

# ***Prkcb Cas9-CKO Strategy***

**Designer:**

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**Design Date:**

**2019-8-22**

# Project Overview

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**Project Name**

*Prkcb*

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**Project type**

Cas9-CKO

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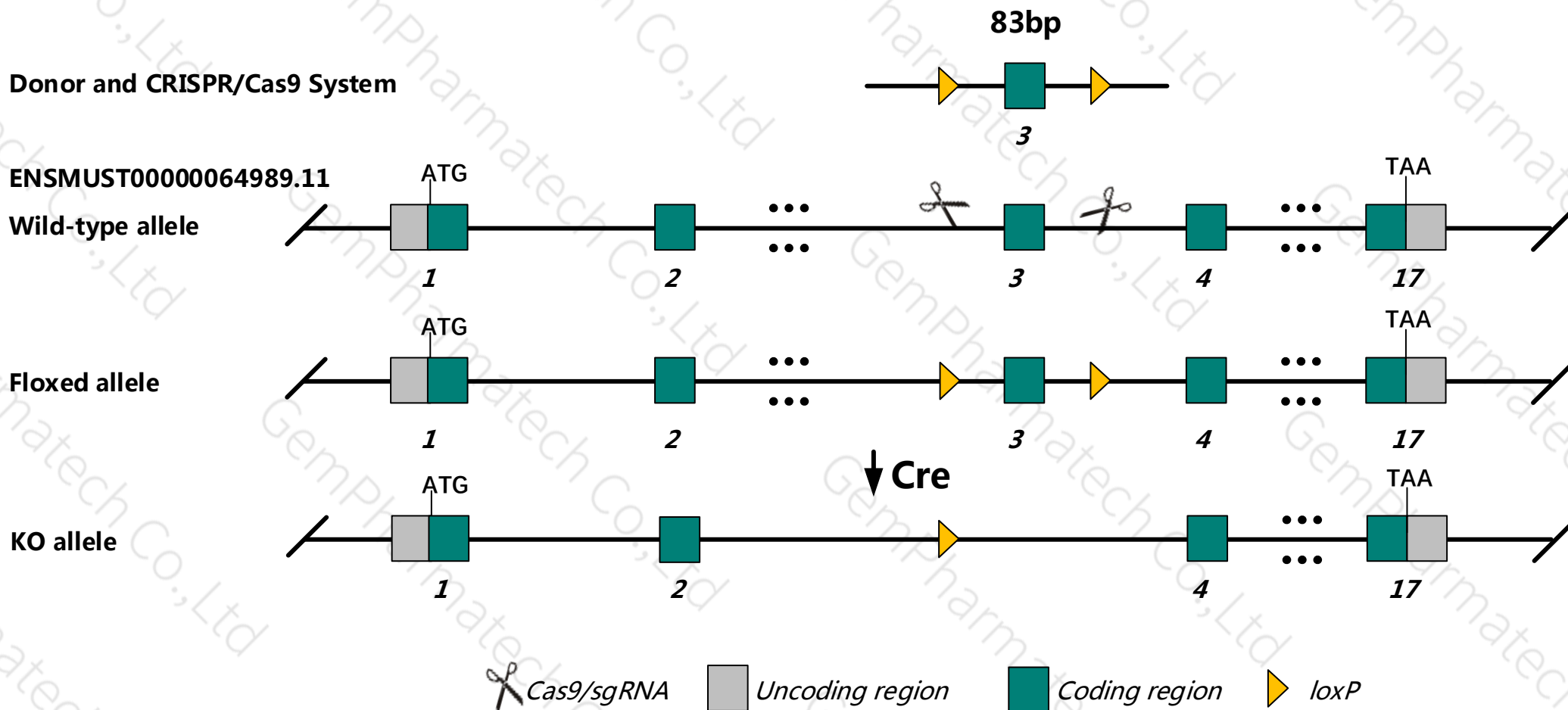
**Animal background**

C57BL/6JGpt

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# Conditional Knockout strategy

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



# Technical routes

- The *Prkcb* gene has 8 transcripts, According to the structure of *Prkcb* gene, exon3 of *Prkcb-202* transcript is recommended as the knockout region. The region contains the 83bp coding sequence. Knock out the region, result in destruction of protein.
- This project uses CRISPR/Cas9 technology to modify *Prkcb* 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 impaired humoral immune responses, altered proliferative responses of B cells to various stimuli, abnormal vascular wound healing, and deficits in contextual and cued fear conditioning. ENU-induced mutations lead to impaired T cell-independent IgM responses.
- The *Prkcb* gene is located in the Chr7. 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 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 )



## Prkcb protein kinase C, beta [ *Mus musculus* (house mouse) ]

Gene ID: 18751, updated on 8-Dec-2018

### Summary

Official Symbol	Prkcb provided by <a href="#">MGI</a>
Official Full Name	protein kinase C, beta provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:97596</a>
See related	<a href="#">Ensembl:ENSMUSG00000052889</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Pkcb; PKC-B; Prkcb1; Prkcb2; PKC-Beta
Expression	Biased expression in cortex adult (RPKM 62.0), frontal lobe adult (RPKM 44.4) and 8 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information ( Ensembl )

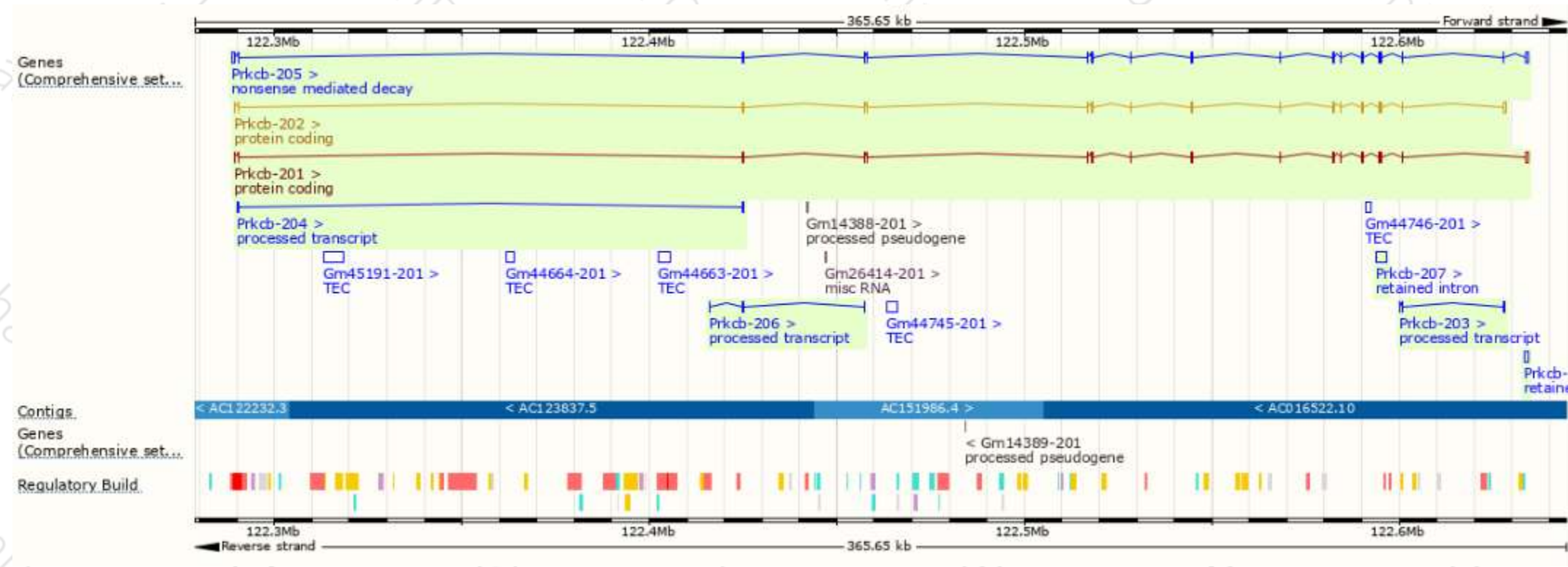
The gene has 8 transcripts, and all transcripts are shown below :

