Mllt3 Cas9-CKO Strategy

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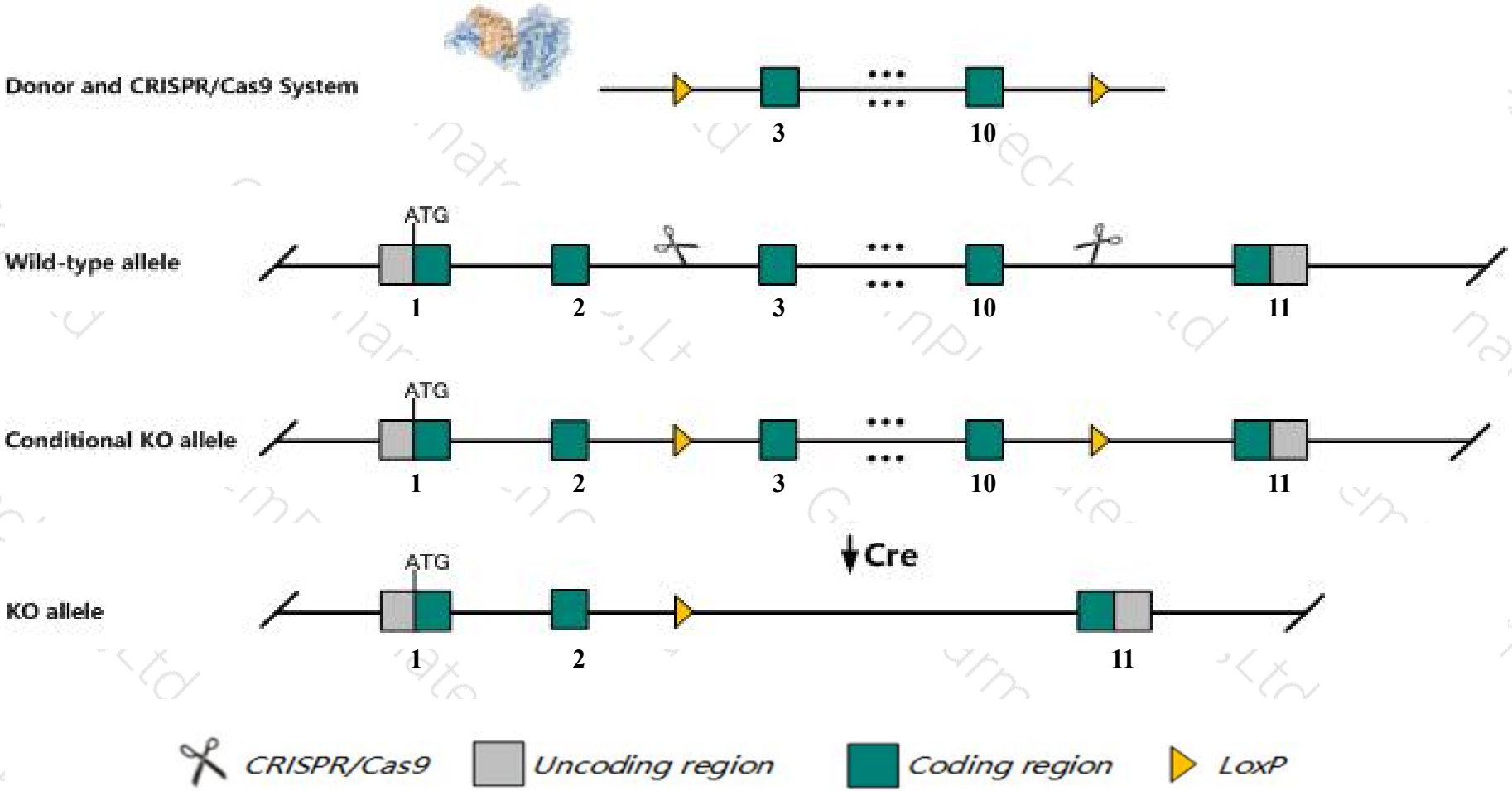
Design Date: 2019-7-24

Project Overview

Project Name	***Mllt3***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mllt3* gene. The schematic diagram is as follows:



Technical routes

- The *Mllt3* gene has 8 transcripts. According to the structure of *Mllt3* gene, exon3-exon10 of *Mllt3-201* (ENSMUST00000078090.11) transcript is recommended as the knockout region.The region contains 1385bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Mllt3* 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,About 50% of homozygous null mice die perinatally while the remaining 50% become runted and die within two weeks of birth with severe defects of the axial skeleton, including anterior homeotic transformation of the cervical and thoracic regions, a deformed atlas and an extra cervical vertebra.

