

Hes2 Cas9-KO Strategy

Designer: JiaYu

Reviewer: Xiaojing Li

Design Date: 2020-7-28

Project Overview

Project Name

Hes2

Project type

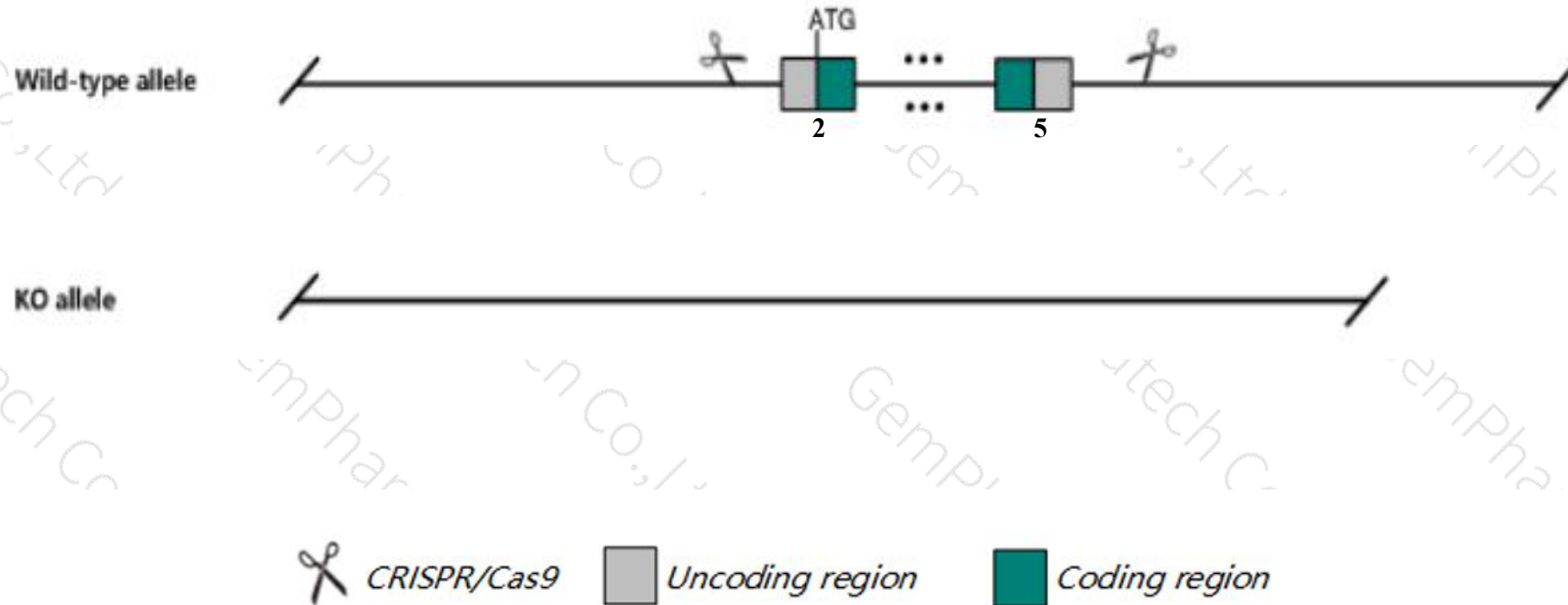
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hes2* gene. The schematic diagram is as follows:



- The *Hes2* gene has 2 transcripts. According to the structure of *Hes2* gene, exon2-exon5 of *Hes2*-201(ENSMUST00000030782.1) 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 *Hes2* 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.

- The *Hes2* gene is located on the Chr4. 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)

Hes2 hes family bHLH transcription factor 2 [Mus musculus (house mouse)]

Gene ID: 15206, updated on 13-Mar-2020

Summary



Official Symbol Hes2 provided by [MGI](#)

Official Full Name hes family bHLH transcription factor 2 provided by [MGI](#)

Primary source [MGI:MGI:1098624](#)

See related [Ensembl:ENSMUSG00000028940](#)

Gene type protein coding

RefSeq status REVIEWED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as HES-2

Summary The protein encoded by this gene belongs to the mammalian Hes gene family, the mammalian homologues of Drosophila hairy and Enhancer of split. Hes 2 is a basic helix-loop-helix transcriptional repressor and is an effector of the Notch signaling pathway. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Sep 2014]

Expression Biased expression in duodenum adult (RPKM 4.4), small intestine adult (RPKM 3.5) and 4 other tissues [See more](#)

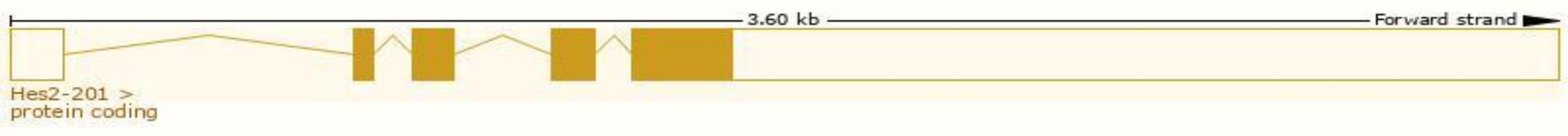
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

