

Proc Cas9-KO Strategy

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Reviewer:

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Project Overview

Project Name

Proc

Project type

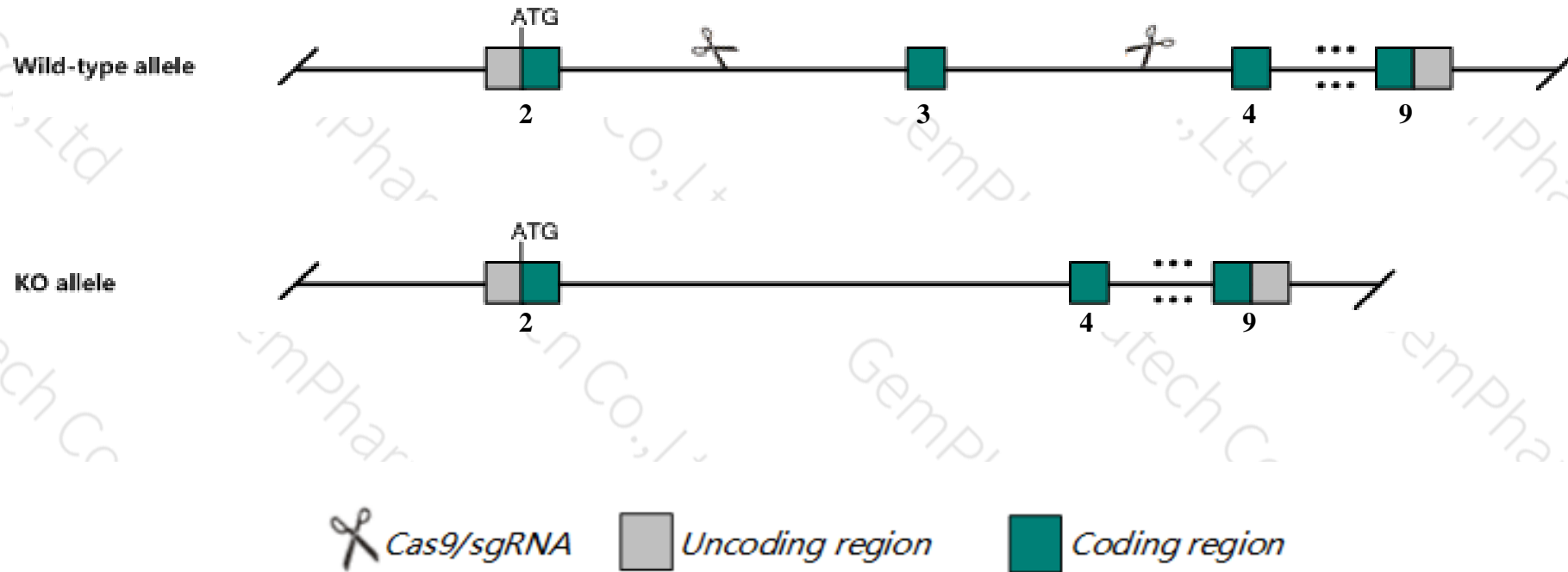
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Proc* gene has 8 transcripts. According to the structure of *Proc* gene, exon3 of *Proc-201* (ENSMUST00000171765.1) transcript is recommended as the knockout region. The region contains 164bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Proc* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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.

- According to the existing MGI data, Inactivation of the locus results in death within 24 hours of birth due to consumptive coagulopathy. Thromboses and bleeding are observed in the brains and livers of homozygous mutant mice.
- The *Proc* gene is located on the Chr18. 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)

Proc protein C [*Mus musculus* (house mouse)]

