

Atf5 Cas9-KO Strategy

Designer: Yanhua Shen

Reviewer: Xueting Zhang

Design Date: 2020-3-16

Project Overview

Project Name

Atf5

Project type

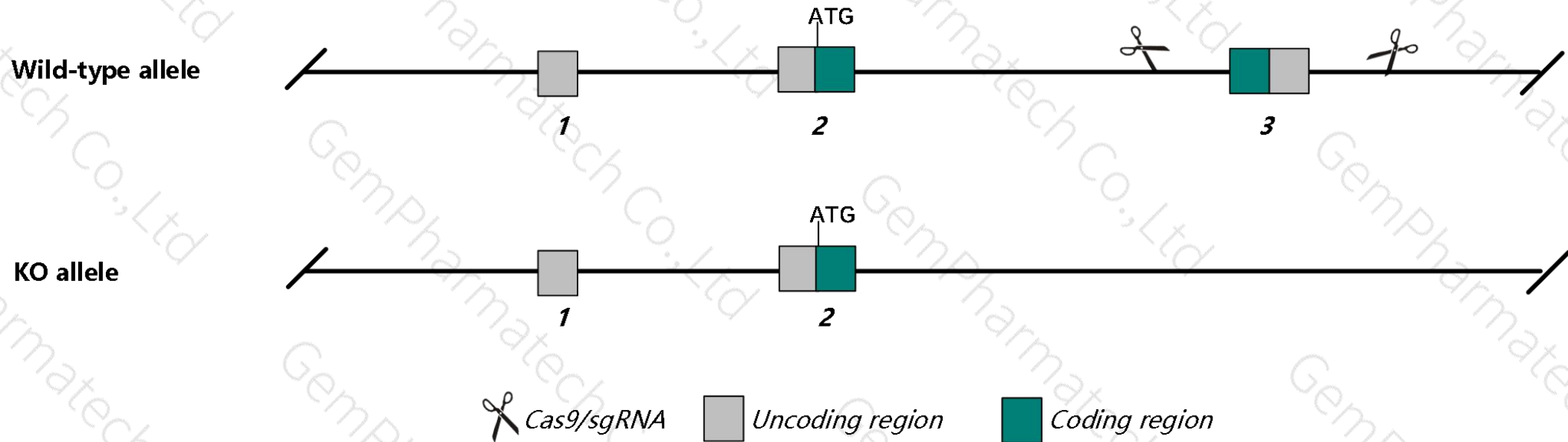
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Atf5* gene. The schematic diagram is as follows:



Technical routes

- The *Atf5* gene has 3 transcripts. According to the structure of *Atf5* gene, exon3 of *Atf5-201* (ENSMUST00000047356.10) transcript is recommended as the knockout region. The region contains most of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Atf5* gene. The brief process is as follows: CRISPR/Cas9 system were

- According to the existing MGI data, Mice homozygous for a knock-out allele exhibit partial neonatal and postnatal lethality, absence of gastric milk in some mice, decreased body weight in mice that survive and loss of mature olfactory sensory neurons with increased apoptosis in olfactory epithelium.
- The knockout region is about 2.4 kb from the 5th end of the *Nup62* gene, which may affect the 5-terminal regulation of the gene.
- The knockout region is about 2.8 kb from the 5th end of the *Il4i1* gene, which may affect the 5-terminal regulation of the gene.
- The *Atf5* gene is located on the Chr7. 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)

Atf5 activating transcription factor 5 [*Mus musculus* (house mouse)]

Gene ID: 107503, updated on 13-Mar-2020

Summary

Official Symbol	Atf5 provided by MGI
Official Full Name	activating transcription factor 5 provided by MGI
Primary source	MGI:MGI:2141857
See related	Ensembl:ENSMUSG000000038539
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	AFTA; Atf7; Atfx; ODA-10
Expression	Broad expression in liver adult (RPKM 173.6), adrenal adult (RPKM 143.8) and 21 other tissues See more
Orthologs	human all

Genomic context

Location: 7; 7 B3

Exon count: 4

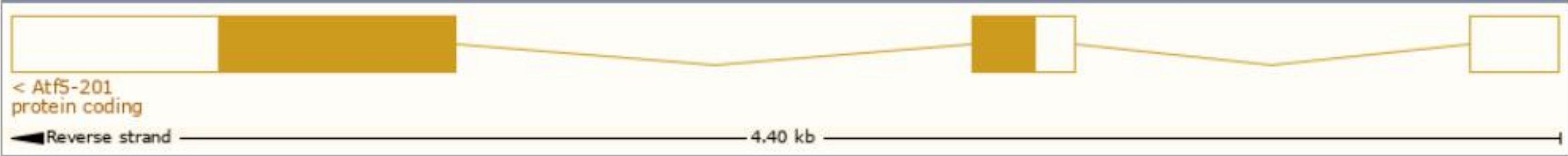
See Atf5 in [Genome Data Viewer](#)

Transcript information (Ensembl)

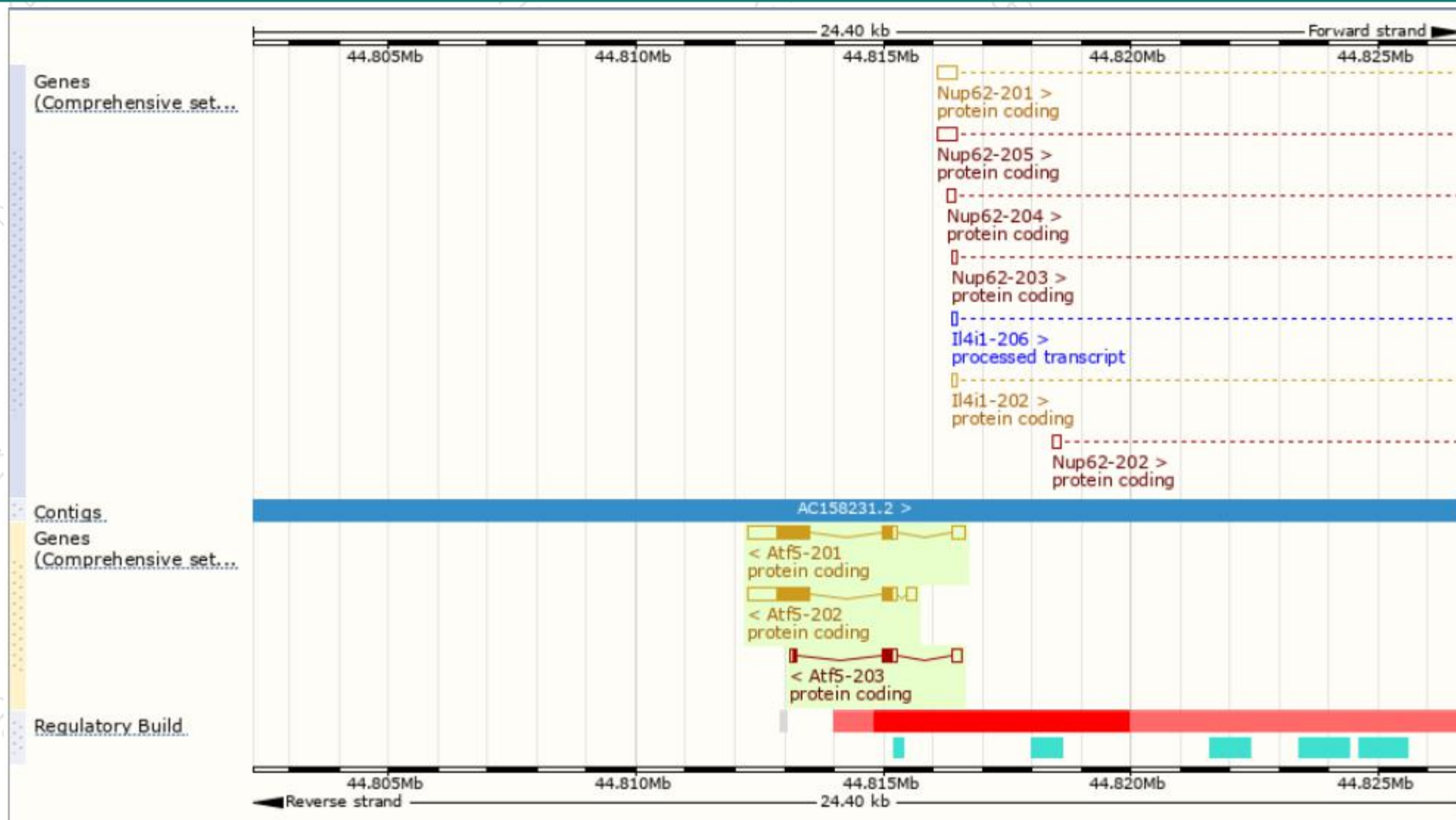
The gene has 3 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Atf5-201	ENSMUST00000047356.10	1816	283aa	Protein coding	CCDS21215	O70191 Q3UJF3	TSL:1 GENCODE basic APPRIS P1
Atf5-202	ENSMUST00000107893.8	1735	283aa	Protein coding	CCDS21215	O70191 Q3UJF3	TSL:1 GENCODE basic APPRIS P1
Atf5-203	ENSMUST00000209072.1	595	75aa	Protein coding	-	A0A140LIB7	TSL:5 GENCODE basic

The strategy is based on the design of *Atf5-201* transcript,The transcription is shown below



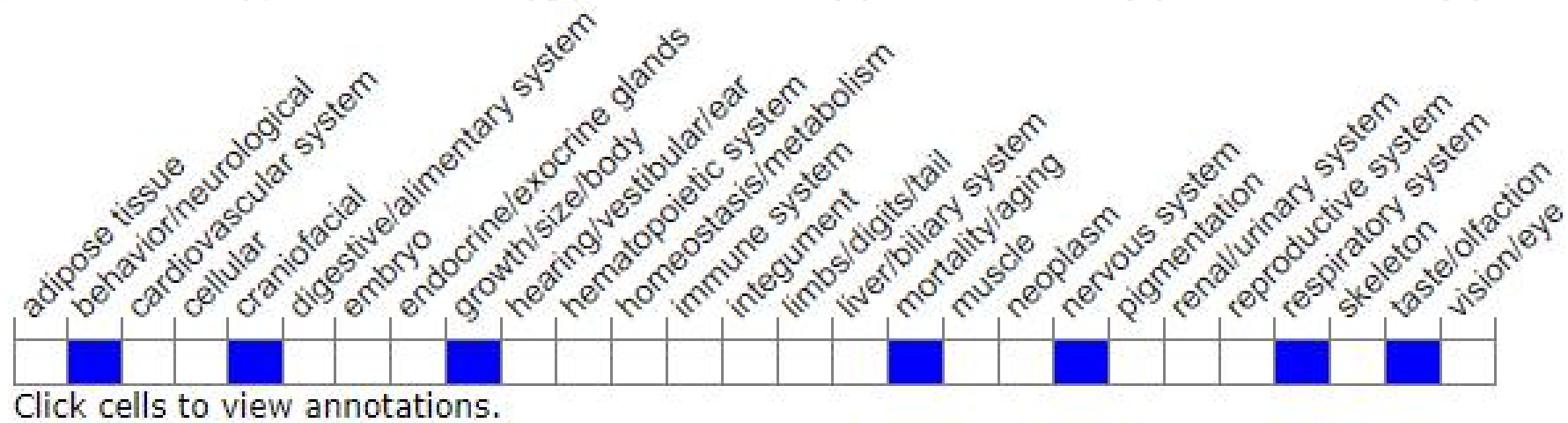
Genomic location distribution



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 knock-out allele exhibit partial neonatal and postnatal lethality, absence of gastric milk in some mice, decreased body weight in mice that survive and loss of mature olfactory sensory neurons with increased apoptosis in olfactory epithelium.

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

Tel: 400-9660890

