

Helz Cas9-CKO Strategy

Designer: Xueting Zhang
Reviewer: Yanhua Shen
Design Date: 2019-8-22

Project Overview

Project Name

Helz

Project type

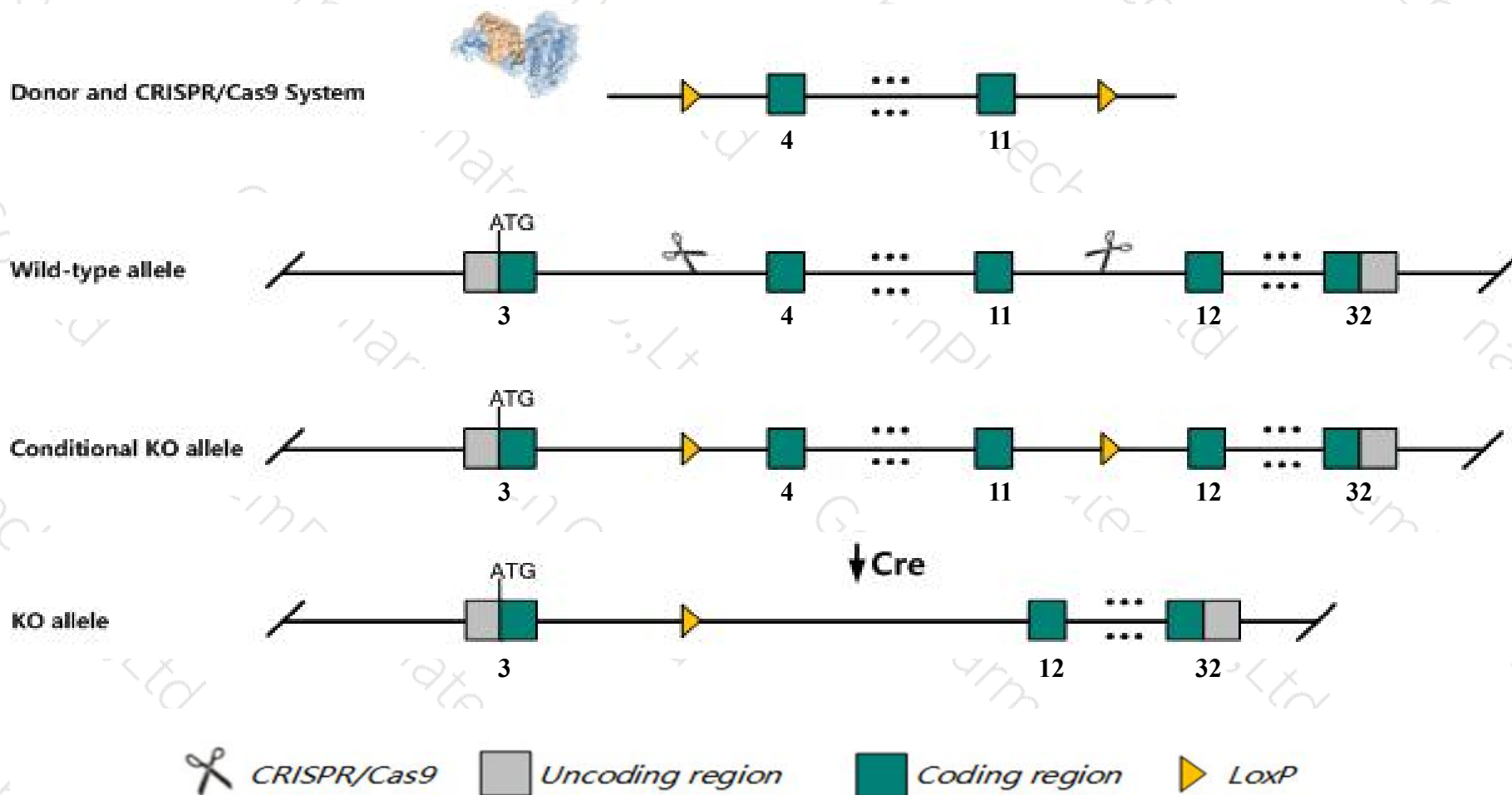
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

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



Technical routes

- The *Helz* gene has 8 transcripts. According to the structure of *Helz* gene, exon4-exon11 of *Helz-201* (ENSMUST00000075012.7) transcript is recommended as the knockout region. The region contains 952bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Helz* 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.

- According to the existing MGI data, Mice homozygous for a gene-trapped allele are viable, fertile and phenotypically normal with no apparent skeletal defects.
- Transcript *Helz*-206&207&208 may not be affected. And the effect on transcript *Helz*-204 is unknown.
- The *Helz* gene is located on the Chr11. 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)

Helz helicase with zinc finger domain [*Mus musculus* (house mouse)]

Gene ID: 78455, updated on 17-Aug-2019

Summary

Official Symbol	Helz provided by MGI
Official Full Name	helicase with zinc finger domain provided by MGI
Primary source	MGI:MGI:1925705
See related	Ensembl:ENSMUSG00000020721
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<i>Mus musculus</i>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	DRHC; AI851979; 3110078M01Rik; 9430093I07Rik; 9630002H22Rik
Expression	Ubiquitous expression in thymus adult (RPKM 11.0), placenta adult (RPKM 5.8) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 11; 11 E1

See Helz in [Genome Data Viewer](#)

Exon count: 34

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	11	NC_000077.6 (107546963..107693826)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	11	NC_000077.5 (107409274..107548257)

Transcript information (Ensembl)

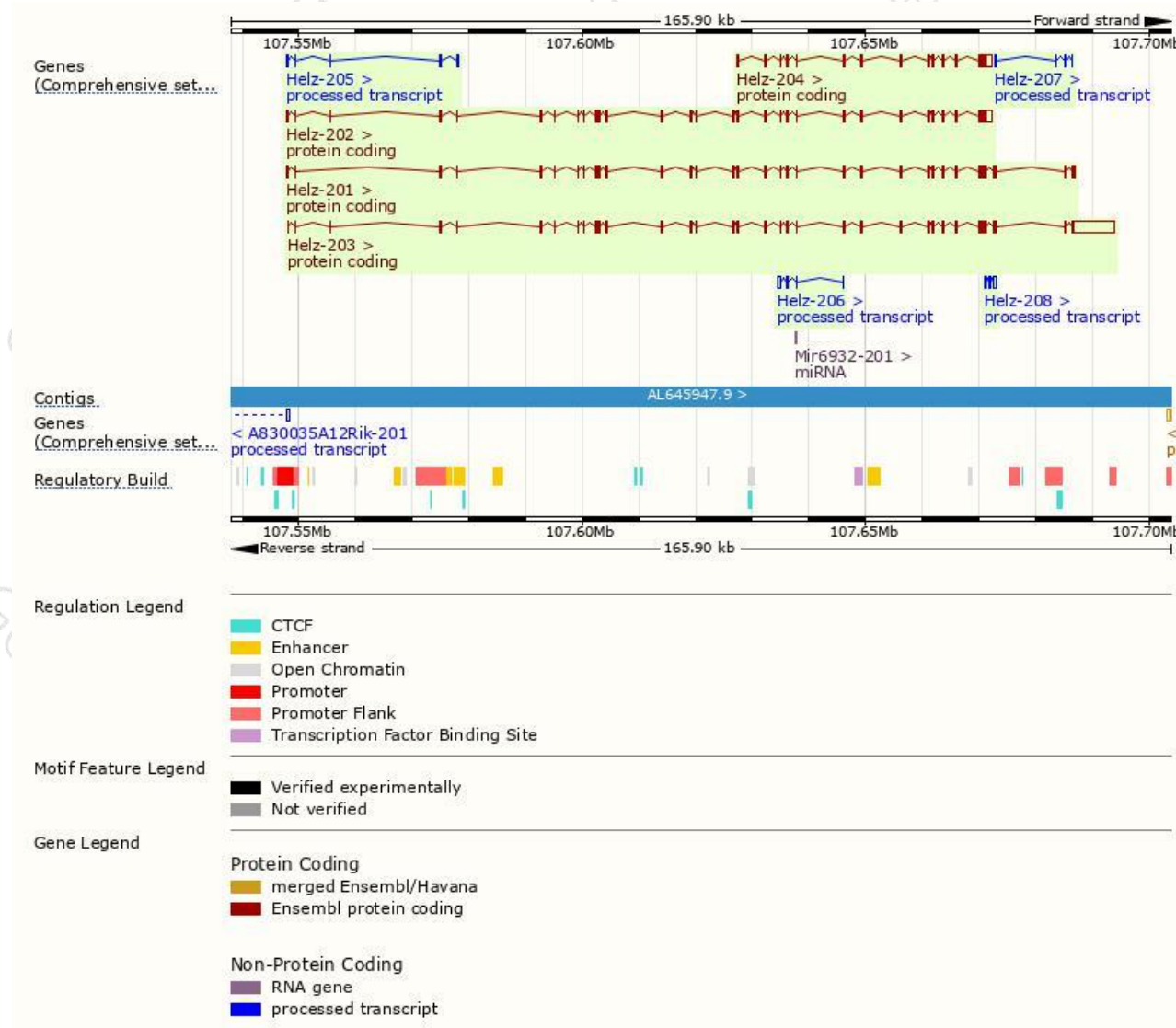
The gene has 8 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Helz-201	ENSMUST00000075012.7	6218	1965aa	Protein coding	CCDS25569	A0A0R4J0Y3 Q6DFV5	TSL:1 GENCODE basic APPRIS P2
Helz-203	ENSMUST00000106746.7	13147	1964aa	Protein coding	-	Q6DFV5	TSL:5 GENCODE basic APPRIS ALT2
Helz-202	ENSMUST00000100305.7	5953	1616aa	Protein coding	-	A2AAU3 Q6DFV5	TSL:1 GENCODE basic APPRIS ALT2
Helz-204	ENSMUST00000133862.1	3753	935aa	Protein coding	-	A2AAU5	CDS 5' incomplete TSL:1
Helz-206	ENSMUST00000143634.1	937	No protein	Processed transcript	-	-	TSL:5
Helz-208	ENSMUST00000154847.1	859	No protein	Processed transcript	-	-	TSL:5
Helz-205	ENSMUST00000141730.7	687	No protein	Processed transcript	-	-	TSL:3
Helz-207	ENSMUST00000153080.1	553	No protein	Processed transcript	-	-	TSL:5

