

Hand1 Cas9-KO Strategy

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Project Overview

Project Name

Hand1

Project type

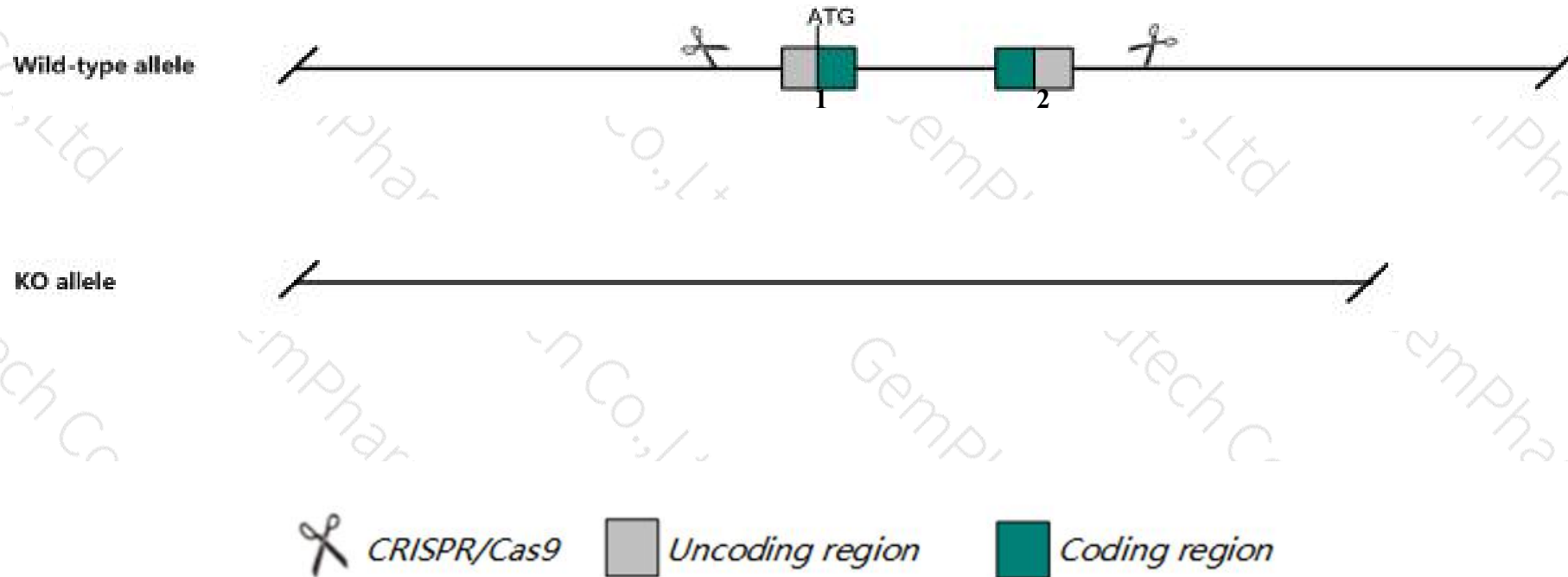
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hand1* gene. The schematic diagram is as follows:



- The *Hand1* gene has 3 transcripts. According to the structure of *Hand1* gene, exon1-exon2 of *Hand1-201* (ENSMUST00000036917.2) 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 *Hand1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygotes for targeted null mutations die at embryonic day 8.5-9.5 with yolk sac abnormalities associated with a deficiency of extraembryonic mesoderm and defective trophoblast differentiation. Tetraploid chimeric rescue slightly extends development.
- The *Hand1* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Hand1 heart and neural crest derivatives expressed 1 [Mus musculus (house mouse)]

Gene ID: 15110, updated on 19-Mar-2019

Summary



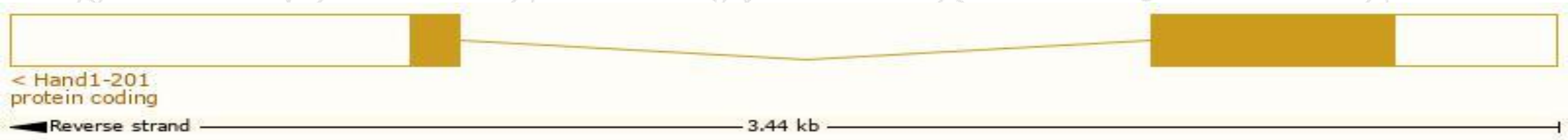
Official Symbol	Hand1 provided by MGI
Official Full Name	heart and neural crest derivatives expressed 1 provided by MGI
Primary source	MGI:MGI:103577
See related	Ensembl:ENSMUSG000000037335
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Ehand1, Hxt, Th1, Thing1, bHLHa27, eHAND
Expression	Biased expression in placenta adult (RPKM 62.0), adrenal adult (RPKM 9.9) and 3 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

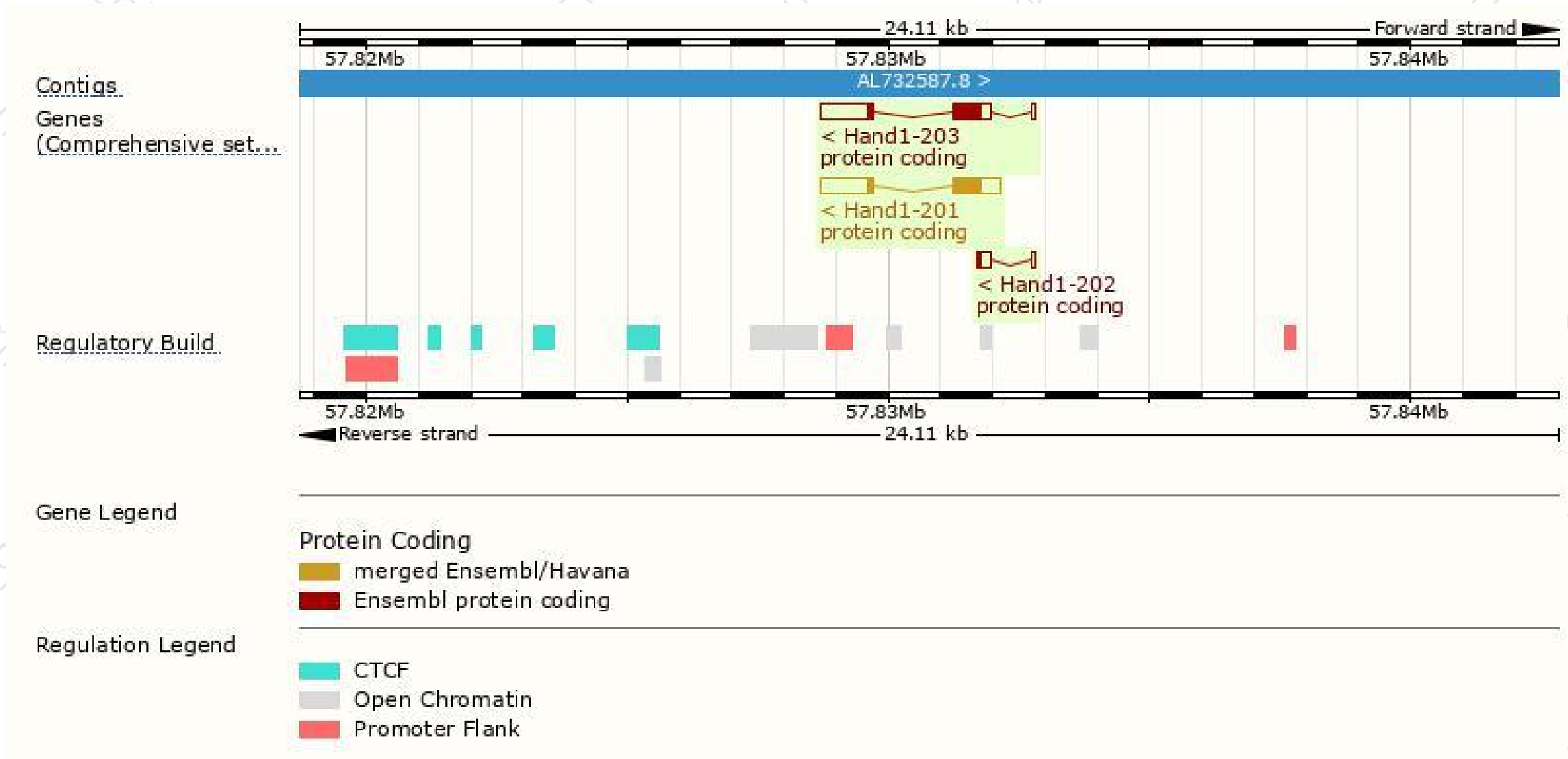
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hand1-201	ENSMUST00000036917.2	1904	216aa	Protein coding	CCDS24721	Q5SQG1 Q64279	TSL:1 GENCODE basic APPRIS P1
Hand1-203	ENSMUST00000160392.8	1806	216aa	Protein coding	CCDS24721	Q5SQG1 Q64279	TSL:1 GENCODE basic APPRIS P1
Hand1-202	ENSMUST00000108845.2	354	31aa	Protein coding	-	Q5SQG0	CDS 3' incomplete TSL:5

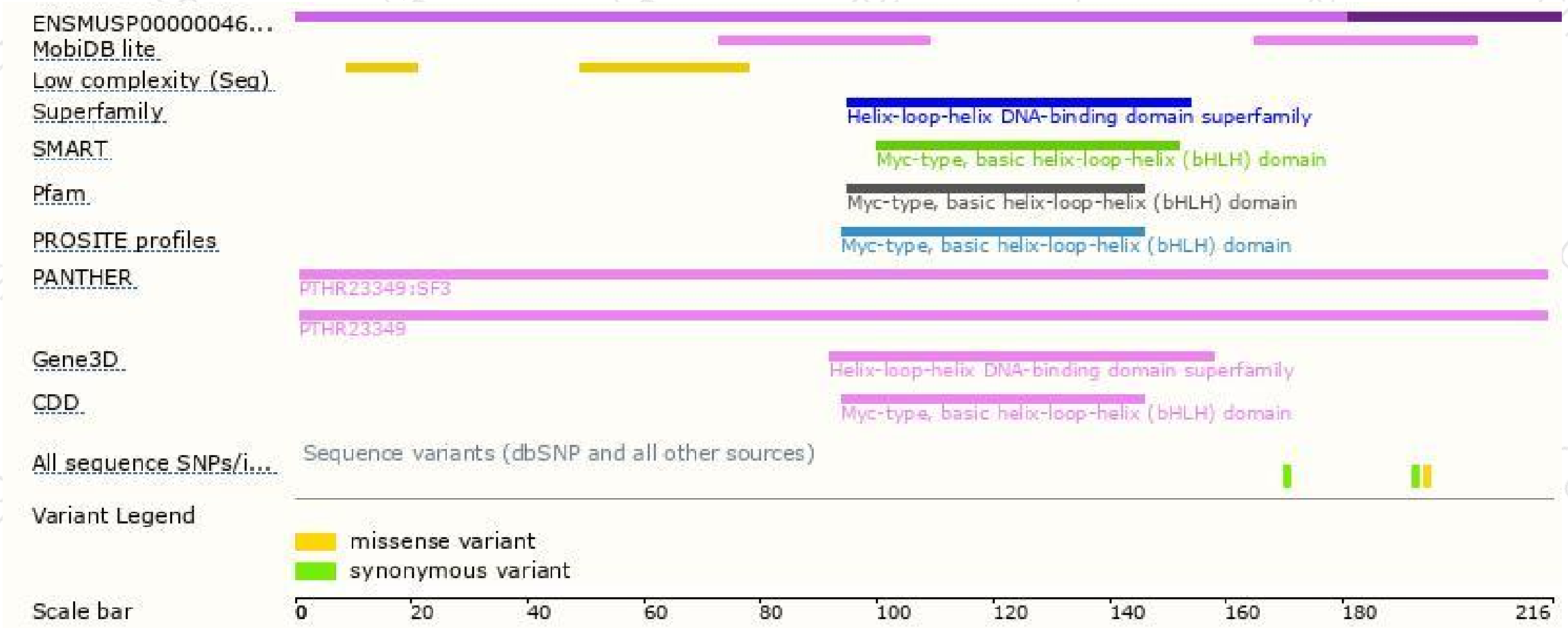
The strategy is based on the design of *Hand1-201* transcript,The transcription is shown below



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, Homozygotes for targeted null mutations die at embryonic day 8.5-9.5 with yolk sac abnormalities associated with a deficiency of extraembryonic mesoderm and defective trophoblast differentiation.

Tetraploid chimeric rescue slightly extends development.

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

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