

# *Efemp2* Cas9-KO Strategy

Designer:Xiaojing Li

Reviewer:JiaYu

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# Project Overview

**Project Name**

*Efemp2*

**Project type**

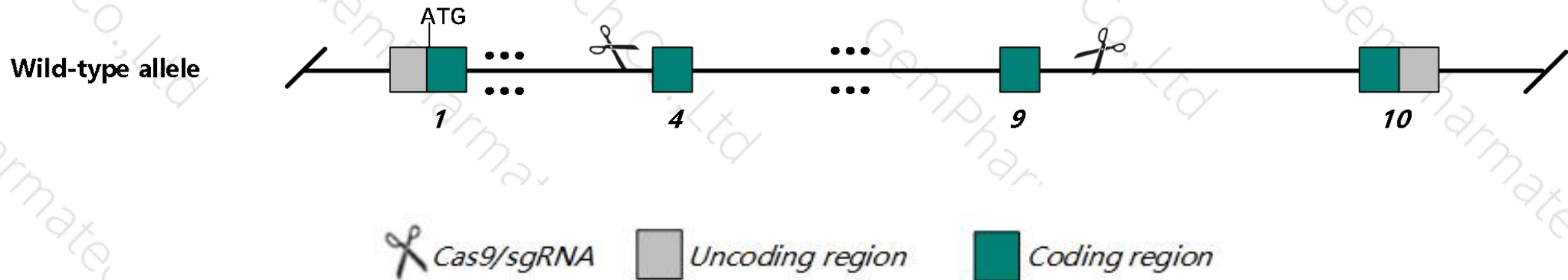
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Efemp2* gene. The schematic diagram is as follows:



- The *Efemp2* gene has 17 transcripts. According to the structure of *Efemp2* gene, exon4-exon9 of *Efemp2-201* (ENSMUST00000070118.13) transcript is recommended as the knockout region. The region contains 803bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Efemp2* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous mutation of this gene results in perinatal lethality with abnormal artery and lung morphology and defects in vascular, pulmonary, and hypodermal elastic fibers. Some alleles of *Mus81* also affect expression of this gene.
- The *Efemp2* gene is located on the Chr19. 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)

**Efemp2** epidermal growth factor-containing fibulin-like extracellular matrix protein 2 [ *Mus musculus* (house mouse) ]

Gene ID: 58859, updated on 28-Oct-2019

## Summary

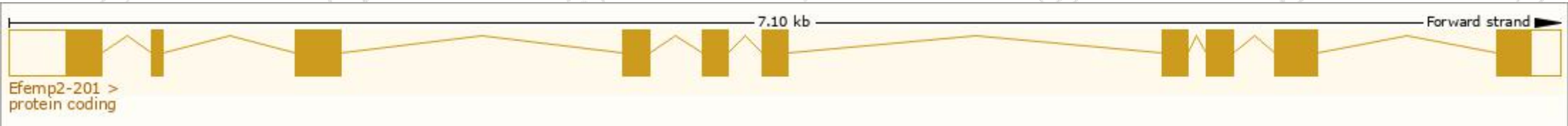
Official Symbol	Efemp2 provided by <a href="#">MGI</a>
Official Full Name	epidermal growth factor-containing fibulin-like extracellular matrix protein 2 provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1891209</a>
See related	<a href="#">Ensembl:ENSMUSG00000024909</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	MBP1; Fbln4; 0610011K11Rik
Expression	Broad expression in limb E14.5 (RPKM 51.1), ovary adult (RPKM 49.4) and 27 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

