Gnai2 Cas9-KO Strategy

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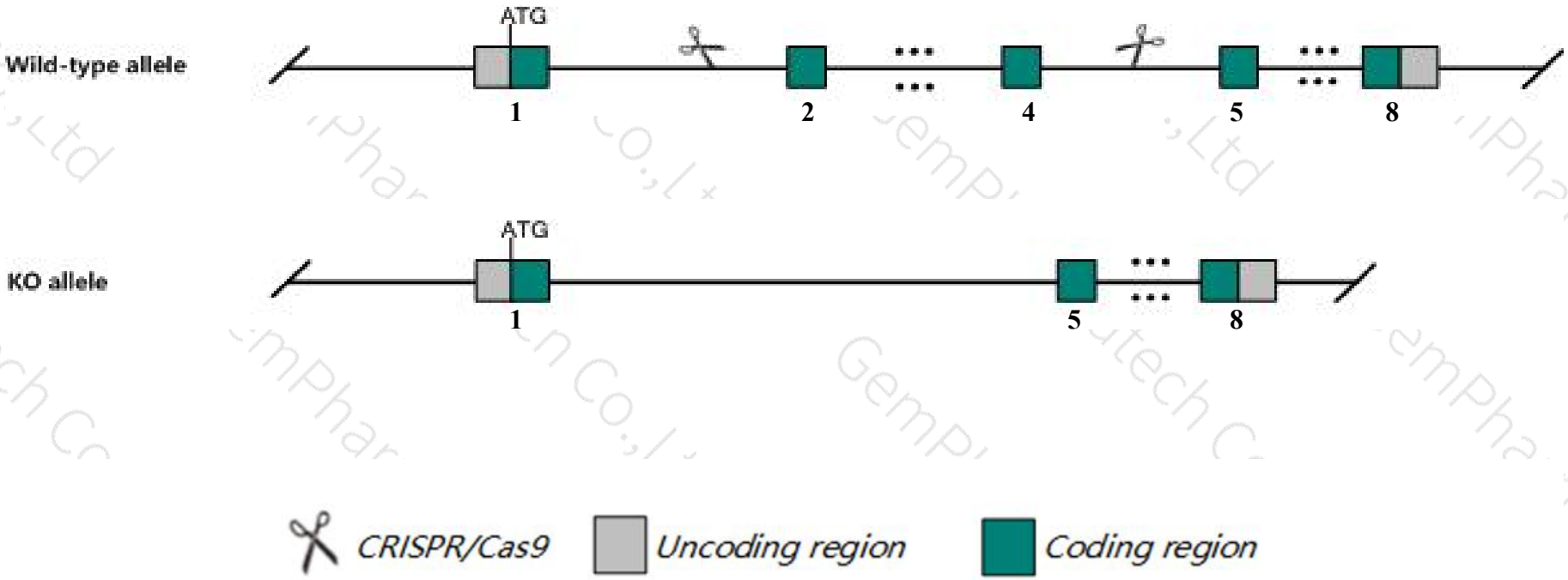
Project Overview

Project Name	***Gnai2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Gnai2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Gnai2* gene has 10 transcripts. According to the structure of *Gnai2* gene, exon2-exon4 of *Gnai2-201* (ENSMUST00000055704.11) transcript is recommended as the knockout region.The region contains 346bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Gnai2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Nullizygous mice exhibit growth retardation, lethal ulcerative colitis, colon adenocarcinomas, granulocytosis, altered thymocyte maturation and function and enhanced production of pro-inflammatory cytokines, and may show alterations in leukocyte physiology and susceptibility to parasitic infection.

