

# *Procr* Cas9-KO Strategy

**Designer: Shilei Zhu**

**Reviewer: Linyan Wu**

**Design Date: 2020-9-9**

# Project Overview



**Project Name**

***Procr***

**Project type**

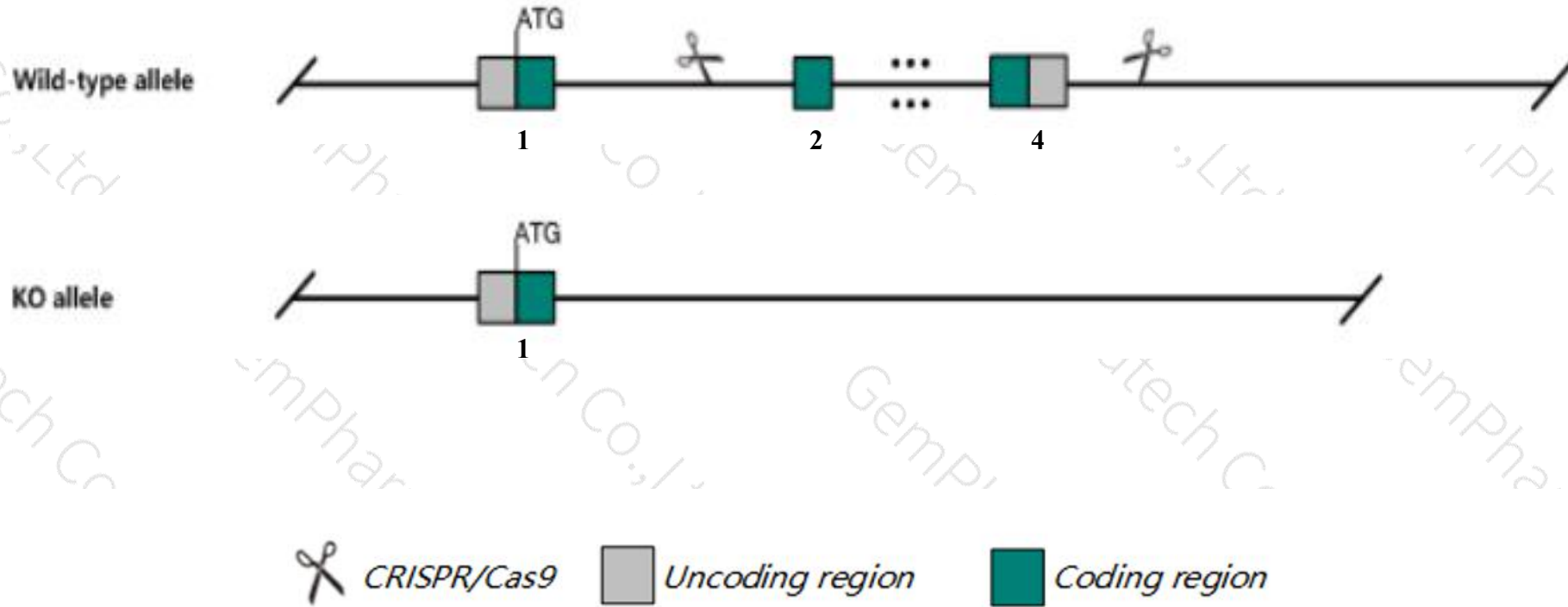
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

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



- The *Procr* gene has 4 transcripts. According to the structure of *Procr* gene, exon2-exon4 of *Procr-201*(ENSMUST00000029140.11) transcript is recommended as the knockout region. The region contains 662bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Procr* gene. The brief process is as follows: CRISPR/Cas9 system 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, nullizygous embryos die by E10.5 showing placental thrombosis, small size, and incomplete turning. Mice with a severe deficiency survive and reproduce normally. Homozygotes for the R84A variant show increased thrombin formation after thrombotic and LPS challenge, splenomegaly, and bone marrow failure.
- The *Procr* gene is located on the Chr2. 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)

## Procr protein C receptor, endothelial [Mus musculus (house mouse)]

Gene ID: 19124, updated on 13-Mar-2020

### Summary



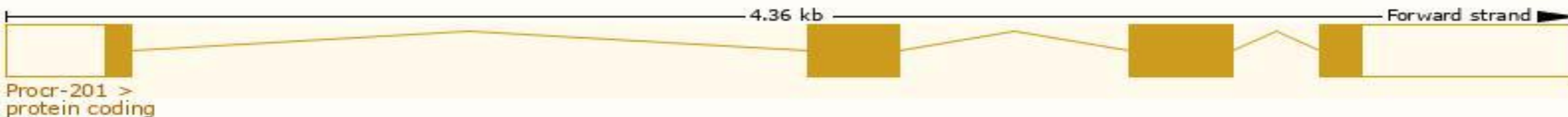
<b>Official Symbol</b>	Procr provided by <a href="#">MGI</a>
<b>Official Full Name</b>	protein C receptor, endothelial provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:104596</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000027611</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	AI325044, Ccca, Ccd41, Epcr
<b>Expression</b>	Biased expression in placenta adult (RPKM 44.4), bladder adult (RPKM 5.1) and 8 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

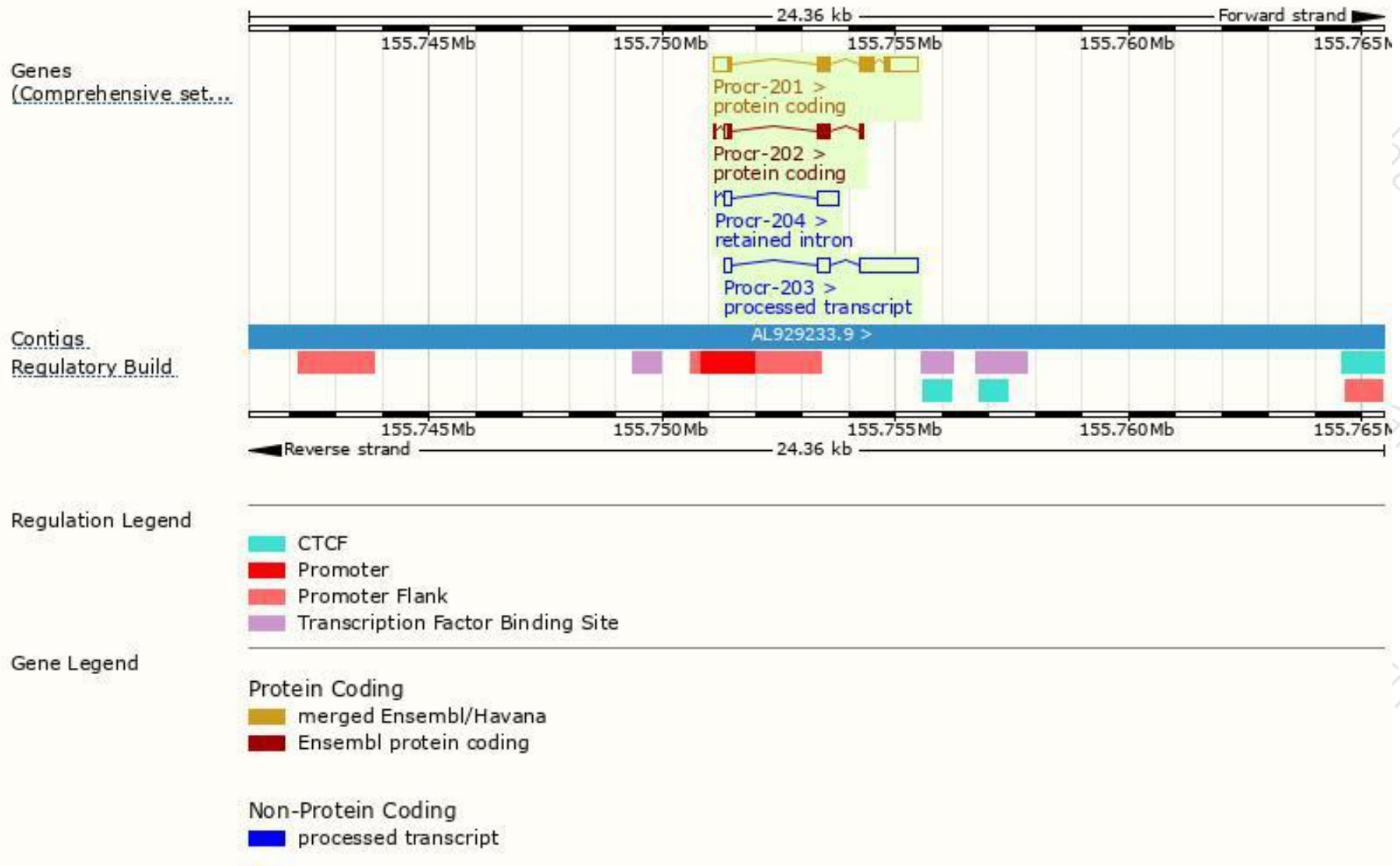
The gene has 4 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
<b>Procr-201</b>	<a href="#">ENSMUST00000029140.11</a>	1597	<a href="#">242aa</a>	Protein coding	<a href="#">CCDS16954</a>	<a href="#">Q64695</a>	TSL:1 GENCODE basic APPRIS P1
<b>Procr-202</b>	<a href="#">ENSMUST00000132608.1</a>	504	<a href="#">138aa</a>	Protein coding	-	<a href="#">A2AUV5</a>	CDS 3' incomplete TSL:3
<b>Procr-203</b>	<a href="#">ENSMUST00000143493.1</a>	1608	No protein	Processed transcript	-	-	TSL:2
<b>Procr-204</b>	<a href="#">ENSMUST00000155095.1</a>	578	No protein	Retained intron	-	-	TSL:3

