Gyg Cas9-KO Strategy

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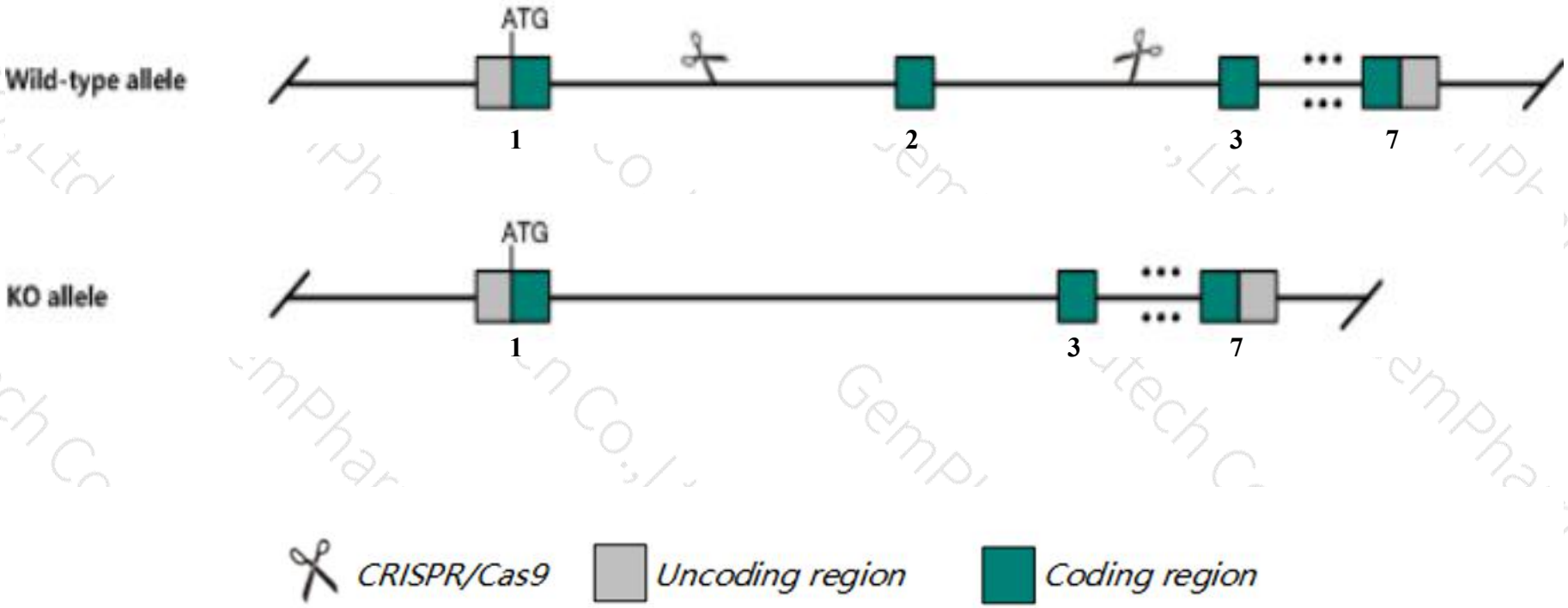
Design Date: 2018/11/1

Project Overview

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

Knockout strategy

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



Technical routes

➢ The *Gyg* gene has 4 transcripts. According to the structure of *Gyg* gene, exon2 of *Gyg-201*(ENSMUST00000118015.8) transcript is recommended as the knockout region.The region contains 136bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Gyg* gene. The brief process is as follows: CRISPR/Cas9 system 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,mice homozygous for a knock-out allele exhibit partial neonatal lethality due to cardiorespiratory failure, increased glycogen level in skeletal and cardiac muscle, decreased energy expenditure, abnormalities in cellular respiration and muscle electrophysiology, and impaired exercise endurance.

➢ The *Gyg* gene is located on the Chr3. 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

Gyg glycogenin [Mus musculus (house mouse)]

Gene ID: 27357, updated on 13-Mar-2020

Summary

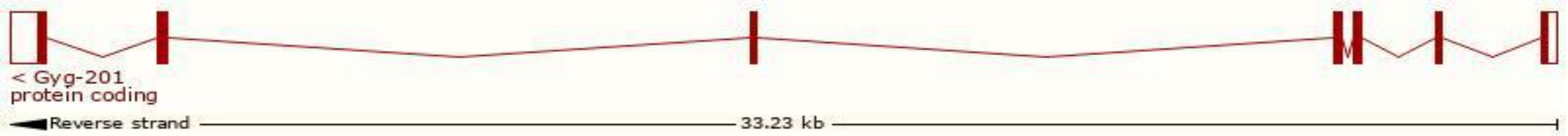
Official Symbol	Gyg provided by MGI
Official Full Name	glycogenin provided byMGI
Primary source	MGI:MGI:1351614
See related	Ensembl:ENSMUSG00000019528
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AU017667, GN1, Gyg1
Expression	Ubiquitous expression in heart adult (RPKM 43.0), lung adult (RPKM 28.8) and 24 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

