

Serpinc1 Cas9-CKO Strategy

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Reviewer:

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Design Date:

2019/9/5

Project Overview

Project Name

Serpinc1

Project type

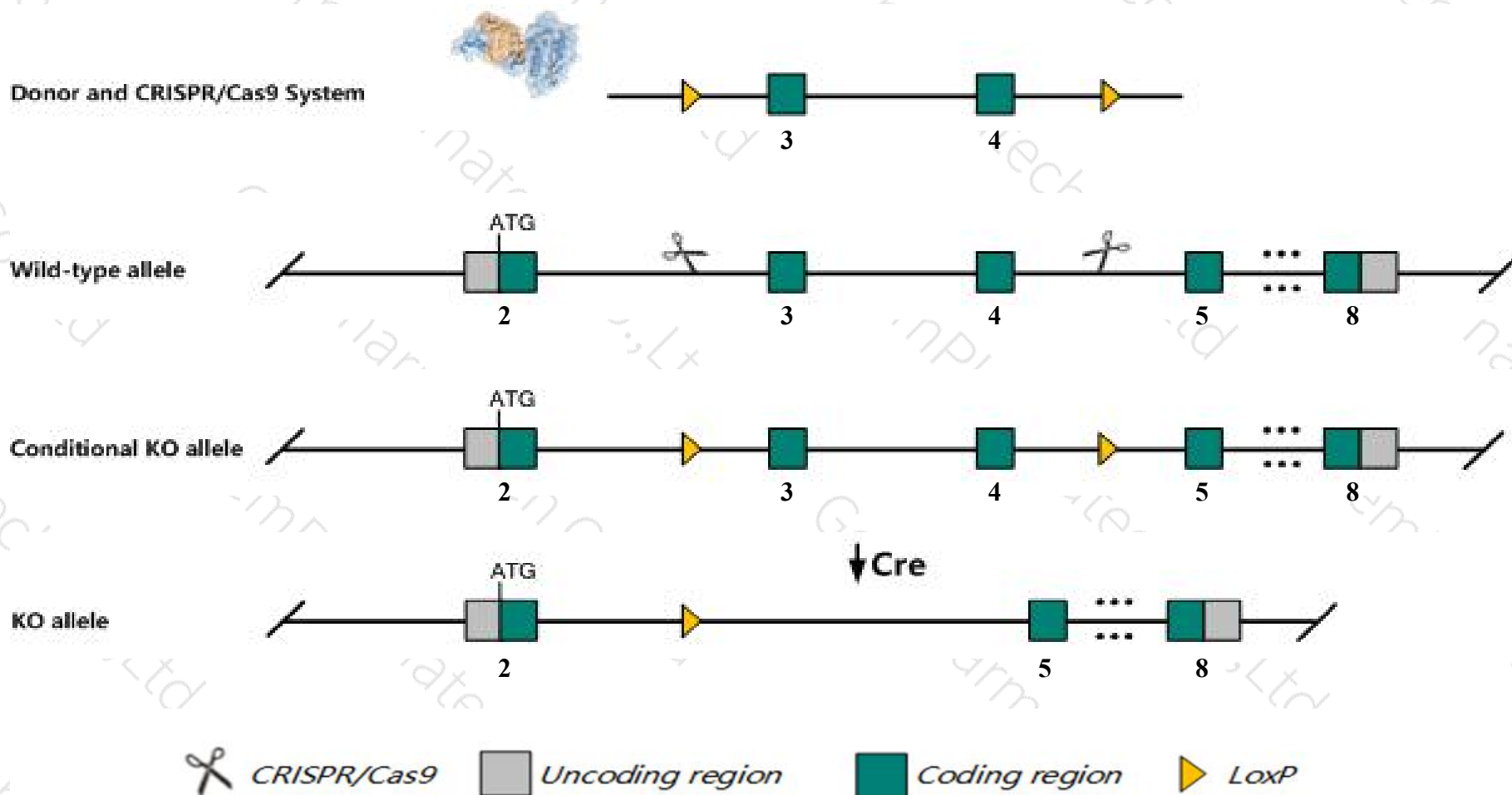
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Serpinc1* gene. The schematic diagram is as follows:



- The *Serpinc1* gene has 8 transcripts. According to the structure of *Serpinc1* gene, exon3-exon4 of *Serpinc1-201* (ENSMUST00000064725.10) transcript is recommended as the knockout region. The region contains 586bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Serpinc1* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

- According to the existing MGI data, Homozygotes for a targeted null mutation exhibit extensive subcutaneous hemorrhage, fibrin deposits in the myocardium and liver, and lethality by embryonic day 16.5. Heterozygotes challenged with lipopolysaccharide show increased fibrin deposits.
- The *Serpinc1* gene is located on the Chr1. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Serpinc1 serine (or cysteine) peptidase inhibitor, clade C (antithrombin), member 1 [*Mus musculus* (house mouse)]

