Lgi1 Cas9-CKO Strategy

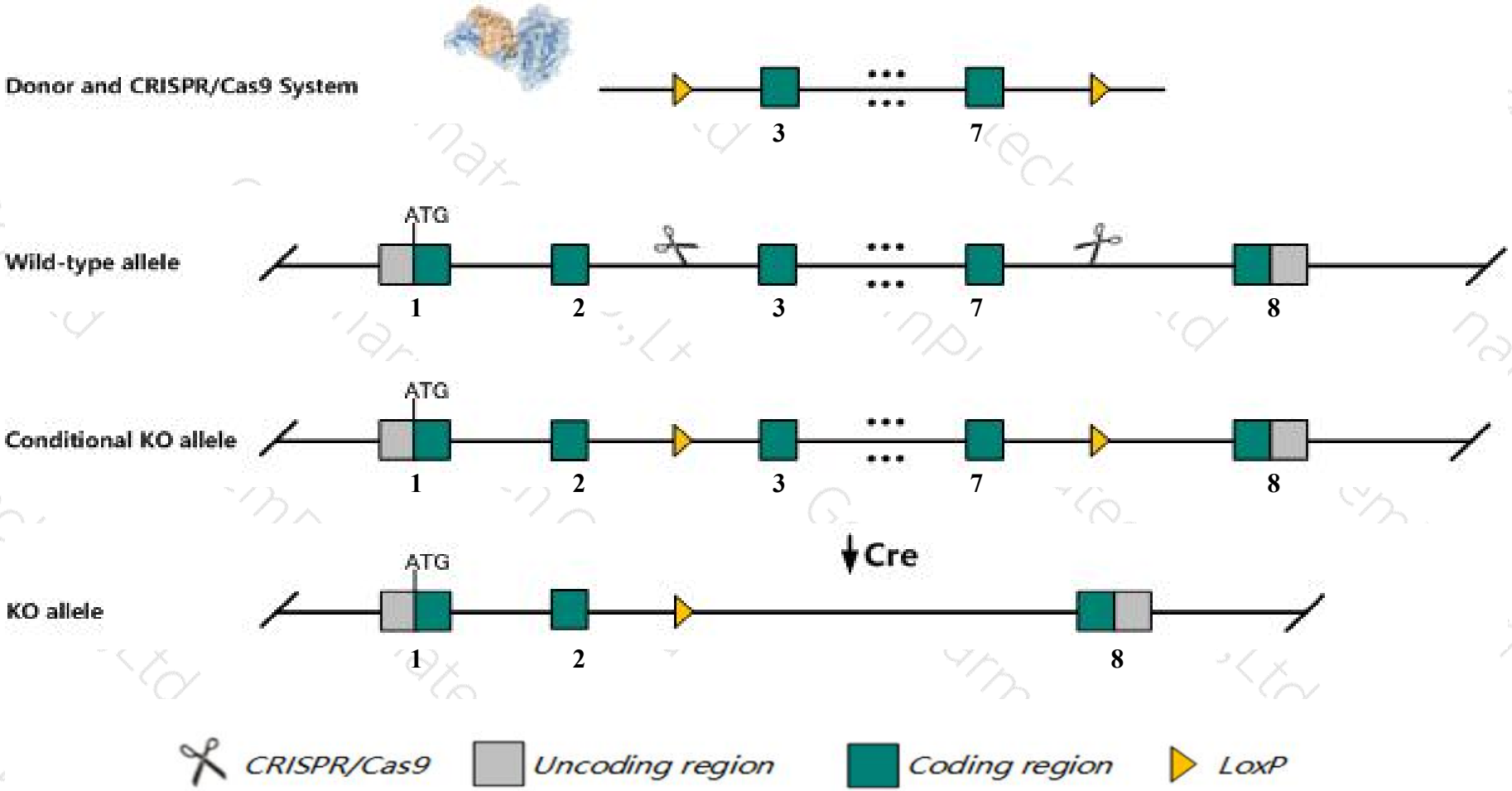
Designer: Daohua Xu
Reviewer: Huimin Su
Design Date: 2019-8-29

Project Overview

Project Name	***Lgi1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Lgi1* gene. The schematic diagram is as follows:



Technical routes

- The *Lgi1* gene has 9 transcripts. According to the structure of *Lgi1* gene, exon3-exon7 of *Lgi1-207* (ENSMUST00000198518.4) transcript is recommended as the knockout region.The region contains 551bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Lgi1* gene. The brief process is as follows:CRISPR/Cas9 system and Donor 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.

- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele exhibit growth retardation, seizures, and death by the third week of life. Mice heterozygous for this allele exhibit increased suseptibility to pentylenetetrazole-induced seizures.
- The KO region contains functional region of the *AC116871.2* gene.Knockout the region may affect the function of *AC116871.2* gene.
- The *Lgi1* gene is located on the Chr19. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

集萃药康 GemPharmatech

Lgi1 leucine-rich repeat LGI family, member 1 [Mus musculus (house mouse)]

Gene ID: 56839, updated on 7-Apr-2019

Summary

Official Symbol	Lgi1 provided by MGI
Official Full Name	leucine-rich repeat LGI family, member 1 provided by MGI
Primary source	MGI:MGI:1861691
See related	Ensembl:ENSMUSG00000067242
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	BB130740
Expression	Biased expression in cortex adult (RPKM 19.4), frontal lobe adult (RPKM 15.9) and 5 other tissues See more
Orthologs	human all

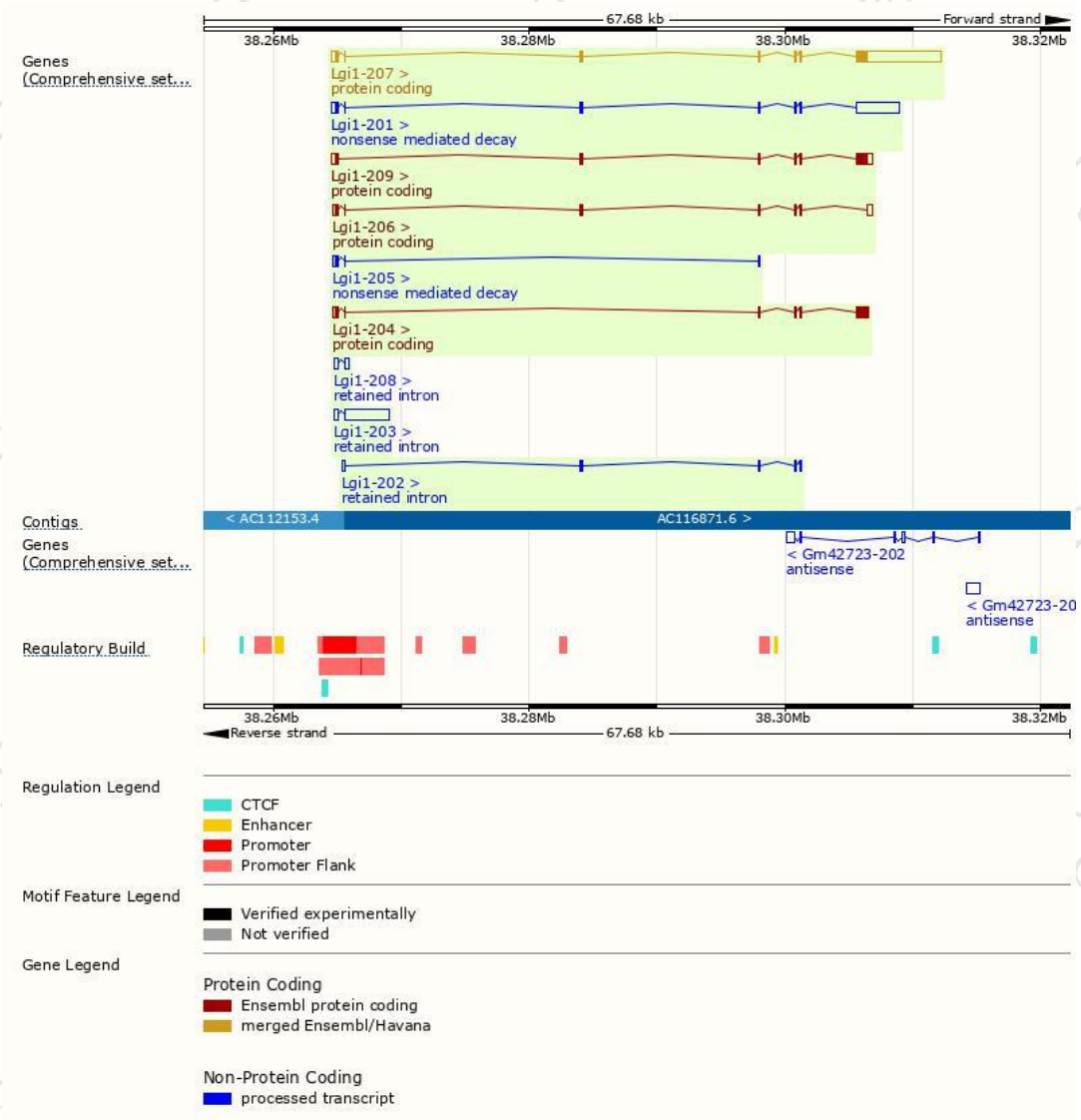
Transcript information（Ensembl）

The gene has 9 transcripts,all transcripts are shown below:

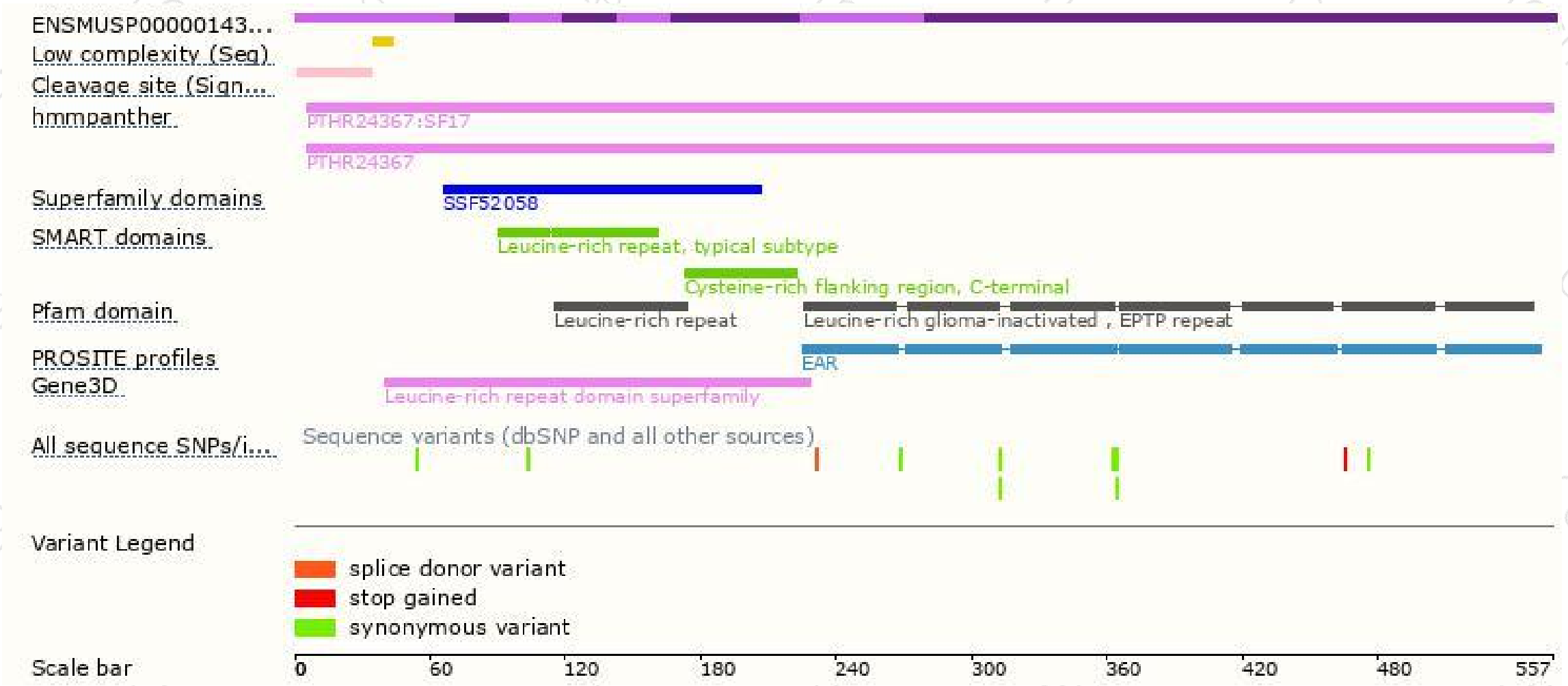
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Lgi1-207	ENSMUST00000198518.4	7780	557aa	Protein coding	CCDS29786	Q9JIA1	TSL:1 GENCODE basic APPRIS P1
Lgi1-209	ENSMUST00000199812.4	2262	533aa	Protein coding	-	A0A0G2JGB7	TSL:5 GENCODE basic
Lgi1-204	ENSMUST00000196090.1	1789	509aa	Protein coding	-	A0A0G2JGE8	TSL:5 GENCODE basic
Lgi1-206	ENSMUST00000198045.4	1483	291aa	Protein coding	-	A0A0G2JFT0	TSL:5 GENCODE basic
Lgi1-201	ENSMUST00000087252.11	4482	72aa	Nonsense mediated decay	-	A0A0G2JEY8	TSL:1
Lgi1-205	ENSMUST00000197123.1	574	72aa	Nonsense mediated decay	-	A0A0G2JEY8	TSL:5
Lgi1-203	ENSMUST00000134832.2	3766	No protein	Retained intron	-	-	TSL:1
Lgi1-202	ENSMUST00000130039.2	723	No protein	Retained intron	-	-	TSL:3
Lgi1-208	ENSMUST00000199665.1	676	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Lgi1-207* transcript,The transcription is shown below

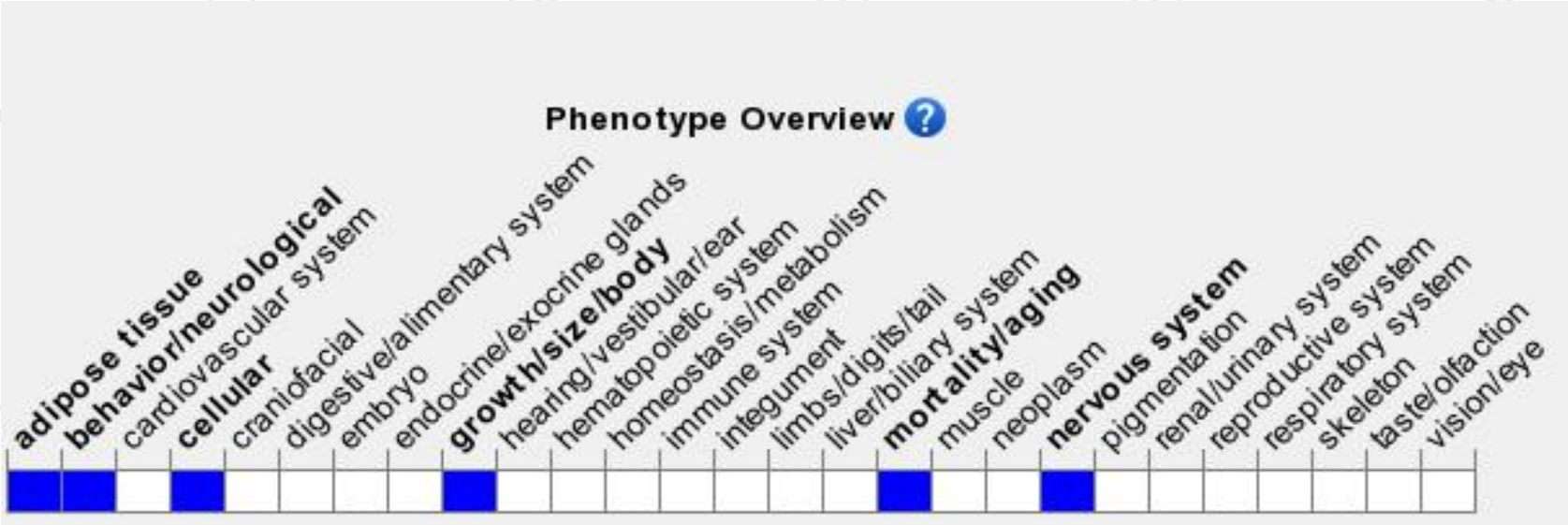
Genomic location distribution



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 knock-out allele exhibit growth retardation, seizures, and death by the third week of life. Mice heterozygous for this allele exhibit increased suseptibility to pentylenetetrazole-induced seizures.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd