

Col1a2 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Col1a2

Project type

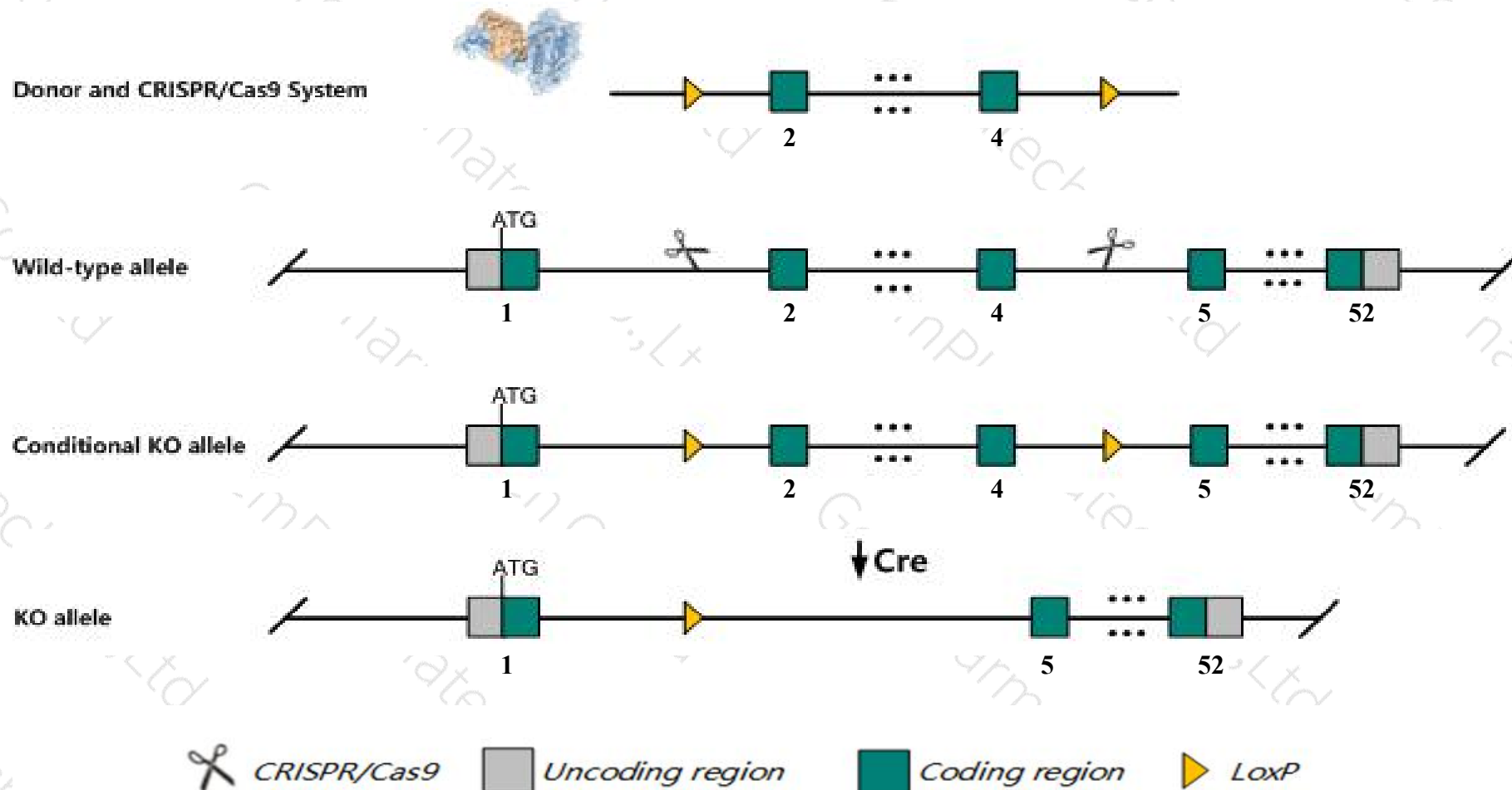
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Col1a2* gene. The schematic diagram is as follows:



Technical routes

- The *Colla2* gene has 8 transcripts. According to the structure of *Colla2* gene, exon2-exon4 of *Colla2*-201 (ENSMUST00000031668.9) transcript is recommended as the knockout region. The region contains 62bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Colla2* 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, The tails of mice heterozygous for an ENU-induced mutation at this locus are flexible or rubbery.
- The *Colla2* 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)

