Star Cas9-KO Strategy

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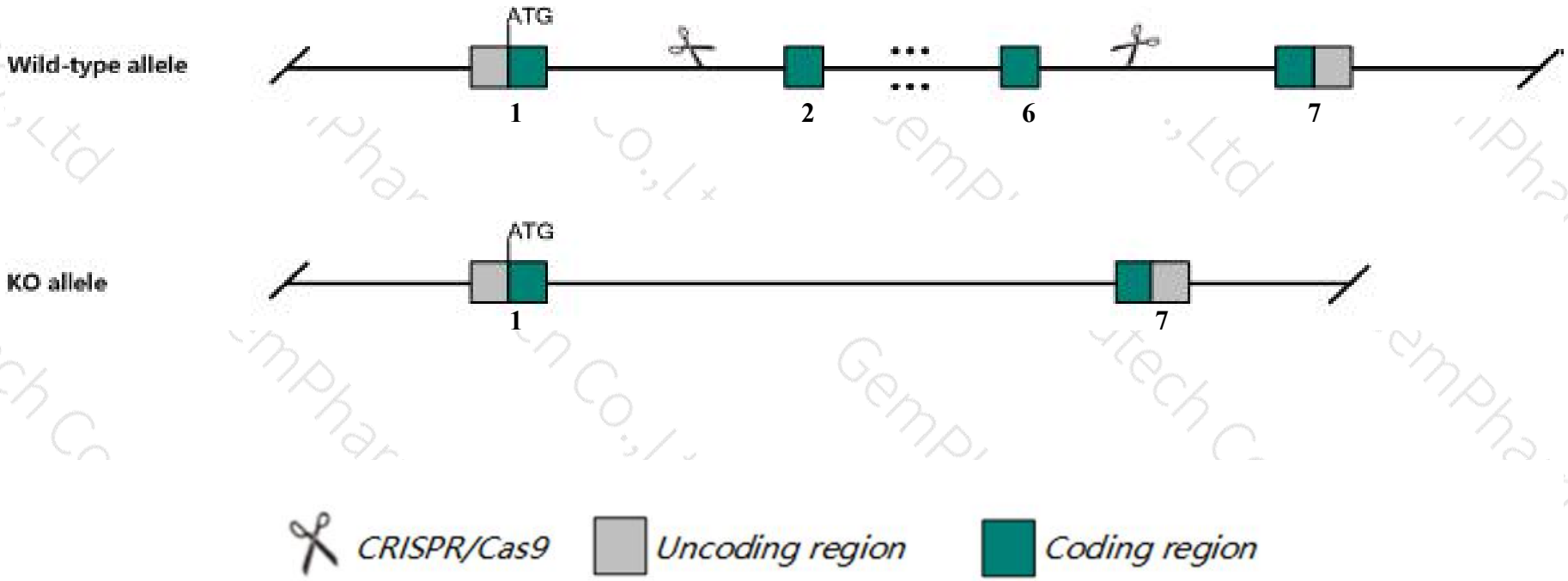
Project Overview

Project Name	***Star***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

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



Technical routes

➢ The *Star* gene has 2 transcripts. According to the structure of *Star* gene, exon2-exon6 of *Star-201* (ENSMUST00000033979.5) transcript is recommended as the knockout region.The region contains 677bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Star* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

➢ According to the existing MGI data,Homozygous null mice fail to thrive and die during the postnatal period due to adrenocortical insufficiency. Mice exhibit male pseudohermaprhoditism and show a progressive accumulation of lipids within steroidogenic cells of the adrenal glands and gonads.

➢ The effect on transcript *Star*-202 is unknown.

➢ The *Star* gene is located on the Chr8. 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）

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Star steroidogenic acute regulatory protein [*Mus musculus* (house mouse)]

Gene ID: 20845, updated on 12-Aug-2019

Summary

Official Symbol	Star provided by MGI
Official Full Name	steroidogenic acute regulatory protein provided by MGI
Primary source	MGI:MGI:102760
See related	Ensembl:ENSMUSG00000031574
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	stARD1; AV363654; D8Ertd419e
Expression	Restricted expression toward adrenal adult (RPKM 849.8) See more
Orthologs	human all

Genomic context

Location: 8 A2; 8 14.17 cM

See Star in Genome Data Viewer

Exon count: 7

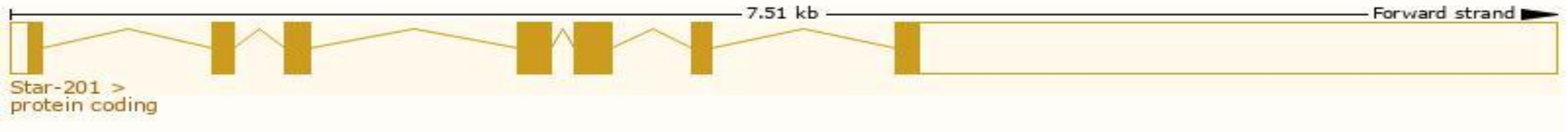
Annotation release	Status	Assembly	Chr	Location
108	current	GRCm38.p6 (GCF_000001635.26)	8	NC_000074.6 (25808474..25815982)
Build 37.2	previous assembly	MGSCv37 (GCF_000001635.18)	8	NC_000074.5 (26918985..26926454)