- The *Mllt3* 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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Mllt3 myeloid/lymphoid or mixed-lineage leukemia; translocated to, 3 [Mus musculus (house mouse)]

Gene ID: 70122, updated on 31-Jan-2019

Summary

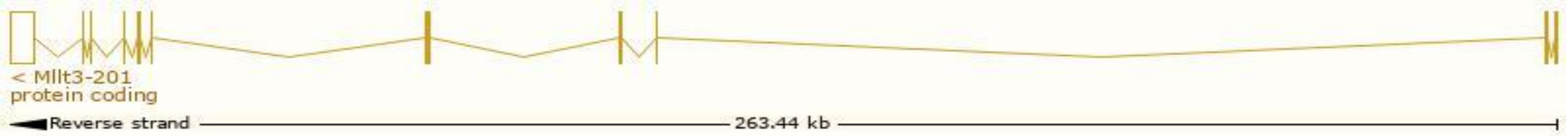
Official Symbol	Mllt3 provided by MGI
Official Full Name	myeloid/lymphoid or mixed-lineage leukemia; translocated to, 3 provided by MGI
Primary source	MGI:MGI:1917372
See related	Ensembl:ENSMUSG00000028496
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2210011H10Rik, 2610012I03Rik, 3830408D16Rik, Af9, D4Ertd321e
Expression	Broad expression in whole brain E14.5 (RPKM 9.1), CNS E14 (RPKM 9.1) and 26 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

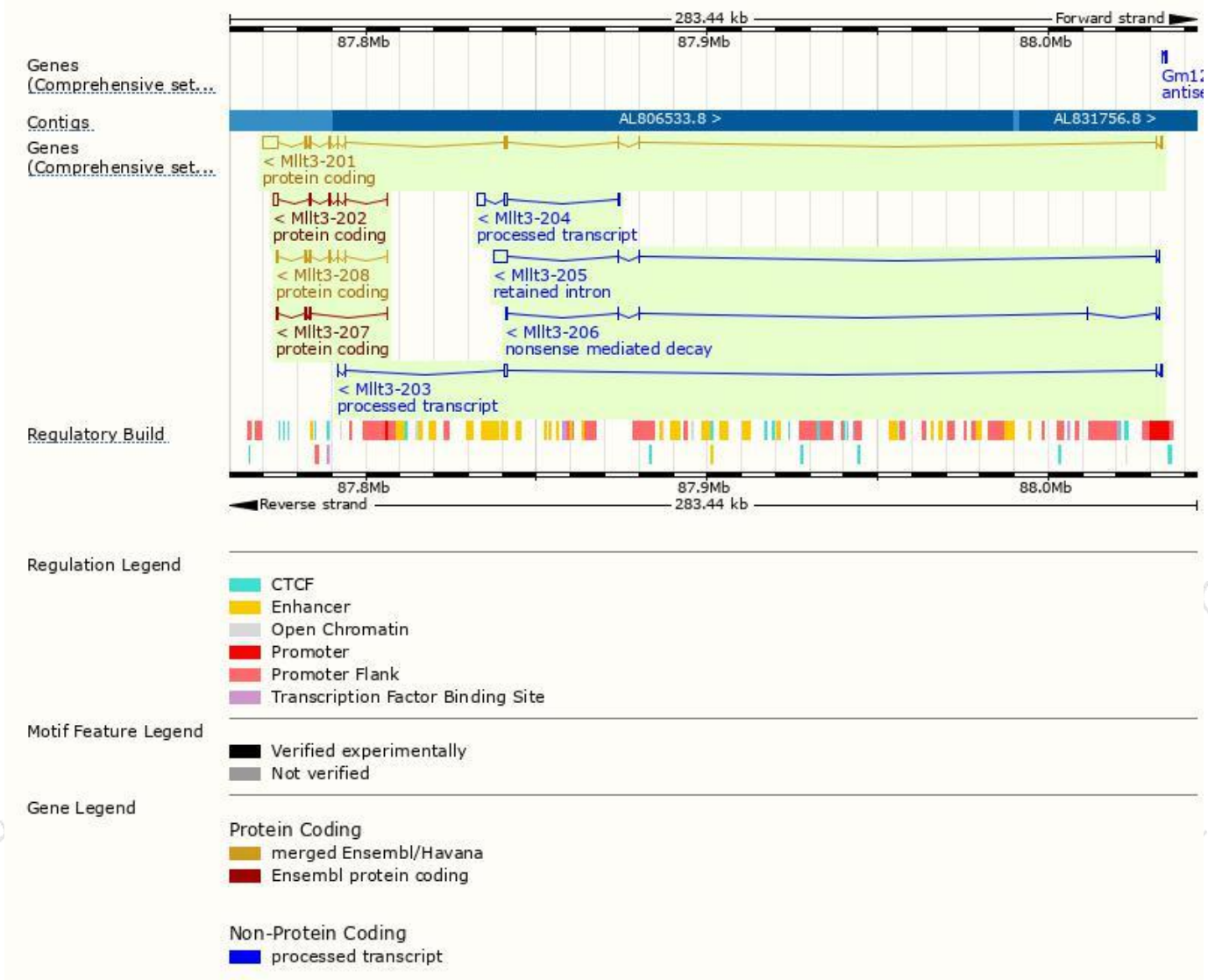
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mllt3-201	ENSMUST00000078090.11	6069	569aa	Protein coding	CCDS38796	A2AM29	TSL:1 GENCODE basic APPRIS P1
Mllt3-202	ENSMUST00000126353.7	1956	138aa	Protein coding	CCDS71418	Q9D2P1	TSL:1 GENCODE basic
Mllt3-208	ENSMUST00000149357.7	794	162aa	Protein coding	CCDS38797	Q3UIA3	TSL:1 GENCODE basic
Mllt3-207	ENSMUST00000148059.1	422	54aa	Protein coding	-	E9PXP8	TSL:5 GENCODE basic
Mllt3-206	ENSMUST00000142454.1	966	73aa	Nonsense mediated decay	-	E9Q3B8	TSL:1
Mllt3-204	ENSMUST00000134555.8	3159	No protein	Processed transcript	-	-	TSL:1
Mllt3-203	ENSMUST00000128930.7	1293	No protein	Processed transcript	-	-	TSL:5
Mllt3-205	ENSMUST00000141526.7	4556	No protein	Retained intron	-	-	TSL:1

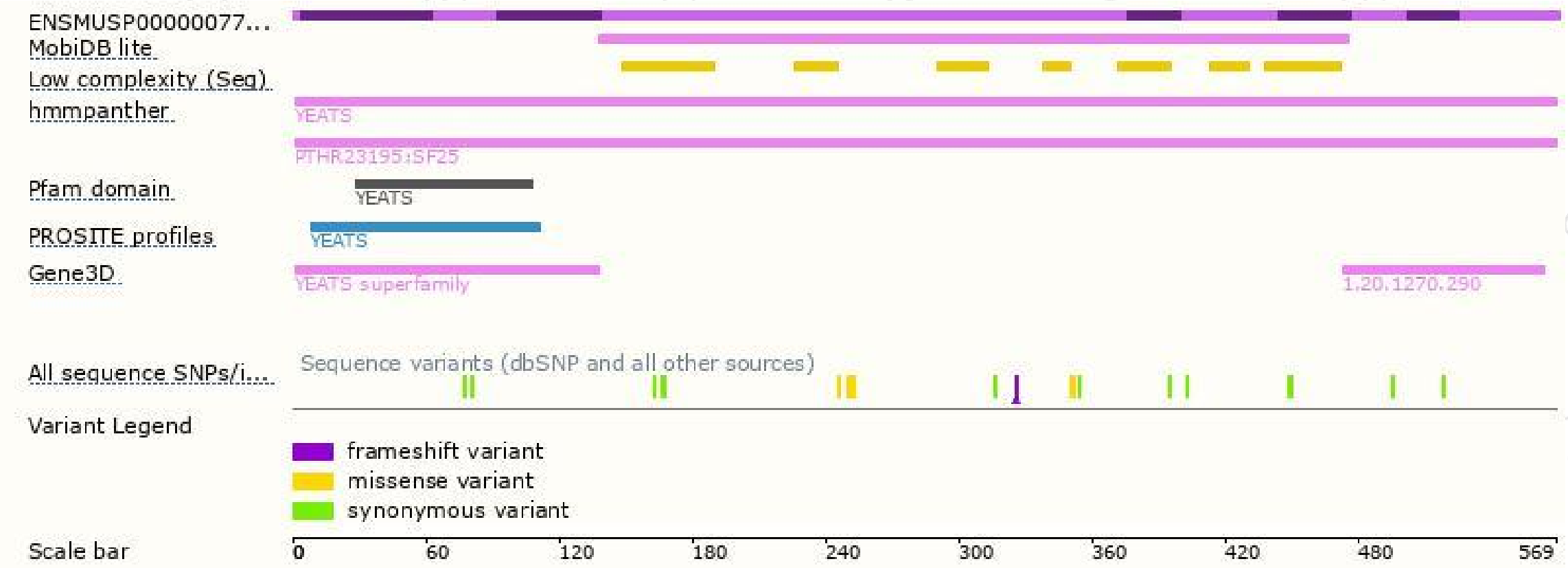
The strategy is based on the design of *Mllt3-201* transcript,The transcription is shown below



