C57BL/6NGpt-*Slc15a4* Cas9-KO Strategy

Designer: Zihe Cui

Reviewer: Daohua Xu

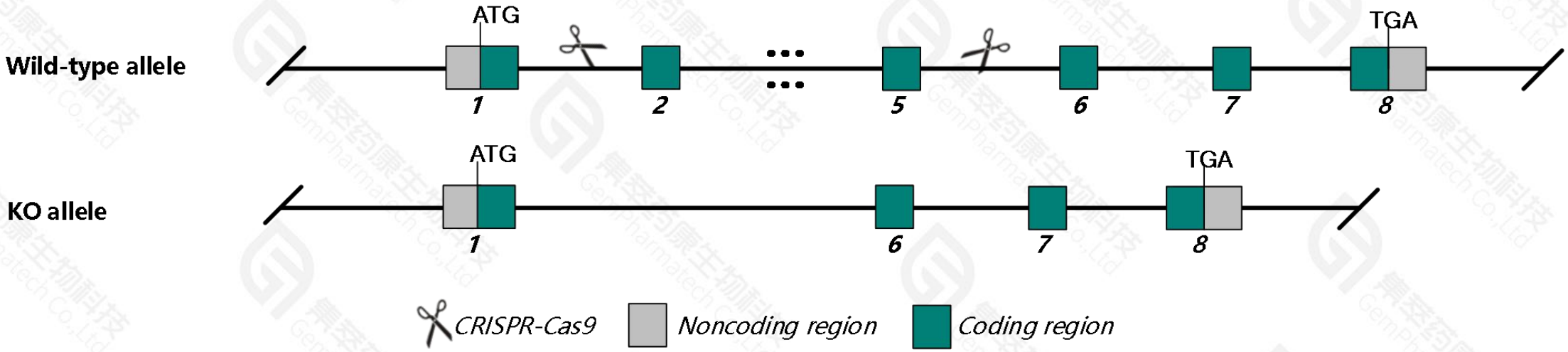
Design Date: 2022-5-6

Project Overview

Project Name	***Slc15a4***
Project type	**Cas9-KO**
Strain background	**C57BL/6NGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Slc15a4* gene. The schematic diagram is as follows:



Technical routes

➢ The *Slc15a4* gene has 11 transcripts. According to the structure of *Slc15a4* gene, exon 2-exon 5 of MGP_C57BL6NJ_T0075038.1 transcript is recommended as the knockout region. The region contains 706bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR-Cas9 technology to modify *Slc15a4* gene. The brief process is as follows: CRISPR-Cas9 system were microinjected into the fertilized eggs of C57BL/6NGpt 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/6NGpt mice.

Notice

➢ According to the existing MGI data, mice homozygous for an ENU-induced mutation display abrogation of both Toll-like receptor (TLR)-induced type I IFN and proinflammatory cytokine production by plasmacytoid dendritic cells. Mice homozygous for a knock-out allele show impaired TLR9-and NOD1-mediated cytokine production and decreased susceptibility to DSS-induced colitis.

➢ The *Slc15a4* gene is located on the Chr 5. 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

Slc15a4 solute carrier family 15, member 4 [*Mus musculus* (house mouse)]

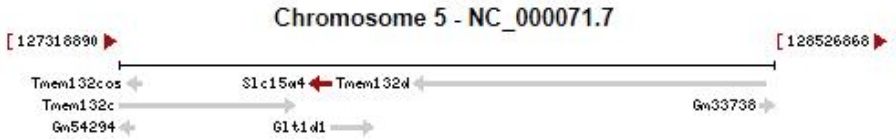
Download Datasets

Gene ID: 100561, updated on 24-Apr-2022

Summary

Official Symbol	Slc15a4 provided by MGI
Official Full Name	solute carrier family 15, member 4 provided by MGI
Primary source	MGI:MGI:2140796
See related	Ensembl:ENSMUSG00000029416 AllianceGenome:MGI:2140796
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	PHT1; PTR4; AA987064; AW742963; C130069N12Rik
Summary	Enables L-histidine transmembrane transporter activity and peptide:proton symporter activity. Involved in several processes, including L-histidine transmembrane export from vacuole; positive regulation of pattern recognition receptor signaling pathway; and regulation of isotype switching to IgG isotypes. Located in early endosome membrane and lysosomal membrane. Is integral component of endosome membrane and integral component of lysosomal membrane. Is expressed in embryo. Orthologous to human SLC15A4 (solute carrier family 15 member 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in spleen adult (RPKM 27.6), mammary gland adult (RPKM 16.0) and 28 other tissues See more
Orthologs	human all

NEW Try the new Gene table
Try the new Transcript table

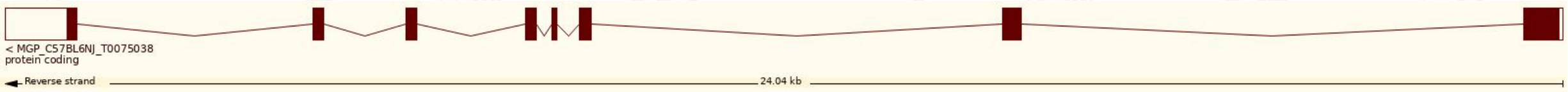


Transcript information（Ensembl）

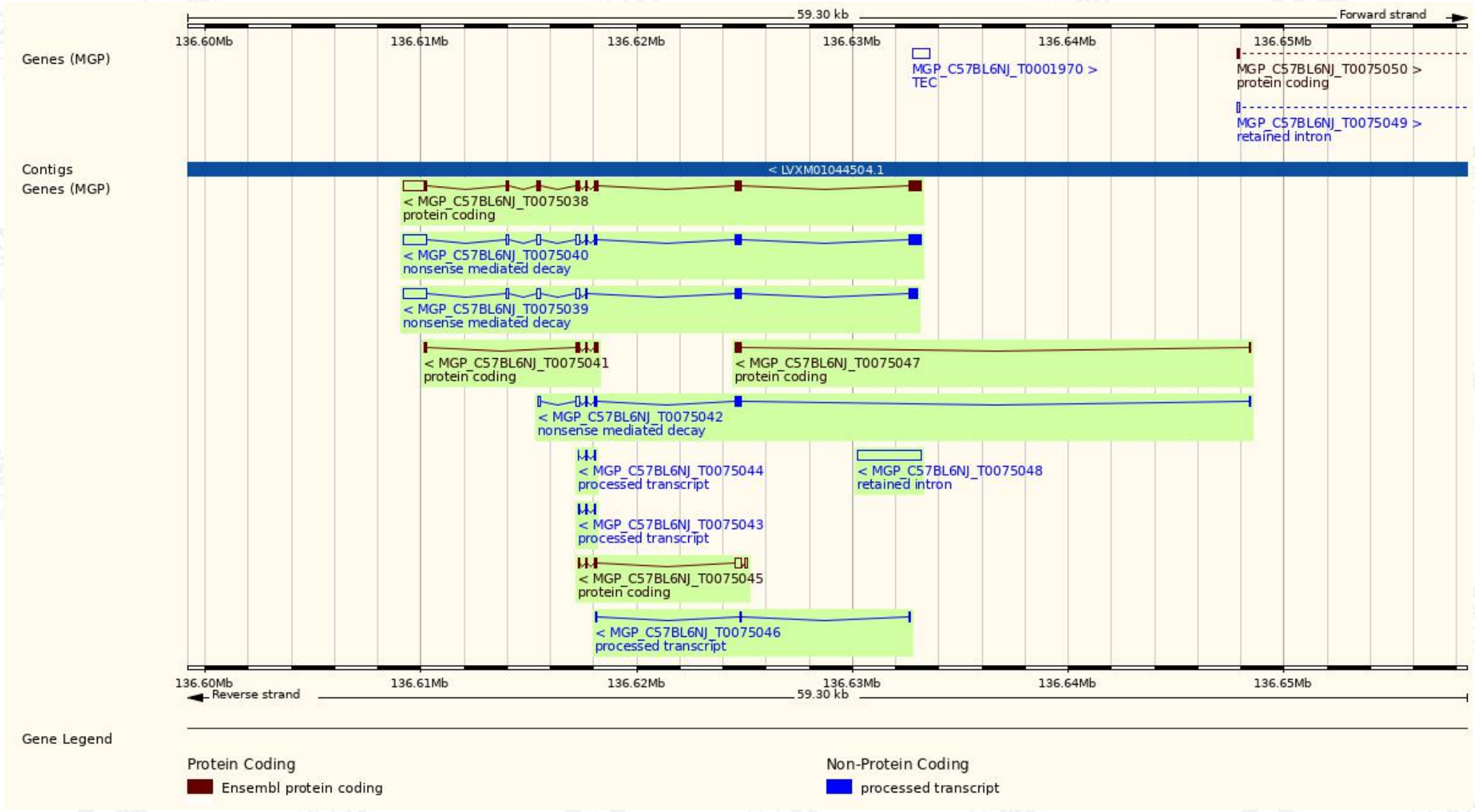
The gene has 11 transcripts, and all transcripts are shown below:

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
MGP_C57BL6NJ_T0075038.1	-	2732	574aa	Protein coding	CCDS19688	A0A0G2JDS1 D3Z4X0 D3Z5E9 D6RDC2 F6QFB4 F7AZ26 Q91W98	Ensembl Canonical
MGP_C57BL6NJ_T0075039.1	-	2370	245aa	Nonsense mediated decay	-	-	-
MGP_C57BL6NJ_T0075040.1	-	2673	296aa	Nonsense mediated decay	-	-	-
MGP_C57BL6NJ_T0075041.1	-	507	168aa	Protein coding	-	-	-
MGP_C57BL6NJ_T0075042.1	-	779	126aa	Nonsense mediated decay	-	-	-
MGP_C57BL6NJ_T0075043.1	-	219	No protein	Processed transcript	-	-	-
MGP_C57BL6NJ_T0075044.1	-	166	No protein	Processed transcript	-	-	-
MGP_C57BL6NJ_T0075045.1	-	679	81aa	Protein coding	-	-	-
MGP_C57BL6NJ_T0075046.1	-	200	No protein	Processed transcript	-	-	-
MGP_C57BL6NJ_T0075047.1	-	333	105aa	Protein coding	-	-	-
MGP_C57BL6NJ_T0075048.1	-	2937	No protein	Retained intron	-	-	-

The strategy is based on the design of MGP_C57BL6NJ_T0075038.1 transcript,the transcription is shown below:

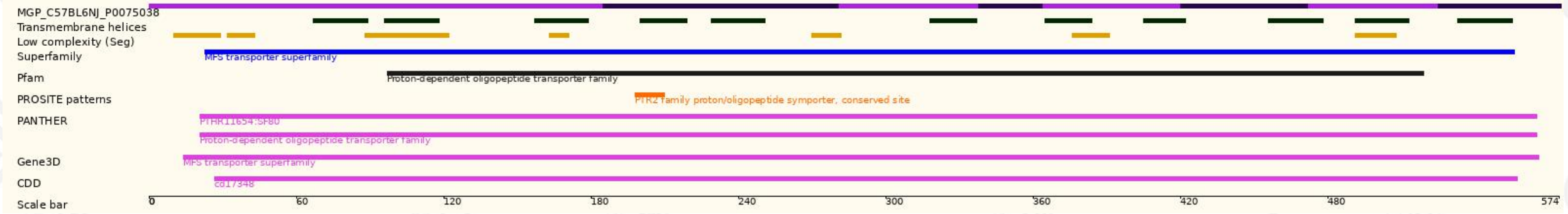


Genomic location distribution

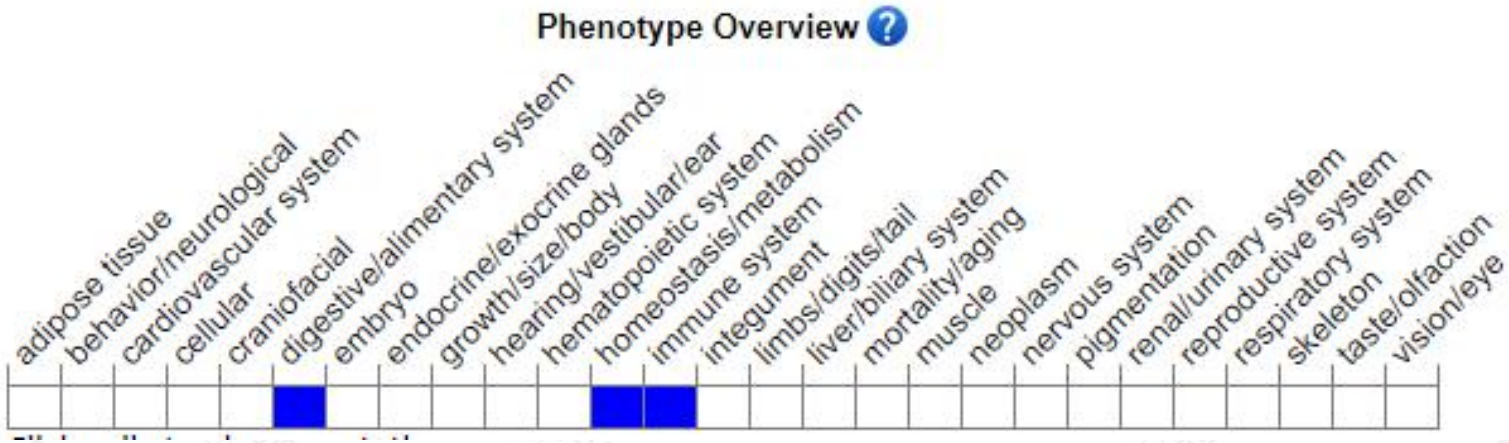


Protein domain

Protein domains for MGP_C57BL6NJ_P0075038



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue.Data quoted from MGI database(http://www.informatics.jax.org/).

Mice homozygous for an ENU-induced mutation display abrogation of both Toll-like receptor (TLR)-induced type I IFN and proinflammatory cytokine production by plasmacytoid dendritic cells. Mice homozygous for a knock-out allele show impaired TLR9-and NOD1-mediated cytokine production and decreased susceptibility to DSS-induced colitis.

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