

# *Igfbp2* Cas9-CKO Strategy

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**Reviewer:**

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# Project Overview

**Project Name**

***Igfbp2***

**Project type**

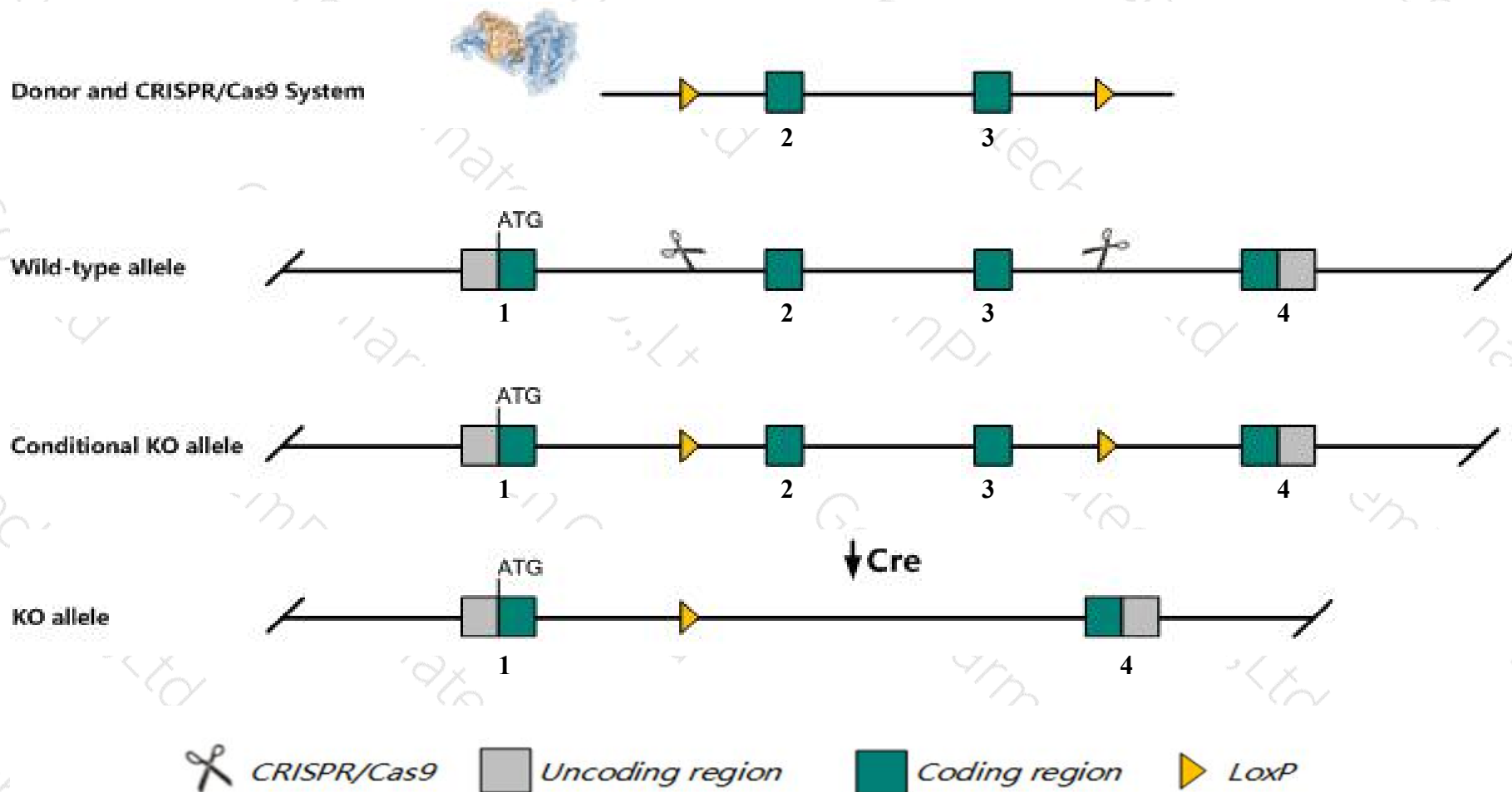
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Igfbp2* gene. The schematic diagram is as follows:



- The *Igfbp2* gene has 3 transcripts. According to the structure of *Igfbp2* gene, exon2-exon3 of *Igfbp2-201* (ENSMUST00000047328.10) transcript is recommended as the knockout region. The region contains 368bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Igfbp2* 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.

