

Sgsh Cas9-KO Strategy

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Project Overview

Project Name

Sgsh

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Sgsh* gene has 6 transcripts. According to the structure of *Sgsh* gene, exon3-exon6 of *Sgsh*-201(ENSMUST00000005173.10) transcript is recommended as the knockout region. The region contains 496bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Sgsh* gene. The brief process is as follows: CRISPR/Cas9 system 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.

- According to the existing MGI data, mice homozygous for a spontaneous allele die prematurely displaying low sulfamidase activity, variable lysosomal storage in various brain cell types and other tissues, heparan sulfate-uria, scruffy coats, corneal opacities, bladder distension, hydronephrosis, hepatosplenomegaly and bone deformities.
- The knockout region is near to the N-terminal of *Slc26a11* gene, this strategy may influence the regulatory function of the N-terminal of *Slc26a11* gene.
- Transcript *Sgsh*-203 may not be affected.
- The *Sgsh* gene is located on the Chr11. 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)

Sgsh N-sulfoglucosamine sulfohydrolase (sulfamidase) [Mus musculus (house mouse)]

Gene ID: 27029, updated on 13-Mar-2020

Summary



Official Symbol Sgsh provided by [MGI](#)

Official Full Name N-sulfoglucosamine sulfohydrolase (sulfamidase) provided by [MGI](#)

Primary source [MGI:MGI:1350341](#)

See related [Ensembl:ENSMUSG00000005043](#)

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 4632406A19Rik

Expression Broad expression in adrenal adult (RPKM 23.1), lung adult (RPKM 17.3) and 21 other tissues [See more](#)

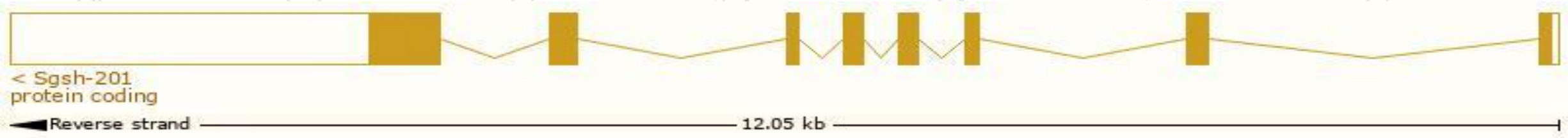
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

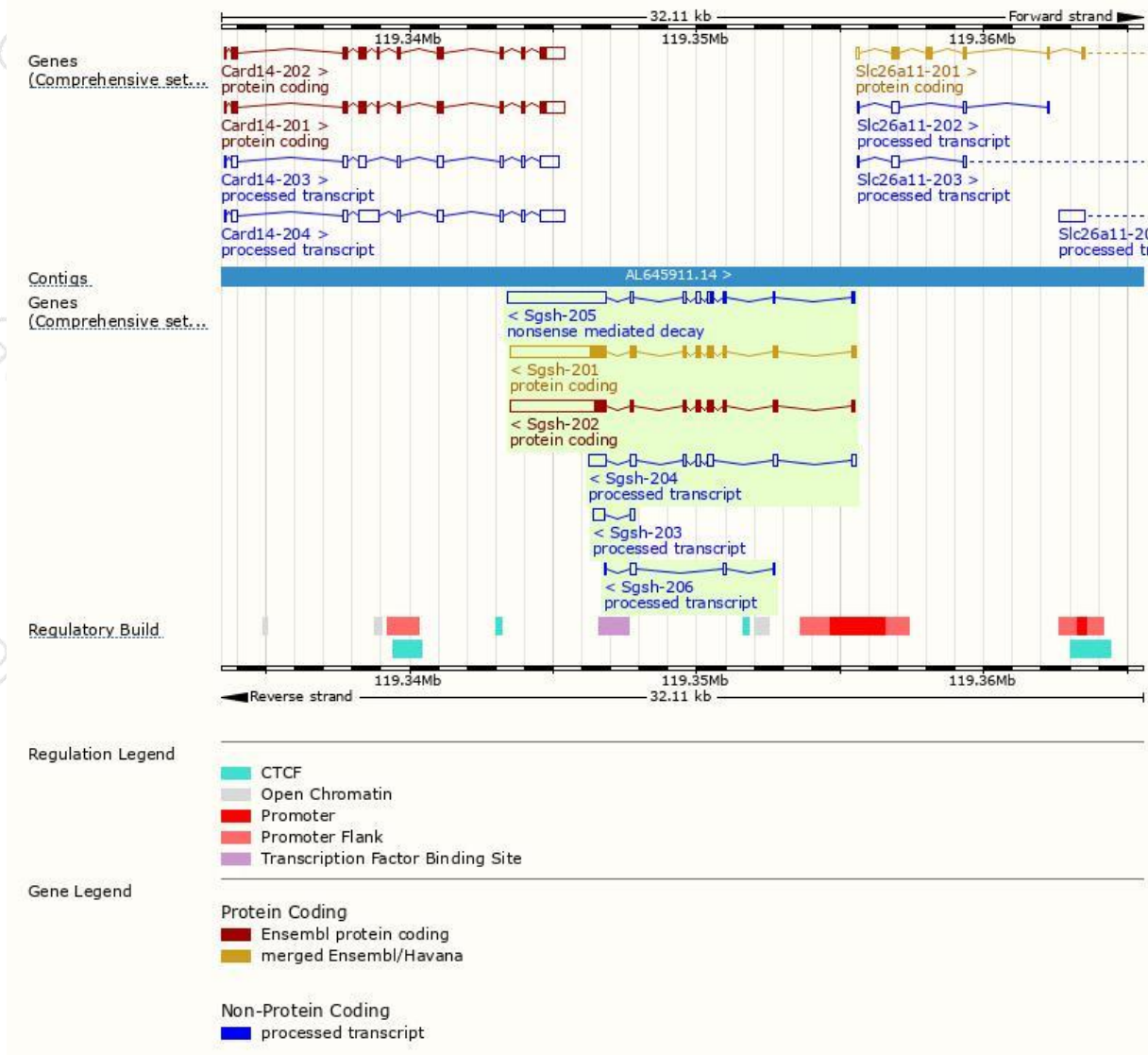
The gene has 6 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Sgsh-201	ENSMUST00000005173.10	4357	502aa	Protein coding	CCDS36384	Q9EQ08	TSL:1 GENCODE basic APPRIS P1
Sgsh-202	ENSMUST00000100172.2	4223	422aa	Protein coding	-	B1ATE0	TSL:1 GENCODE basic
Sgsh-205	ENSMUST00000136523.7	4191	117aa	Nonsense mediated decay	-	G3XA02	TSL:5
Sgsh-204	ENSMUST00000133507.7	1485	No protein	Processed transcript	-	-	TSL:5
Sgsh-203	ENSMUST00000126132.1	548	No protein	Processed transcript	-	-	TSL:5
Sgsh-206	ENSMUST00000141540.1	403	No protein	Processed transcript	-	-	TSL:5

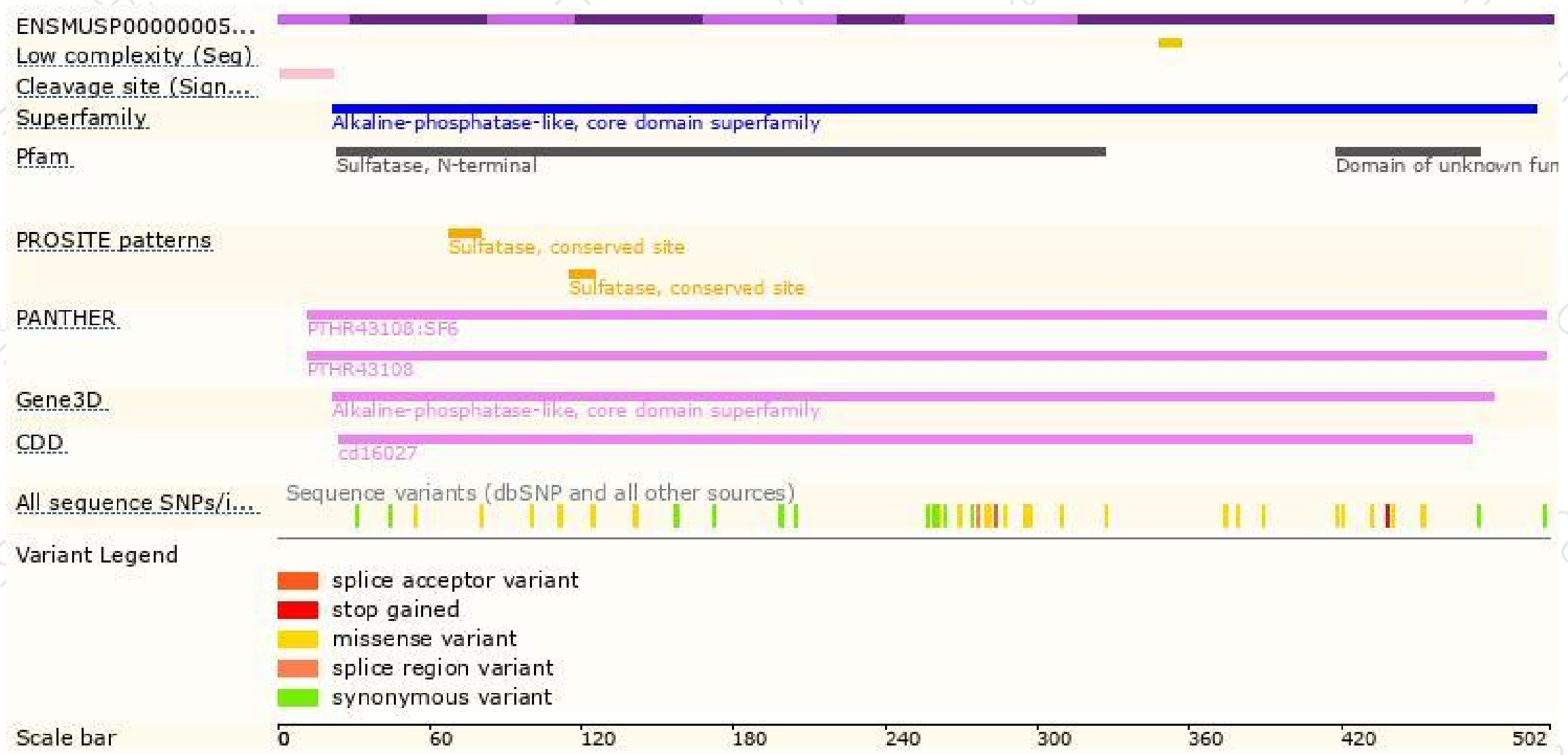
The strategy is based on the design of *Sgsh-201* transcript,the transcription is shown below:



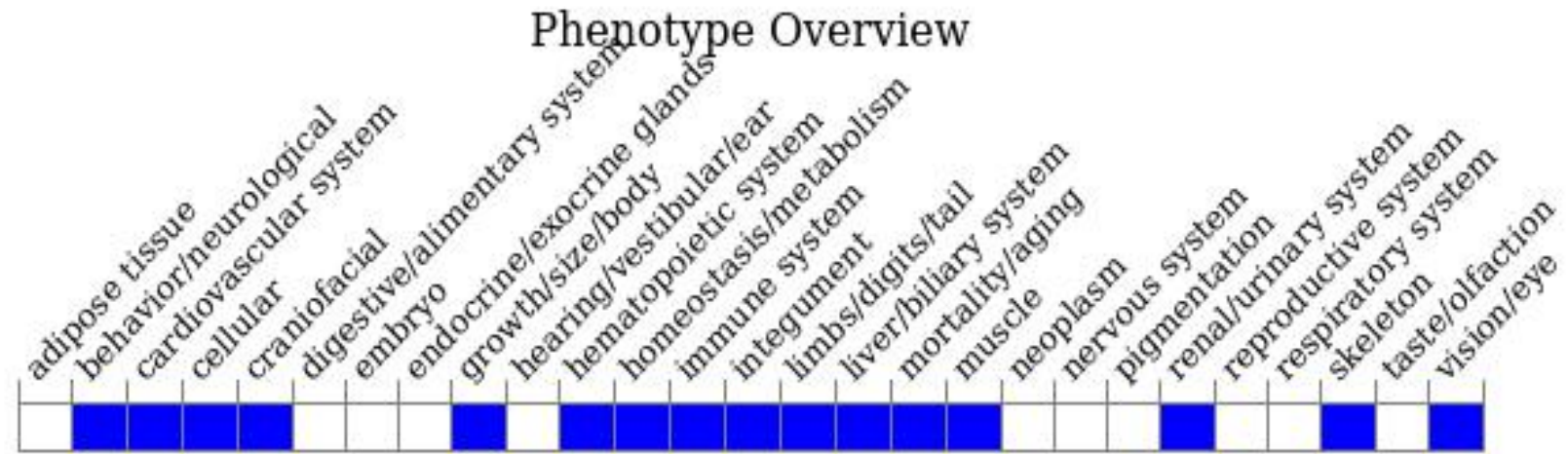
Genomic location distribution



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, mice homozygous for a spontaneous allele die prematurely displaying low sulfamidase activity, variable lysosomal storage in various brain cell types and other tissues, heparan sulfate-uria, scruffy coats, corneal opacities, bladder distension, hydronephrosis, hepatosplenomegaly and bone deformities.

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

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