

Ndst3 Cas9-CKO Strategy

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Reviewer:

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Project Overview

Project Name

Ndst3

Project type

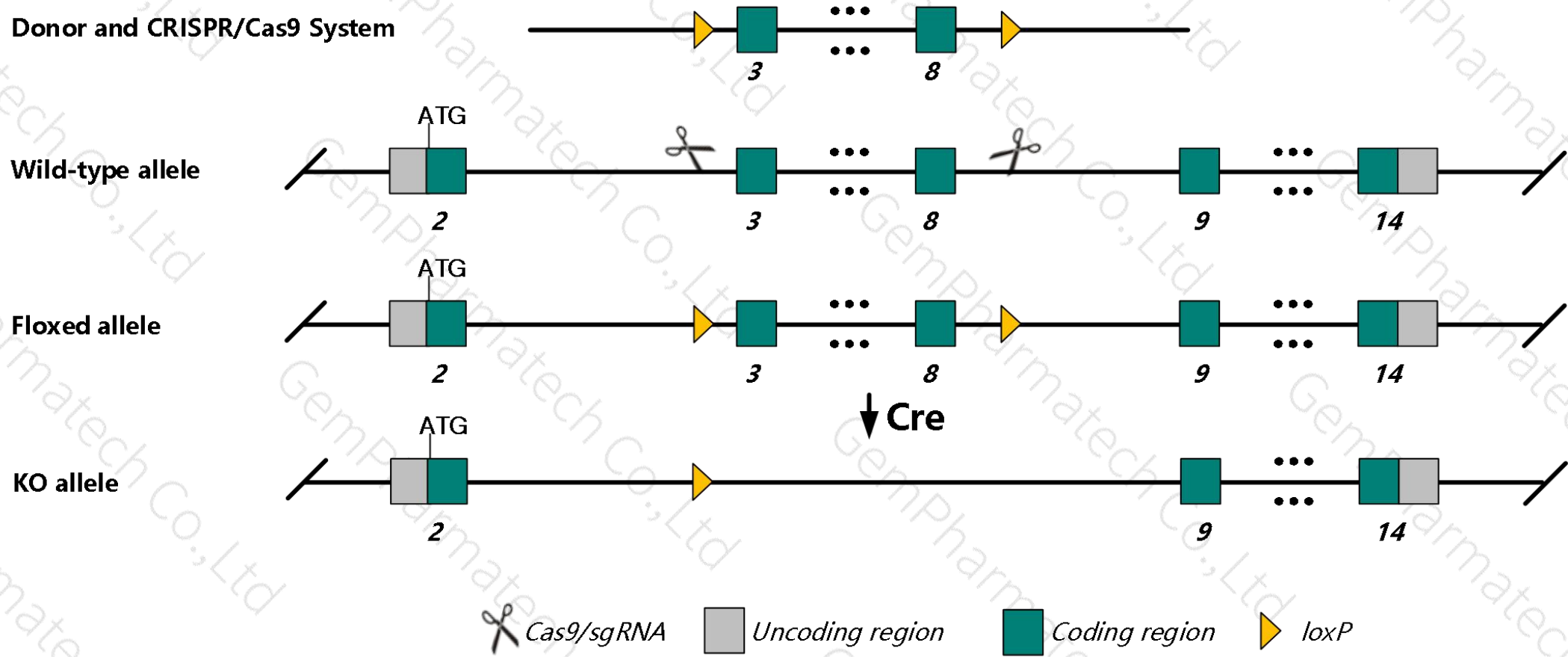
Cas9-CKO

Strain background

C57BL/6JGpt

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Ndst3* gene. The schematic diagram is as follows:



Technical routes

- The *Ndst3* gene has 9 transcripts. According to the structure of *Ndst3* gene, exon3-exon8 of *Ndst3*-206 (ENSMUST00000154668.7) transcript is recommended as the knockout region. The region contains 838bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Ndst3* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

- According to the existing MGI data, Mice homozygous for a knockout allele exhibit decreased anxiety-related behavior, cholesterol levels and CD8+ T cells due to moderate heparan-sulfate undersulfation.
- The *Ndst3* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information (NCBI)

Ndst3 N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 3 [*Mus musculus* (house mouse)]

