Gcgr Cas9-KO Strategy

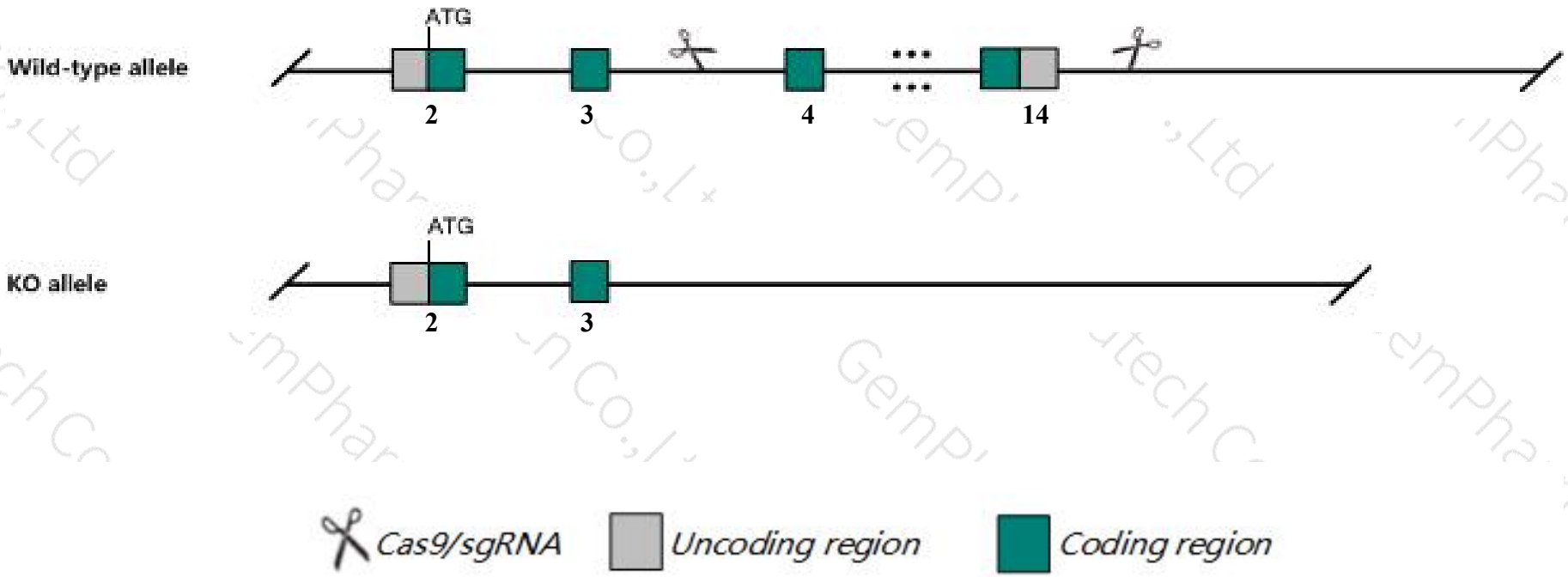
Designer: Yanhua Shen
Design Date: 2019-08-06

Project Overview

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

Knockout strategy

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



Technical routes

- The *Gcgr* gene has 4 transcripts. According to the structure of *Gcgr* gene, exon4-exon14 of *Gcgr-201* (ENSMUST00000026119.7) transcript is recommended as the knockout region.The region contains 1292bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Gcgr* 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, animals homozygous for a targeted mutation in this gene exhibit reduced blood glucose levels and increased plasma glucagon and amino acid levels associated with alpha-cell hyperplasia.
- Animals homozygous male and female for knockout are infertility.
- The *Gcgr* gene is located on the Chr11. 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

Gcgr glucagon receptor [Mus musculus (house mouse)]

