Prlh Cas9-KO Strategy

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Reviewer: Xiaojing Li

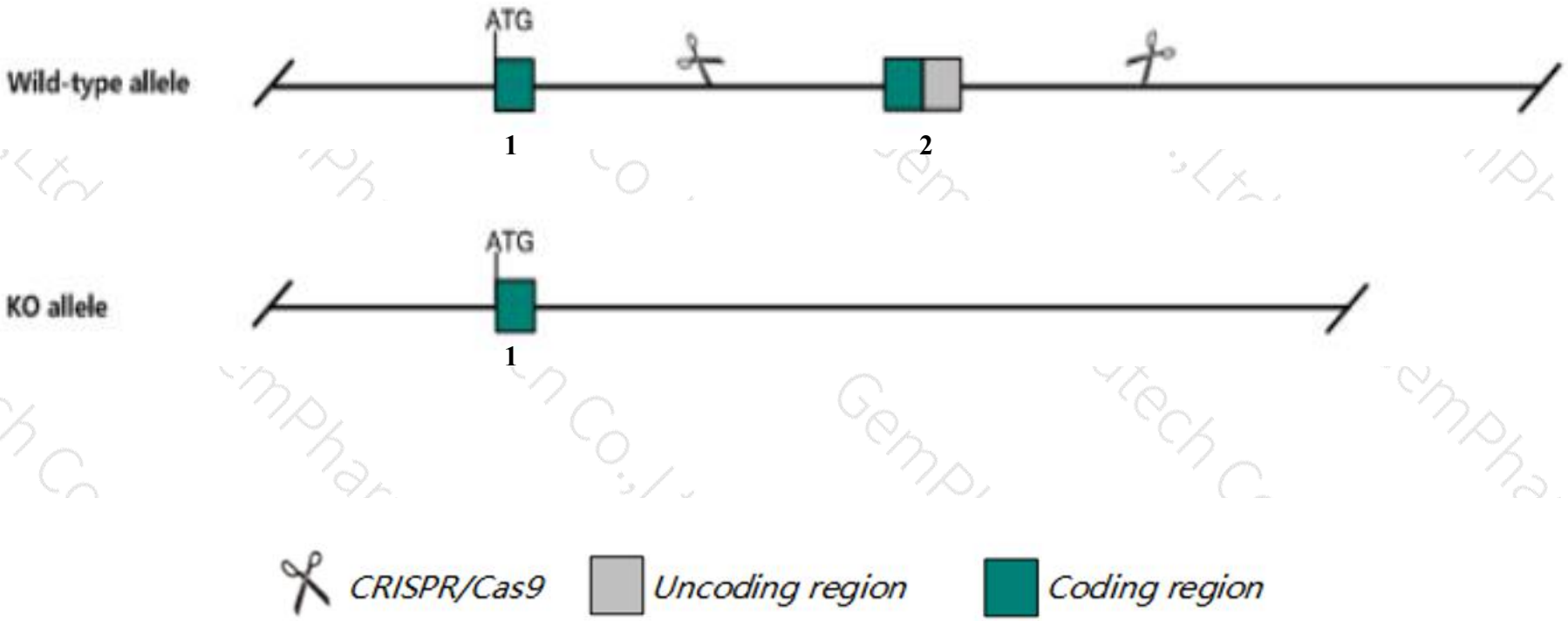
Design Date: 2020-8-14

Project Overview

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

Knockout strategy

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



Technical routes

➢ The *Prlh* gene has 1 transcript. According to the structure of *Prlh* gene, exon2 of *Prlh-201*(ENSMUST00000166281.2) transcript is recommended as the knockout region.The region contains 164bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Prlh* 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,homozygous mutation of this gene results in polyphagia; late-onset obesity and adiposity; increase in circulating insulin, leptin, and triglyceride levels; impaired glucose tolerance and insulin resistance; and attenuated responses to the anorexigenic signals cholecystokinin and leptin.

➢ The *Prlh* gene is located on the Chr1. 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

Prlh prolactin releasing hormone [Mus musculus (house mouse)]

Gene ID: 623503, updated on 13-Mar-2020

Summary

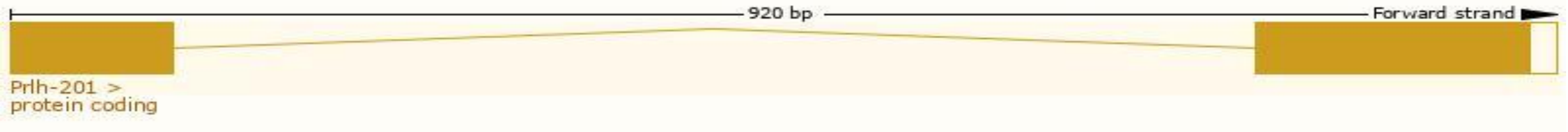
Official Symbol	Prlh provided by MGI
Official Full Name	prolactin releasing hormone provided by MGI
Primary source	MGI:MGI:3644668
See related	Ensembl:ENSMUSG00000090550
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	EG623503
Expression	Low expression observed in reference dataset See more
Orthologs	human all

