Bhlhe23 Cas9-KO Strategy

Designer: Huimin Su

Reviewer: Ruirui Zhang

Design Date: 2020/2/13

Project Overview

Project Name	***Bhlhe23***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Bhlhe23* gene. The schematic diagram is as follows:

Technical routes

➢ The *Bhlhe23* gene has 1 transcript. According to the structure of *Bhlhe23* gene, exon1 of *Bhlhe23-201* (ENSMUST00000108878.1) transcript is recommended as the knockout region.The region contains all of the coding sequence.Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Bhlhe23* gene. The brief process is as follows: CRISPR/Cas9 syste

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele display a severe deficit in retinal activity characterized by improper retinal rod bipolar cell maturation, loss of the scotopic ERG b-wave, and a significant increase in inner nuclear layer (INL) cell apoptosis.

- Exon1 of *Gm14343* gene is overlapped with *Bhlhe23, so* exon1 of *Gm14343* will also be deleted.

- The *Bhlhe23* gene is located on the Chr2. 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

Bhlhe23 basic helix-loop-helix family, member e23 [*Mus musculus* (house mouse)]

Gene ID: 140489, updated on 15-Oct-2019

Summary

Official Symbol	Bhlhe23 provided by MGI
Official Full Name	basic helix-loop-helix family, member e23 provided by MGI
Primary source	MGI:MGI:2153710
See related	Ensembl:ENSMUSG00000045493
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	BETA4; Beta3b; Bhlhb4; A930001L02Rik
Orthologs	human all

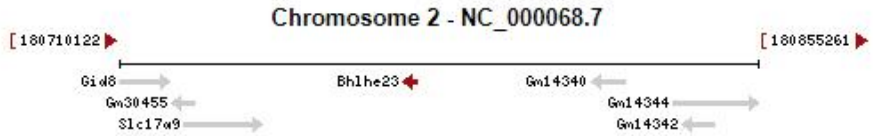
Genomic context

Location: 2 H4; 2 103.34 cM

See Bhlhe23 in Genome Data Viewer

Exon count: 1

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	2	NC_000068.7 (180774381..180776900, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	2	NC_000068.6 (180509086..180511605, complement)

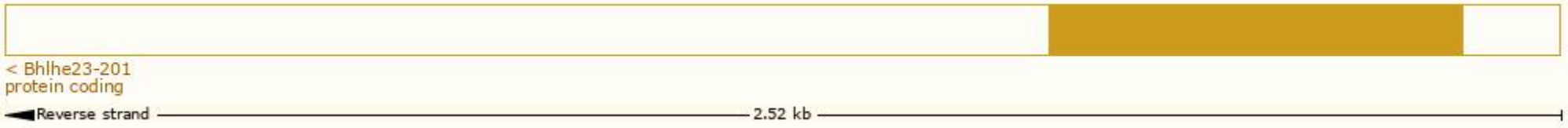


Transcript information（Ensembl）

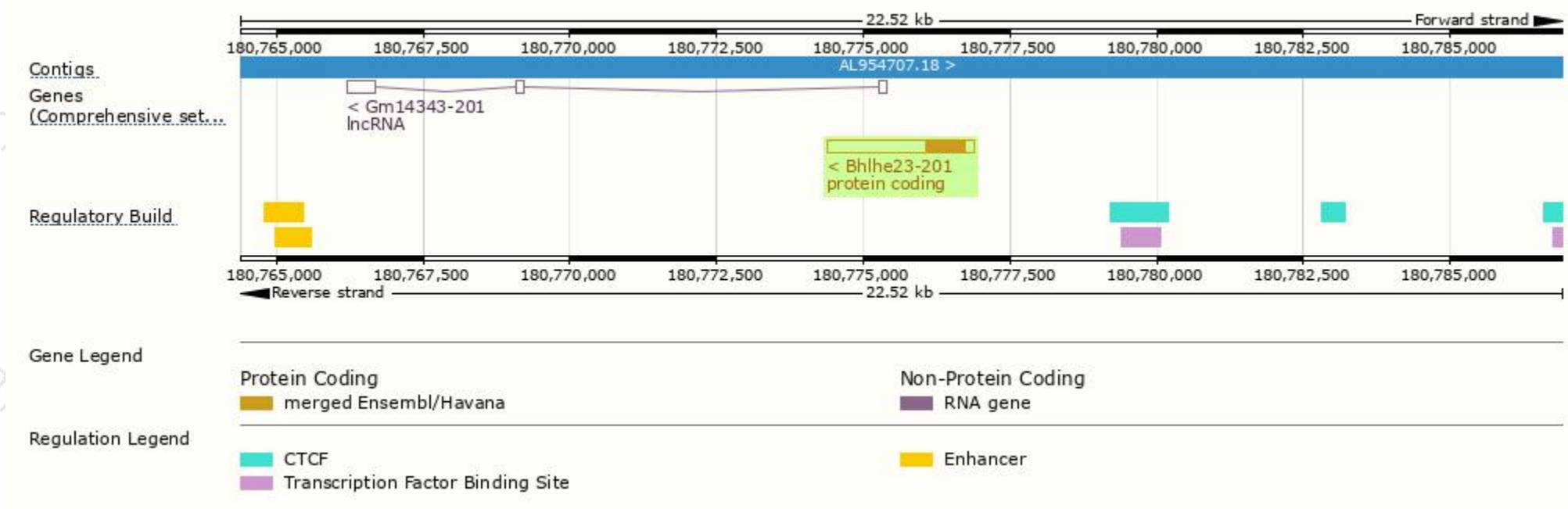
The gene has 1 transcript,and the transcript is shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Bhlhe23-201	ENSMUST00000108878.1	2520	223aa	Protein coding	CCDS17187	Q0VEJ8 Q8BGW3	TSL:NA GENCODE basic APPRIS P1

