Derl2 Cas9-KO Strategy

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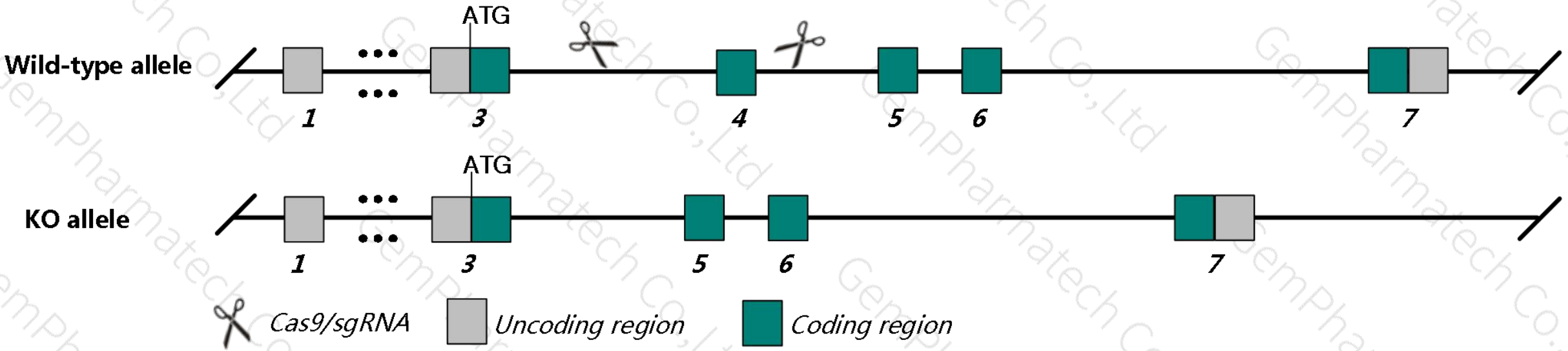
Project Overview

Project Name	***Derl2***
Project type	**Cas9-KO**
Strain background	**C57BL/6J**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Derl2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Derl2* gene has 7 transcripts. According to the structure of *Derl2* gene, exon4 of *Derl2-207* (ENSMUST00000171041.7) transcript is recommended as the knockout region.The region contains 94bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Derl2* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA were microinjected into the fertilized eggs of C57BL/6J 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/6J mice.

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele exhibit partial neonatal lethality with surviving mice exhibiting male sterility, inverted rib cage, abnormal chondrocytes in the ribs, lethality during pregancy, cachexia, and premature death.

- The *Derl2* gene is located on the Chr11. 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）

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Derl2 Der1-like domain family, member 2 [*Mus musculus* (house mouse)]

Gene ID: 116891, updated on 10-Oct-2019

Summary

Official Symbol	Derl2 provided by MGI
Official Full Name	Der1-like domain family, member 2 provided by MGI
Primary source	MGI:MGI:2151483
See related	Ensembl:ENSMUSG00000018442
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	Flana; F-lana; CGI-101; Derlin-2
Expression	Ubiquitous expression in placenta adult (RPKM 9.6), liver E18 (RPKM 9.3) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 11 B4; 11 43.21 cM

See Derl2 in Genome Data Viewer

Exon count: 8

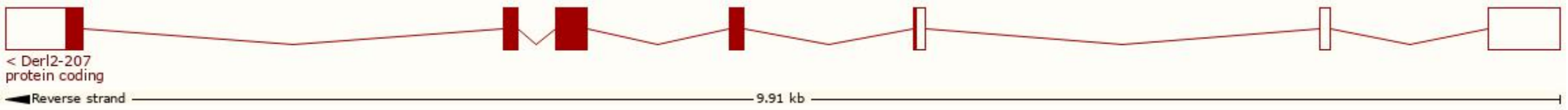
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	11	NC_000077.6 (71007440..71019841, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	11	NC_000077.5 (70820947..70832765, complement)