Gene ID: 14527, updated on 5-Mar-2019

Summary

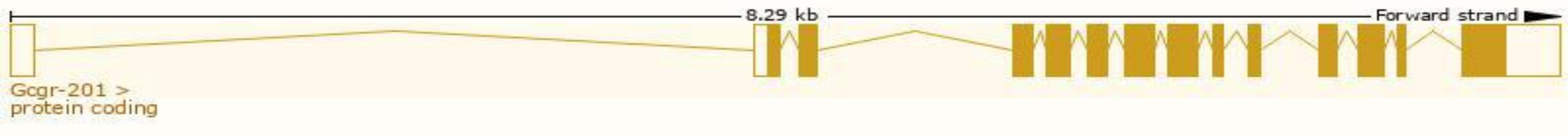
Official Symbol	Gcgr provided by MGI
Official Full Name	glucagon receptor provided by MGI
Primary source	MGI:MGI:99572
See related	Ensembl:ENSMUSG00000025127
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	GR
Expression	Biased expression in liver adult (RPKM 145.3), liver E18 (RPKM 21.1) and 4 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

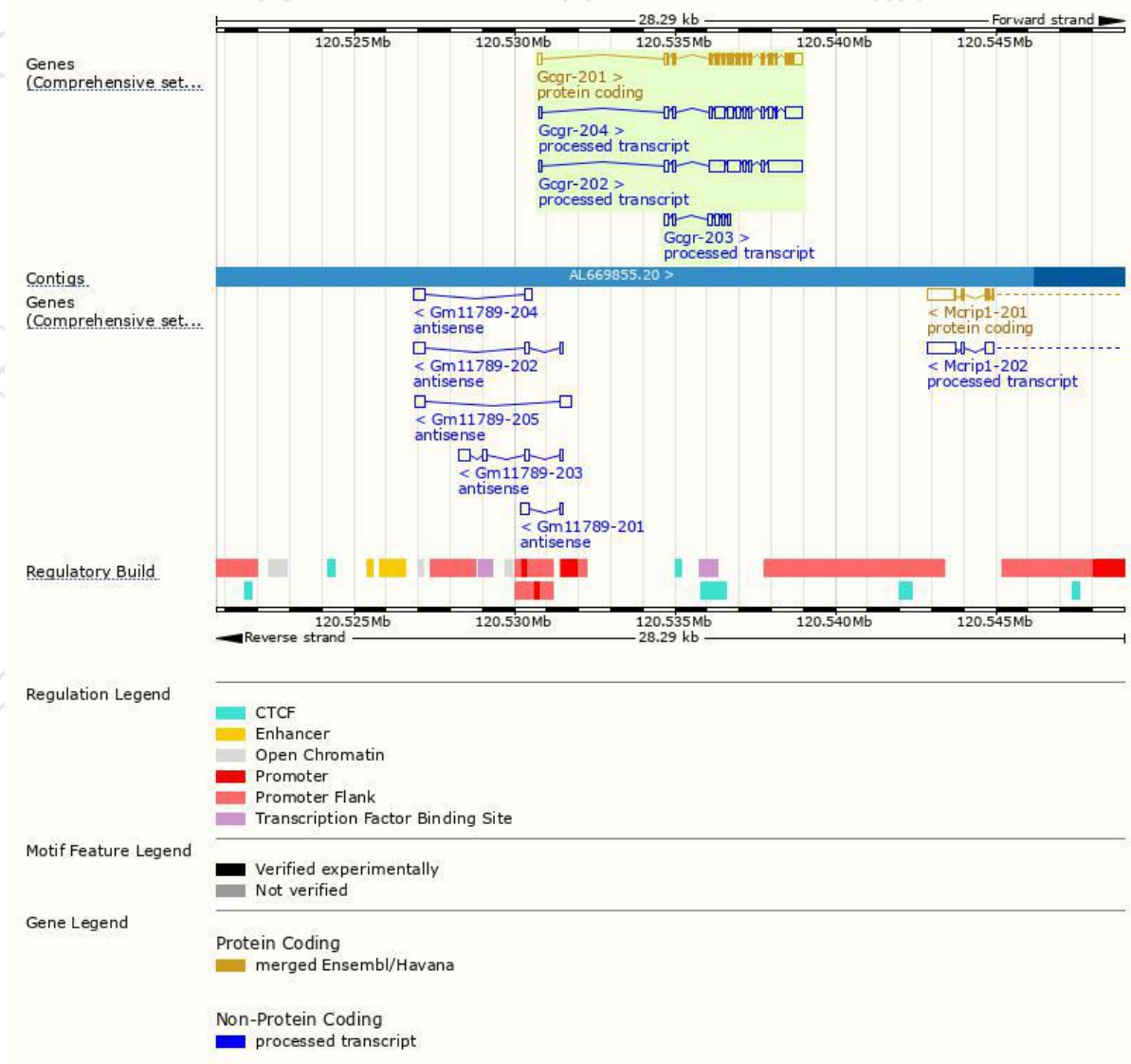
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gcgr-201	ENSMUST00000026119.7	1957	485aa	Protein coding	CCDS25739	Q61606	TSL:1 GENCODE basic APPRIS P1
Gcgr-202	ENSMUST00000128827.7	2502	No protein	Processed transcript	-	-	TSL:2
Gcgr-204	ENSMUST00000147877.7	2004	No protein	Processed transcript	-	-	TSL:1
Gcgr-203	ENSMUST00000143063.1	674	No protein	Processed transcript	-	-	TSL:5

