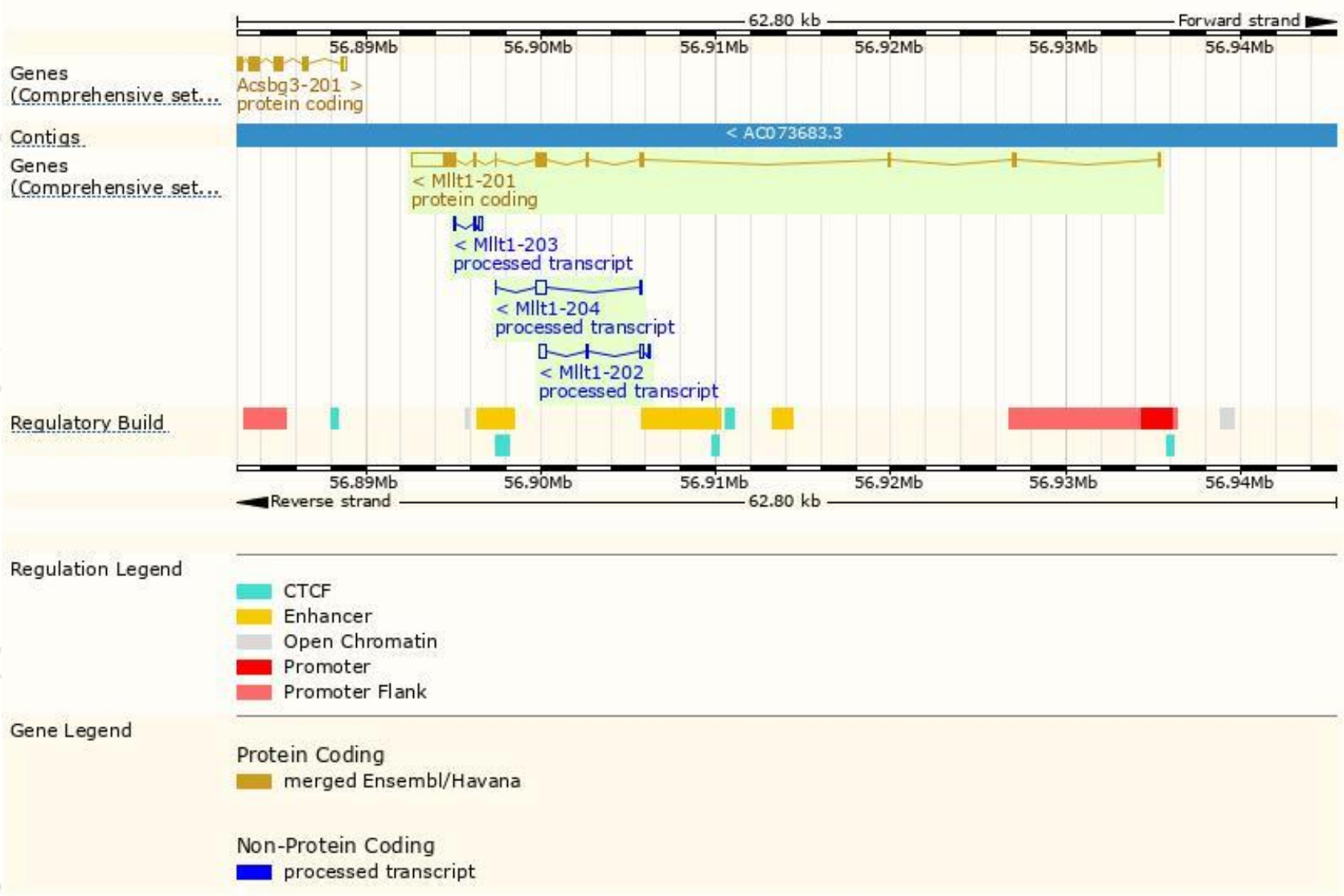
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mllt1-201	ENSMUST00000025053.9	3636	547aa	Protein coding	CCDS28918	Q9ERL0	TSL:1 GENCODE basic APPRIS P1
Mllt1-202	ENSMUST00000233063.1	671	No protein	Processed transcript	-	-	
Mllt1-204	ENSMUST00000233854.1	652	No protein	Processed transcript	-	-	
Mllt1-203	ENSMUST00000233829.1	413	No protein	Processed transcript	-	-	