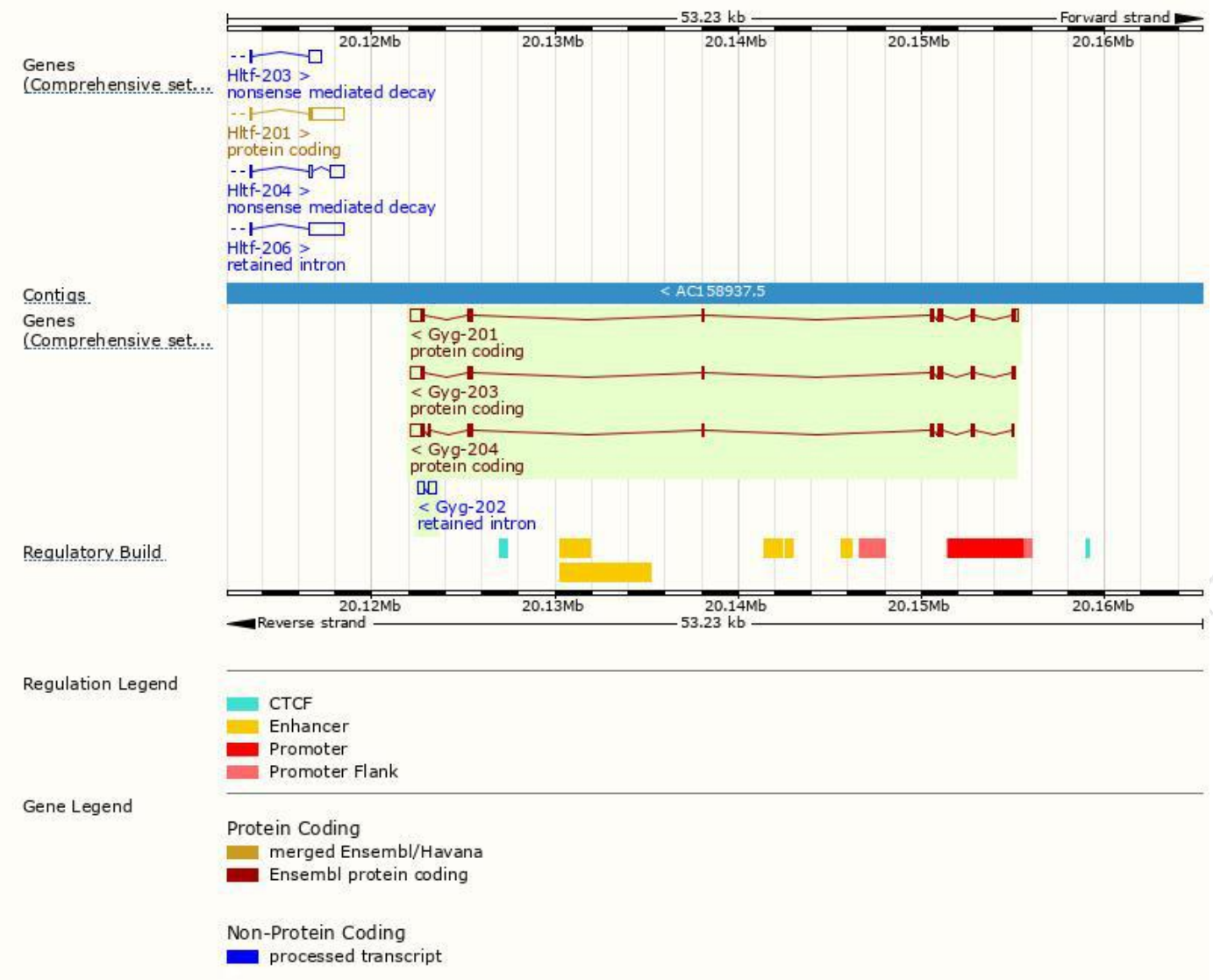
The gene has 4 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Gyg-203	ENSMUST00000178328.7	1698	333aa	Protein coding	CCDS50873	Q9R062	TSL:1 GENCODE basic APPRIS P1
Gyg-201	ENSMUST00000118015.8	1922	377aa	Protein coding	-	K3W4S6	TSL:1 GENCODE basic
Gyg-204	ENSMUST00000184552.1	1662	372aa	Protein coding	-	V9GX26	CDS 5' incomplete TSL:5
Gyg-202	ENSMUST00000135475.1	731	No protein	Retained intron	-	-	TSL:2