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



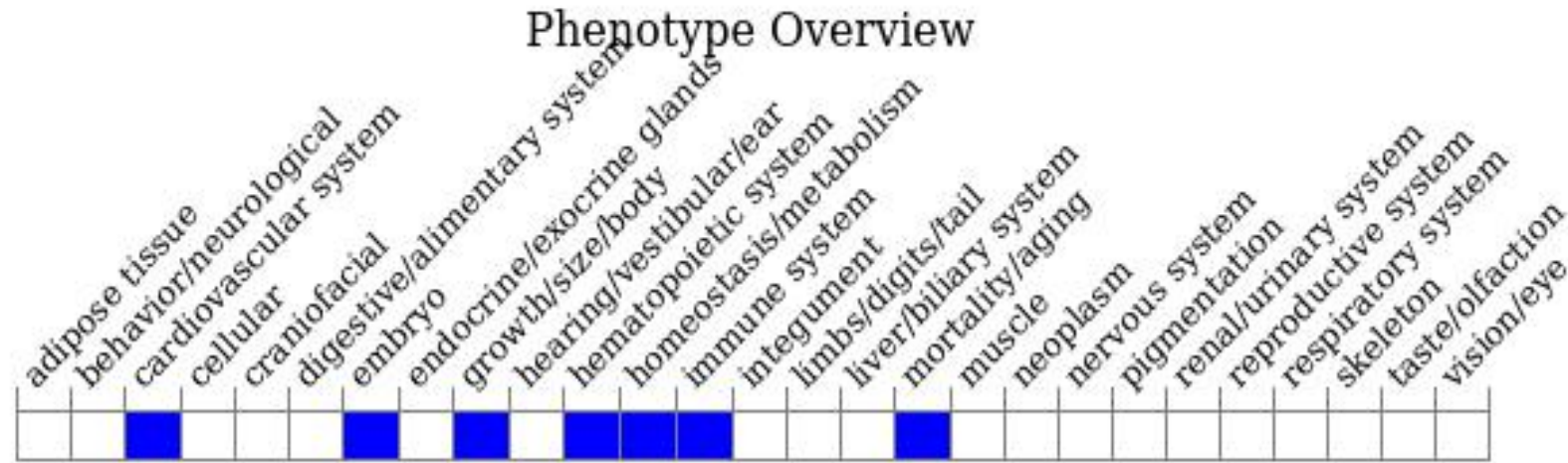
# Genomic location distribution



# 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, nullizygous embryos die by E10.5 showing placental thrombosis, small size, and incomplete turning. Mice with a severe deficiency survive and reproduce normally. Homozygotes for the R84A variant show increased thrombin formation after thrombotic and LPS challenge, splenomegaly, and bone marrow failure.

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

Tel: 400-9660890