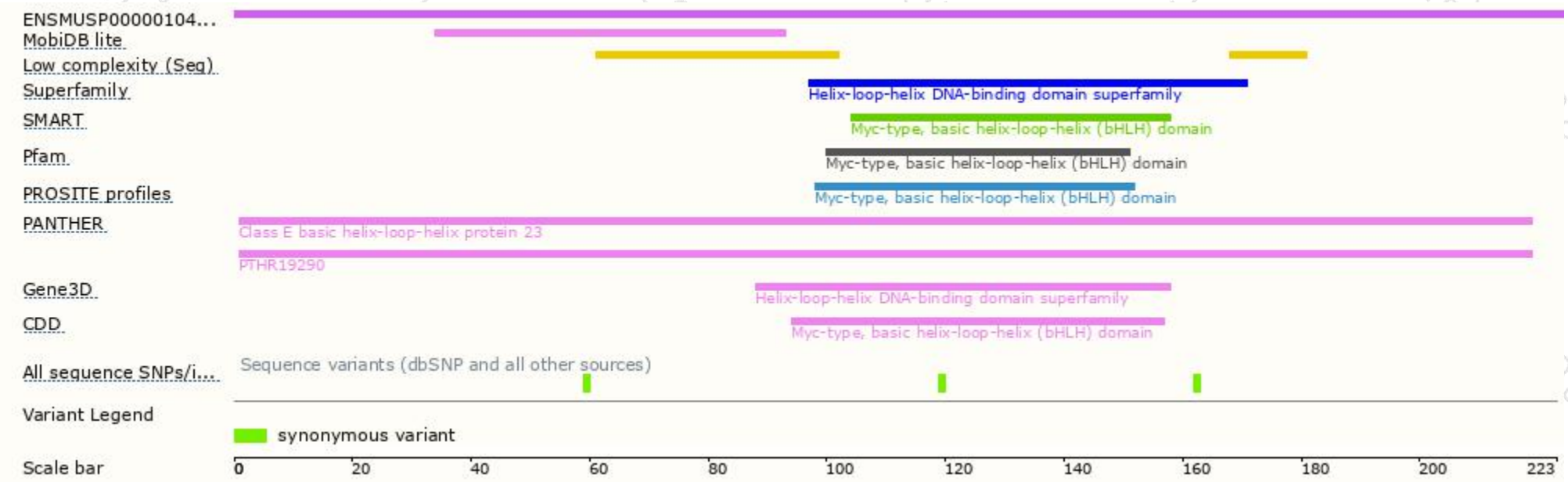
The strategy is based on the design of *Bhlhe23-201* transcript,The transcription is shown below



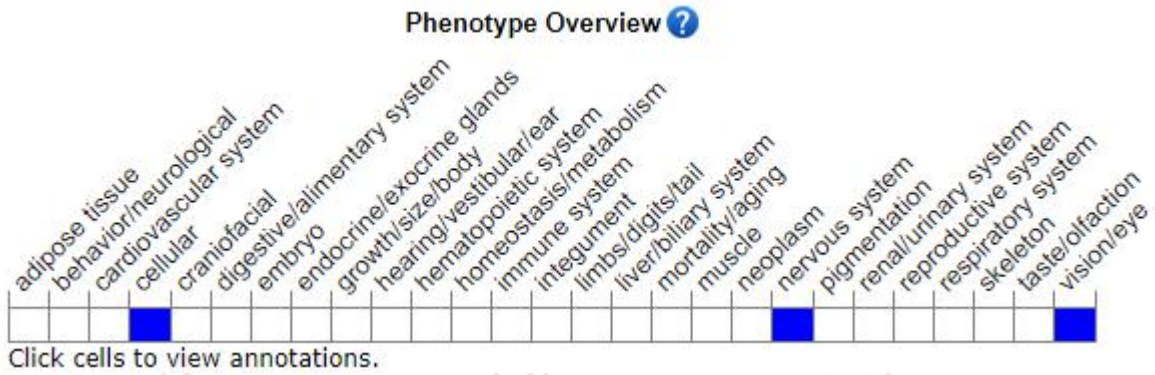
Genomic location distribution



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,Mice homozygous for a knock-out allele display a severe deficit in retinal activity characterized by improper retinal rod bipolar cell maturation, loss of the scotopic ERG b-wave, and a significant increase in inner nuclear layer (INL) cell apoptosis.

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