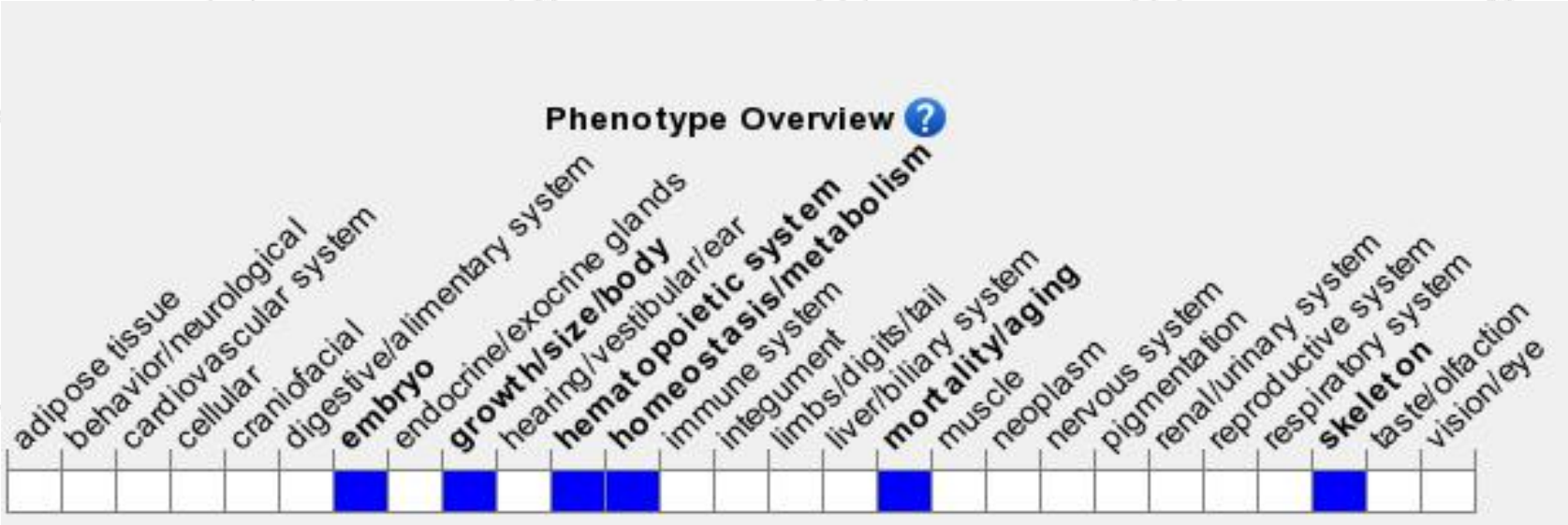
Genomic location distribution



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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