- The *Gnai2* gene is located on the Chr9. 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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Gnai2 guanine nucleotide binding protein (G protein), alpha inhibiting 2 [Mus musculus (house mouse)]

Gene ID: 14678, updated on 7-Apr-2019

Summary

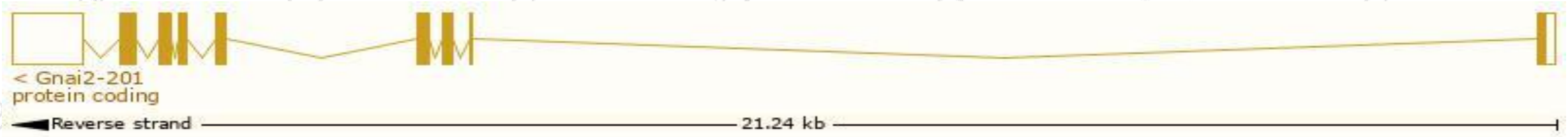
Official Symbol	Gnai2 provided by MGI
Official Full Name	guanine nucleotide binding protein (G protein), alpha inhibiting 2 provided by MGI
Primary source	MGI:MGI:95772
See related	Ensembl:ENSMUSG00000032562
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	C76432, Galphai2, Gia, Gnai-2
Expression	Ubiquitous expression in lung adult (RPKM 259.7), thymus adult (RPKM 238.6) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

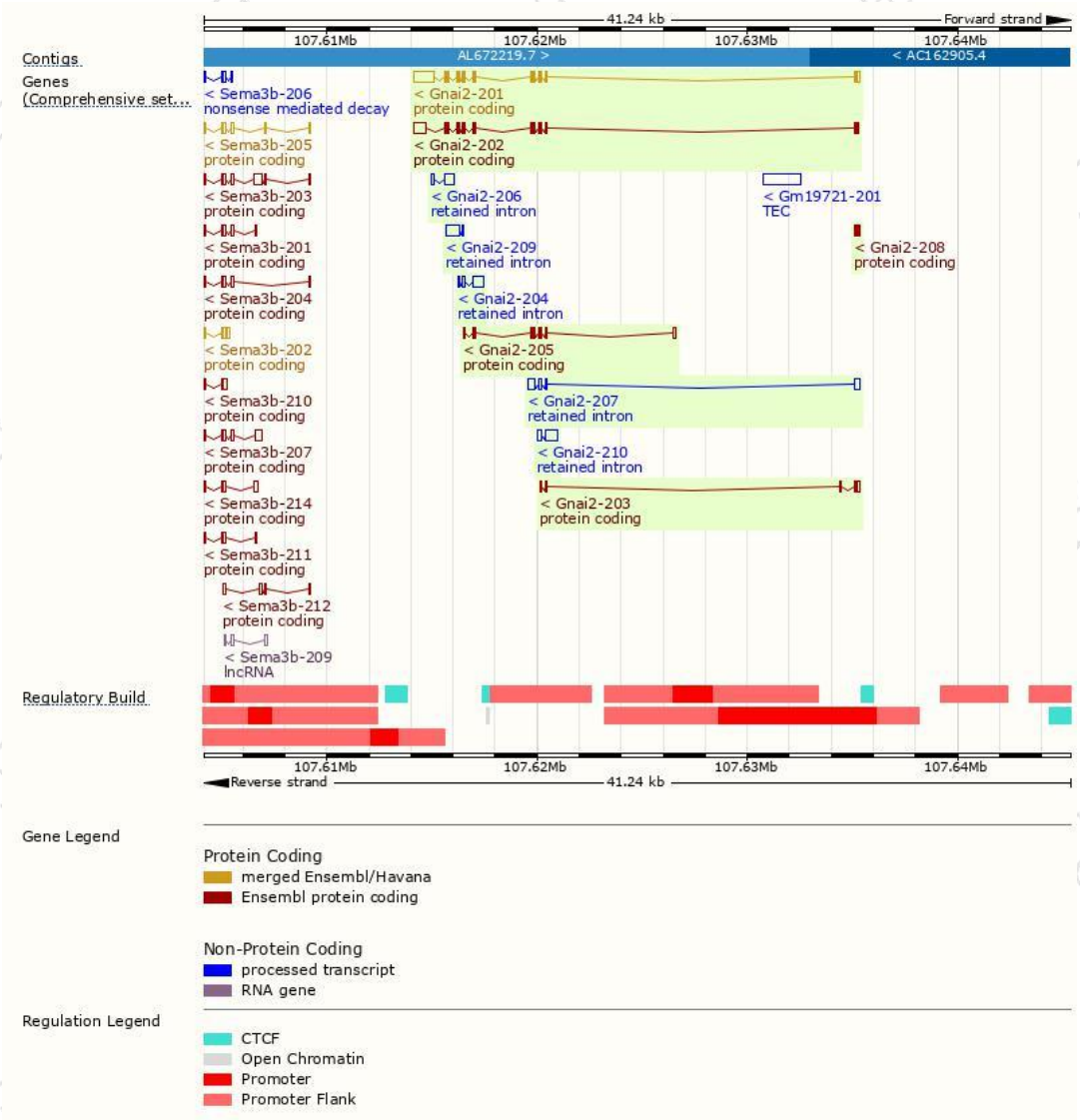
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gnai2-201	ENSMUST00000055704.11	2215	355aa	Protein coding	CCDS23502	P08752	TSL:1 GENCODE basic APPRIS P1
Gnai2-202	ENSMUST00000192615.5	1777	355aa	Protein coding	CCDS23502	P08752	TSL:1 GENCODE basic APPRIS P1
Gnai2-205	ENSMUST00000193394.1	621	160aa	Protein coding	-	A0A0A6YWA9	CDS 3' incomplete TSL:3
Gnai2-203	ENSMUST00000192837.1	421	85aa	Protein coding	-	A0A0A6YXC2	TSL:5 GENCODE basic
Gnai2-208	ENSMUST00000193876.1	197	39aa	Protein coding	-	A0A0A6YXN0	CDS 3' incomplete TSL:5
Gnai2-204	ENSMUST00000193372.1	752	No protein	Retained intron	-	-	TSL:2
Gnai2-209	ENSMUST00000195231.1	752	No protein	Retained intron	-	-	TSL:3
Gnai2-210	ENSMUST00000195762.1	706	No protein	Retained intron	-	-	TSL:3
Gnai2-207	ENSMUST00000193835.1	698	No protein	Retained intron	-	-	TSL:1
Gnai2-206	ENSMUST00000193538.1	595	No protein	Retained intron	-	-	TSL:1

