

Col11a1 Cas9-KO Strategy

Designer: Yupeng Yang

Reviewer: Miaomiao Cui

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Project Overview

Project Name

Col11a1

Project type

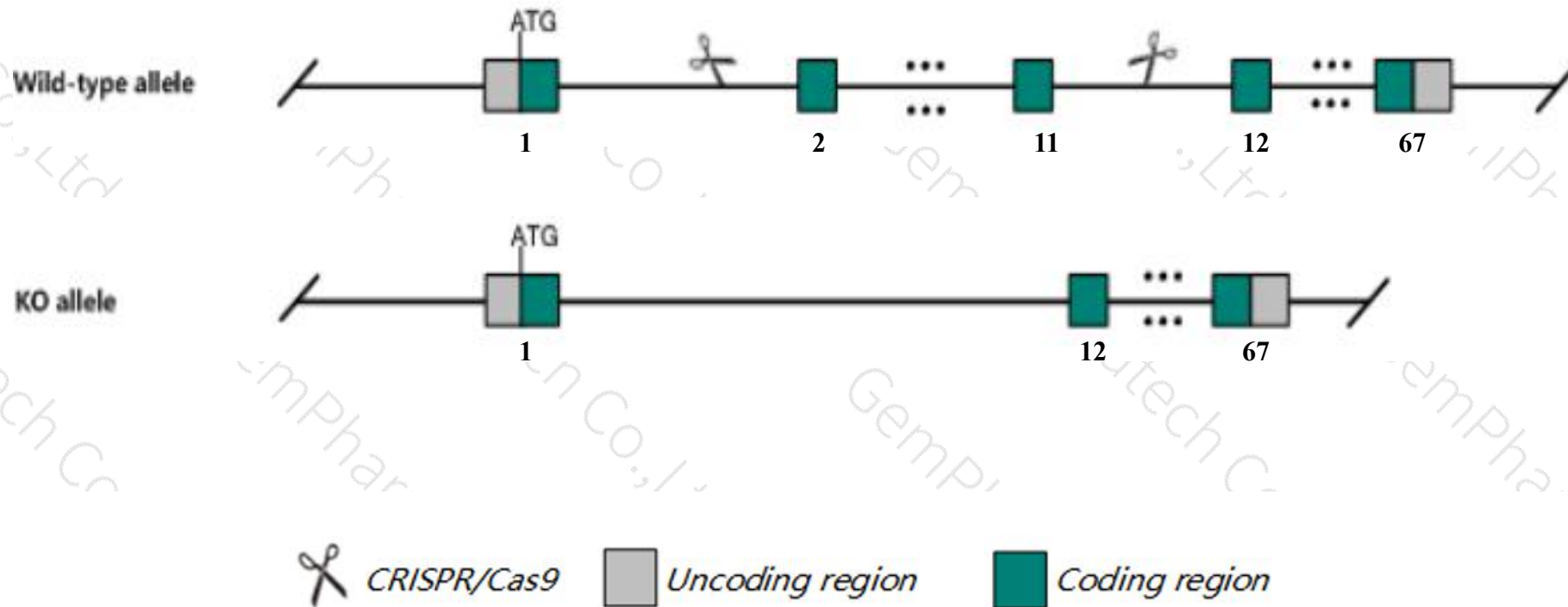
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Col11a1* gene. The schematic diagram is as follows:



- The *Col11a1* gene has 7 transcripts. According to the structure of *Col11a1* gene, exon2-exon11 of *Col11a1-201*(ENSMUST00000092155.11) transcript is recommended as the knockout region. The region contains 1304bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Col11a1* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, homozygous mutation of this gene results in perinatal lethality by asphyxia. Mutants animals display weak tracheal cartilage, short snout, short mandible, cleft palate, short limbs, and externally rotated distal portion of the hindlimbs.
- The *Col11a1* gene is located on the Chr3. 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Col11a1 collagen, type XI, alpha 1 [Mus musculus (house mouse)]

