Dsg2 Cas9-CKO Strategy

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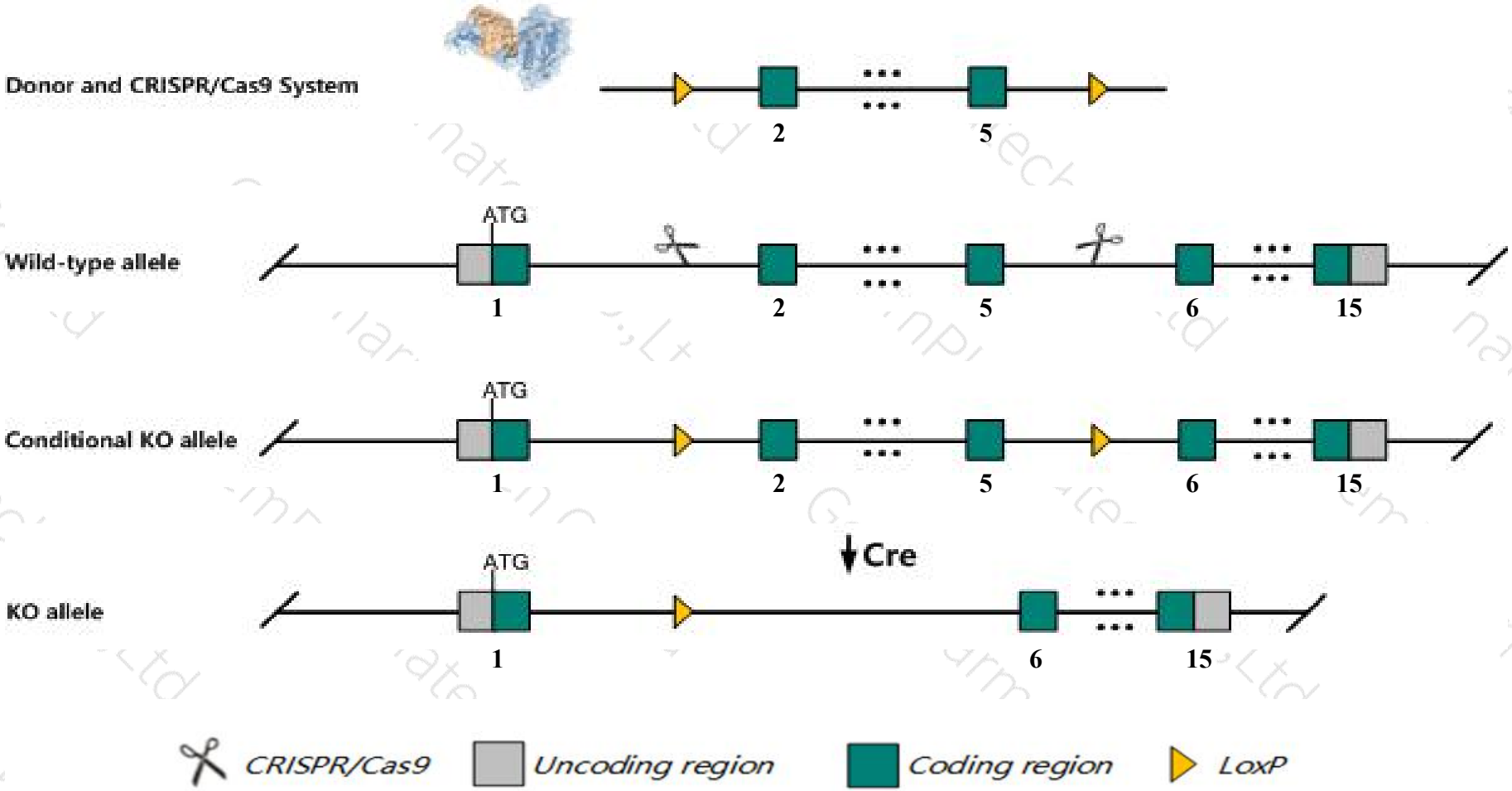
Project Overview

Project Name	***Dsg2***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dsg2* gene. The schematic diagram is as follows:



Technical routes

- The *Dsg2* gene has 3 transcripts. According to the structure of *Dsg2* gene, exon2-exon5 of *Dsg2-201* (ENSMUST00000059787.14) transcript is recommended as the knockout region.The region contains 478bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Dsg2* 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,Homozygous mutation of this gene results in embryonic lethality before somite formation, impaired cell proliferation, and increased apoptosis. Heterozygous mutation of this gene also results in embryonic lethality before somite formation with partial penetrance.

