Tgm2 Cas9-KO Strategy

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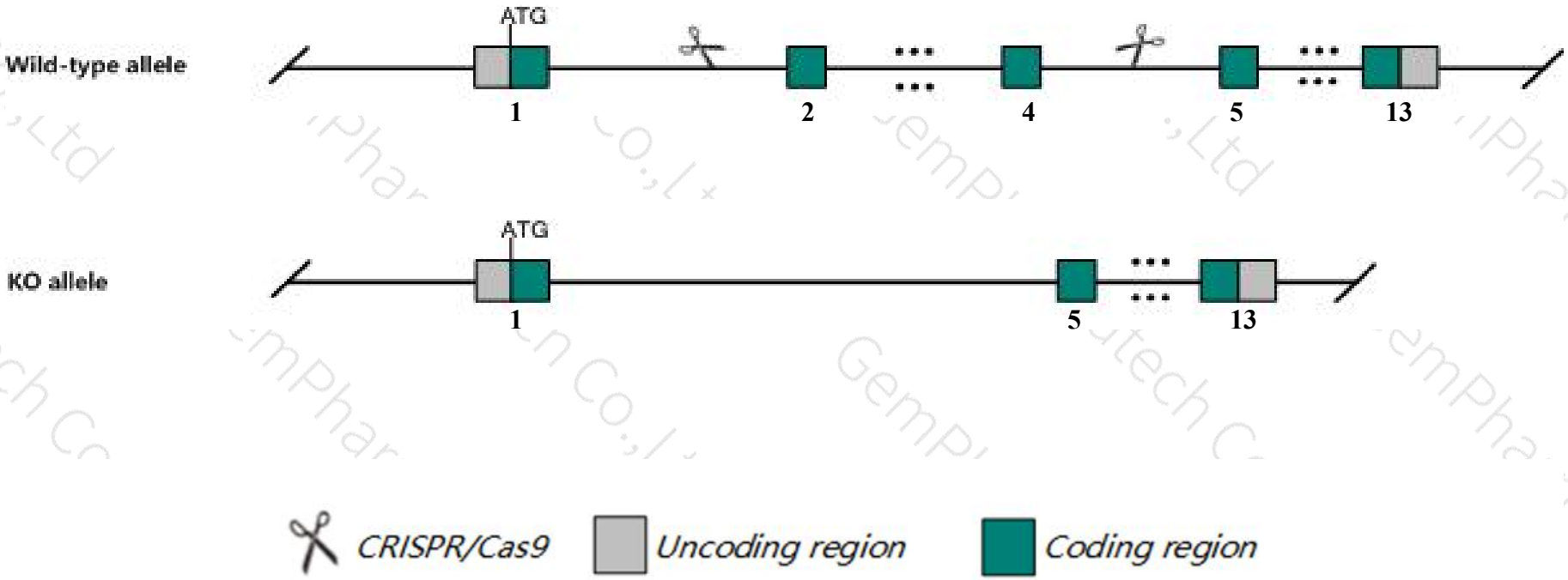
Design Date: 2019-7-31

Project Overview

Project Name	***Tgm2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tgm2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Tgm2* gene has 4 transcripts. According to the structure of *Tgm2* gene, exon2-exon4 of *Tgm2-201* (ENSMUST00000103122.9) transcript is recommended as the knockout region.The region contains 542bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Tgm2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,A homozygous null mutation causes alterations in glucose and aerobic energy metabolism, tumor growth, and response to myocardial infarction, liver injury, and LPS-induced sepsis. A second null mutation confers resistance to renal injury, while a third one alters cell adhesion and T cell physiology.