Transcript information（Ensembl）

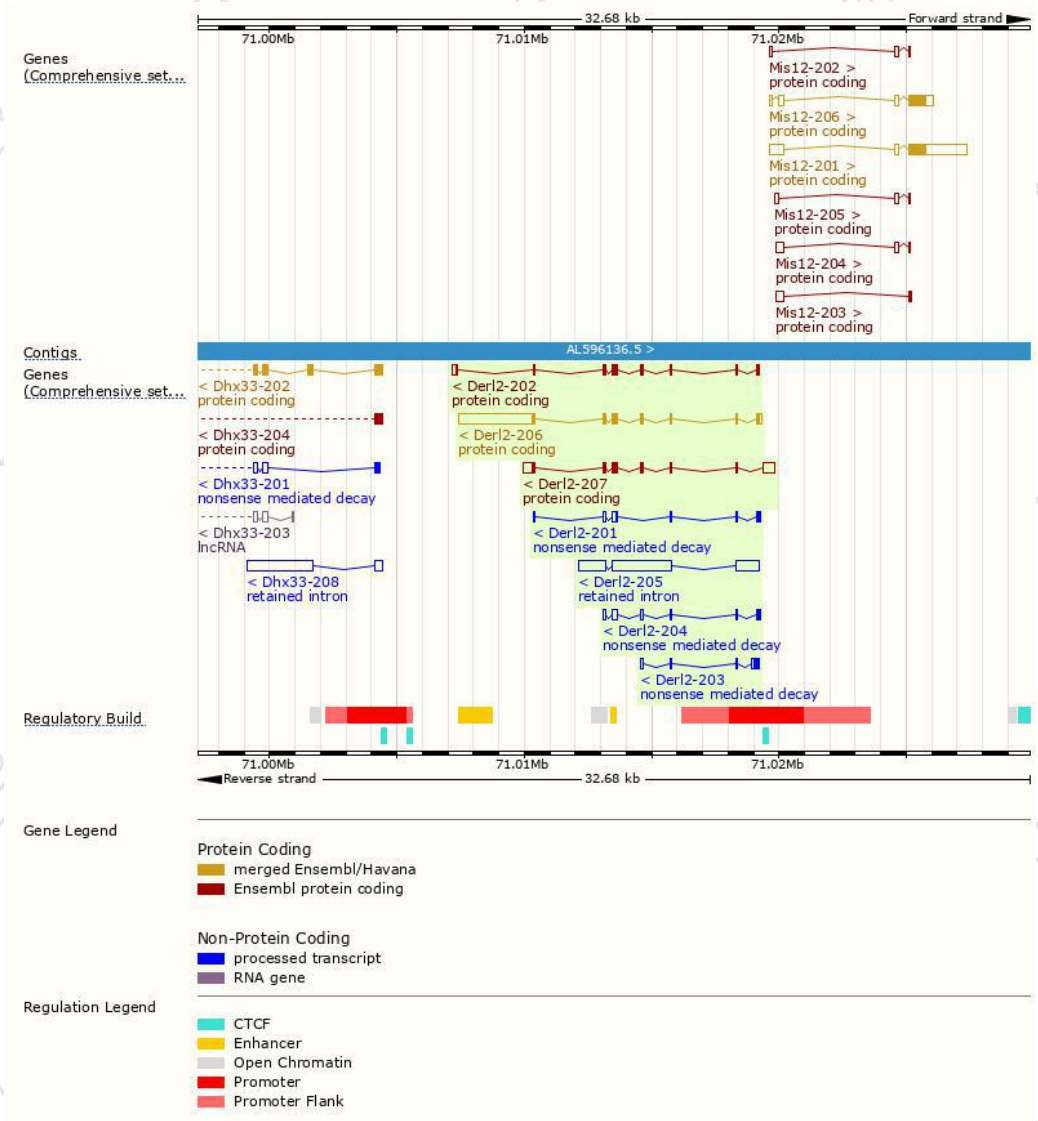
The gene has 7 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Derl2-206	ENSMUST00000143850.7	3666	239aa	Protein coding	CCDS24972	Q8BNI4	TSL:1 GENCODE basic APPRIS P1
Derl2-207	ENSMUST00000171041.7	1466	165aa	Protein coding	CCDS70235	Q3U957	TSL:1 GENCODE basic
Derl2-202	ENSMUST00000108523.9	884	239aa	Protein coding	-	Q8BNI4	TSL:1 GENCODE basic
Derl2-204	ENSMUST00000132198.7	676	46aa	Nonsense mediated decay	-	J3QMQ7	TSL:3
Derl2-201	ENSMUST00000018586.5	629	83aa	Nonsense mediated decay	-	J3QMF4	TSL:3
Derl2-203	ENSMUST00000131340.1	491	65aa	Nonsense mediated decay	-	J3KMR6	CDS 5' incomplete TSL:3
Derl2-205	ENSMUST00000140712.1	4369	No protein	Retained intron	-	-	TSL:1

