GemPharmatech™

Sting1 Cas9-KO Strategy

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Reviewer: Yanhua Shen

Design Date: 2023-8-14

Overview

Target Gene Name

- Sting1

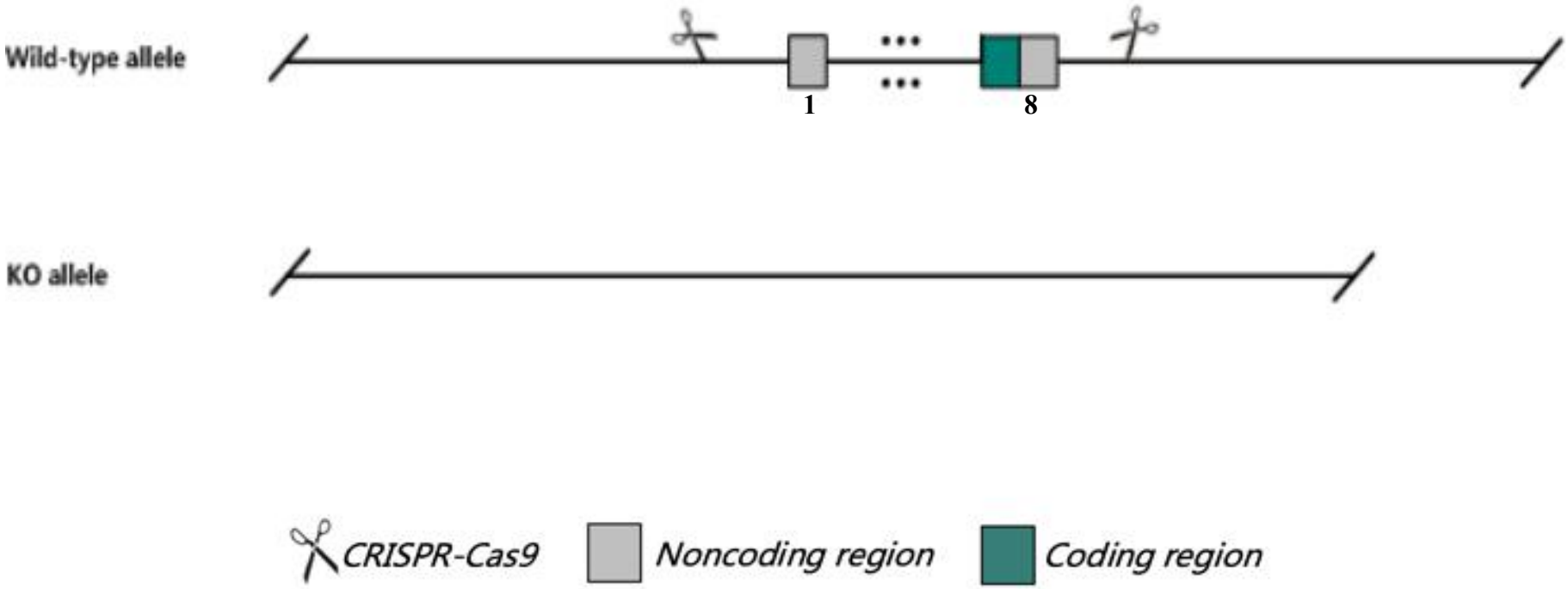
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Technical Information

- The *Sting1* gene has 10 transcripts. According to the structure of *Sting1* gene, exon1-exon8 of *Sting1*-201 (ENSMUST00000115728.5) transcript is recommended as the knockout region. The region contains all of the coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Sting1* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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.

