Adgrv1 Cas9-KO Strategy

Designer: Lingyan Wu
Reviewer: Jiayuan Yao

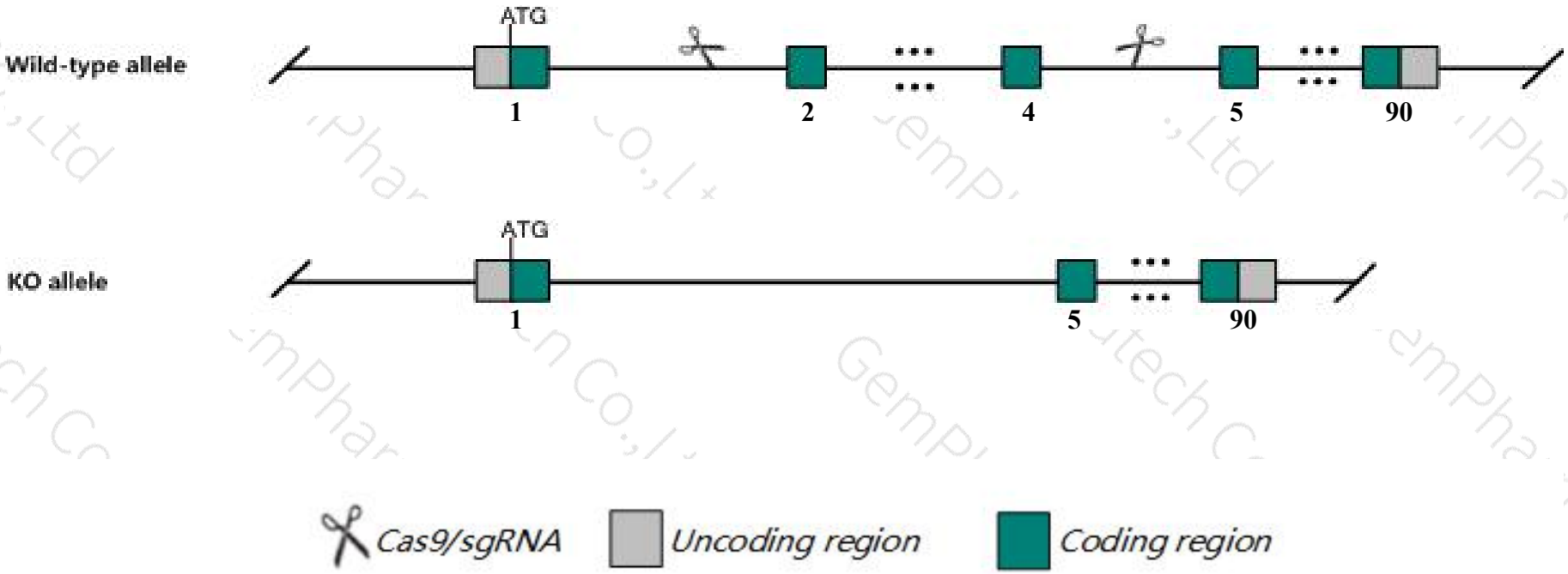
Design Date: 2019-12-6

Project Overview

Project Name	***Adgrv1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adgrv1* gene. The schematic diagram is as follows:



Technical routes

➢ The *Adgrv1* gene has 14 transcripts. According to the structure of *Adgrv1* gene, exon2-exon4 of *Adgrv1-201* (ENSMUST00000095585.10) transcript is recommended as the knockout region.The region contains 428bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Adgrv1* gene. The brief process is as follows: sgRNA was transcribed in vitro.Cas9 and sgRNA 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,Homozygotes for a spontaneous and a targeted mutation exhibit high sensitivity to audiogenic seizures. Targeted mutant mice lack the ankle links that connect growing stereocilia in the developing cochlear hair cells.

➢Transcripts *Adgrv1*-202, 206, 214 are not be affected.