Gene ID: 19123, updated on 12-Aug-2019

Summary

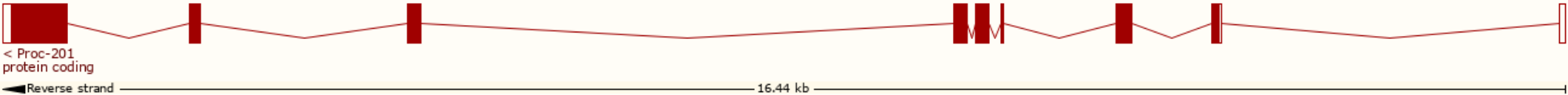
Official Symbol	Proc provided by MGI
Official Full Name	protein C provided by MGI
Primary source	MGI:MGI:97771
See related	Ensembl:ENSMUSG00000024386
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	PC
Summary	This gene encodes the vitamin K-dependent protein C, which plays a vital role in the anticoagulation pathway. The encoded protein undergoes proteolytic processing including activation by thrombin-thrombomodulin complex to form the anticoagulant serine protease that degrades activated coagulation factors. A complete lack of the encoded protein in mice results in severe perinatal consumptive coagulopathy in the brain and liver, resulting in death within 24 hours after birth. Alternative splicing results in multiple transcript variants encoding different isoforms that may undergo similar processing to generate the mature protein. [provided by RefSeq, Sep 2015]
Expression	Biased expression in liver adult (RPKM 230.9), liver E18 (RPKM 159.9) and 4 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

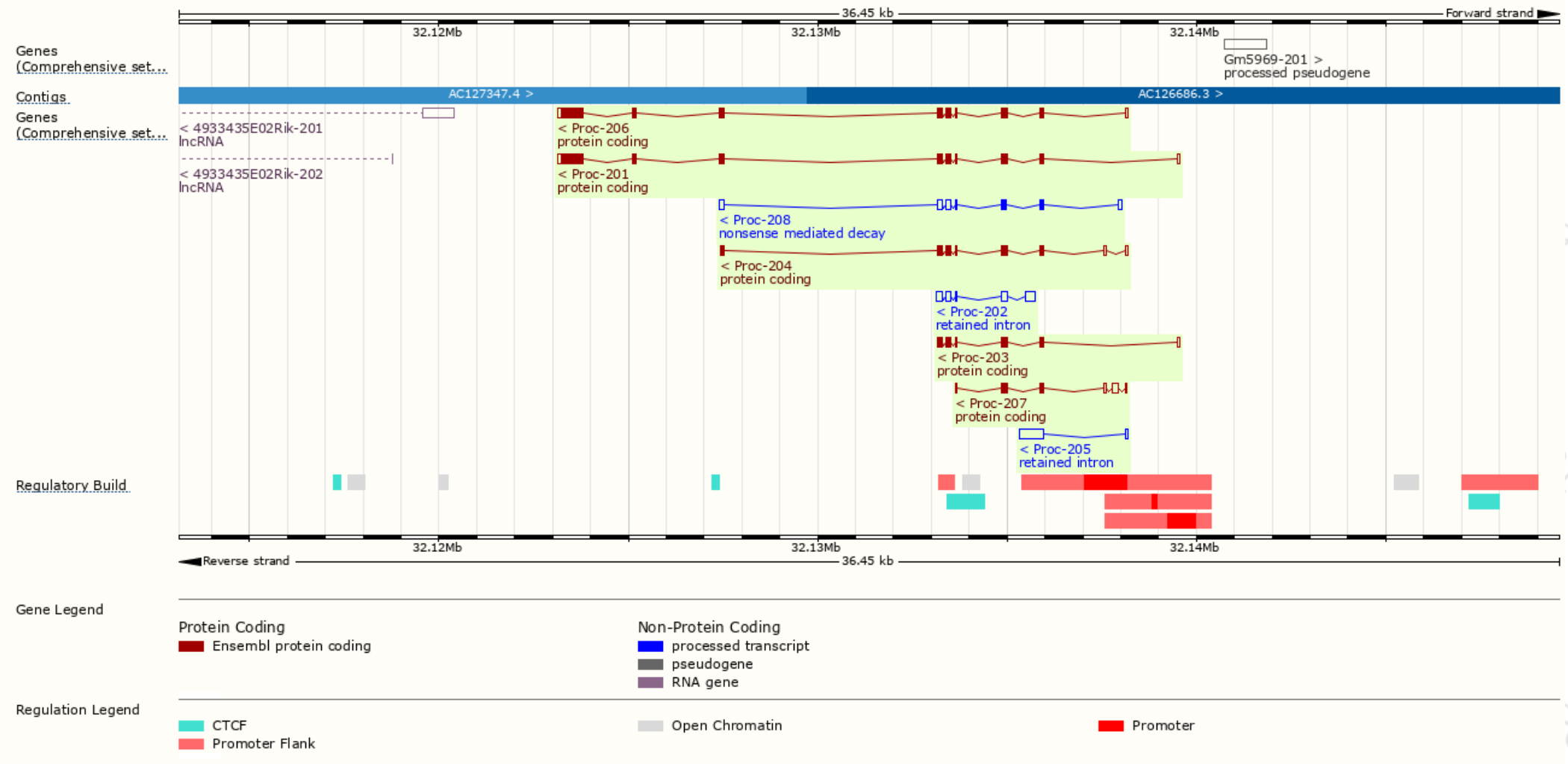
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Proc-206	ENSMUST00000234651.1	1575	460aa	Protein coding	CCDS29116	-	GENCODE basic APPRIS P1
Proc-201	ENSMUST00000171765.1	1566	460aa	Protein coding	CCDS29116	P33587	TSL:5 GENCODE basic APPRIS P1
Proc-204	ENSMUST00000234386.1	781	214aa	Protein coding	-	-	CDS 3' incomplete
Proc-203	ENSMUST00000234375.1	614	177aa	Protein coding	-	-	CDS 3' incomplete
Proc-207	ENSMUST00000234657.1	558	86aa	Protein coding	-	-	CDS 3' incomplete
Proc-208	ENSMUST00000234746.1	719	51aa	Nonsense mediated decay	-	-	-
Proc-202	ENSMUST00000234198.1	733	No protein	Retained intron	-	-	-
Proc-205	ENSMUST00000234649.1	659	No protein	Retained intron	-	-	-

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



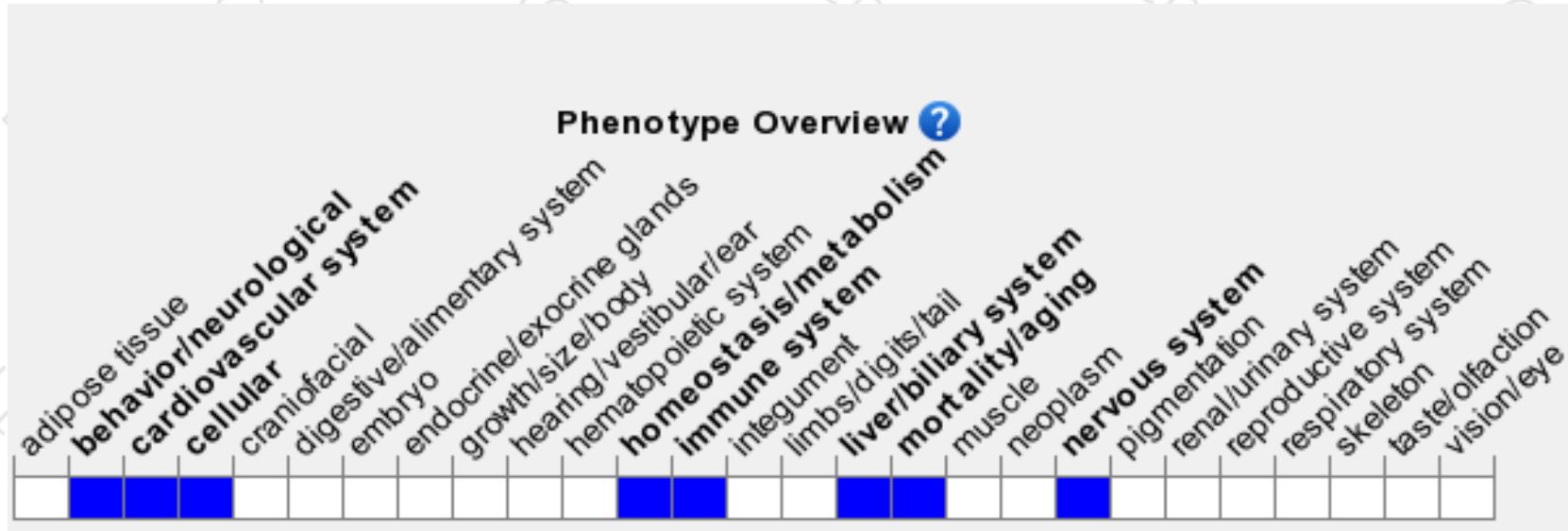
Genomic location distribution



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/>).

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

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