

***Col4a3bp* Cas9-CKO Strategy**

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Project Overview

Project Name

Col4a3bp

Project type

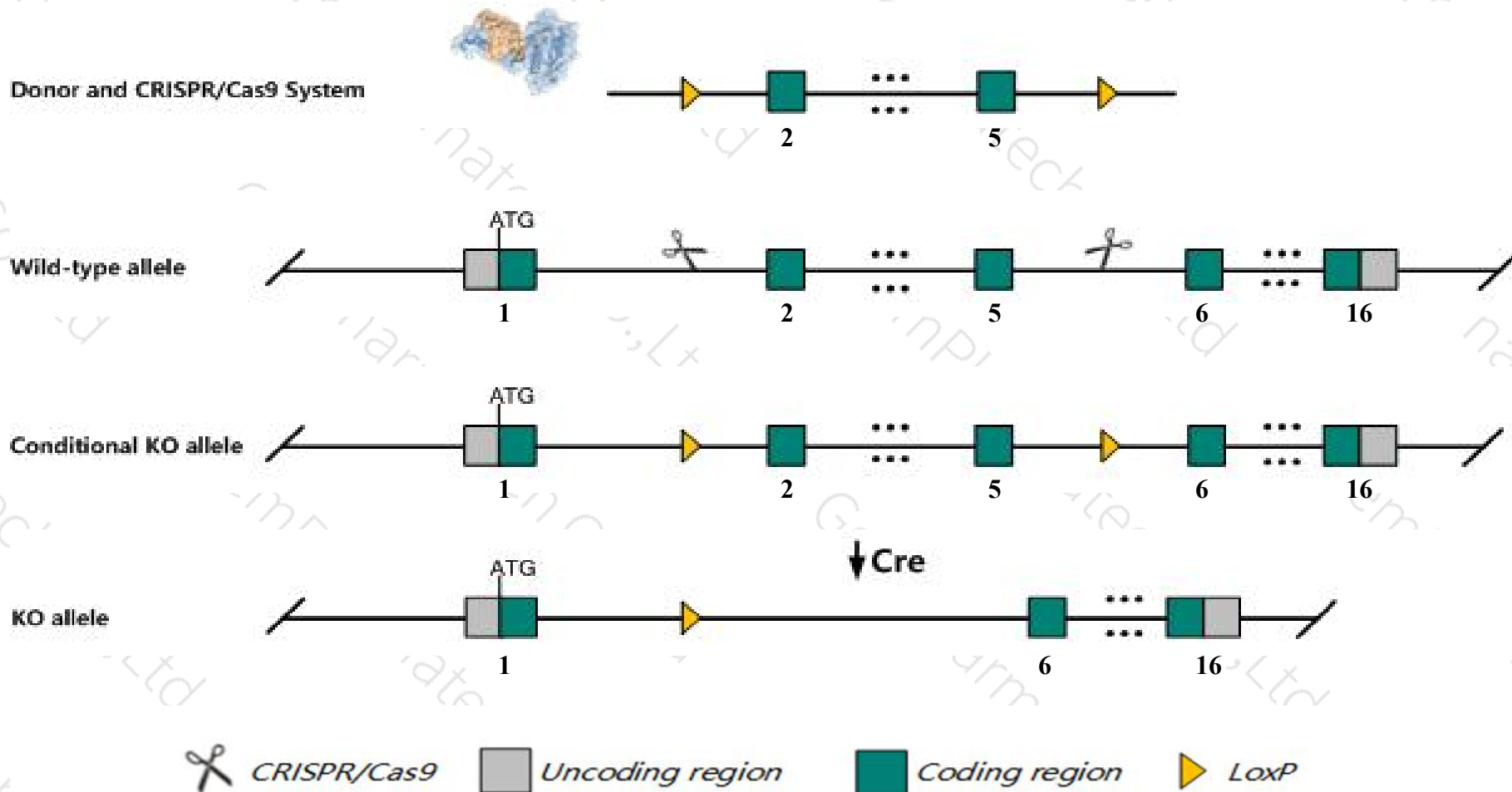
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Col4a3bp* gene. The schematic diagram is as follows:



Technical routes

- The *Col4a3bp* gene has 7 transcripts. According to the structure of *Col4a3bp* gene, exon2-exon5 of *Col4a3bp*-202 (ENSMUST00000109444.2) transcript is recommended as the knockout region. The region contains 499bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Col4a3bp* 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 mice display embryonic lethality during organogenesis with reduced embryo size, impaired heart function, abnormal heart morphology, abnormal mitochondrial morphology and physiology, abnormal endoplasmic reticulum morphology, and decreased cell proliferation.
- The *Col4a3bp* gene is located on the Chr13. 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)

Col4a3bp collagen, type IV, alpha 3 (Goodpasture antigen) binding protein [Mus musculus (house mouse)]

Gene ID: 68018, updated on 19-Mar-2019

Summary



Official Symbol	Col4a3bp provided by MGI
Official Full Name	collagen, type IV, alpha 3 (Goodpasture antigen) binding protein provided by MGI
Primary source	MGI:MGI:1915268
See related	Ensembl:ENSMUSG000000021669
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
Also known as	2810404O15Rik, 9230101K08Rik, AU016711, CERT, GPBP
Expression	Ubiquitous expression in bladder adult (RPKM 14.2), adrenal adult (RPKM 13.0) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

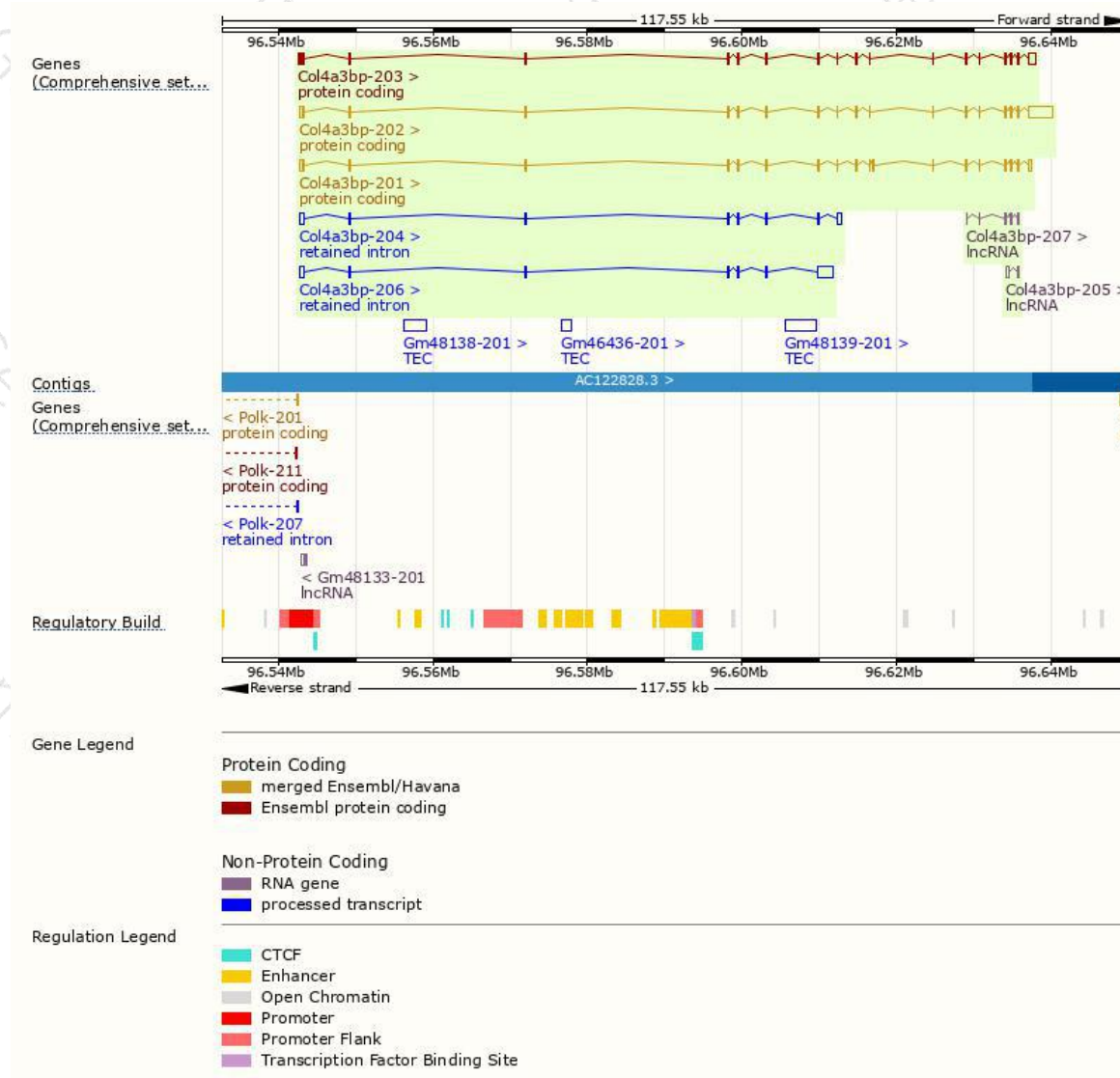
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col4a3bp-202	ENSMUST00000109444.2	5285	598aa	Protein coding	CCDS49335	Q9EQG9	TSL:1 GENCODE basic APPRIS ALT 1
Col4a3bp-203	ENSMUST00000179226.7	3040	598aa	Protein coding	CCDS49335	Q9EQG9	TSL:1 GENCODE basic APPRIS ALT 1
Col4a3bp-201	ENSMUST00000077672.11	2746	624aa	Protein coding	CCDS26705	Q9EQG9	TSL:1 GENCODE basic APPRIS P3
Col4a3bp-206	ENSMUST00000222434.1	3054	No protein	Retained intron	-	-	TSL:1
Col4a3bp-204	ENSMUST00000220464.1	1912	No protein	Retained intron	-	-	TSL:1
Col4a3bp-205	ENSMUST00000221394.1	506	No protein	lncRNA	-	-	TSL:5
Col4a3bp-207	ENSMUST00000223471.1	494	No protein	lncRNA	-	-	TSL:3