- The *Tgm2* gene is located on the Chr2. 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）

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Tgm2 transglutaminase 2, C polypeptide [Mus musculus (house mouse)]

Gene ID: 21817, updated on 25-Mar-2019

Summary

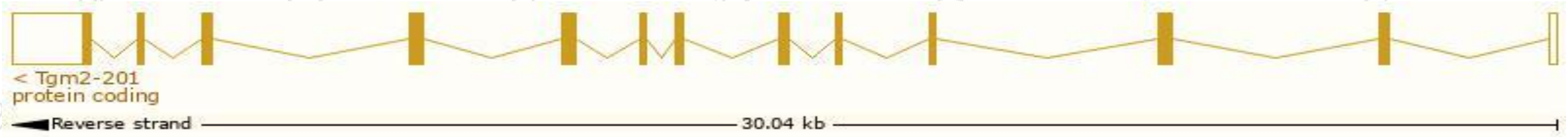
Official Symbol	Tgm2 provided by MGI
Official Full Name	transglutaminase 2, C polypeptide provided by MGI
Primary source	MGI:MGI:98731
See related	Ensembl:ENSMUSG00000037820
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	G[a]h, TG2, TGase2, tTG, tTGas
Expression	Broad expression in mammary gland adult (RPKM 134.3), lung adult (RPKM 130.8) and 19 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

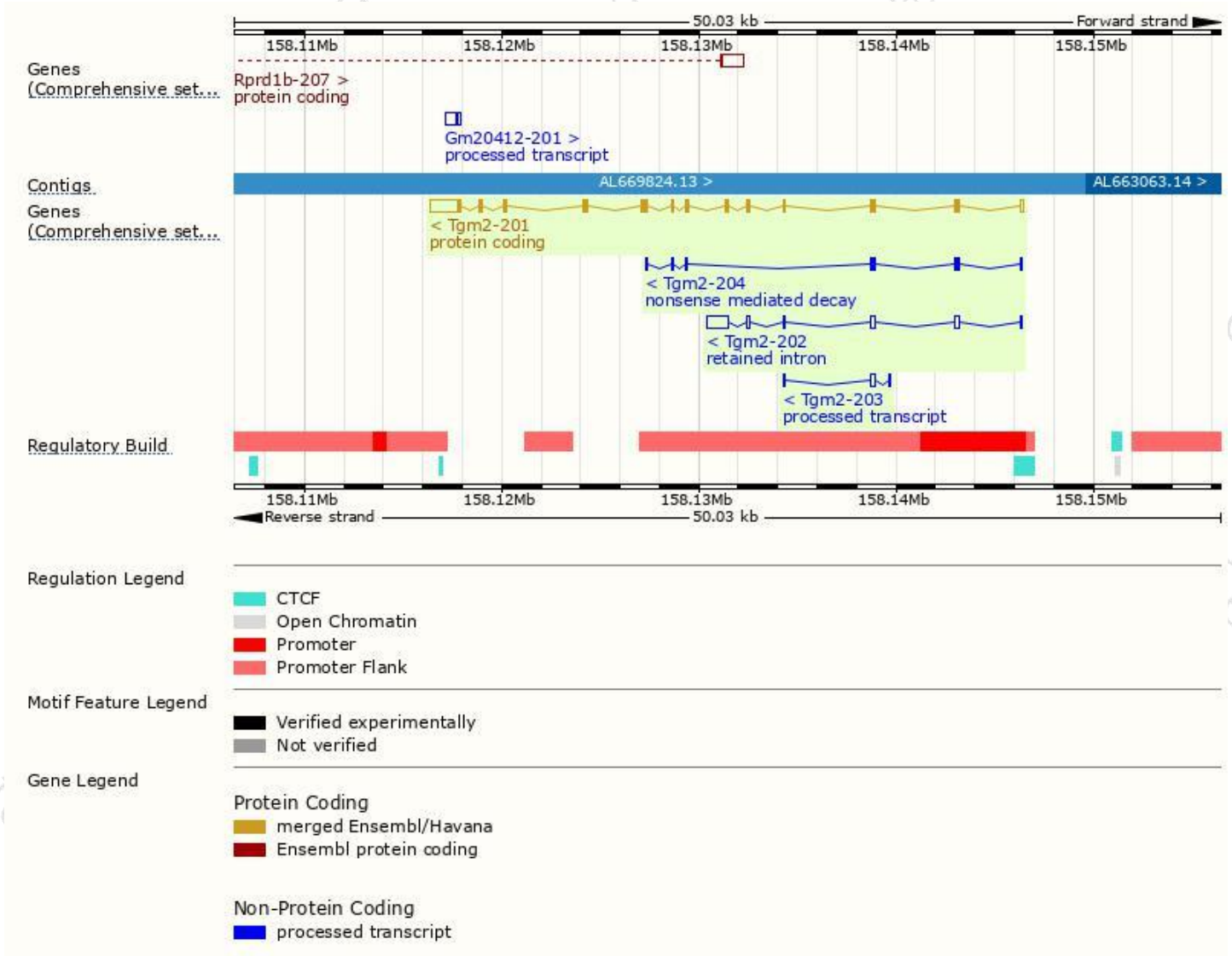
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tgm2-201	ENSMUST00000103122.9	3596	686aa	Protein coding	CCDS16985	P21981	TSL:1 GENCODE basic APPRIS P1
Tgm2-204	ENSMUST00000174718.1	748	146aa	Nonsense mediated decay	-	G3UXE8	TSL:5
Tgm2-203	ENSMUST00000152690.1	352	No protein	Processed transcript	-	-	TSL:3
Tgm2-202	ENSMUST00000140923.7	1876	No protein	Retained intron	-	-	TSL:1

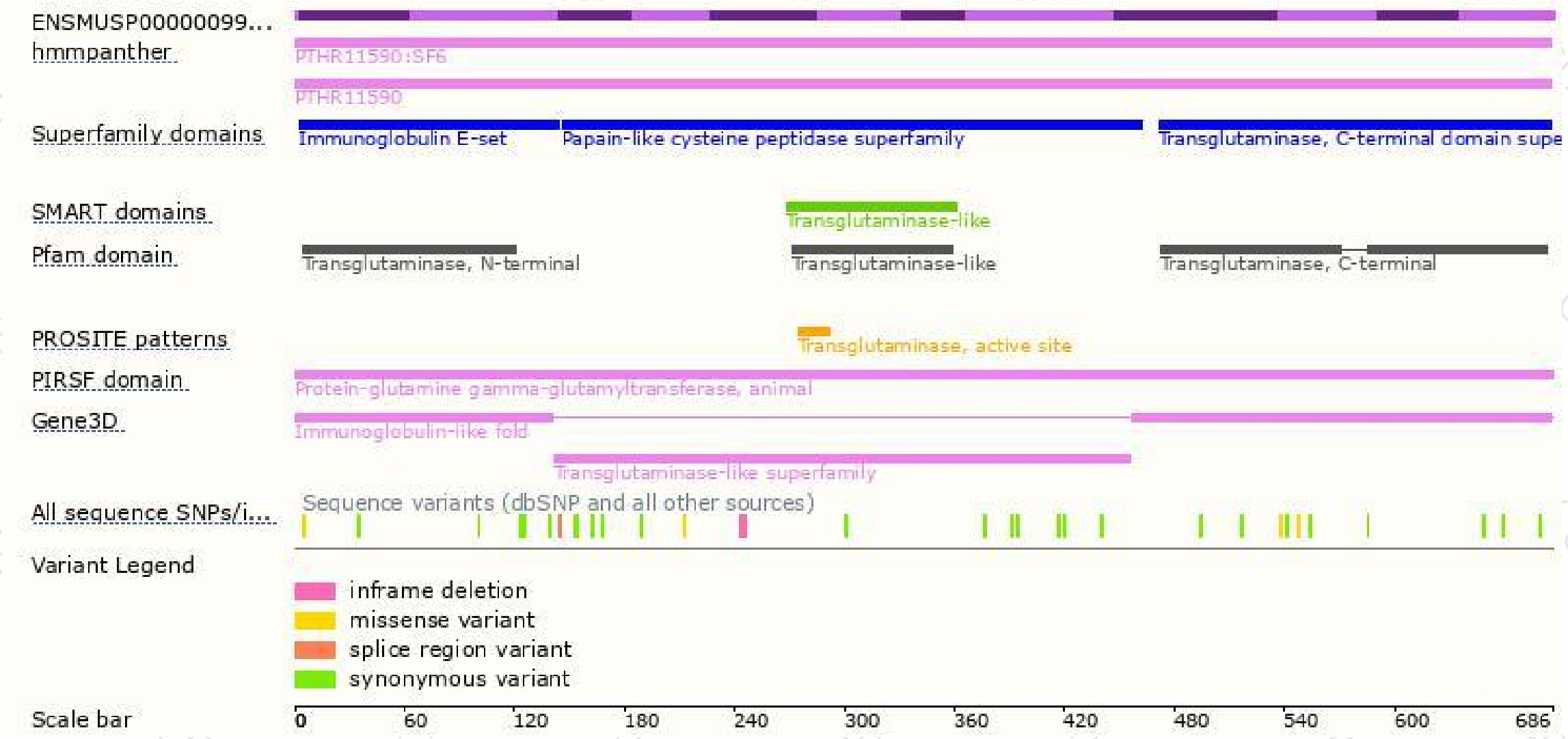
The strategy is based on the design of *Tgm2-201* transcript,The transcription is shown below



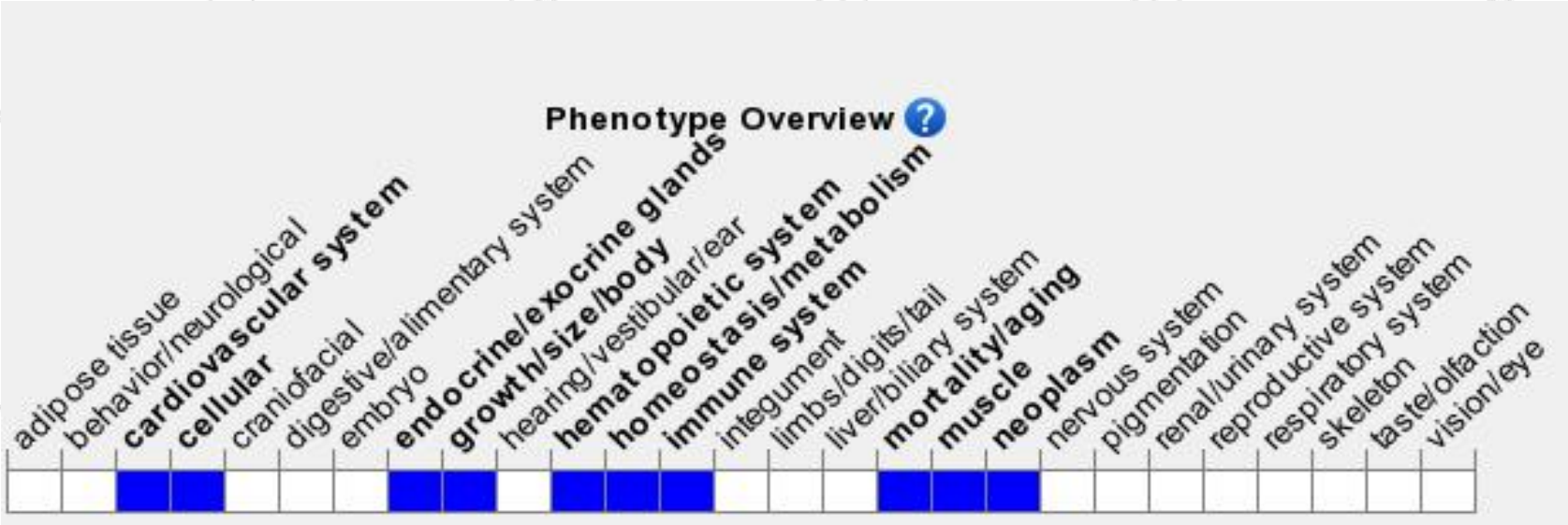
Genomic location distribution



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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