Ush2a Cas9-KO Strategy

Designer: Xiaojing Li
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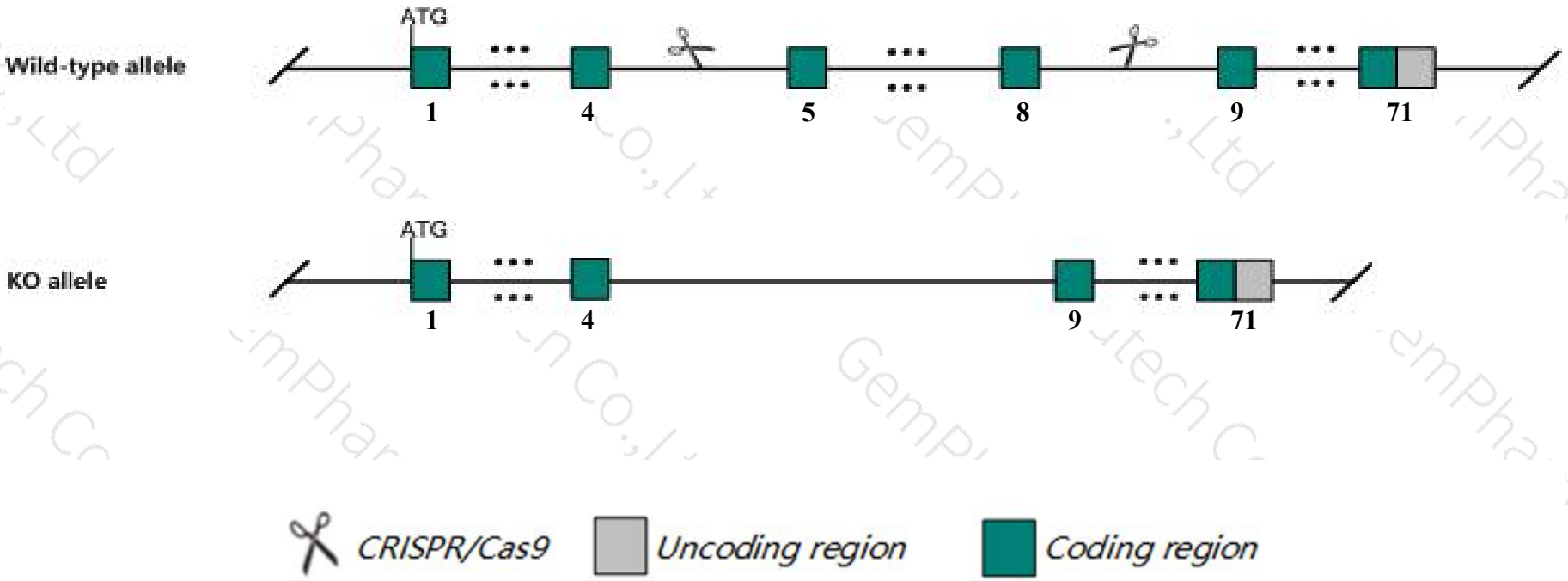
Reviewer: JiaYu

Project Overview

Project Name	***Ush2a***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ush2a* gene. The schematic diagram is as follows:



Technical routes

➢ The *Ush2a* gene has 5 transcripts. According to the structure of *Ush2a* gene, exon5-exon8 of *Ush2a-201* (ENSMUST00000060479.13) transcript is recommended as the knockout region.The region contains 796bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Ush2a* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Mice homozygous for a knock-out allele display progressive retinal photoreceptor degeneration along with significantly reduced a- and b-wave amplitudes, and a moderate but nonprogressive high-frequency hearing loss associated with widespread loss of outer hair cells in the basal turn of the cochlea.