Transcript information（Ensembl）

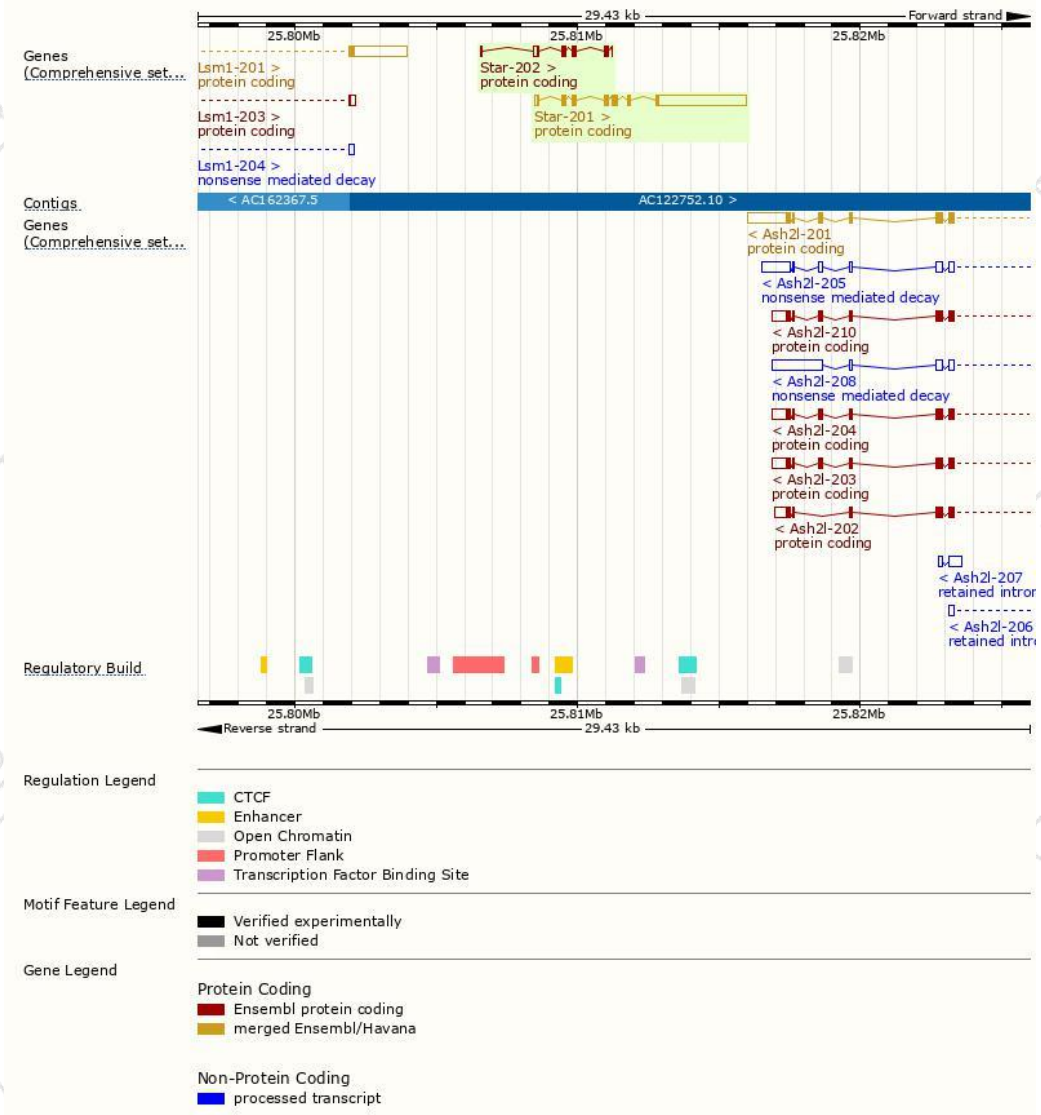
The gene has 2 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Star-201	ENSMUST00000033979.5	4046	284aa	Protein coding	CCDS22203	P51557	TSL:1 GENCODE basic APPRIS P1
Star-202	ENSMUST00000210565.1	633	157aa	Protein coding	-	A0A1B0GSV6	CDS 3' incomplete TSL:5

