

Arid2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Arid2

Project type

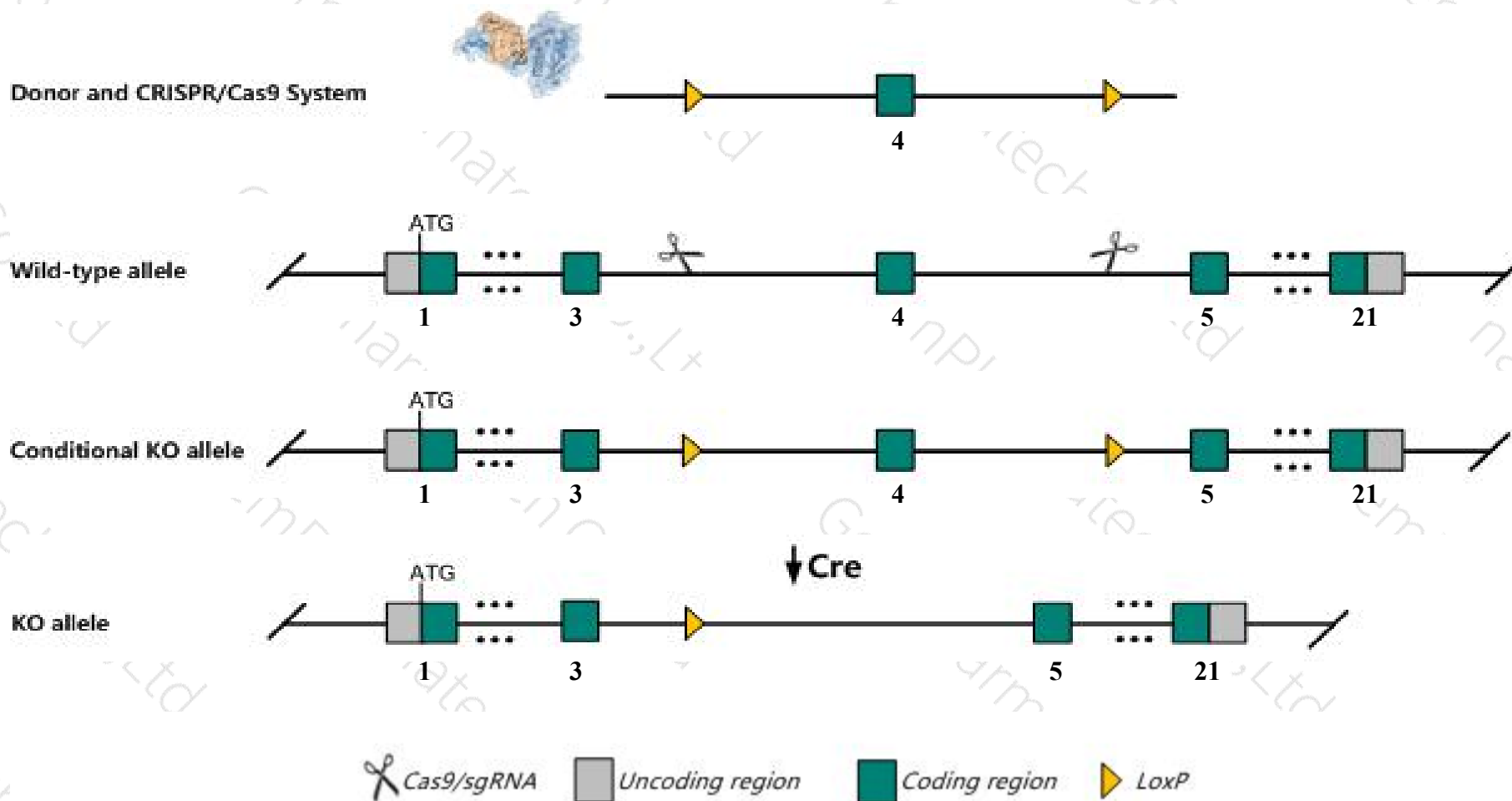
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Arid2* gene. The schematic diagram is as follows:



- The *Arid2* gene has 4 transcripts. According to the structure of *Arid2* gene, exon4 of *Arid2-201* (ENSMUST00000096250.4) transcript is recommended as the knockout region. The region contains 134bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Arid2* gene. The brief process is as follows: sgRNA was transcribed in vitro, donor vector was constructed. Cas9, sgRNA 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 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 knock-out allele exhibit embryonic lethality between E12.5 and E14.5, congenital heart defects, impaired coronary artery development, subcutaneous edema and hemorrhage.
- Transcript *Arid2-202/204* may not be affected.
- The *Arid2* gene is located on the Chr15. 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.

