

# *Septin4* Cas9-KO Strategy

**Designer: Miaomiao Cui**

**Reviewer: Lingyan Wu**

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# Project Overview

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**Project Name**

*Septin4*

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**Project type**

**Cas9-KO**

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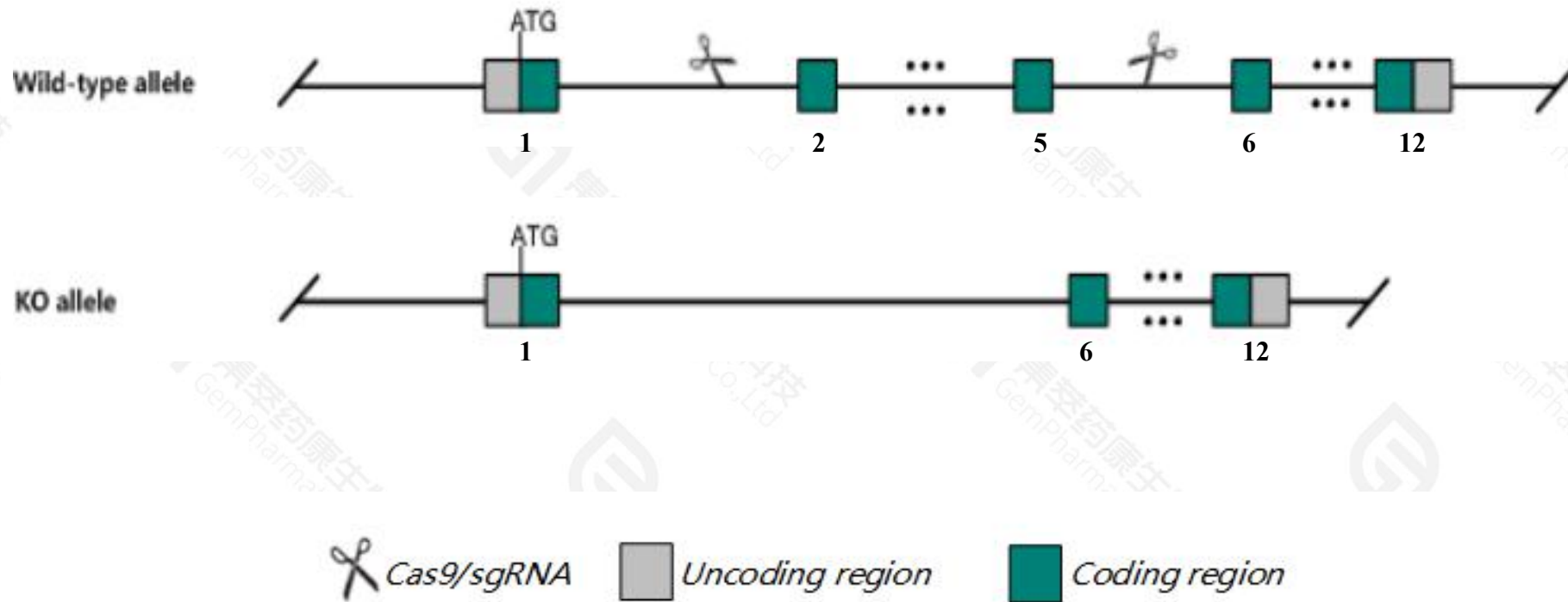
**Strain background**

**C57BL/6JGpt**

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# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Septin4* gene. The schematic diagram is as follows:



- The *Septin4* gene has 20 transcripts. According to the structure of *Septin4* gene, exon2-exon5 of *Septin4-201*(ENSMUST00000018544.12) transcript is recommended as the knockout region. The region contains 602bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Septin4* gene. The brief process is as follows: sgRNA was transcribed in vitro. Cas9 and sgRNA 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 sterile and have immotile and structurally defective sperm that is bent and lacks the annulus.
- Transcript *Septin4*-202 may not be affected.
- The *Septin4* 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 the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

## Septin4 septin 4 [Mus musculus (house mouse)]

Gene ID: 18952, updated on 23-Jan-2021

### Summary



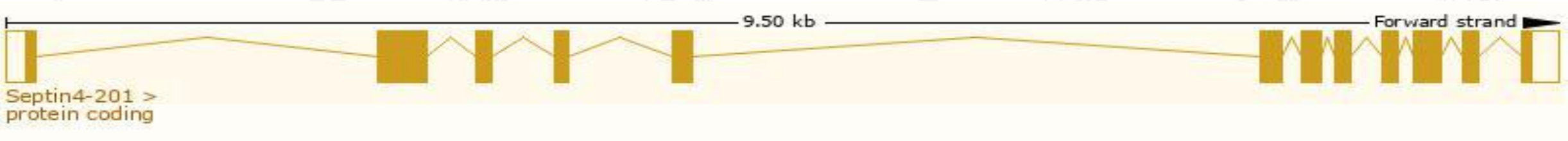
<b>Official Symbol</b>	Septin4 provided by <a href="#">MGI</a>
<b>Official Full Name</b>	septin 4 provided by <a href="#">MGI</a>
<b>Primary source</b>	<a href="#">MGI:MGI:1270156</a>
<b>See related</b>	<a href="#">Ensembl:ENSMUSG00000020486</a>
<b>Gene type</b>	protein coding
<b>RefSeq status</b>	VALIDATED
<b>Organism</b>	<a href="#">Mus musculus</a>
<b>Lineage</b>	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
<b>Also known as</b>	A, ARTS, Bh5, Pnu, Pnutl2, Sep, Sept4
<b>Expression</b>	Biased expression in cerebellum adult (RPKM 67.1), testis adult (RPKM 31.3) and 9 other tissues <a href="#">See more</a>
<b>Orthologs</b>	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

The gene has 20 transcripts,all transcripts are shown below:

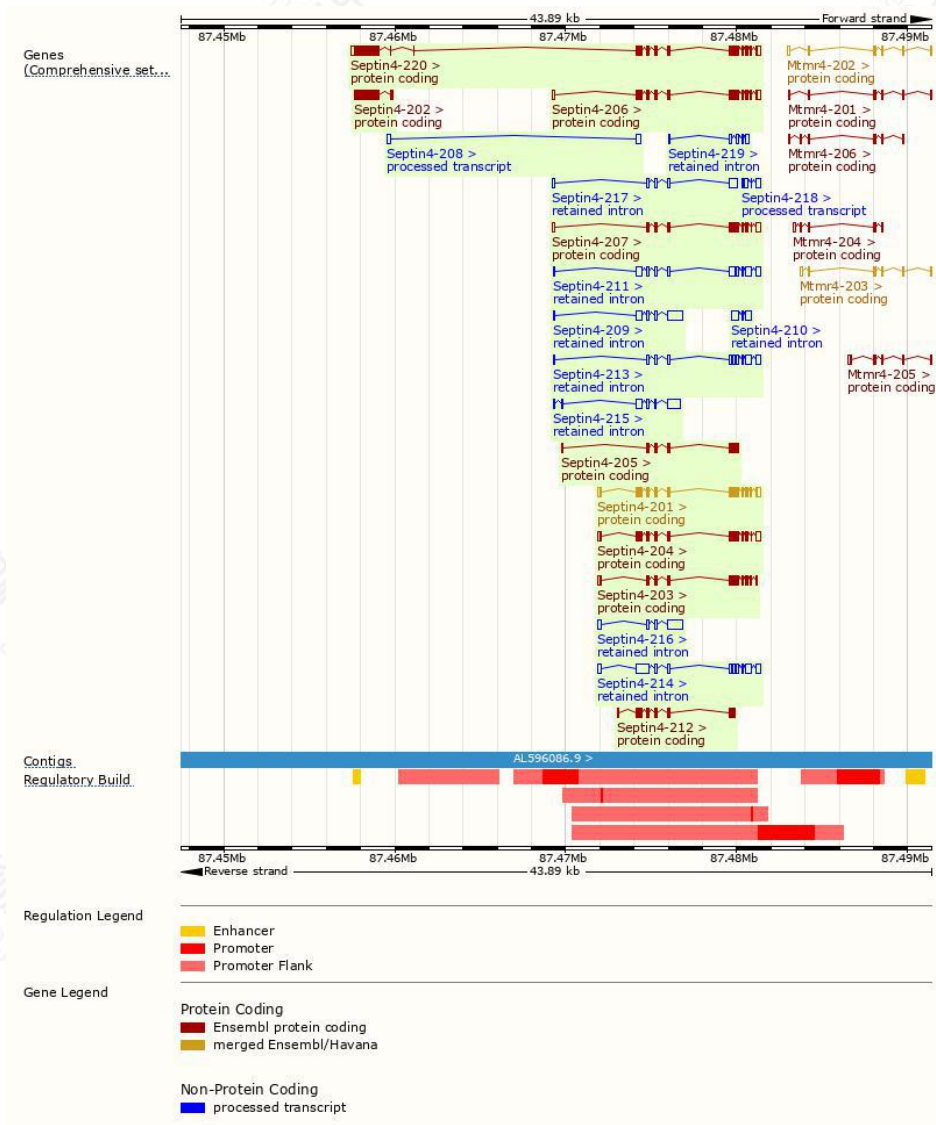
Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Septin4-201	<a href="#">ENSMUST00000018544.12</a>	1726	<a href="#">478aa</a>	Protein coding	<a href="#">CCDS25213</a>		TSL:1 , GENCODE basic ,
Septin4-204	<a href="#">ENSMUST00000107960.8</a>	1653	<a href="#">431aa</a>	Protein coding	<a href="#">CCDS70276</a>		TSL:1 , GENCODE basic ,
Septin4-207	<a href="#">ENSMUST00000122067.8</a>	1303	<a href="#">313aa</a>	Protein coding	<a href="#">CCDS70275</a>		TSL:1 , GENCODE basic ,
Septin4-203	<a href="#">ENSMUST00000063156.11</a>	1245	<a href="#">379aa</a>	Protein coding	<a href="#">CCDS70277</a>		TSL:1 , GENCODE basic ,
Septin4-220	<a href="#">ENSMUST00000239011.2</a>	3229	<a href="#">971aa</a>	Protein coding	-		APPRIS P1 ,
Septin4-206	<a href="#">ENSMUST00000107962.8</a>	1678	<a href="#">459aa</a>	Protein coding	-		TSL:5 , GENCODE basic ,
Septin4-202	<a href="#">ENSMUST00000060360.7</a>	1611	<a href="#">536aa</a>	Protein coding	-		TSL:5 , GENCODE basic ,
Septin4-212	<a href="#">ENSMUST00000133202.3</a>	878	<a href="#">280aa</a>	Protein coding	-		CDS 3' incomplete , TSL:5 ,
Septin4-205	<a href="#">ENSMUST00000107961.8</a>	759	<a href="#">232aa</a>	Protein coding	-		CDS 3' incomplete , TSL:3 ,
Septin4-218	<a href="#">ENSMUST00000143950.2</a>	535	No protein	Processed transcript	-		TSL:3 ,
Septin4-208	<a href="#">ENSMUST00000122945.9</a>	469	No protein	Processed transcript	-		TSL:3 ,
Septin4-214	<a href="#">ENSMUST00000134923.8</a>	2136	No protein	Retained intron	-		TSL:5 ,
Septin4-211	<a href="#">ENSMUST00000132723.8</a>	1884	No protein	Retained intron	-		TSL:5 ,
Septin4-209	<a href="#">ENSMUST00000123081.8</a>	1474	No protein	Retained intron	-		TSL:1 ,
Septin4-213	<a href="#">ENSMUST00000133638.8</a>	1449	No protein	Retained intron	-		TSL:5 ,
Septin4-215	<a href="#">ENSMUST00000135175.8</a>	1354	No protein	Retained intron	-		TSL:5 ,
Septin4-216	<a href="#">ENSMUST00000136229.8</a>	1252	No protein	Retained intron	-		TSL:1 ,
Septin4-217	<a href="#">ENSMUST00000140398.8</a>	900	No protein	Retained intron	-		TSL:2 ,
Septin4-210	<a href="#">ENSMUST00000127414.2</a>	845	No protein	Retained intron	-		TSL:3 ,
Septin4-219	<a href="#">ENSMUST00000148216.8</a>	560	No protein	Retained intron	-		TSL:5 ,

The strategy is based on the design of *Septin4-201* transcript,the transcription is shown below:



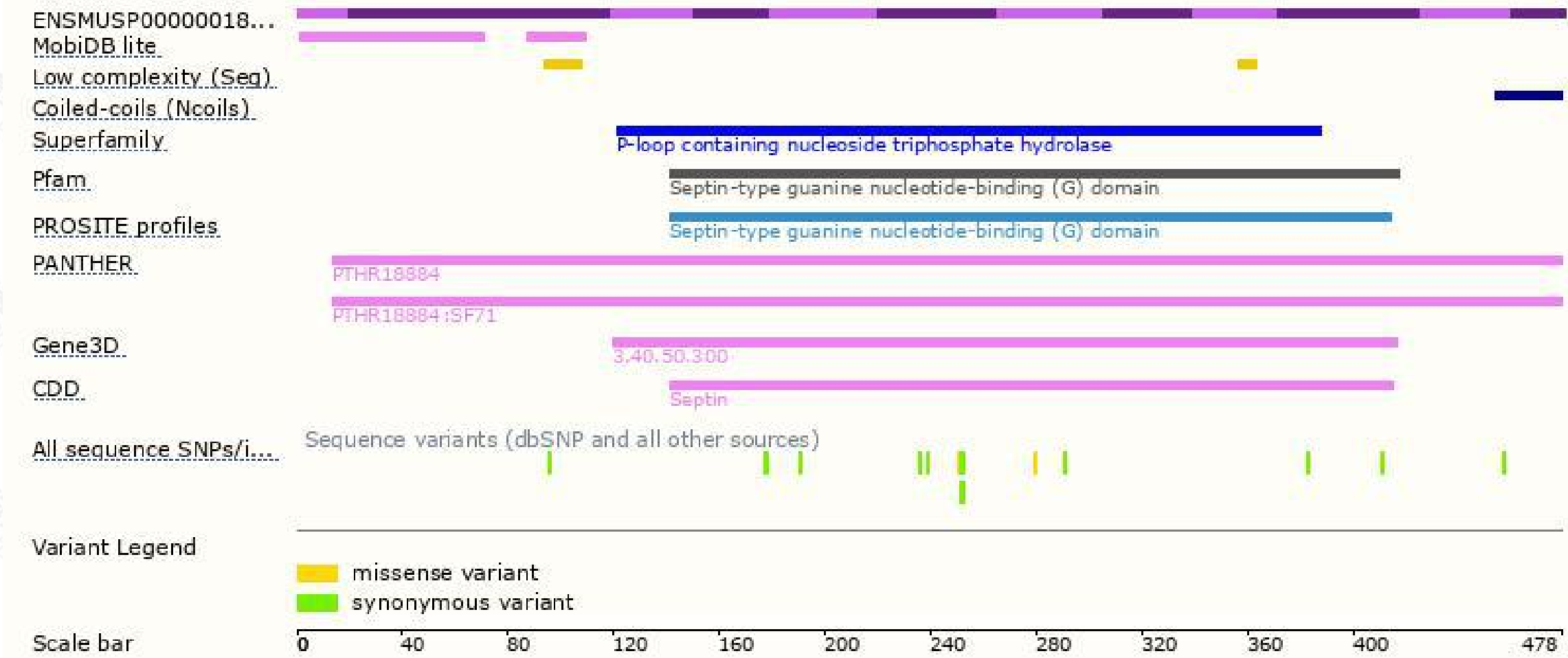


# Genomic location distribution

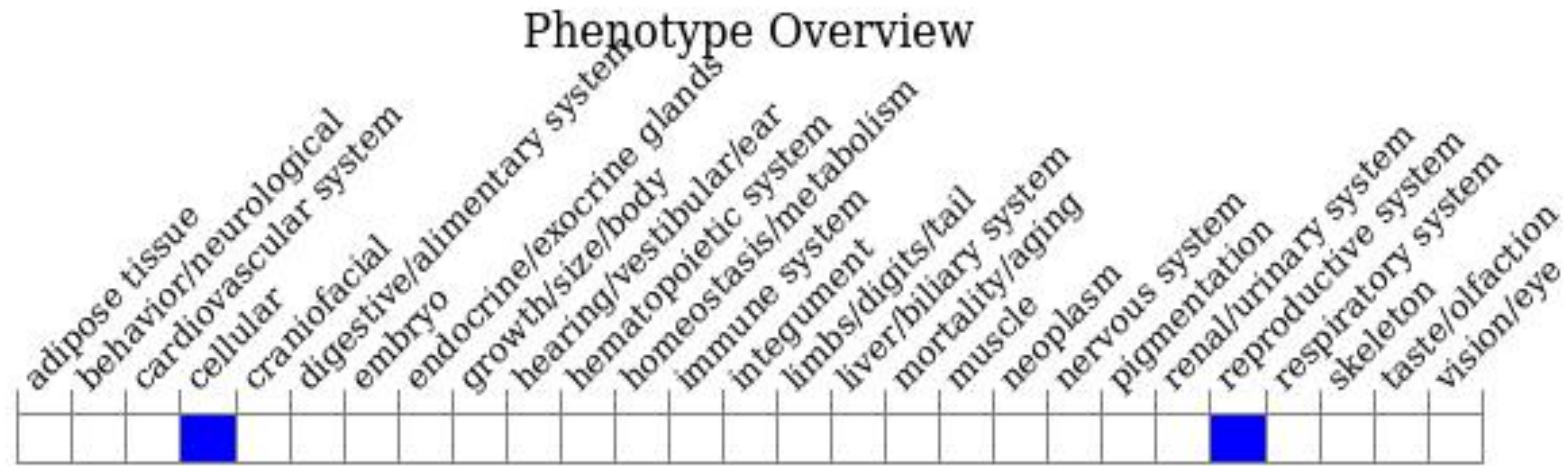




# Protein domain



# 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 sterile and have immotile and structurally defective sperm that is bent and lacks the annulus.

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

Tel: 025-5864 1534

