Col13a1 Cas9-CKO Strategy

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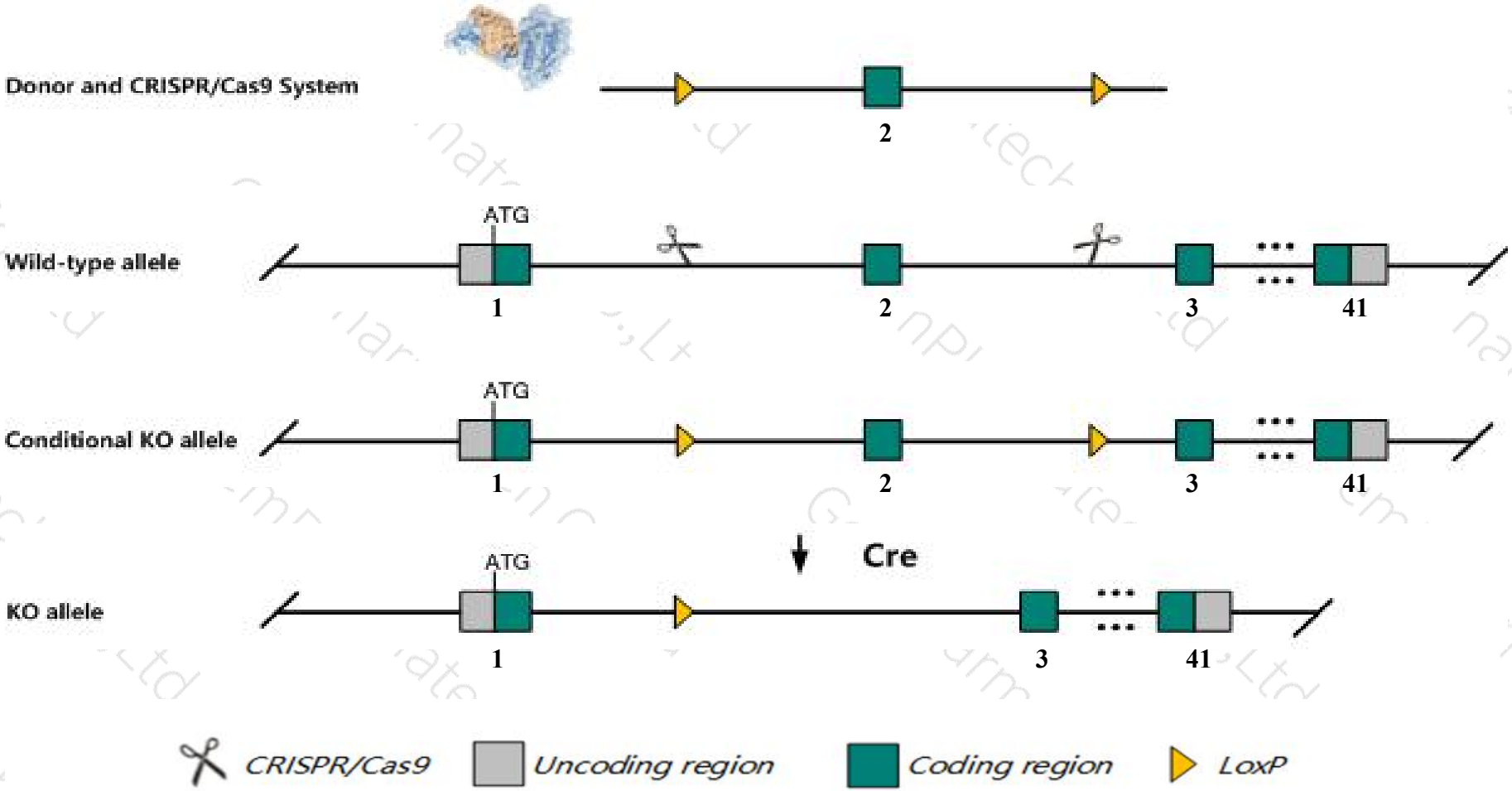
Project Overview

Project Name	***Col13a1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Col13a1* gene. The schematic diagram is as follows:



Technical routes

- The *Col13a1* gene has 7 transcripts. According to the structure of *Col13a1* gene, exon2 of *Col13a1-205* (ENSMUST00000105454.2) transcript is recommended as the knockout region.The region contains 70bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Col13a1* 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 an allele lacking the transmembrane exhibit small muscle fibers and are susceptible to excerise-induced muscle damage and muscle inflammation. Mice homozygous for a knock-out allele exhibit tremors and abnormal neuromuscular junction morphology and endplate potential.
- The KO region contains functional region of the *Gm5750* gene.Knockout the region may affect the function of *Gm5750* gene.
- Transcript *Col13a1-206 and Col13a1-208* may not be affected.
- The *Col13a1* gene is located on the Chr10. 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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Col13a1 collagen, type XIII, alpha 1 [Mus musculus (house mouse)]

Gene ID: 12817, updated on 3-Feb-2019

Summary

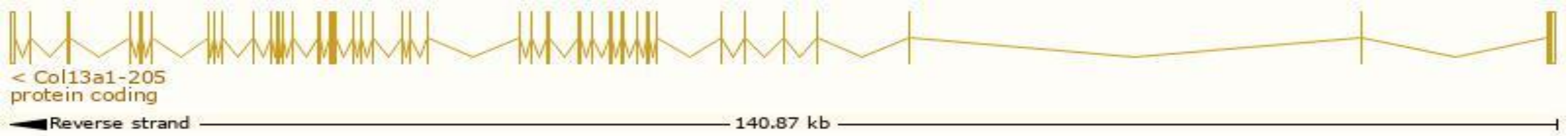
Official Symbol	Col13a1 provided by MGI
Official Full Name	collagen, type XIII, alpha 1 provided byMGI
Primary source	MGI:MGI:1277201
See related	Ensembl:ENSMUSG00000058806
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Broad expression in lung adult (RPKM 5.8), limb E14.5 (RPKM 1.5) and 15 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

