GemPharmatech™

Gsn Cas9-CKO Strategy

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Design Date: 2023-6-19

Overview

Target Gene Name

- Gsn

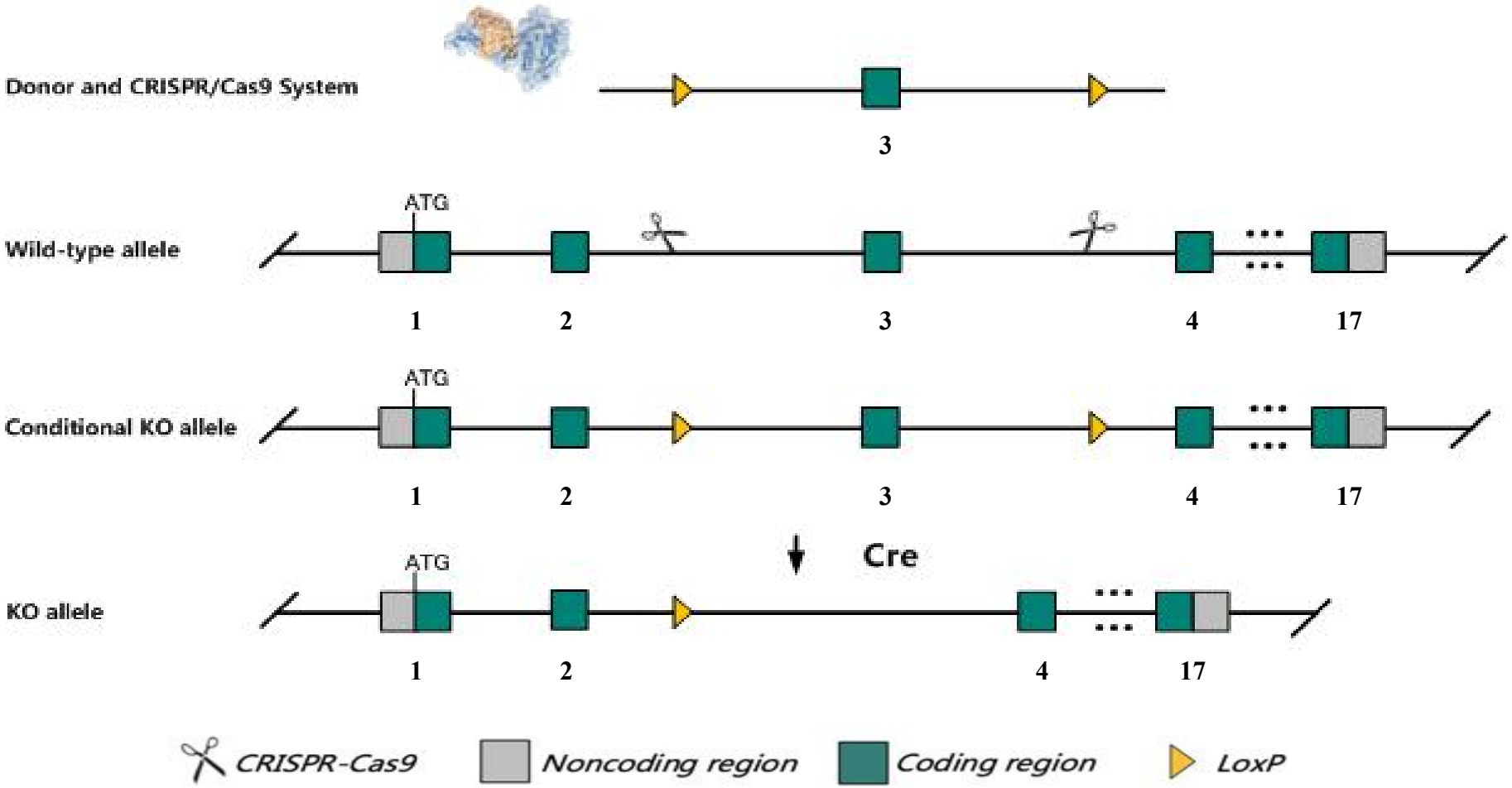
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



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

Technical Information

- The *Gsn* gene has 7 transcripts. According to the structure of *Gsn* gene, exon3 of *Gsn*-201 (ENSMUST00000028239.8) transcript is recommended as the knockout region. The region contains 155bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Gsn* 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

Gsn gelsolin [Mus musculus (house mouse)]

Gene ID: 227753, updated on 23-Feb-2021

Summary

Official Symbol	Gsn provided by MGI
Official Full Name	gelsolin provided by MGI
Primary source	MGI:MGI:95851
See related	Ensembl:ENSMUSG00000026879
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	ADF
Expression	Biased expression in subcutaneous fat pad adult (RPKM 1628.5), bladder adult (RPKM 1379.3) and 12 other tissues See more
Orthologs	human all

