

Cdh23 Cas9-KO Strategy

Designer:

Huimin Su

Reviewer:

Ruirui Zhang

Design Date:

2020/1/22

Project Overview

Project Name

Cdh23

Project type

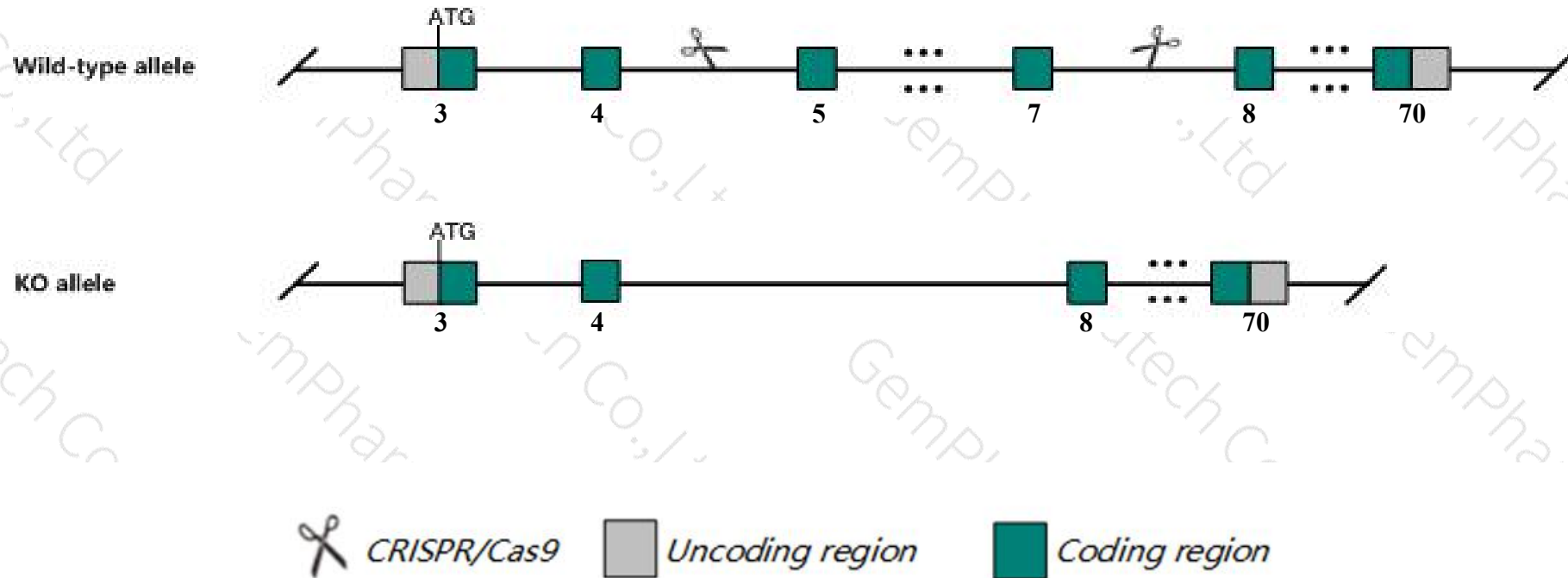
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdh23* gene. The schematic diagram is as follows:



- The *Cdh23* gene has 16 transcripts. According to the structure of *Cdh23* gene, exon5-exon7 of *Cdh23-205* (ENSMUST00000105464.8) transcript is recommended as the knockout region. The region contains 284bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cdh23* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mutant mice exhibit circling behavior, tilting of the head and are deaf. Mice homozygous for a targeted knock-out exhibit abnormal outer hair cells morphology.
- The *Cdh23* gene is located on the Chr10. 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)

Cdh23 cadherin 23 (otocadherin) [*Mus musculus* (house mouse)]

Gene ID: 22295, updated on 19-Nov-2019

Summary

Official Symbol	Cdh23 provided by MGI
Official Full Name	cadherin 23 (otocadherin) provided by MGI
Primary source	MGI:MGI:1890219
See related	Ensembl:ENSMUSG00000012819
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	v; ahl; bob; bus; ahl1; mdfw; sals; USH1D; nmf112; nmf181; nmf252; 4930542A03Rik
Expression	Biased expression in testis adult (RPKM 8.3), heart adult (RPKM 1.0) and 8 other tissues See more
Orthologs	human all

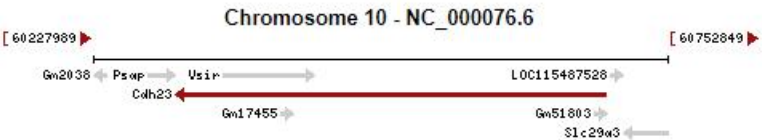
Genomic context

Location: 10 B4; 10 30.11 cM

See Cdh23 in [Genome Data Viewer](#)

Exon count: 73

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	10	NC_000076.6 (60302748..60696513, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	10	NC_000076.5 (59766022..60159238, complement)

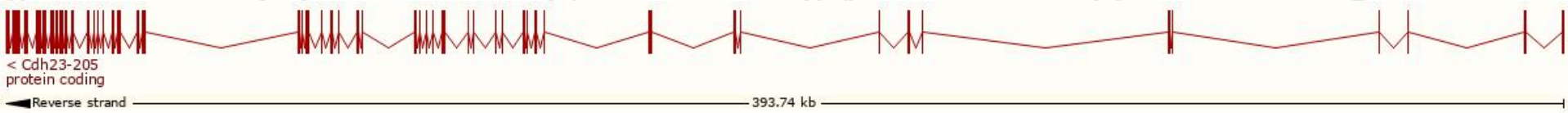


Transcript information (Ensembl)

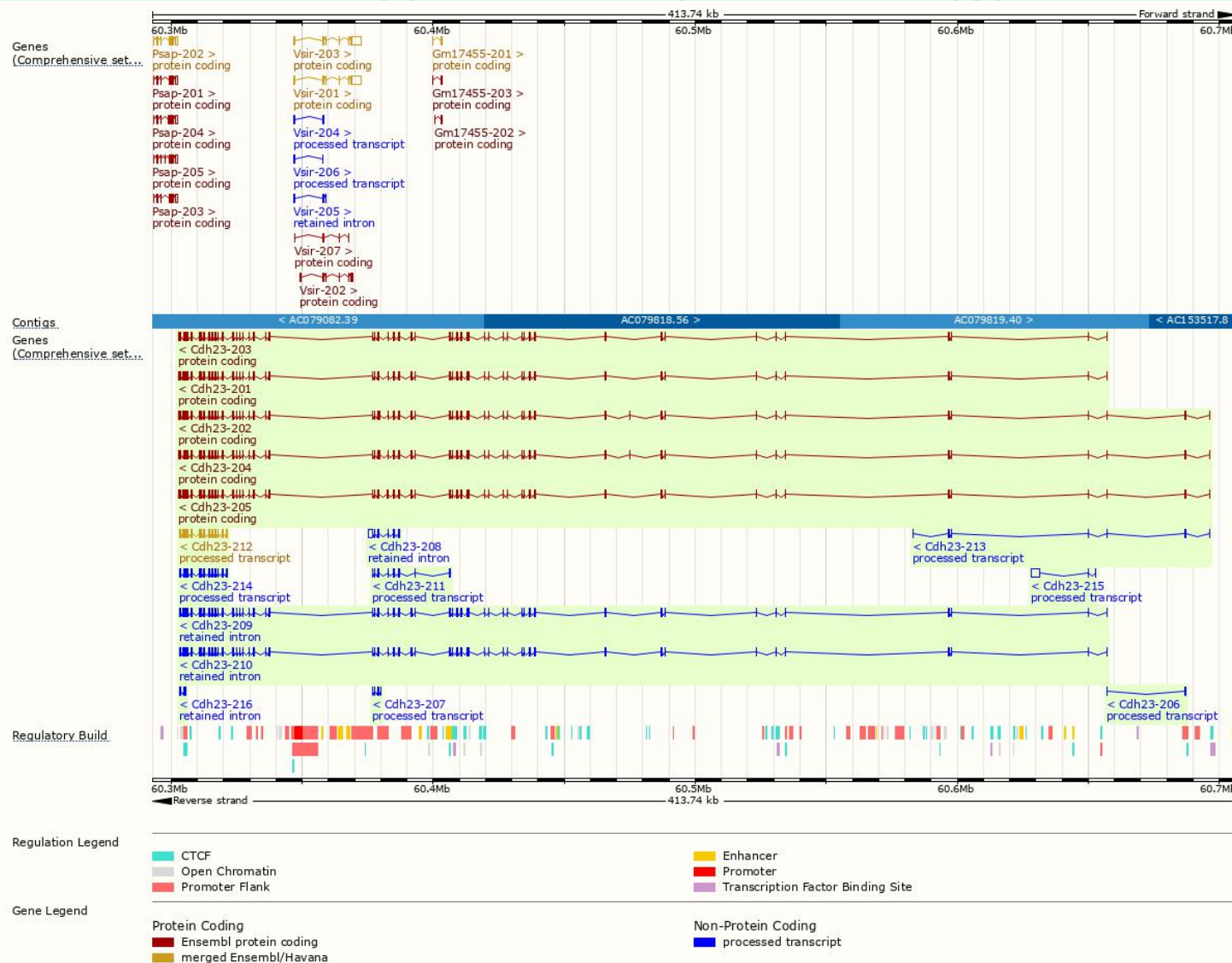
The gene has 16 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdh23-205	ENSMUST00000105464.8	11090	3352aa	Protein coding	CCDS56704.4	K4DI74	TSL:5 GENCODE basic APPRIS P2
Cdh23-202	ENSMUST00000105461.9	11096	3354aa	Protein coding	-	Q99PF4	TSL:5 GENCODE basic APPRIS ALT2
Cdh23-204	ENSMUST00000105463.8	10991	3319aa	Protein coding	-	Q99PF4	TSL:5 GENCODE basic APPRIS ALT2
Cdh23-201	ENSMUST00000073242.10	10688	3353aa	Protein coding	-	F8WIF5	TSL:5 GENCODE basic APPRIS ALT2
Cdh23-203	ENSMUST00000105462.7	10592	3321aa	Protein coding	-	E9Q7M6	TSL:5 GENCODE basic APPRIS ALT2
Cdh23-212	ENSMUST00000151194.7	3787	No protein	Processed transcript	-	-	TSL:1
Cdh23-214	ENSMUST00000153525.7	3682	No protein	Processed transcript	-	-	TSL:1
Cdh23-215	ENSMUST00000153677.1	3041	No protein	Processed transcript	-	-	TSL:1
Cdh23-211	ENSMUST00000144462.7	1510	No protein	Processed transcript	-	-	TSL:5
Cdh23-213	ENSMUST00000153149.7	1052	No protein	Processed transcript	-	-	TSL:1
Cdh23-207	ENSMUST00000124712.1	650	No protein	Processed transcript	-	-	TSL:3
Cdh23-206	ENSMUST00000123309.1	438	No protein	Processed transcript	-	-	TSL:2
Cdh23-210	ENSMUST00000135638.7	10435	No protein	Retained intron	-	-	TSL:5
Cdh23-209	ENSMUST00000128249.7	10295	No protein	Retained intron	-	-	TSL:5
Cdh23-208	ENSMUST00000127312.7	2574	No protein	Retained intron	-	-	TSL:5
Cdh23-216	ENSMUST00000156501.1	1064	No protein	Retained intron	-	-	TSL:2

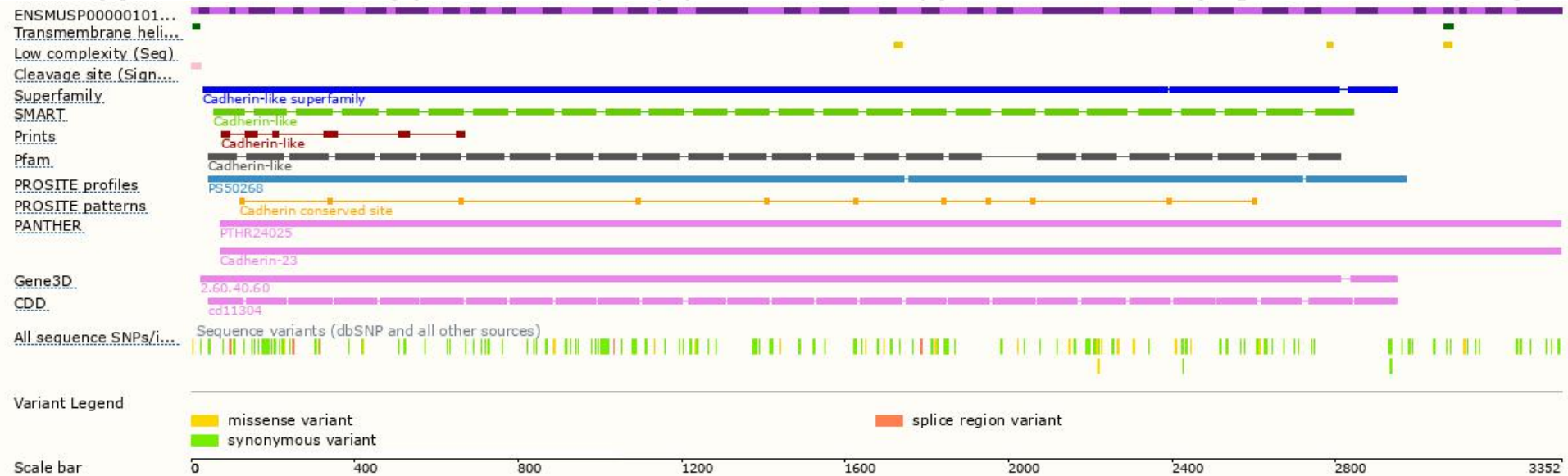
The strategy is based on the design of *Cdh23-205* transcript,The transcription is shown below



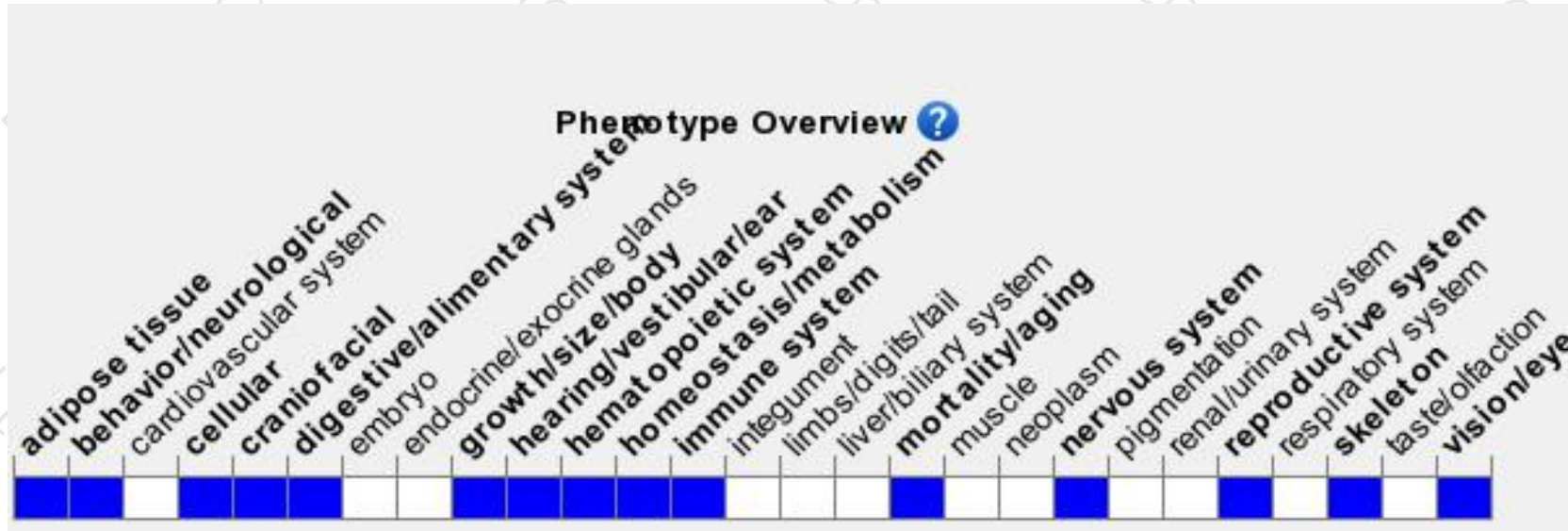
Genomic location distribution



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, Mutant mice exhibit circling behavior, tilting of the head and are deaf. Mice homozygous for a targeted knock-out exhibit abnormal outer hair cells morphology.

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

Tel: 400-9660890