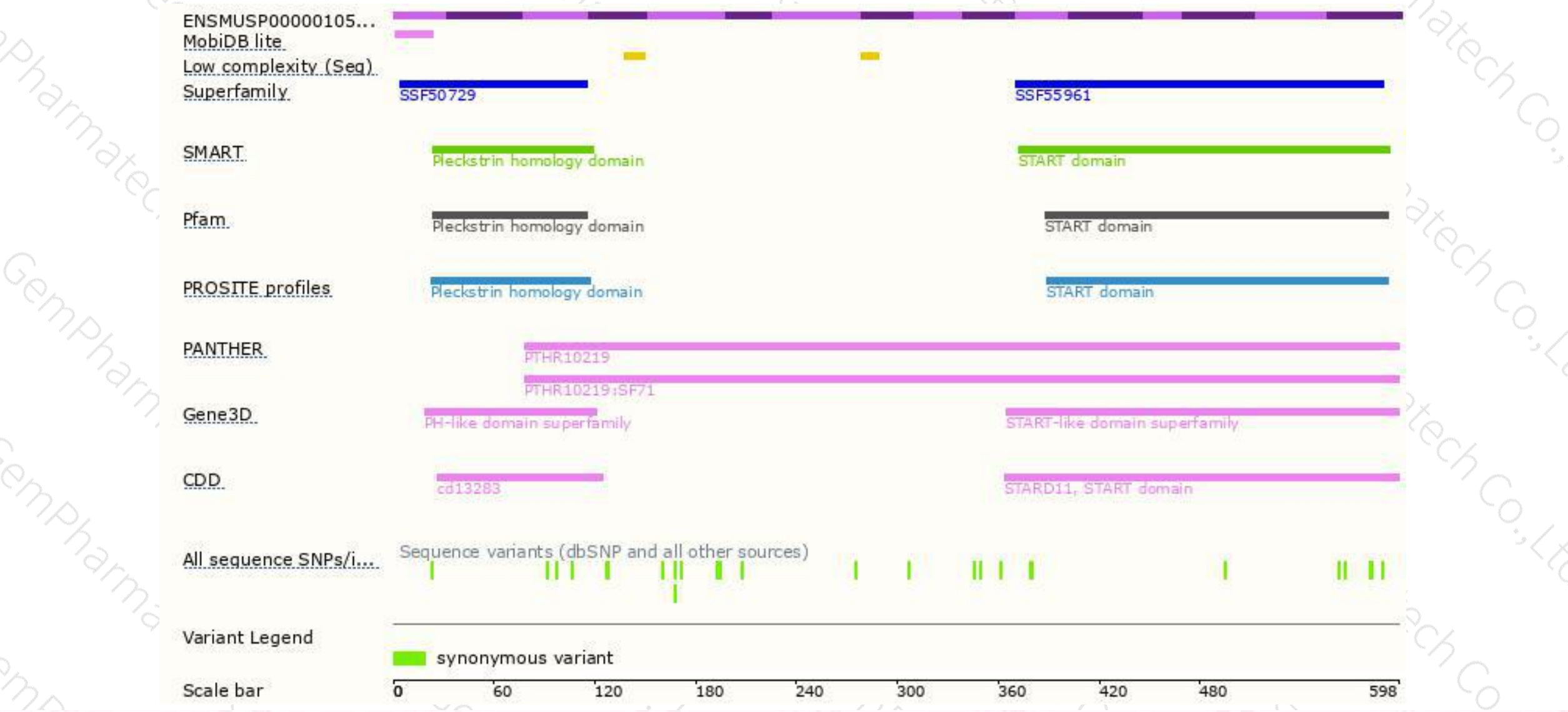
The strategy is based on the design of *Col4a3bp-202* transcript,The transcription is shown below