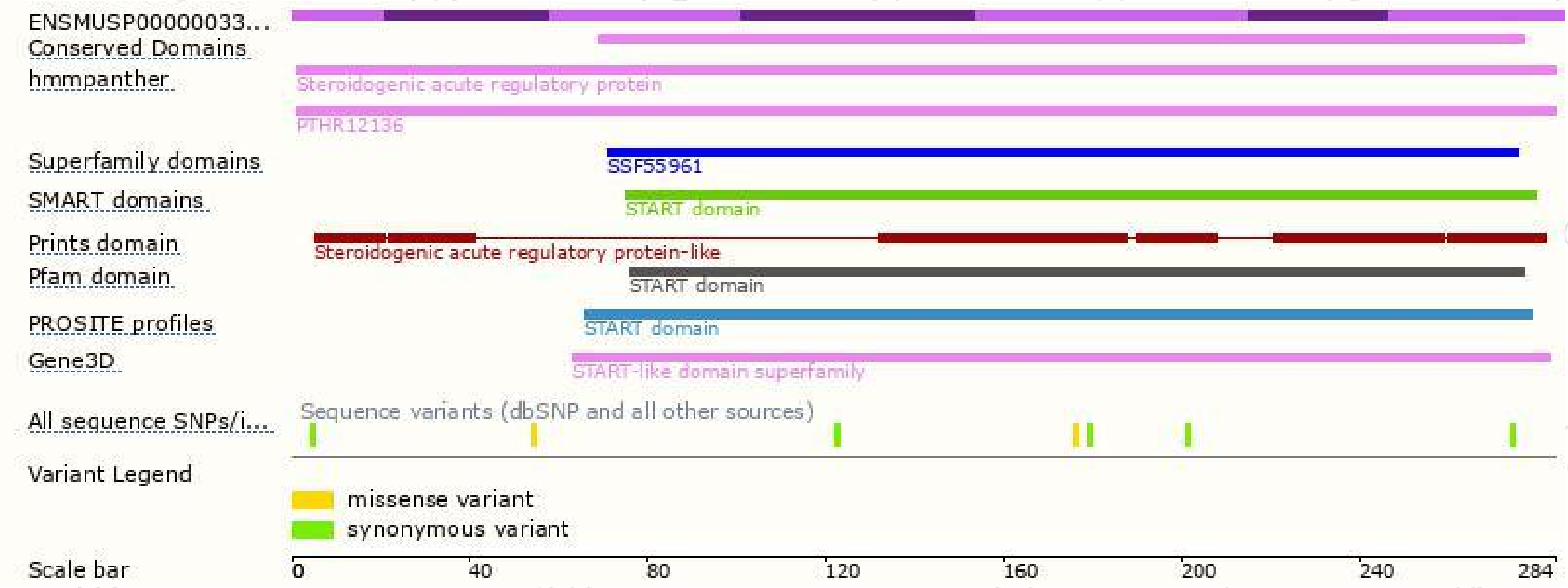
The strategy is based on the design of *Star-201* transcript,The transcription is shown below



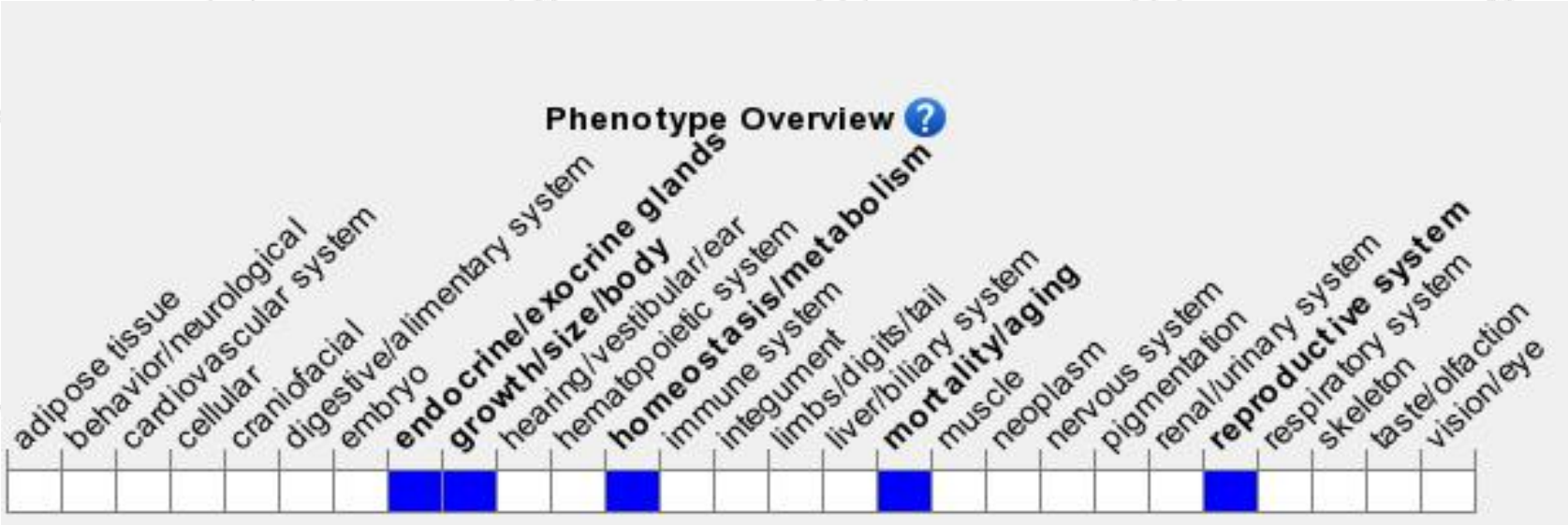
Genomic location distribution



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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