

Galnt1 Cas9-CKO Strategy

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Reviewer :

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Design Date:

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Project Overview

Project Name

Galnt1

Project type

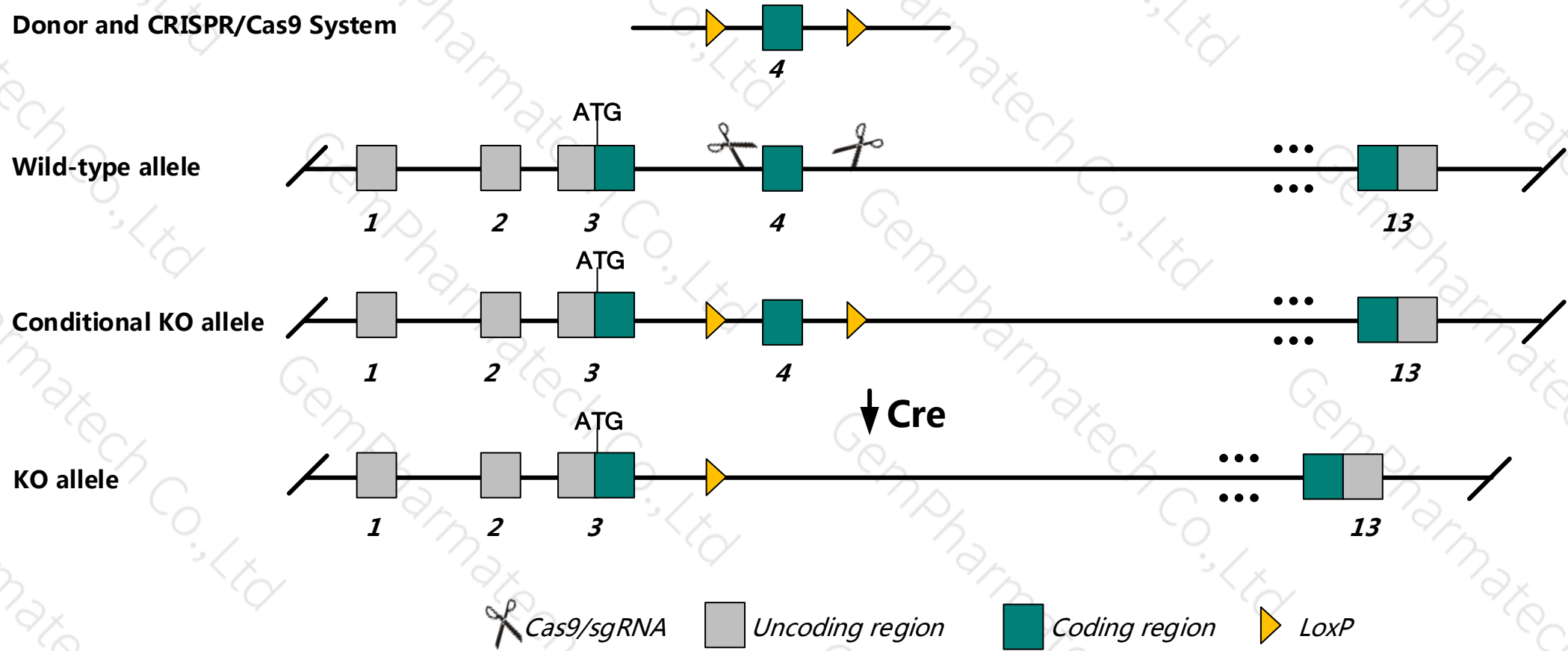
Cas9-CKO

Animal background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Galnt1* gene. The schematic diagram is as follows:



Technical routes

- The *Galnt1* gene has 8 transcripts, According to the structure of *Galnt1* gene, exon4 of *Galnt1-201* transcript is recommended as the knockout region. The region contains the 175bp coding sequence. Knock out the region, result in destruction of protein.
- This project uses CRISPR/Cas9 technology to modify *Galnt1* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed, Cas9, sgRNA and donor were microinjected into fertilized eggs of C57BL/6JGpt mice and homologous recombination was carried out to obtain F0 mice. A stable and hereditary F1 generation mouse model was obtained by mating F0 generation mice with C57BL/6JGpt mice which were confirmed positive by PCR-sequencing.
- 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 and cell types.