- The *Dsg2* gene is located on the Chr18. 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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Dsg2 desmoglein 2 [Mus musculus (house mouse)]

Gene ID: 13511, updated on 2-Apr-2019

Summary

Official Symbol	Dsg2 provided by MGI
Official Full Name	desmoglein 2 provided by MGI
Primary source	MGI:MGI:1196466
See related	Ensembl:ENSMUSG00000044393
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA408168, D18Ertd293e
Summary	This gene encodes a member of the cadherin family of proteins that forms an integral transmembrane component of desmosomes, the multiprotein complexes involved in cell adhesion, organization of the cytoskeleton, cell sorting and cell signaling. The encoded preproprotein undergoes proteolytic processing to generate a mature, functional protein. Mice lacking the encoded protein die in utero. Mutant mice lacking a part of the extracellular adhesive domain of the encoded protein develop cardiac fibrosis and dilation. This gene is located in a cluster of desmosomal cadherin genes on chromosome 18. [provided by RefSeq, Jan 2016]
Expression	Broad expression in large intestine adult (RPKM 25.2), colon adult (RPKM 24.6) and 16 other tissuesSee more
Orthologs	human all

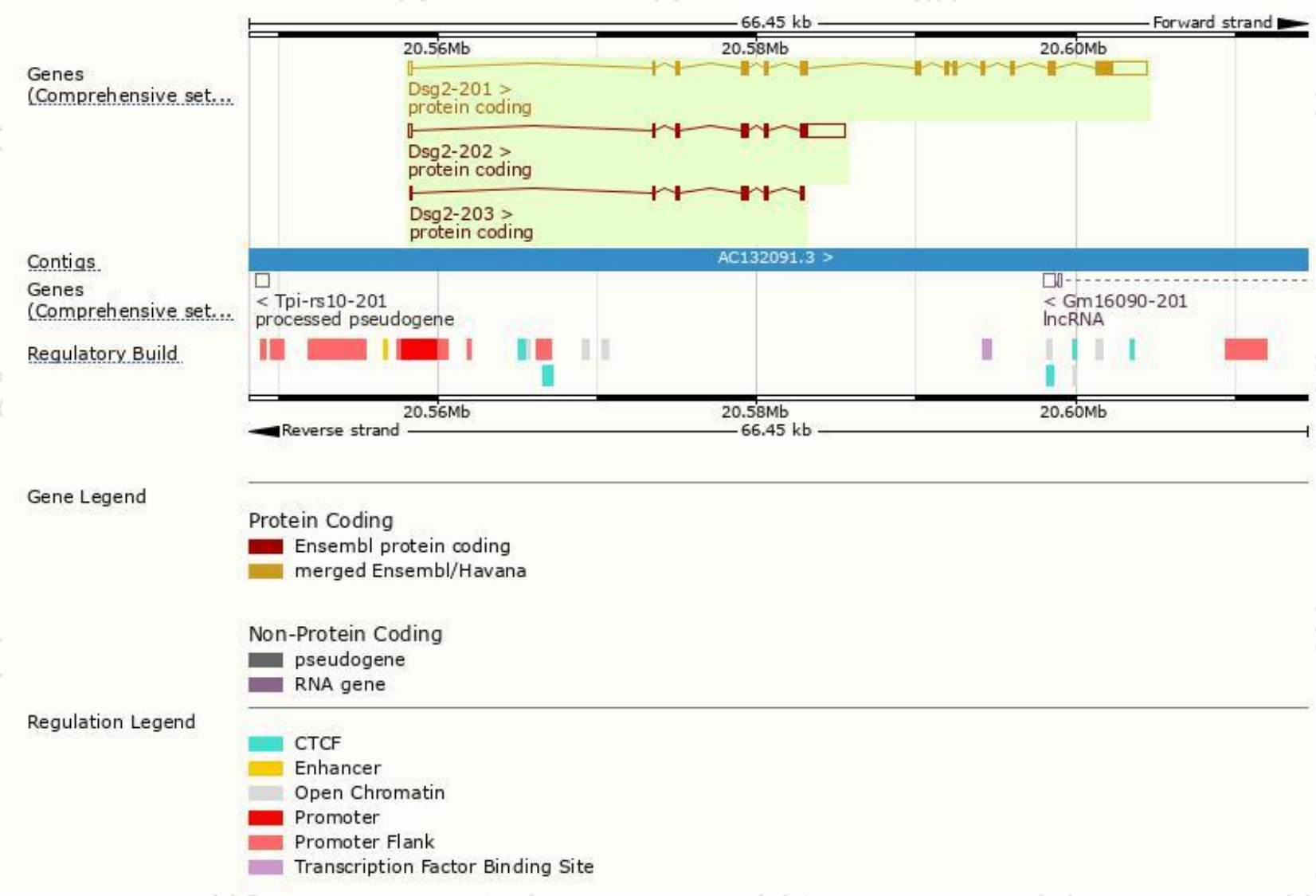
Transcript information（Ensembl）

The gene has 3 transcripts,all transcripts are shown below:

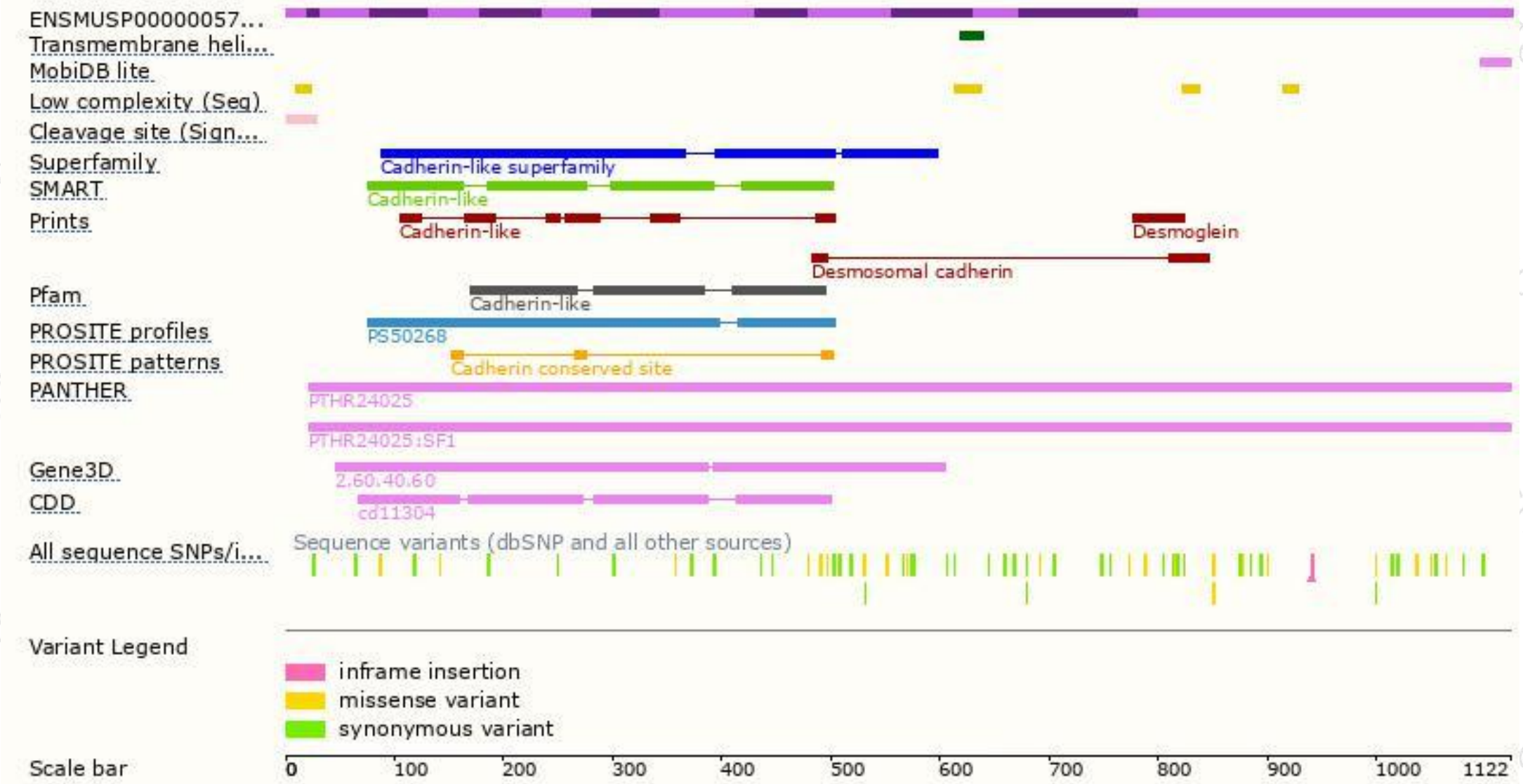
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dsg2-201	ENSMUST00000059787.14	5766	1122aa	Protein coding	CCDS29084	O55111	TSL:1 GENCODE basic APPRIS P1
Dsg2-202	ENSMUST00000120102.7	3590	360aa	Protein coding	-	Q811I1	TSL:1 GENCODE basic
Dsg2-203	ENSMUST00000121837.1	953	292aa	Protein coding	-	Q8VCE3	TSL:1 GENCODE basic

The strategy is based on the design of *Dsg2-201* transcript,The transcription is shown below

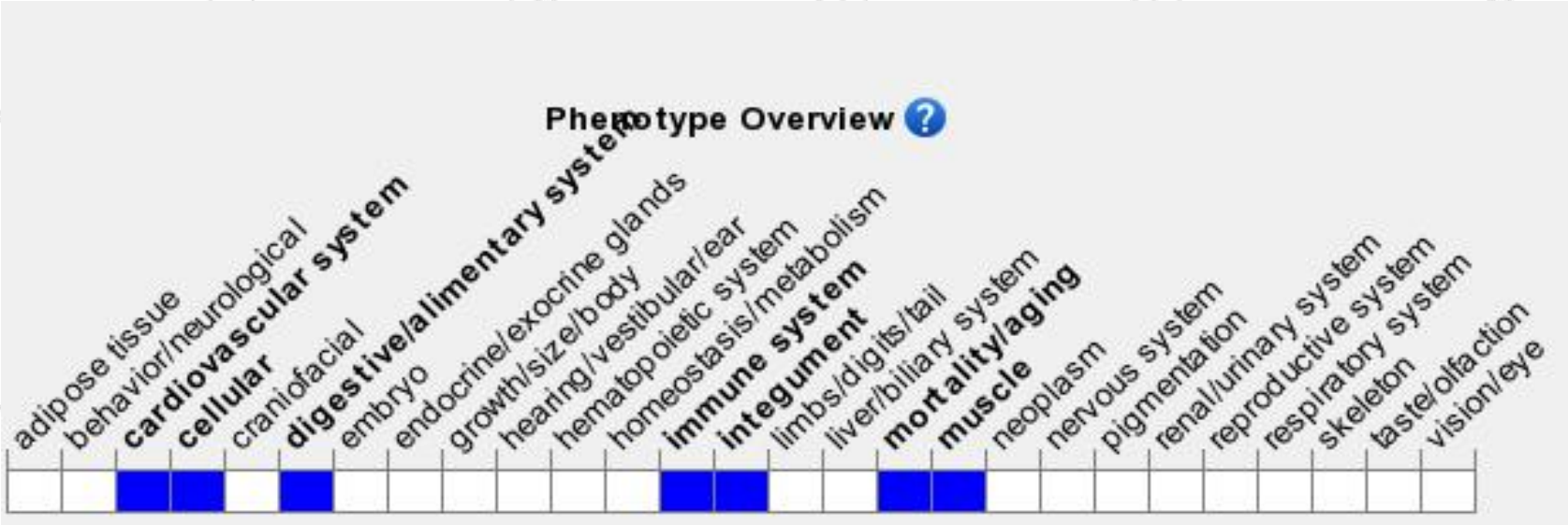
Genomic location distribution



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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