Rhoc Cas9-KO Strategy

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Project Overview

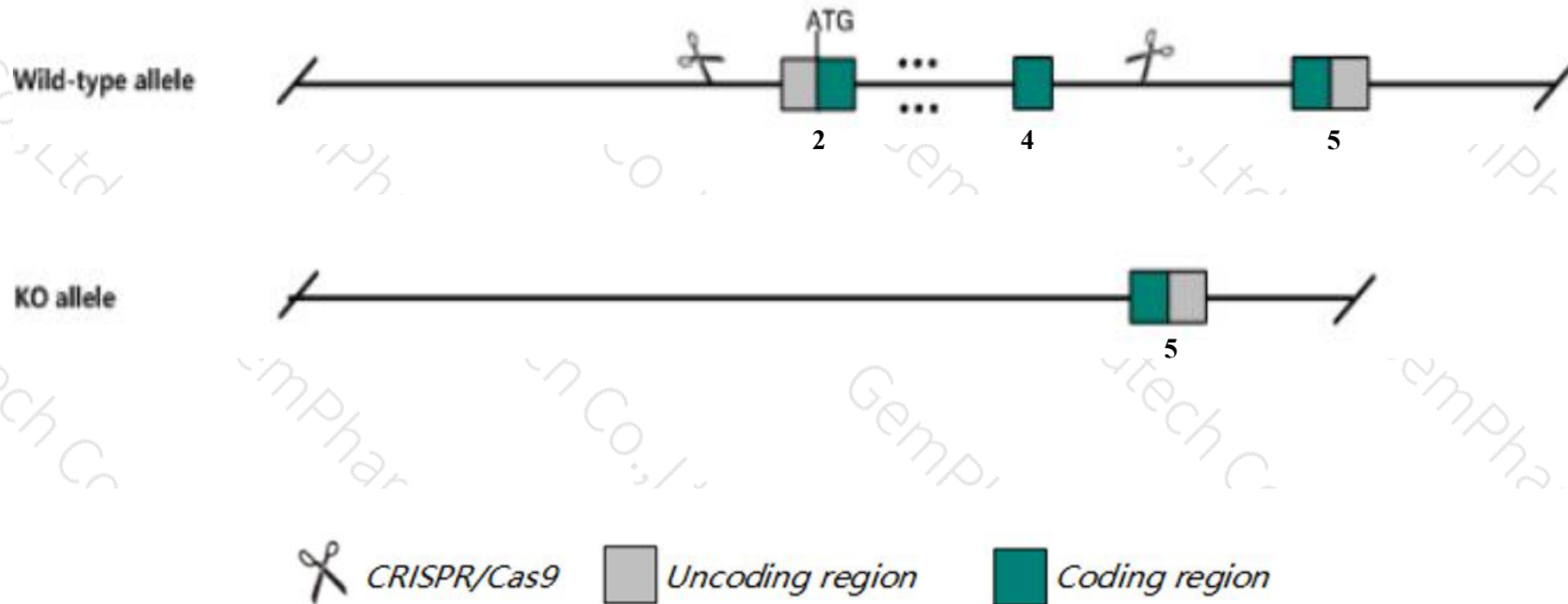|	
Project Name	*Rhoc*
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

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

Technical routes

➢ The *Rhoc* gene has 6 transcripts. According to the structure of *Rhoc* gene, exon2-exon4 of *Rhoc-201*(ENSMUST00000002303.11) transcript is recommended as the knockout region.The region contains start codon ATG.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rhoc* 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.

Notice

➢ According to the existing MGI data,homozygous null mutation in this gene results in no abnormal phenotype, except for reduced stress fiber formation in serum starved fibroblasts. However, in combination with Tg(MMTV-PyVT)634Mul mice, metastatic potential of tumors and tumor cell motility are decreased.

