Cxcl12 Cas9-CKO Strategy

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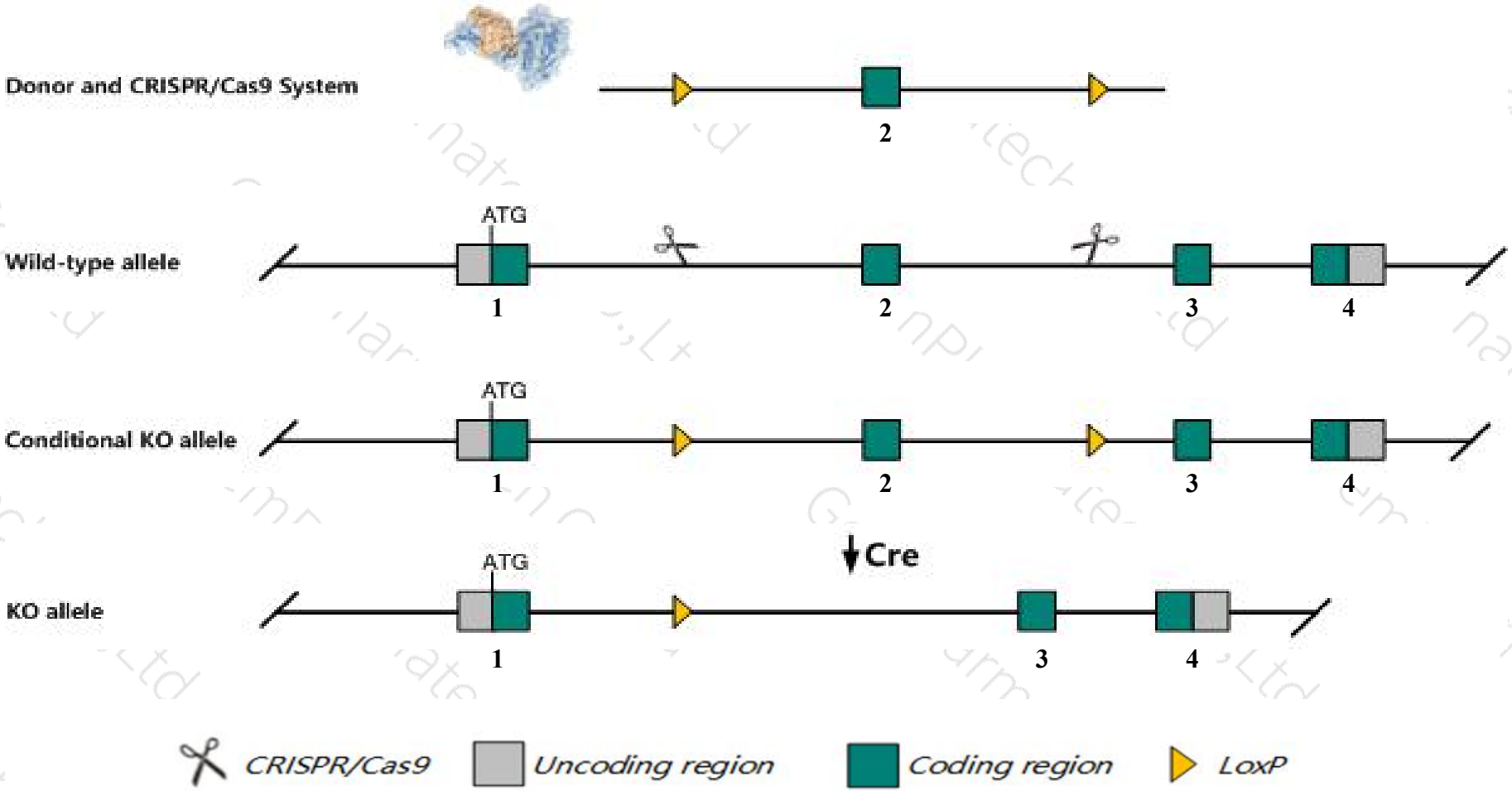
Project Overview

Project Name	***Cxcl12***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cxcl12* gene. The schematic diagram is as follows:



Technical routes

- The *Cxcl12* gene has 4 transcripts. According to the structure of *Cxcl12* gene, exon2 of *Cxcl12-201* (ENSMUST00000073043.4) transcript is recommended as the knockout region.The region contains 118bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Cxcl12* 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 mice display late embryonic lethality, impaired myelopoiesis, abnormal cerebellum development, abnormal germ cell migration, abnormal angiogenesis around the stomach, and ventricular septal defects.