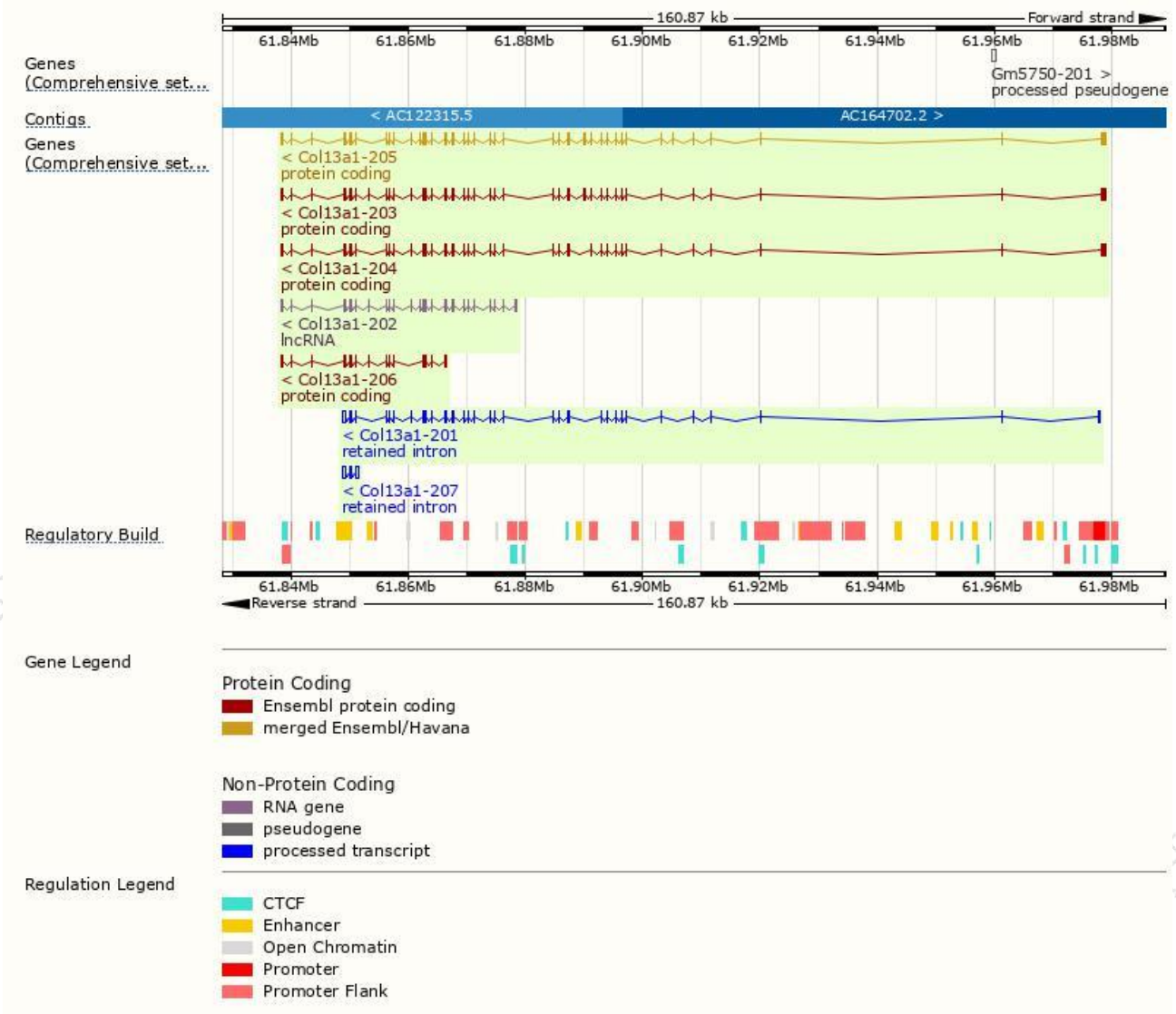
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Col13a1-205	ENSMUST00000105454.2	3162	739aa	Protein coding	CCDS35918	Q9R1N9	TSL:1 GENCODE basic APPRIS P2
Col13a1-204	ENSMUST00000105453.7	2935	675aa	Protein coding	CCDS78821	D3Z7B8	TSL:2 GENCODE basic
Col13a1-203	ENSMUST00000105452.8	3037	709aa	Protein coding	-	D3Z7B9	TSL:5 GENCODE basic APPRIS ALT2
Col13a1-206	ENSMUST00000145469.7	1204	244aa	Protein coding	-	F6Y6J7	CDS 5' incomplete TSL:5
Col13a1-201	ENSMUST00000051826.13	2407	No protein	Retained intron	-	-	TSL:2
Col13a1-207	ENSMUST00000153120.1	819	No protein	Retained intron	-	-	TSL:5
Col13a1-202	ENSMUST00000105451.7	1948	No protein	lncRNA	-	-	TSL:5

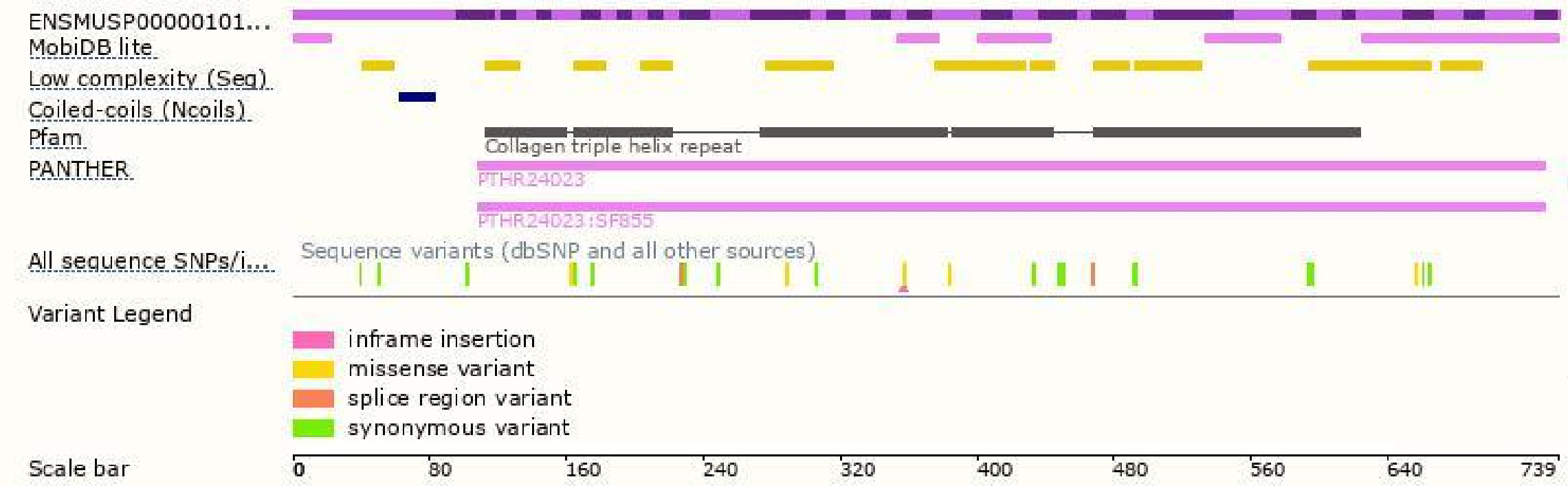
The strategy is based on the design of *Col13a1-205* transcript,The transcription is shown below



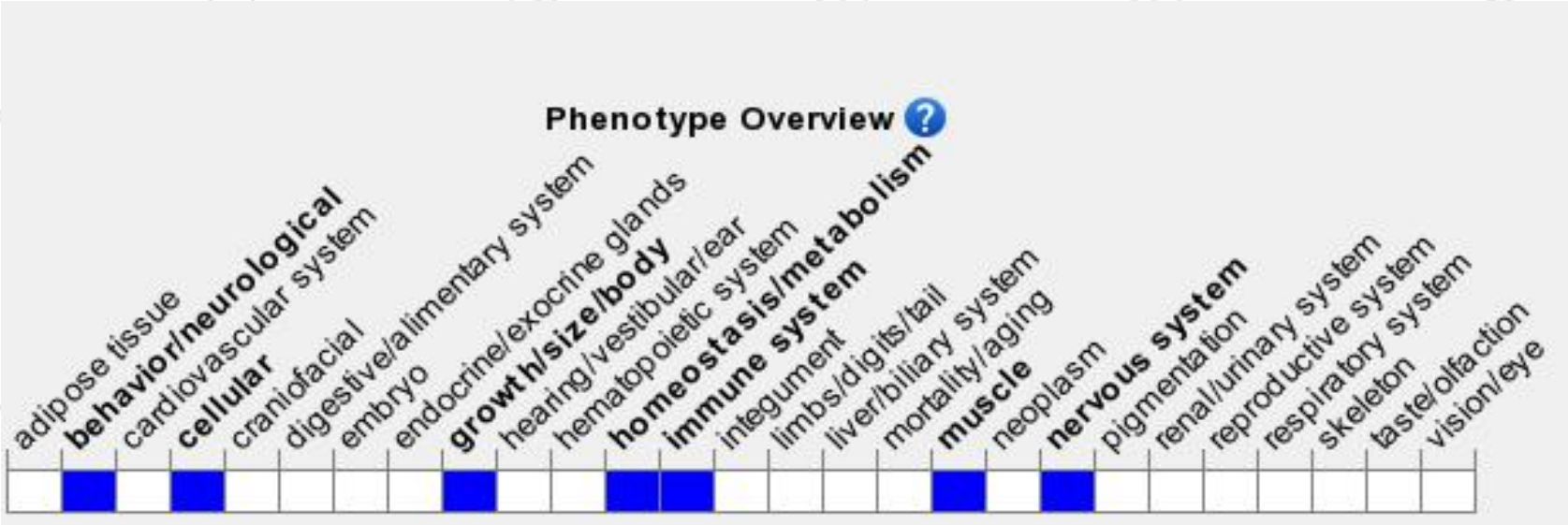
Genomic location distribution



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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