

***Lemd3* Cas9-KO Strategy**

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Project Overview

Project Name

Lemd3

Project type

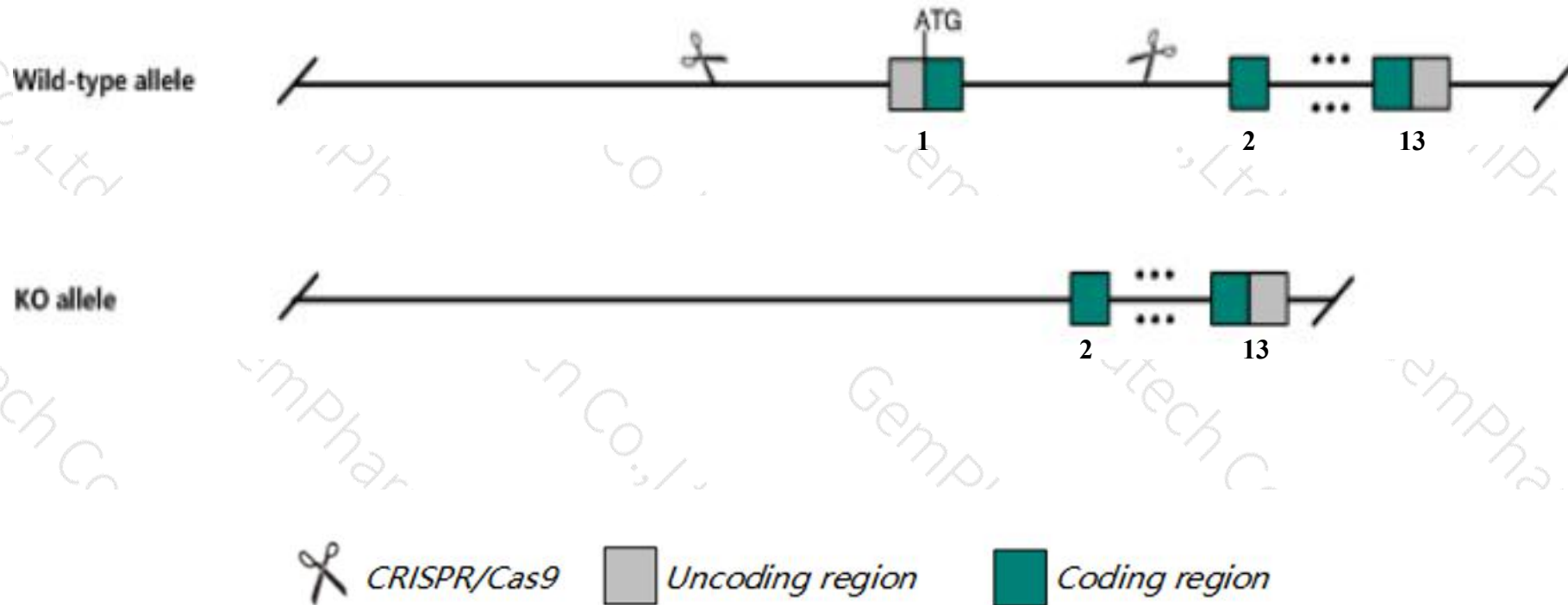
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lemd3* gene. The schematic diagram is as follows:



- The *Lemd3* gene has 2 transcripts. According to the structure of *Lemd3* gene, exon1 of *Lemd3*-202(ENSMUST00000119944.7) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Lemd3* 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 embryonic lethality at midgestation, defects in vascular remodeling and increased apoptosis in embryos, particularly in mesenchymal tissues.
- The flox region is about 5.5kb away from the 3th end of the Gm48341 gene, which may affect the regulation of this gene.
- The flox region is about 3 kb away from the 5th end of the Gm23632 gene, which may affect the regulation of this gene.
- The *Lemd3* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Lemd3 LEM domain containing 3 [Mus musculus (house mouse)]