Transcript information（Ensembl）

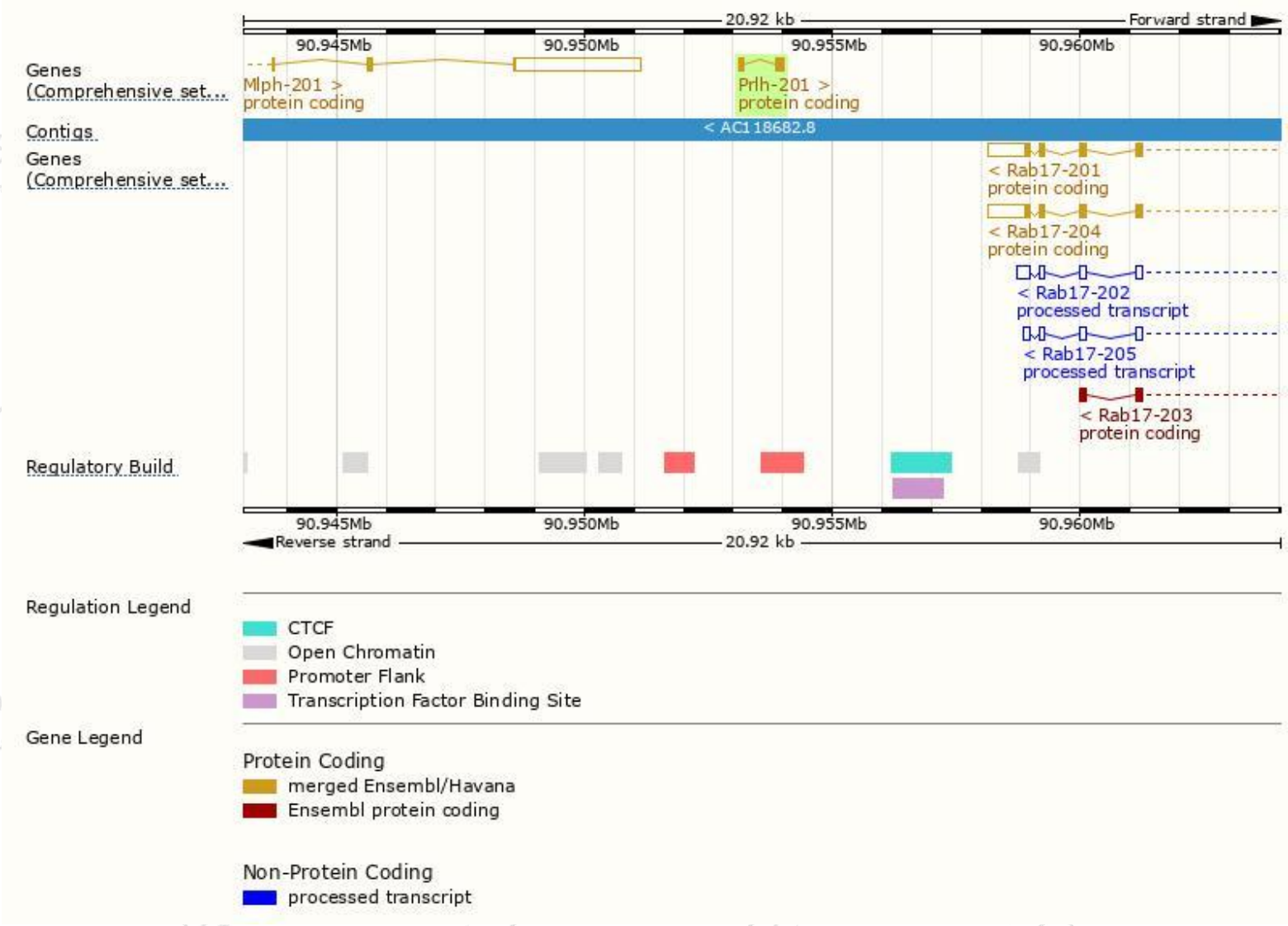
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Prlh-201	ENSMUST00000166281.2	276	86aa	Protein coding	CCDS48318	G3UWC3	TSL:1 GENCODE basic APPRIS P1