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	RefSeq	Flags
Prkcb-202	<a href="#">ENSMUST00000064989.11</a>	2911	<a href="#">673aa</a>	Protein coding	<a href="#">CCDS21815</a>	<a href="#">P68404</a>	<a href="#">NM_008855</a> <a href="#">NP_032881</a>	TSL:1 Gencode basic APPRIS P3
Prkcb-201	<a href="#">ENSMUST00000064921.4</a>	2557	<a href="#">671aa</a>	Protein coding	<a href="#">CCDS85402</a>	<a href="#">P68404</a>	<a href="#">NM_001316672</a> <a href="#">NP_001303601</a>	TSL:1 Gencode basic APPRIS ALT1
Prkcb-205	<a href="#">ENSMUST00000143692.7</a>	3328	<a href="#">673aa</a>	Nonsense mediated decay	<a href="#">CCDS21815</a>	<a href="#">P68404</a>	-	TSL:5
Prkcb-203	<a href="#">ENSMUST00000127910.1</a>	770	No protein	Processed transcript	-	-	-	TSL:3
Prkcb-204	<a href="#">ENSMUST00000131167.7</a>	409	No protein	Processed transcript	-	-	-	TSL:3
Prkcb-206	<a href="#">ENSMUST00000149583.1</a>	329	No protein	Processed transcript	-	-	-	TSL:2
Prkcb-207	<a href="#">ENSMUST00000205550.1</a>	2794	No protein	Retained intron	-	-	-	TSL:NA
Prkcb-208	<a href="#">ENSMUST00000206495.1</a>	955	No protein	Retained intron	-	-	-	TSL:NA

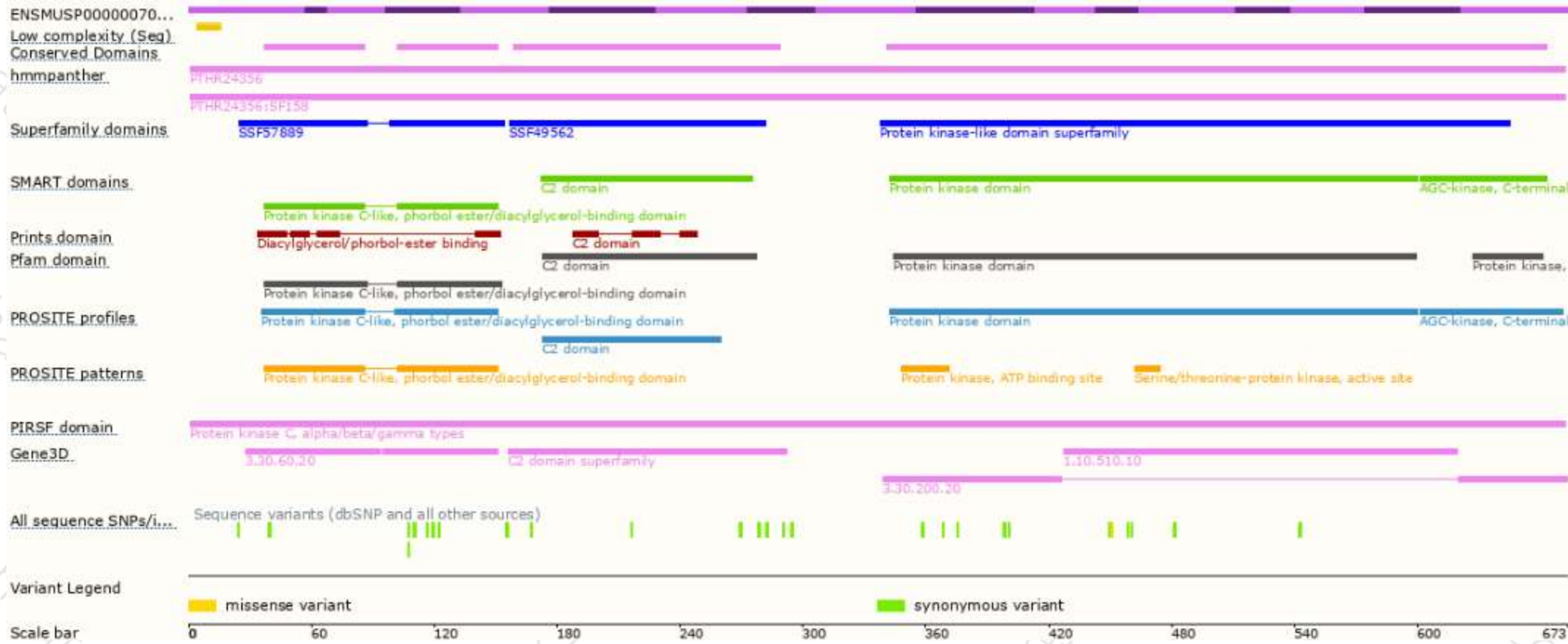
The strategy is based on the design of *Prkcb-202* transcript, The transcription is shown below :



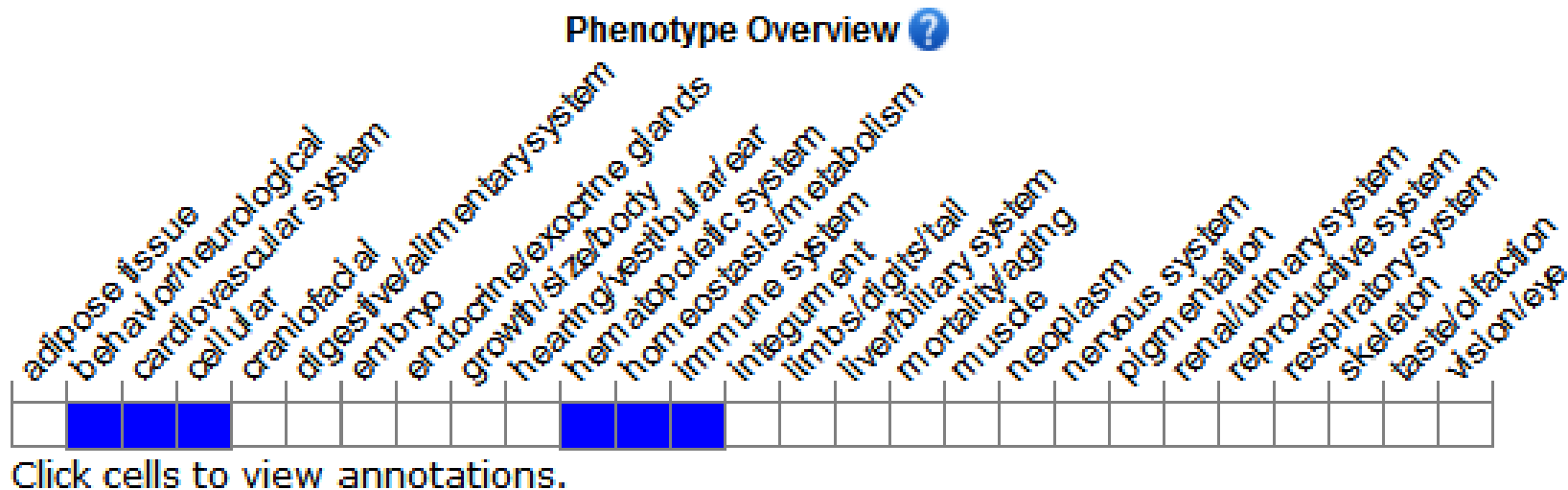
# Genomic location distribution



# 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 impaired humoral immune responses, altered proliferative responses of B cells to various stimuli, abnormal vascular wound healing, and deficits in contextual and cued fear conditioning. ENU-induced mutations lead to impaired T cell-independent IgM responses.

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