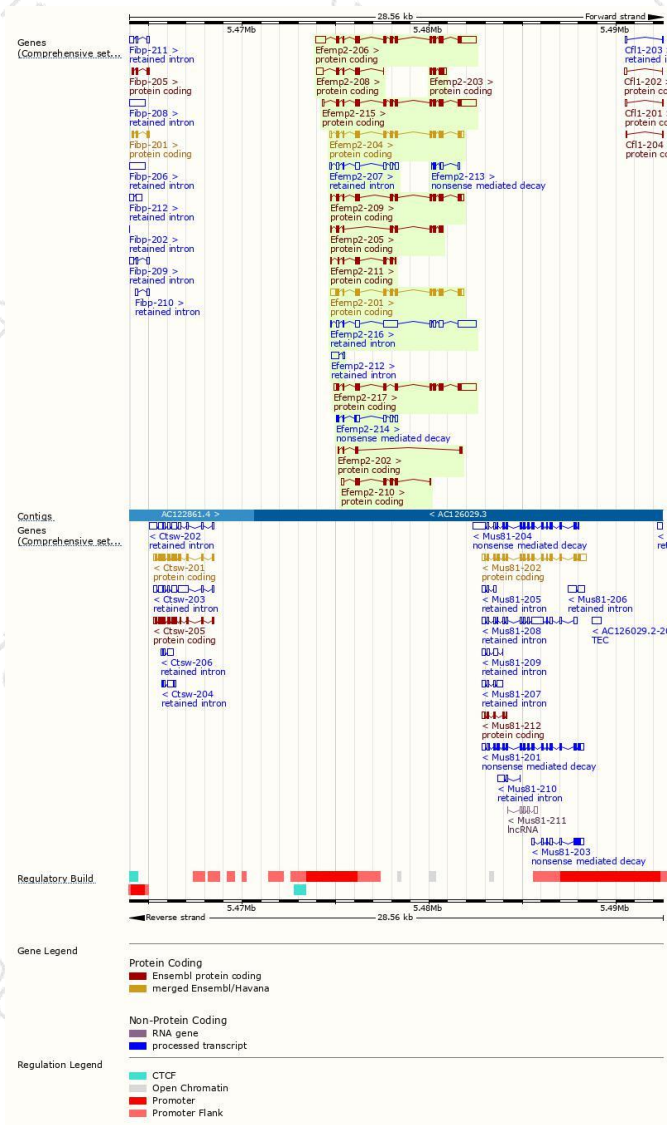
The gene has 17 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Efemp2-206	<a href="#">ENSMUST00000166303.8</a>	2634	<a href="#">443aa</a>	Protein coding	<a href="#">CCDS29466</a>	<a href="#">E9Q8E0 Q542X5</a>	TSL:5 GENCODE basic APPRIS P1
Efemp2-201	<a href="#">ENSMUST00000070118.13</a>	1781	<a href="#">462aa</a>	Protein coding	<a href="#">CCDS50358</a>	<a href="#">G5E8D6</a>	TSL:1 GENCODE basic
Efemp2-204	<a href="#">ENSMUST00000165485.7</a>	1557	<a href="#">443aa</a>	Protein coding	<a href="#">CCDS29466</a>	<a href="#">Q542X5 Q9WVJ9</a>	TSL:1 GENCODE basic APPRIS P1
Efemp2-215	<a href="#">ENSMUST00000235523.1</a>	2215	<a href="#">455aa</a>	Protein coding	-	-	GENCODE basic
Efemp2-217	<a href="#">ENSMUST00000236518.1</a>	2154	<a href="#">404aa</a>	Protein coding	-	-	GENCODE basic
Efemp2-209	<a href="#">ENSMUST00000167371.7</a>	1382	<a href="#">402aa</a>	Protein coding	-	<a href="#">E9Q3N9</a>	TSL:5 GENCODE basic
Efemp2-205	<a href="#">ENSMUST00000166253.7</a>	882	<a href="#">280aa</a>	Protein coding	-	<a href="#">E9Q3F3</a>	CDS 3' incomplete TSL:5
Efemp2-210	<a href="#">ENSMUST00000167827.1</a>	769	<a href="#">191aa</a>	Protein coding	-	<a href="#">E9Q2T8</a>	CDS 3' incomplete TSL:5
Efemp2-208	<a href="#">ENSMUST00000167304.7</a>	742	<a href="#">128aa</a>	Protein coding	-	<a href="#">E9Q1U0</a>	CDS 3' incomplete TSL:5
Efemp2-211	<a href="#">ENSMUST00000167855.7</a>	607	<a href="#">153aa</a>	Protein coding	-	<a href="#">E9Q2A0</a>	CDS 3' incomplete TSL:3
Efemp2-203	<a href="#">ENSMUST00000164388.1</a>	603	<a href="#">157aa</a>	Protein coding	-	<a href="#">F6Z1C2</a>	CDS 5' incomplete TSL:5
Efemp2-202	<a href="#">ENSMUST00000164204.1</a>	362	<a href="#">120aa</a>	Protein coding	-	<a href="#">F7AYH6</a>	CDS 5' incomplete TSL:5
Efemp2-214	<a href="#">ENSMUST00000169943.7</a>	773	<a href="#">82aa</a>	Nonsense mediated decay	-	<a href="#">E9PYW6</a>	TSL:5
Efemp2-213	<a href="#">ENSMUST00000168330.1</a>	406	<a href="#">70aa</a>	Nonsense mediated decay	-	<a href="#">F6R0V7</a>	CDS 5' incomplete TSL:5
Efemp2-216	<a href="#">ENSMUST00000236109.1</a>	2556	No protein	Retained intron	-	-	
Efemp2-207	<a href="#">ENSMUST00000166558.7</a>	848	No protein	Retained intron	-	-	TSL:2
Efemp2-212	<a href="#">ENSMUST00000167920.1</a>	463	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Efemp2-201* transcript,The transcription is shown below

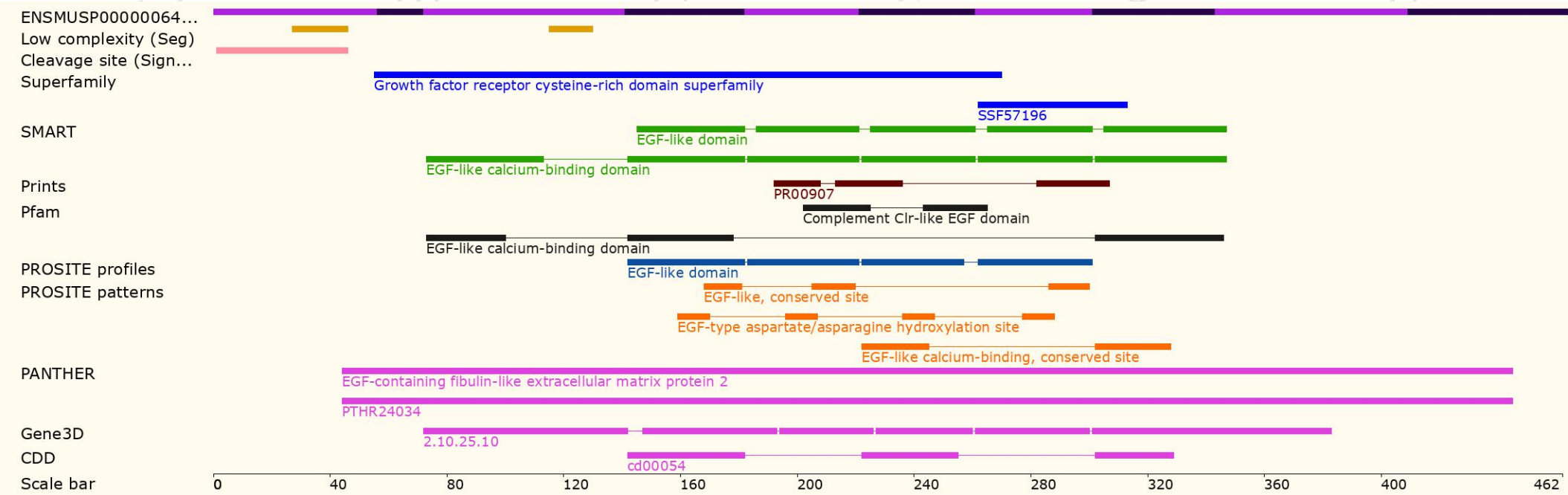


# Genomic location distribution

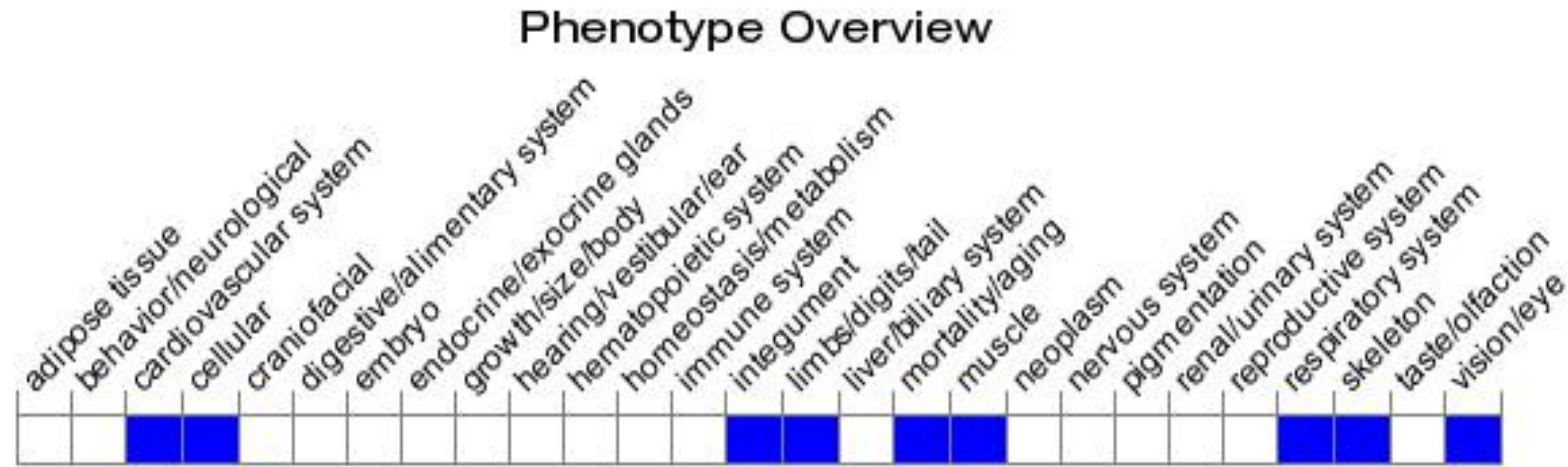




# Protein domain



# Mouse phenotype description(MGI )



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).*

According to the existing MGI data, Homozygous mutation of this gene results in perinatal lethality with abnormal artery and lung morphology and defects in vascular, pulmonary, and hypodermal elastic fibers. Some alleles of Mus81 also affect expression of this gene.

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

Tel: 400-9660890

