Runx3 Cas9-CKO Strategy

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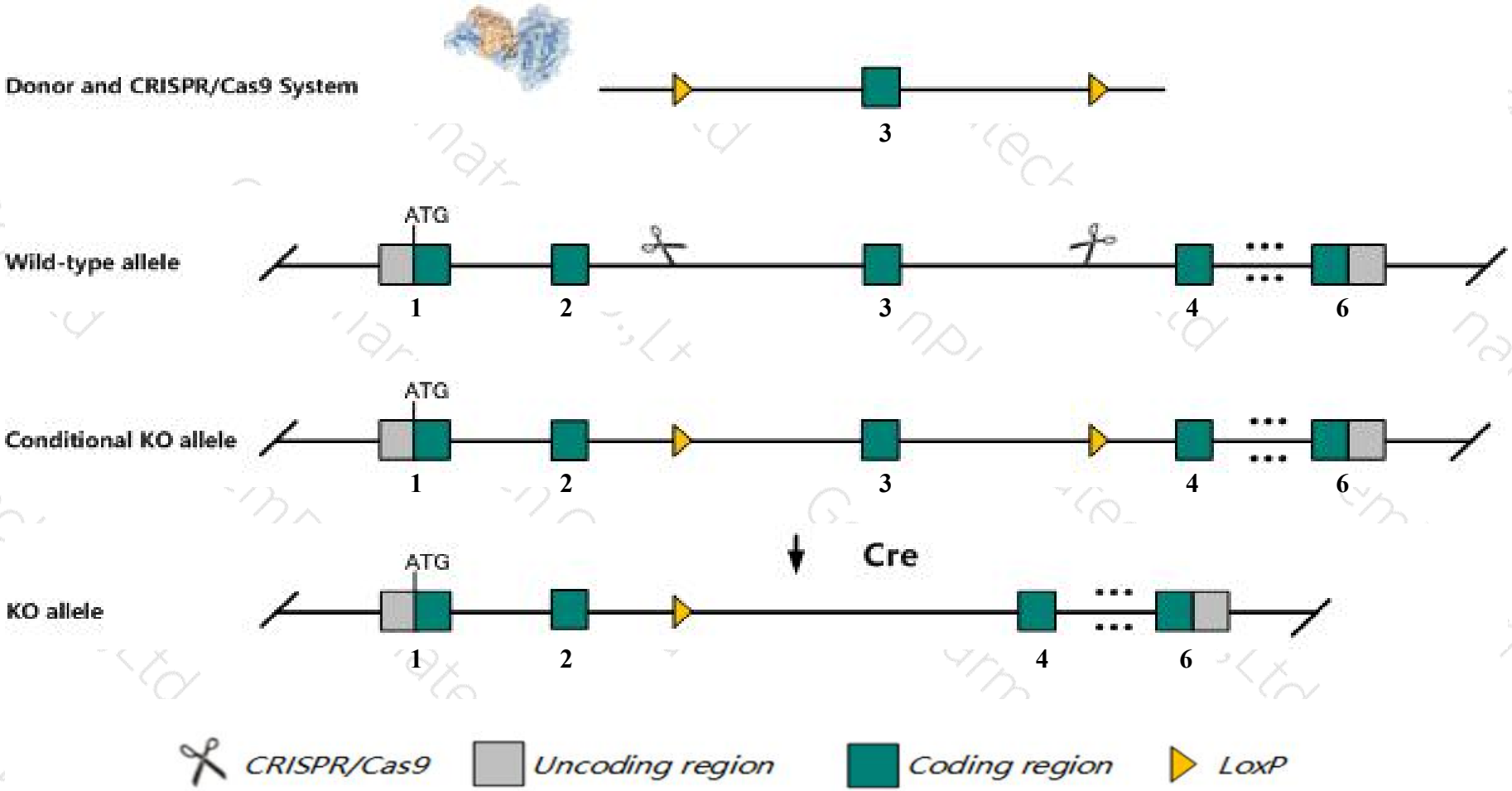
Project Overview

Project Name	***Runx3***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Runx3* gene. The schematic diagram is as follows:



Technical routes

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- The *Runx3* gene has 6 transcripts. According to the structure of *Runx3* gene, exon3 of *Runx3-201* (ENSMUST00000056977.13) transcript is recommended as the knockout region.The region contains 157bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Runx3* 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.