➢ The *Rhoc* gene is located on the Chr3. 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）

Rhoc ras homolog family member C [Mus musculus (house mouse)]

Gene ID: 11853, updated on 13-Mar-2020

▲ Summary

|	
Official Symbol	Rhoc provided by MGI
Official Full Name	ras homolog family member C provided by MGI
Primary source	MGI:MGI:106028
See related	Ensembl:ENSMUSG00000002233
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	AI324259, Arh9, Arhc
Expression	Ubiquitous expression in duodenum adult (RPKM 107.6), colon adult (RPKM 105.0) and 26 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

The gene has 6 transcripts,all transcripts are shown below:

| Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rhoc-201	ENSMUST00000002303.11	1202	193aa	Protein coding	CCDS17704	Q62159	TSL:1 GENCODE basic APPRIS P1
Rhoc-202	ENSMUST00000106787.7	959	193aa	Protein coding	CCDS17704	Q62159	TSL:2 GENCODE basic APPRIS P1
Rhoc-205	ENSMUST00000196817.4	877	193aa	Protein coding	CCDS17704	Q62159	TSL:3 GENCODE basic APPRIS P1
Rhoc-204	ENSMUST00000176347.5	583	149aa	Protein coding	-	H3BL56	TSL:5 GENCODE basic
Rhoc-206	ENSMUST00000199824.1	518	118aa	Protein coding	-	A0A0G2JEP8	CDS 3' incomplete TSL:5
Rhoc-203	ENSMUST00000132721.1	386	No protein	Retained intron	-	-	TSL:2

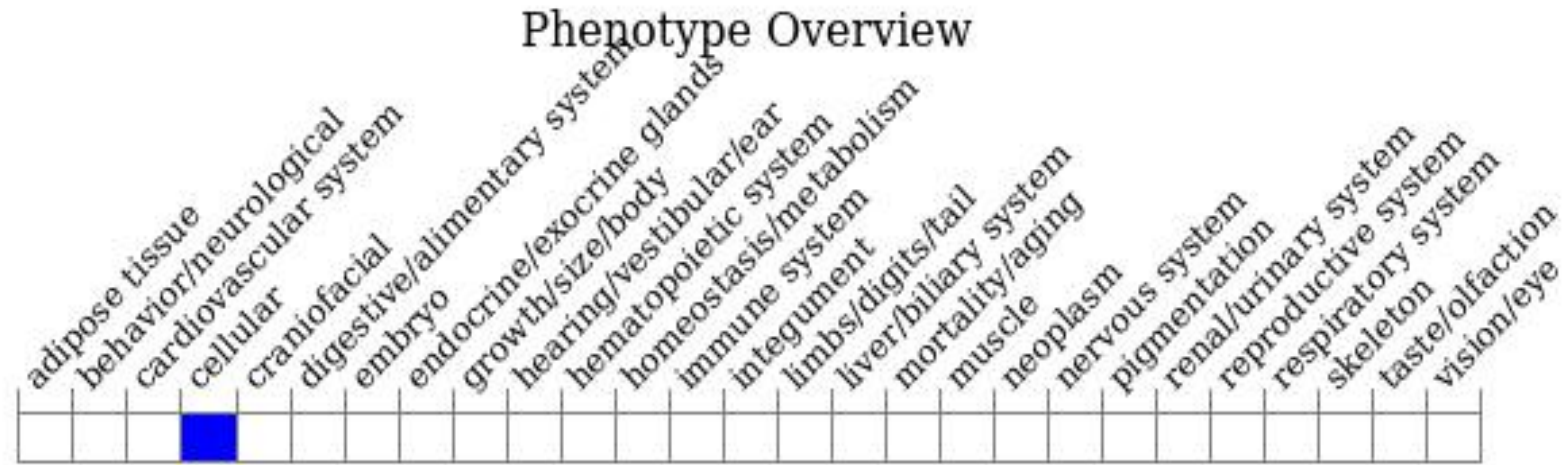The strategy is based on the design of *Rhoc-201* transcript,the transcription is shown below:
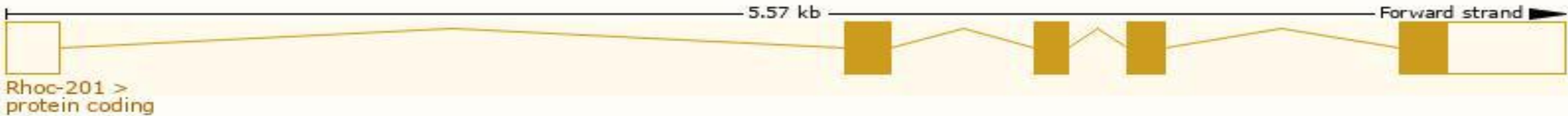
Genomic location distribution
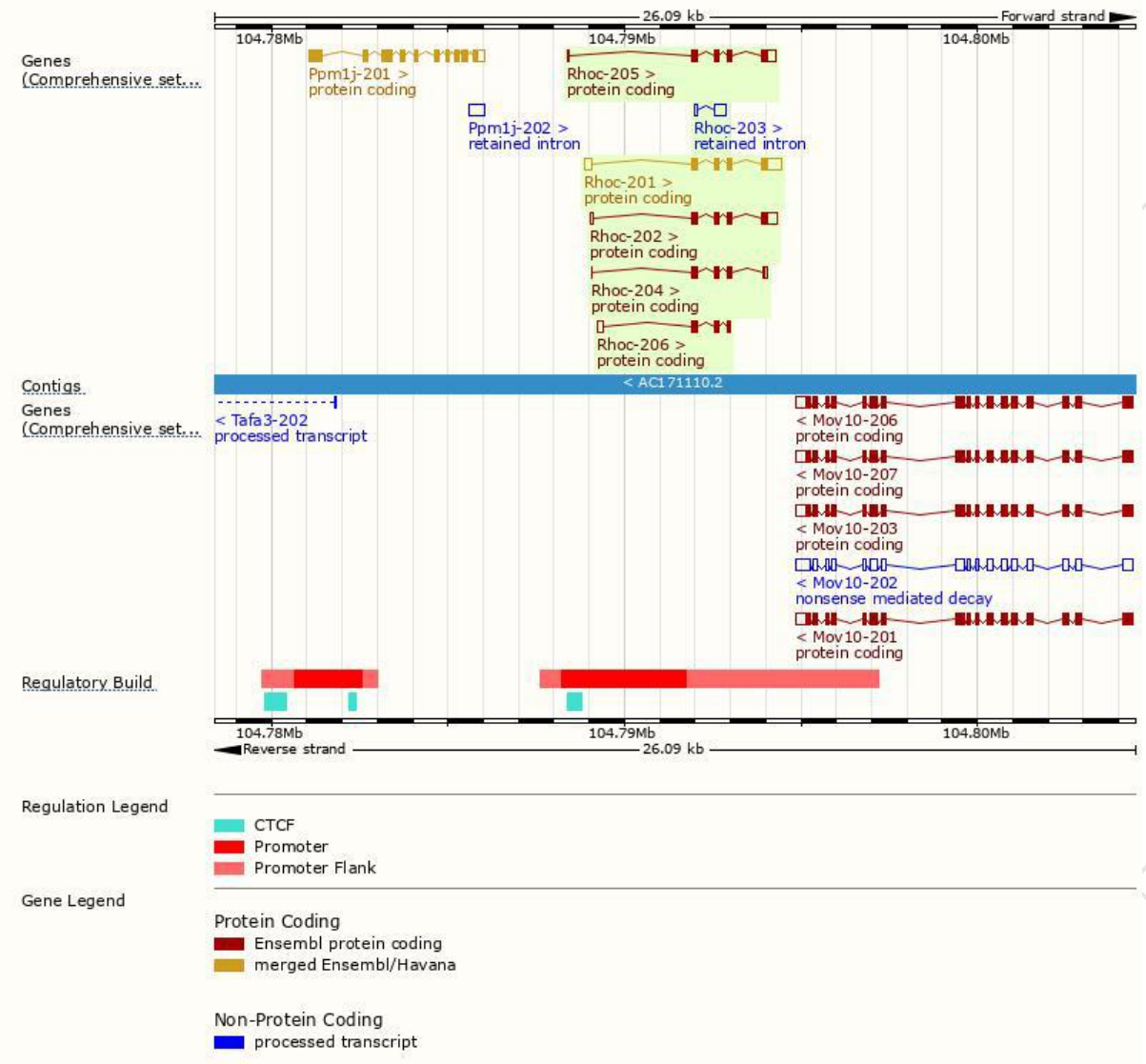
Protein domain
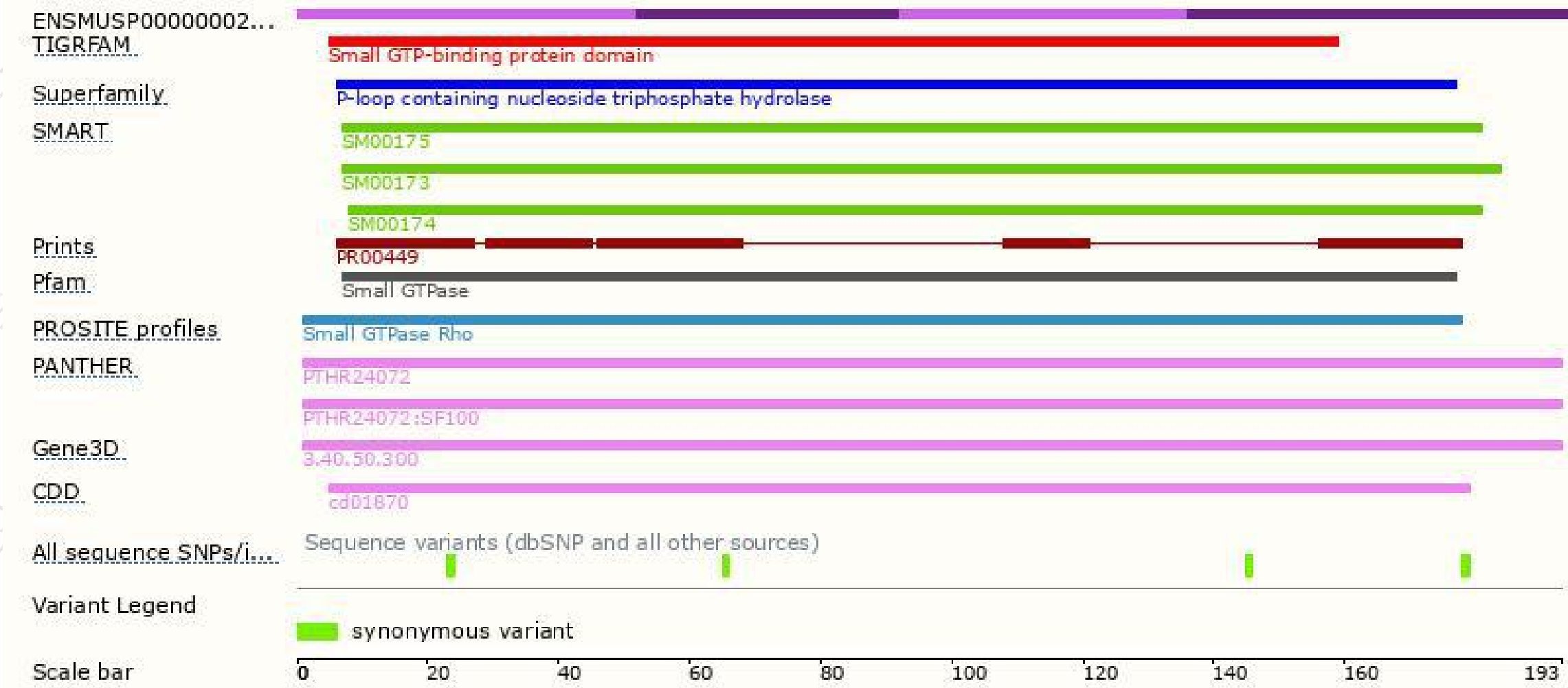
Mouse phenotype description(MGI)

Phenotype Overview

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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