- The *Cxcl12* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Cxcl12 chemokine (C-X-C motif) ligand 12 [Mus musculus (house mouse)]

Gene ID: 20315, updated on 9-Apr-2019

Summary

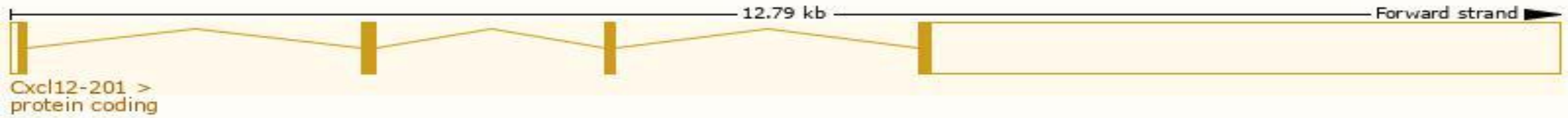
Official Symbol	Cxcl12 provided by MGI
Official Full Name	chemokine (C-X-C motif) ligand 12 provided by MGI
Primary source	MGI:MGI:103556
See related	Ensembl:ENSMUSG00000061353
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Pbsf, Scyb12, Sdf1, Tlsf, Tpar1
Summary	This gene encodes a member of the alpha chemokine protein family. The encoded protein is secreted and functions as the ligand for the G-protein coupled receptor, chemokine (C-X-C motif) receptor 4. The encoded protein plays a role in many diverse cellular functions, including embryogenesis, immune surveillance, inflammation response, tissue homeostasis, and tumor growth and metastasis. Alternative splicing results in multiple transcript variants. [provided by RefSeq, May 2013]
Expression	Ubiquitous expression in spleen adult (RPKM 77.0), liver adult (RPKM 50.9) and 27 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

