Gal3st1 Cas9-CKO Strategy

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Reviewer: Yun Li

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Overview

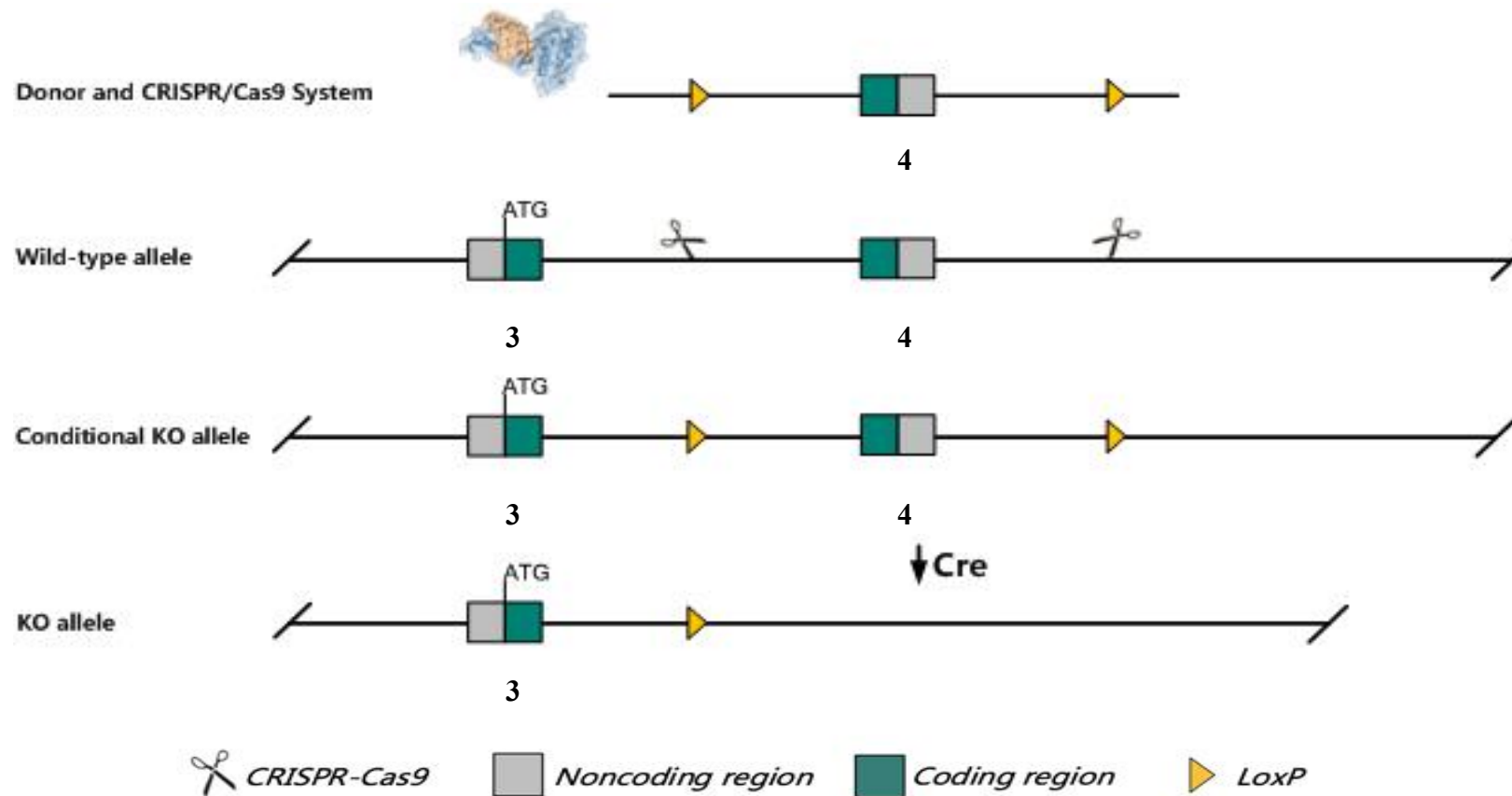## Target Gene Name

- *Gal3st1*

Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy

Schematic representation of CRISPR-Cas9 engineering used to edit the *Gal3st1* gene.

Technical Information

- The *Gal3st1* gene has 3 transcripts. According to the structure of *Gal3st1* gene, exon4 of *Gal3st1-201*(ENSMUST00000063004.14) transcript is recommended as the knockout region.The region contains 1141bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR-Cas9 technology to modify *Gal3st1* 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.

Gene Information

Gal3st1 galactose-3-O-sulfotransferase 1 [*Mus musculus* (house mouse)]

Gene ID: 53897, updated on 24-Jan-2023

⌃ Summary   ⌃ ?

Official Symbol	Gal3st1 provided by MGI
Official Full Name	galactose-3-O-sulfotransferase 1 provided by MGI
Primary source	MGI:MGI:1858277
See related	Ensembl:ENSMUSG00000049721 AllianceGenome:MGI:1858277
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	Cst; Gcst
Summary	Enables galactosylceramide sulfotransferase activity. Involved in galactosylceramide metabolic process. Acts upstream of or within galactosylceramide biosynthetic process; myelination; and spermatogenesis. Predicted to be integral component of membrane. Is expressed in brain; future spinal cord; heart ventricle; and spinal cord cervical region. Orthologous to human GAL3ST1 (galactose-3-O-sulfotransferase 1). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Biased expression in stomach adult (RPKM 105.3), duodenum adult (RPKM 57.3) and 7 other tissues See more
Orthologs	human all

NEW **Try the new Gene table**
Try the new Transcript table

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

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Transcript Information

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

Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags			
ENSMUST00000063004.14	Gal3st1-201	1879	423aa	Protein coding	CCDS24373	Q9JHE4	Ensembl Canonical	GENCODE basic	APPRIS P1	TSL:1
ENSMUST00000078757.8	Gal3st1-202	1749	423aa	Protein coding	CCDS24373	Q9JHE4		GENCODE basic	APPRIS P1	TSL:1
ENSMUST0000109981.2	Gal3st1-203	1600	423aa	Protein coding	CCDS24373	Q9JHE4		GENCODE basic	APPRIS P1	TSL:1

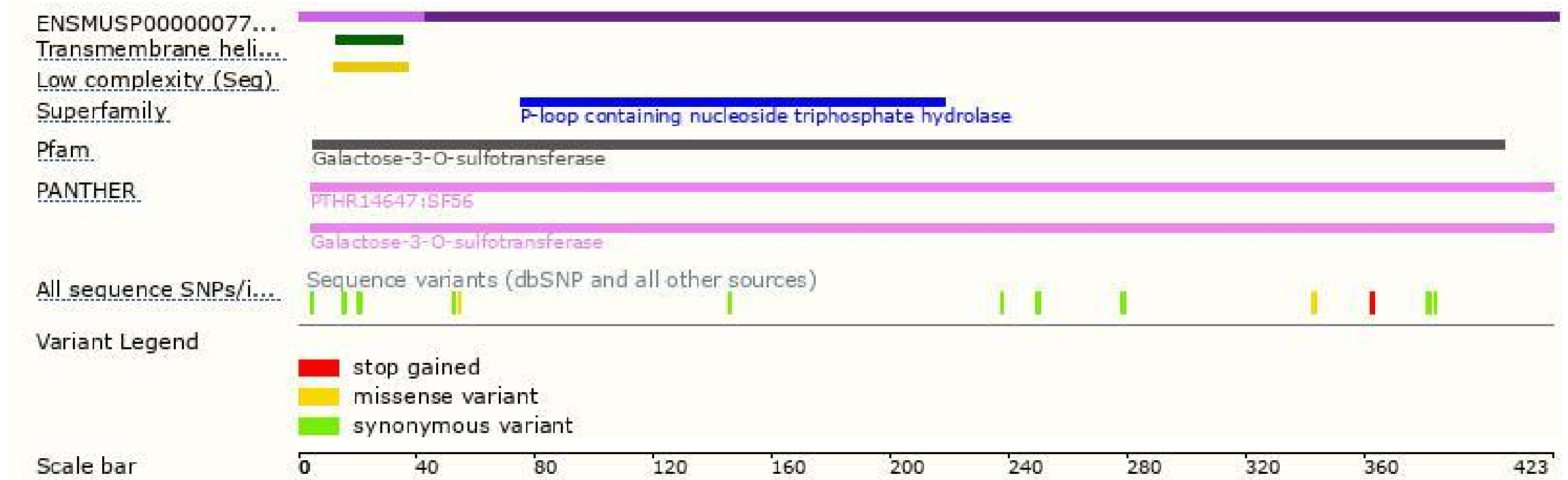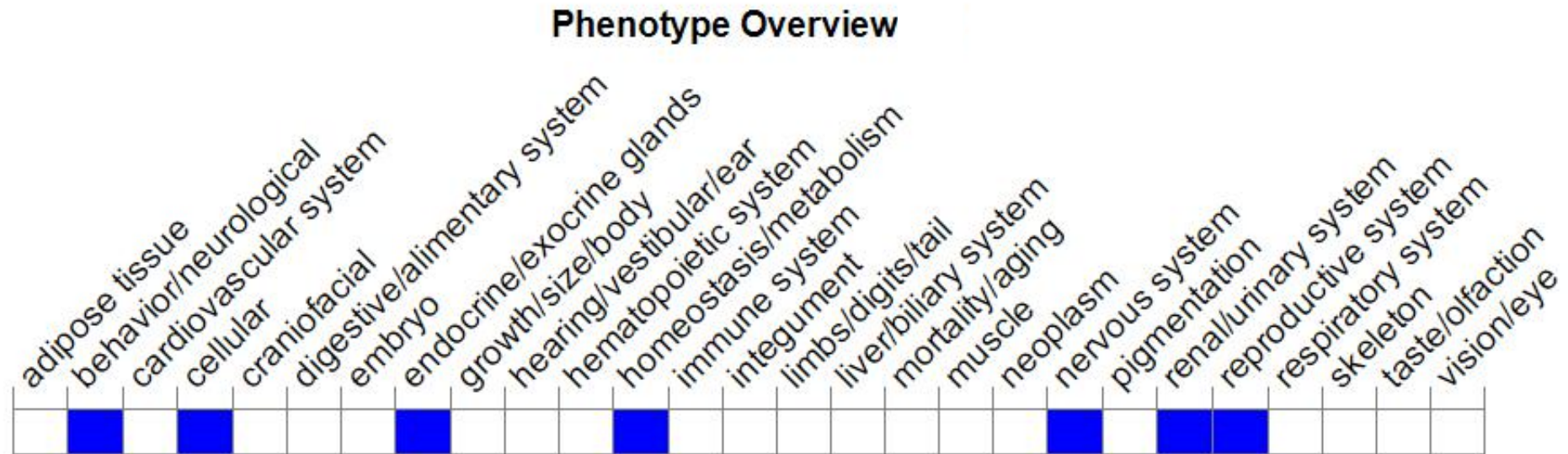The strategy is based on the design of *Gal3st1-201* transcript,the transcription is shown below:

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Genomic Information
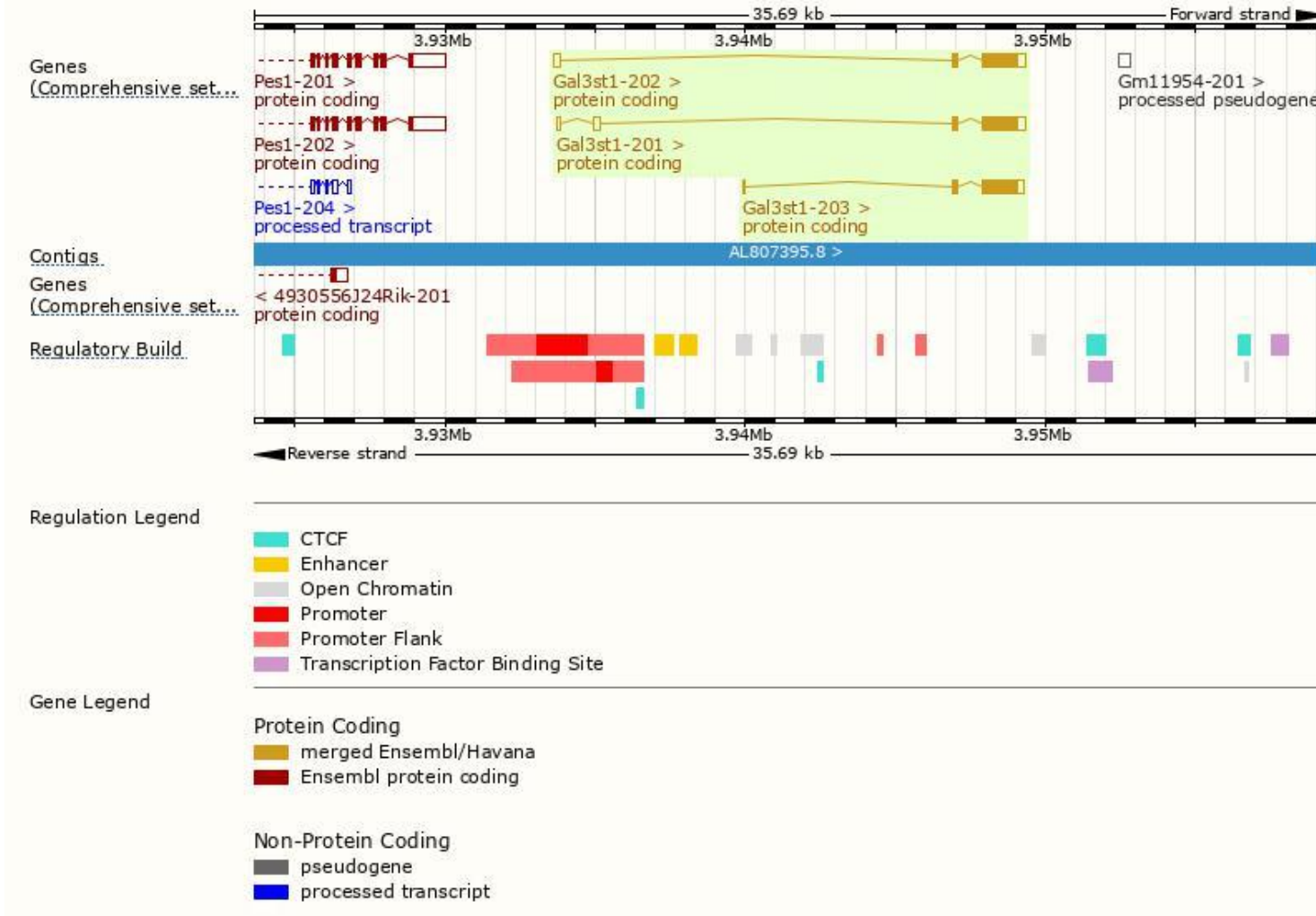
Protein Information

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Mouse Phenotype Information (MGI)

Phenotype Overview

adipose tissue, behavior/neurological, cardiovascular system, cellular, craniofacial, digestive/alimentary system, embryo, endocrine/exocrine glands, growth/size/body, hearing/vestibular/ear, hematopoietic system, homeostasis/metabolism, immune system, integument, limbs/digits/tail, liver/biliary system, mortality/aging, muscle, neoplasm, nervous system, pigmentation, renal/urinary system, reproductive system, respiratory system, skeleton, taste/olfaction, vision/eye

- Phenotypes affected by the mutations of *Gal3st1* gene are marked in blue. According to the existing MGI data,homozygotes for a targeted null mutation exhibit hindlimb weakness and progressive ataxia beginning at six weeks of age. Homozygous males exhibit sterility with a block in spermatogenesis prior to the first meiotic division.

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

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Important Information

- The *Gal3st1* 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

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