- According to the existing MGI data , Mice homozygous for a null allele exhibit some embryonic lethality, increased bleeding time, decreased T and B cells, impaired leukocyte rolling, decreased IgG levels, and hypoalbuminemia.
- The *Galnt1* gene is located in the Chr18. If the knockout mice are mixed with other mice, two target genes are avoided on the same chromosome as possible, otherwise the offspring of mice with double gene positive and homozygous gene knockout can not be obtained.
- This Strategy is designed based on genetic information in existing databases. Due to the complexity of gene transcription and translation processes, all risks cannot be predicted under existing information.

Gene information (NCBI)

Galnt1 polypeptide N-acetylgalactosaminyltransferase 1 [*Mus musculus* (house mouse)]

Gene ID: 14423, updated on 8-Dec-2018

Summary

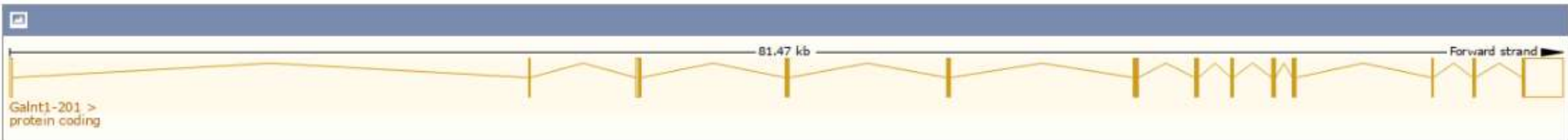
Official Symbol	Galnt1 provided by MGI
Official Full Name	polypeptide N-acetylgalactosaminyltransferase 1 provided by MGI
Primary source	MGI:MGI:894693
See related	Ensembl:ENSMUSG00000000420
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Ubiquitous expression in liver E14 (RPKM 19.5), placenta adult (RPKM 18.4) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

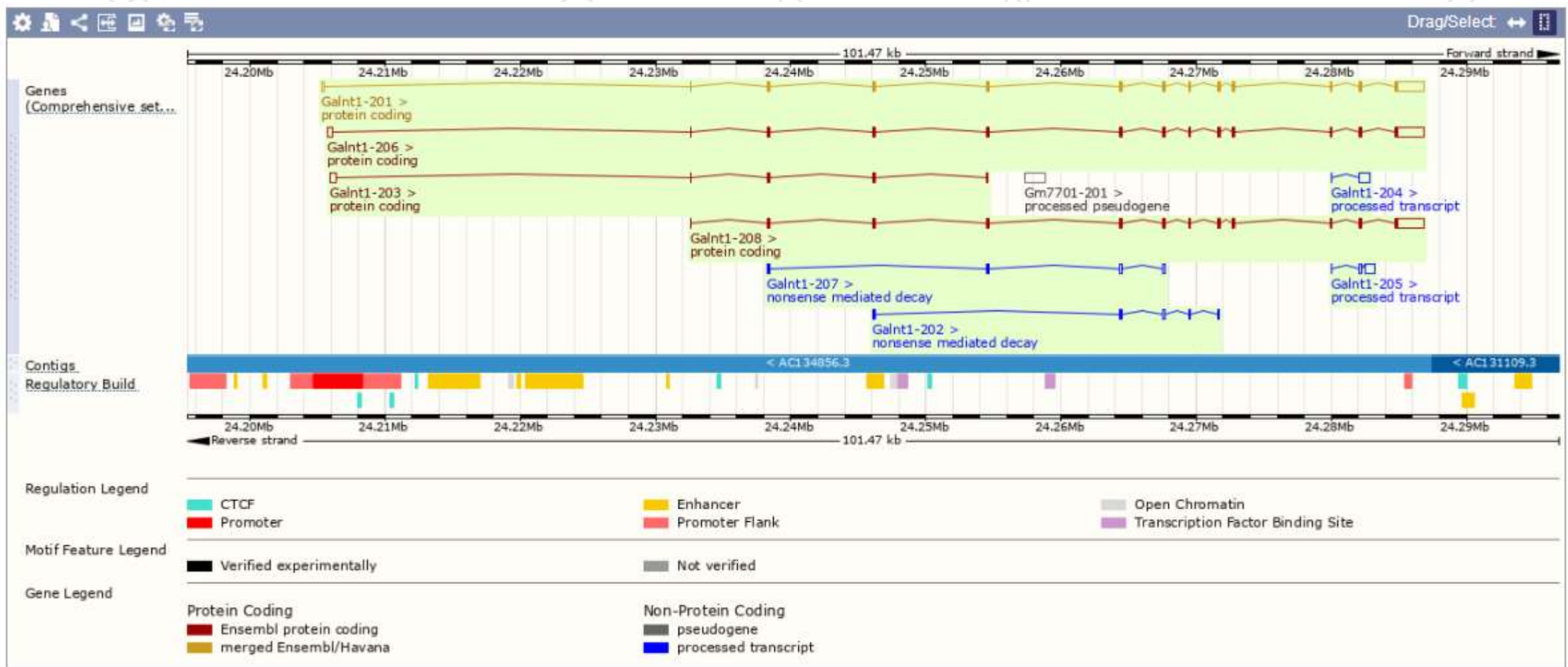
The gene has 8 transcripts, and all transcripts are shown below :

