Klf15 Cas9-CKO *Strategy*

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Reviewer： **Huimin Su**

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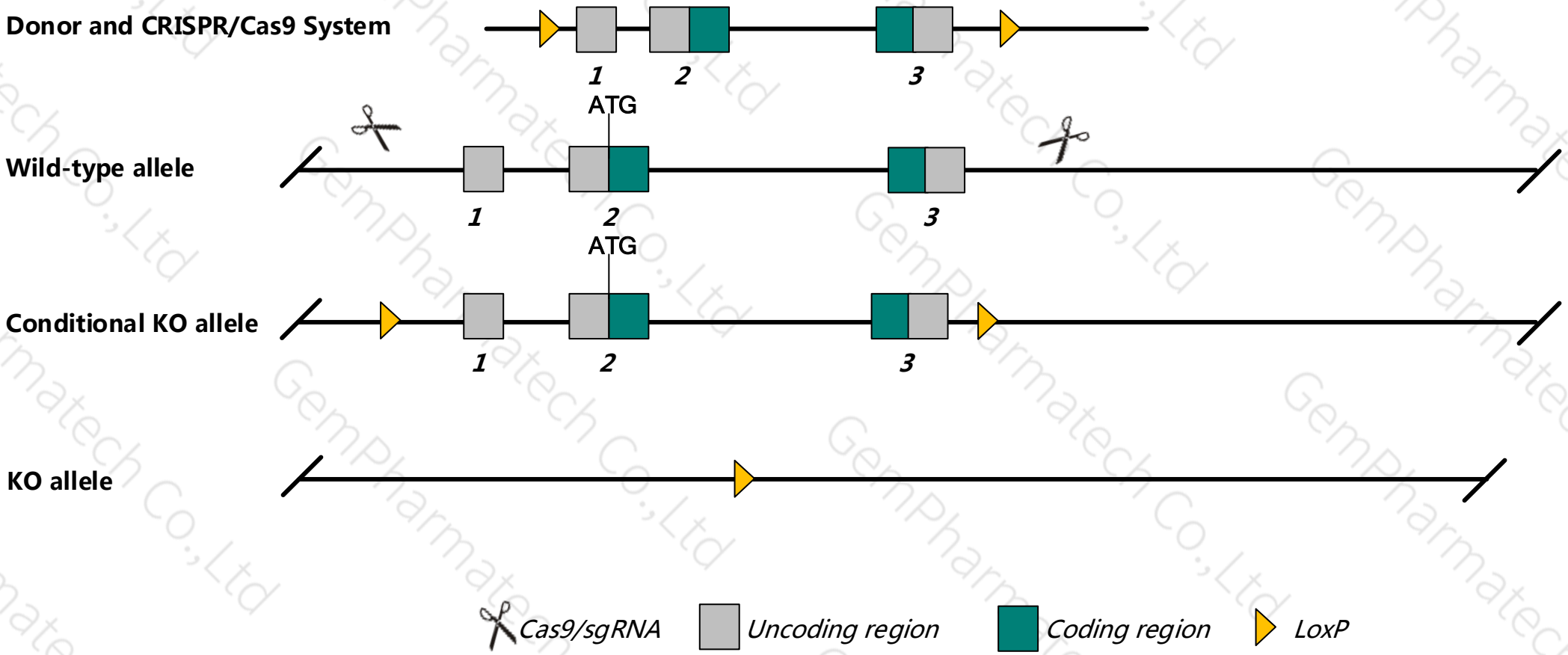
Project Overview

Project Name	***Klf15***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Klf15* gene. The schematic diagram is as follows:



Technical routes

- The *Klf15* gene has 5 transcripts.According to the structure of *Klf15* gene, exon1-exon3 of *Klf15*-201 (ENSMUST00000203039.2) transcript is recommended as the knockout region.The region contains all coding sequence.Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Klf15* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed.Cas9, sgRNA 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 was knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues or cell types.

Notice

- According to the existing MGI data，Mice homozygous for a null allele display impaired gluconeogenesis with severe fasting induce hypoglycemia. Homozygotes are also more sensitive to induced cardiac stress and display mild cardiac and aortic abnormalities.
- The KO region contains functional region of the *Gm44117* gene.Knockout the region may affect the function of *Gm44117* gene.
- The *Klf15* gene is located on the Chr6. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information （NCBI）

Klf15 Kruppel-like factor 15 [*Mus musculus* (house mouse)]

Gene ID: 66277, updated on 8-Dec-2018

Summary

Official Symbol	Klf15 provided by MGI
Official Full Name	Kruppel-like factor 15 provided by MGI
Primary source	MGI:MGI:1929988
See related	Ensembl:ENSMUSG00000030087
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	CKLF; KKLF; AV048136; AW494632; 1810013I09Rik
Expression	Broad expression in liver adult (RPKM 36.3), kidney adult (RPKM 26.2) and 20 other tissues See more
Orthologs	human all

Transcript information（ Ensembl ）

The gene has 5 transcripts, and all transcripts are shown below:

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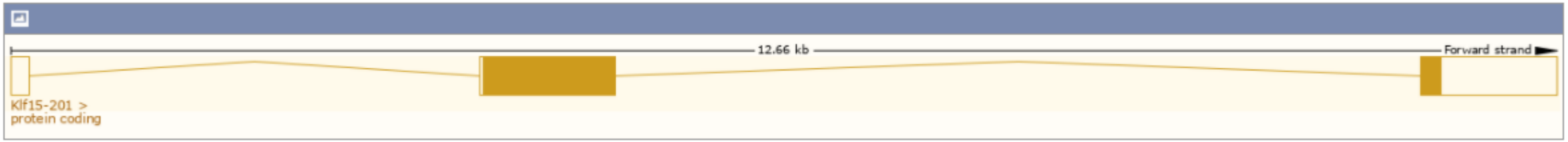
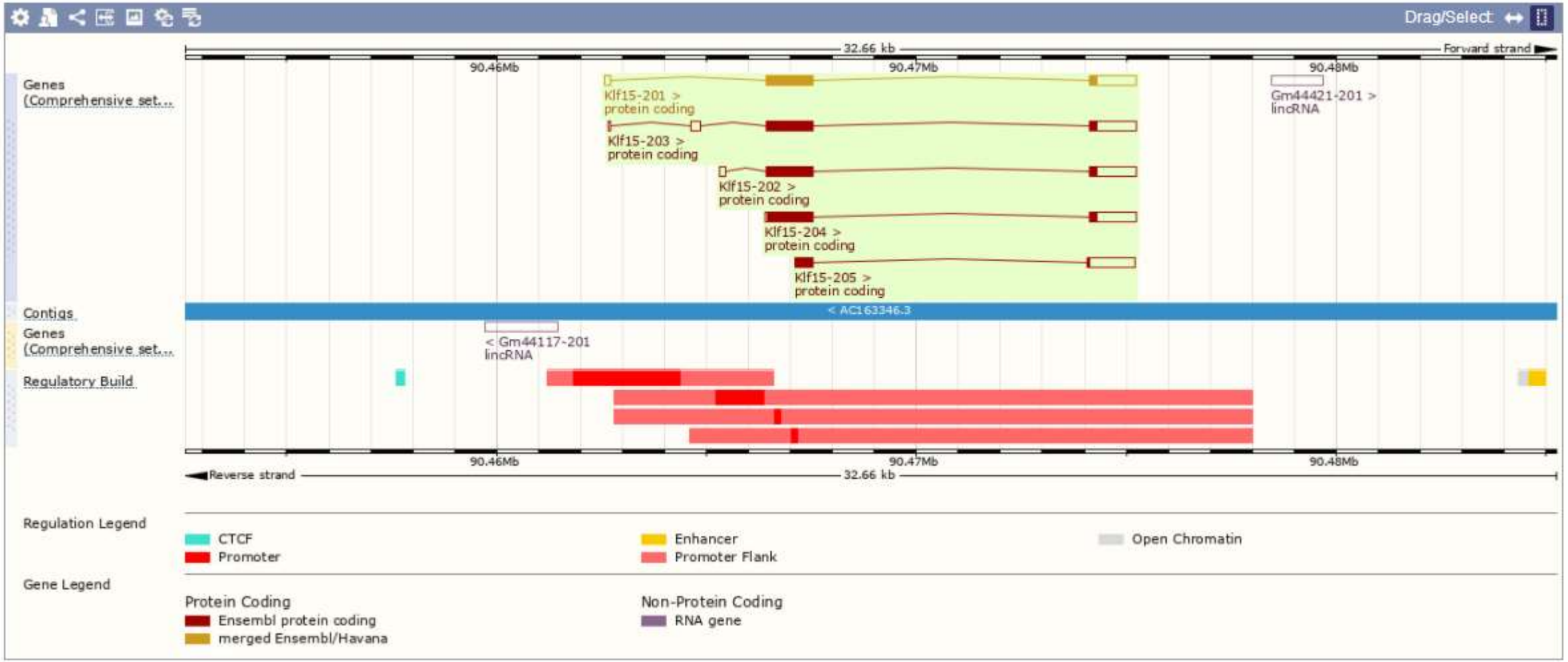
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
Klf15-203	ENSMUST00000203039.2	2482	415aa	Protein coding	CCDS20360	Q9EPW2	-	TSL:5 GENCODE basic APPRIS P1
Klf15-202	ENSMUST00000113530.3	2374	415aa	Protein coding	CCDS20360	Q9EPW2	-	TSL:5 GENCODE basic APPRIS P1
Klf15-201	ENSMUST00000032174.11	2373	415aa	Protein coding	CCDS20360	Q9EPW2	NM_023184 NP_075673	TSL:1 GENCODE basic APPRIS P1
Klf15-204	ENSMUST00000203607.1	2240	415aa	Protein coding	CCDS20360	Q9EPW2	-	TSL:1 GENCODE basic APPRIS P1
Klf15-205	ENSMUST00000205136.1	1545	153aa	Protein coding	-	A0A0N4SVC6	-	CDS 5' incomplete TSL:1

