Rapgef2 Cas9-KO Strategy

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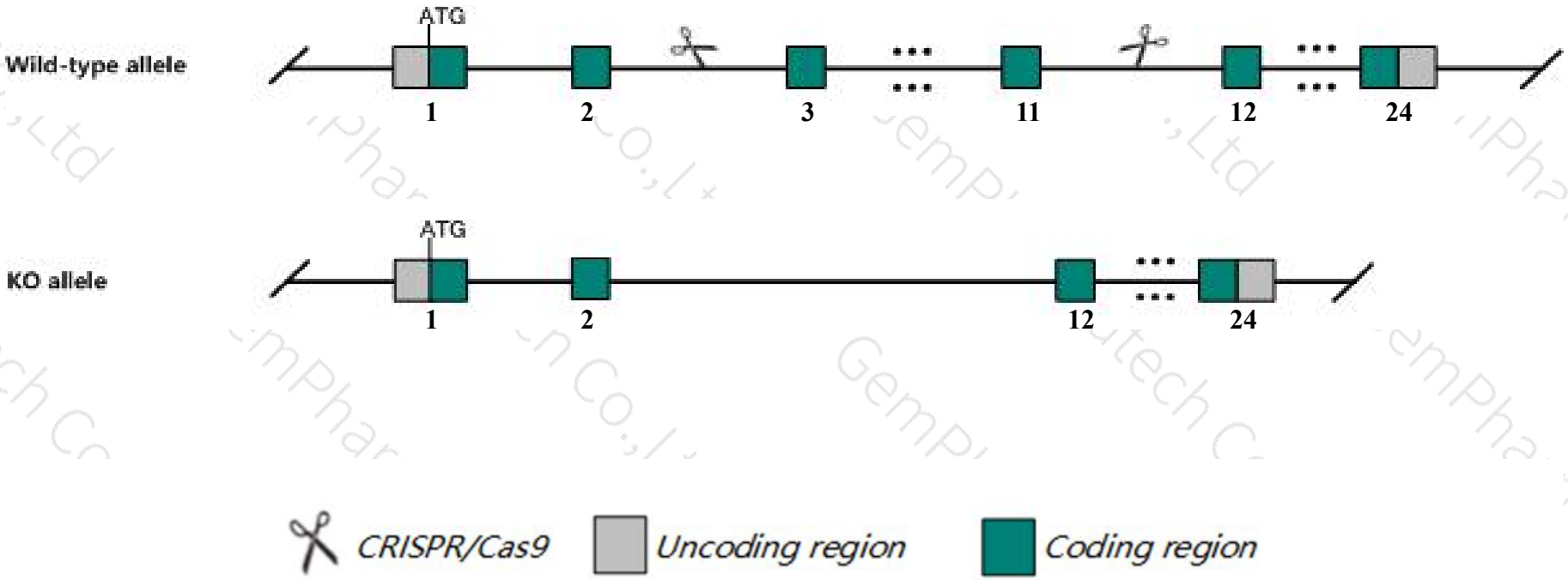
Design Date:	**2019-12-16**

Project Overview

Project Name	***Rapgef2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rapgef2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rapgef2* gene has 6 transcripts. According to the structure of *Rapgef2* gene, exon3-exon11 of *Rapgef2-202* (ENSMUST00000118340.6) transcript is recommended as the knockout region.The region contains 1460bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rapgef2* gene. The brief process is as follows: CRISPR/Cas9 syste

Notice

➢ According to the existing MGI data,Homozygotes for a null allele die at mid-gestation exhibiting growth arrest and defects in vascular development, neural tube closure and embryo turning. Homozygotes for another null allele show yolk sac vascular defects, impaired cell physiology and heart, primitive gut, liver and brain formation.

➢ Transcript *Rapgef2-203* lncRNA may not be affected.

