

# *Ush1c* Cas9-KO Strategy

**Designer:**

**Ruirui Zhang**

**Reviewer:**

**Huimin Su**

**Design Date:**

**2019-11-13**

# Project Overview

**Project Name**

*Ush1c*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ush1c* gene. The schematic diagram is as follows:



- The *Ush1c* gene has 9 transcripts. According to the structure of *Ush1c* gene, exon2-exon8 of *Ush1c-201* (ENSMUST00000009667.11) transcript is recommended as the knockout region. The region contains 638bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ush1c* gene. The brief process is as follows: gRNA was transcribed in vitro. Cas9 and gRNA 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, mutations at this locus affect hearing and result in movement anomalies generally associated with vestibular mutants, such as head tossing and circling.
- The *Ush1c* gene is located on the Chr7. 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)

## Ush1c USH1 protein network component harmonin [ *Mus musculus* (house mouse) ]

Gene ID: 72088, updated on 24-Sep-2019

### Summary

Official Symbol	Ush1c provided by <a href="#">MGI</a>
Official Full Name	USH1 protein network component harmonin provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:1919338</a>
See related	<a href="#">Ensembl:ENSMUSG00000030838</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	harmonin; 2010016F01Rik
Expression	Biased expression in large intestine adult (RPKM 31.9), colon adult (RPKM 22.1) and 4 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

