Cdh1 Cas9-KO Strategy

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Reviewer: Huan Fan

Design Date: 2019-12-25

Project Overview

Project Name	***Cdh1***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdh1* gene. The schematic diagram is as follows:

Technical routes

➢ The *Cdh1* gene has 3 transcripts. According to the structure of *Cdh1* gene, exon3 of *Cdh1-201* (ENSMUST00000000312.11) transcript is recommended as the knockout region.The region contains 224bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Cdh1* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

➢ According to the existing MGI data,In mutant homozygotes, adhesive cells of the morula dissociate shortly after initial compaction, probably due to depletion of maternal protein. Mutant embryos fail to form a trophectodermal epithelium or blastocyst cavity, and die near implantation time.

➢ The *Cdh1* 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）

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Cdh1 cadherin 1 [Mus musculus (house mouse)]

Gene ID: 12550, updated on 2-Apr-2019

Summary

Official Symbol	Cdh1 provided by MGI
Official Full Name	cadherin 1 provided by MGI
Primary source	MGI:MGI:88354
See related	Ensembl:ENSMUSG00000000303
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	AA960649, ARC-1, E-cad, Ecad, L-CAM, UVO, Um
Summary	This gene encodes E-cadherin, a calcium-dependent cell adhesion molecule that functions in the establishment and maintenance of epithelial cell morphology during embryongenesis and adulthood. The encoded preproprotein undergoes proteolytic processing to generate a mature protein. Targeted mutations disrupting binding of calcium to the encoded protein in mice cause death in utero due to failed blastocyst and trophectoderm formation. This gene is located adjacent to a related cadherin gene on chromosome 8. [provided by RefSeq, Oct 2015]
Expression	Broad expression in colon adult (RPKM 139.2), large intestine adult (RPKM 100.0) and 15 other tissuesSee more
Orthologs	human all

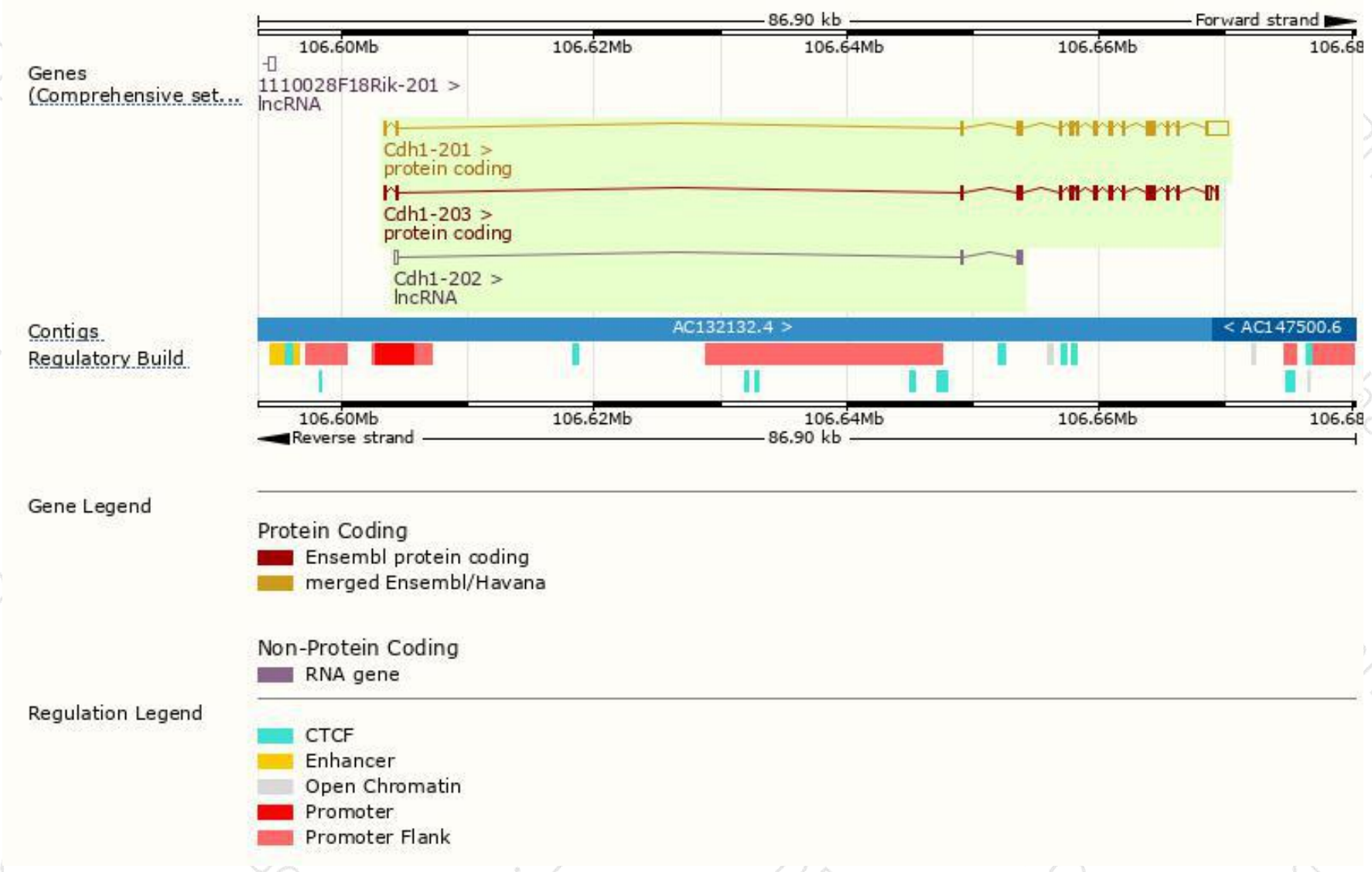
Transcript information（Ensembl）

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

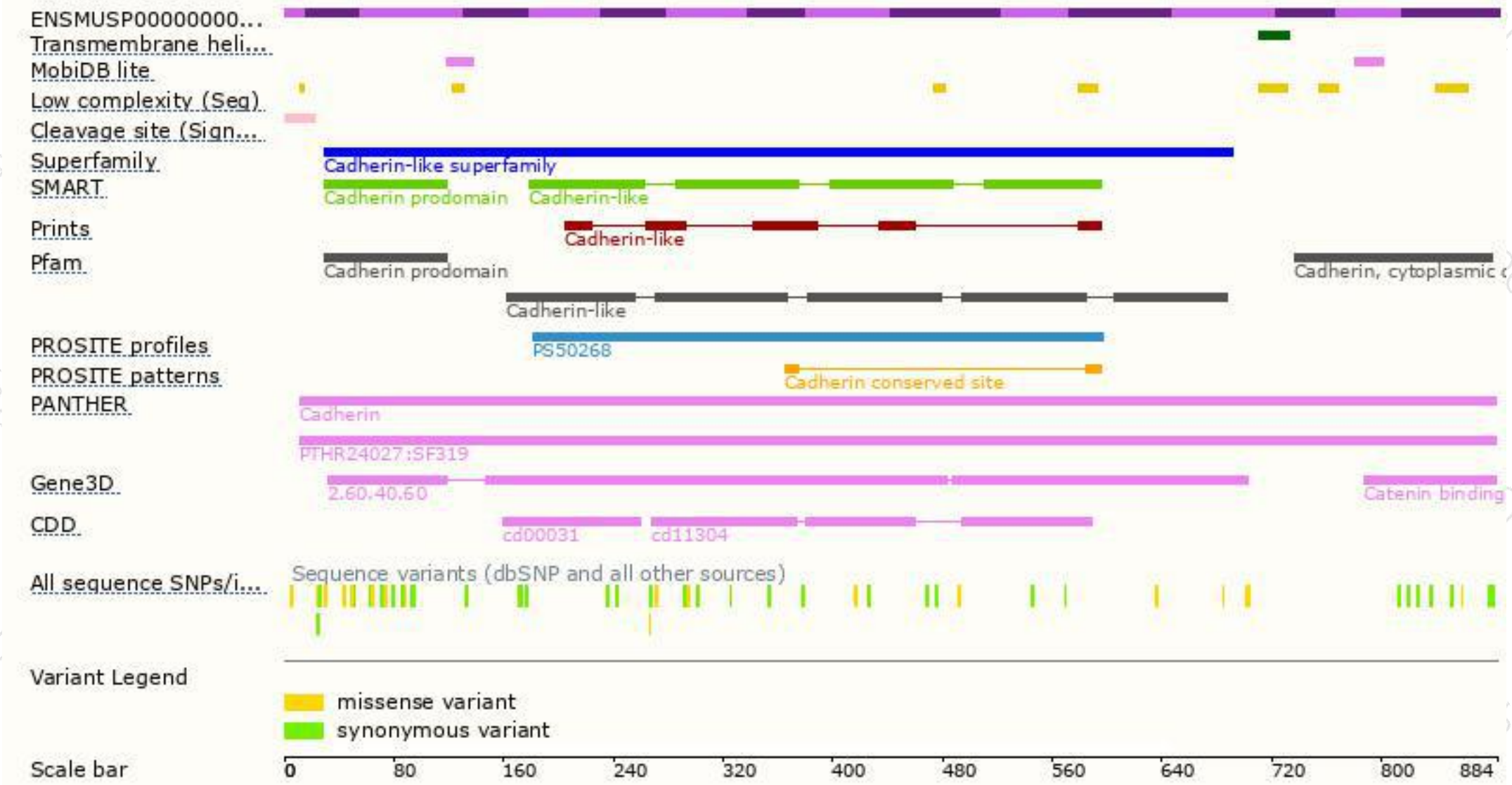
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdh1-201	ENSMUST00000000312.11	4430	884aa	Protein coding	CCDS22638	A0A0R4IZW5	TSL:1 GENCODE basic APPRIS P1
Cdh1-203	ENSMUST00000167688.1	3203	884aa	Protein coding	CCDS22638	A0A0R4IZW5	TSL:5 GENCODE basic APPRIS P1
Cdh1-202	ENSMUST00000136580.1	789	No protein	lncRNA	-	-	TSL:2

