Hand2 Cas9-KO Strategy

Designer: Huan Wang

Reviewer: Huan Fan

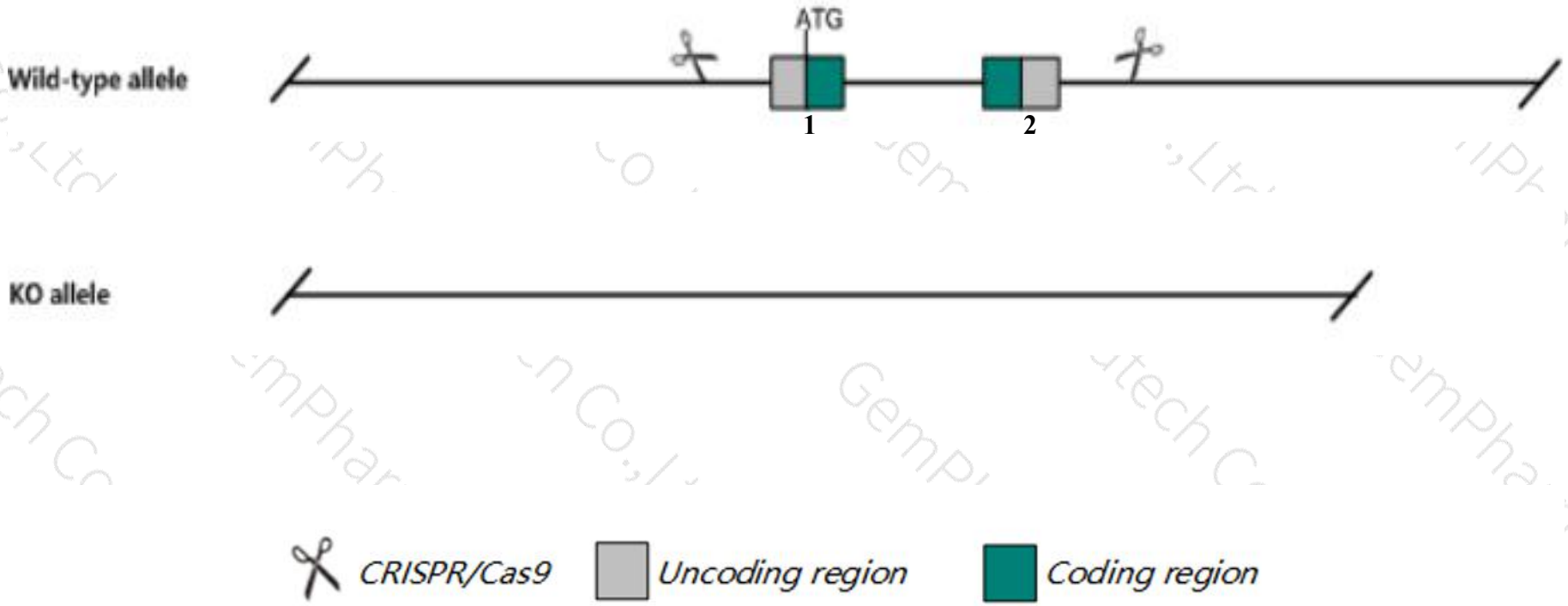
Design Date: 2020-4-16

Project Overview

Project Name	***Hand2***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hand2* gene. The schematic diagram is as follows:



Technical routes

➢ The *Hand2* gene has 1 transcript. According to the structure of *Hand2* gene, exon1-exon2 of *Hand2-201* (ENSMUST00000040104.4) 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 *Hand2* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,homozygous targeted null mutants have defects of the neural crest component of branchial and aortic arches and die from heart failure at embryonic day 10.5. targeted branchial arch specific enhancer mutants show craniofacial defects and die perinatally.
- The KO region contains functional region of the Hand2os1 gene.Knockout the region may affect the function of Hand2os1 gene
- The *Hand2* gene is located on the Chr8. 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

Hand2 heart and neural crest derivatives expressed 2 [Mus musculus (house mouse)]

Gene ID: 15111, updated on 13-Mar-2020

Summary

Official Symbol	Hand2 provided by MGI
Official Full Name	heart and neural crest derivatives expressed 2 provided by MGI
Primary source	MGI:MGI:103580
See related	Ensembl:ENSMUSG00000038193
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	AI225906, AI661148, Ehand2, Hed, Th2, Thing2, bHLHa26, dHAND
Expression	Biased expression in adrenal adult (RPKM 31.8), stomach adult (RPKM 17.4) and 12 other tissues See more
Orthologs	human all

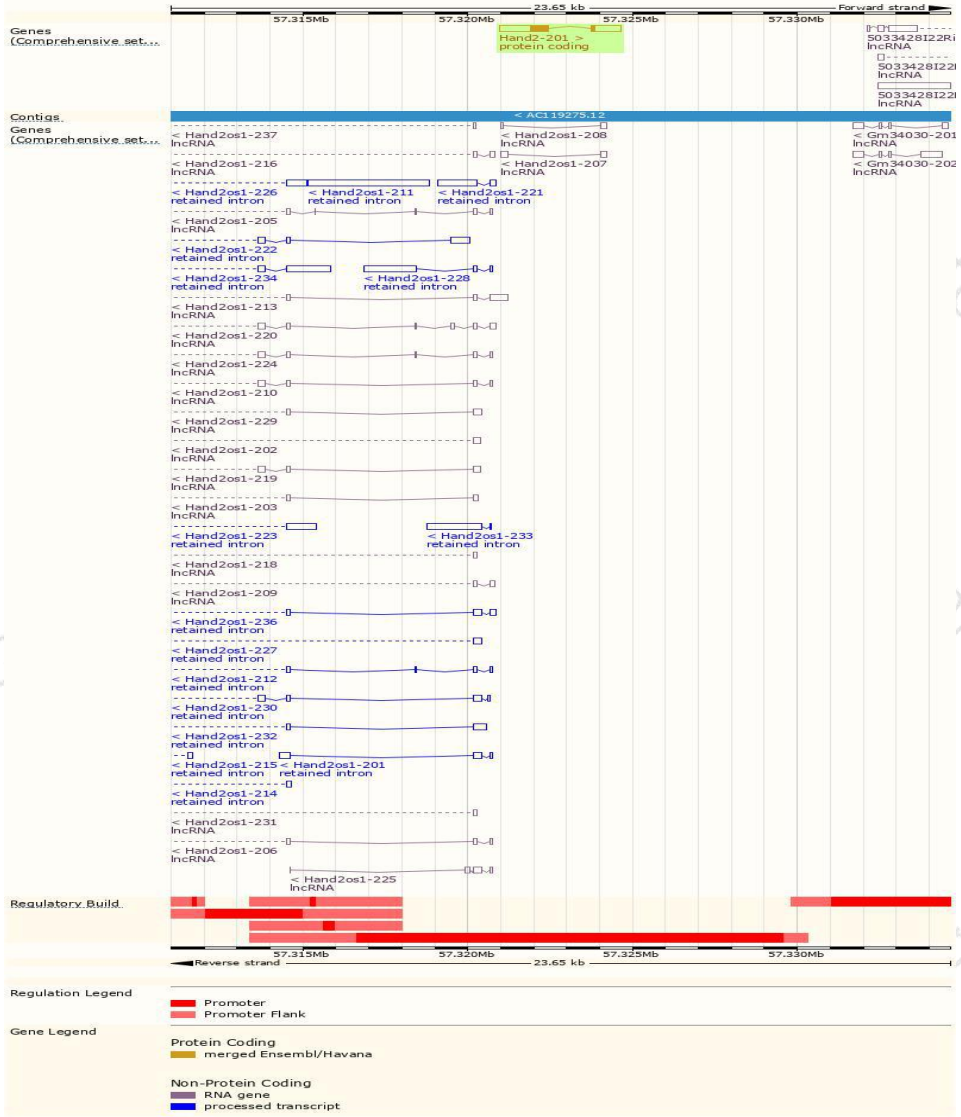
Transcript information（Ensembl）

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

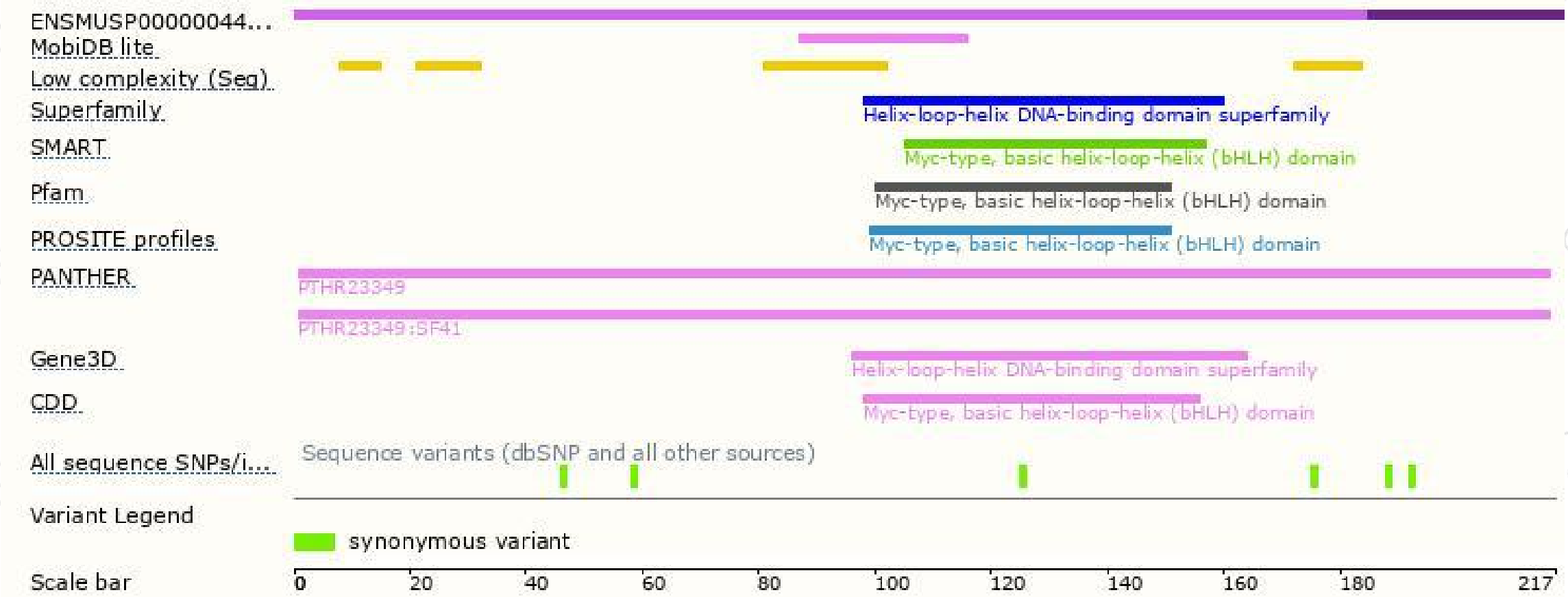
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hand2-201	ENSMUST00000040104.4	2351	217aa	Protein coding	CCDS22315	Q61039	TSL:1 GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1

The strategy is based on the design of *Hand2-201* transcript,the transcription is shown below

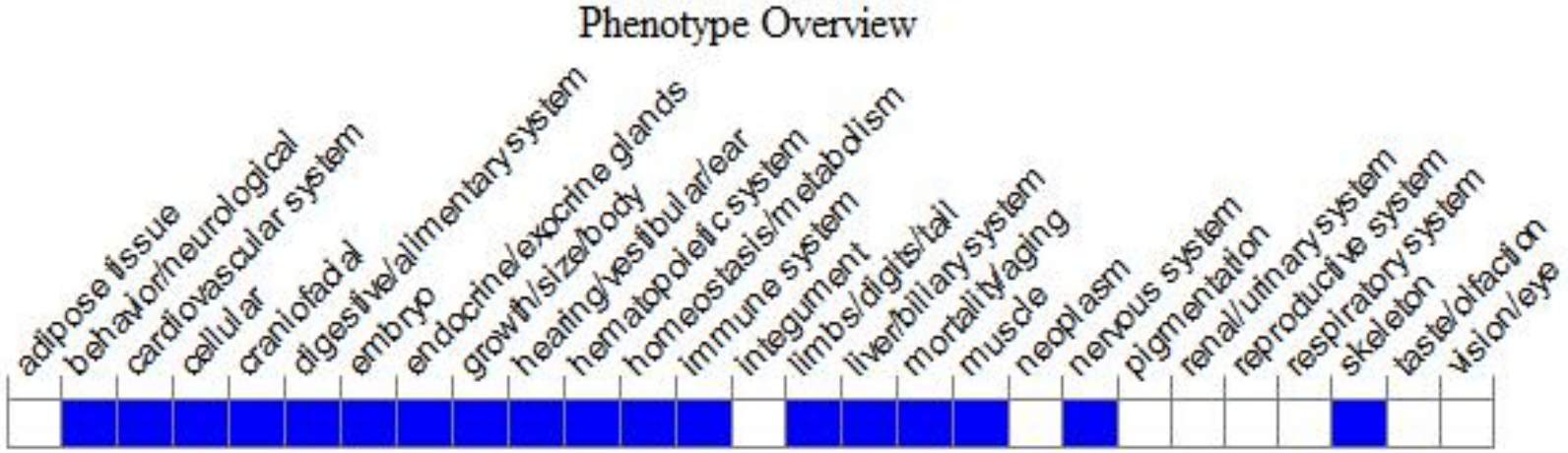
Genomic location distribution



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,homozygous targeted null mutants have defects of the neural crest component of branchial and aortic arches and die from heart failure at embryonic day 10.5. Targeted branchial arch specific enhancer mutants show craniofacial defects and die perinatally.

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