

# ***Man2a2* Cas9-KO Strategy**

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**Reviewer: JiaYu**

**Design Date: 2020-7-22**

# Project Overview

**Project Name**

*Man2a2*

**Project type**

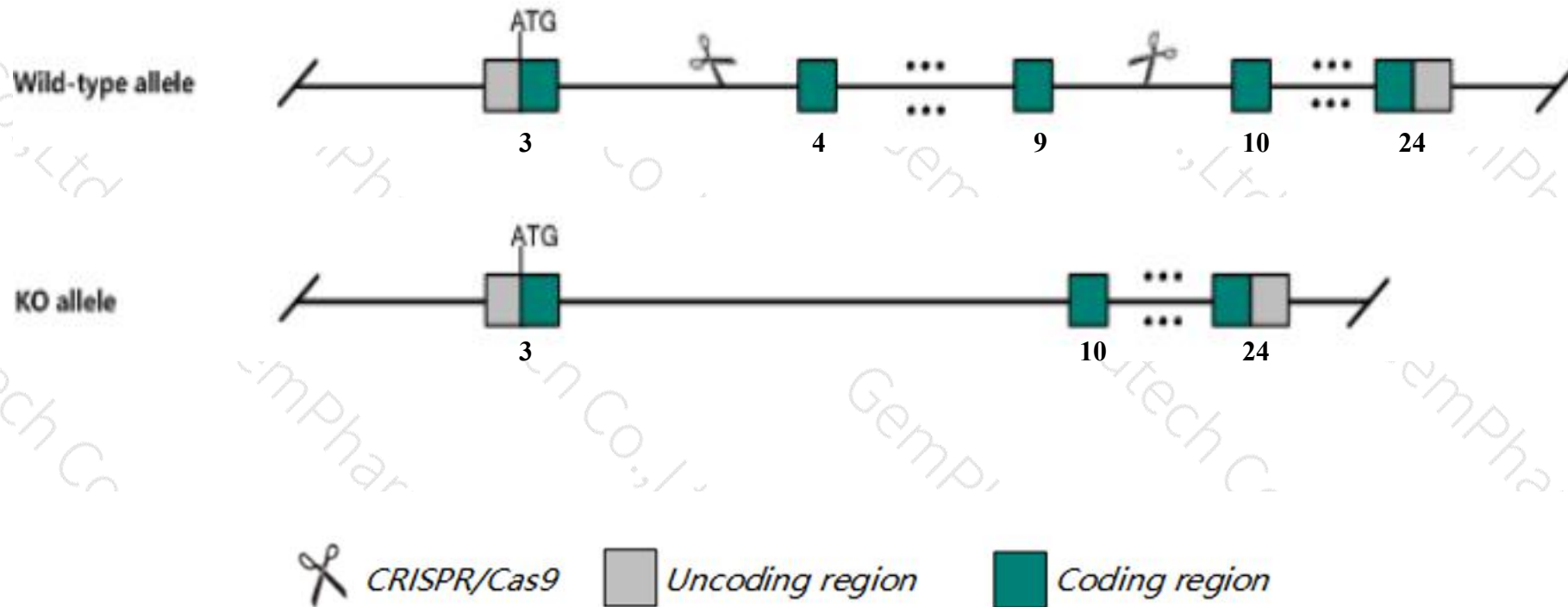
**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Man2a2* gene. The schematic diagram is as follows:



- The *Man2a2* gene has 11 transcripts. According to the structure of *Man2a2* gene, exon4-exon9 of *Man2a2*-201(ENSMUST00000098346.4) transcript is recommended as the knockout region. The region contains 1064bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Man2a2* 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, homozygous null males are infertile due to a defect during spermatogenesis involving the premature release of germ cells from the seminiferous tubules into the epididymis.
- The *Man2a2* 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)

Man2a2 mannosidase 2, alpha 2 [Mus musculus (house mouse)]

Gene ID: 140481, updated on 13-Mar-2020

## Summary



Official Symbol Man2a2 provided by [MGI](#)

Official Full Name mannosidase 2, alpha 2 provided by [MGI](#)

Primary source [MGI:MGI:2150656](#)

See related [Ensembl:ENSMUSG00000038886](#)