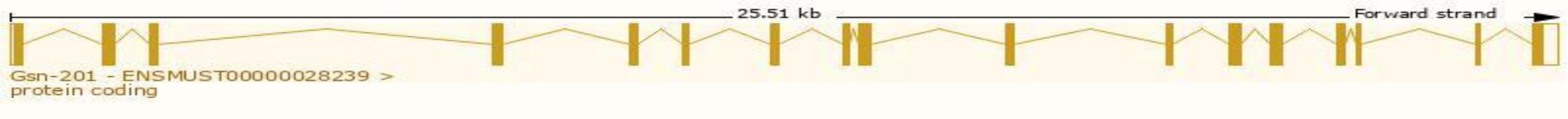
Source: https://www.ncbi.nlm.nih.gov/

Transcript Information

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

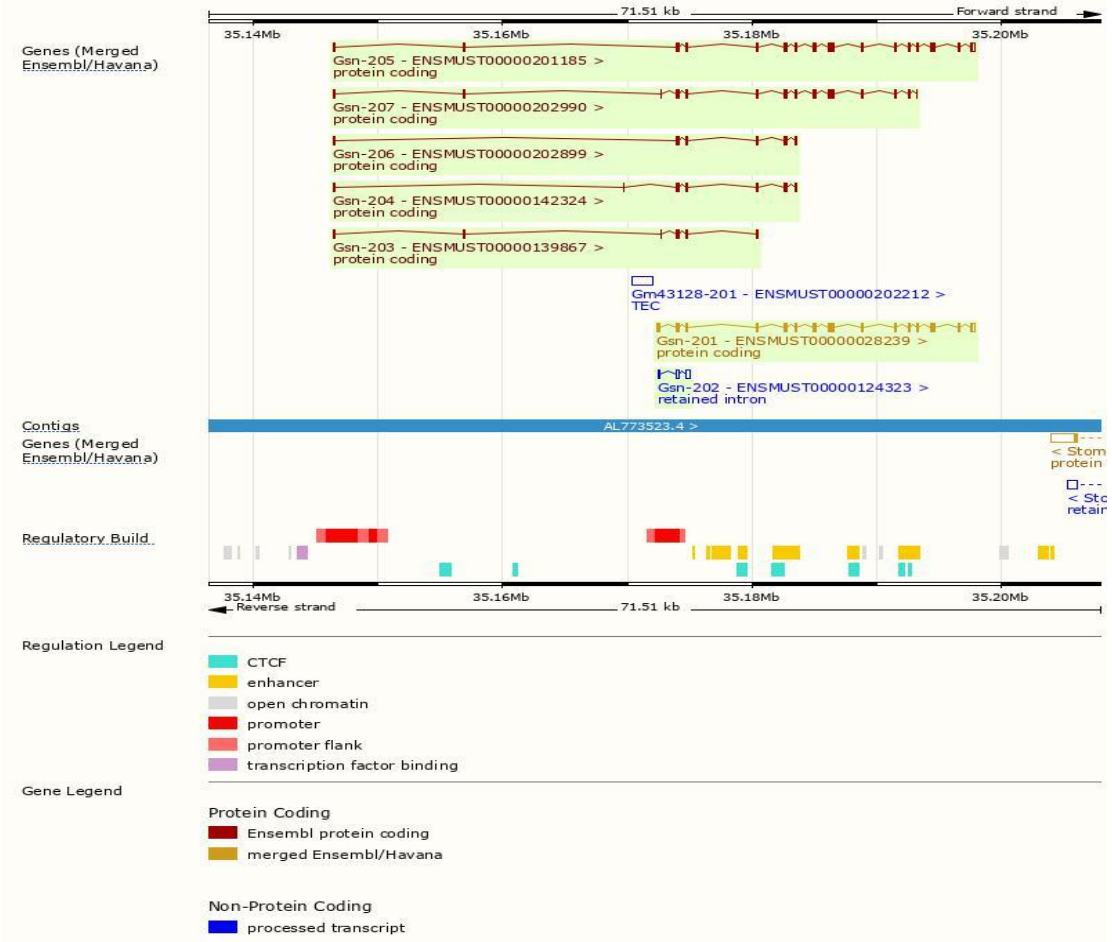
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gsn-201	ENSMUST00000028239.8	2653	780aa	Protein coding	CCDS15960		TSL:1 , GENCODE basic ,
Gsn-205	ENSMUST00000201185.4	2607	731aa	Protein coding	CCDS79785		TSL:1 , GENCODE basic , APPRIS P1 ,
Gsn-207	ENSMUST00000202990.4	1925	568aa	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Gsn-204	ENSMUST00000142324.8	883	251aa	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Gsn-206	ENSMUST00000202899.4	842	251aa	Protein coding	-		CDS 3' incomplete , TSL:3 ,
Gsn-203	ENSMUST00000139867.5	646	166aa	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Gsn-202	ENSMUST00000124323.5	646	No protein	Retained intron	-		TSL:2 ,