Show/hide columns (1 hidden)								Filter		
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags		
Galnt1-206	ENSMUST00000170243.7	4108	559aa	Protein coding	CCDS29100	O08912	NM_001160404 NP_001153876	TSL:1	GENCODE basic	APPRIS P1
Galnt1-201	ENSMUST00000000430.13	3977	559aa	Protein coding	CCDS29100	O08912	NM_001361200 NM_013814 NP_001348129 NP_038842	TSL:1	GENCODE basic	APPRIS P1
Galnt1-208	ENSMUST00000178605.1	3796	559aa	Protein coding	CCDS29100	O08912	-	TSL:1	GENCODE basic	APPRIS P1
Galnt1-203	ENSMUST00000164998.7	980	142aa	Protein coding	-	E9Q0U0	-	CDS 3' incomplete TSL:5		
Galnt1-202	ENSMUST00000164066.1	720	78aa	Nonsense mediated decay	-	F6PYE1	-	CDS 5' incomplete TSL:3		
Galnt1-207	ENSMUST00000171583.1	678	62aa	Nonsense mediated decay	-	E9PVK6	-	TSL:3		
Galnt1-204	ENSMUST00000169474.1	818	No protein	Processed transcript	-	-	-	TSL:3		
Galnt1-205	ENSMUST00000170191.1	798	No protein	Processed transcript	-	-	-	TSL:5		

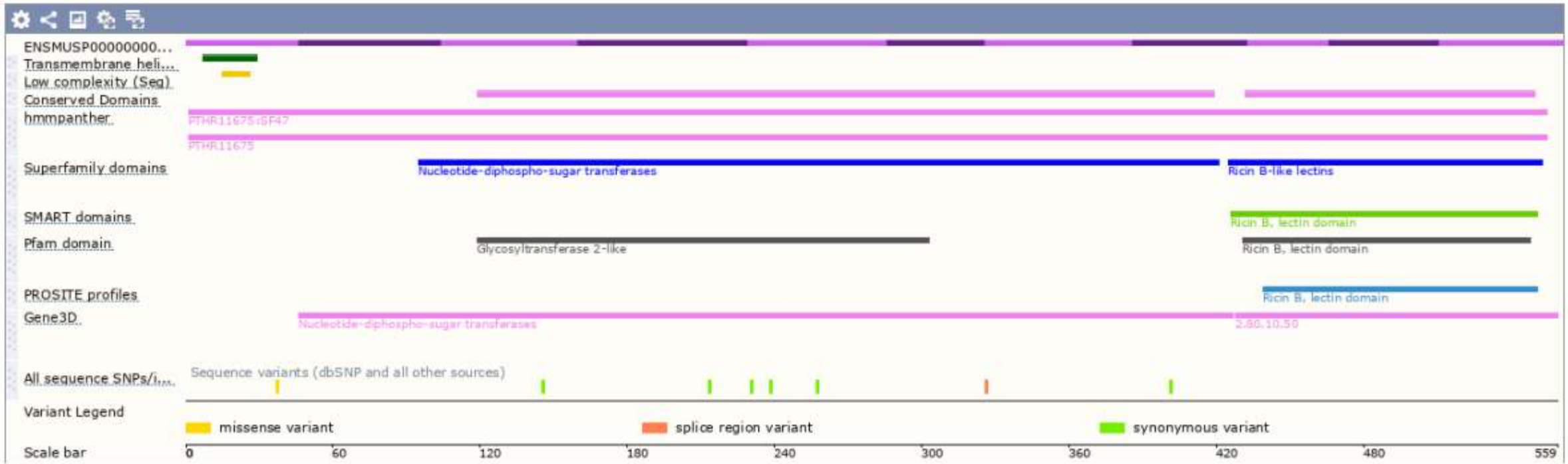
The strategy is based on the design of *Galnt1-201* transcript,The transcription is shown below :



