Stard4 Cas9-CKO Strategy

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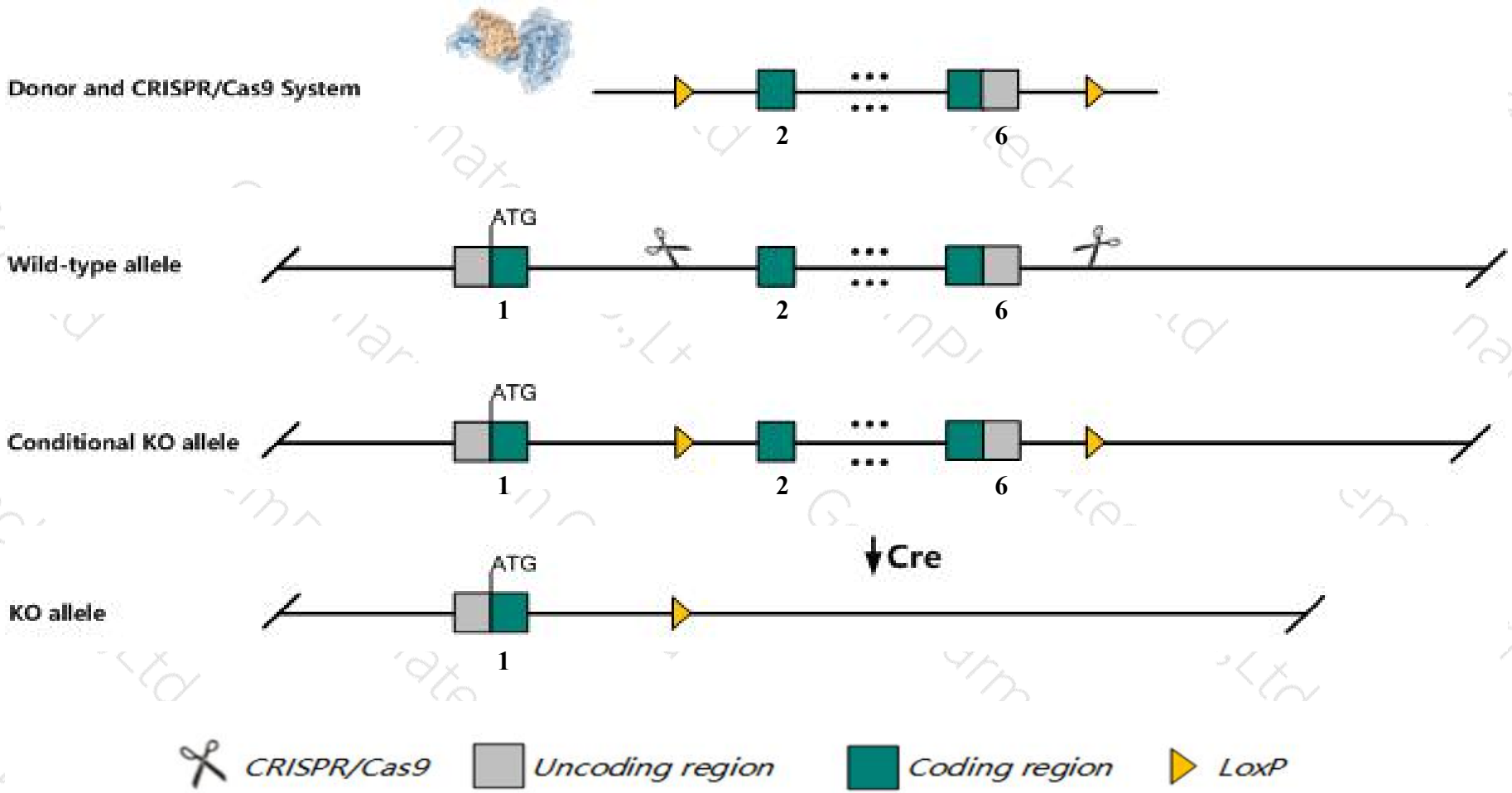
Project Overview

Project Name	***Stard4***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Stard4* gene. The schematic diagram is as follows:



Technical routes

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➢ The *Stard4* gene has 4 transcripts. According to the structure of *Stard4* gene, exon2-exon6 of *Stard4-201* (ENSMUST00000025236.8) transcript is recommended as the knockout region.The region contains most of the coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Stard4* 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,Mice homozygous for a knock-out allele exhibit decreased liver weight, body weight, and body length. Female mice homozygous for this allele exhibit decreased circulating cholesterol when fed a low cholesterol diet and altered bile composition when fed standard chow.