Gene Information

Sting1 stimulator of interferon response cGAMP interactor 1 [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 72512, updated on 8-Aug-2023

Summary

Official Symbol	Sting1 provided by MGI
Official Full Name	stimulator of interferon response cGAMP interactor 1 provided by MGI
Primary source	MGI:MGI:1919762
See related	Ensembl:ENSMUSG00000024349 AllianceGenome:MGI:1919762
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	ERIS; MPYS; Mita; STING; Tmem173; STING-beta; 2610307O08Rik
Summary	Enables 2',3'-cyclic GMP-AMP binding activity; cyclic-di-GMP binding activity; and ubiquitin protein ligase binding activity. Involved in several processes, including defense response to other organism; macroautophagy; and positive regulation of interferon-beta production. Acts upstream of or within cellular response to interferon-beta; positive regulation of transcription by RNA polymerase II; and regulation of inflammatory response. Located in several cellular components, including autophagosome; perinuclear region of cytoplasm; and peroxisome. Is expressed in ductus deferens; epididymis; ileum; and prostate gland. Human ortholog(s) of this gene implicated in STING-associated vasculopathy with onset in infancy. Orthologous to human STING1 (stimulator of interferon response cGAMP interactor 1). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Broad expression in spleen adult (RPKM 30.3), mammary gland adult (RPKM 29.1) and 20 other tissues See more
Orthologs	human all

NEW Try the new Gene table
Try the new Transcript table

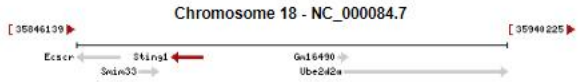
Genomic context

Location: 18 B2; 18 19.23 cM

See Sting1 in Genome Data Viewer

Exon count: 8

Annotation release	Status	Assembly	Chr	Location
RS_2023_04	current	GRCm39 (GCF_000001635.27)	18	NC_000084.7 (35866731..35873607, complement)
108.20200622	previous assembly	GRCm38.p6 (GCF_000001635.26)	18	NC_000084.6 (35733678..35740554, complement)



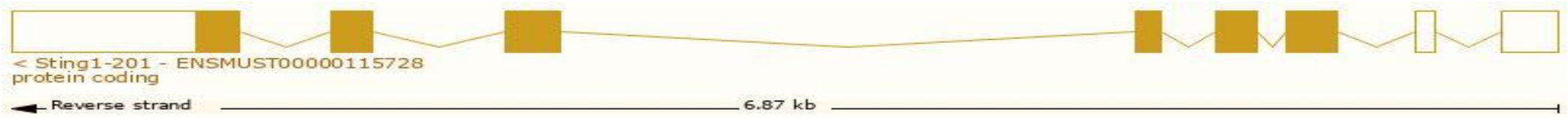
Source: https://www.ncbi.nlm.nih.gov/

Transcript Information

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

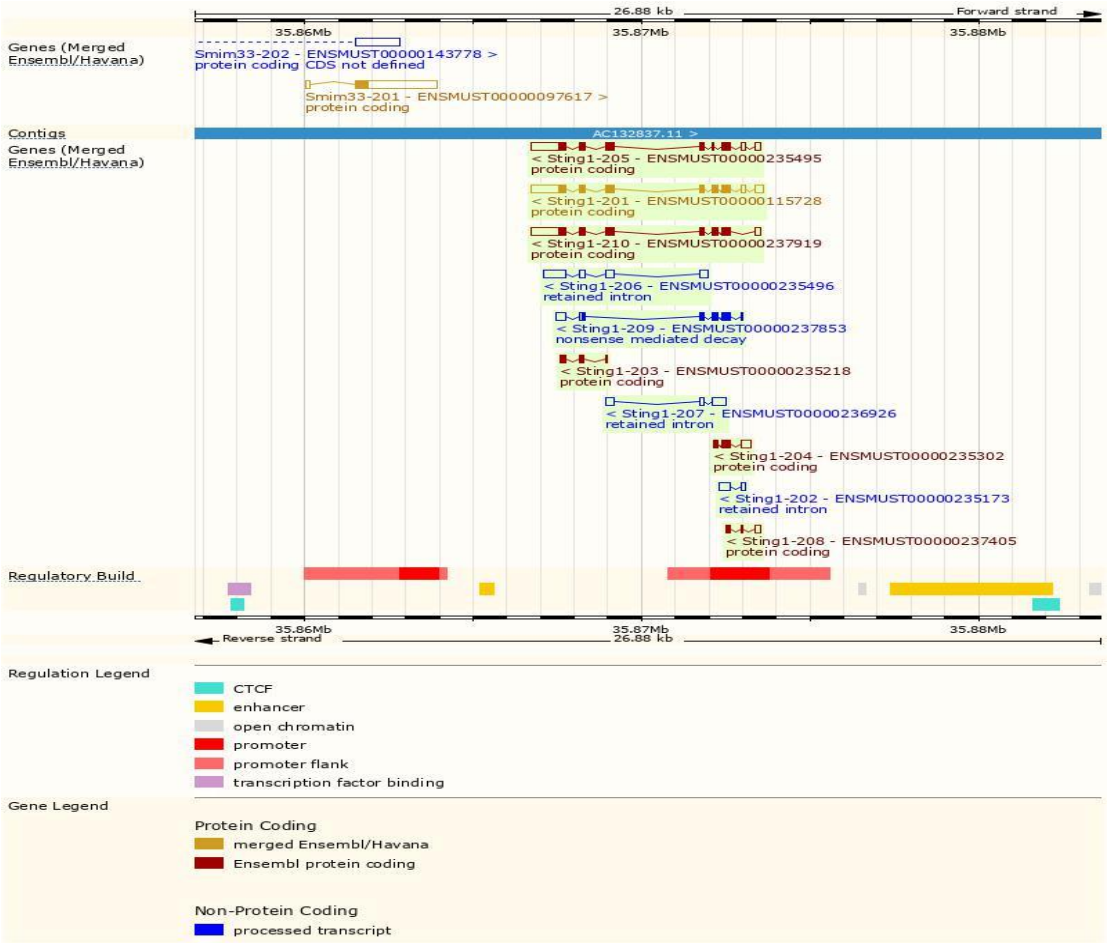
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sting1-201	ENSMUST00000115728.5	2299	378aa	Protein coding	CCDS50253		A single transcript chosen for a gene which is the most conserved, most highly expressed, has the longest coding sequence and is represented in other key resources, such as NCBI and UniProt. This is defined in detail on http://www.ensembl.org/info/genome/genebuild/canonical.html Ensembl Canonical , The GENCODE set is the gene set for human and mouse. GENCODE basic , APPRIS P1 , TSL:1 ,
Sting1-210	ENSMUST00000237919.2	2134	378aa	Protein coding	CCDS50253		The GENCODE set is the gene set for human and mouse. GENCODE basic , APPRIS P1 ,
Sting1-205	ENSMUST00000235495.2	2086	337aa	Protein coding			The GENCODE set is the gene set for human and mouse. GENCODE basic ,
Sting1-204	ENSMUST00000235302.2	657	125aa	Protein coding			CDS 3' incomplete ,
Sting1-208	ENSMUST00000237405.2	342	45aa	Protein coding			CDS 3' incomplete ,
Sting1-203	ENSMUST00000235218.2	334	111aa	Protein coding			CDS 5' and 3' incomplete ,
Sting1-209	ENSMUST00000237853.2	1025	204aa	Nonsense mediated decay			
Sting1-206	ENSMUST00000235496.2	1320	No protein	Retained intron			
Sting1-207	ENSMUST00000236926.2	776	No protein	Retained intron			
Sting1-202	ENSMUST00000235173.2	428	No protein	Retained intron			

The strategy is based on the design of *Sting1*-201 transcript, the transcription is shown below:



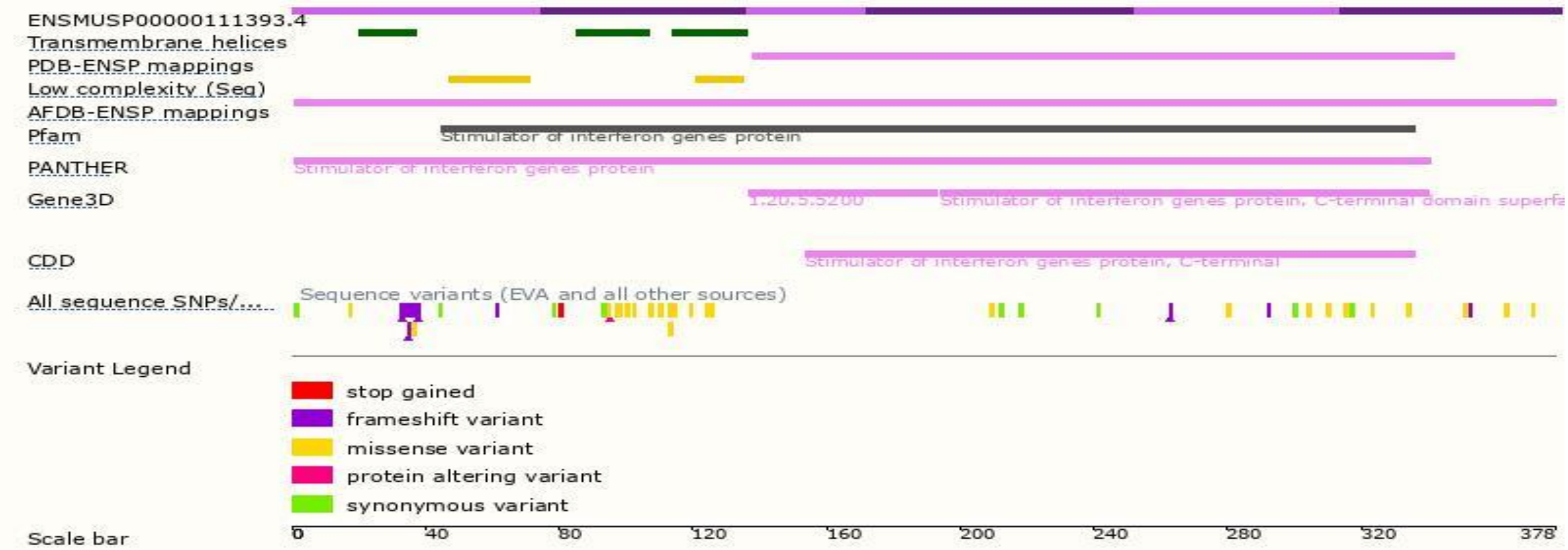
Source: https://www.ensembl.org

Genomic Information



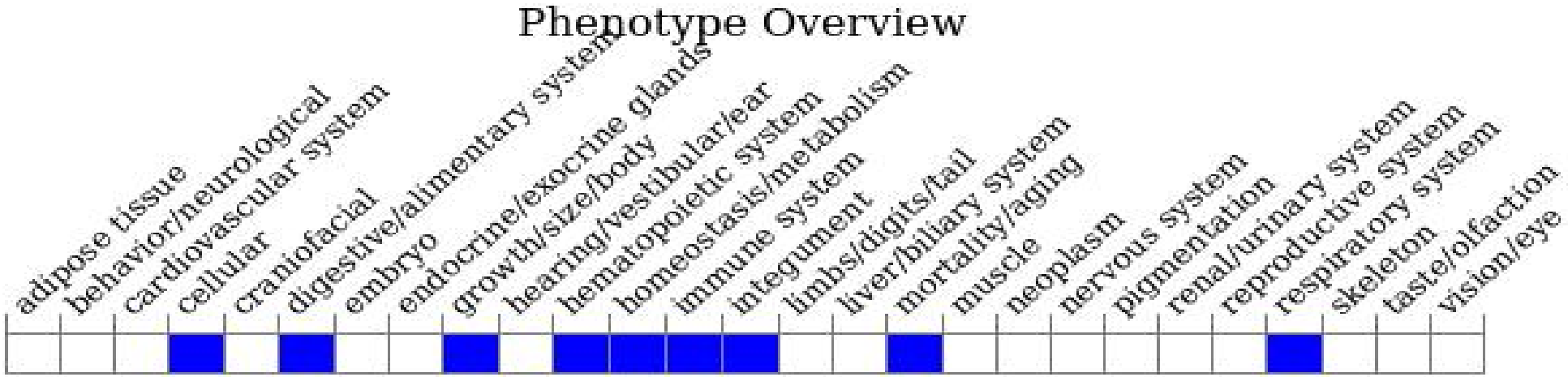
Source: : https://www.ensembl.org

Protein Information



Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



- Mice homozygous for a knock-out allele exhibit increased susceptibility to viral infection and abnormal innate immunity. Mice homozygous for an ENU-induced allele exhibit altered response to bacterial and viral infection.

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

Important Information

- *Sting1* is located on Chr18. 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 risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.