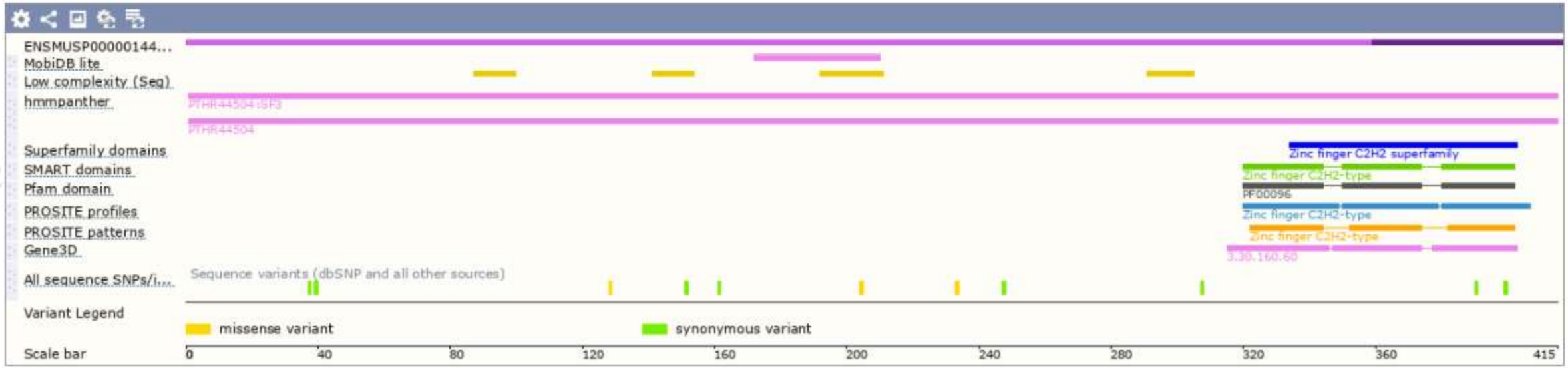
The strategy is based on the design of *Klf15*-201 transcript,The transcription is shown below



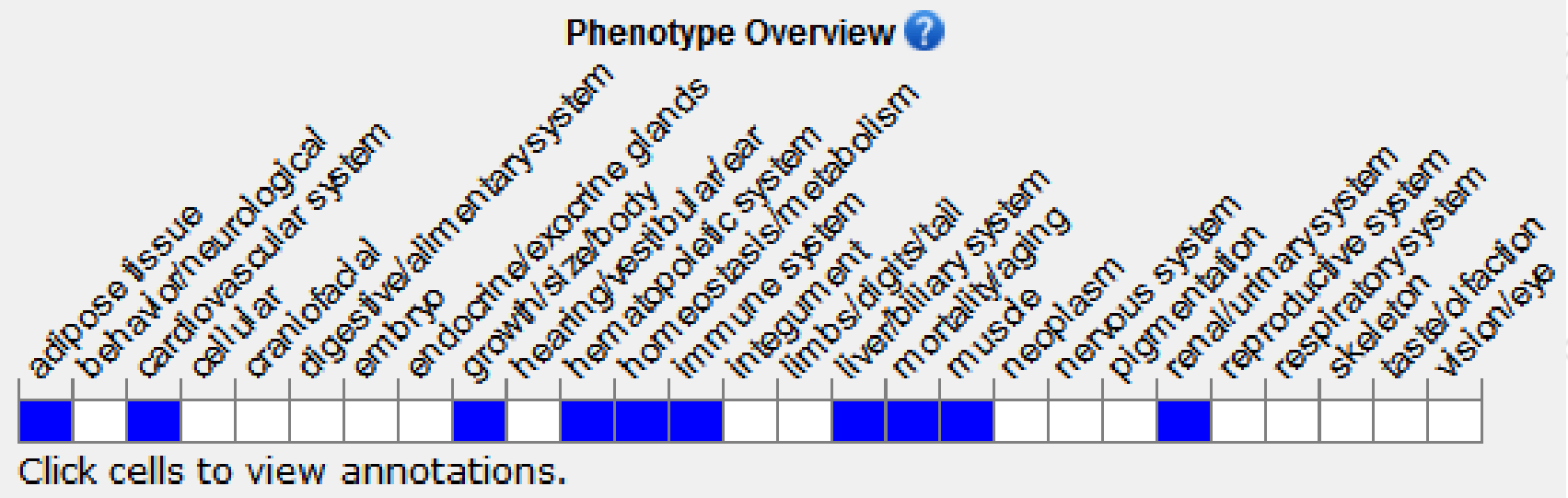
Genomic location distribution



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,Mice homozygous for a null allele display impaired gluconeogenesis with severe fasting induce hypoglycemia. Homozygotes are also more sensitive to induced cardiac stress and display mild cardiac and aortic abnormalities.

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

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