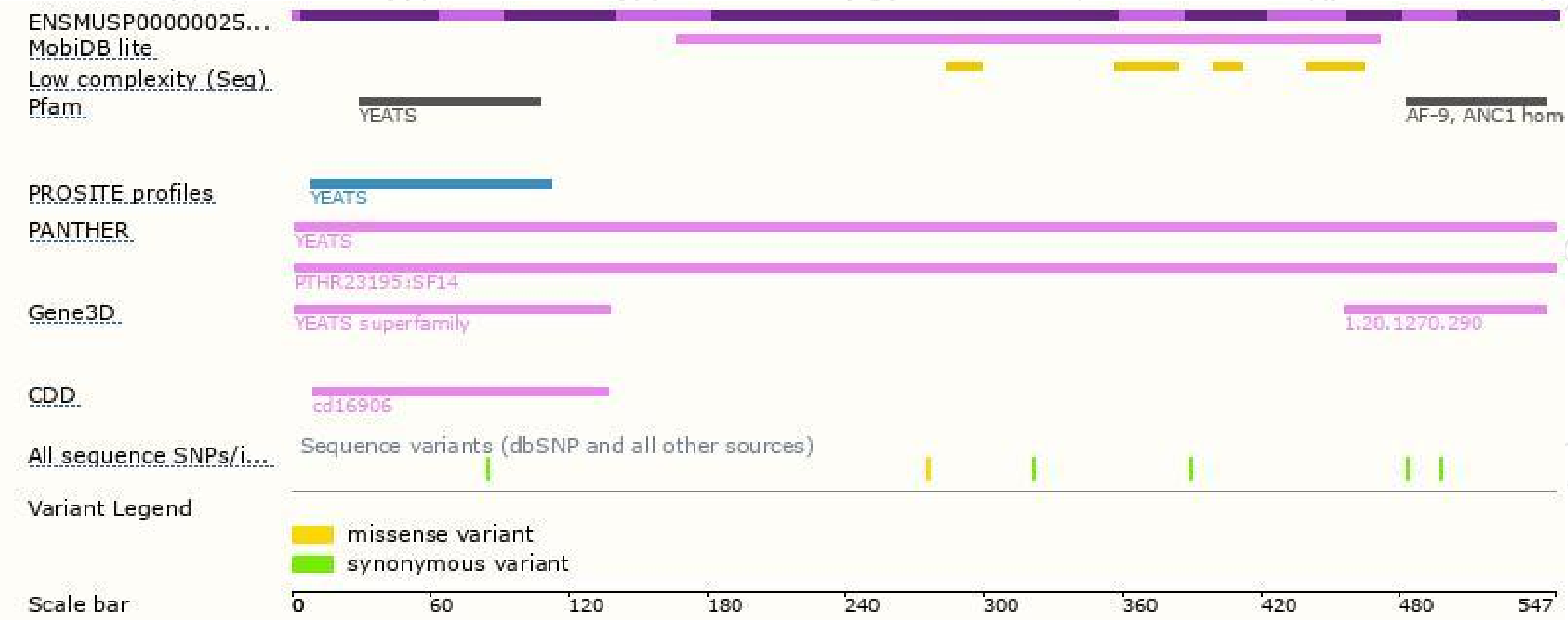
The strategy is based on the design of *Mllt1-201* transcript,the transcription is shown below:



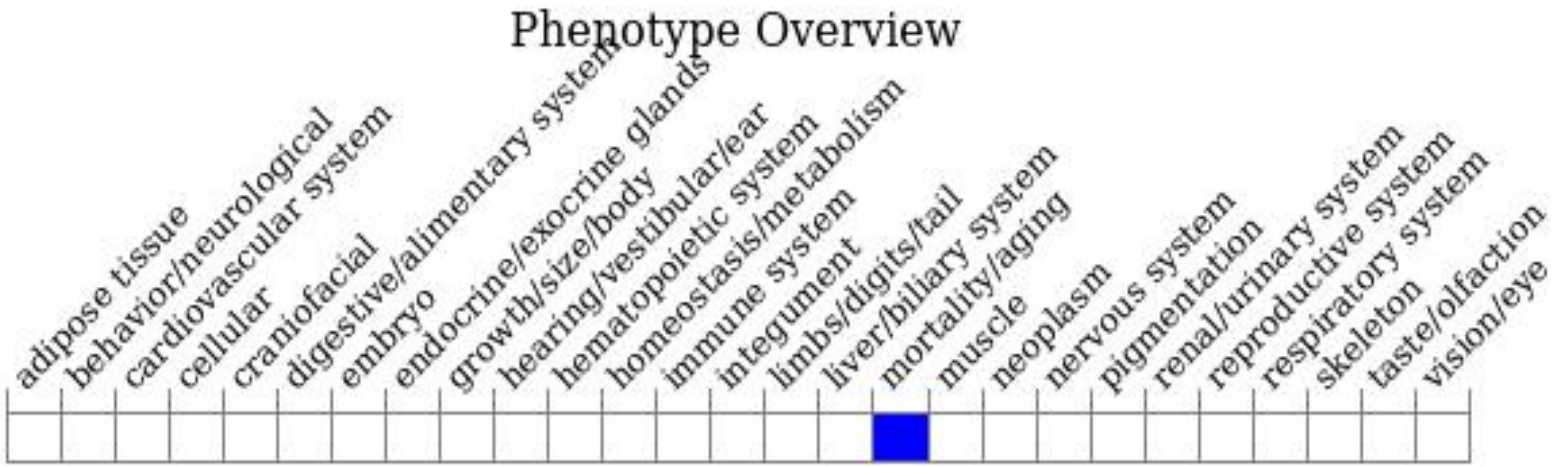
Genomic location distribution



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,embryos homozygous for a knock-out allele die prior to E8.5.

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

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