

Hes2 Cas9-CKO Strategy

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Reviewer: Xiaojing Li

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Project Overview

Project Name

Hes2

Project type

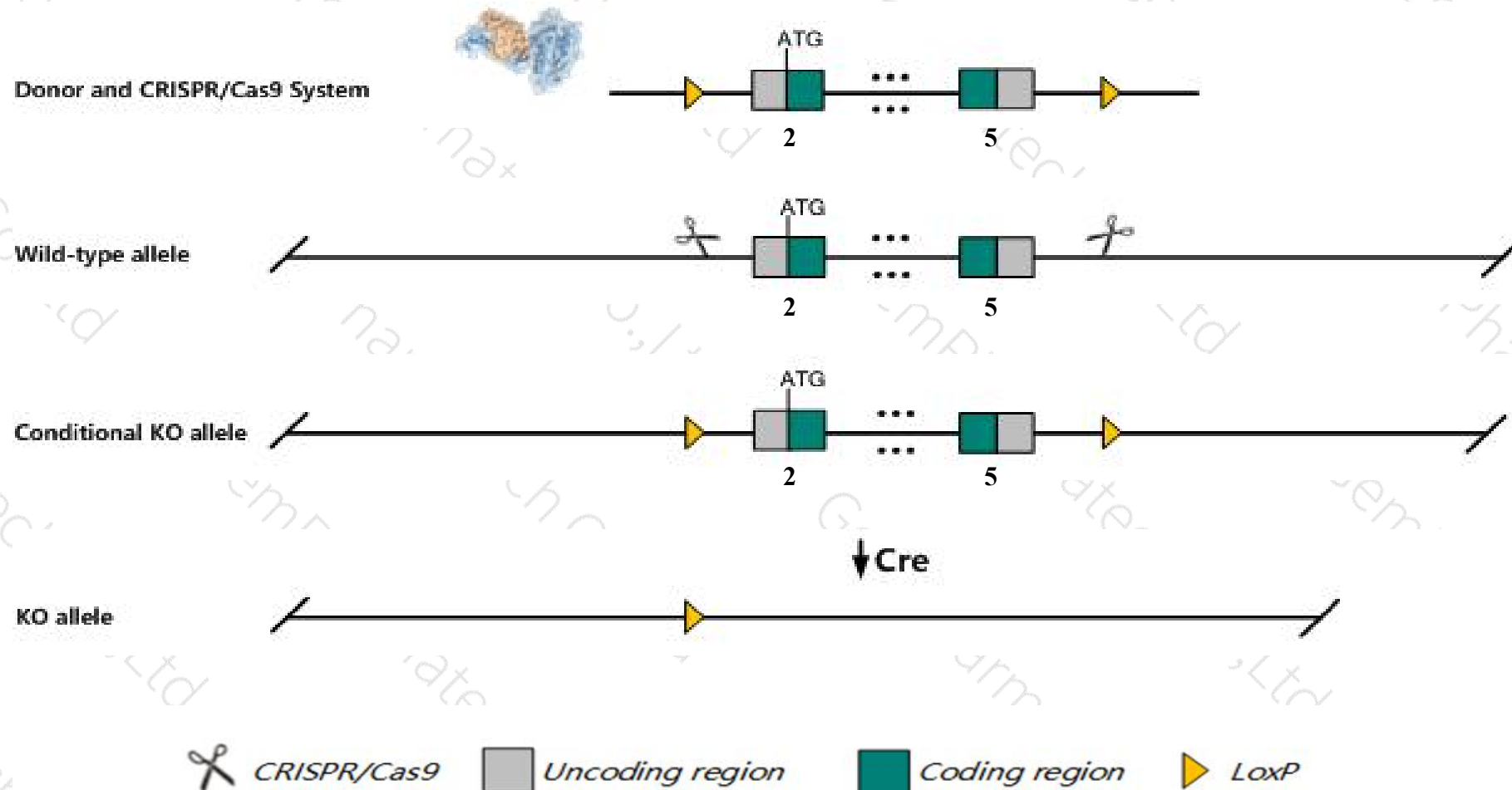
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



Technical routes

- 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 and Donor 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 flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

- 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological 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](#)

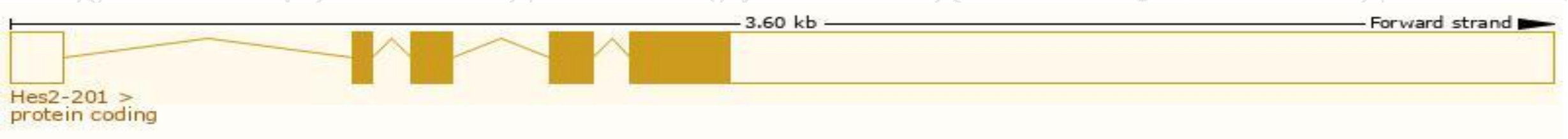
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

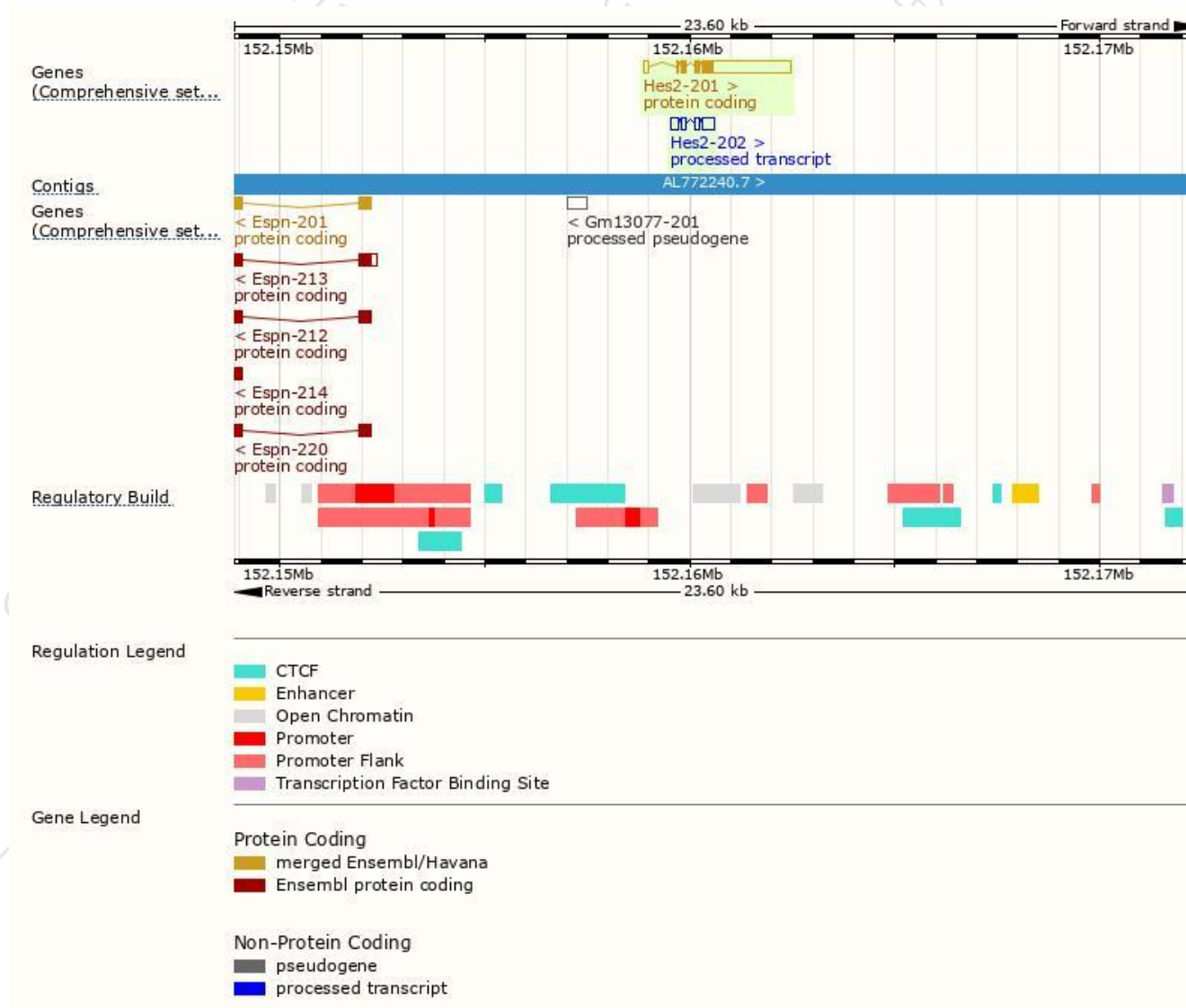
The gene has 2 transcripts,all transcripts are shown below:

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

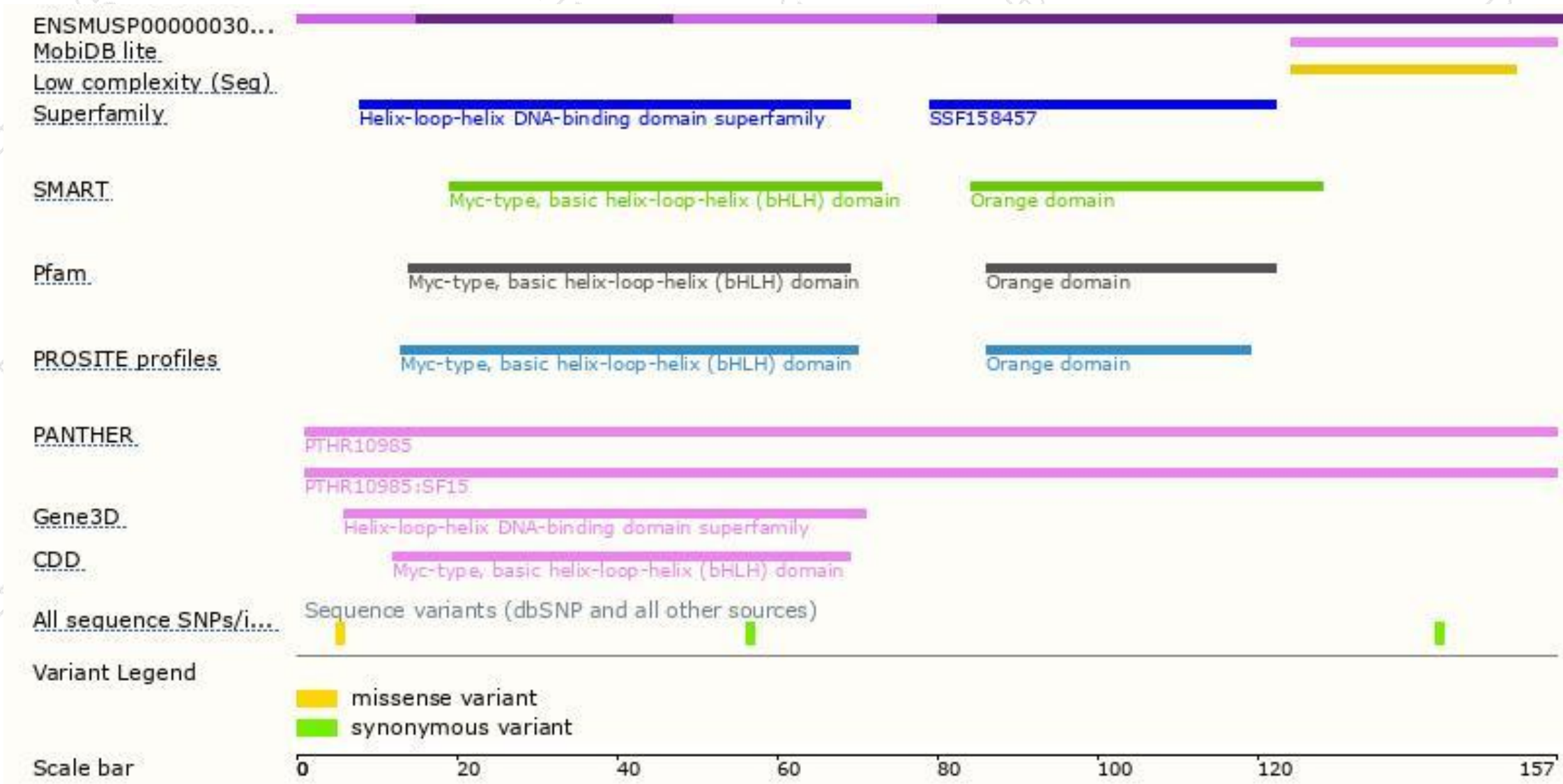
The strategy is based on the design of *Hes2-201* transcript,the transcription is shown below:



Genomic location distribution



Protein domain



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

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