Col1a2 collagen, type I, alpha 2 [Mus musculus (house mouse)]

Gene ID: 12843, updated on 26-Feb-2019

Summary



Official Symbol Col1a2 provided by [MGI](#)

Official Full Name collagen, type I, alpha 2 provided by [MGI](#)

Primary source [MGI:MGI:88468](#)

See related [Ensembl:ENSMUSG00000029661](#)

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 AA960264, AI325291, Col1a-2, Cola-2, Cola2, oim

Summary This gene encodes the alpha-2 subunit of the fibril-forming type I collagen, the most abundant protein of bone, skin and tendon extracellular matrices. The encoded protein, in association with alpha-1 subunit, forms heterotrimeric type I procollagen that undergoes proteolytic processing during fibril formation. Mice harboring certain mutations in the encoded gene exhibit symptoms of moderate to severe forms of osteogenesis imperfecta. [provided by RefSeq, Dec 2015]

Expression Biased expression in bladder adult (RPKM 443.5), limb E14.5 (RPKM 423.9) and 13 other tissues [See more](#)

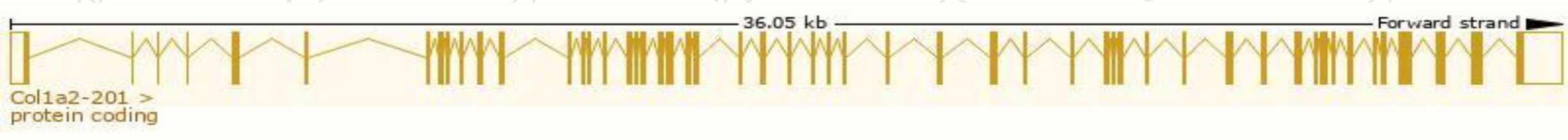
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

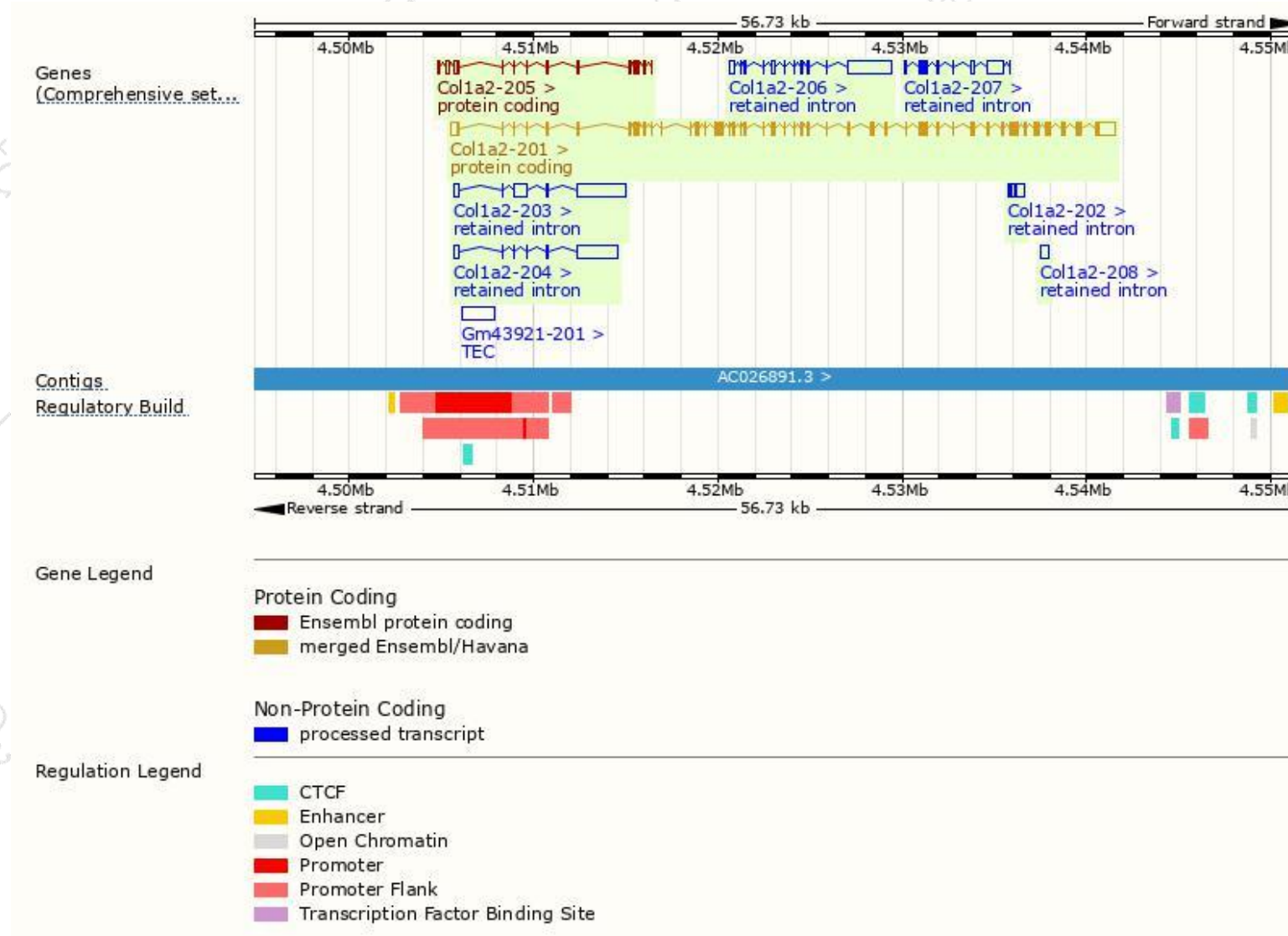
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col1a2-201	ENSMUST00000031668.9	5348	1372aa	Protein coding	CCDS39420	Q01149 Q3TX57	TSL:1 GENCODE basic APPRIS P1
Col1a2-205	ENSMUST00000141483.7	850	177aa	Protein coding	-	E0CXI2	CDS 3' incomplete TSL:5
Col1a2-203	ENSMUST00000132029.1	3689	No protein	Retained intron	-	-	TSL:2
Col1a2-206	ENSMUST00000148864.1	3221	No protein	Retained intron	-	-	TSL:1
Col1a2-204	ENSMUST00000138511.7	2550	No protein	Retained intron	-	-	TSL:1
Col1a2-207	ENSMUST00000155687.2	1519	No protein	Retained intron	-	-	TSL:5
Col1a2-202	ENSMUST00000124686.1	628	No protein	Retained intron	-	-	TSL:3
Col1a2-208	ENSMUST00000203346.1	502	No protein	Retained intron	-	-	TSL:NA

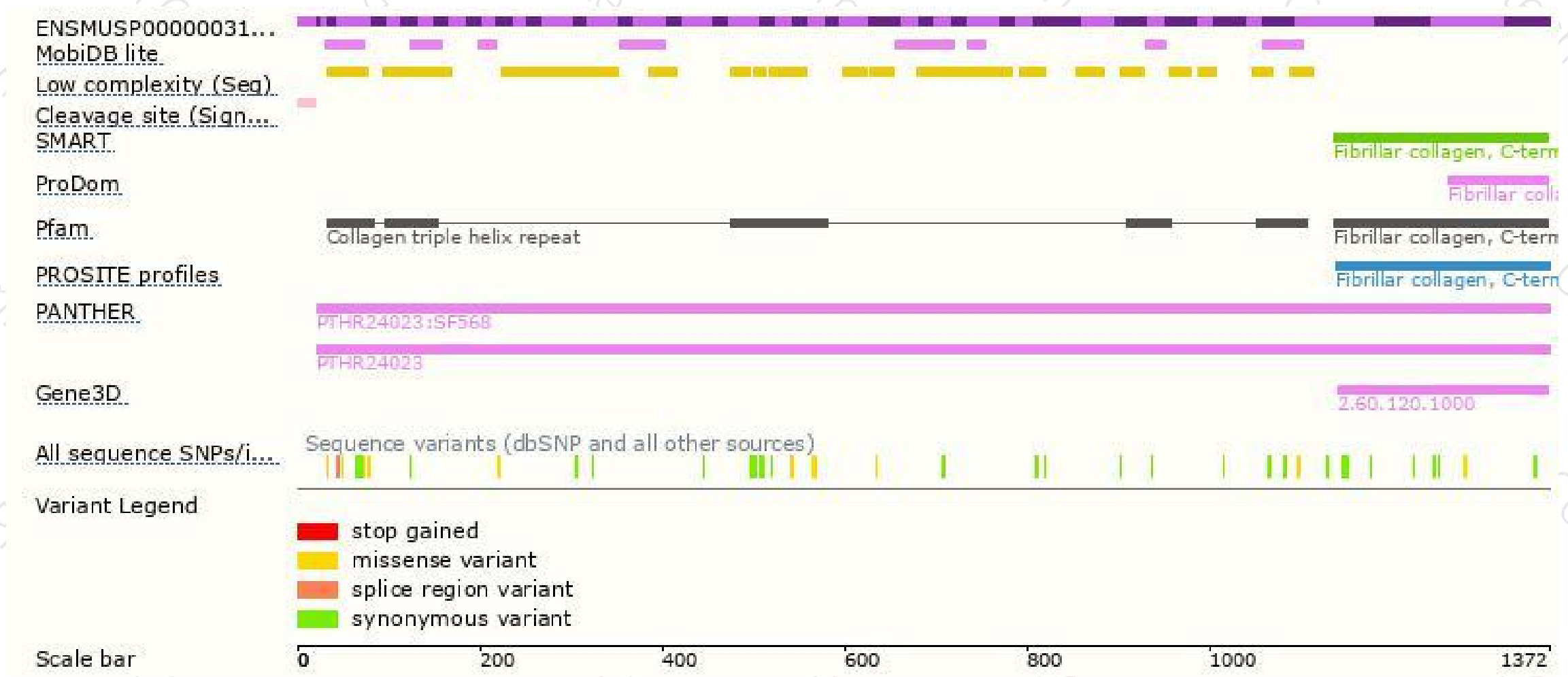
The strategy is based on the design of *Col1a2-201* transcript,The transcription is shown below



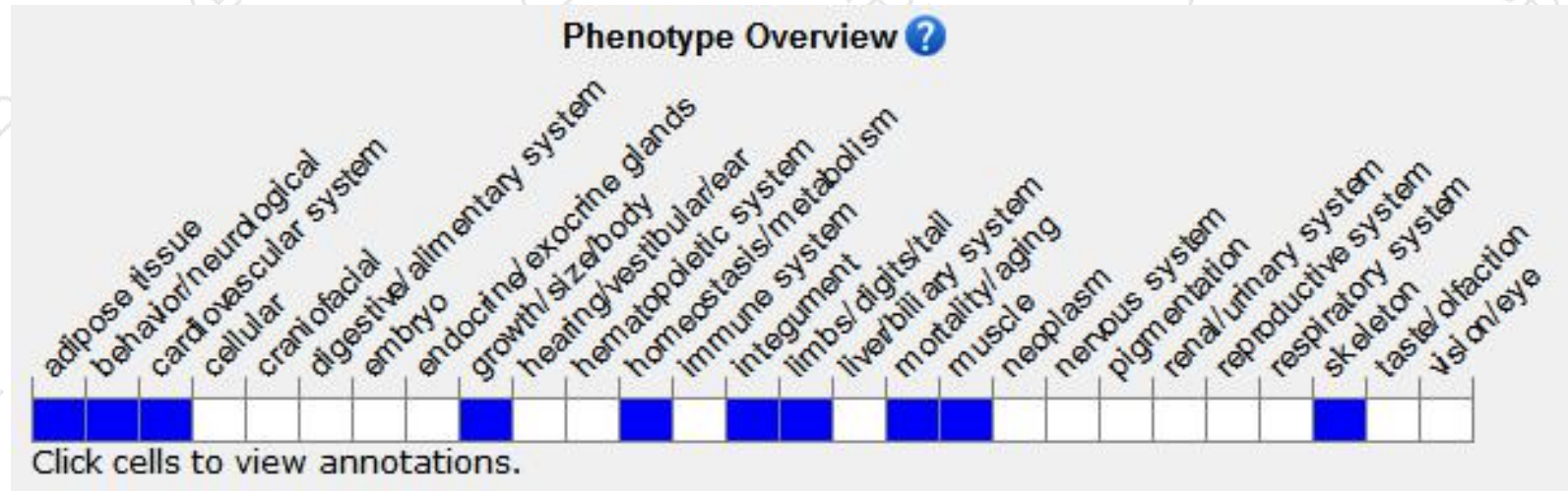
Genomic location distribution



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, The tails of mice heterozygous for an ENU-induced mutation at this locus are flexible or rubbery.

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

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