Notice

- According to the existing MGI data,Nullizygous mutations can lead to variable phenotypes, including postnatal lethality, ataxia, skeletal and behavioral defects, altered differentiation and function of T cells and dendritic cells, gastric hyperplasia, intestinal and lung inflammation, hair shape changes, and absent Langerhans cells.

- The *Runx3* gene is located on the Chr4. 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）

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Runx3 runt related transcription factor 3 [Mus musculus (house mouse)]

Gene ID: 12399, updated on 19-Mar-2019

Summary

Official Symbol	Runx3 provided by MGI
Official Full Name	runt related transcription factor 3 provided by MGI
Primary source	MGI:MGI:102672
See related	Ensembl:ENSMUSG00000070691
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	AML2, Cbfa3, Pebp2a3
Expression	Biased expression in spleen adult (RPKM 11.1), thymus adult (RPKM 6.0) and 11 other tissues See more
Orthologs	human all

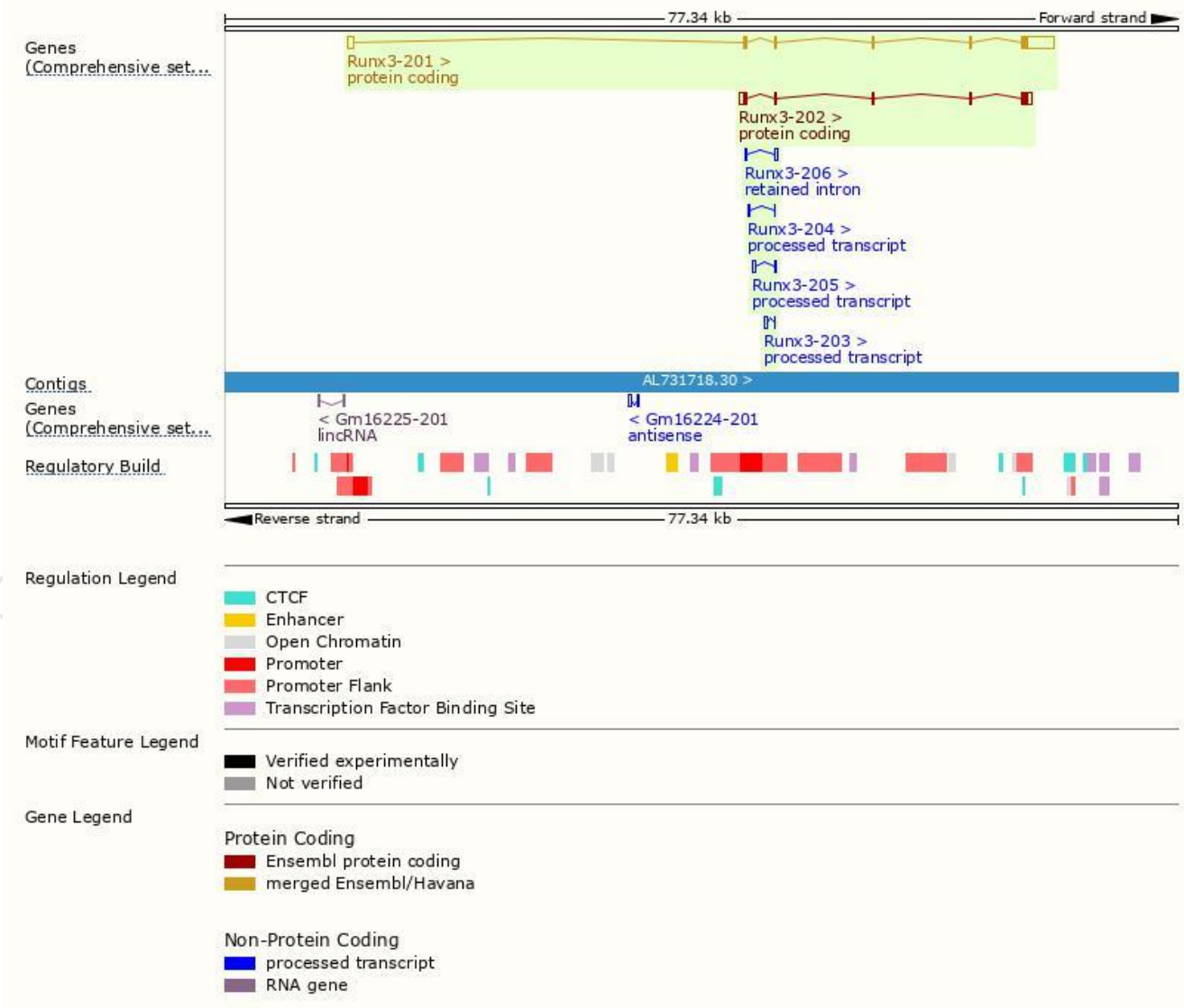
Transcript information（Ensembl）

The gene has 6 transcripts,all transcripts are shown below:

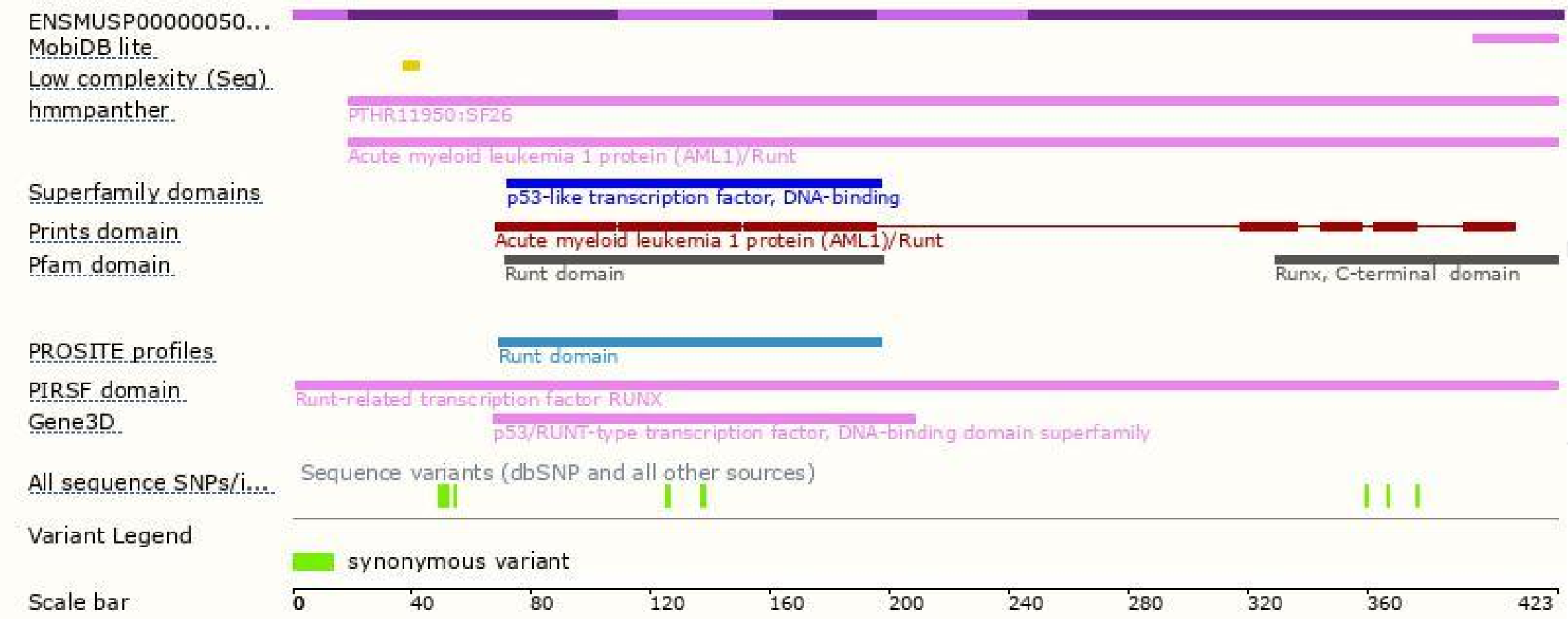
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Runx3-201	ENSMUST00000056977.13	3884	423aa	Protein coding	CCDS18782	Q3U1Q3	TSL:1 GENCODE basic APPRIS P2
Runx3-202	ENSMUST00000119564.1	1855	409aa	Protein coding	-	Q64131	TSL:1 GENCODE basic APPRIS ALT2
Runx3-205	ENSMUST00000140642.1	372	No protein	Processed transcript	-	-	TSL:5
Runx3-203	ENSMUST00000127109.1	353	No protein	Processed transcript	-	-	TSL:3
Runx3-204	ENSMUST00000137027.1	227	No protein	Processed transcript	-	-	TSL:3
Runx3-206	ENSMUST00000156478.1	447	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Runx3-201* transcript,The transcription is shown below