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 1700052022Rik, 4931438M07Rik, AI480988, MX, Man IIx

Expression Ubiquitous expression in adrenal adult (RPKM 32.8), mammary gland adult (RPKM 28.0) and 26 other tissues [See more](#)

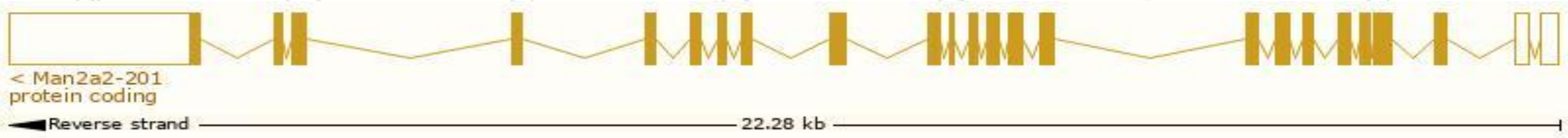
Orthologs [human all](#)

# Transcript information (Ensembl)

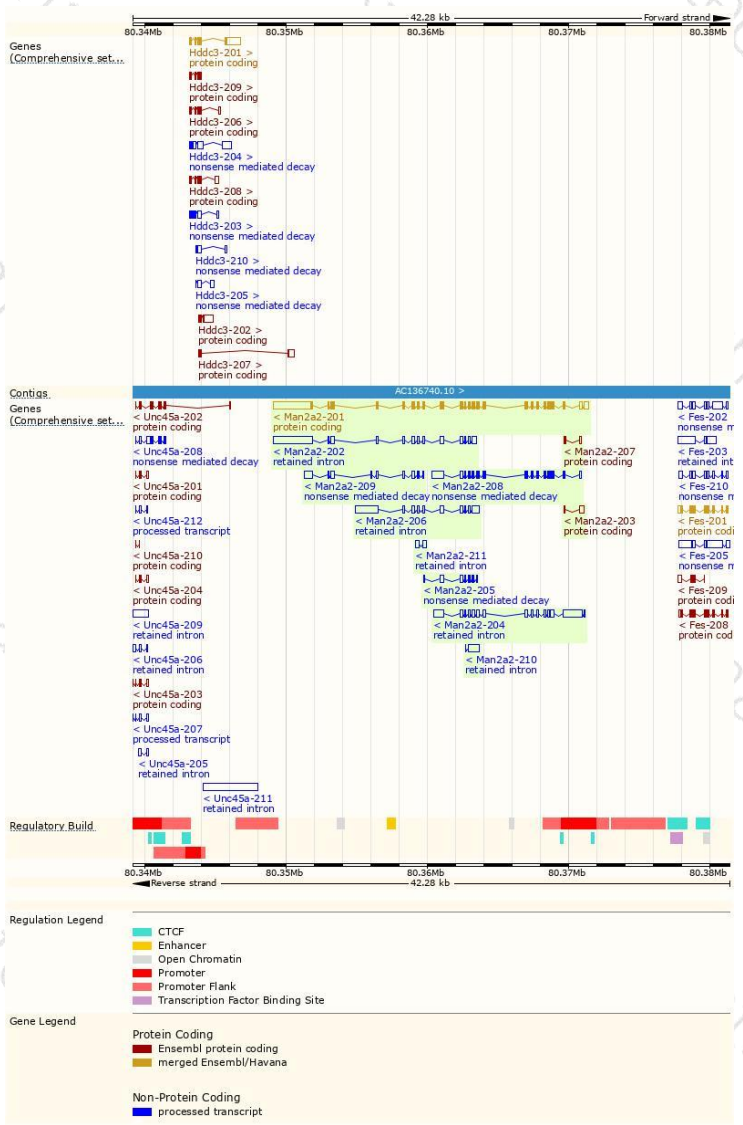
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Man2a2-201	<a href="#">ENSMUST00000098346.4</a>	6554	<a href="#">1152aa</a>	Protein coding	<a href="#">CCDS57556</a>	<a href="#">Q197W7</a> <a href="#">Q8BRK9</a>	TSL:1 GENCODE basic APPRIS P1
Man2a2-203	<a href="#">ENSMUST00000205436.1</a>	431	<a href="#">19aa</a>	Protein coding	-	<a href="#">A0A0U1RNS8</a>	CDS 3' incomplete TSL:2
Man2a2-207	<a href="#">ENSMUST00000206212.1</a>	262	<a href="#">29aa</a>	Protein coding	-	<a href="#">A0A0U1RP42</a>	CDS 3' incomplete TSL:5
Man2a2-208	<a href="#">ENSMUST00000206301.1</a>	3007	<a href="#">583aa</a>	Nonsense mediated decay	-	<a href="#">Q3TSU5</a>	TSL:1
Man2a2-209	<a href="#">ENSMUST00000206807.1</a>	1607	<a href="#">67aa</a>	Nonsense mediated decay	-	<a href="#">A0A0U1RQ19</a>	CDS 5' incomplete TSL:5
Man2a2-205	<a href="#">ENSMUST00000205853.1</a>	747	<a href="#">69aa</a>	Nonsense mediated decay	-	<a href="#">A0A0U1RPB8</a>	CDS 5' incomplete TSL:3
Man2a2-202	<a href="#">ENSMUST00000205318.1</a>	4610	No protein	Retained intron	-	-	TSL:1
Man2a2-204	<a href="#">ENSMUST00000205535.1</a>	4020	No protein	Retained intron	-	-	TSL:1
Man2a2-206	<a href="#">ENSMUST00000206066.1</a>	3190	No protein	Retained intron	-	-	TSL:1
Man2a2-210	<a href="#">ENSMUST00000206917.1</a>	783	No protein	Retained intron	-	-	TSL:5
Man2a2-211	<a href="#">ENSMUST00000206973.1</a>	537	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Man2a2-201* transcript,the transcription is shown below:

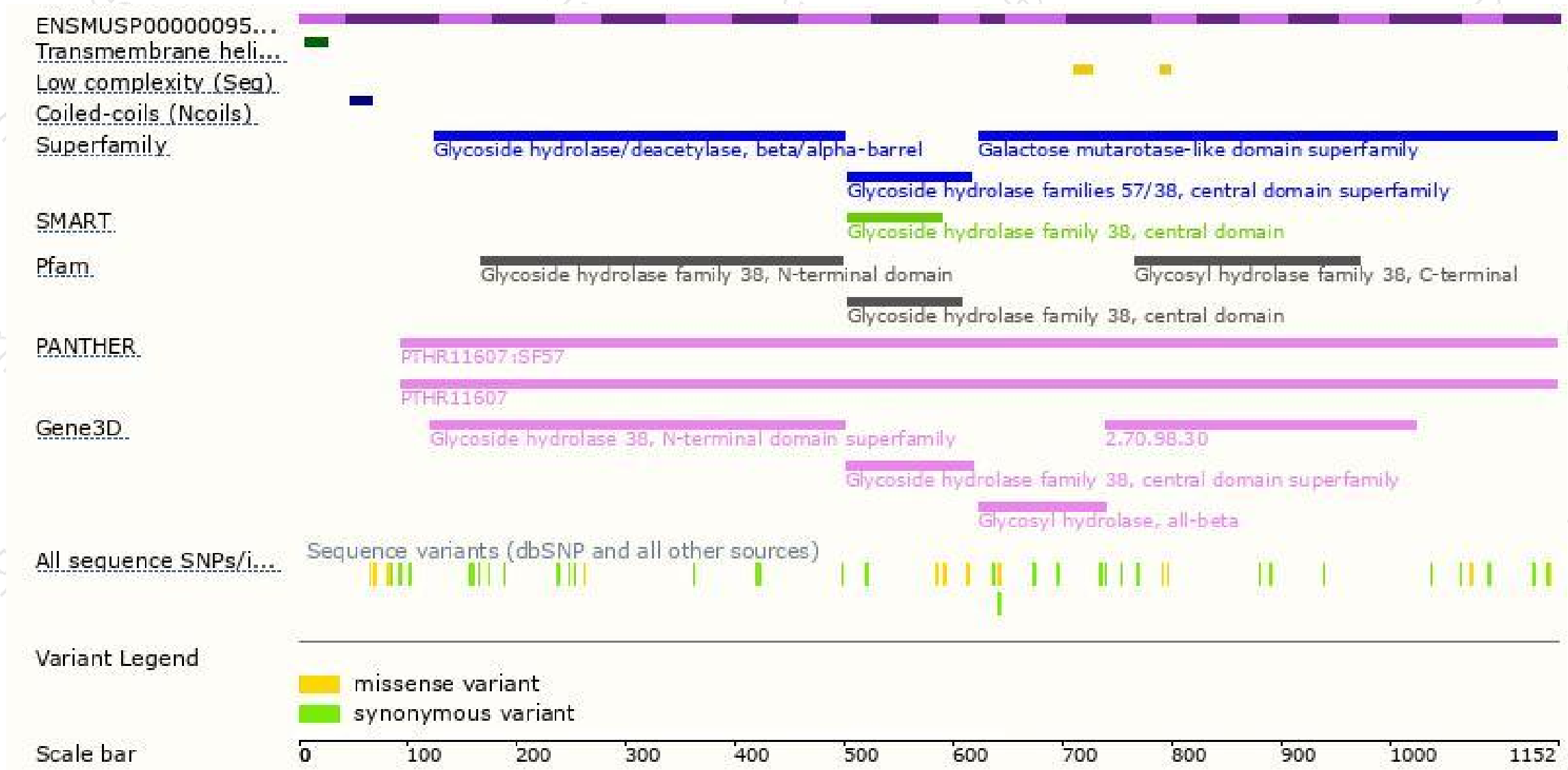


# Genomic location distribution

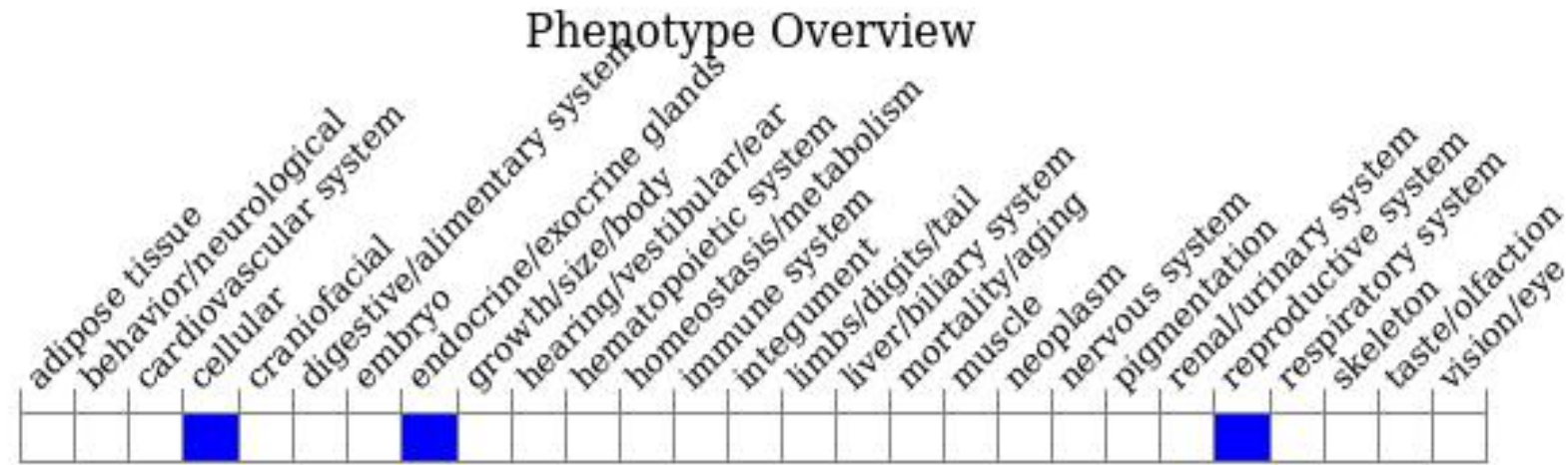




# Protein domain



# 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, homozygous null males are infertile due to a defect during spermatogenesis involving the premature release of germ cells from the seminiferous tubules into the epididymis.

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

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