➢ The *Stard4* gene is located on the Chr18. 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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Stard4 StAR-related lipid transfer (START) domain containing 4 [*Mus musculus* (house mouse)]

Gene ID: 170459, updated on 12-Aug-2019

Summary

Official Symbol	Stard4 provided by MGI
Official Full Name	StAR-related lipid transfer (START) domain containing 4 provided by MGI
Primary source	MGI:MGI:2156764
See related	Ensembl:ENSMUSG00000024378
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	4632419C16Rik; 9030213J02Rik
Expression	Ubiquitous expression in placenta adult (RPKM 12.6), large intestine adult (RPKM 11.2) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 18 B1; 18 18.18 cM

See Stard4 in Genome Data Viewer

Exon count: 7

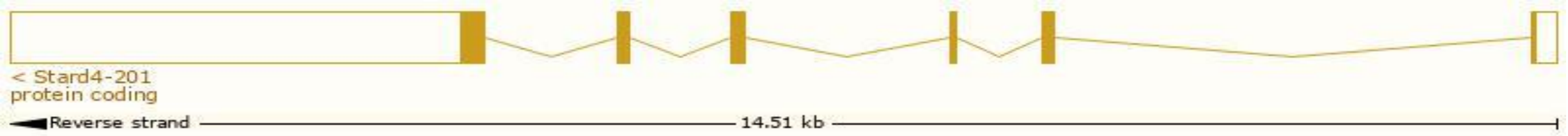
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	18	NC_000084.6 (33199138..33213862, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	18	NC_000084.5 (33361075..33373470, complement)

