

# ***Rasgrf2 Cas9-KO Strategy***

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Reviewer: Yanhua Shen

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# Project Overview

**Project Name**

*Rasgrf2*

**Project type**

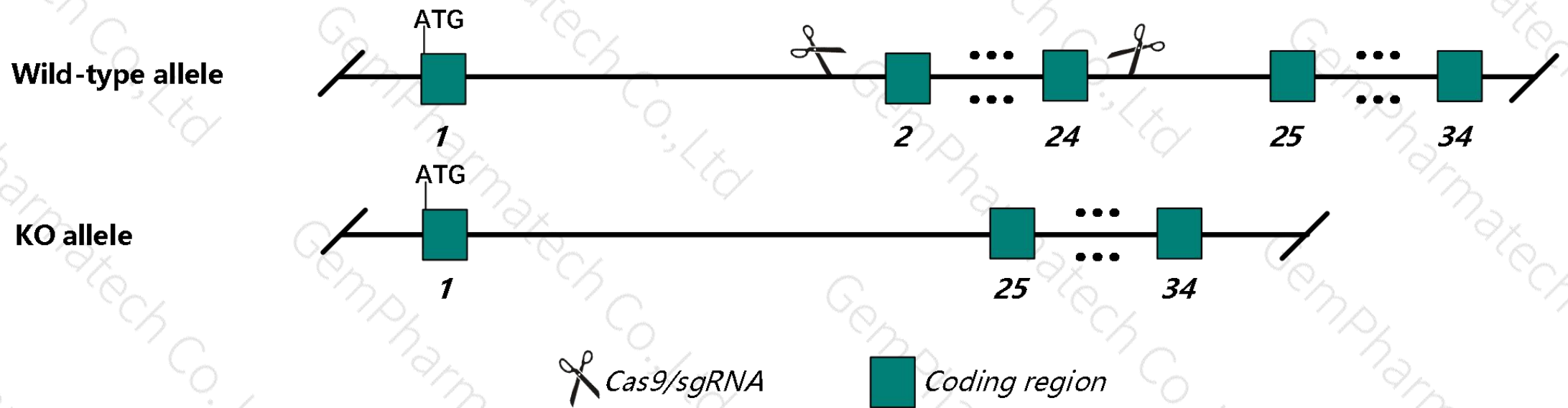
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rasgrf2* gene. The schematic diagram is as follows:



- The *Rasgrf2* gene has 6 transcripts. According to the structure of *Rasgrf2* gene, exon2-exon24 of *Rasgrf2-201* (ENSMUST00000099326.9) transcript is recommended as the knockout region. The region contains 2254bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Rasgrf2* gene. The brief process is as follows: CRISPR/Cas9 system v

- According to the existing MGI data, Mice homozygous for a targeted null mutation exhibit decreased Il2 and TNF-alpha production in stimulated T cells. Mice homozygous for mutations in both *Rasgrf1* and *Rasgrf2* exhibit no additional abnormalities than those observed in the *Rasgrf1* mutant mice.
- The effect on transcript *Rasgrf2*-202&203&204&205 is unknown.
- The *Rasgrf2* gene is located on the Chr13. 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)

**Rasgrf2** RAS protein-specific guanine nucleotide-releasing factor 2 [ *Mus musculus* (house mouse) ]

Gene ID: 19418, updated on 5-Nov-2019

Summary

Official Symbol

Rasgrf2 provided by MGI

Official Full Name

RAS protein-specific guanine nucleotide-releasing factor 2 provided by MGI

Primary source

[MGI:MGI:109137](#)

See related

[Ensembl:ENSMUSG00000021708](#)

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

Grf2; AW048350; Ras-GRF2; 6330417G04Rik

Annotation information

Annotation category: suggests misassembly  
Annotation category: partial on reference assembly

Expression

Biased expression in frontal lobe adult (RPKM 11.9), cortex adult (RPKM 11.9) and 14 other tissues [See more](#)

Orthologs

[human](#) [all](#)

Genomic context

Location: 13 C3; 13 47.43 cM

See Rasgrf2 in [Genome Data Viewer](#)