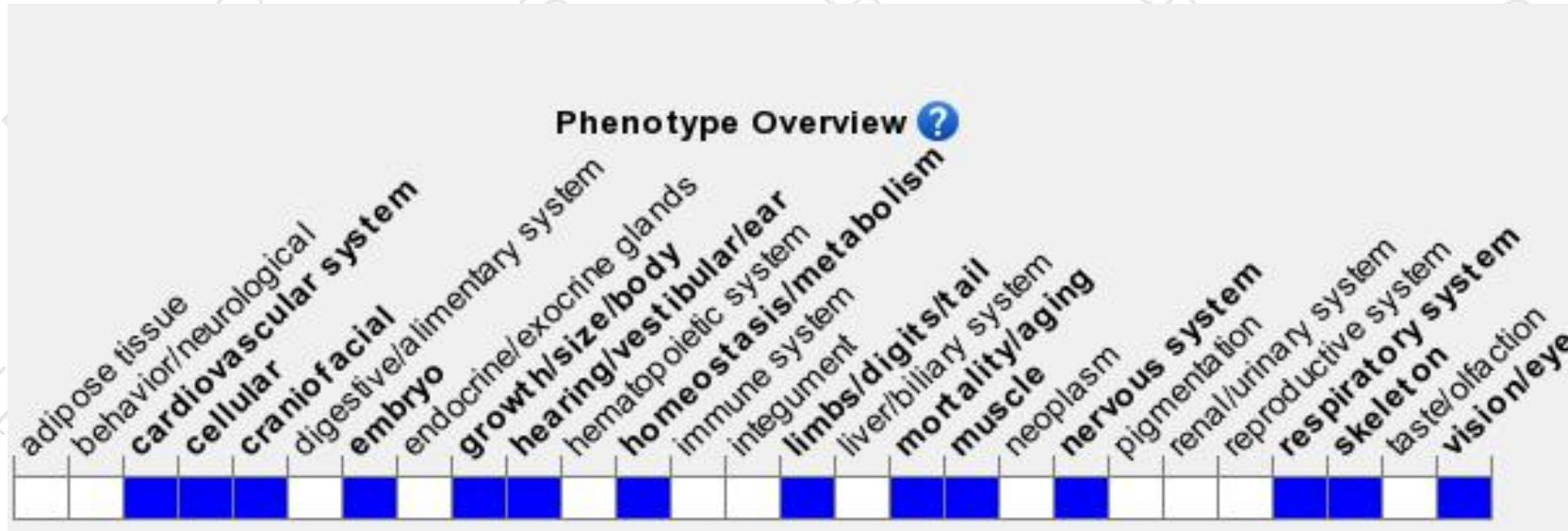
Genomic location distribution



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, Homozygous mice display embryonic lethality during organogenesis with reduced embryo size, impaired heart function, abnormal heart morphology, abnormal mitochondrial morphology and physiology, abnormal endoplasmic reticulum morphology, and decreased cell proliferation.

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

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