Transcript information（Ensembl）

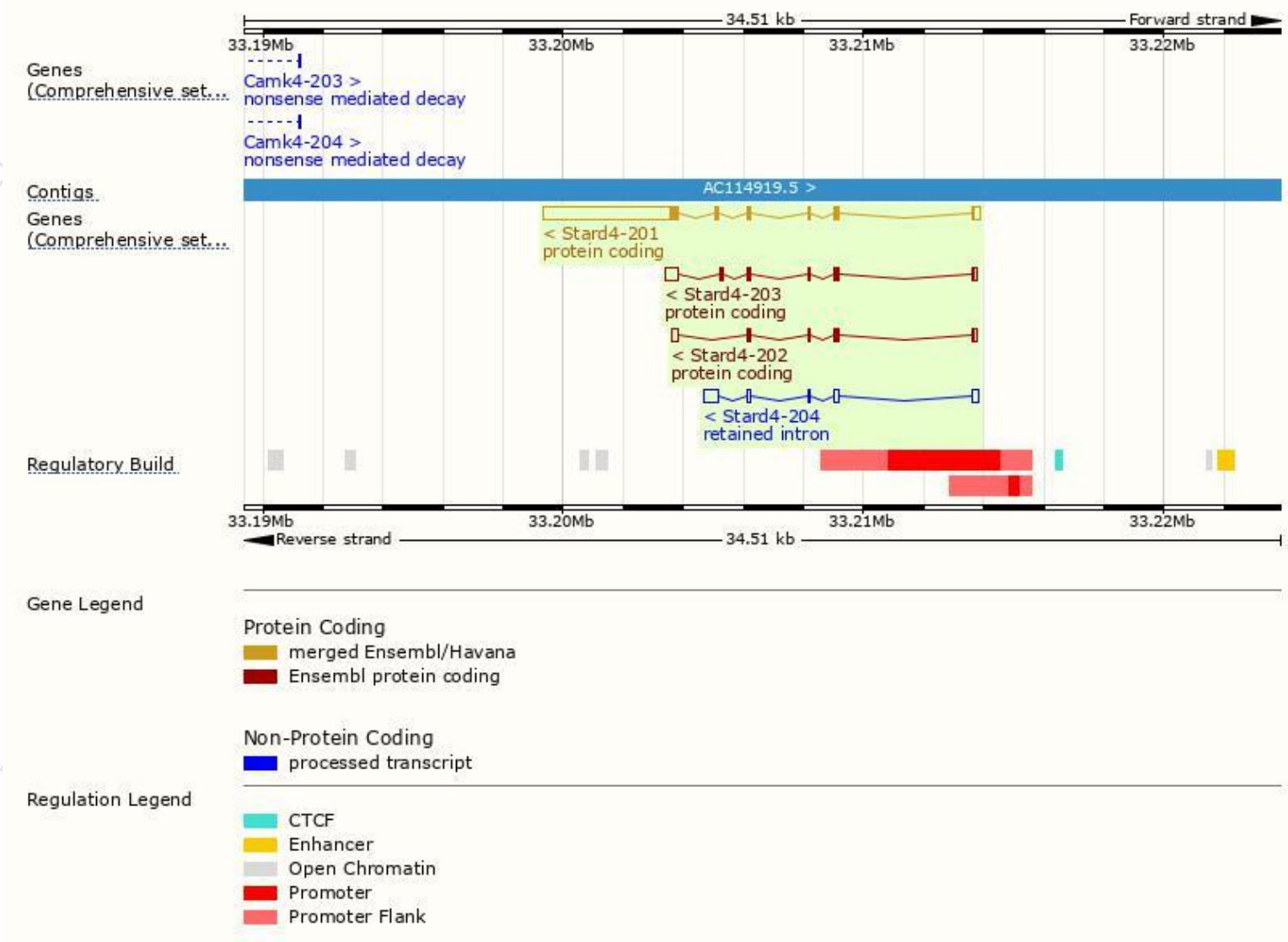
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Stard4-201	ENSMUST00000025236.8	5097	224aa	Protein coding	CCDS29123	Q80SX0	TSL:1 GENCODE basic APPRIS P1
Stard4-203	ENSMUST00000119991.7	941	146aa	Protein coding	CCDS84369	D3YW30	TSL:5 GENCODE basic
Stard4-202	ENSMUST00000118990.1	648	111aa	Protein coding	-	D3YW24	TSL:2 GENCODE basic
Stard4-204	ENSMUST00000141617.1	979	No protein	Retained intron	-	-	TSL:1

