Hs2st1 Cas9-CKO Strategy

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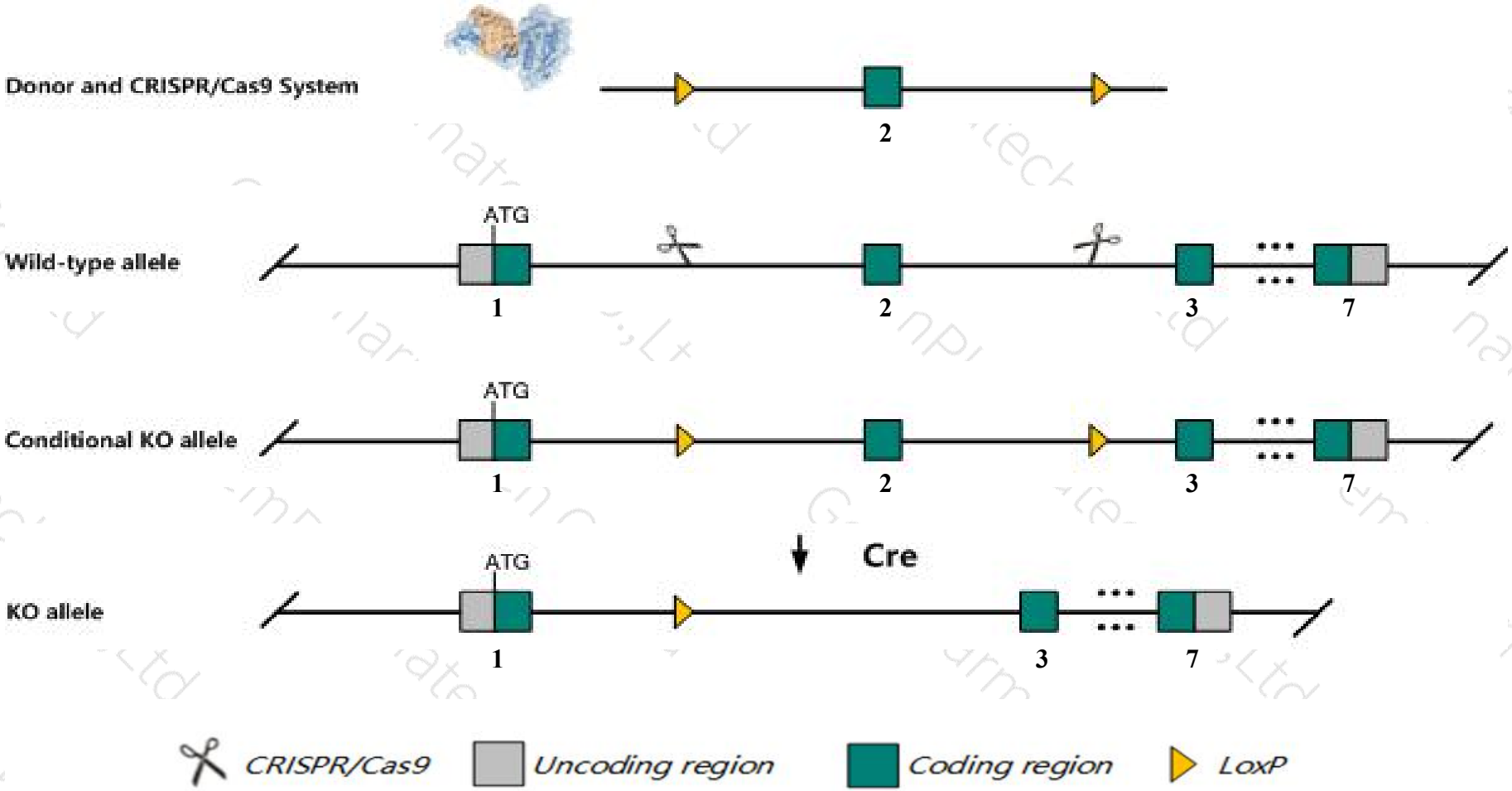
Date:2020-1-20

Project Overview

Project Name	***Hs2st1***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Hs2st1* gene. The schematic diagram is as follows:



Technical routes

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- The *Hs2st1* gene has 3 transcripts. According to the structure of *Hs2st1* gene, exon2 of *Hs2st1-201* (ENSMUST00000043325.8) transcript is recommended as the knockout region.The region contains 239bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Hs2st1* 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.

Notice

- According to the existing MGI data,A mutation in this gene causes bilateral renal agenesis, bone defects, eye development abnormalities and cataracts in homozygous mice.

- The *Hs2st1* 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）

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Hs2st1 heparan sulfate 2-O-sulfotransferase 1 [*Mus musculus* (house mouse)]

Gene ID: 23908, updated on 4-Jan-2020

Summary

Official Symbol	Hs2st1 provided by MGI
Official Full Name	heparan sulfate 2-O-sulfotransferase 1 provided by MGI
Primary source	MGI:MGI:1346049
See related	Ensembl:ENSMUSG00000040151
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	2OST; Hs2st; AW214369; mKIAA0448
Expression	Ubiquitous expression in lung adult (RPKM 8.3), whole brain E14.5 (RPKM 6.1) and 28 other tissues See more
Orthologs	human all

Genomic context

Location: 3; 3 H2

See Hs2st1 in Genome Data Viewer

Exon count: 8

Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	3	NC_000069.6 (144429701..144570216, complement)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	3	NC_000069.5 (144094071..144233180, complement)

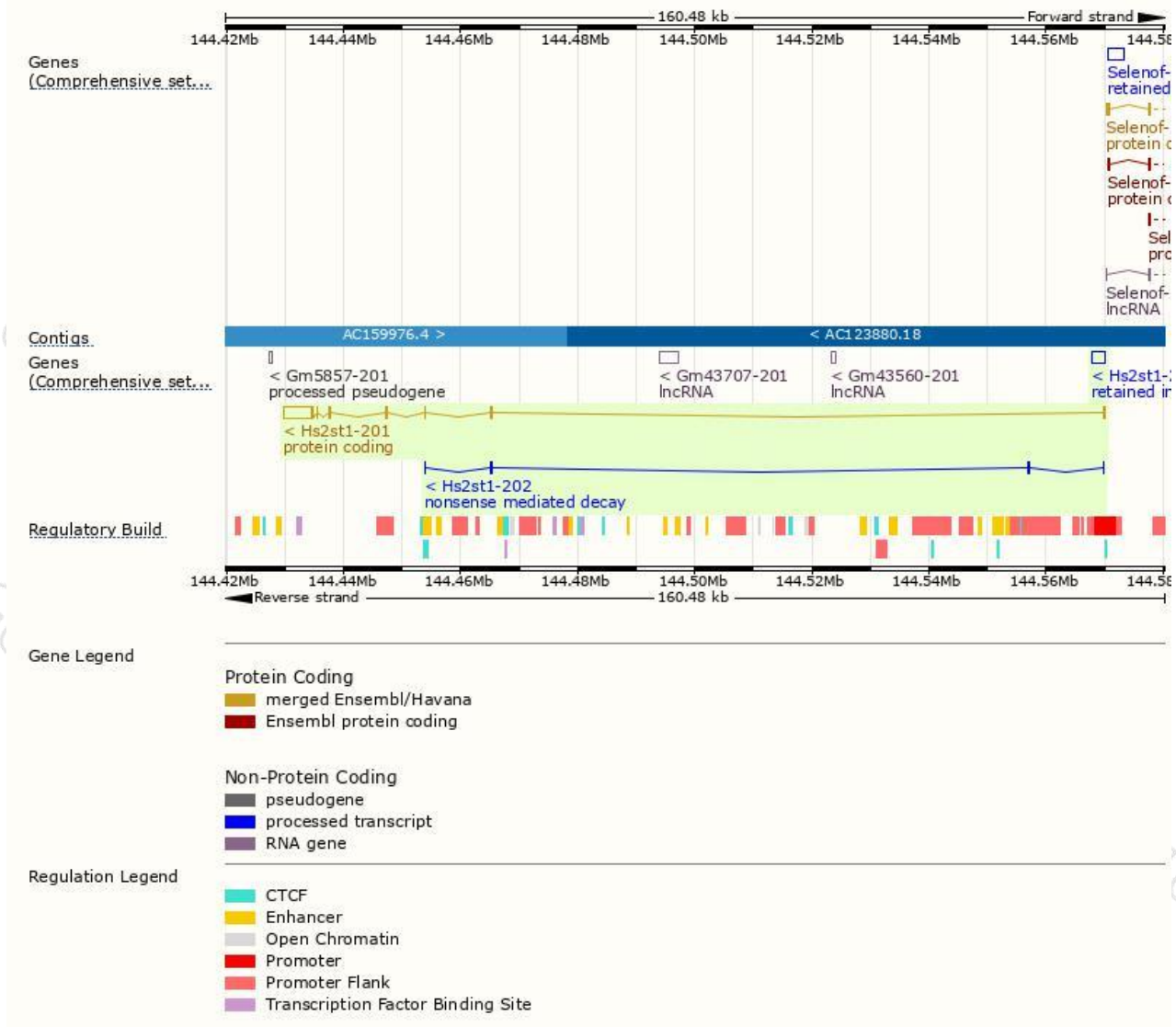
Transcript information（Ensembl）

The gene has 3 transcripts,all transcripts are shown below:

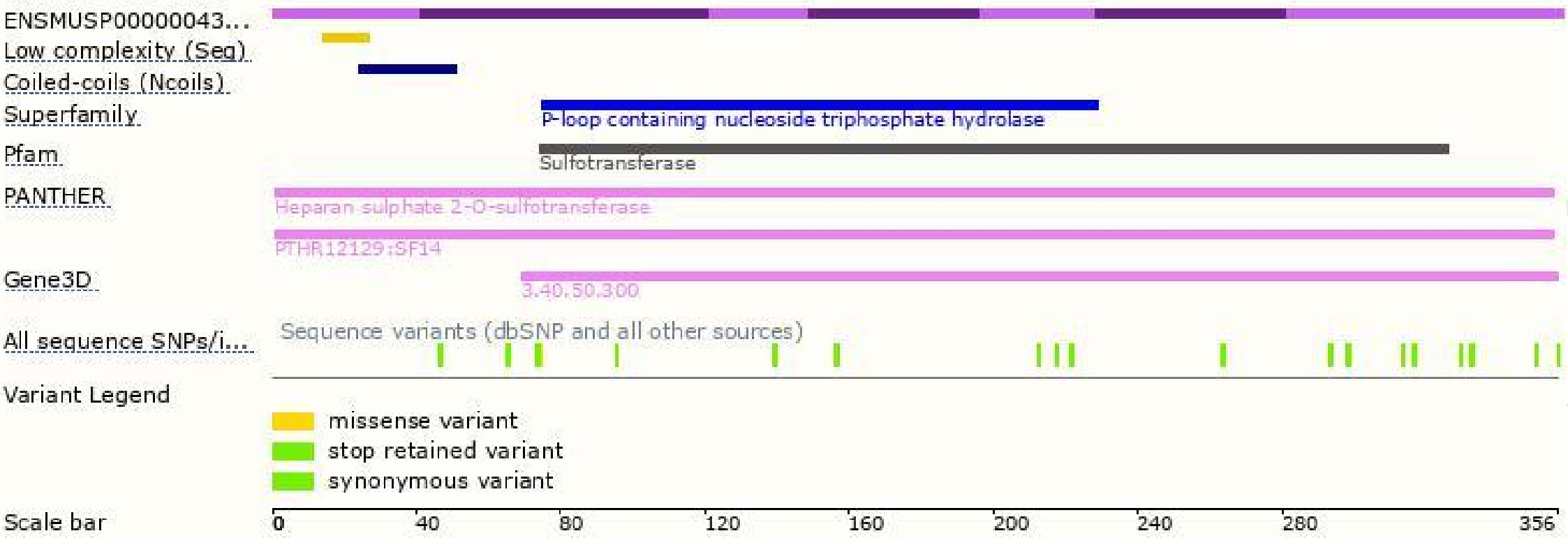
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Hs2st1-201	ENSMUST00000043325.8	6177	356aa	Protein coding	CCDS17883	Q8R3H7	TSL:1 GENCODE basic APPRIS P1
Hs2st1-202	ENSMUST00000160690.1	598	75aa	Nonsense mediated decay	-	E0CYX6	TSL:3
Hs2st1-203	ENSMUST00000199680.1	2321	No protein	Retained intron	-	-	TSL:NA

The strategy is based on the design of *Hs2st1-201* transcript,The transcription is shown below

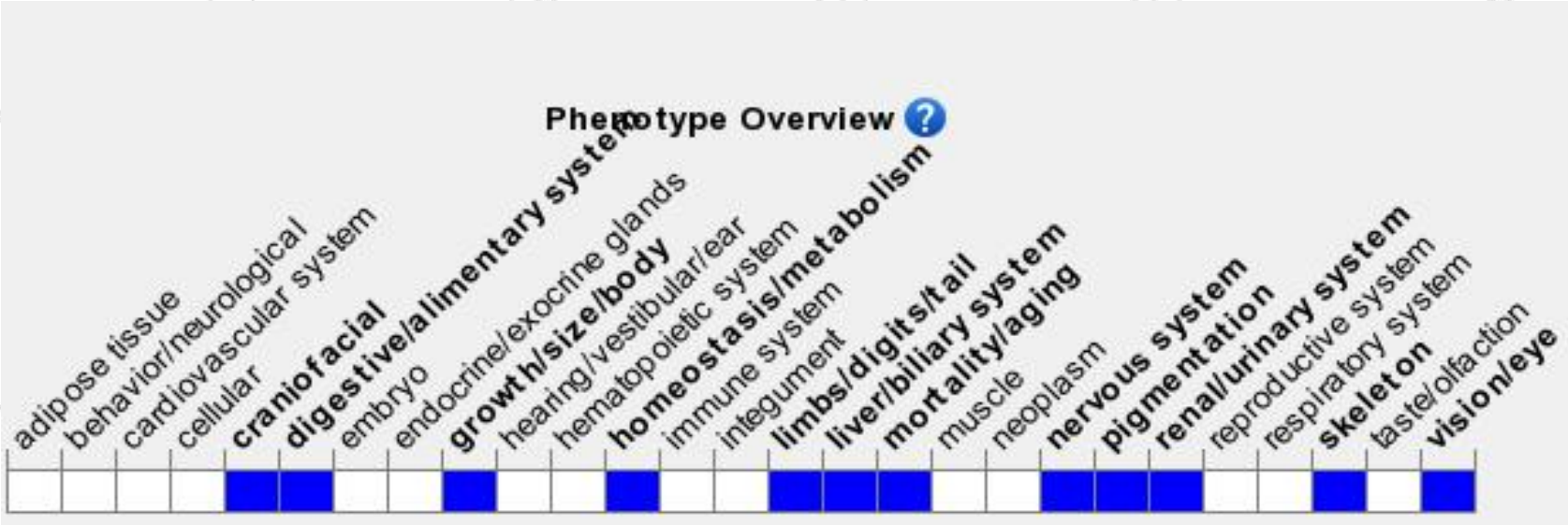
Genomic location distribution



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/).

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

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