- The *Ush2a* gene is located on the Chr1. 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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Ush2a usherin [*Mus musculus* (house mouse)]

Gene ID: 22283, updated on 10-Oct-2019

Summary

Official Symbol	Ush2a provided by MGI
Official Full Name	usherin provided by MGI
Primary source	MGI:MGI:1341292
See related	Ensembl:ENSMUSG00000026609
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	Gm676; Gm983; Ushrn; Mush2a; A930011D15Rik; A930037M10Rik
Expression	Biased expression in testis adult (RPKM 1.3) and ovary adult (RPKM 0.0) See more
Orthologs	human all

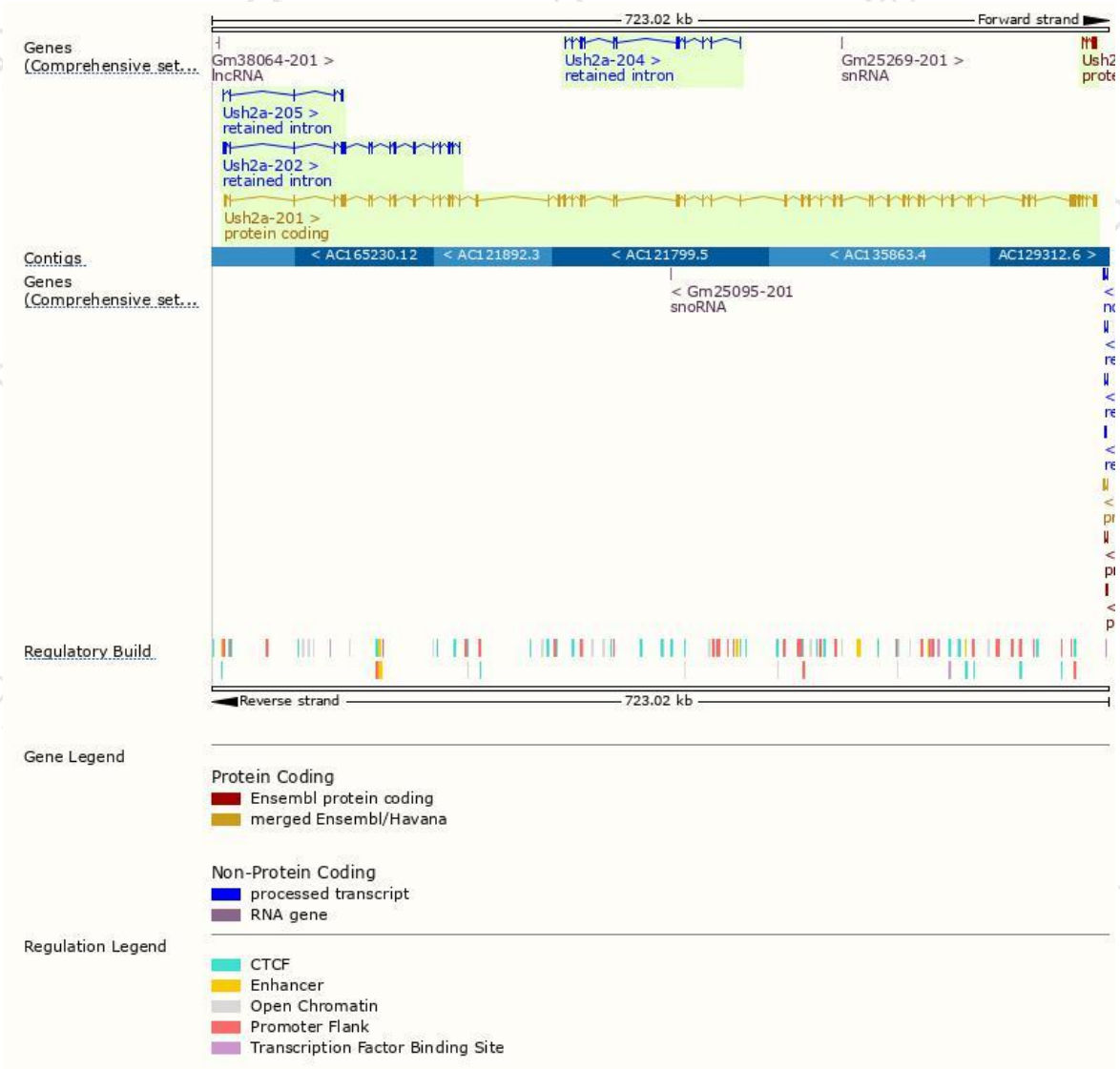
Transcript information（Ensembl）

The gene has 5 transcripts,all transcripts are shown below:

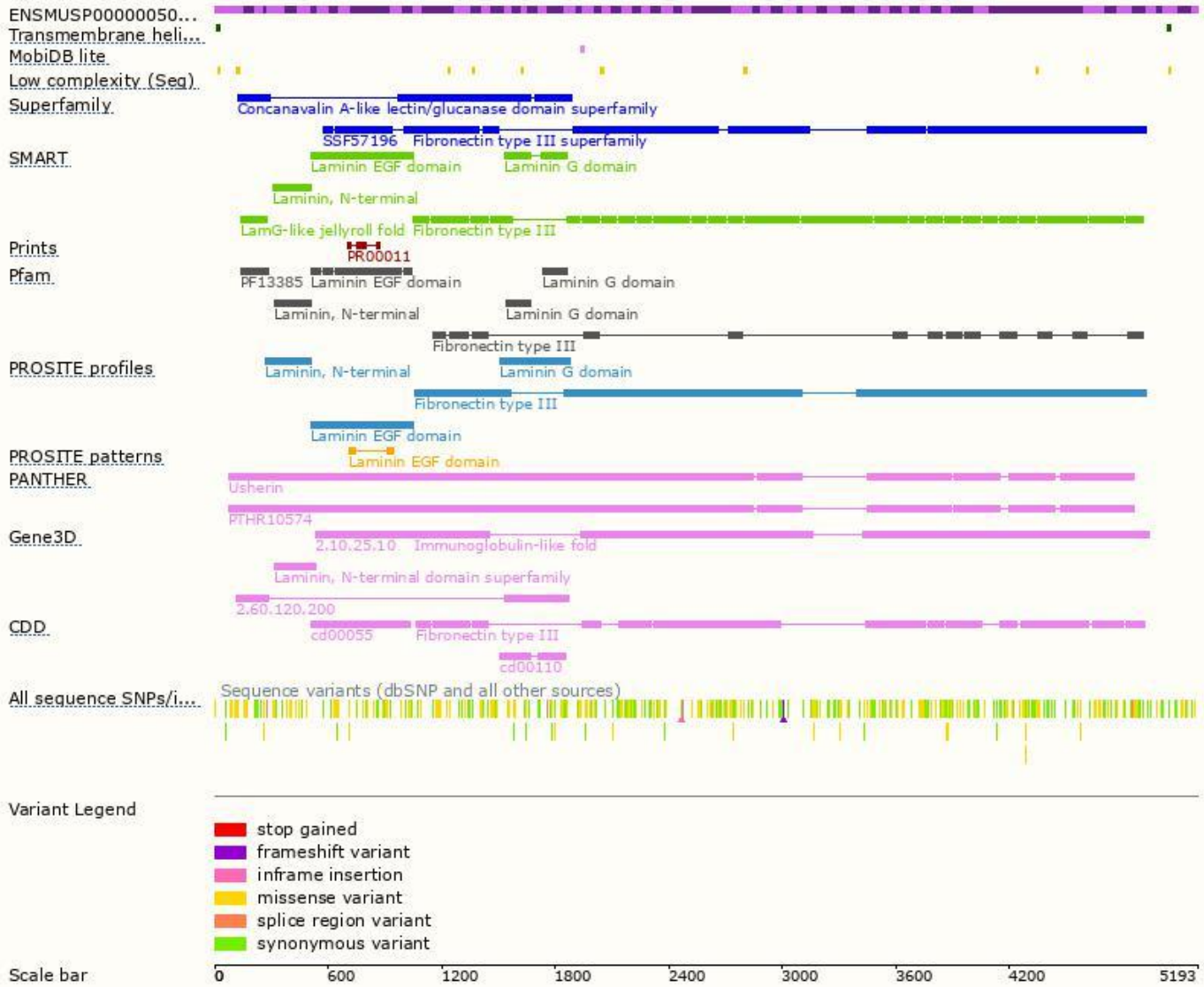
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ush2a-201	ENSMUST00000060479.13	15695	5193aa	Protein coding	CCDS15607	Q2QI47	TSL:1 GENCODE basic APPRIS P1
Ush2a-203	ENSMUST00000127077.1	750	237aa	Protein coding	-	F6TQ19	CDS 5' incomplete TSL:5
Ush2a-202	ENSMUST00000124358.1	5126	No protein	Retained intron	-	-	TSL:1
Ush2a-204	ENSMUST00000142159.1	2282	No protein	Retained intron	-	-	TSL:1
Ush2a-205	ENSMUST00000142189.7	1236	No protein	Retained intron	-	-	TSL:1