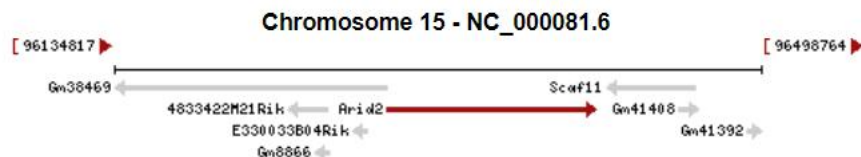
Gene information (NCBI)

Arid2 AT rich interactive domain 2 (ARID, RFX-like) [*Mus musculus* (house mouse)]

Gene ID: 77044, updated on 28-Oct-2019

Summary

Official Symbol	Arid2 provided by MGI
Official Full Name	AT rich interactive domain 2 (ARID, RFX-like) provided by MGI
Primary source	MGI:MGI:1924294
See related	Ensembl:ENSMUSG00000033237
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	BAF200; zipzap/p200; 1700124K17Rik; 4432409D24Rik
Expression	Ubiquitous expression in testis adult (RPKM 32.0), thymus adult (RPKM 22.9) and 28 other tissues See more
Orthologs	human all

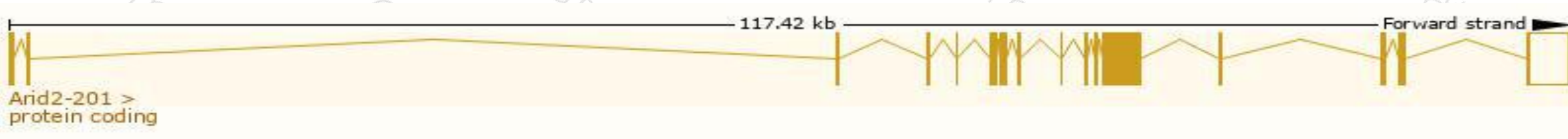


Transcript information (Ensembl)

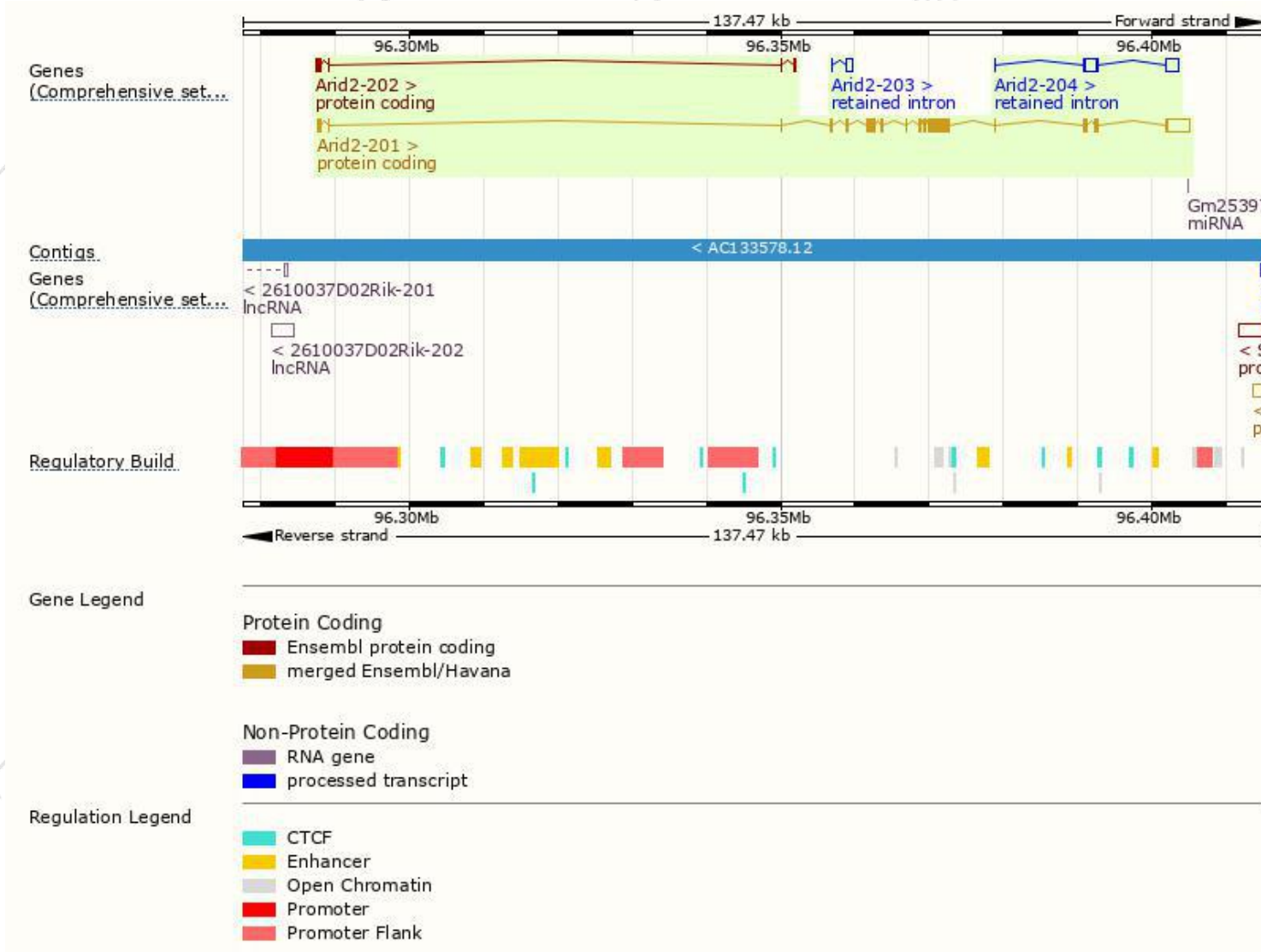
The gene has 4 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Arid2-201	ENSMUST00000096250.4	8507	1828aa	ENSMUSP00000093969.4	Protein coding	CCDS37185	E9Q7E2	TSL:5 GENCODE basic APPRIS P1
Arid2-202	ENSMUST00000134985.8	809	145aa	ENSMUSP00000135829.1	Protein coding	-	Q9D982	TSL:1 GENCODE basic
Arid2-204	ENSMUST00000176739.2	3404	No protein	-	Retained intron	-	-	TSL:5
Arid2-203	ENSMUST00000175735.1	936	No protein	-	Retained intron	-	-	TSL:3

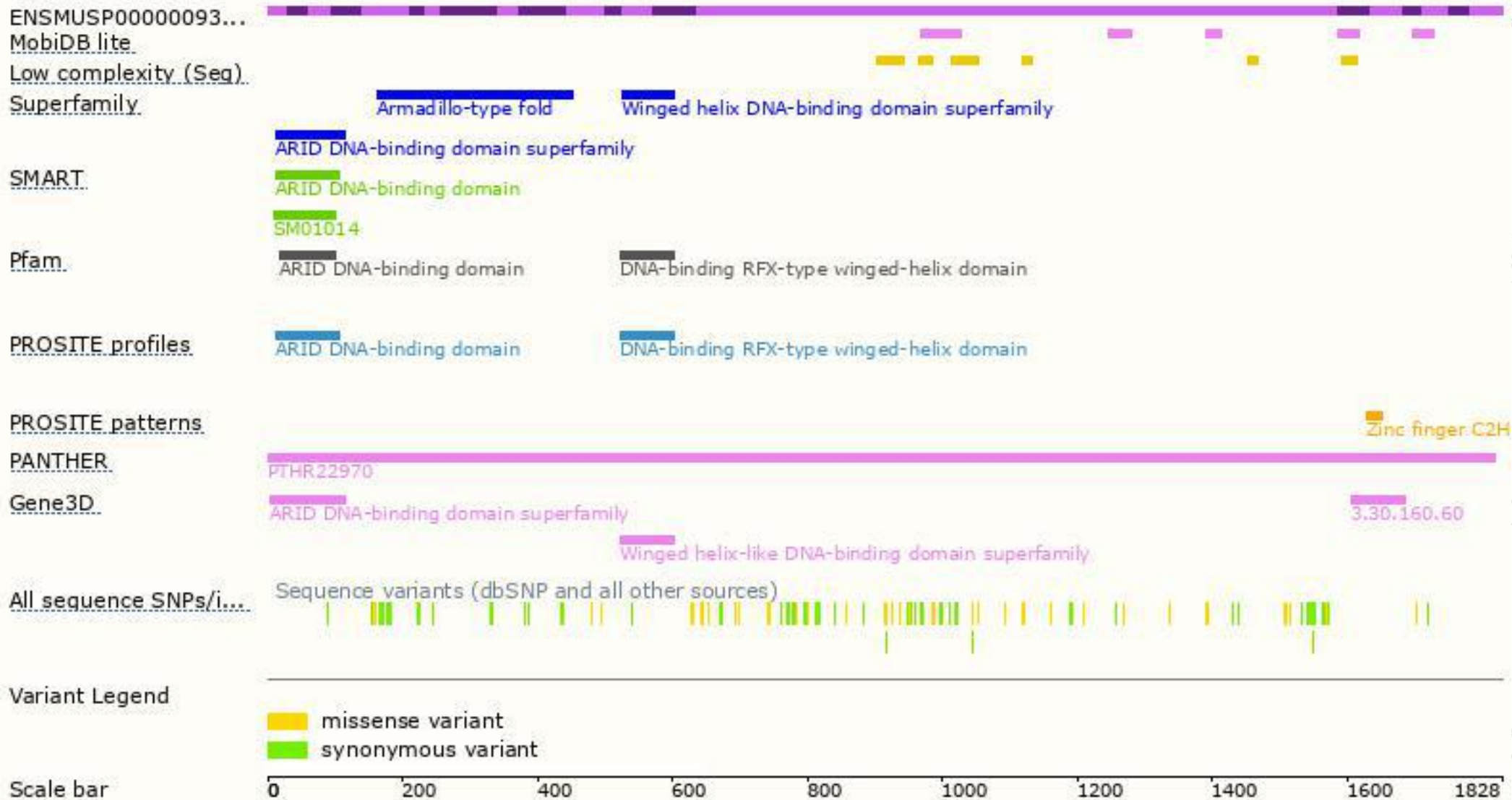
The strategy is based on the design of *Arid2-201* transcript, The transcription is shown below