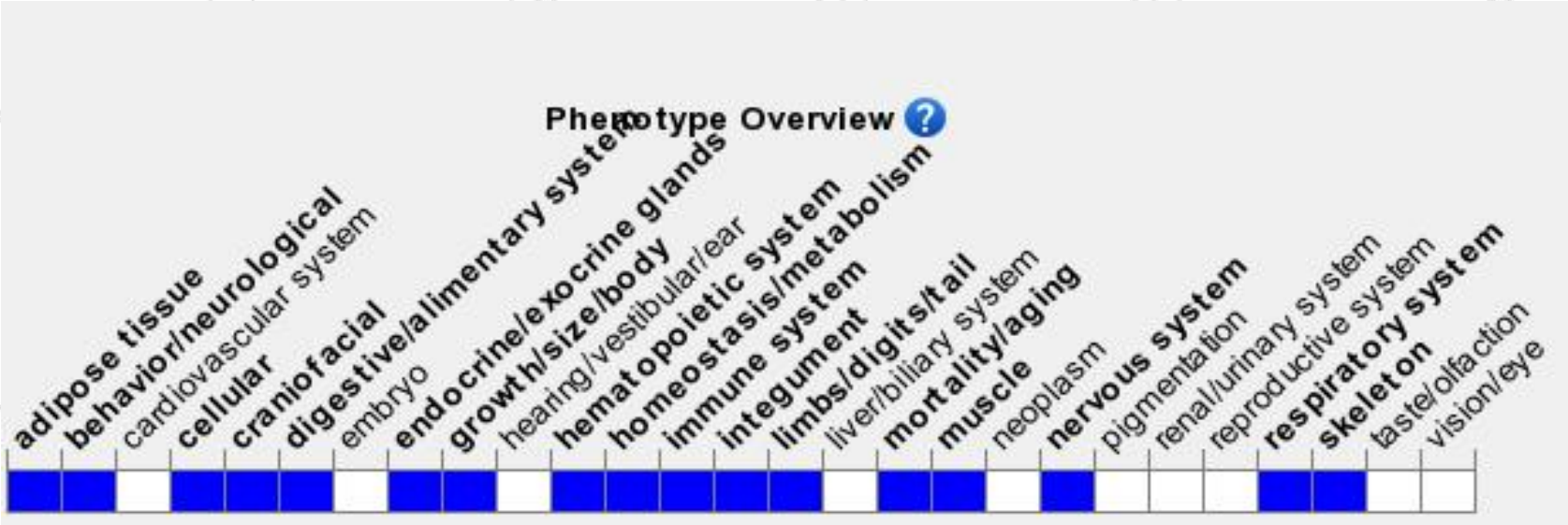
Genomic location distribution



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/).

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

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