Exon count: 26

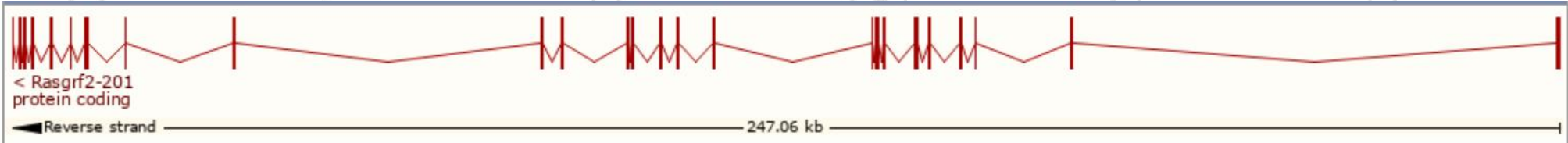
Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	13	NC_000079.6 (91880407..92131828, complement)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	13	NC_000079.5 (92792695..92901449, complement) , (92020012..92127647, complement)

# Transcript information (Ensembl)

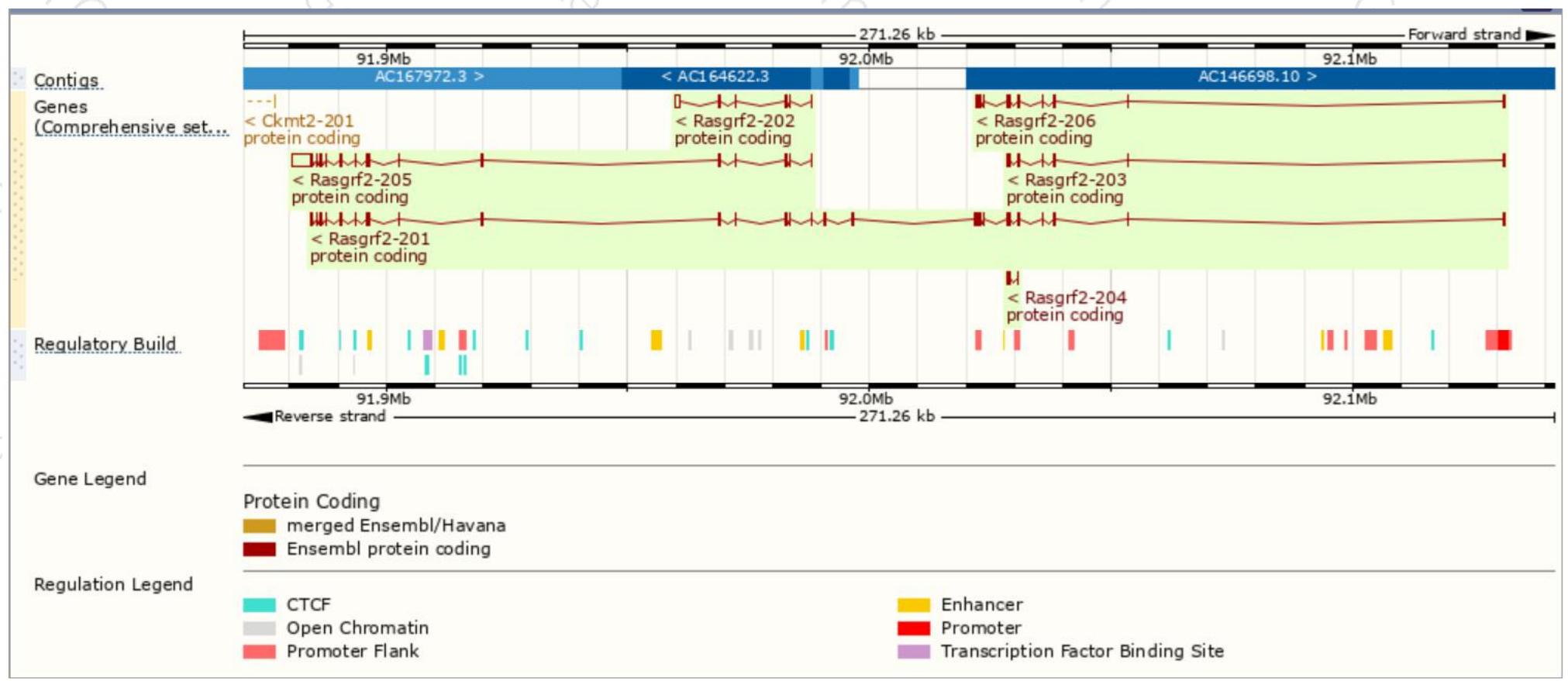
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rasgrf2-205	<a href="#">ENSMUST00000151408.7</a>	5797	<a href="#">588aa</a>	Protein coding	-	<a href="#">F7B9R2</a>	CDS 5' incomplete TSL:1
Rasgrf2-201	<a href="#">ENSMUST00000099326.9</a>	3567	<a href="#">1188aa</a>	Protein coding	-	<a href="#">D3Z6K8</a>	TSL:5 GENCODE basic APPRIS P1
Rasgrf2-206	<a href="#">ENSMUST00000216219.1</a>	2115	<a href="#">505aa</a>	Protein coding	-	<a href="#">A0A1L1SS23</a>	TSL:5 GENCODE basic
Rasgrf2-202	<a href="#">ENSMUST00000142378.1</a>	1789	<a href="#">252aa</a>	Protein coding	-	<a href="#">F6TYF8</a>	CDS 5' incomplete TSL:1
Rasgrf2-203	<a href="#">ENSMUST00000146492.2</a>	1323	<a href="#">387aa</a>	Protein coding	-	<a href="#">D3Z685</a>	CDS 3' incomplete TSL:5
Rasgrf2-204	<a href="#">ENSMUST00000149630.7</a>	502	<a href="#">168aa</a>	Protein coding	-	<a href="#">F6TCD3</a>	CDS 5' and 3' incomplete TSL:5

The strategy is based on the design of *Rasgrf2-201* transcript,The transcription is shown below

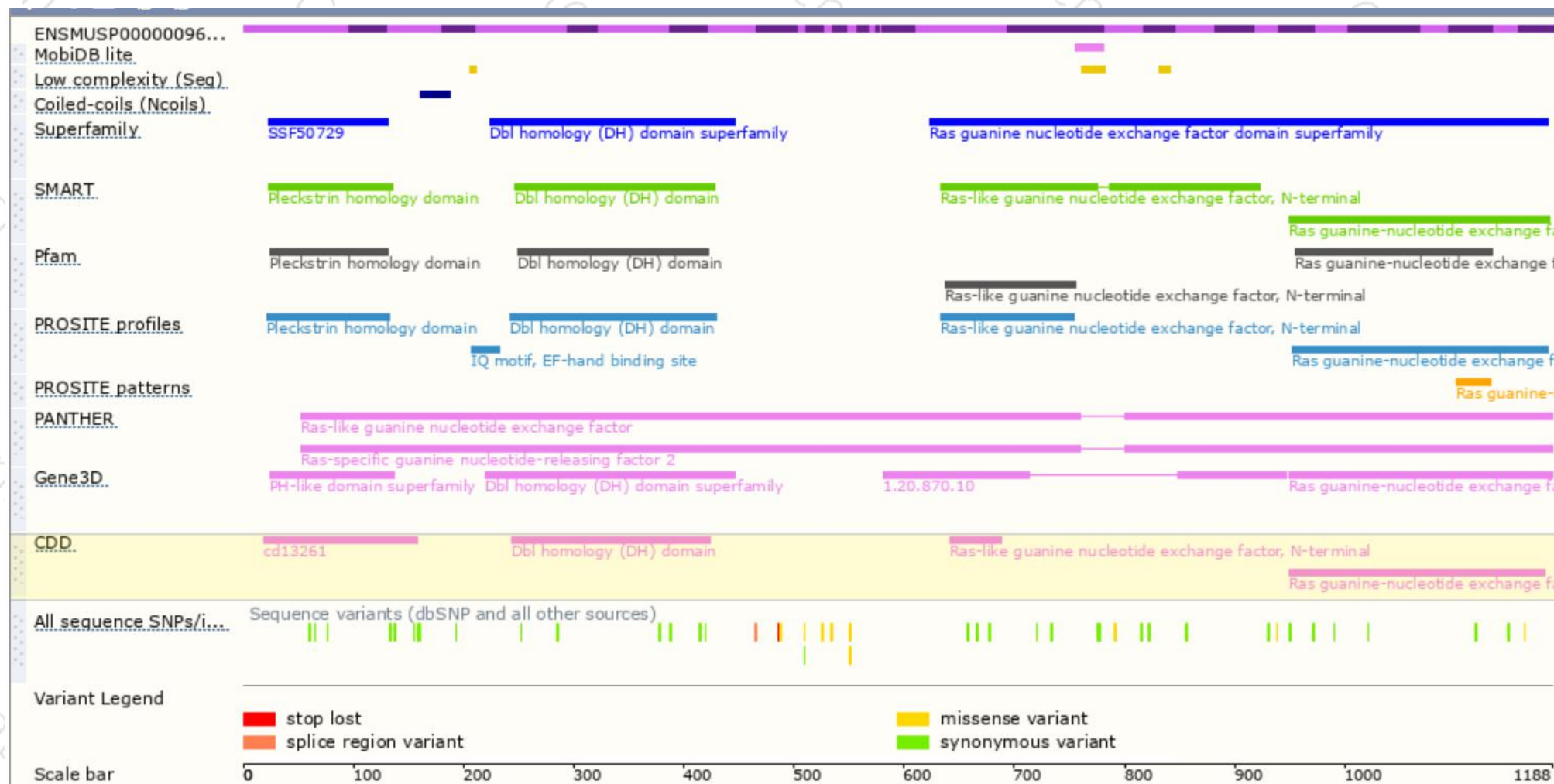


# Genomic location distribution

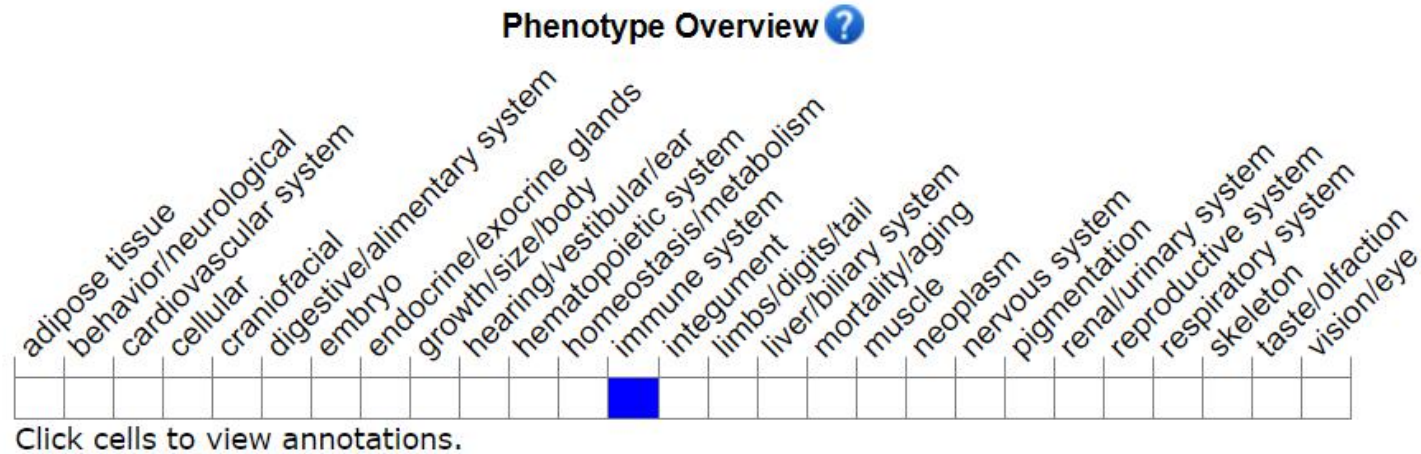




# Protein domain



# 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, Mice homozygous for a targeted null mutation exhibit decreased Il2 and TNF-alpha production in stimulated T cells. Mice homozygous for mutations in both Rasgrf1 and Rasgrf2 exhibit no additional abnormalities than those observed in the Rasgrf1 mutant mice.

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

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