

Lamtor1 Cas9-CKO Strategy

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Overview

Target Gene Name

• Lamtor1

Project Type

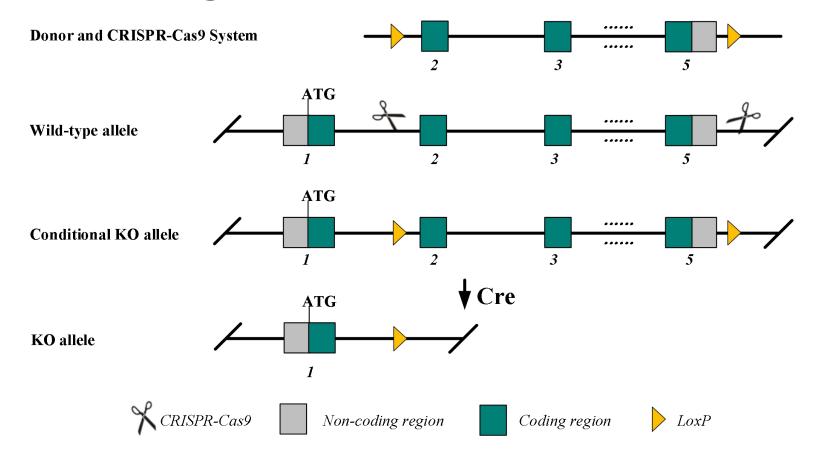
• Cas9-CKO

Genetic Background

• C57BL/6JGpt



Strain Strategy

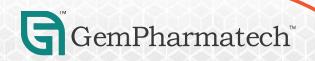


Schematic representation of CRISPR-Cas9 engineering used to edit the Lamtor1 gene.



Technical Information

- The Lamtor1 gene has 3 transcripts. According to the structure of Lamtor1 gene, exon2-5 of Lamtor1-201 (ENSMUST00000033131.12) transcript is recommended as the knockout region. The region contains most of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Lamtor1* 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- 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.



Gene Information

Lamtor1 late endosomal/lysosomal adaptor, MAPK and MTOR activator 1 [*Mus musculus* (house mouse)]

Gene ID: 66508, updated on 7-Sep-2023

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Expression Ubiquitous expression in adrenal adult (RPKM 108.3), genital fat pad adult (RPKM 107.5) and 28 other tissues See more

Orthologs human all

NEW

Try the new Gene table

Try the new <u>Transcript table</u>



Location: 7 E2; 7 54.68 cM See Lamtor1 in Genome Data Viewer

Exon count: 5

Source: https://www.ncbi.nlm.nih.gov/

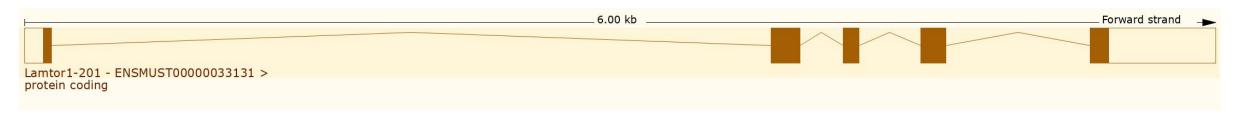


Transcript Information

The gene has 3 transcripts, all transcripts are shown below:

Transcript ID 🗼	Name bandor1-201	bp \$ 1119		Biotype Protein coding	 UniProt Match Q9CQ22	Flags			
ENSMUST00000033131.12						Ensembl Canonical	GENCODE basic	APPRIS P1	TSL:1
ENSMUST00000193465.2	Lamtor1-202	661	142aa	Protein coding	A0A0A6YX02 🗗	GENCODE basic TSL:5			
ENSMUST00000211180.2	Lamtor1-203	1936	No protein	Retained intron	5		TSL:NA		

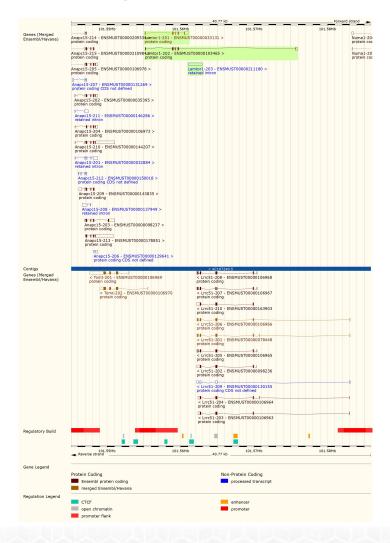
The strategy is based on the design of *Lamtor1-201* transcript, the transcription is shown below:



Source: https://www.ensembl.org



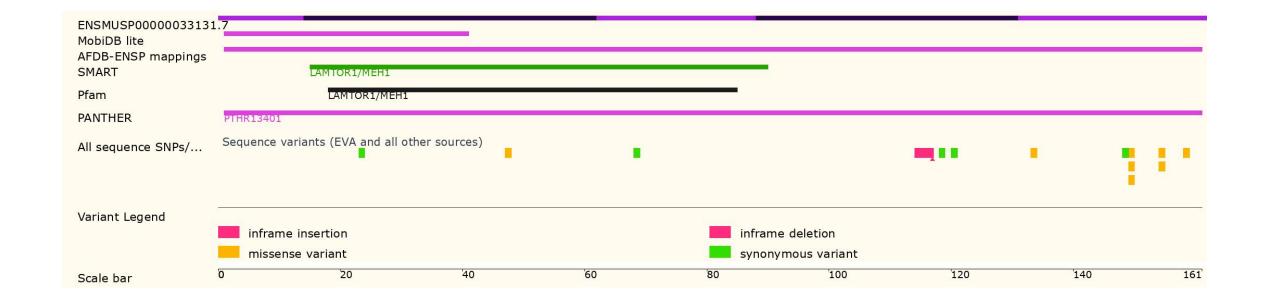
Genomic Information





Source: : https://www.ensembl.org

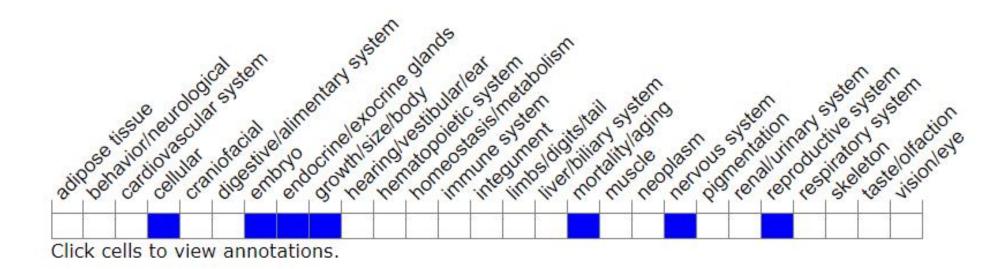
Protein Information





Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



• Mice homozygous for a knock-out allele exhibit growth arrest and lethality at E7 and abnormal visceral endoderm with abnormal endosome-like organelles and small lysosomes.



Important Information

- According the MGI data, mice homozygous for a knock-out allele exhibit growth arrest and lethality at E7 and abnormal visceral endoderm with abnormal endosome-like organelles and small lysosomes.
- The effect of *Tomt* and *Lrrc51* genes is unknown.
- The effect of Lamtor1-202 transcript is unknown.
- Lamtor1 is located on Chr7. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 the existing technology level.



Reference

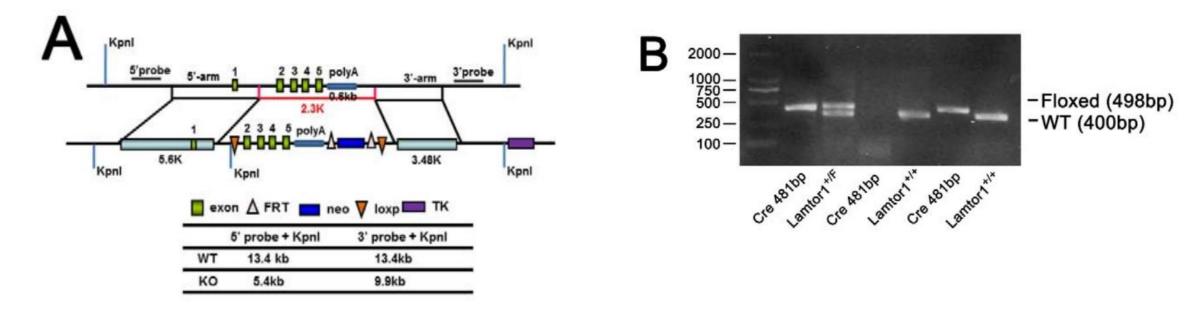


Figure S14. SMC-specific *Lamtor1* **knockout (KO) mice.** (A) Schematic map showed the strategy to generate SMC-specific *Lamtor1* KO mice. (B) Genomic PCR showed the presence of *SM22*Cre gene in *Lamtor1*^{fl/fl} mice.

Reference:Arterial cyclic stretch regulates Lamtor1 and promotes neointimal hyperplasia via circSlc8a1/miR-20a-5p axis in vein grafts.

