

Adam2 Cas9-KO Strategy

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Project Overview

Project Name

Adam2

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Adam2* gene. The schematic diagram is as follows:



- The *Adam2* gene has 2 transcripts. According to the structure of *Adam2* gene, exon3 of *Adam2-201*(ENSMUST00000022618.5) transcript is recommended as the knockout region. The region contains 56bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Adam2* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, mice homozygous for targeted mutations that inactivate the gene are viable, females are fertile, but males have severely reduced fertility. Mutant male sperm are defective in sperm-egg membrane adhesion, sperm-egg fusion, migration from the uterus to the oviduct, and binding to the egg zona pellucida.
- The *Adam2* gene is located on the Chr14. 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)

Adam2 a disintegrin and metallopeptidase domain 2 [Mus musculus (house mouse)]

Gene ID: 11495, updated on 13-Mar-2020

Summary

Official Symbol Adam2 provided by [MGI](#)

Official Full Name a disintegrin and metallopeptidase domain 2 provided by [MGI](#)

Primary source [MGI:MGI:1340894](#)

See related [Ensembl:ENSMUSG00000022039](#)

Gene type protein coding

RefSeq status REVIEWED

Organism [Mus musculus](#)

Lineage Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus

Also known as AI323749, Ftnb, Ph30-beta

Summary This gene encodes a member of a disintegrin and metalloprotease (ADAM) family of endoproteases that play important roles in various biological processes including cell signaling, adhesion and migration. This gene is predominantly expressed in the epididymis, where the encoded preproprotein undergoes proteolytic processing to generate a mature, functional protein. Male mice lacking the encoded protein are infertile and exhibit multiple defects in reproduction. [provided by RefSeq, May 2016]

Expression Restricted expression toward testis adult (RPKM 65.0)[See more](#)

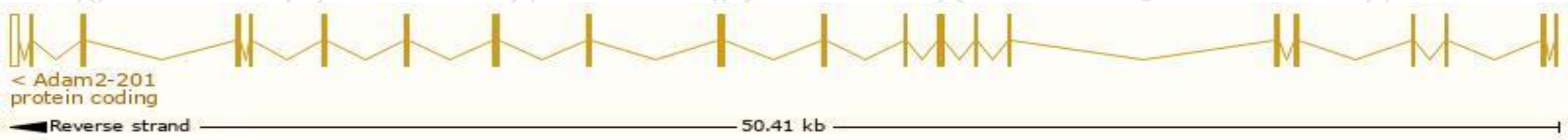
Orthologs [human](#) [all](#)

Transcript information (Ensembl)

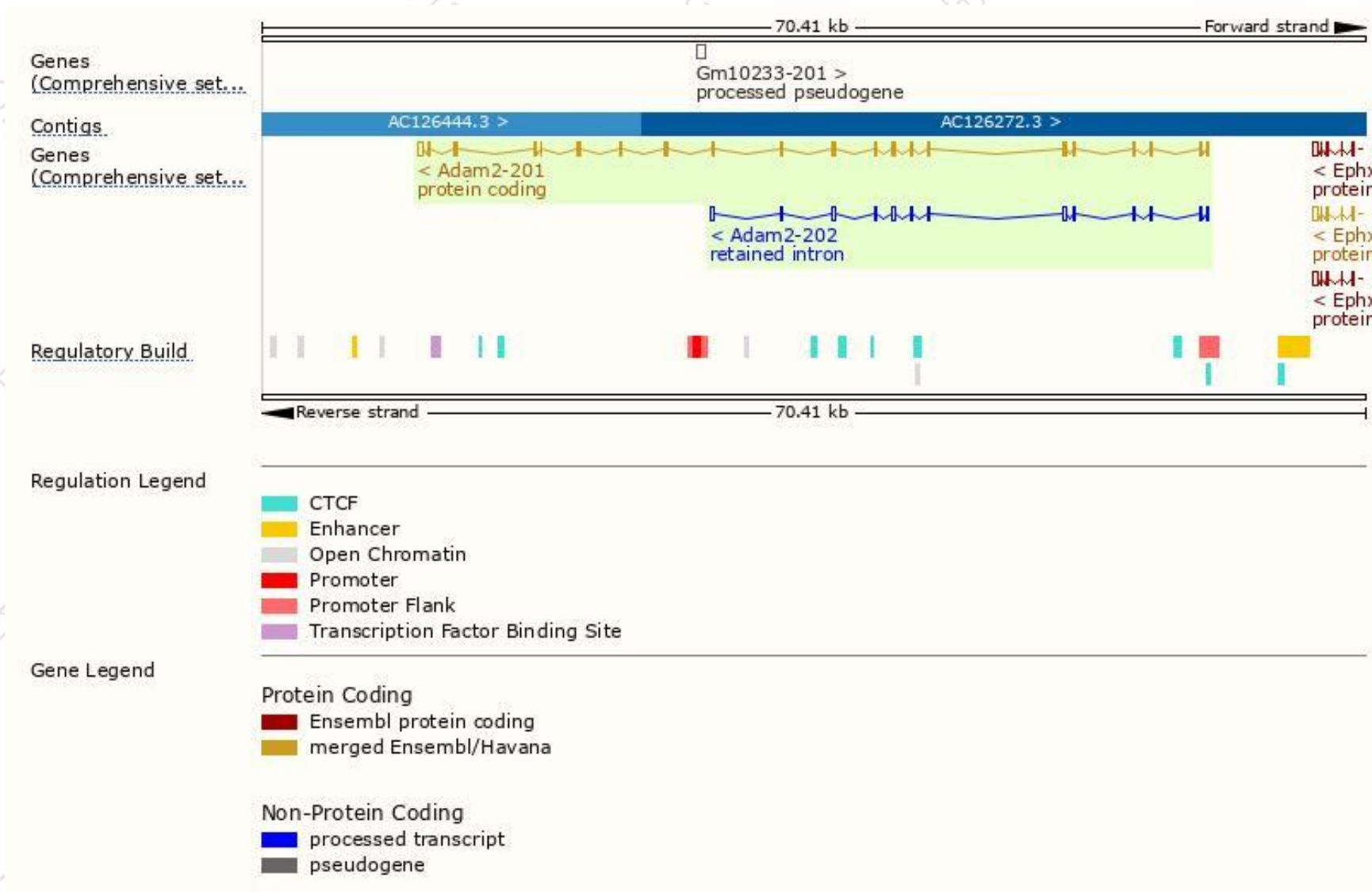
The gene has 2 transcripts,all transcripts are shown below:

| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|-----------|---------------------------------------|------|-----------------------|-----------------|---------------------------|------------------------|-------------------------------|
| Adam2-201 | ENSMUST00000022618.5 | 2551 | 735aa | Protein coding | CCDS36959 | Q60718 | TSL:1 GENCODE basic APPRIS P1 |
| Adam2-202 | ENSMUST000000225667.1 | 1438 | No protein | Retained intron | - | - | |

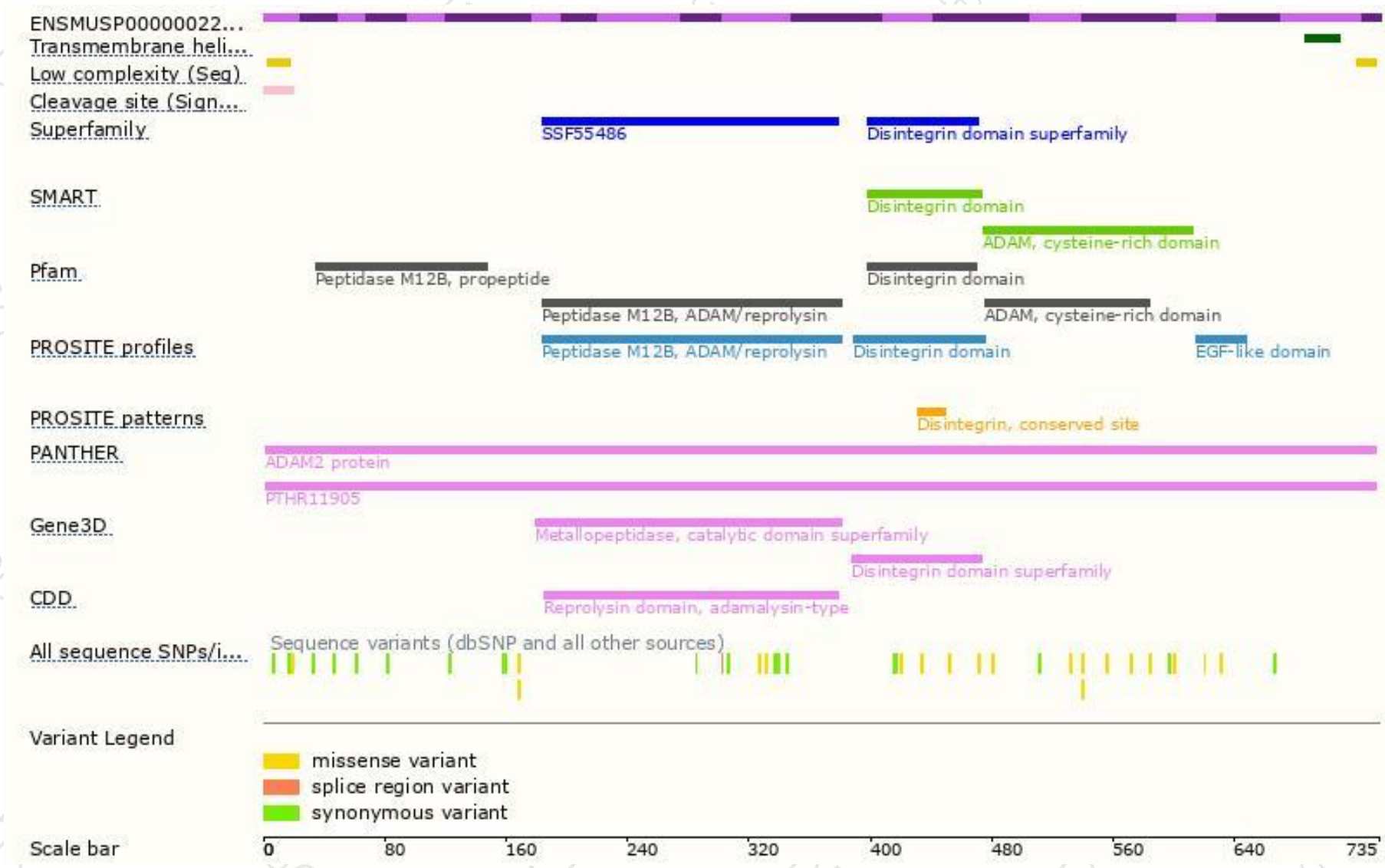
The strategy is based on the design of *Adam2-201* transcript,the transcription is shown below:



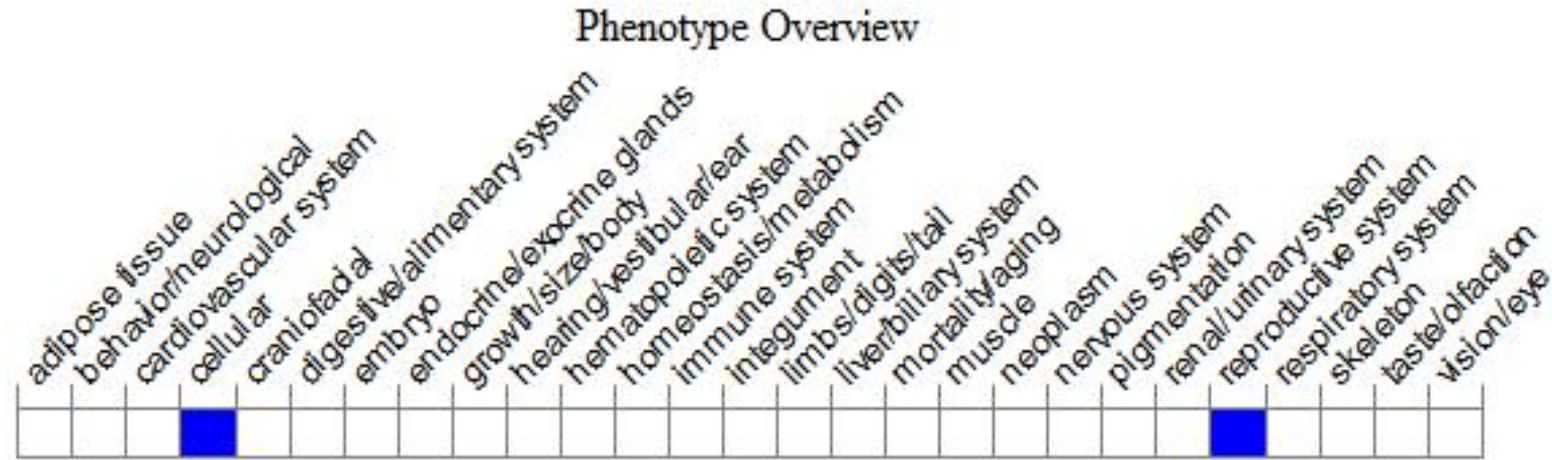
Genomic location distribution



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 targeted mutations that inactivate the gene are viable, females are fertile, but males have severely reduced fertility. Mutant male sperm are defective in sperm-egg membrane adhesion, sperm-egg fusion, migration from the uterus to the oviduct, and binding to the egg zona pellucida.

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

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