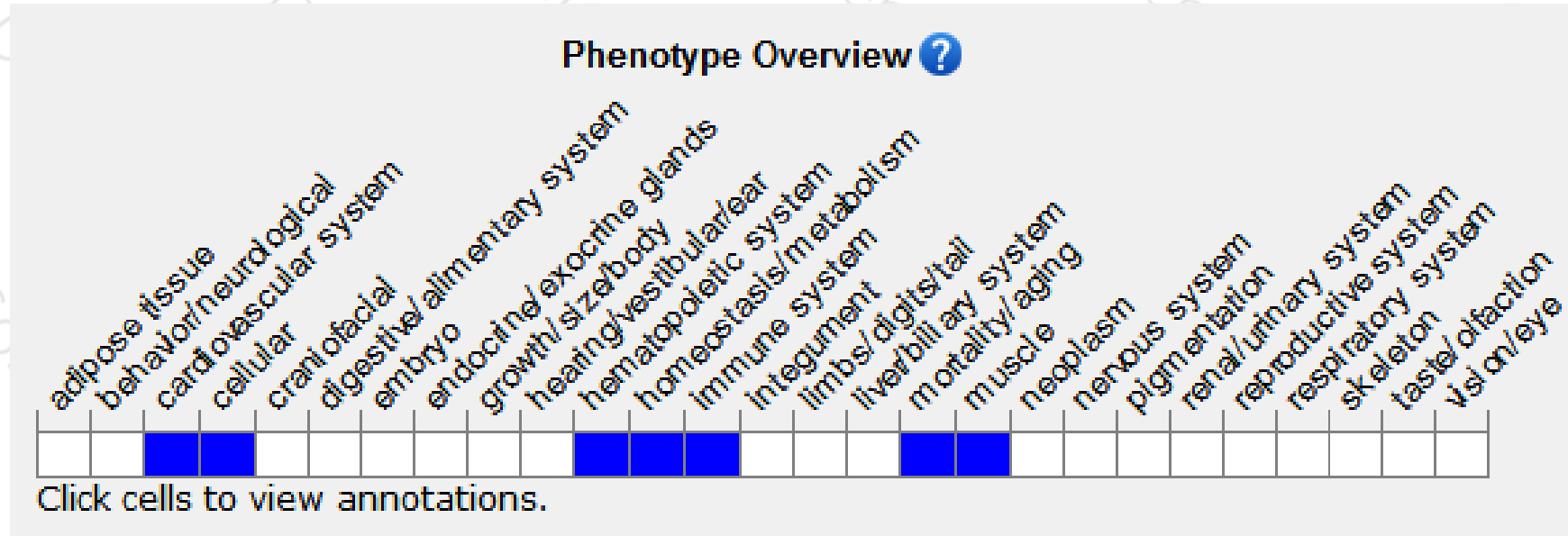
Genomic location distribution



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 exhibit some embryonic lethality, increased bleeding time, decreased T and B cells, impaired leukocyte rolling, decreased IgG levels, and hypoalbuminemia.

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