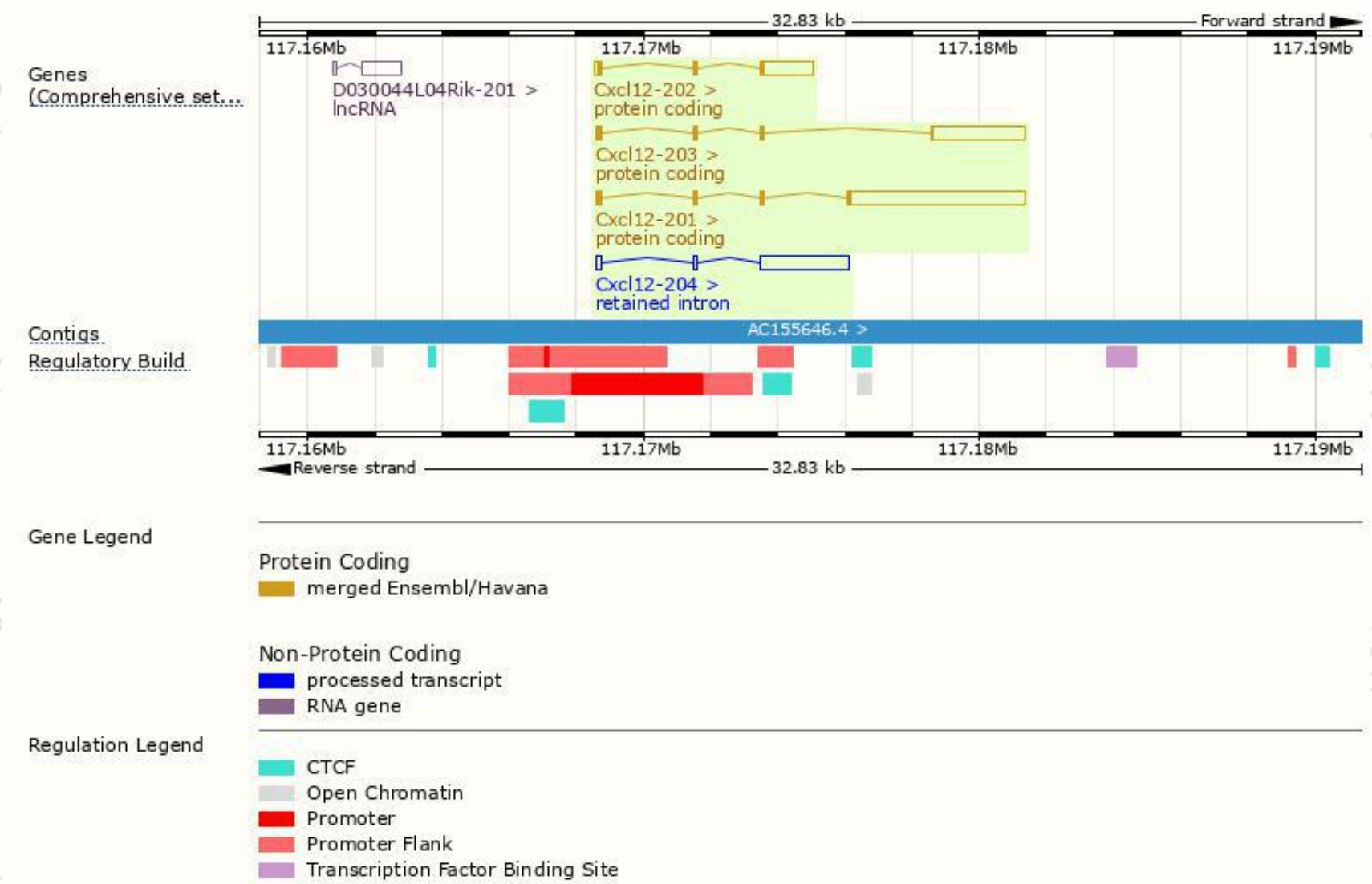
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cxcl12-201	ENSMUST00000073043.4	5627	119aa	Protein coding	CCDS20463	H7BX38	TSL:1 GENCODE basic
Cxcl12-203	ENSMUST00000112871.7	3132	93aa	Protein coding	CCDS39605	P40224	TSL:1 GENCODE basic APPRIS P4
Cxcl12-202	ENSMUST00000112866.7	1878	89aa	Protein coding	CCDS39606	P40224	TSL:1 GENCODE basic APPRIS ALT1
Cxcl12-204	ENSMUST00000134244.1	2894	No protein	Retained intron	-	-	TSL:1

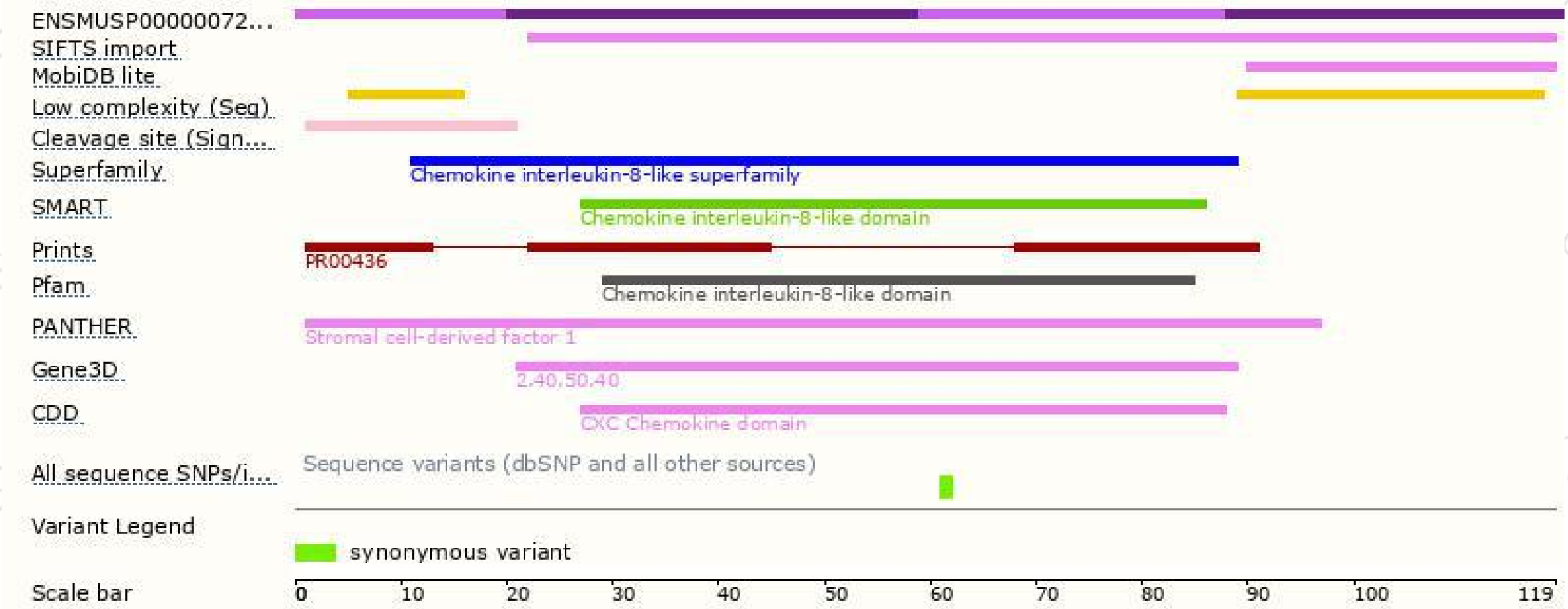
The strategy is based on the design of *Cxcl12-201* transcript,The transcription is shown below



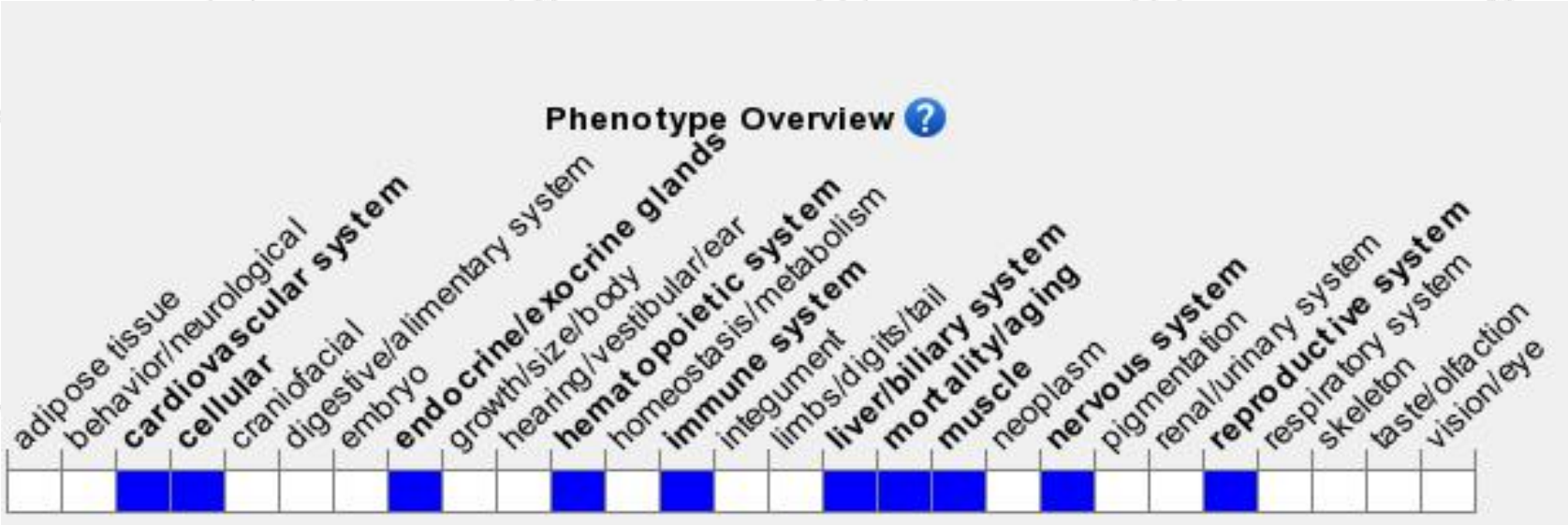
Genomic location distribution



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 mice display late embryonic lethality, impaired myelopoiesis, abnormal cerebellum development, abnormal germ cell migration, abnormal angiogenesis around the stomach, and ventricula septal defects.

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

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