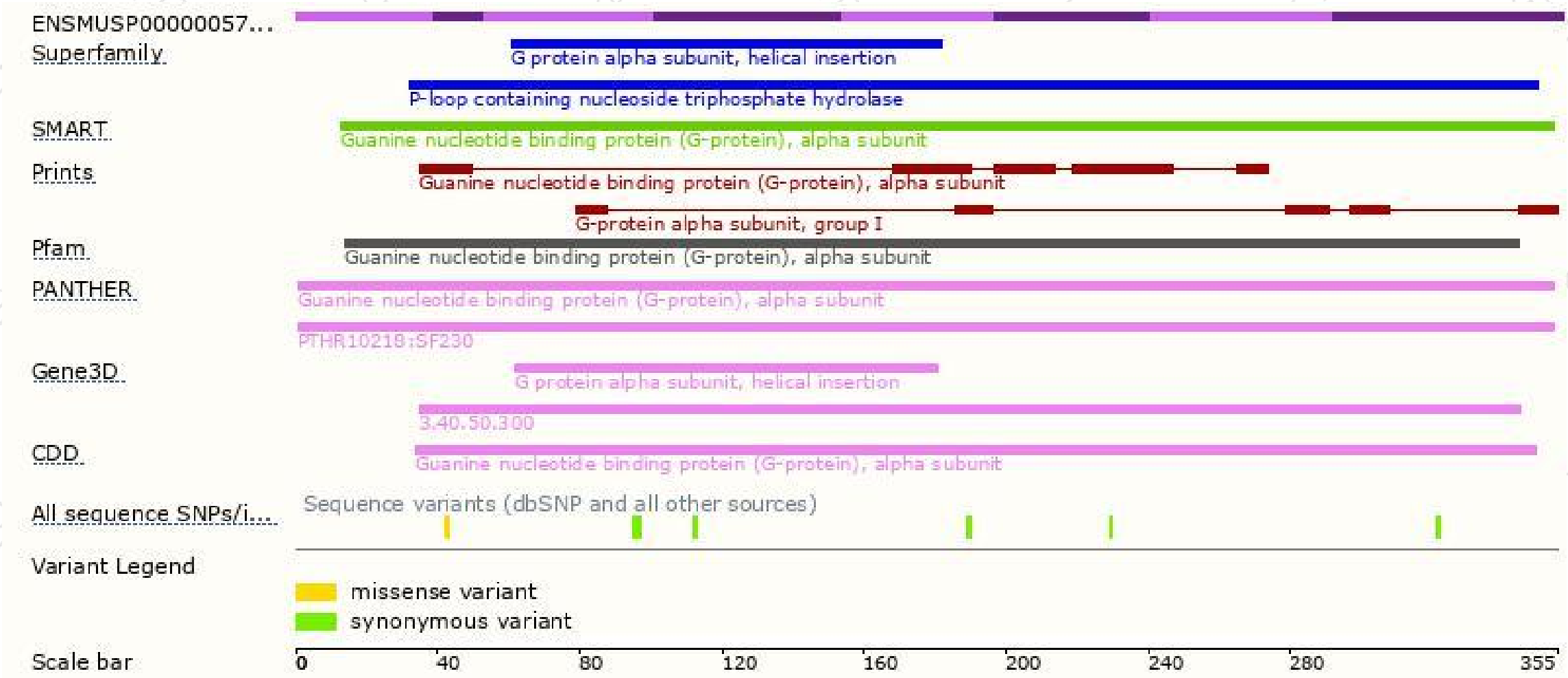
The strategy is based on the design of *Gnai2-201* transcript,The transcription is shown below



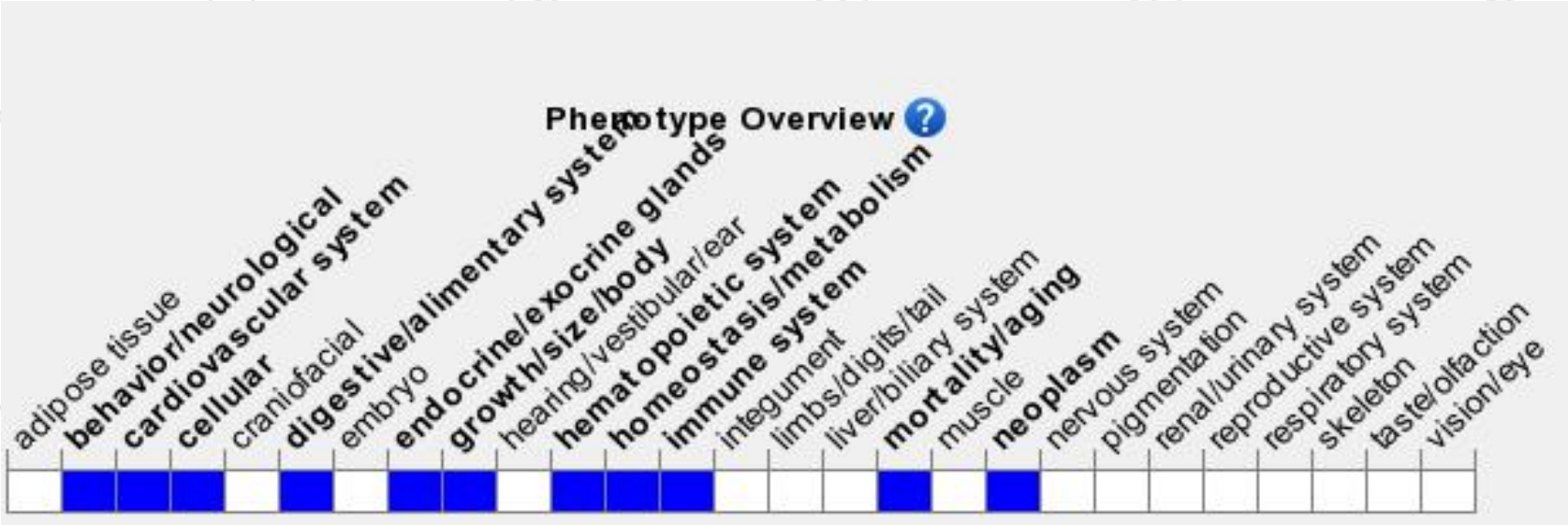
Genomic location distribution



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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