Usp53 Cas9-KO Strategy

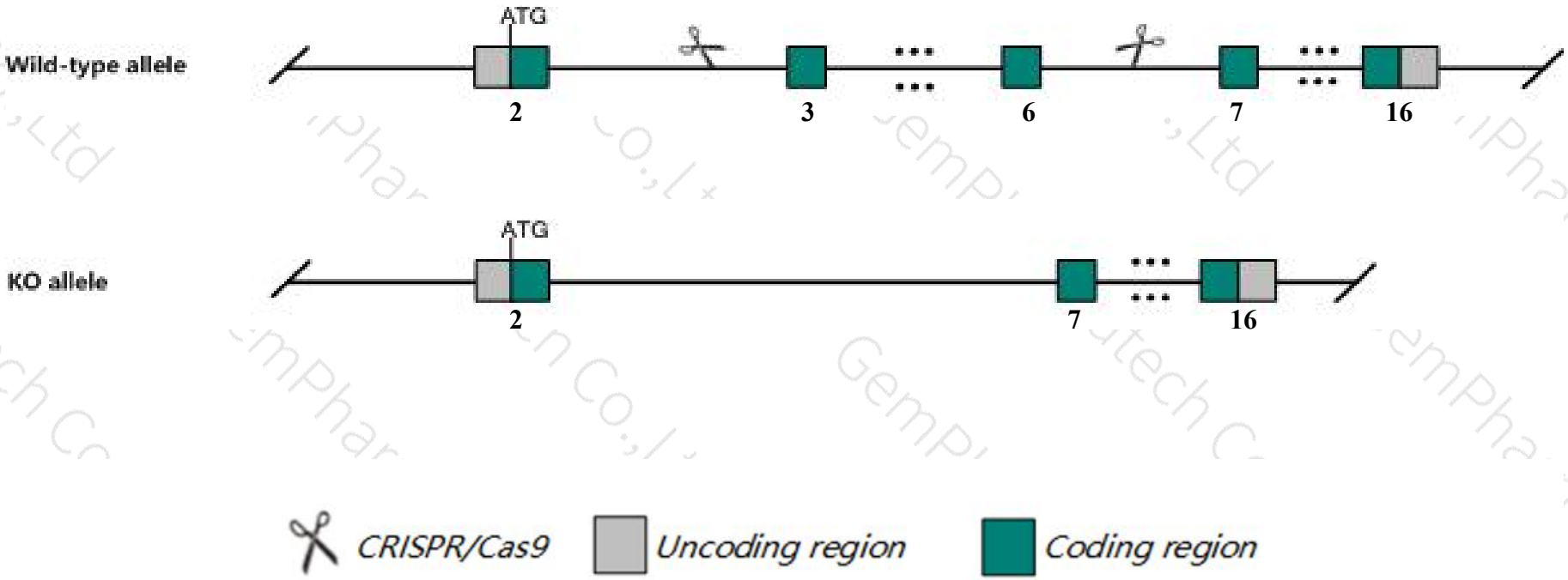
Designer: JiaYu

Project Overview

Project Name	***Usp53***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Usp53* gene. The schematic diagram is as follows:



Technical routes

➢ The *Usp53* gene has 10 transcripts. According to the structure of *Usp53* gene, exon3-exon6 of *Usp53-201* (ENSMUST00000090379.6) transcript is recommended as the knockout region.The region contains 425bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Usp53* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,Homozygotes for an ENU-induced allele show progressive hearing loss associated with altered cochlear outer hair cell (OHC) morphology, reduced endocochlear potential, and early OHC loss followed by IHC and spiral ganglion degeneration. Heterozygotes are susceptible to noise-induced hearing loss.

- The *Usp53* gene is located on the Chr3. 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）

集萃药康 GemPharmatech

Usp53 ubiquitin specific peptidase 53 [Mus musculus (house mouse)]

Gene ID: 99526, updated on 31-Jan-2019

Summary

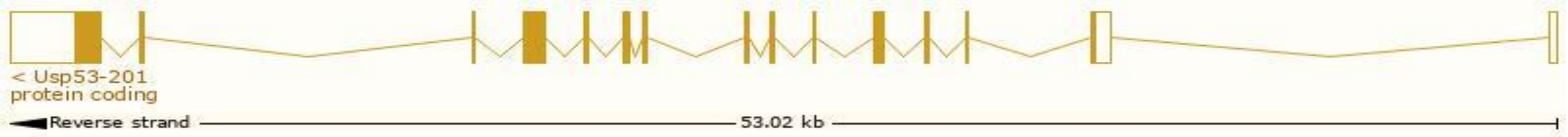
Official Symbol	Usp53 provided by MGI
Official Full Name	ubiquitin specific peptidase 53 provided by MGI
Primary source	MGI:MGI:2139607
See related	Ensembl:ENSMUSG00000039701
Gene type	protein coding
RefSeq status	PROVISIONAL
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA939927, Phxr3, Sp6, mKIAA1350, mbo
Expression	Ubiquitous expression in cerebellum adult (RPKM 3.0), colon adult (RPKM 2.7) and 28 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

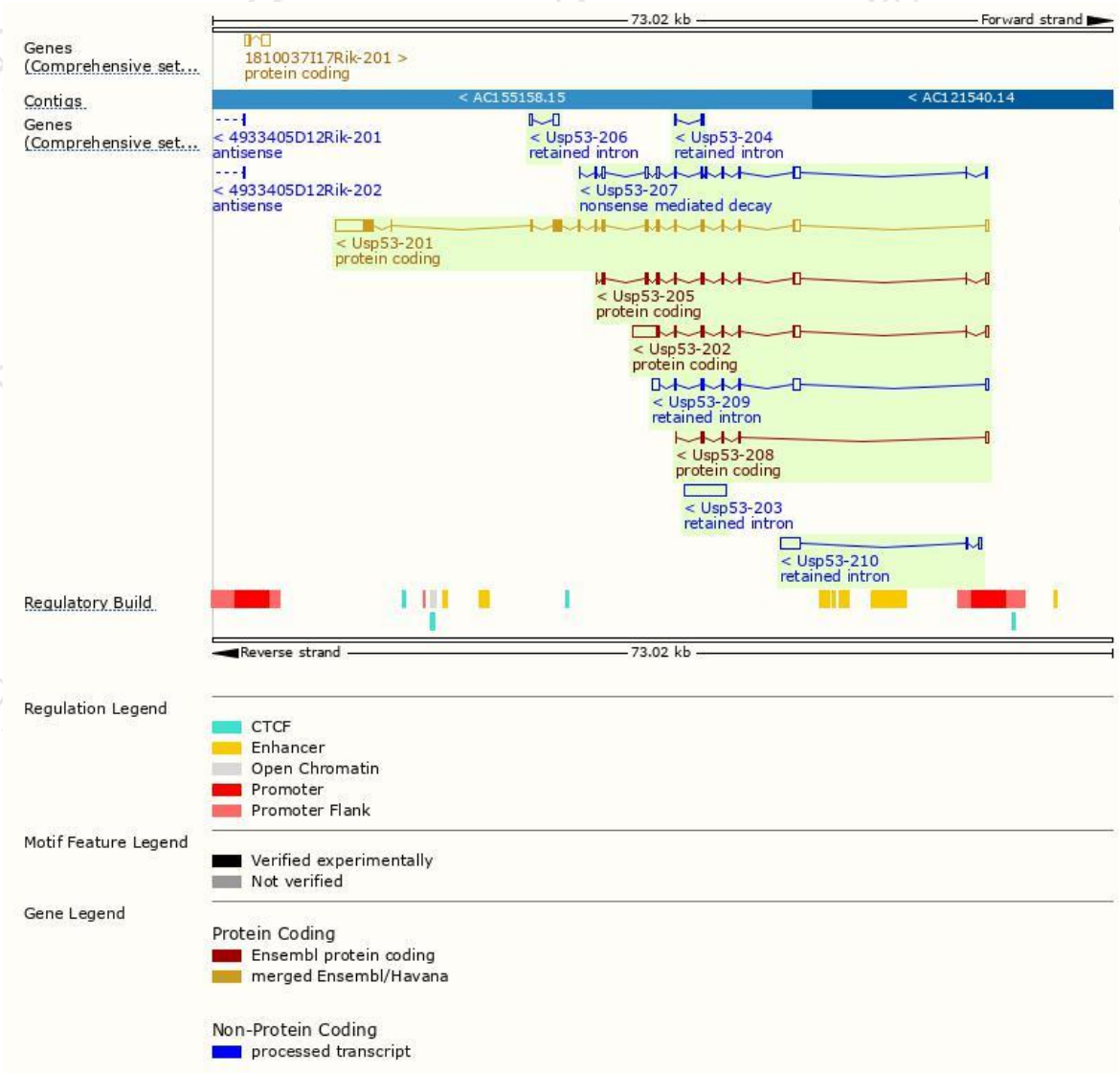
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Usp53-201	ENSMUST00000090379.6	6185	1069aa	Protein coding	CCDS17815	P15975	TSL:1 GENCODE basic APPRIS P1
Usp53-202	ENSMUST00000197314.4	3586	283aa	Protein coding	-	P15975 Q8BSX5	TSL:5 GENCODE basic
Usp53-205	ENSMUST00000197934.4	2048	427aa	Protein coding	-	Q3USD9	CDS 3' incomplete TSL:1
Usp53-208	ENSMUST00000199401.1	664	90aa	Protein coding	-	A0A0G2JG80	CDS 3' incomplete TSL:3
Usp53-207	ENSMUST00000199329.4	1882	128aa	Nonsense mediated decay	-	A0A0G2JFC5	TSL:1
Usp53-203	ENSMUST00000197358.1	3407	No protein	Retained intron	-	-	TSL:NA
Usp53-209	ENSMUST00000199923.4	1984	No protein	Retained intron	-	-	TSL:1
Usp53-210	ENSMUST00000200188.1	1960	No protein	Retained intron	-	-	TSL:1
Usp53-206	ENSMUST00000198814.1	745	No protein	Retained intron	-	-	TSL:3
Usp53-204	ENSMUST00000197801.1	306	No protein	Retained intron	-	-	TSL:2

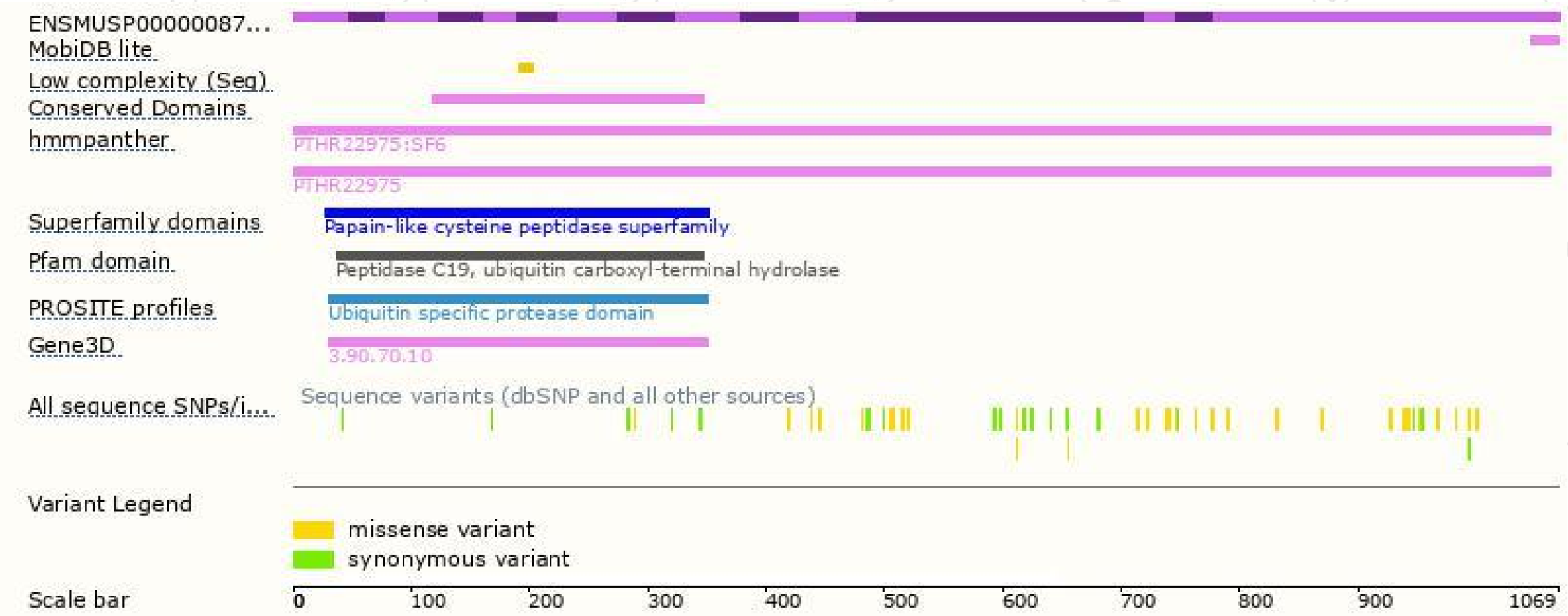
The strategy is based on the design of *Usp53-201* transcript,The transcription is shown below