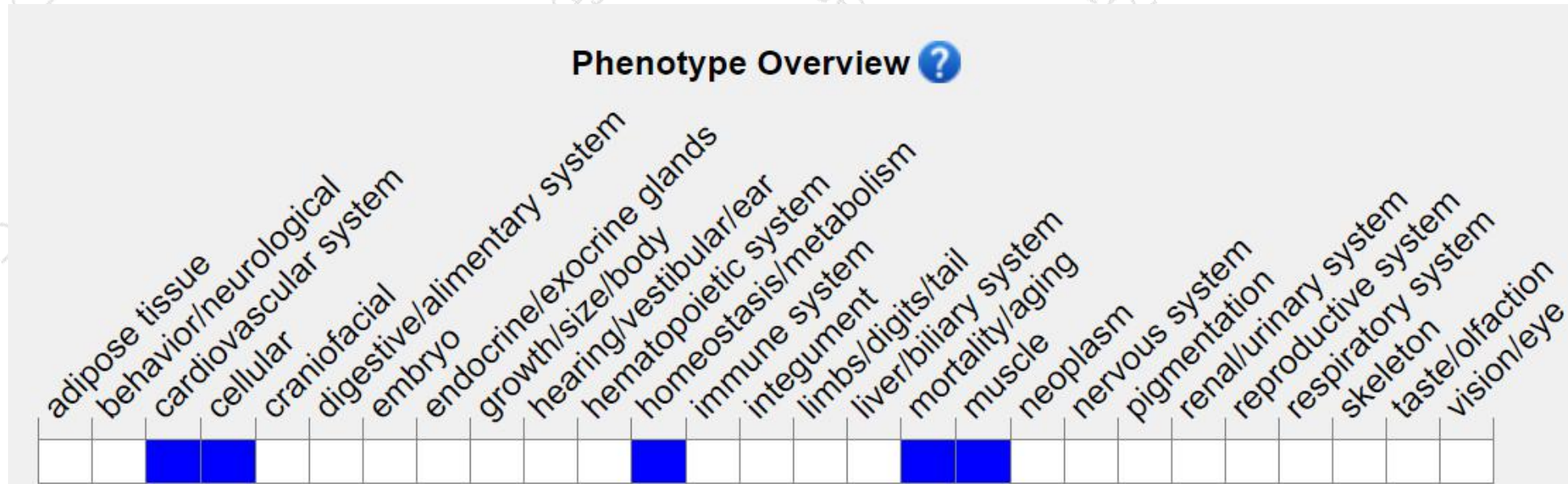
Genomic location distribution



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, Mice homozygous for a knock-out allele exhibit embryonic lethality between E12.5 and E14.5, congenital heart defects, impaired coronary artery development, subcutaneous edema and hemorrhage.

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

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