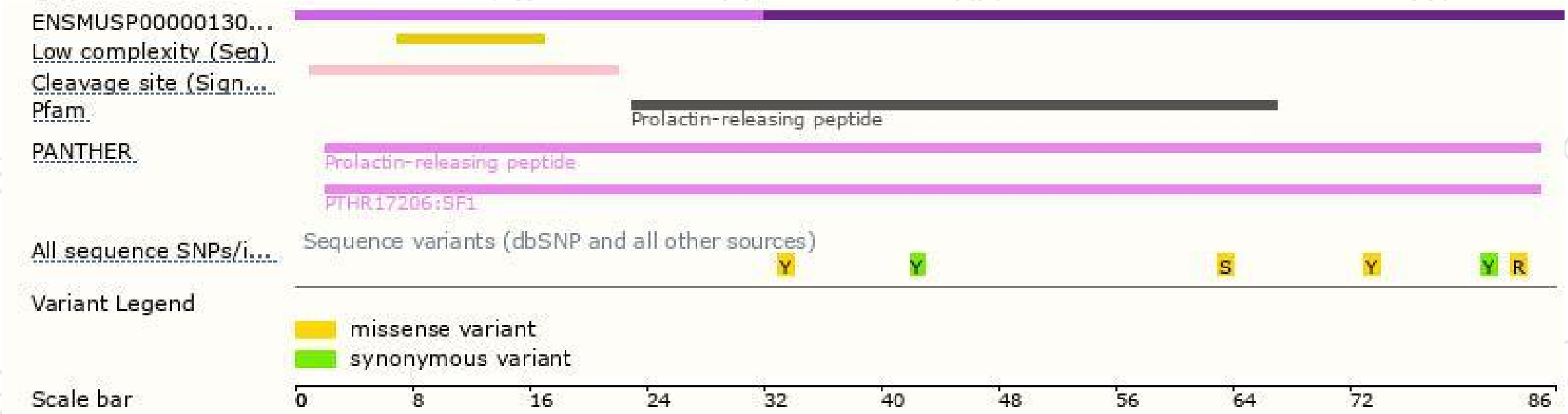
The strategy is based on the design of *Prlh-201* transcript,the transcription is shown below:



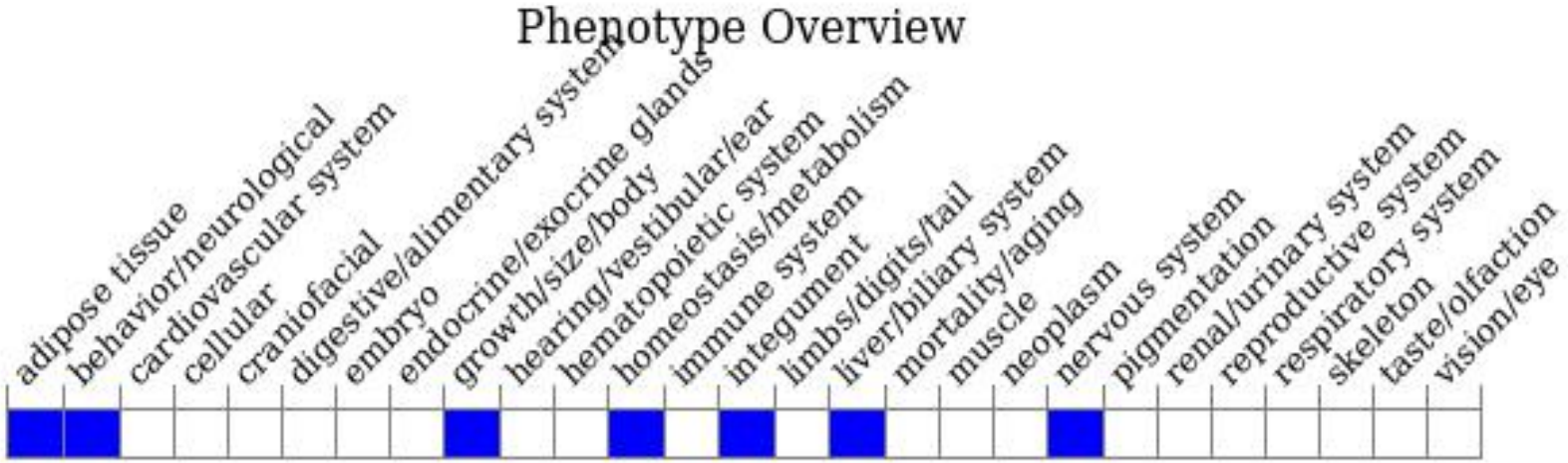
Genomic location distribution



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,homozygous mutation of this gene results in polyphagia; late-onset obesity and adiposity; increase in circulating insulin, leptin, and triglyceride levels; impaired glucose tolerance and insulin resistance; and attenuated responses to the anorexigenic signals cholecystokinin and leptin.

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

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