The strategy is based on the design of *Cdh1-201* transcript,The transcription is shown below

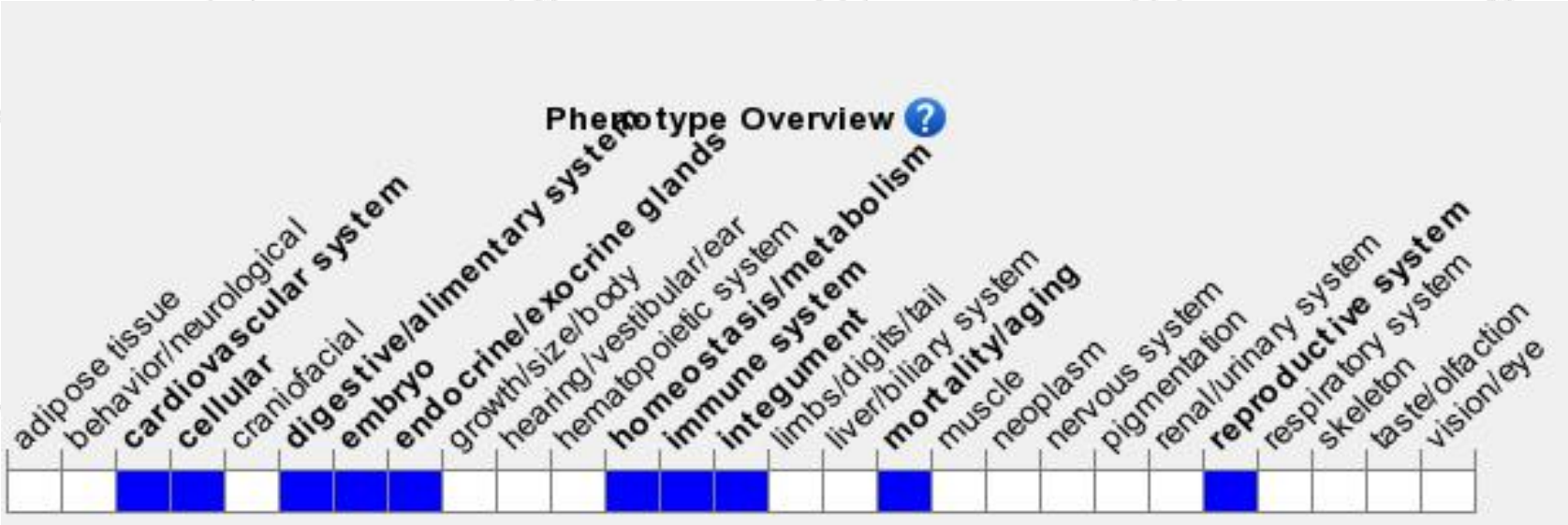
Genomic location distribution



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/).

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

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