Gene ID: 380664, updated on 13-Mar-2020

Summary



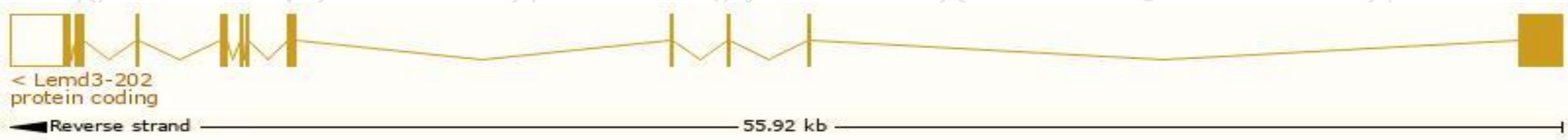
Official Symbol	Lemd3 provided by MGI
Official Full Name	LEM domain containing 3 provided by MGI
Primary source	MGI:MGI:3580376
See related	Ensembl:ENSMUSG00000048661
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AI316861, Man1
Expression	Ubiquitous expression in CNS E18 (RPKM 6.1), cerebellum adult (RPKM 5.6) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

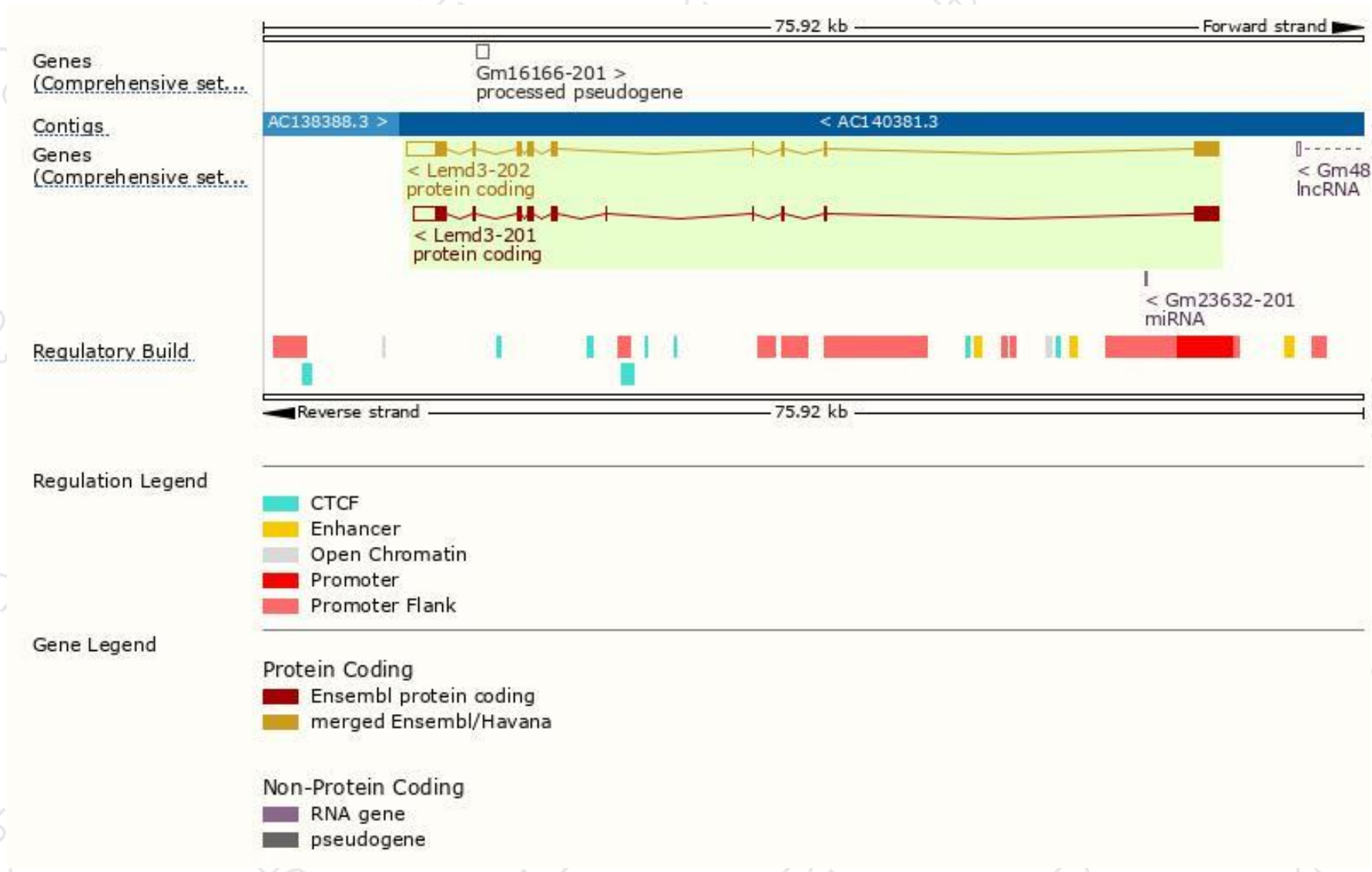
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lemd3-202	ENSMUST00000119944.7	4743	918aa	Protein coding	CCDS48703	E9QP59	TSL:1 GENCODE basic APPRIS P2
Lemd3-201	ENSMUST00000119093.1	4370	940aa	Protein coding	-	D3YU56	TSL:2 GENCODE basic APPRIS ALT2