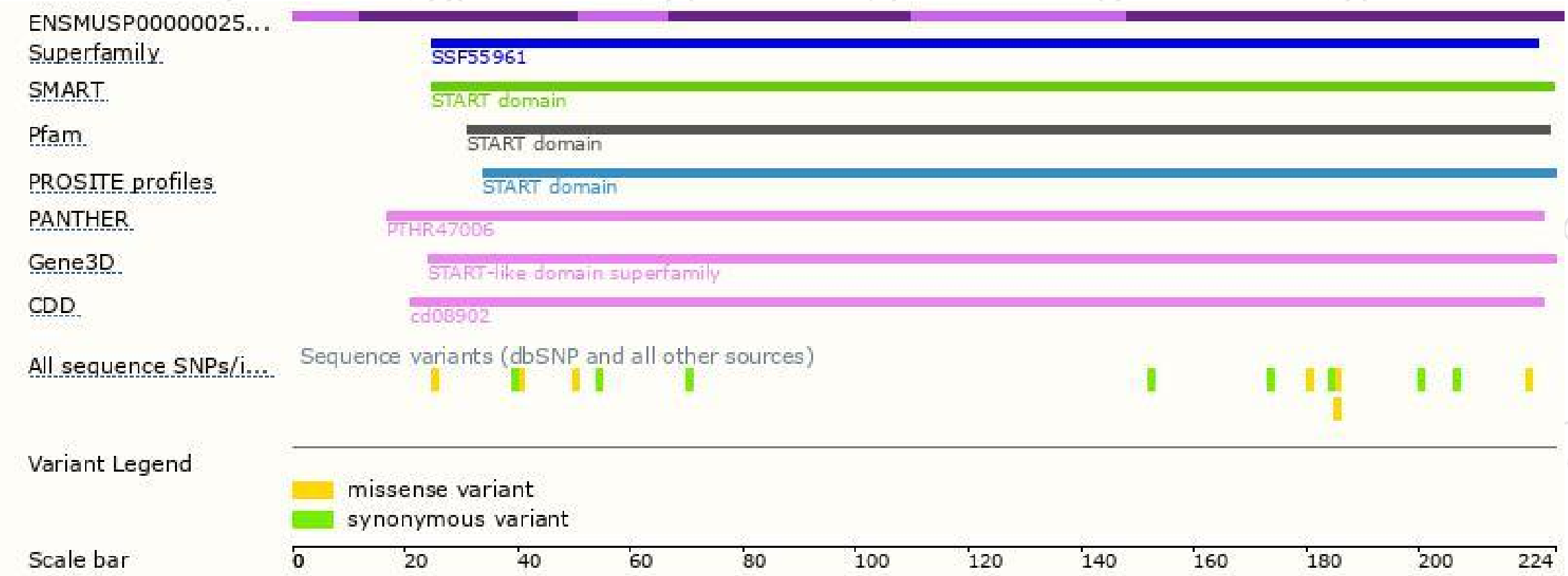
The strategy is based on the design of *Stard4-201* transcript,The transcription is shown below



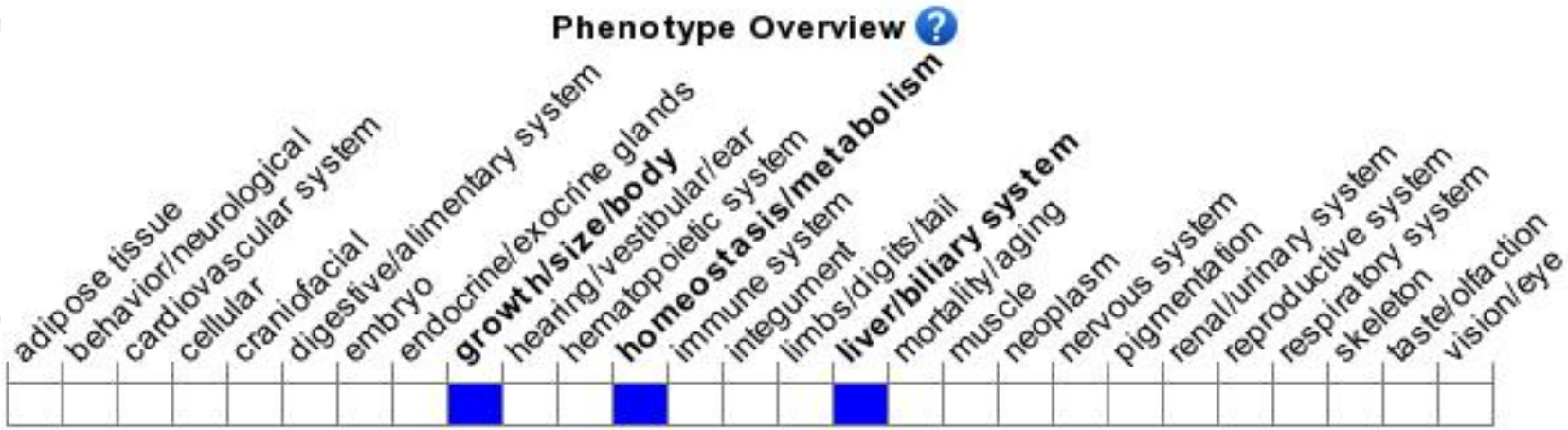
Genomic location distribution



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/).

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

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