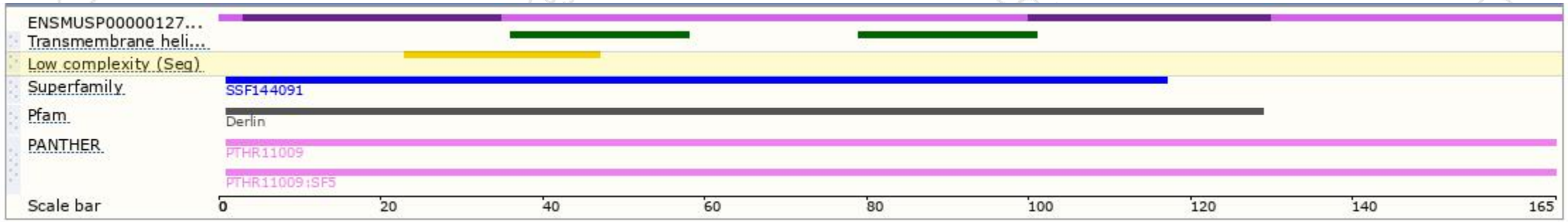
The strategy is based on the design of *Derl2-207* transcript,The transcription is shown below



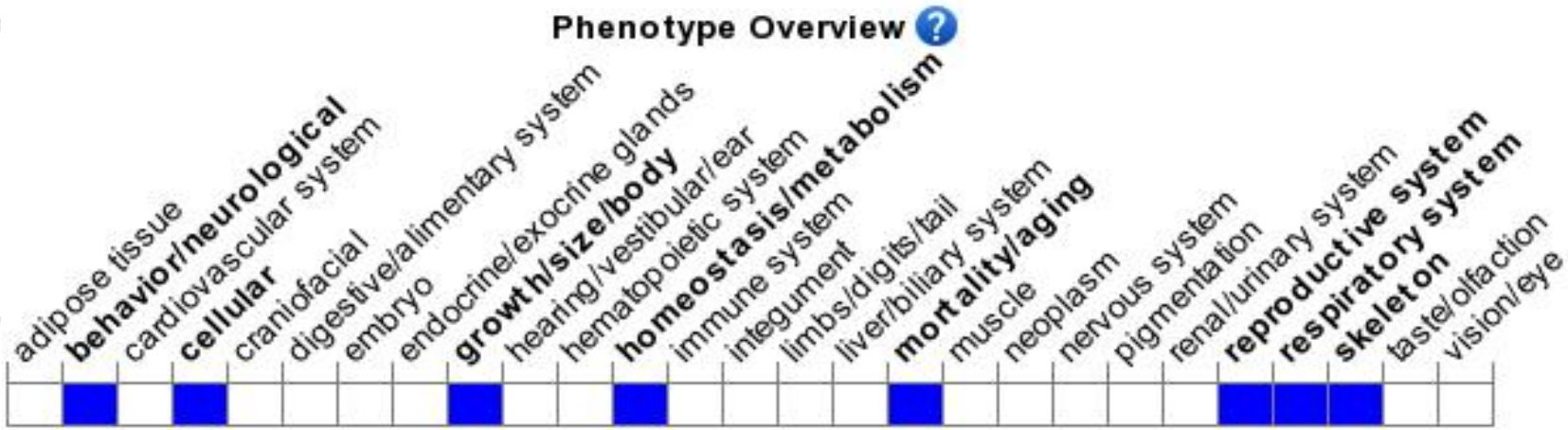
Genomic location distribution



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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