

Dsc3 Cas9-KO Strategy

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Project Overview

Project Name

Dsc3

Project type

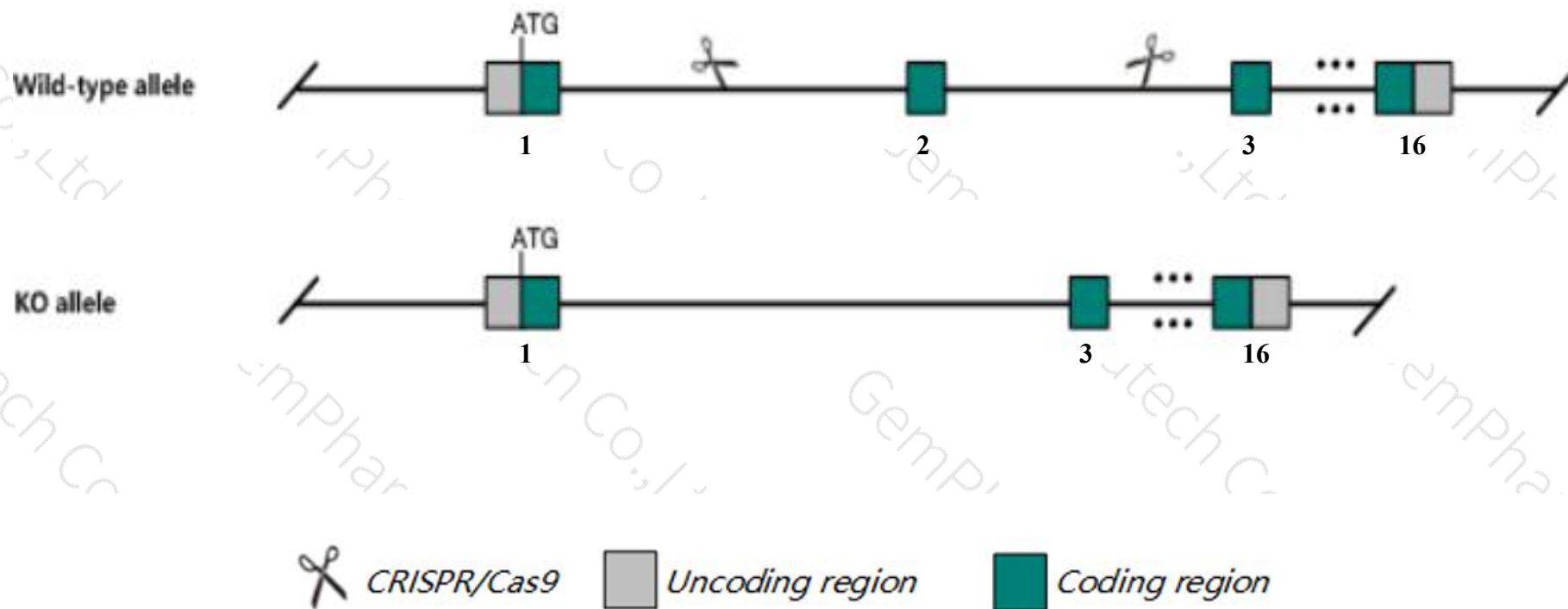
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Dsc3* gene. The schematic diagram is as follows:



- The *Dsc3* gene has 3 transcripts. According to the structure of *Dsc3* gene, exon2 of *Dsc3-201*(ENSMUST00000115848.4) transcript is recommended as the knockout region. The region contains 85bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Dsc3* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, homozygous null mice die before implantation. Heterozygous mice do not display any gross abnormalities and have normal epidermal development and keratinocyte differentiation.
- The *Dsc3* gene is located on the Chr18. 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)

Dsc3 desmocollin 3 [Mus musculus (house mouse)]

Gene ID: 13507, updated on 13-Mar-2020

Summary

Official Symbol Dsc3 provided by [MGI](#)

Official Full Name desmocollin 3 provided by [MGI](#)

Primary source [MGI:MGI:1194993](#)

See related [Ensembl:ENSMUSG00000059898](#)

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 5430426I24Rik

Summary This gene encodes a member of the cadherin family of proteins that mediates adhesion in desmosomes. Together with desmogleins, the encoded protein forms the transmembrane core of desmosomes, a multiprotein complex involved in cell adhesion, organization of the cytoskeleton, cell sorting and cell signaling. Mice lacking the encoded protein exhibit a pre-implantation lethal phenotype. This gene is located in a cluster of desmosomal cadherin genes on chromosome 18. This gene encodes distinct isoforms, some or all of which may undergo similar processing to generate the mature protein. [provided by RefSeq, Jul 2016]

Expression Biased expression in limb E14.5 (RPKM 3.5), mammary gland adult (RPKM 1.1) and 6 other tissues [See more](#)

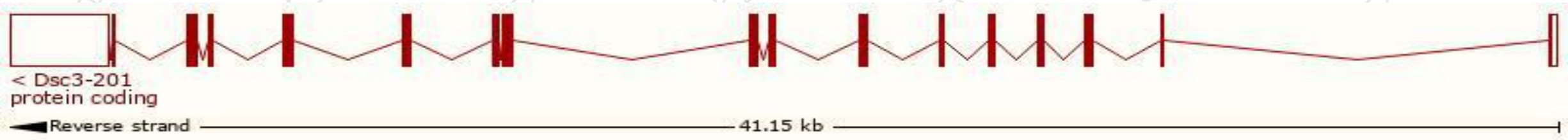
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

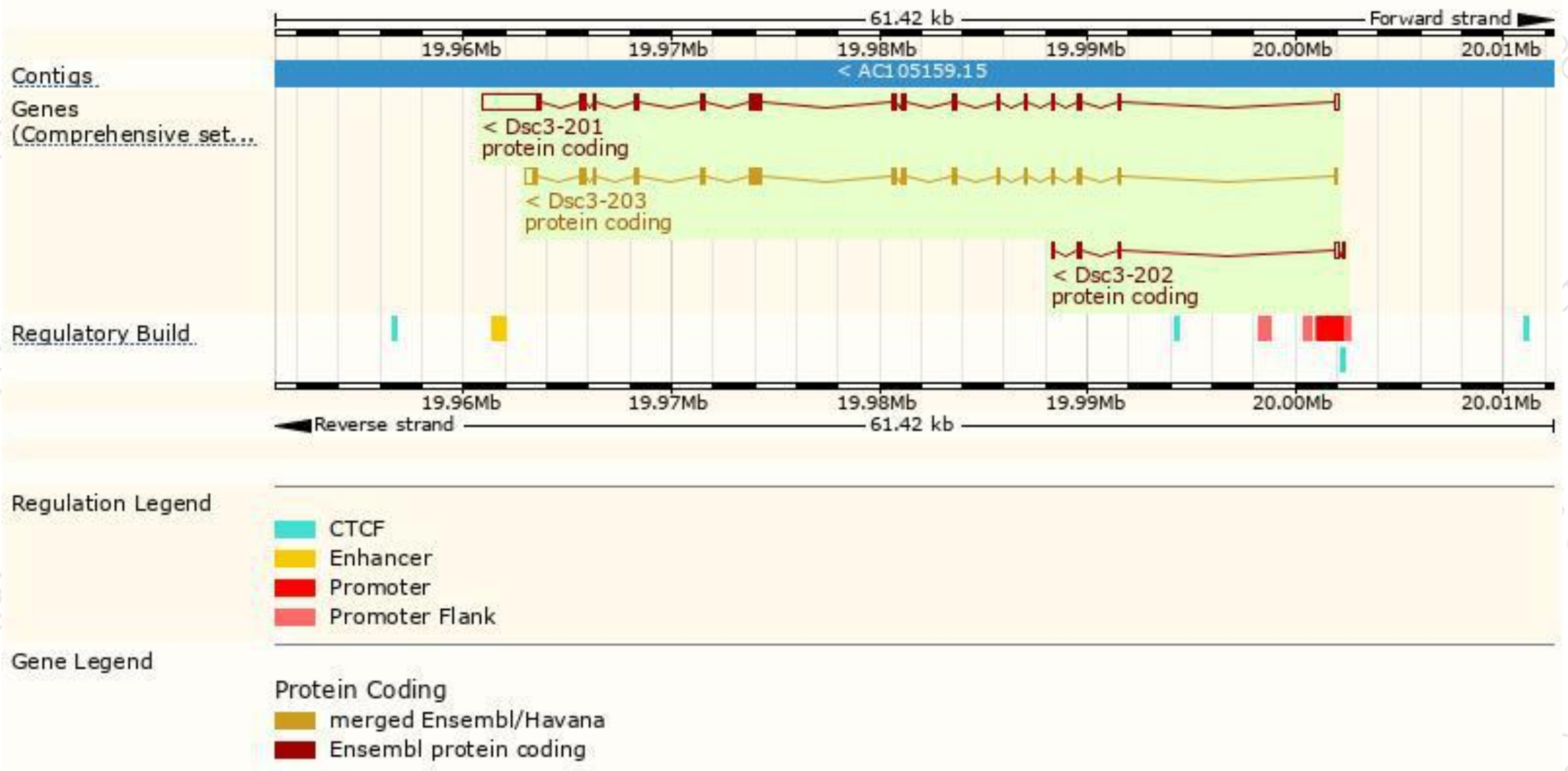
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dsc3-203	ENSMUST00000225110.1	3123	896aa	Protein coding	CCDS37744	P55850	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 P2
Dsc3-201	ENSMUST00000115848.4	5333	839aa	Protein coding	-	P55850	TSL:2 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 ALT2
Dsc3-202	ENSMUST00000223946.1	674	152aa	Protein coding	-	A0A286YD62	CDS 3' incomplete

The strategy is based on the design of *Dsc3-201* transcript,the transcription is shown below:



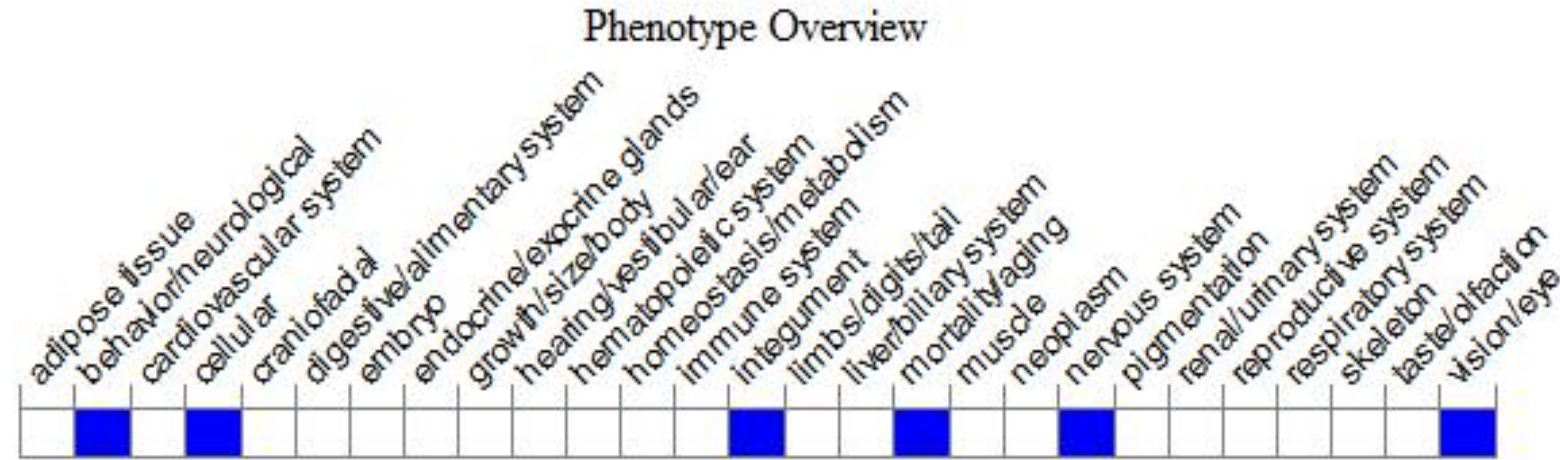
Genomic location distribution



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 null mice die before implantation. Heterozygous mice do not display any gross abnormalities and have normal epidermal development and keratinocyte differentiation.

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

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