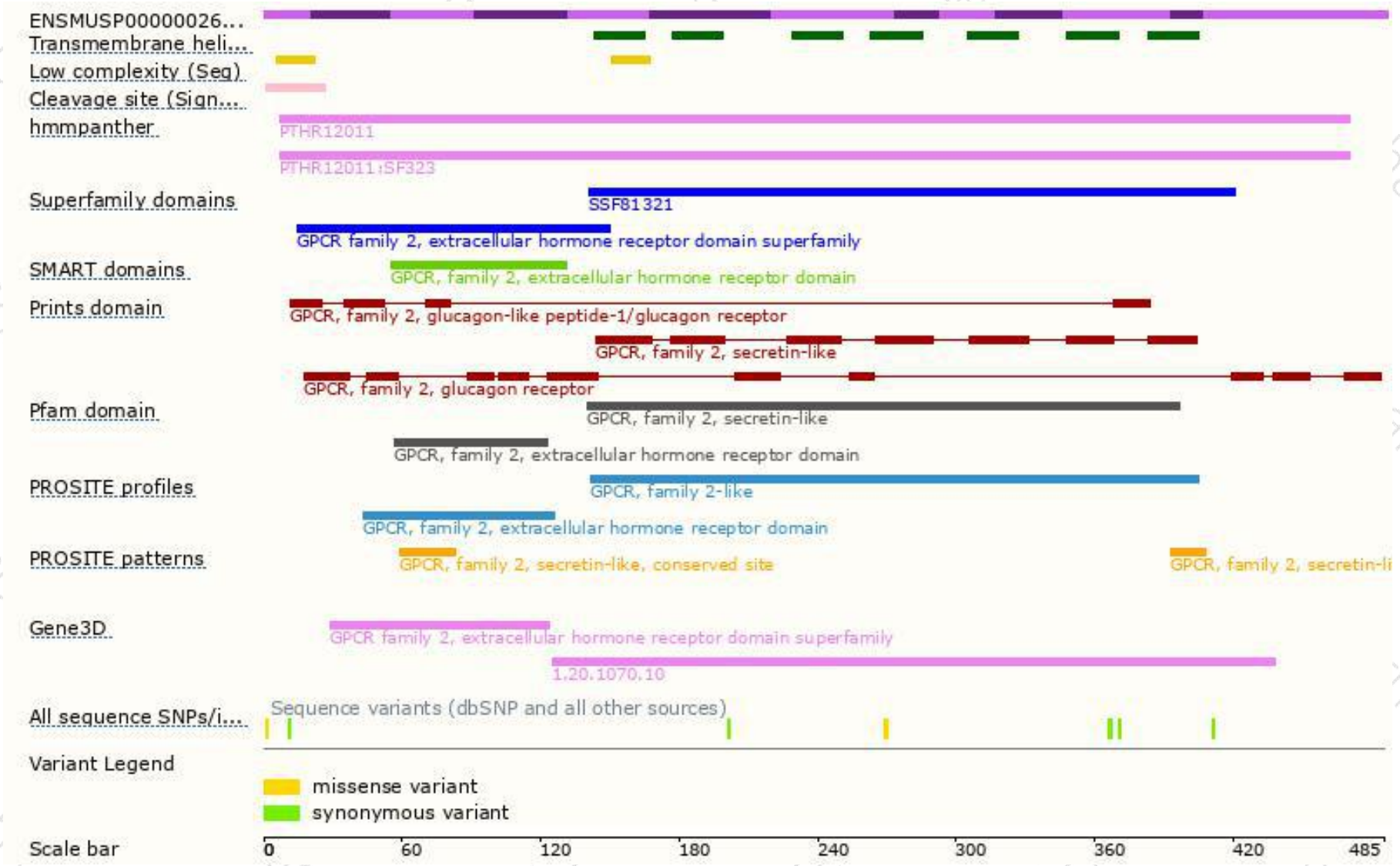
The strategy is based on the design of *Gcgr-201* transcript,The transcription is shown below