➢ The *Adgrv1* 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）

集萃药康 GemPharmatech

Adgrv1 adhesion G protein-coupled receptor V1 [Mus musculus (house mouse)]

Gene ID: 110789, updated on 31-Jan-2019

Summary

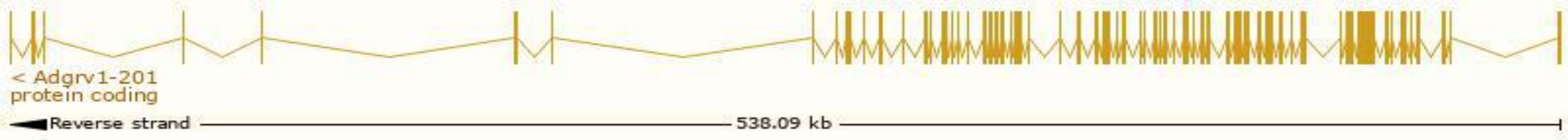
Official Symbol	Adgrv1 provided by MGI
Official Full Name	adhesion G protein-coupled receptor V1 provided by MGI
Primary source	MGI:MGI:1274784
See related	Ensembl:ENSMUSG00000069170
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Frings, Gpr98, Mass1, Mgr1, VLGR1
Expression	Biased expression in CNS E11.5 (RPKM 2.4), whole brain E14.5 (RPKM 1.5) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

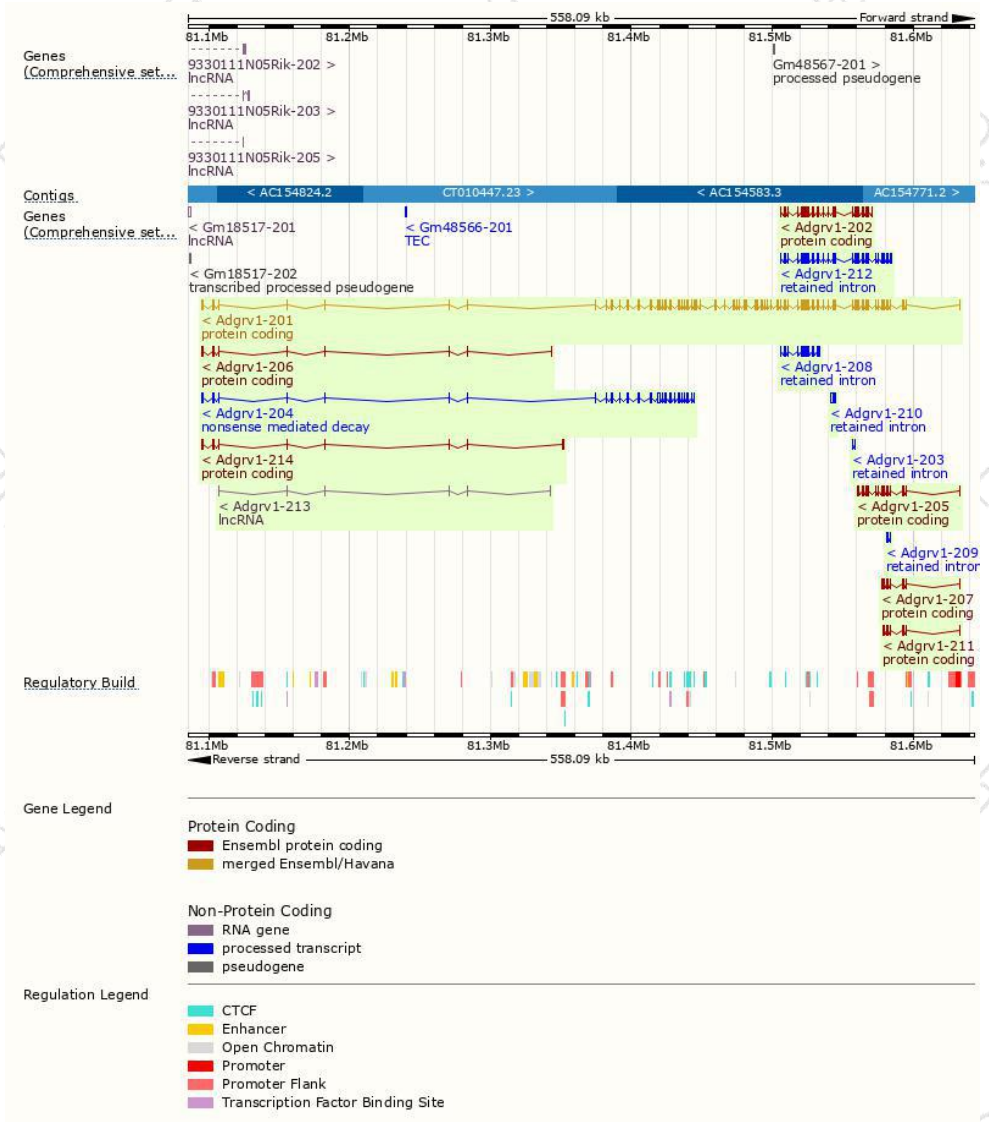
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Adgrv1-201	ENSMUST00000095585.10	19338	6298aa	Protein coding	CCDS36737	B8JJE0	TSL:1 GENCODE basic APPRIS P1
Adgrv1-202	ENSMUST00000109565.8	7094	2238aa	Protein coding	-	G5E8P3	TSL:1 GENCODE basic
Adgrv1-205	ENSMUST00000126444.7	3823	1218aa	Protein coding	-	D3YYF1	TSL:1 GENCODE basic
Adgrv1-207	ENSMUST00000128585.8	2580	616aa	Protein coding	-	Q8VHN7	TSL:1 GENCODE basic
Adgrv1-211	ENSMUST00000146749.1	1592	416aa	Protein coding	-	Q8BPQ5	TSL:1 GENCODE basic
Adgrv1-206	ENSMUST00000128120.1	1591	318aa	Protein coding	-	Q8C1E5	TSL:1 GENCODE basic
Adgrv1-214	ENSMUST00000224088.1	1492	318aa	Protein coding	-	Q8C1E5	GENCODE basic
Adgrv1-204	ENSMUST00000125698.7	6590	533aa	Nonsense mediated decay	-	F6X844	CDS 5' incomplete TSL:1
Adgrv1-212	ENSMUST00000156627.7	9439	No protein	Retained intron	-	-	TSL:1
Adgrv1-208	ENSMUST00000129725.1	4037	No protein	Retained intron	-	-	TSL:1
Adgrv1-210	ENSMUST00000146141.1	2200	No protein	Retained intron	-	-	TSL:1
Adgrv1-203	ENSMUST00000125663.1	720	No protein	Retained intron	-	-	TSL:3
Adgrv1-209	ENSMUST00000132045.1	506	No protein	Retained intron	-	-	TSL:2
Adgrv1-213	ENSMUST00000156631.1	815	No protein	lncRNA	-	-	TSL:3

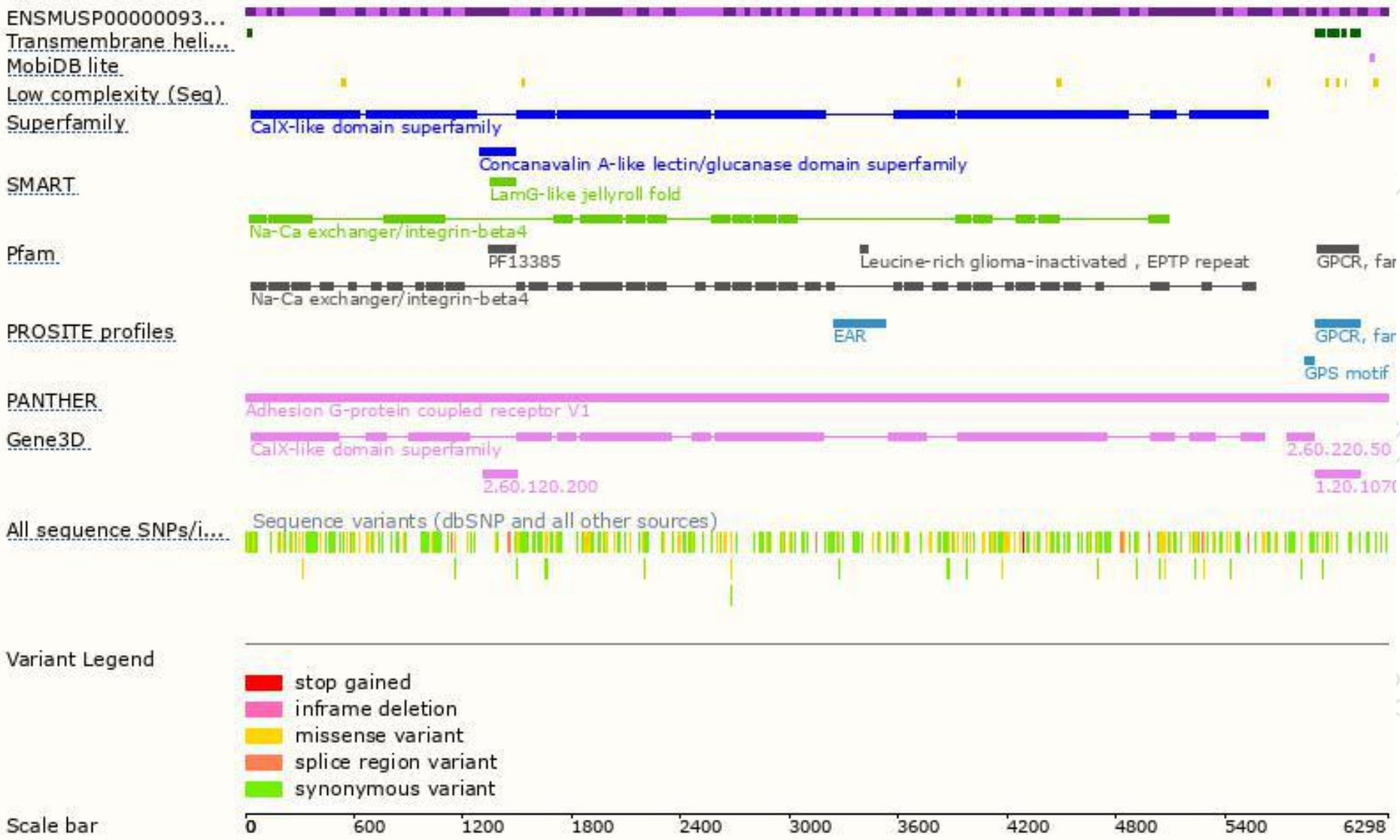
The strategy is based on the design of *Adgrv1-201* transcript,The transcription is shown below