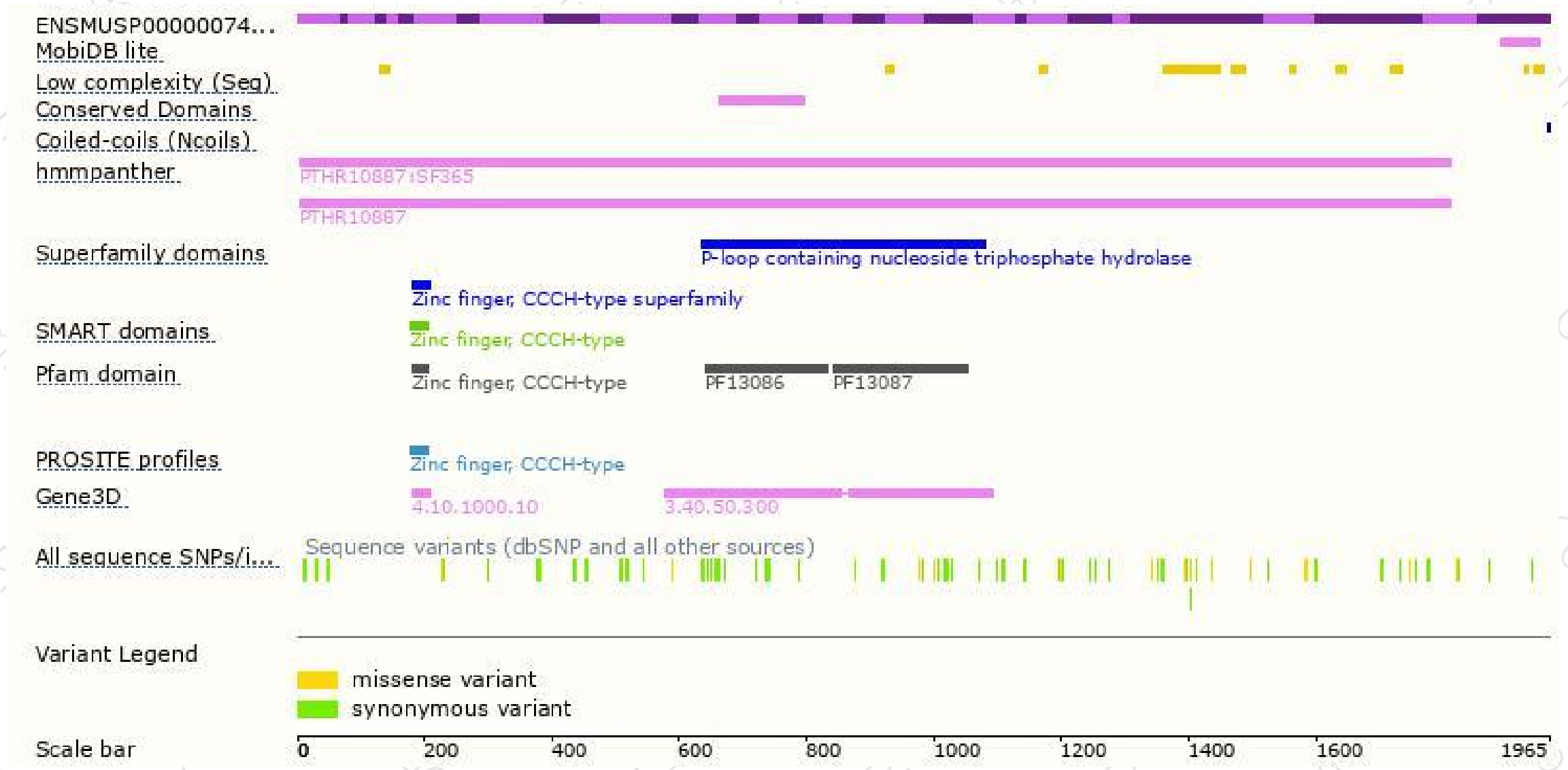
The strategy is based on the design of *Helz-201* transcript,The transcription is shown below



Genomic location distribution



Protein domain



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

Tel: 400-9660890

