

Il1b Cas9-CKO Strategy

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Project Overview

Project Name

Il1b

Project type

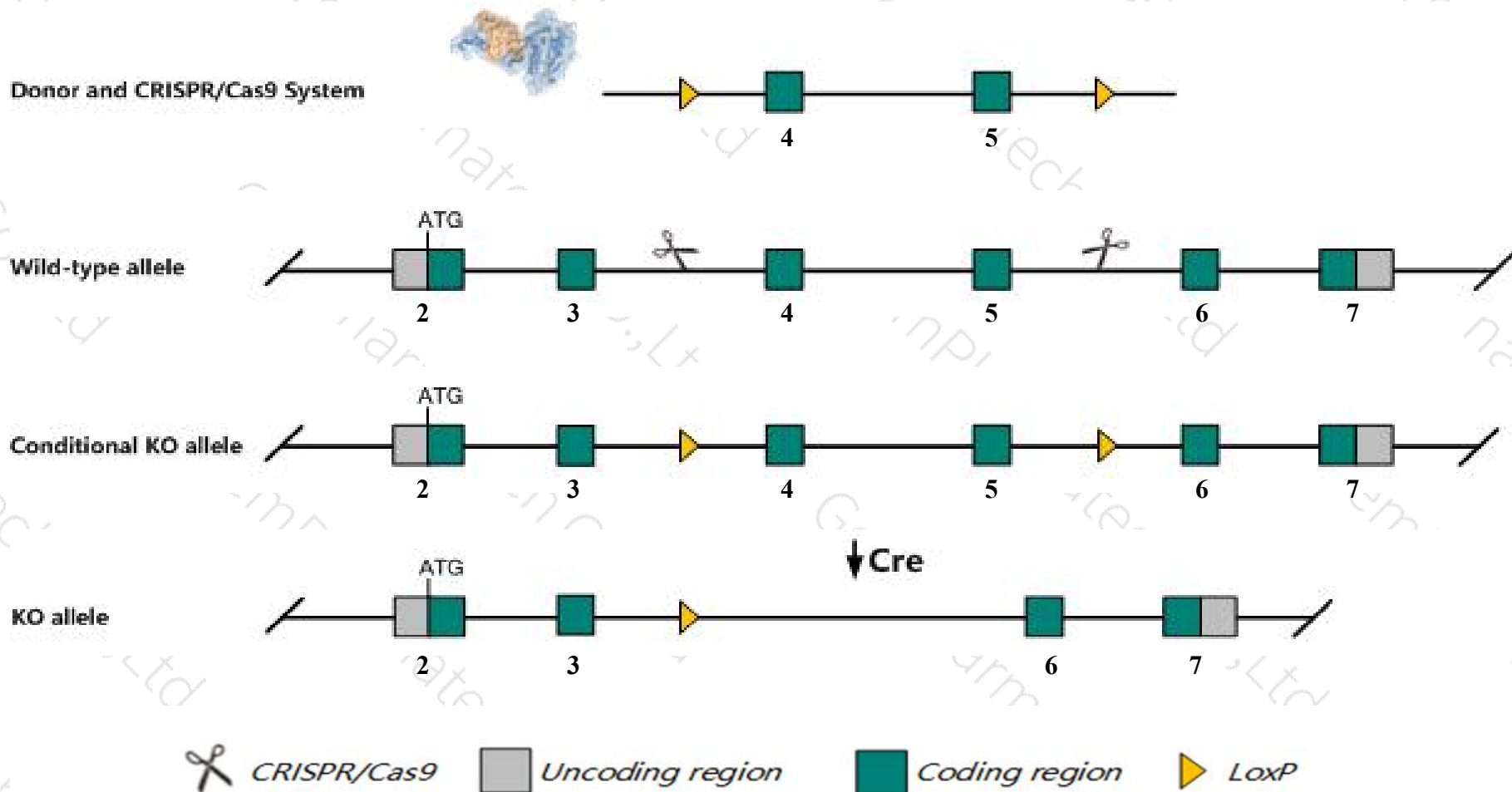
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Il1b* gene. The schematic diagram is as follows:



Technical routes

- The *Il1b* gene has 3 transcripts. According to the structure of *Il1b* gene, exon4-exon5 of *Il1b*-201 (ENSMUST00000028881.13) transcript is recommended as the knockout region. The region contains 373bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Il1b* 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 null mutants show impaired contact hypersensitivity and reduced acute-phase inflammatory response. Lung tumors and metastases of B16 melanoma do not occur in null mutant mice, suggesting inability to support tumor invasiveness and angiogenesis.
- Transcript *Il1b*-203 may not be affected.
- The knockout region is near to the N-terminal of *Gm14039* and *IL1bos* gene, this strategy may influence the regulatory function of the N-terminal of these gene.
- The *Il1b* gene is located on the Chr2. 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)

Il1b interleukin 1 beta [Mus musculus (house mouse)]

Gene ID: 16176, updated on 9-Apr-2019

Summary



Official Symbol Il1b provided by [MGI](#)

Official Full Name interleukin 1 beta provided by [MGI](#)

Primary source [MGI:MGI:96543](#)

See related [Ensembl:ENSMUSG000000027398](#)

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 IL-1beta, Il-1b

Summary The protein encoded by this gene is a member of the interleukin 1 cytokine family. This cytokine is produced by activated macrophages as a proprotein, which is proteolytically processed to its active form by caspase 1. The encoded protein plays a role in thymocyte proliferation and is involved in the inflammatory response. [provided by RefSeq, Aug 2015]

Expression Broad expression in spleen adult (RPKM 1.3), lung adult (RPKM 1.0) and 19 other tissues [See more](#)

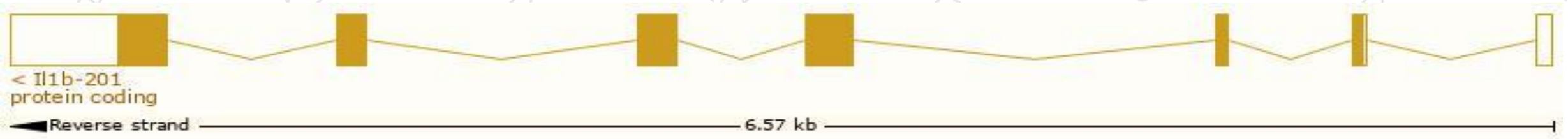
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

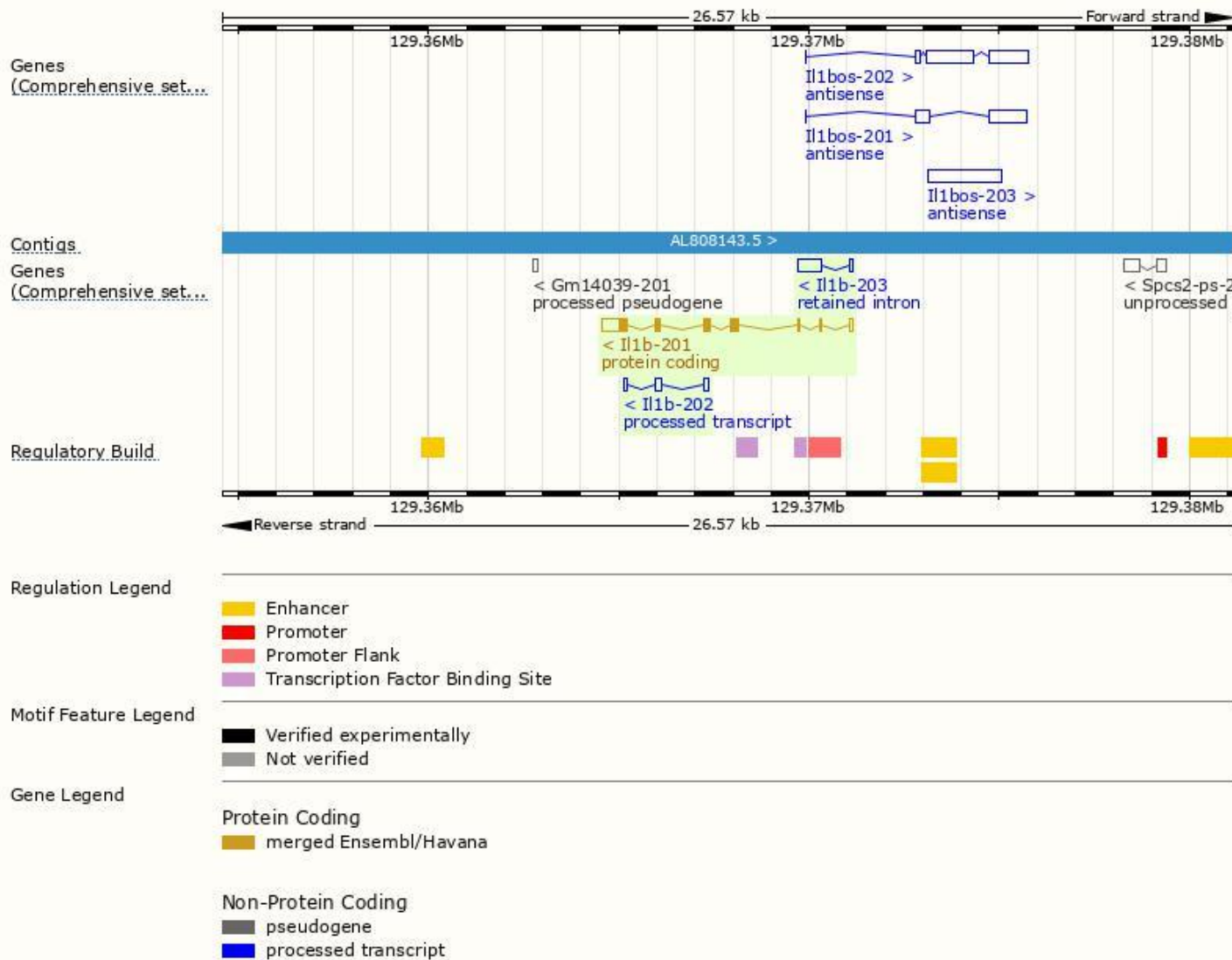
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
II1b-201	ENSMUST00000028881.13	1356	269aa	Protein coding	CCDS16726	P10749	TSL:1 GENCODE basic APPRIS P1
II1b-202	ENSMUST00000141979.1	379	No protein	Processed transcript	-	-	TSL:1
II1b-203	ENSMUST00000155994.1	689	No protein	Retained intron	-	-	TSL:2

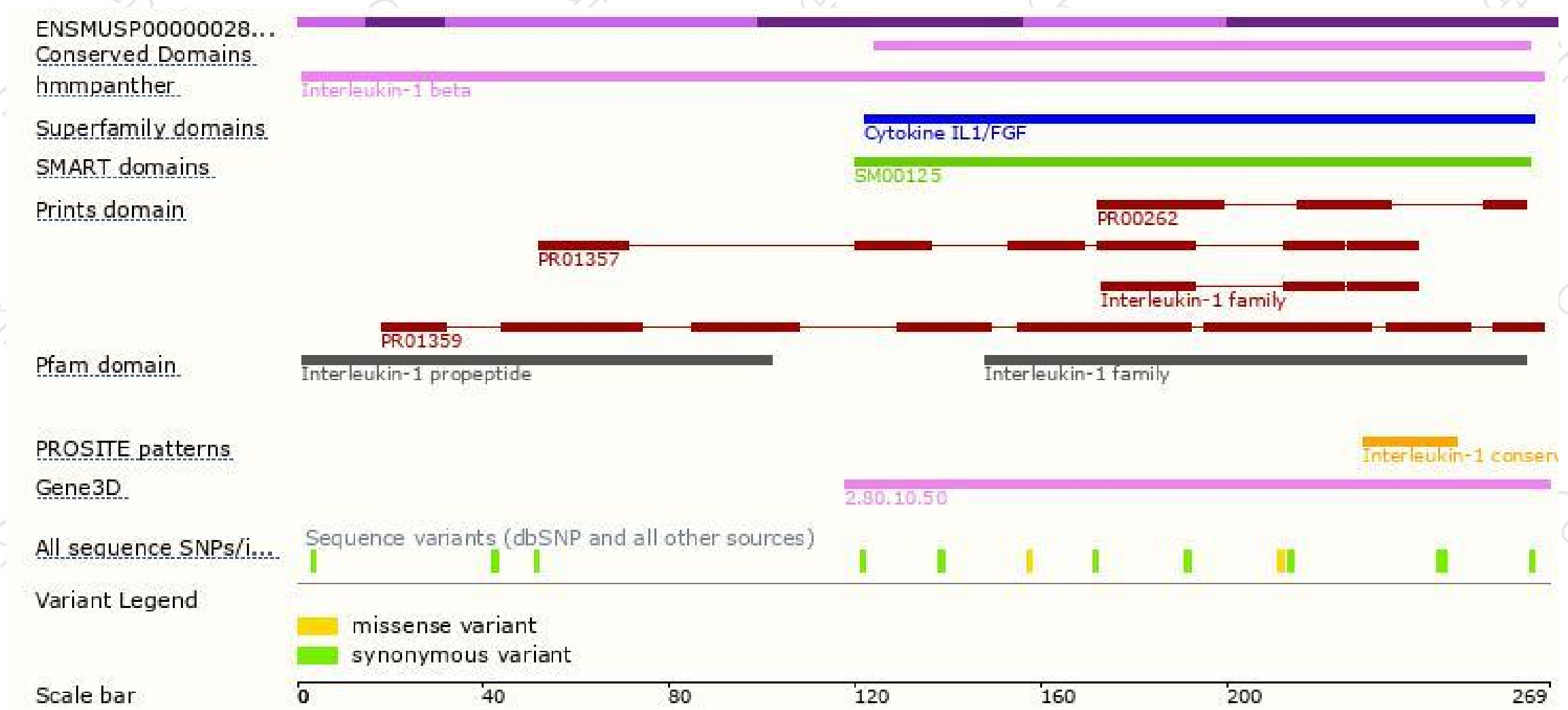
The strategy is based on the design of *II1b-201* transcript,The transcription is shown below