Gene ID: 83398, updated on 13-Mar-2020

Summary

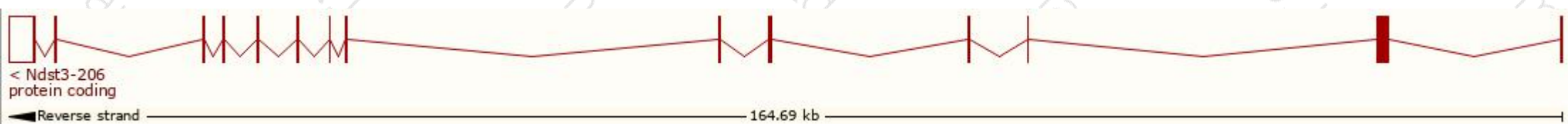
Official Symbol	Ndst3 provided by MGI
Official Full Name	N-deacetylase/N-sulfotransferase (heparan glucosaminyl) 3 provided by MGI
Primary source	MGI:MGI:1932544
See related	Ensembl:ENSMUSG00000027977
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	NDST-3; N-HSST 3; 4921531K01Rik; 4930511P15Rik
Expression	Biased expression in cerebellum adult (RPKM 10.8), CNS E14 (RPKM 4.0) and 6 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

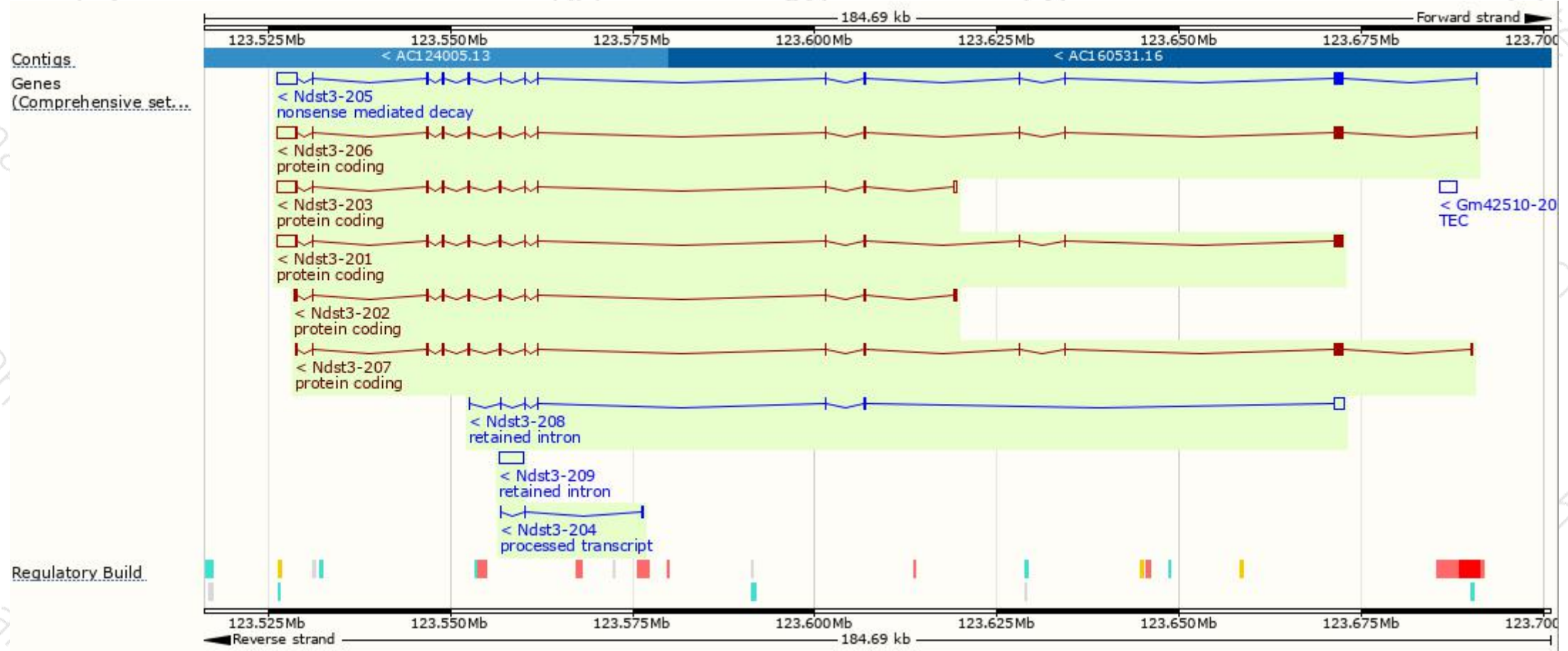
The gene has 9 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Ndst3-206	ENSMUST00000154668.7	5570	873aa	Protein coding	CCDS17818	E9PZJ4	TSL:5 GENCODE basic APPRIS P1
Ndst3-201	ENSMUST00000029602.12	5335	873aa	Protein coding	CCDS17818	E9PZJ4	TSL:1 GENCODE basic APPRIS P1
Ndst3-203	ENSMUST00000132112.7	4460	458aa	Protein coding	CCDS80013	D3YXE5	TSL:1 GENCODE basic
Ndst3-207	ENSMUST00000172537.2	3152	873aa	Protein coding	CCDS17818	E9PZJ4	TSL:5 GENCODE basic APPRIS P1
Ndst3-202	ENSMUST00000124803.7	1917	458aa	Protein coding	CCDS80013	D3YXE5	TSL:1 GENCODE basic
Ndst3-205	ENSMUST00000137404.7	5528	642aa	Nonsense mediated decay	-	Q9EQH7	TSL:1
Ndst3-204	ENSMUST00000132896.2	372	No protein	Processed transcript	-	-	TSL:3
Ndst3-209	ENSMUST00000199825.1	3470	No protein	Retained intron	-	-	TSL:NA
Ndst3-208	ENSMUST00000199046.4	2003	No protein	Retained intron	-	-	TSL:5

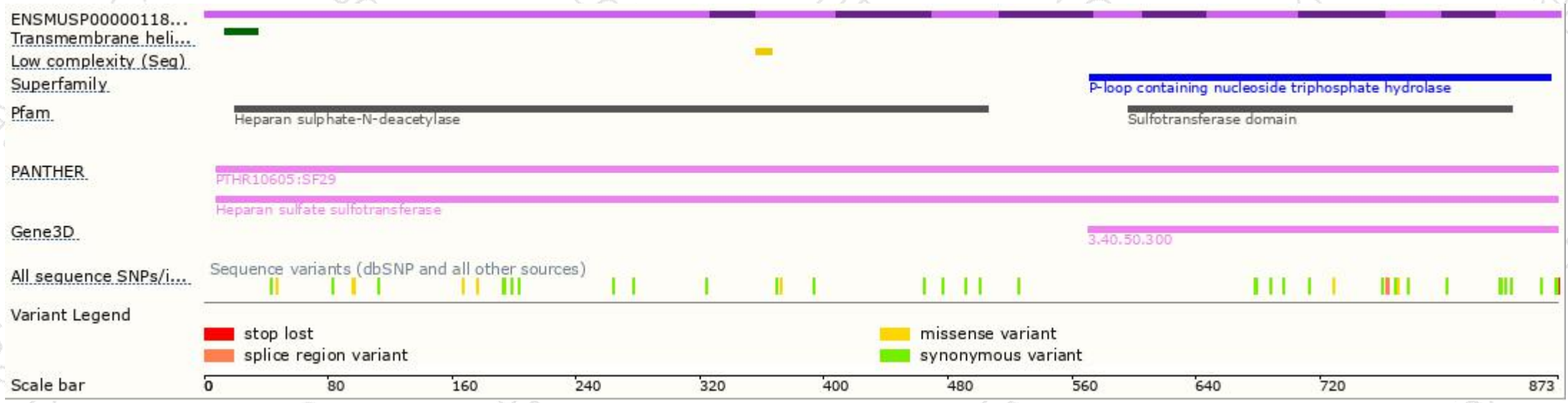
The strategy is based on the design of *Ndst3-206* transcript,The transcription is shown below



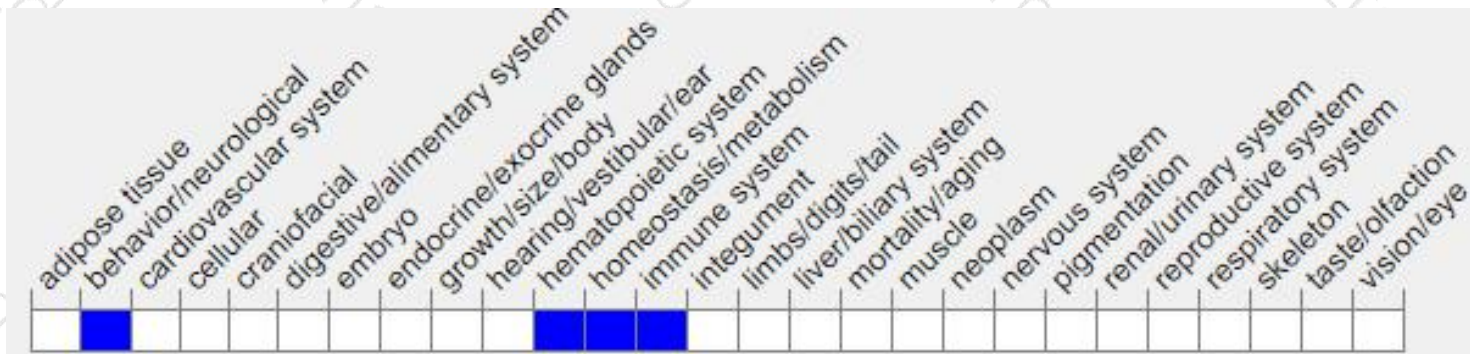
Genomic location distribution



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 knockout allele exhibit decreased anxiety-related behavior, cholesterol levels and CD8⁺ T cells due to moderate heparan-sulfate undersulfation.

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

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