Gene ID: 12814, updated on 13-Mar-2020

Summary



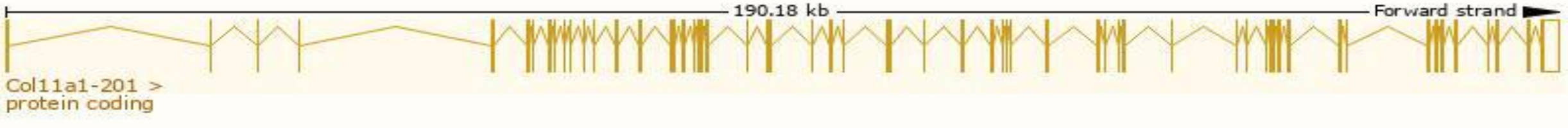
Official Symbol	Col11a1 provided by MGI
Official Full Name	collagen, type XI, alpha 1 provided by MGI
Primary source	MGI:MGI:88446
See related	Ensembl:ENSMUSG00000027966
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C530001D20Rik, cho
Summary	This gene encodes the alpha-1 subunit of type XI collagen, one of the low abundance fibrillar collagens that is essential for normal embryonic skeletal development and the cohesive properties of cartilage. The encoded protein, in association with the alpha-1 subunit of type II collagen, forms a heterotrimeric type XI procollagen that undergoes proteolytic processing. Mice lacking the encoded protein develop severe chondrodysplasia and die at birth. [provided by RefSeq, Dec 2015]
Expression	Biased expression in limb E14.5 (RPKM 65.0), CNS E14 (RPKM 14.0) and 3 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

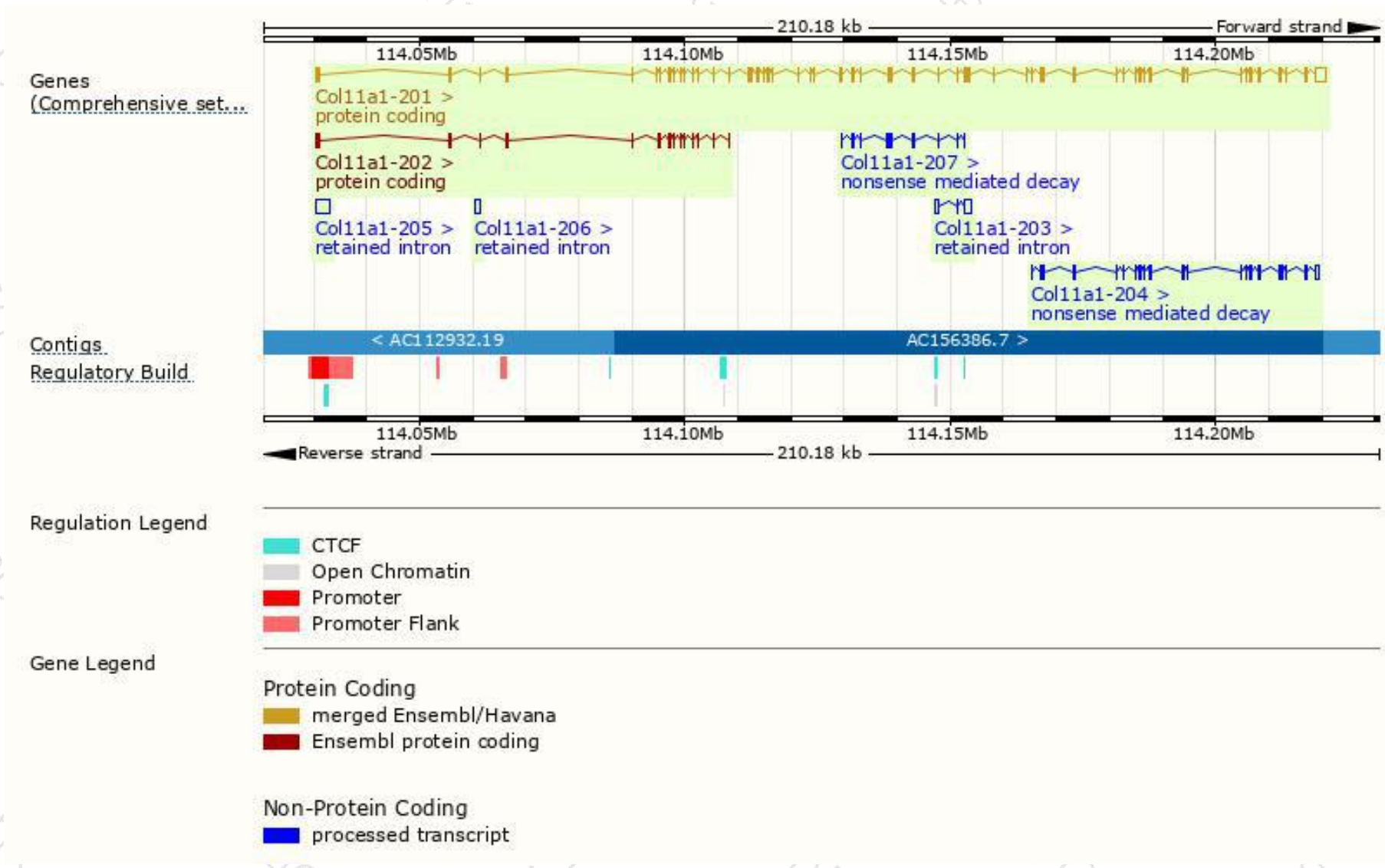
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col11a1-201	ENSMUST00000092155.11	7667	1804aa	Protein coding	CCDS17778	Q61245	TSL:1 GENCODE basic APPRIS P1
Col11a1-202	ENSMUST00000123619.7	2064	567aa	Protein coding	-	E9PVT8	CDS 3' incomplete TSL:5
Col11a1-204	ENSMUST00000184978.1	2570	536aa	Nonsense mediated decay	-	V9GWX8	CDS 5' incomplete TSL:1
Col11a1-207	ENSMUST00000211802.1	675	128aa	Nonsense mediated decay	-	A0A1D5RMJ0	CDS 5' incomplete TSL:3
Col11a1-205	ENSMUST00000196345.1	2519	No protein	Retained intron	-	-	TSL:NA
Col11a1-203	ENSMUST00000138680.1	2112	No protein	Retained intron	-	-	TSL:1
Col11a1-206	ENSMUST00000196654.1	969	No protein	Retained intron	-	-	TSL:NA

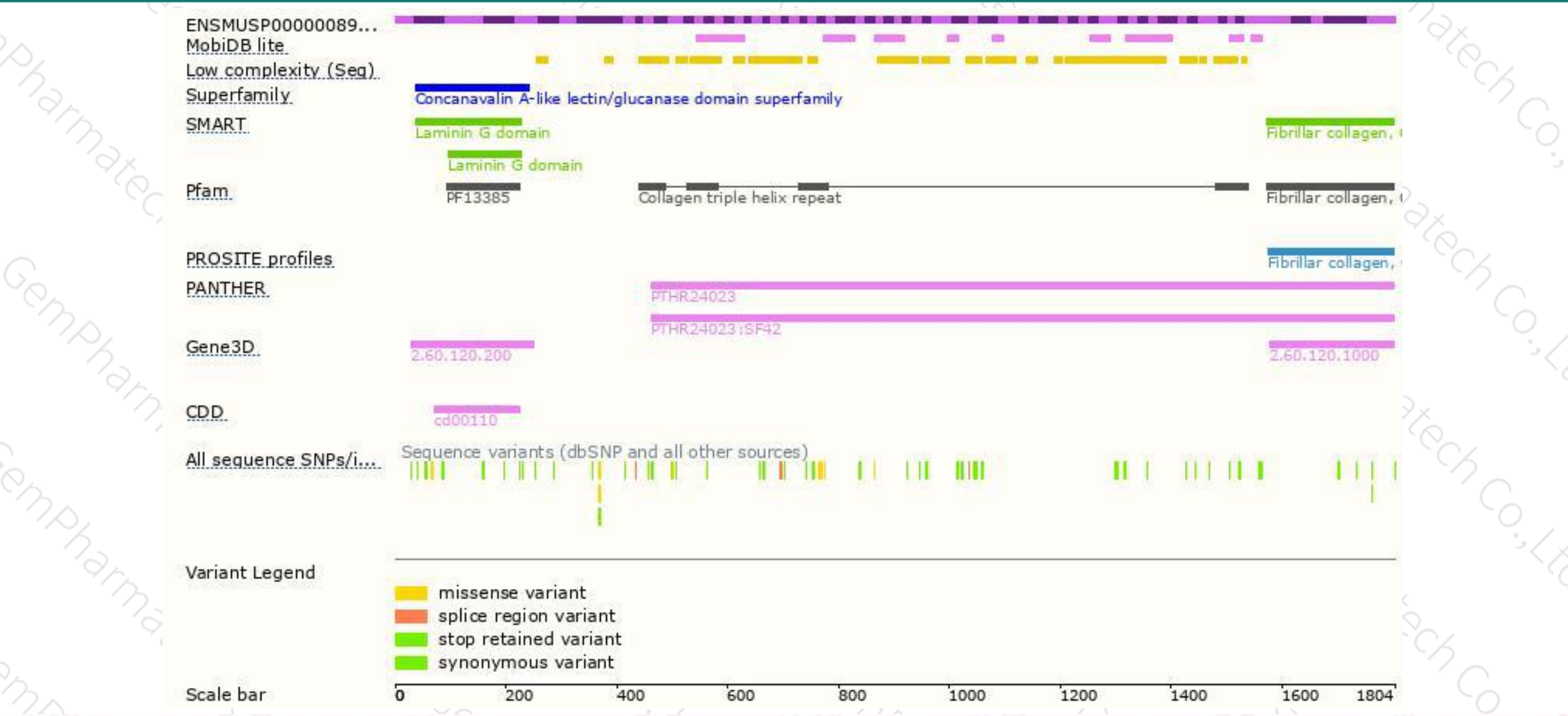
The strategy is based on the design of *Col11a1-201* transcript,the transcription is shown below:



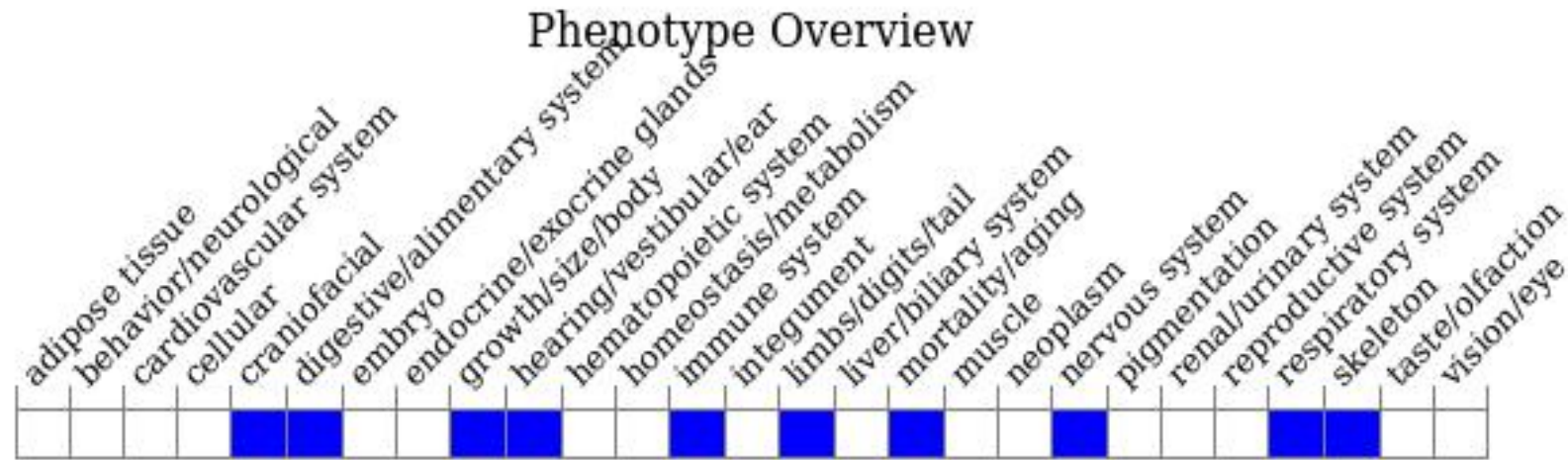
Genomic location distribution



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.

Tel: 400-9660890