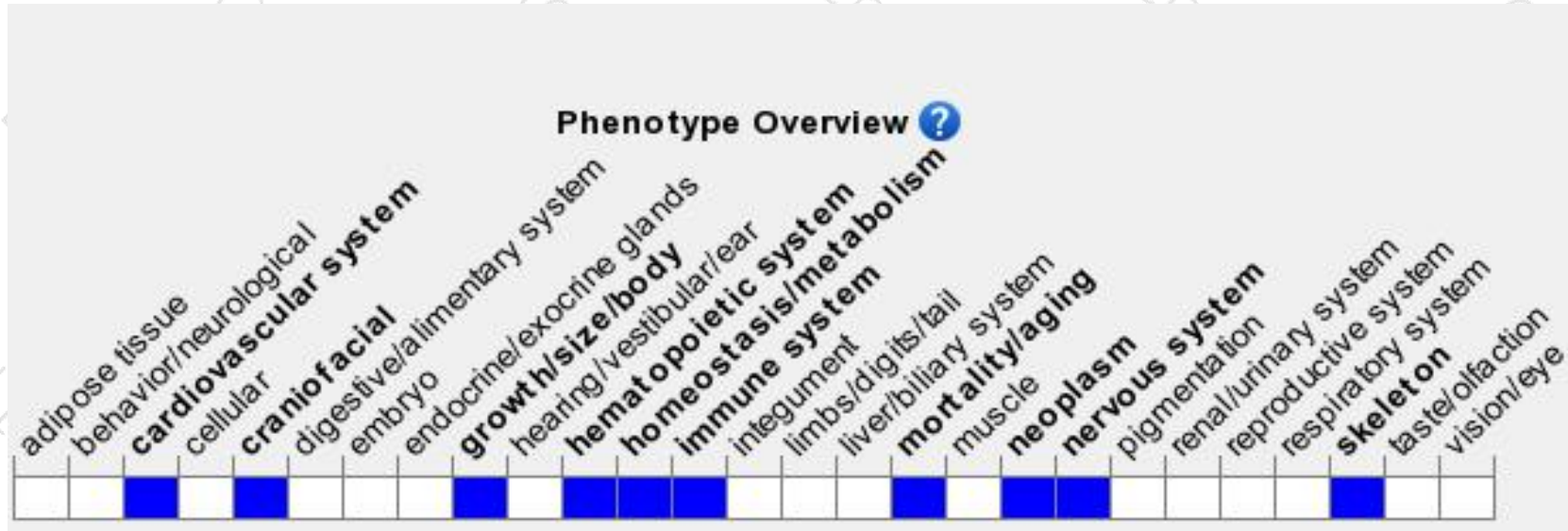
Genomic location distribution



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 null mutants show impaired contact hypersensitivity and reduced acute-phase inflammatory response. Lung tumors and metastases of B16 melanoma do not occur in null mutant mice, suggesting inability to support tumor invasiveness and angiogenesis.

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

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