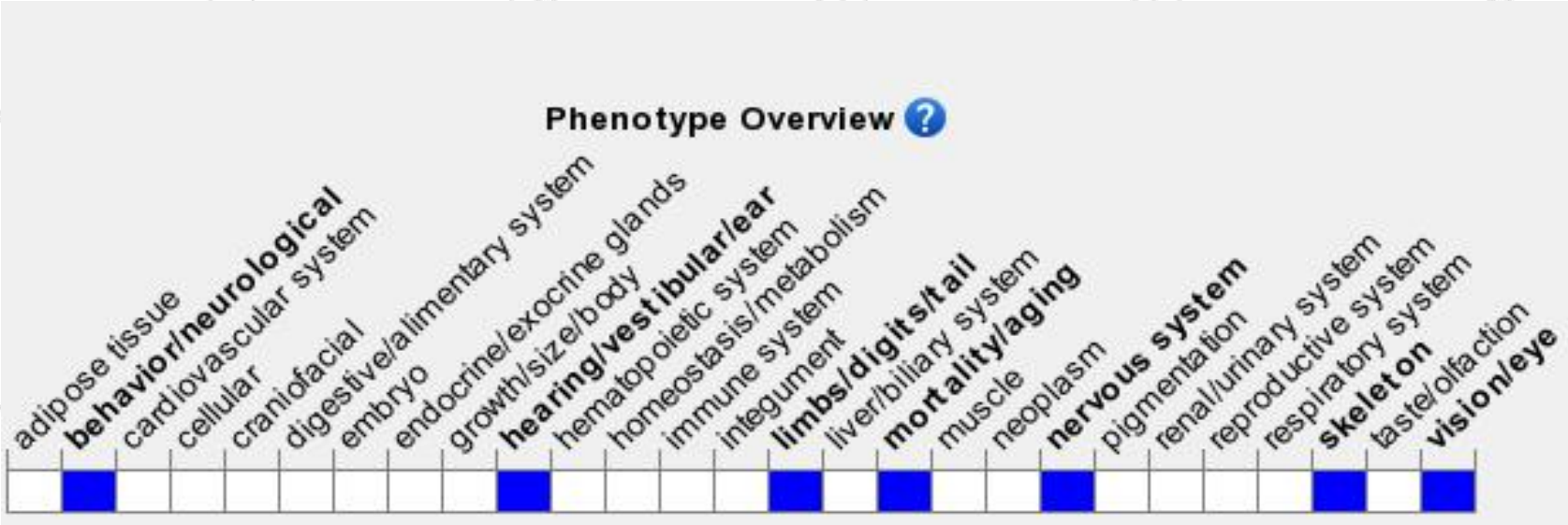
Genomic location distribution



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,Homozygotes for a spontaneous and a targeted mutation exhibit high sensitivity to audiogenic seizures. Targeted mutant mice lack the ankle links that connect growing stereocilia in the developing cochlear hair cells.

集萃药康
GemPharmatech

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

Tel: 025-5864 1534

集萃药康生物科技
GemPharmatech Co.,Ltd