➢ The *Rapgef2* 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）

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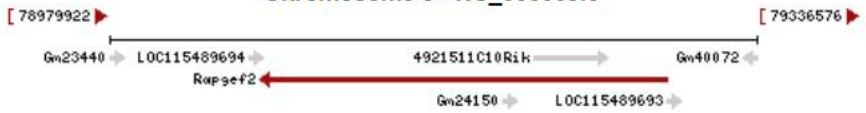
Rapgef2 Rap guanine nucleotide exchange factor (GEF) 2 [*Mus musculus* (house mouse)]

Gene ID: 76089, updated on 24-Oct-2019

Summary

Official Symbol	Rapgef2 provided by MGI
Official Full Name	Rap guanine nucleotide exchange factor (GEF) 2 provided by MGI
Primary source	MGI:MGI:2659071
See related	Ensembl:ENSMUSG00000062232
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	Pdzgef1; nRapGEP; CNRasGEF; RA-GEF-1; mKIAA0313; 5830453M24Rik
Expression	Ubiquitous expression in frontal lobe adult (RPKM 10.4), cortex adult (RPKM 8.4) and 27 other tissues See more
Orthologs	human all

Chromosome 3 - NC_000069.6

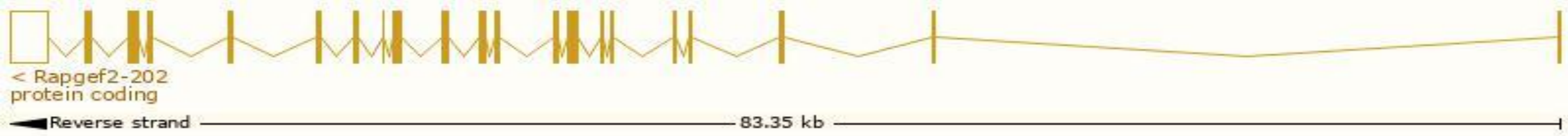


Transcript information（Ensembl）

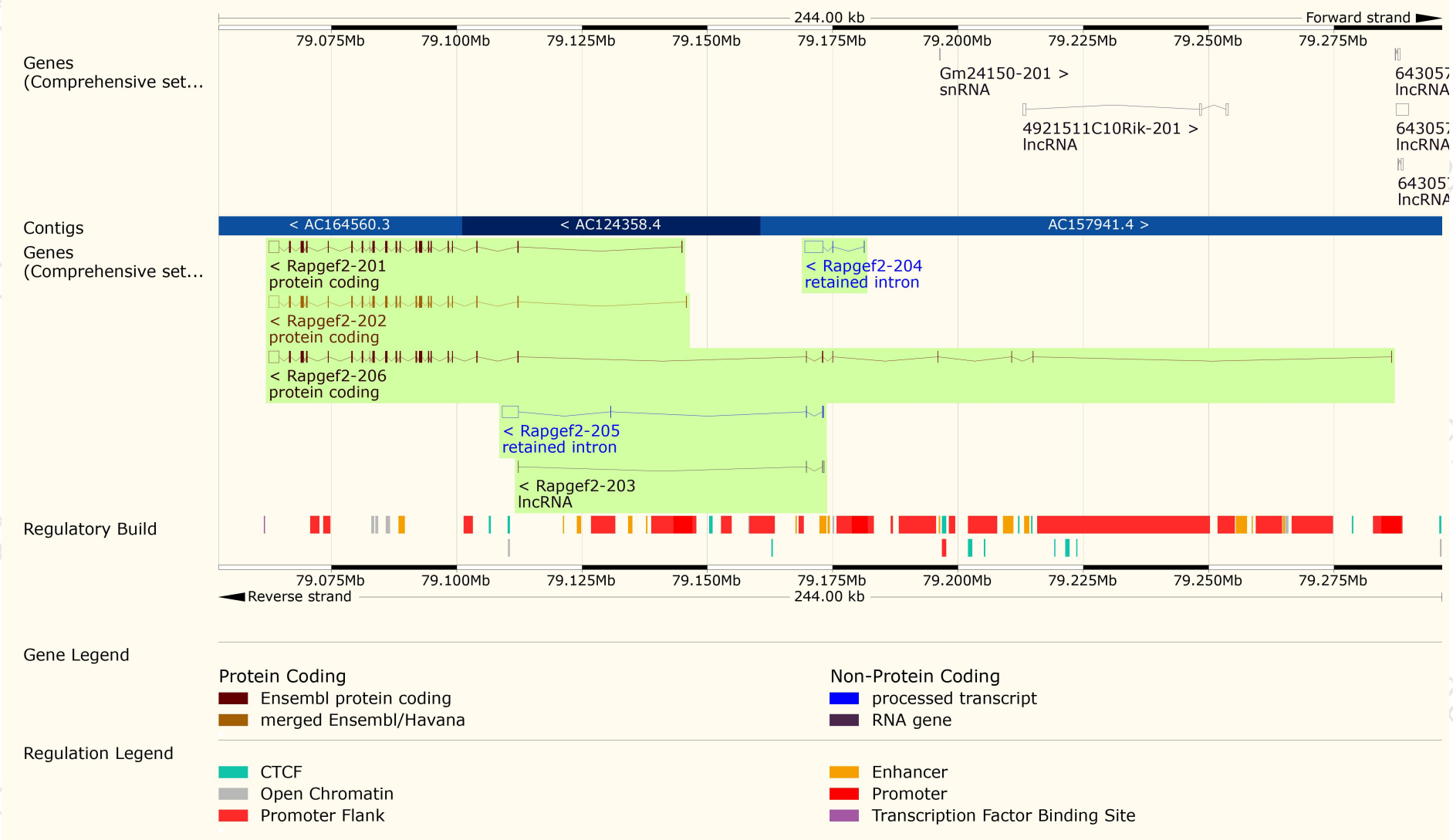
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Translation ID	Biotype	CCDS	UniProt	Flags
Rapgef2-202	ENSMUST00000118340.6	6544	1494aa	ENSMUSP00000113778.1	Protein coding	CCDS50932	E9QNQ4	TSL:1 GENCODE basic
Rapgef2-206	ENSMUST00000195708.1	6964	1644aa	ENSMUSP00000141542.1	Protein coding	-	A0A0A6YWG7	TSL:5 GENCODE basic APPRIS P1
Rapgef2-201	ENSMUST00000118100.7	6573	1496aa	ENSMUSP00000114119.1	Protein coding	-	Q8CHG7	TSL:1 GENCODE basic
Rapgef2-204	ENSMUST00000136126.1	3837	No protein	-	Retained intron	-	-	TSL:1
Rapgef2-205	ENSMUST00000152275.7	3486	No protein	-	Retained intron	-	-	TSL:3
Rapgef2-203	ENSMUST00000124647.1	454	No protein	-	lncRNA	-	-	TSL:2