- According to the existing MGI data, Homozygous mutation of this gene results in reduced spleen, heart and kidney size and increased liver weight. Homozygotes for another allele exhibit a normal phenotype.
- The *Igfbp2* gene is located on the Chr1. 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)

## Igfbp2 insulin-like growth factor binding protein 2 [Mus musculus (house mouse)]

Gene ID: 16008, updated on 2-Apr-2019

### Summary



**Official Symbol** Igfbp2 provided by [MGI](#)

**Official Full Name** insulin-like growth factor binding protein 2 provided by [MGI](#)

**Primary source** [MGI:MGI:96437](#)

**See related** [Ensembl:ENSMUSG00000039323](#)

**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** AI255832, IBP-2, Igfbp-2, mIGFBP-2

**Summary** The protein encoded by this gene is one of several similar proteins that bind insulin-like growth factors I and II (Igf-I and Igf-II). The encoded protein can be secreted into the bloodstream, where it binds Igf-I and Igf-II with high affinity, or it can remain intracellular, interacting with many different ligands. Two transcript variants, one encoding a secreted isoform and the other encoding a nonsecreted isoform, have been found for this gene. [provided by RefSeq, Sep 2015]

**Expression** Biased expression in bladder adult (RPKM 311.4), liver E18 (RPKM 285.8) and 12 other tissues [See more](#)

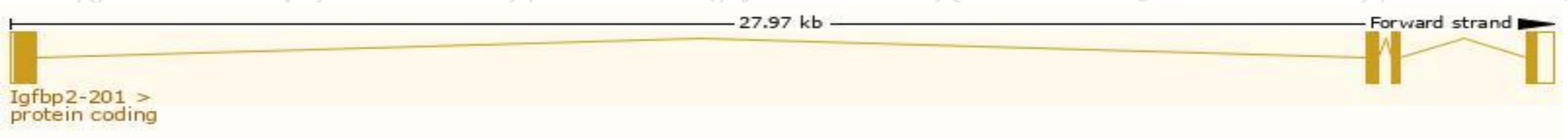
**Orthologs** [human](#) [all](#)

# Transcript information (Ensembl)

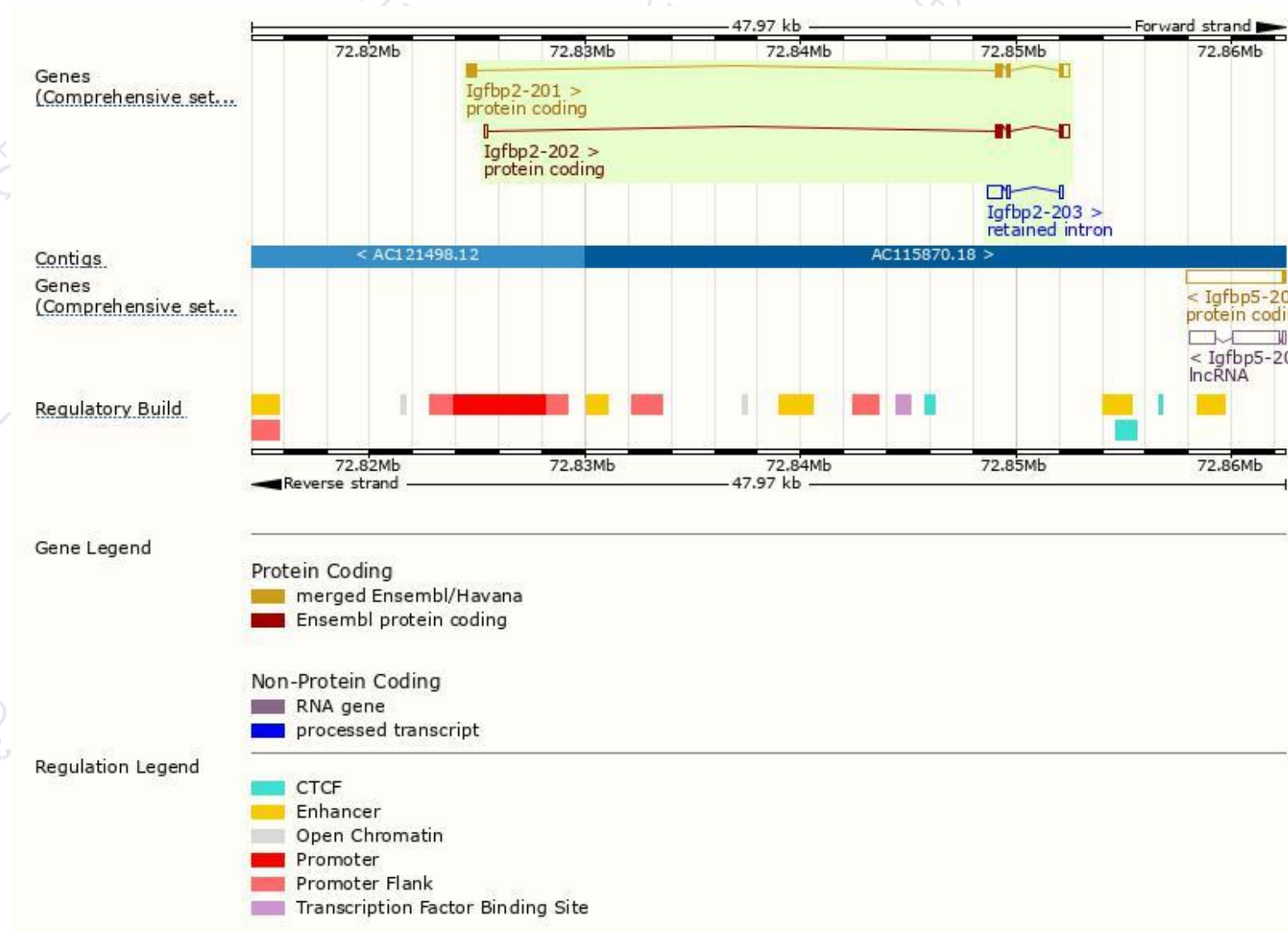
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Igfbp2-201	<a href="#">ENSMUST00000047328.10</a>	1307	<a href="#">305aa</a>	Protein coding	<a href="#">CCDS15036</a>	<a href="#">P47877</a>	TSL:1 GENCODE basic APPRIS P1
Igfbp2-202	<a href="#">ENSMUST00000120564.1</a>	991	<a href="#">158aa</a>	Protein coding	<a href="#">CCDS78613</a>	<a href="#">D3YU40</a>	TSL:3 GENCODE basic
Igfbp2-203	<a href="#">ENSMUST00000155703.1</a>	906	No protein	Retained intron	-	-	TSL:2

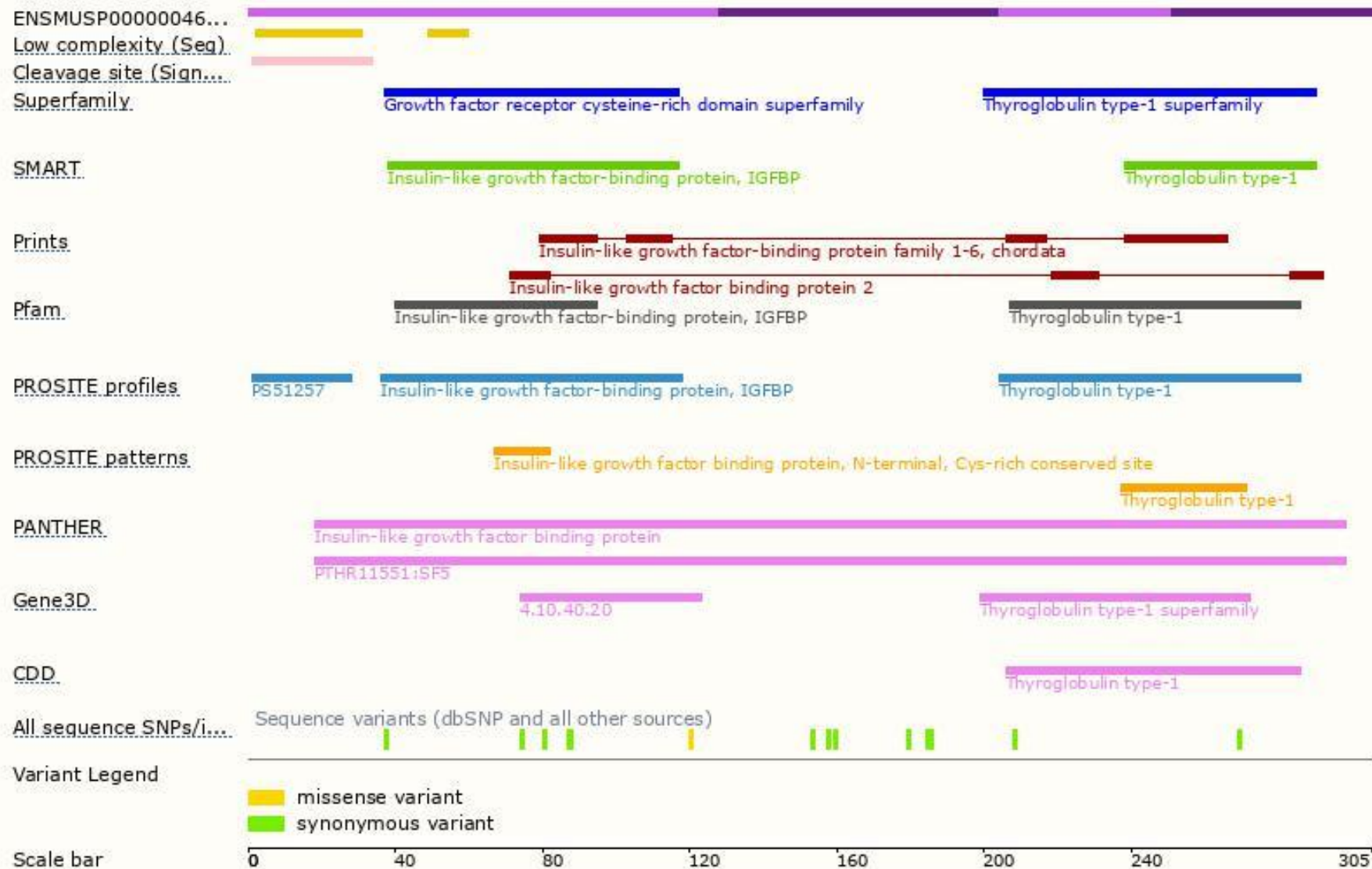
The strategy is based on the design of *Igfbp2-201* transcript,The transcription is shown below



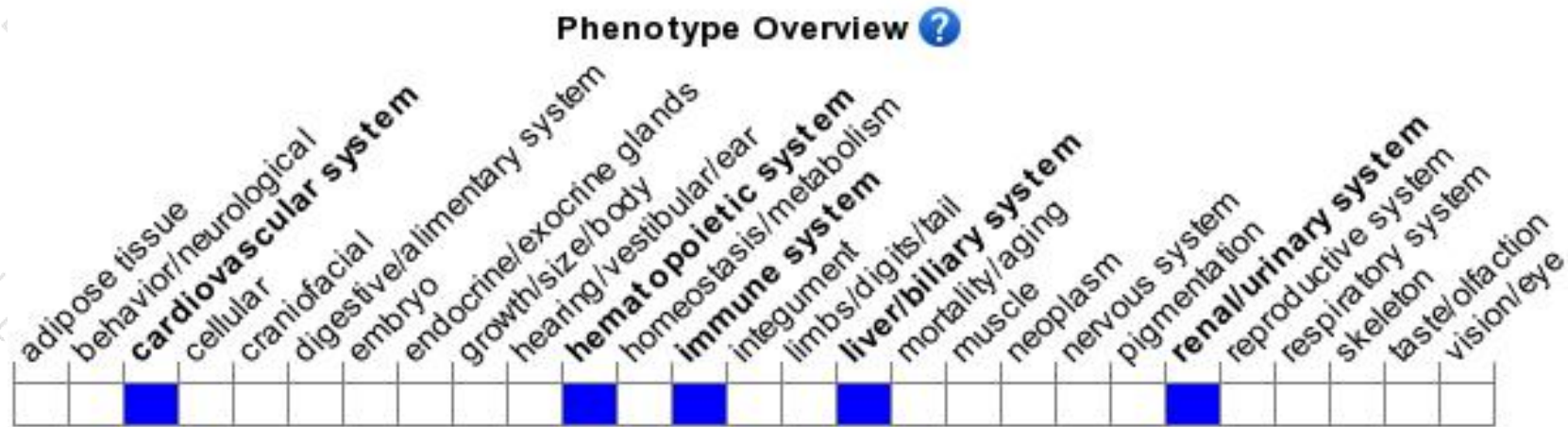
# Genomic location distribution



# 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, Homozygous mutation of this gene results in reduced spleen, heart and kidney size and increased liver weight. Homozygotes for another allele exhibit a normal phenotype.

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

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