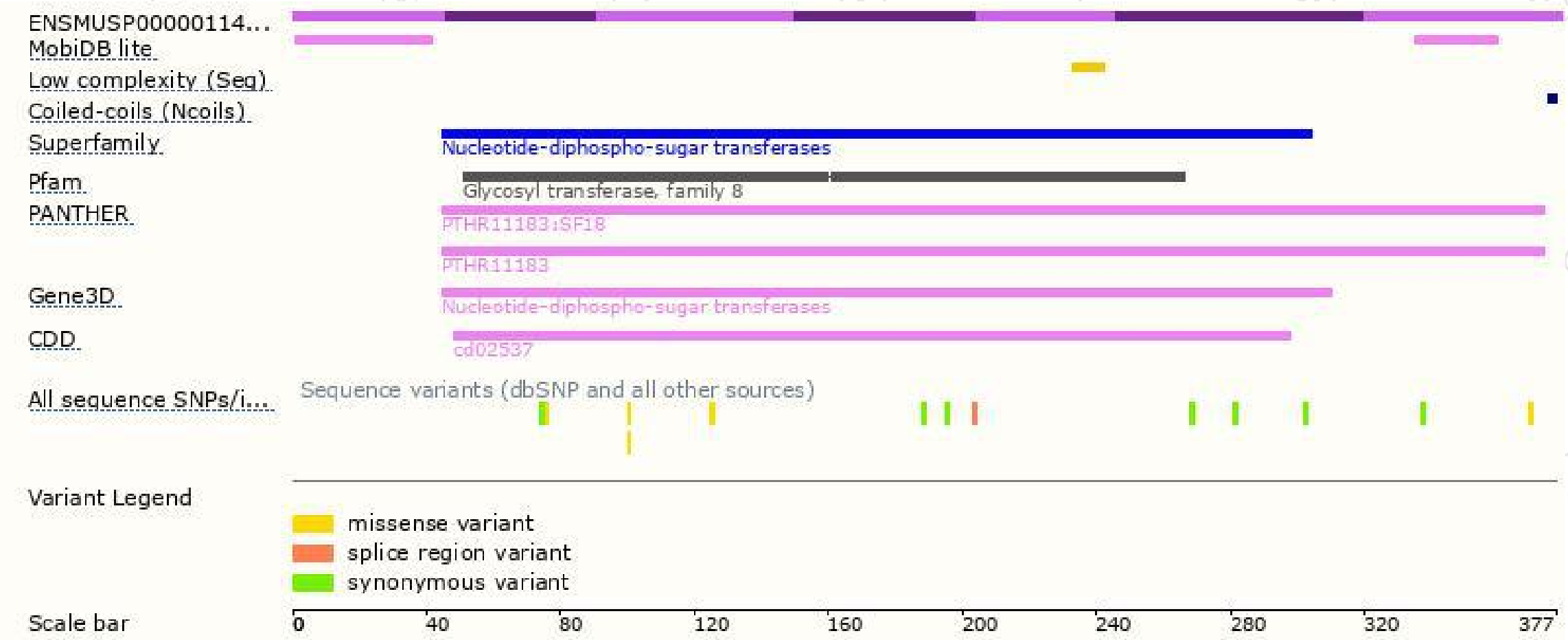
The strategy is based on the design of *Gyg-201* transcript,the transcription is shown below:



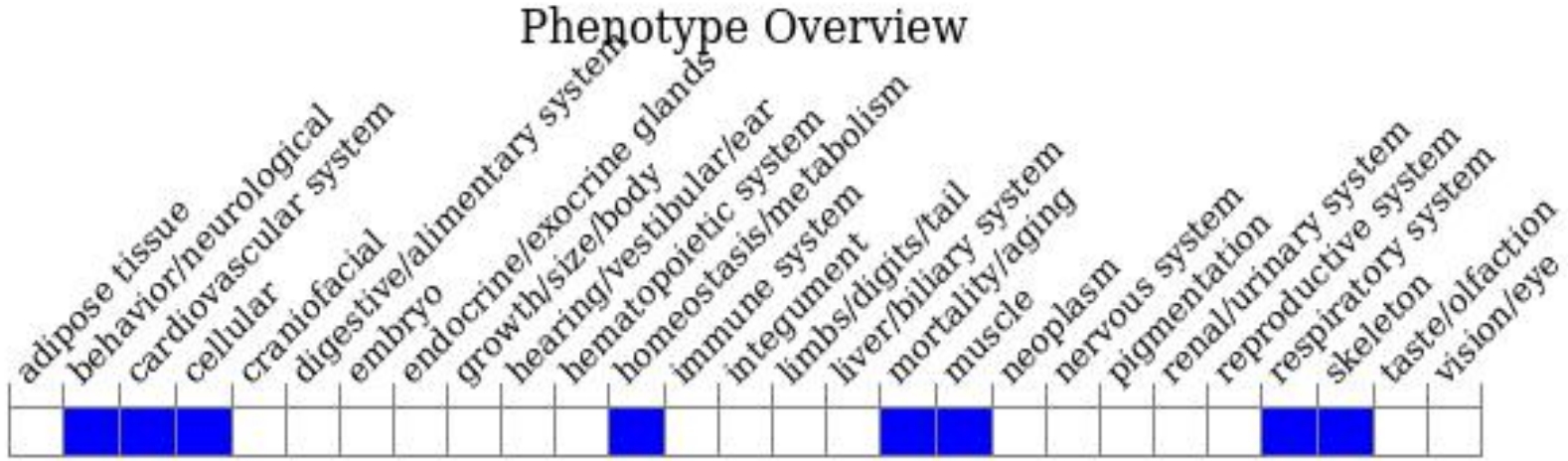
Genomic location distribution



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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