The gene has 9 transcripts,all transcripts are shown below:

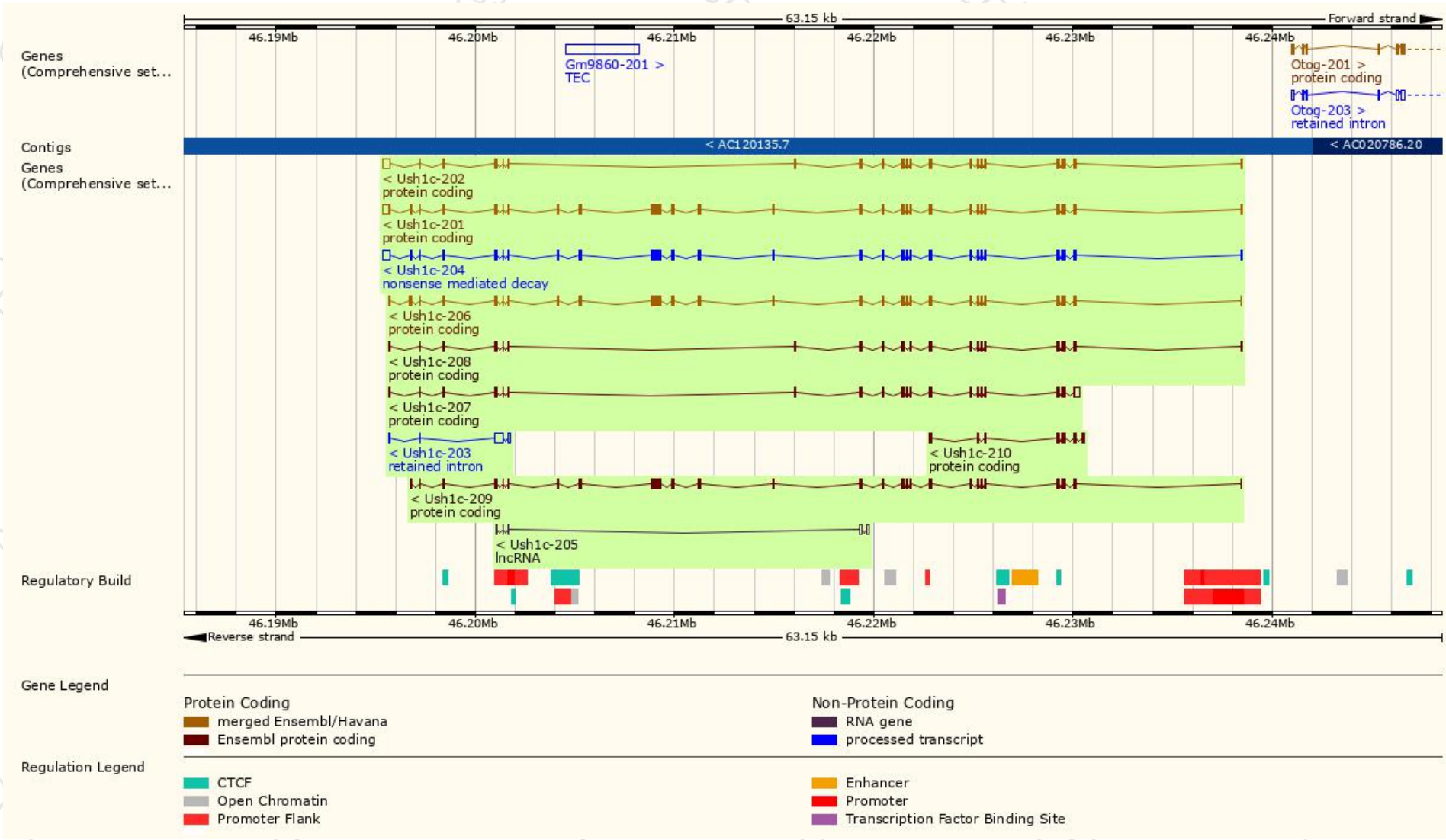
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ush1c-201	<a href="#">ENSMUST00000009667.11</a>	3072	<a href="#">910aa</a>	Protein coding	<a href="#">CCDS21276</a>	<a href="#">E9QMN1</a>	TSL:1 GENCODE basic APPRIS P3
Ush1c-206	<a href="#">ENSMUST00000154292.8</a>	2767	<a href="#">891aa</a>	Protein coding	<a href="#">CCDS52250</a>	<a href="#">E9PYX1</a>	TSL:1 GENCODE basic
Ush1c-209	<a href="#">ENSMUST00000222454.1</a>	2580	<a href="#">859aa</a>	Protein coding	<a href="#">CCDS85309</a>	<a href="#">D6RIM8</a>	TSL:5 GENCODE basic
Ush1c-202	<a href="#">ENSMUST00000078680.12</a>	2047	<a href="#">548aa</a>	Protein coding	<a href="#">CCDS39963</a>	<a href="#">A0A0R4J0Z8</a>	TSL:1 GENCODE basic APPRIS ALT2
Ush1c-207	<a href="#">ENSMUST00000176371.1</a>	1865	<a href="#">517aa</a>	Protein coding	-	<a href="#">H3BIZ2</a>	TSL:5 GENCODE basic
Ush1c-208	<a href="#">ENSMUST00000177212.7</a>	1696	<a href="#">529aa</a>	Protein coding	-	<a href="#">H3BLC4</a>	TSL:5 GENCODE basic
Ush1c-210	<a href="#">ENSMUST00000238793.1</a>	711	<a href="#">223aa</a>	Protein coding	-	-	CDS 3' incomplete
Ush1c-204	<a href="#">ENSMUST00000143155.7</a>	3036	<a href="#">859aa</a>	Nonsense mediated decay	-	<a href="#">D6RIM8</a>	TSL:1
Ush1c-203	<a href="#">ENSMUST00000129266.2</a>	708	No protein	Retained intron	-	-	TSL:5
Ush1c-205	<a href="#">ENSMUST00000148527.1</a>	395	No protein	lncRNA	-	-	TSL:3