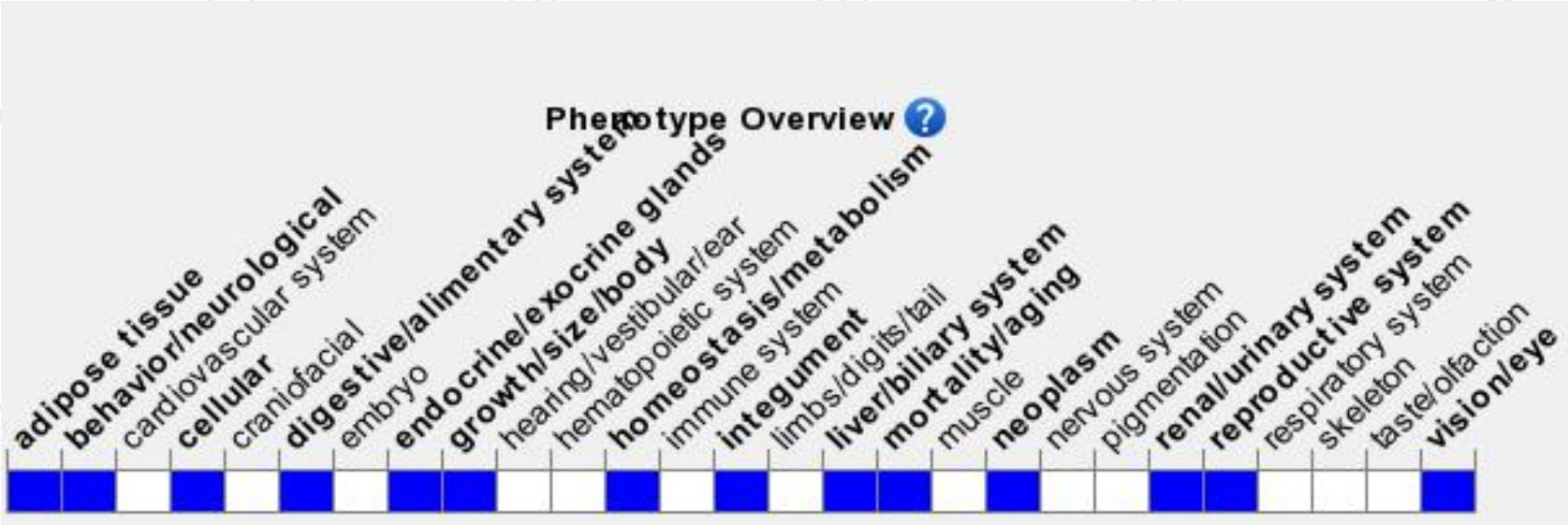
Genomic location distribution



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,Animals homozygous for a targeted mutation in this gene exhibit reduced blood glucose levels and increased plasma glucagon and amino acid levels associated with alpha-cell hyperplasia.

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