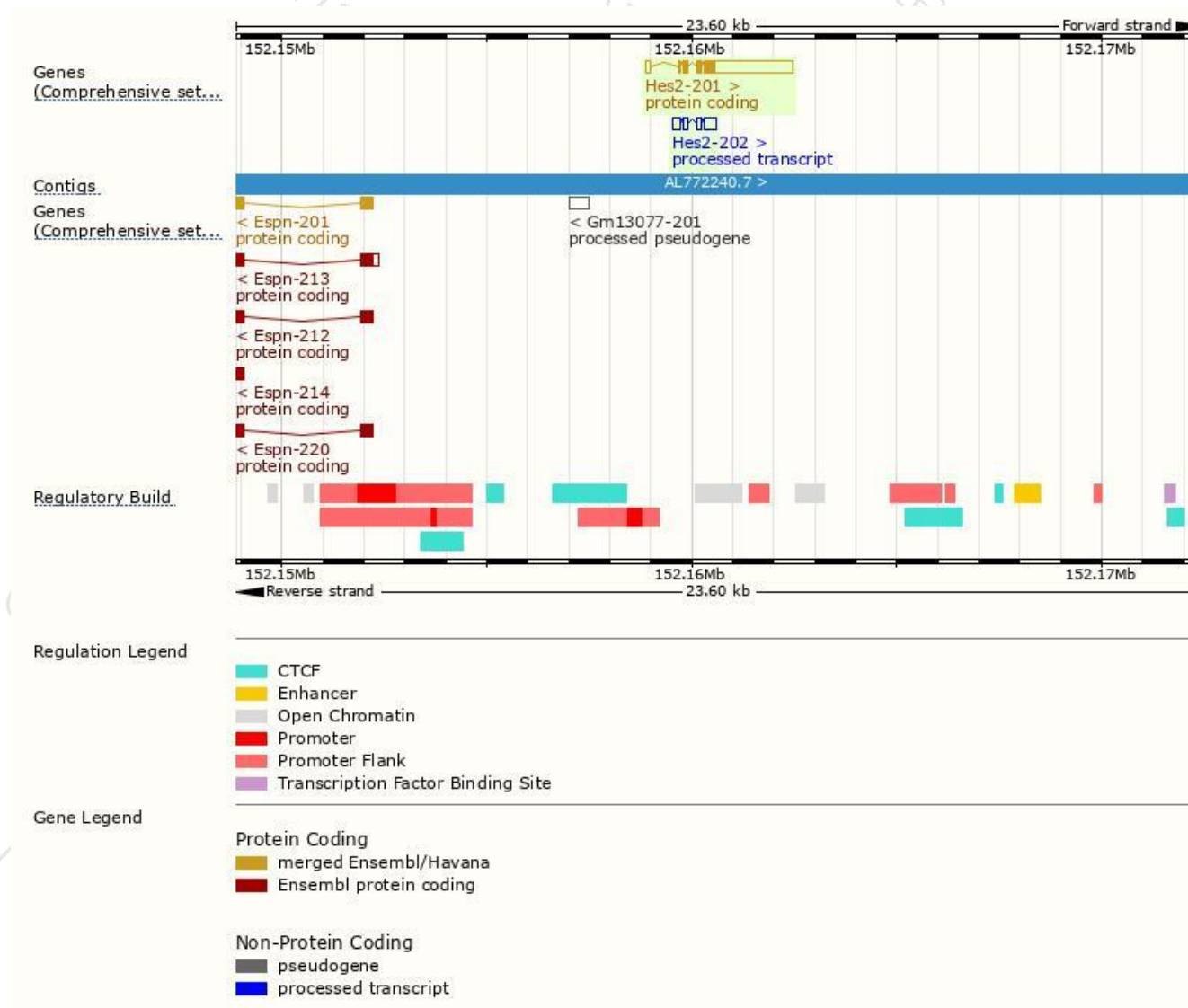
The gene has 2 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|----------|--------------------------------------|------|-----------------------|----------------------|---------------------------|------------------------|-------------------------------|
| Hes2-201 | ENSMUST00000030782.1 | 2521 | 157aa | Protein coding | CCDS18995 | O54792 | TSL:1 GENCODE basic APPRIS P1 |
| Hes2-202 | ENSMUST00000138991.1 | 645 | No protein | Processed transcript | - | - | TSL:5 |

The strategy is based on the design of *Hes2-201* transcript,the transcription is shown below:



Genomic location distribution



Protein domain



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

Tel: 400-9660890