The strategy is based on the design of *Lemd3-202* transcript,the transcription is shown below:



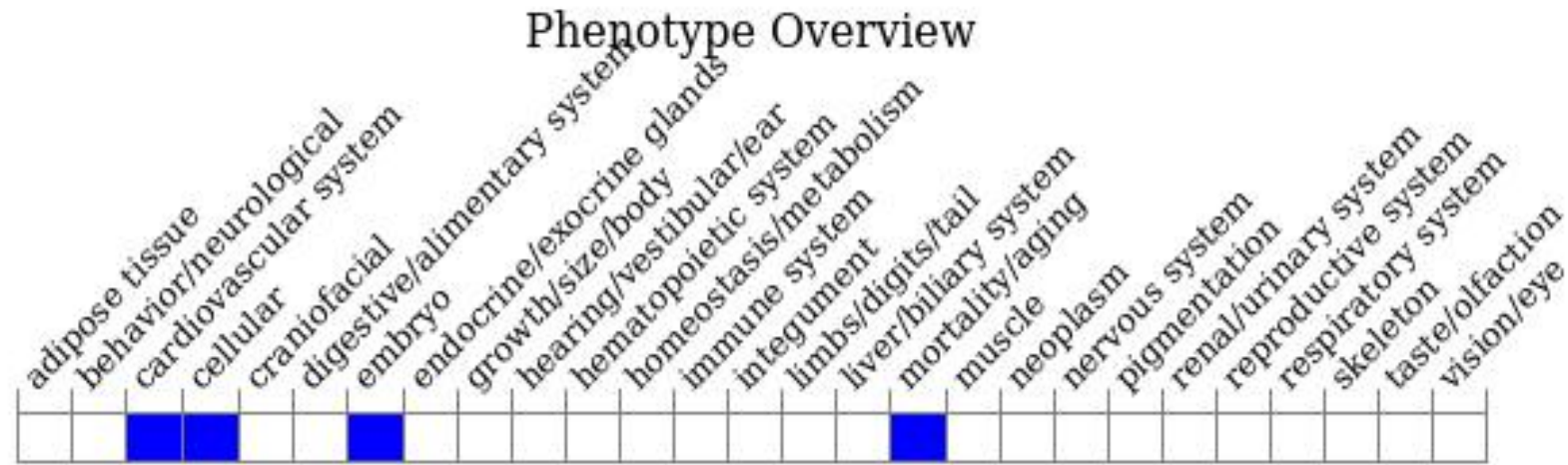
Genomic location distribution



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, homozygous mutation of this gene results in embryonic lethality at midgestation, defects in vascular remodeling and increased apoptosis in embryos, particularly in mesenchymal tissues.

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

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