The strategy is based on the design of *Ush2a-201* transcript,The transcription is shown below

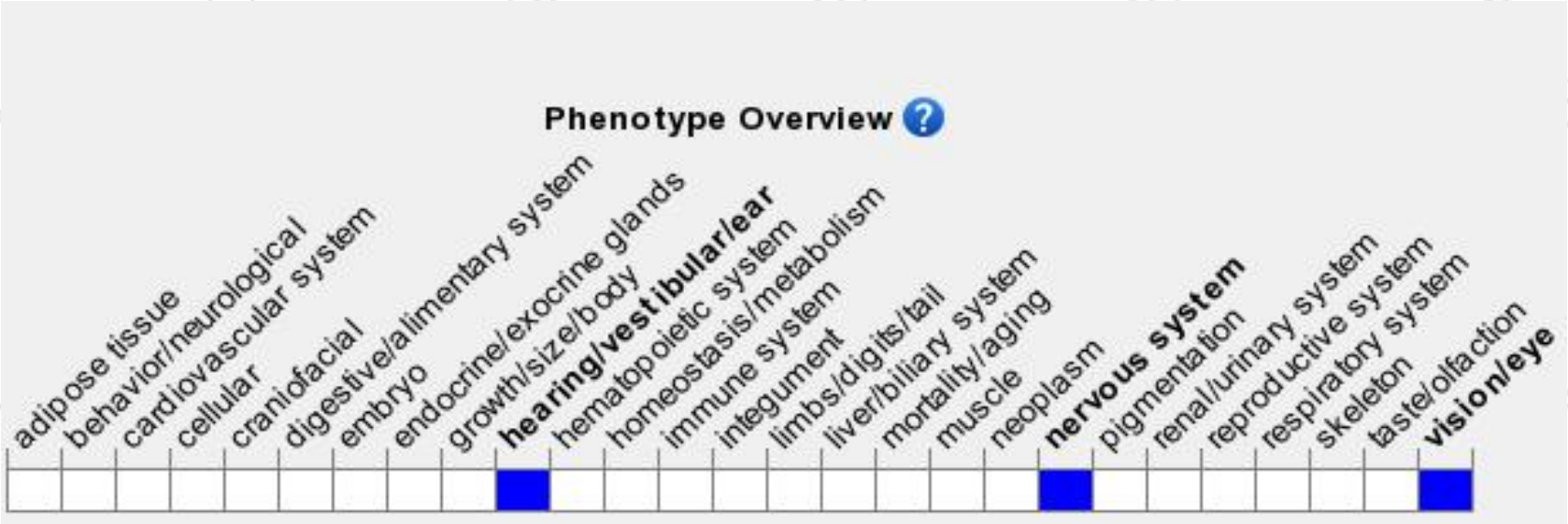
Genomic location distribution



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.

Tel: 400-9660890

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GemPharmatech Co.,Ltd