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



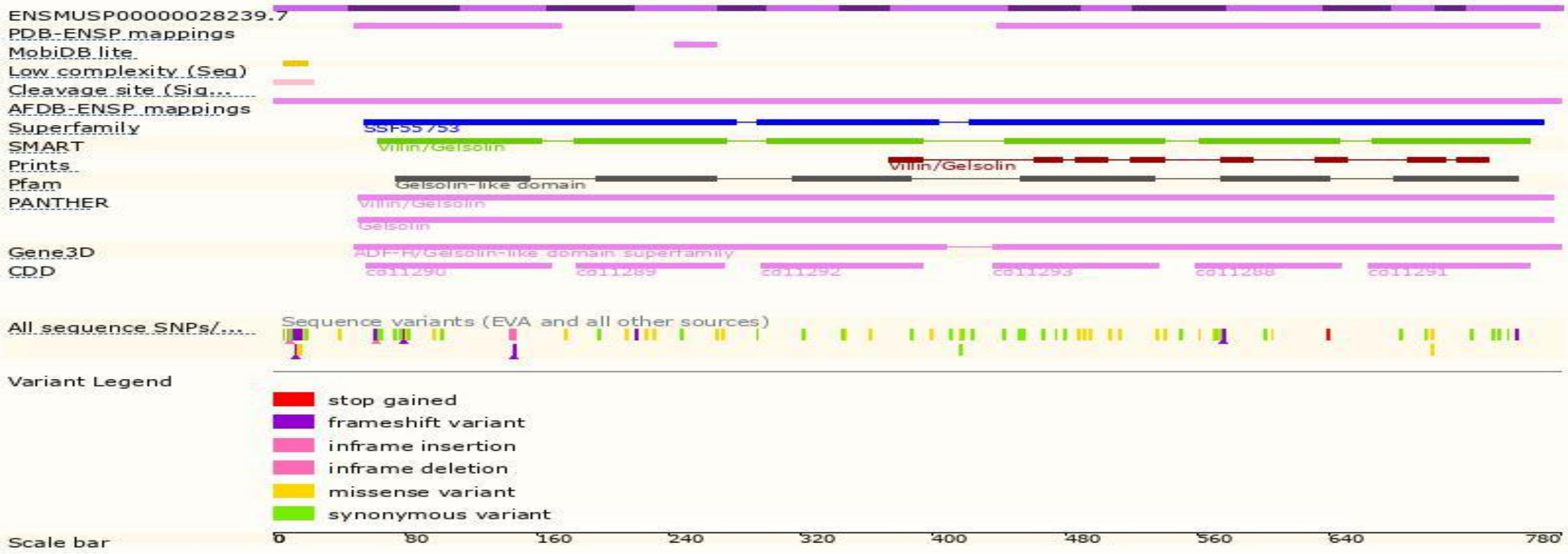
Source: https://www.ensembl.org

Genomic Information



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

Protein Information



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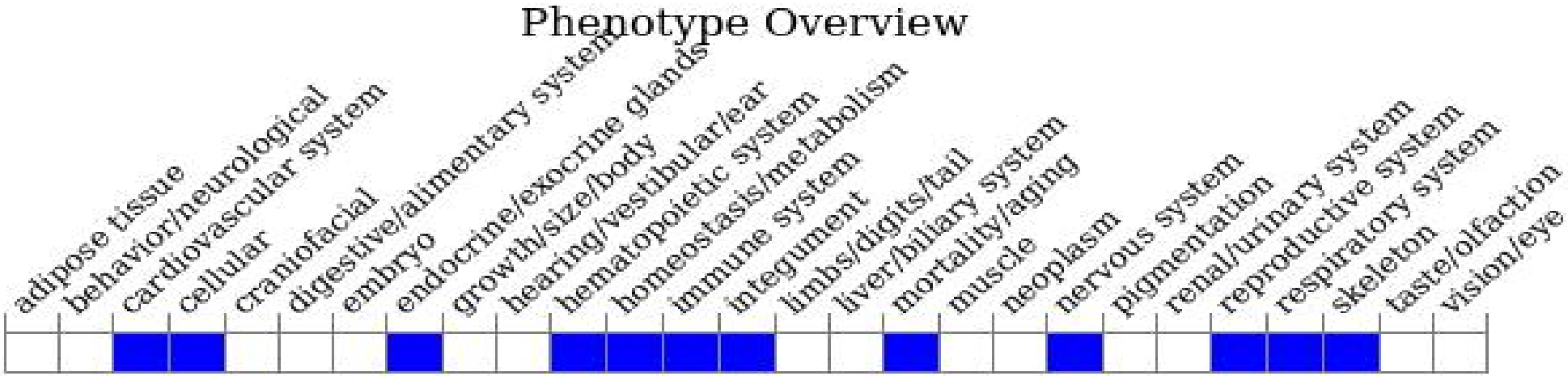
Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



- Mice homozygous for disruptions in this gene display abnormalities in the immune system, platelet and platelet function, bone density, nervous and circulatory system. In addition, there are background related effects on viability and mammary gland development.

Source: https://www.informatics.jax.org

Important Information

- *Gsn* is located on Chr2. 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.
- The intron2 -3 is only 564bp ,loxp insertion may affect mRNA splicing.
- 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.