The strategy is based on the design of *Ush1c-201* transcript,the transcription is shown below:



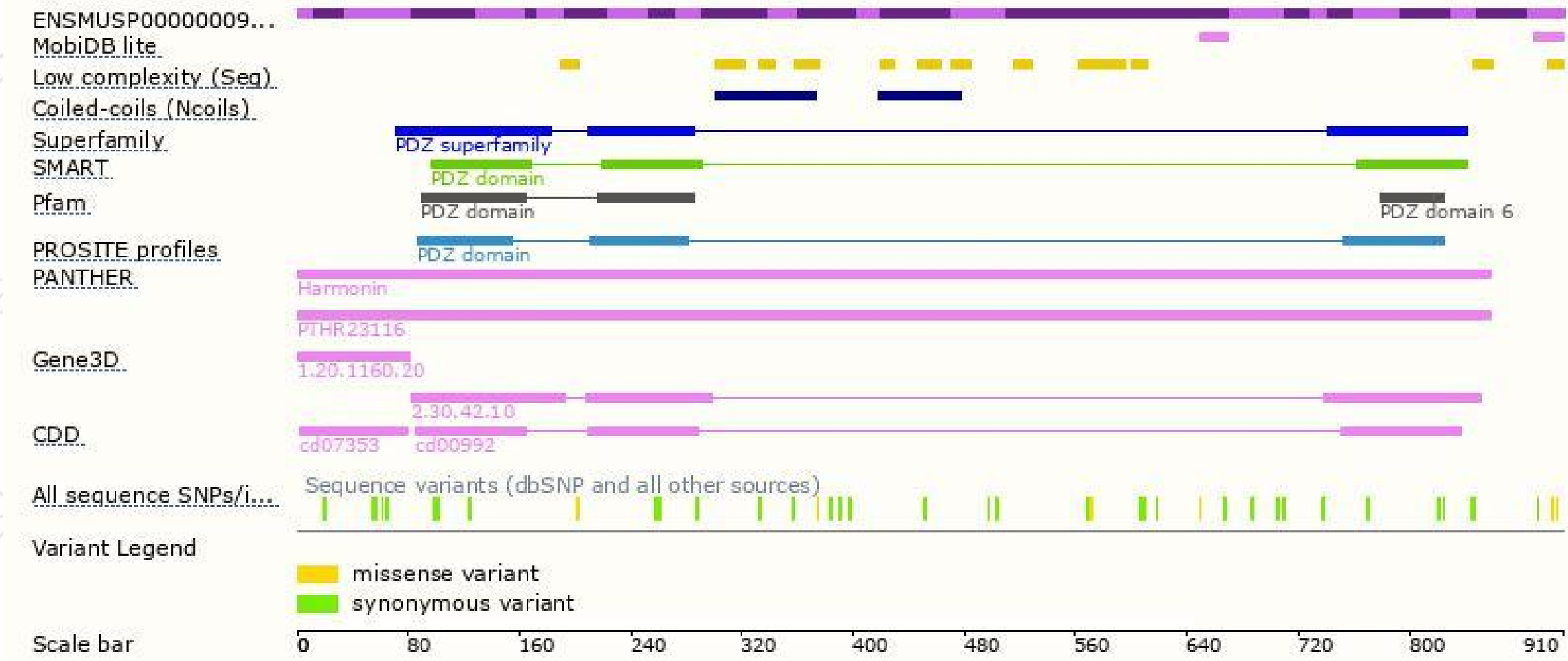


# Genomic location distribution

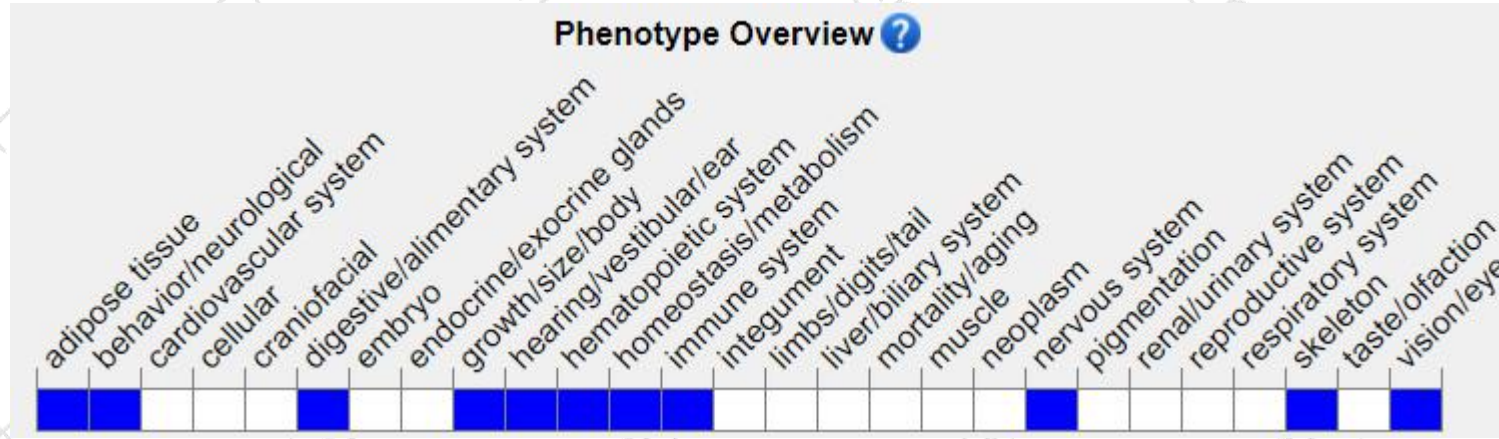




# Protein domain



# 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, mutations at this locus affect hearing and result in movement anomalies generally associated with vestibular mutants, such as head tossing and circling.

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

Tel: 400-9660890