Gene ID: 11905, updated on 12-Aug-2019

Summary

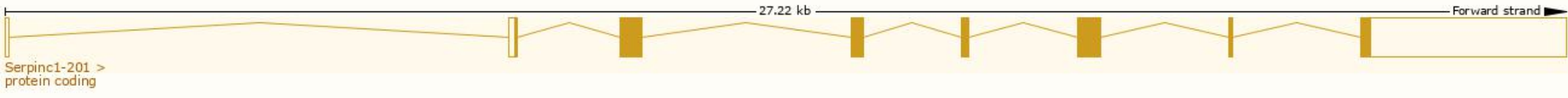
Official Symbol Serpinc1 provided by [MGI](#)
Official Full Name serine (or cysteine) peptidase inhibitor, clade C (antithrombin), member 1 provided by [MGI](#)
Primary source [MGI:MGI:88095](#)
See related [Ensembl:ENSMUSG00000026715](#)
Gene type protein coding
RefSeq status VALIDATED
Organism [Mus musculus](#)
Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as At3; At-3; ATIII; AI114908
Expression Biased expression in liver adult (RPKM 699.7), liver E18 (RPKM 396.3) and 2 other tissues [See more](#)
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

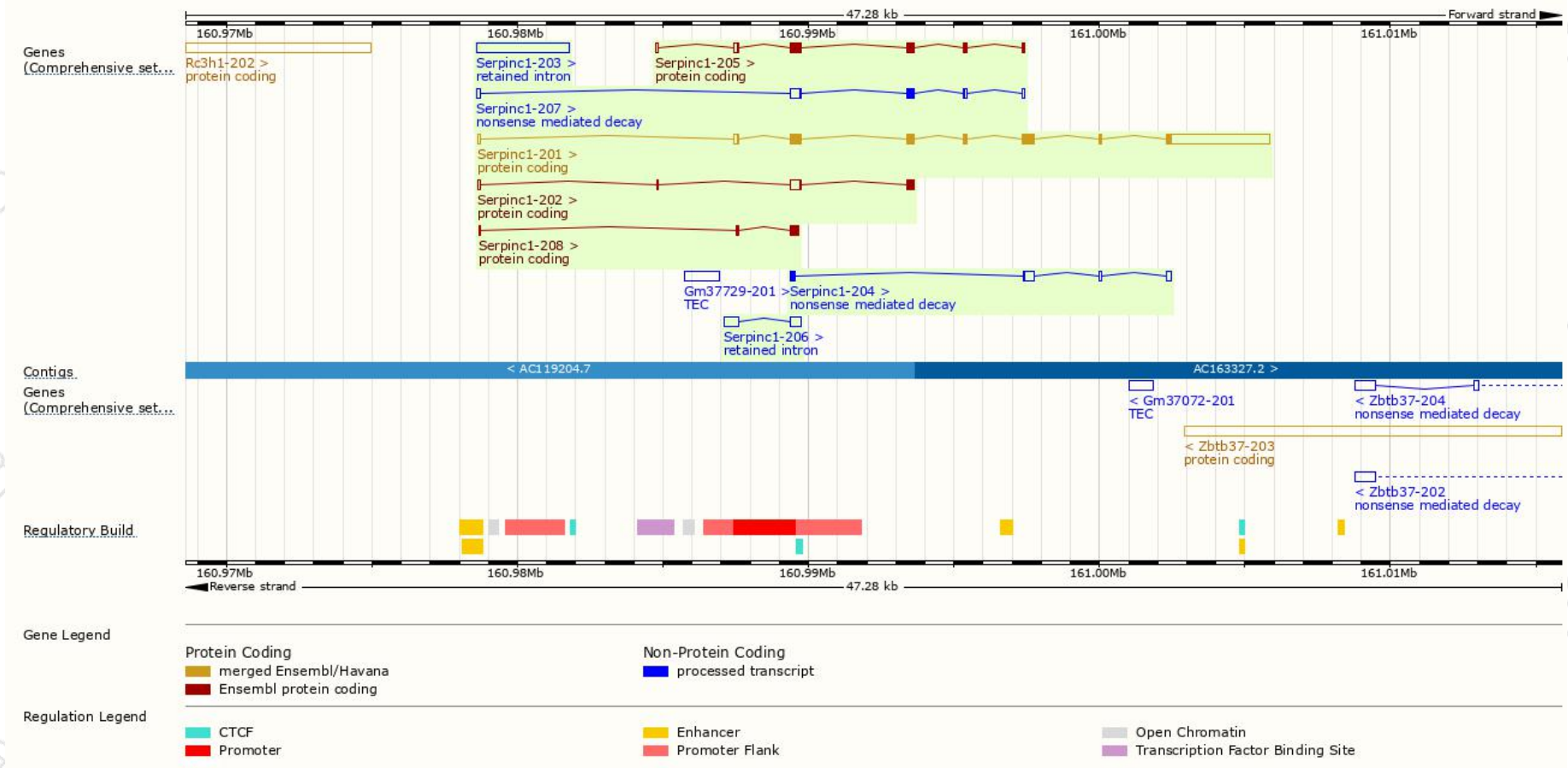
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Serpinc1-201	ENSMUST00000064725.10	4970	465aa	Protein coding	CCDS15411	P32261 Q543J5	TSL:1 GENCODE basic APPRIS P1
Serpinc1-205	ENSMUST00000194592.1	1044	286aa	Protein coding	-	A0A0A6YWH7	CDS 3' incomplete TSL:5
Serpinc1-202	ENSMUST00000191936.1	725	92aa	Protein coding	-	A0A0A6YXS8	TSL:3 GENCODE basic
Serpinc1-208	ENSMUST00000195760.1	360	107aa	Protein coding	-	A0A0A6YX70	CDS 3' incomplete TSL:3
Serpinc1-207	ENSMUST00000195438.5	900	103aa	Nonsense mediated decay	-	A0A0A6YX49	TSL:5
Serpinc1-204	ENSMUST00000194455.1	742	65aa	Nonsense mediated decay	-	A0A0A6YX85	CDS 5' incomplete TSL:5
Serpinc1-203	ENSMUST00000193477.1	3186	No protein	Retained intron	-	-	TSL:NA
Serpinc1-206	ENSMUST00000194777.1	867	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Serpinc1-201* transcript,The transcription is shown below



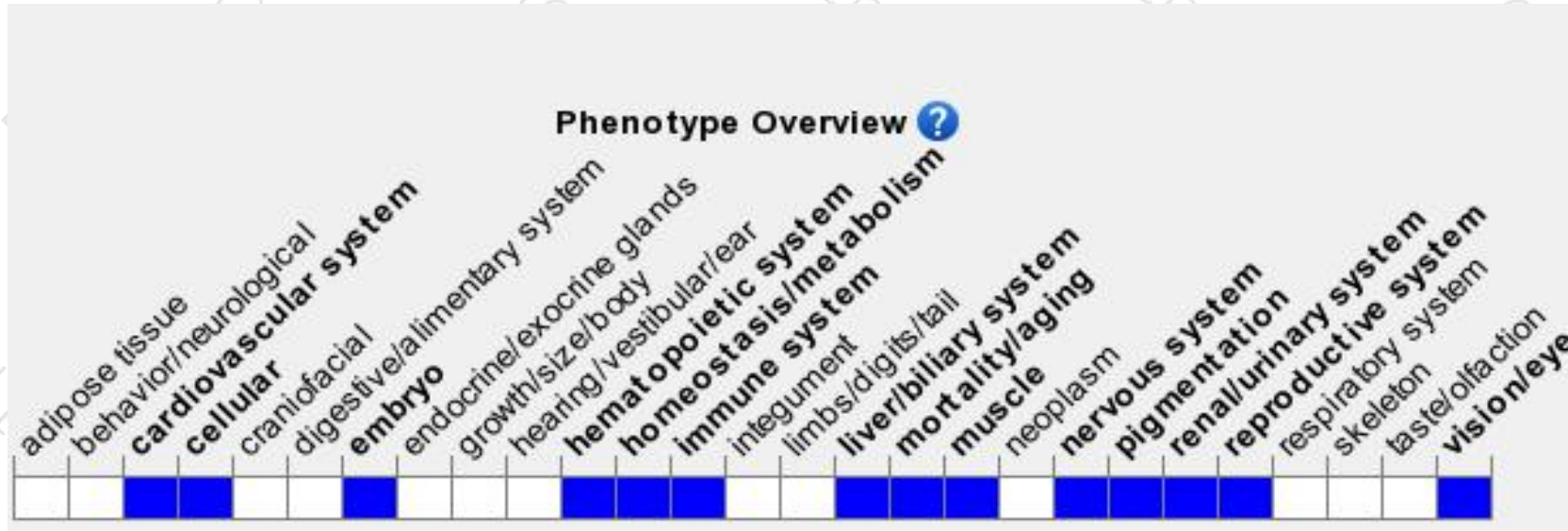
Genomic location distribution



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, Homozygotes for a targeted null mutation exhibit extensive subcutaneous hemorrhage, fibrin deposits in the myocardium and liver, and lethality by embryonic day 16.5. Heterozygotes challenged with lipopolysaccharide show increased fibrin deposits.

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

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