The strategy is based on the design of *Rapgef2-202* transcript,The transcription is shown below

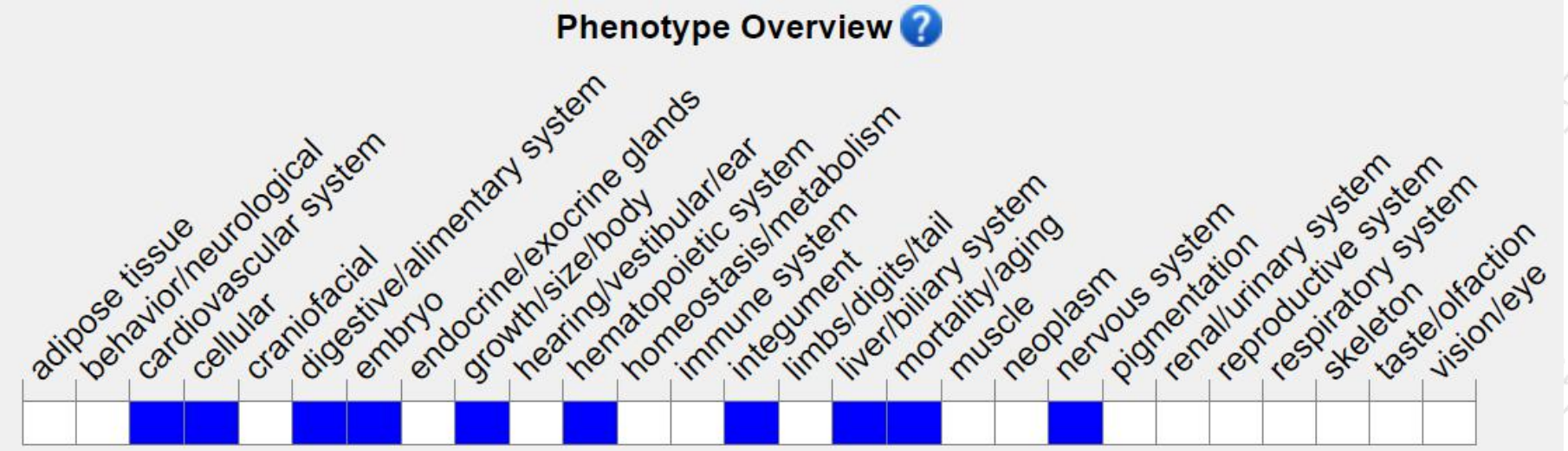


Genomic location distribution



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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