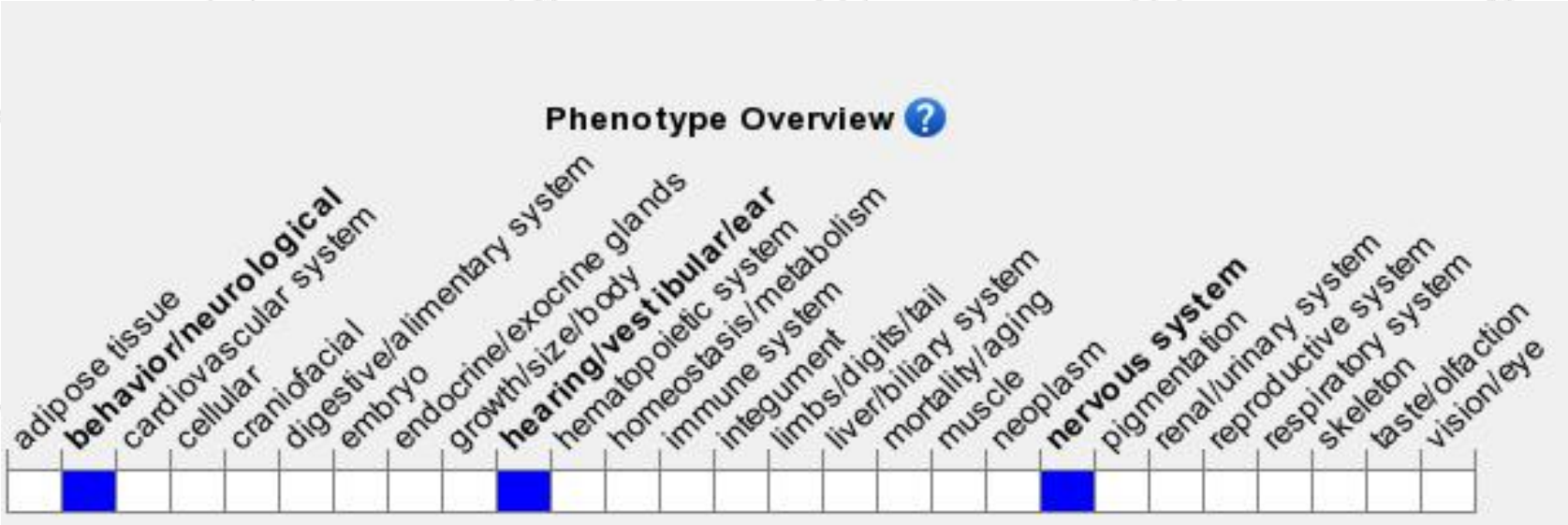
Genomic location distribution



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,Homozygotes for an ENU-induced allele show progressive hearing loss associated with altered cochlear outer hair cell (OHC) morphology, reduced endocochlear potential, and early OHC loss followed by IHC and spiral ganglion degeneration. Heterozygotes are susceptible to noise-induced hearing loss.

集萃药康
GemPharmatech

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

Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd