GemPharmatech™

Slc25a21 Cas9-CKO Strategy

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Overview

Target Gene Name

- *Slc25a21*

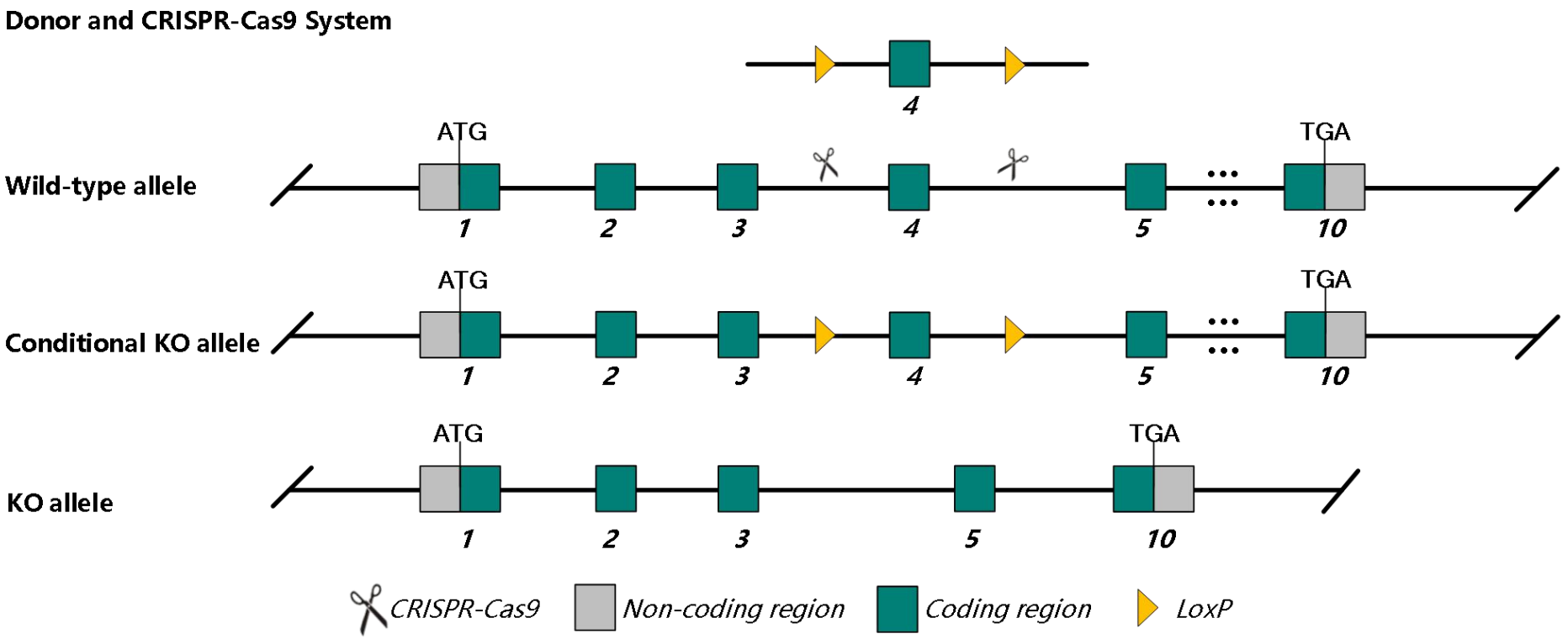
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Schematic representation of CRISPR-Cas9 engineering used to edit the *Slc25a21* gene.

Technical Information

- The *Slc25a21* gene has 5 transcripts. According to the structure of *Slc25a21* gene, exon 4 of *Slc25a21*-201 (ENSMUST00000044634.12) is recommended as the knockout region. The region contains 67 bp of coding sequence. Knocking out the region will result in disruption of gene function.
- In this project we use CRISPR-Cas9 technology to modify *Slc25a21* gene. The brief process is as follows: CRISPR-Cas9 system and Donor 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Gene Information

Slc25a21 solute carrier family 25 (mitochondrial oxodicarboxylate carrier), member 21 [*Mus musculus* (house mouse)]

Gene ID: 217593, updated on 26-Sep-2023

Download Datasets

Summary

Official Symbol	Slc25a21 provided by MGI
Official Full Name	solute carrier family 25 (mitochondrial oxodicarboxylate carrier), member 21 provided by MGI
Primary source	MGI:MGI:2445059
See related	Ensembl:ENSMUSG00000035472 AllianceGenome:MGI:2445059
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	A630030I10; 9930033G19Rik
Summary	Predicted to enable alpha-ketoglutarate transmembrane transporter activity. Predicted to be involved in mitochondrial alpha-ketoglutarate transmembrane transport. Located in mitochondrion. Is expressed in several structures, including integumental system; limb; liver; respiratory system; and skeleton. Human ortholog(s) of this gene implicated in mitochondrial DNA depletion syndrome. Orthologous to human SLC25A21 (solute carrier family 25 member 21). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Biased expression in liver E14 (RPKM 5.7), liver E14.5 (RPKM 5.5) and 11 other tissues See more
Orthologs	human all

https://www.ncbi.nlm.nih.gov/gene/217593

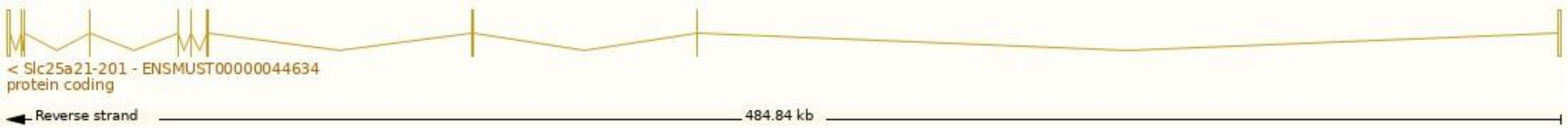
Transcript Information

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

Show/hide columns (1 hidden) Filter

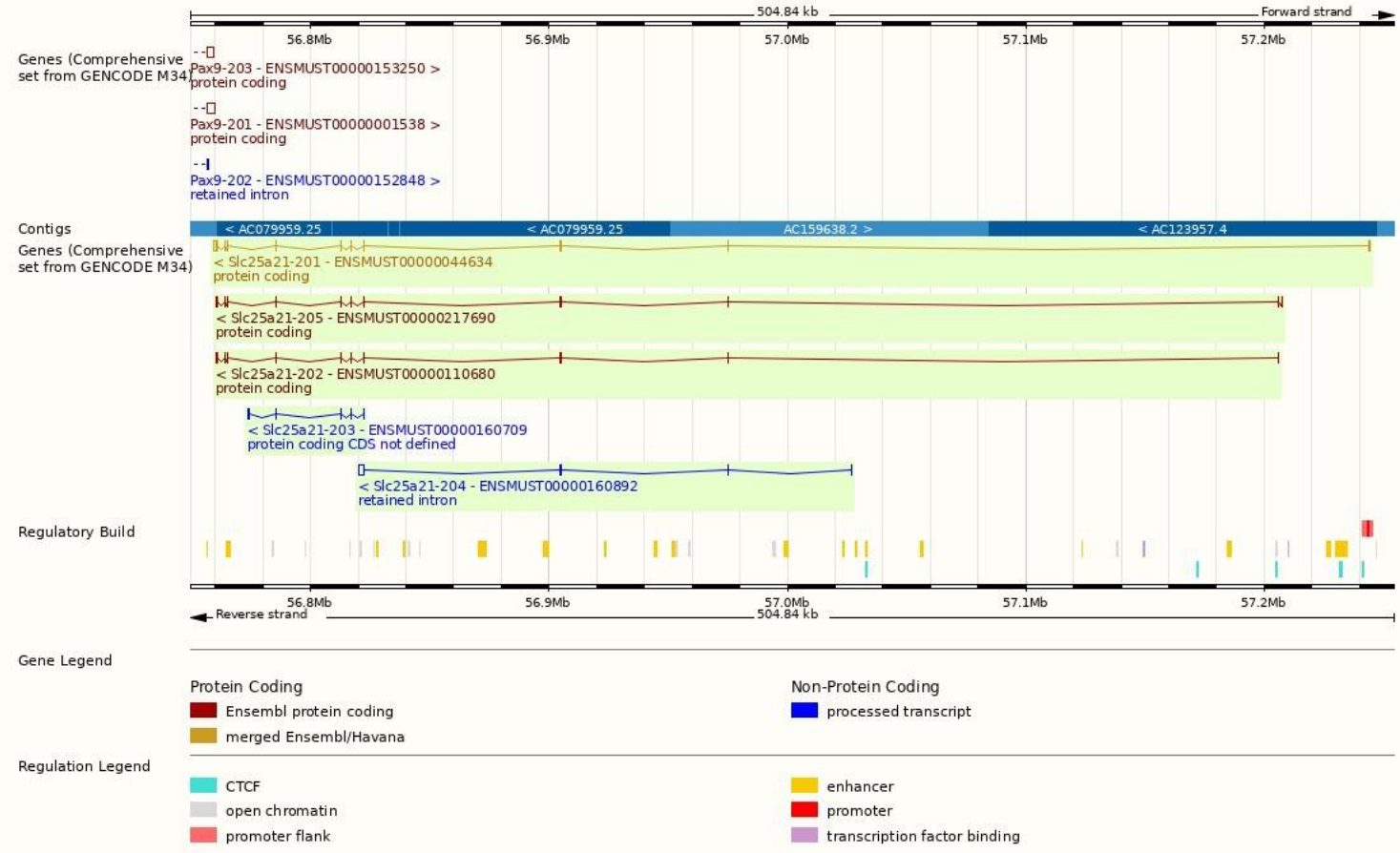
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000217690.2	Slc25a21-205	1388	305aa	Protein coding	CCDS49069	B6CI26	Ensembl Canonical, GENCODE basic, TSL:1
ENSMUST00000044634.12	Slc25a21-201	2609	298aa	Protein coding	CCDS25925	Q8BZ09	GENCODE basic, APPRIS P1, TSL:1
ENSMUST00000110680.3	Slc25a21-202	918	305aa	Protein coding	CCDS49069	B6CI26	GENCODE basic, TSL:5
ENSMUST00000160709.2	Slc25a21-203	558	No protein	Protein coding CDS not defined		-	TSL:2
ENSMUST00000160892.2	Slc25a21-204	2116	No protein	Retained intron		-	TSL:1

The strategy is based on the design of *Slc25a21*-201 transcript, the transcription is shown below:



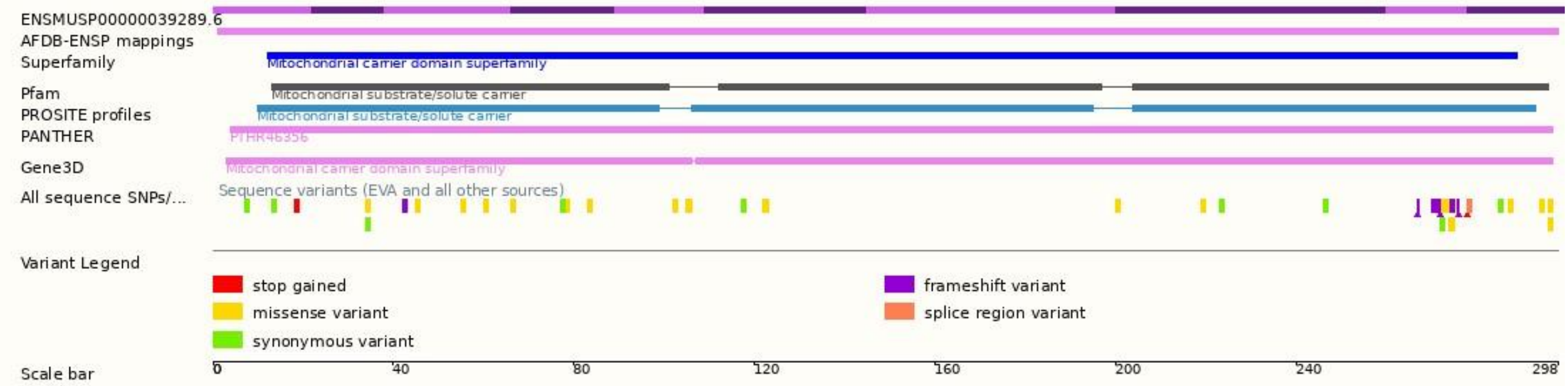
Source: http://asia.ensembl.org/

Genomic Information



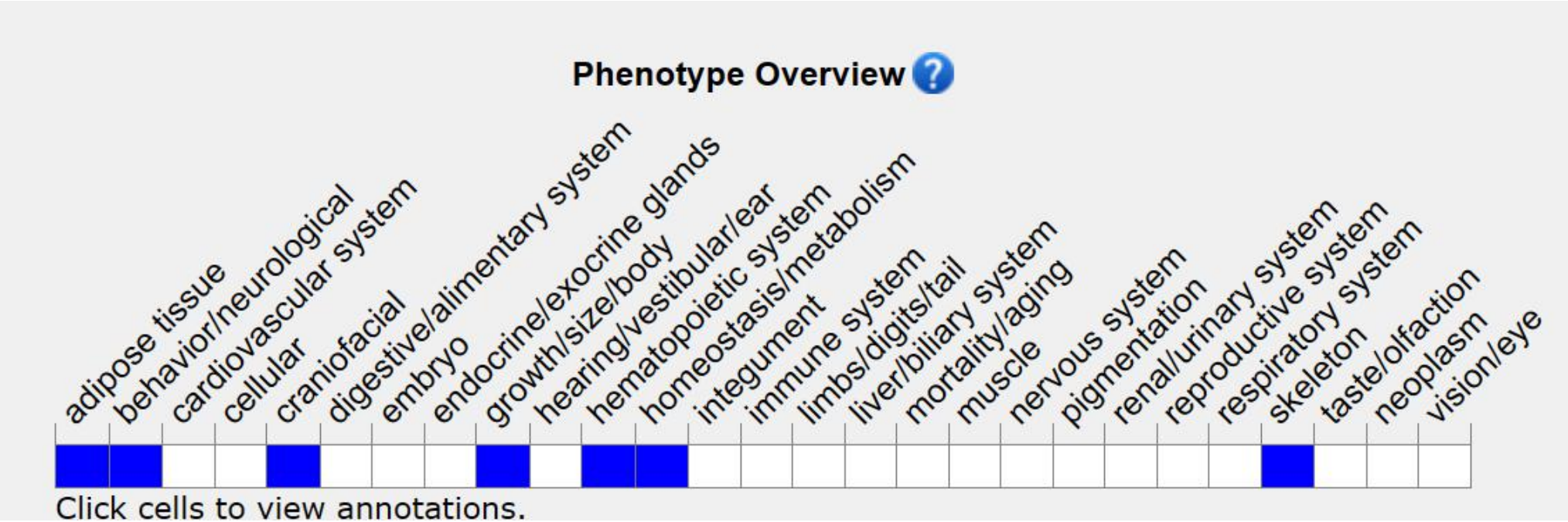
Source: http://asia.ensembl.org/

Protein Information



Source: https://www.ensembl.org

Mouse Phenotype Information (MGI)

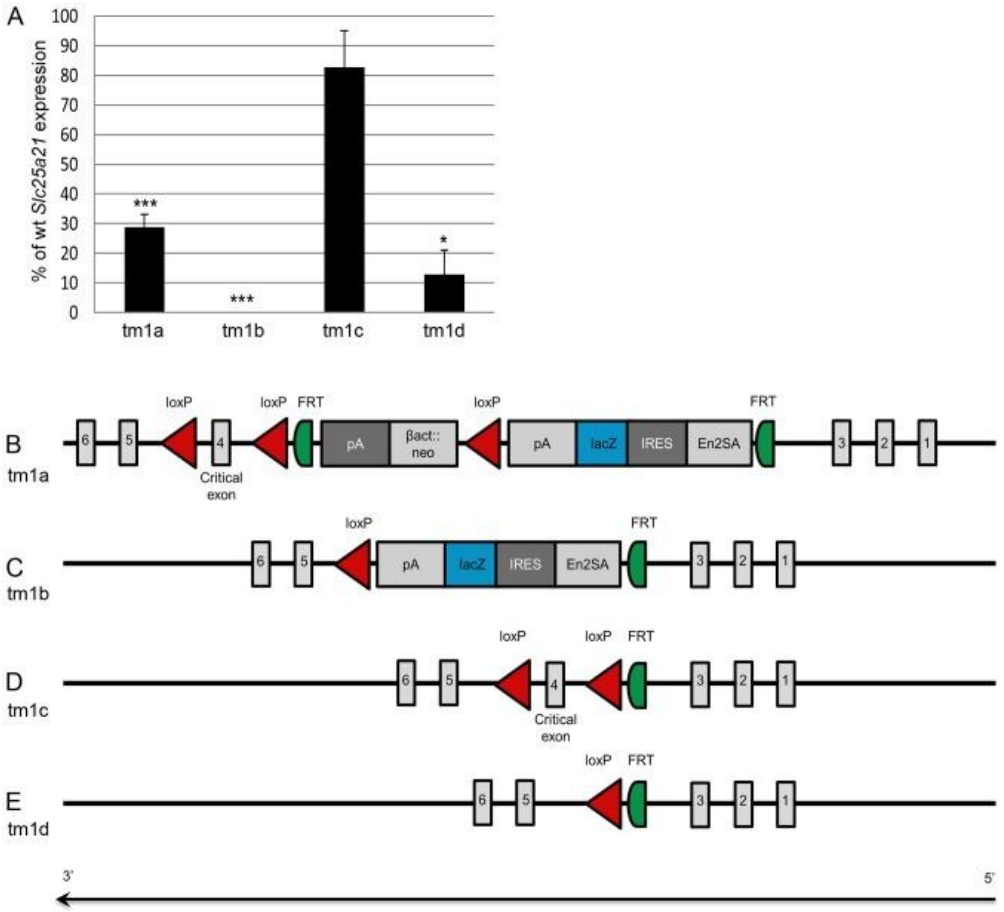


Source: https://www.informatics.jax.org

Important Information

- *Slc25a21* is located on Chr 12. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Reference



[1] Targeting of Slc25a21 is associated with orofacial defects and otitis media due to disrupted expression of a neighbouring gene.