

***Ltbp4* Cas9-CKO Strategy**

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Project Overview

Project Name

Ltbp4

Project type

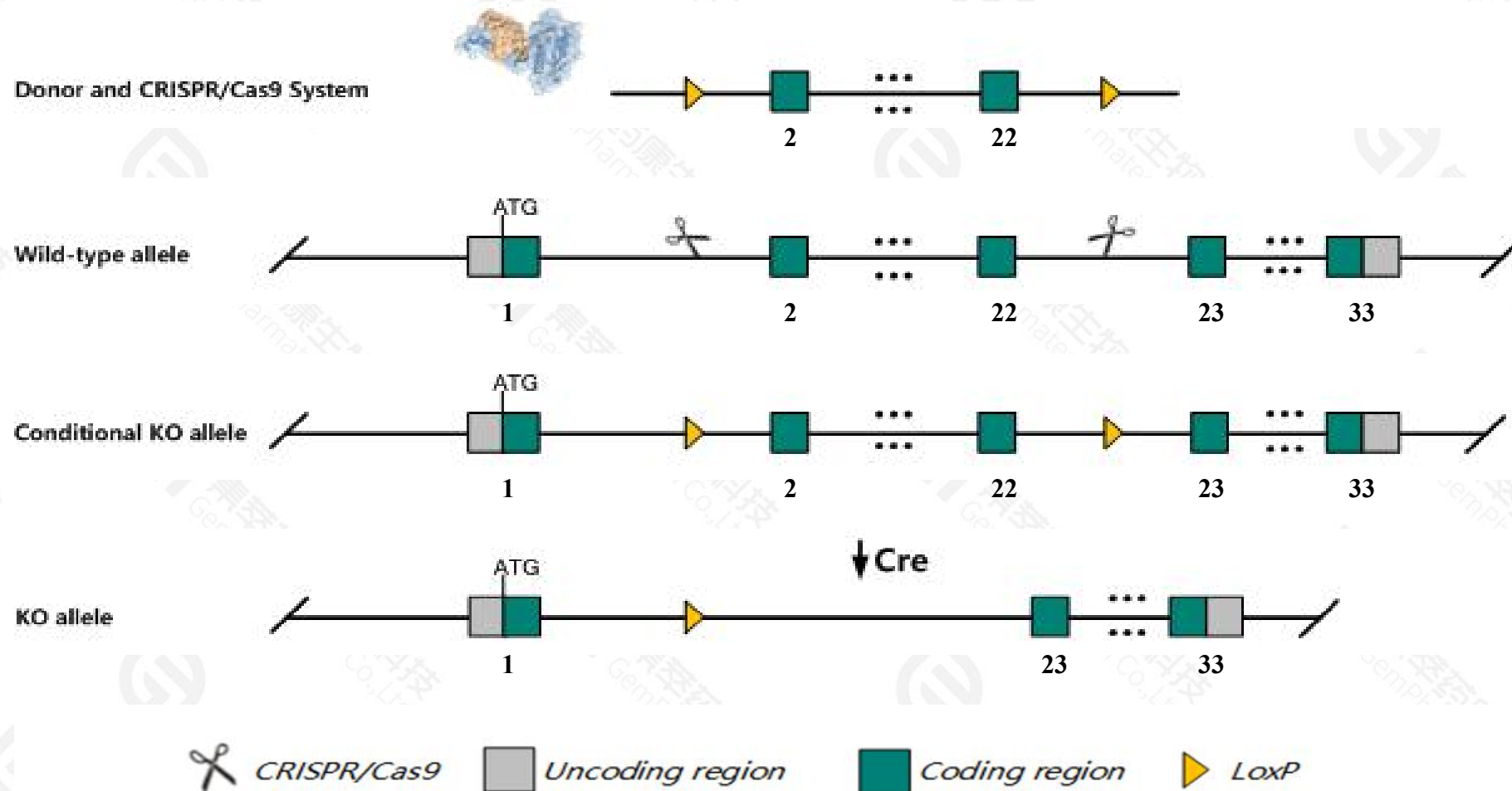
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ltbp4* gene. The schematic diagram is as follows:



Technical routes

- The *Ltbp4* gene has 9 transcripts. According to the structure of *Ltbp4* gene, exon2-exon22 of *Ltbp4*-201(ENSMUST00000038618.13) transcript is recommended as the knockout region. The region contains 2999bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ltbp4* 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, homozygous disruption of this locus results in pulmonary emphysema, cardiomyopathy, and colon cancer.
- The *Ltbp4* gene is located on the Chr7. 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)

Ltbp4 latent transforming growth factor beta binding protein 4 [Mus musculus (house mouse)]

Gene ID: 108075, updated on 2-Feb-2021

Summary



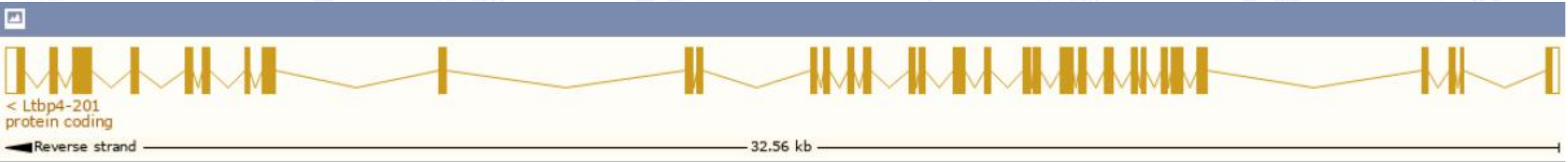
Official Symbol	Ltbp4 provided by MGI
Official Full Name	latent transforming growth factor beta binding protein 4 provided by MGI
Primary source	MGI:MGI:1321395
See related	Ensembl:ENSMUSG00000040488
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	2310046A13Rik
Expression	Broad expression in lung adult (RPKM 180.5), ovary adult (RPKM 138.8) and 17 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

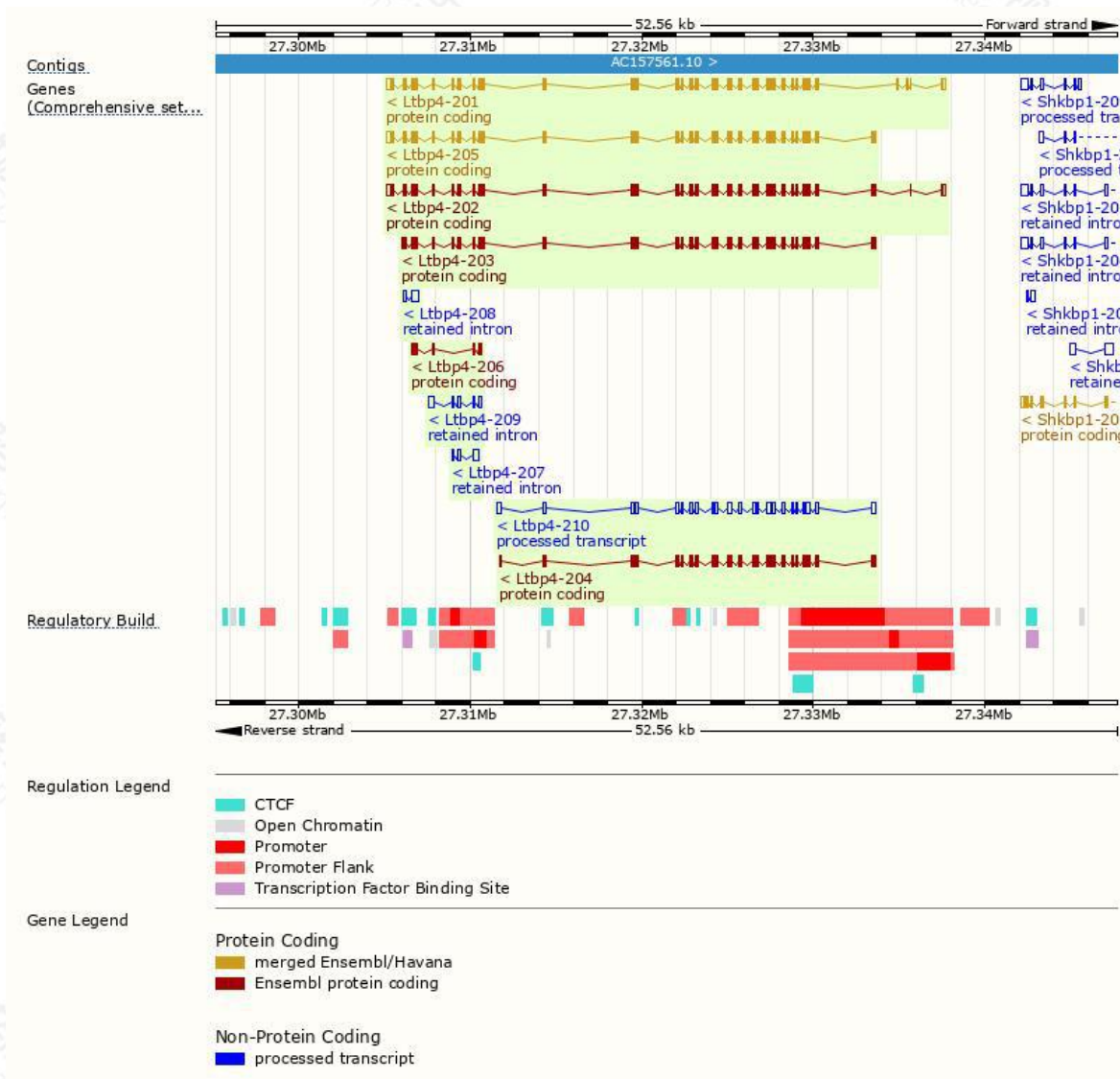
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ltbp4-201	ENSMUST00000038618.13	5386	1666aa	Protein coding	CCDS21017		TSL:1 , GENCODE basic , APPRIS P3 ,
Ltbp4-204	ENSMUST00000121175.8	5118	1600aa	Protein coding	CCDS52158		TSL:1 , GENCODE basic , APPRIS ALT2 ,
Ltbp4-202	ENSMUST00000108369.9	5377	1665aa	Protein coding	-		TSL:5 , GENCODE basic , APPRIS ALT2 ,
Ltbp4-203	ENSMUST00000118583.8	4726	1558aa	Protein coding	-		TSL:1 , GENCODE basic ,
Ltbp4-205	ENSMUST00000125455.2	684	228aa	Protein coding	-		CDS 5' and 3' incomplete , TSL:3 ,
Ltbp4-209	ENSMUST00000206413.2	3643	No protein	Processed transcript	-		TSL:1 ,
Ltbp4-208	ENSMUST00000148594.8	867	No protein	Retained intron	-		TSL:1 ,
Ltbp4-207	ENSMUST00000134464.2	550	No protein	Retained intron	-		TSL:2 ,
Ltbp4-206	ENSMUST00000129471.2	518	No protein	Retained intron	-		TSL:2 ,

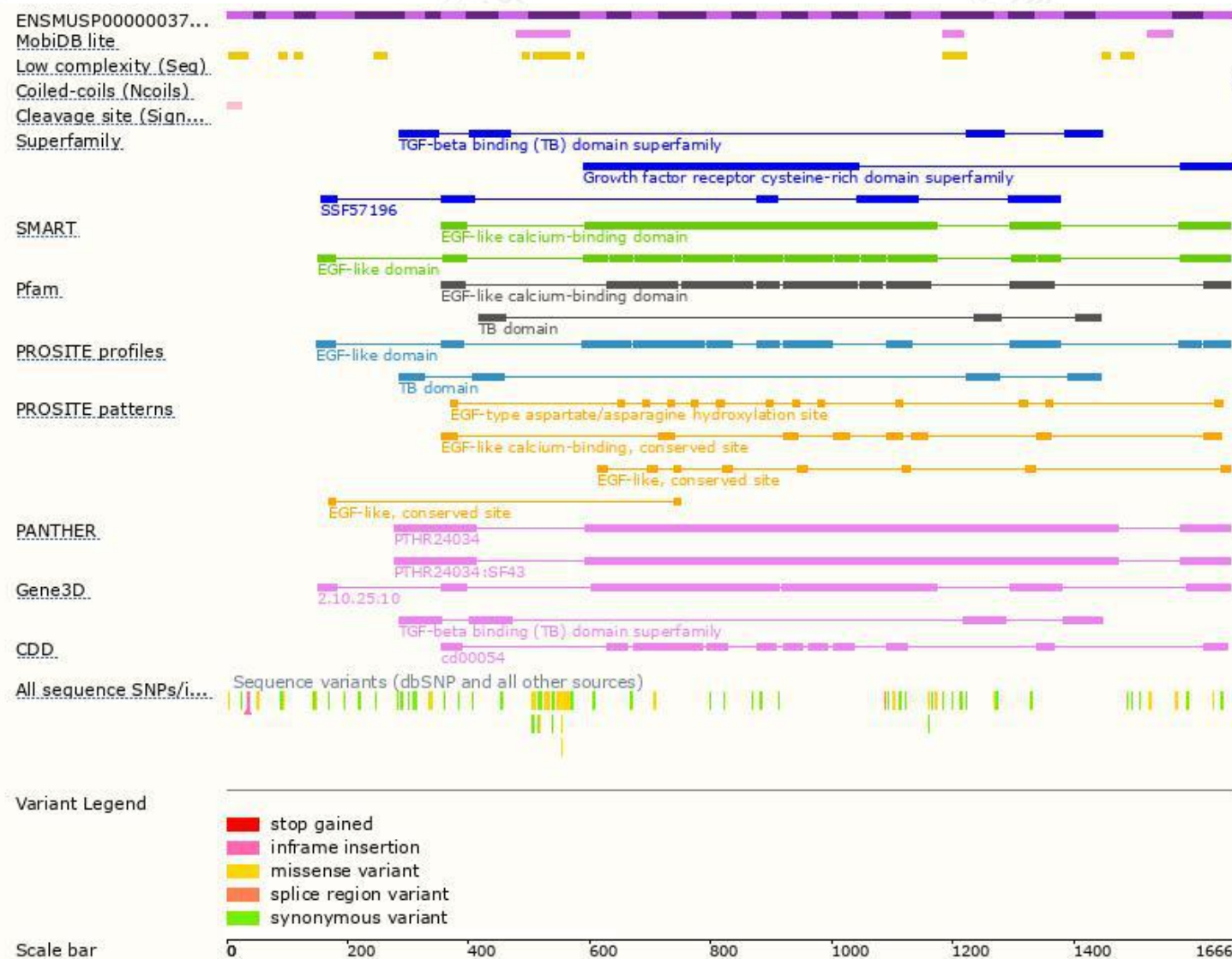
The strategy is based on the design of *Ltbp4-201* transcript,the transcription is shown below:



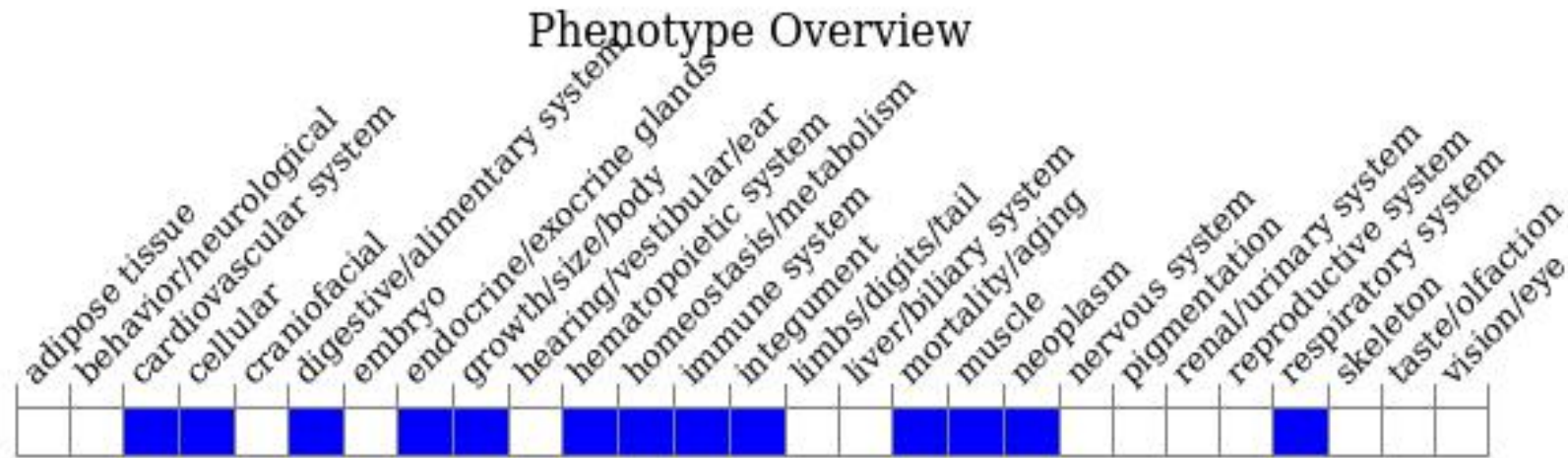
Genomic location distribution



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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