

# ***Muc2-P2A-iCre* Cas9-KI Strategy**

**Designer:**

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**Design Date:**

**2019-8-6**

# Project Overview

**Project Name**

***Muc2-P2A-iCre***

**Project type**

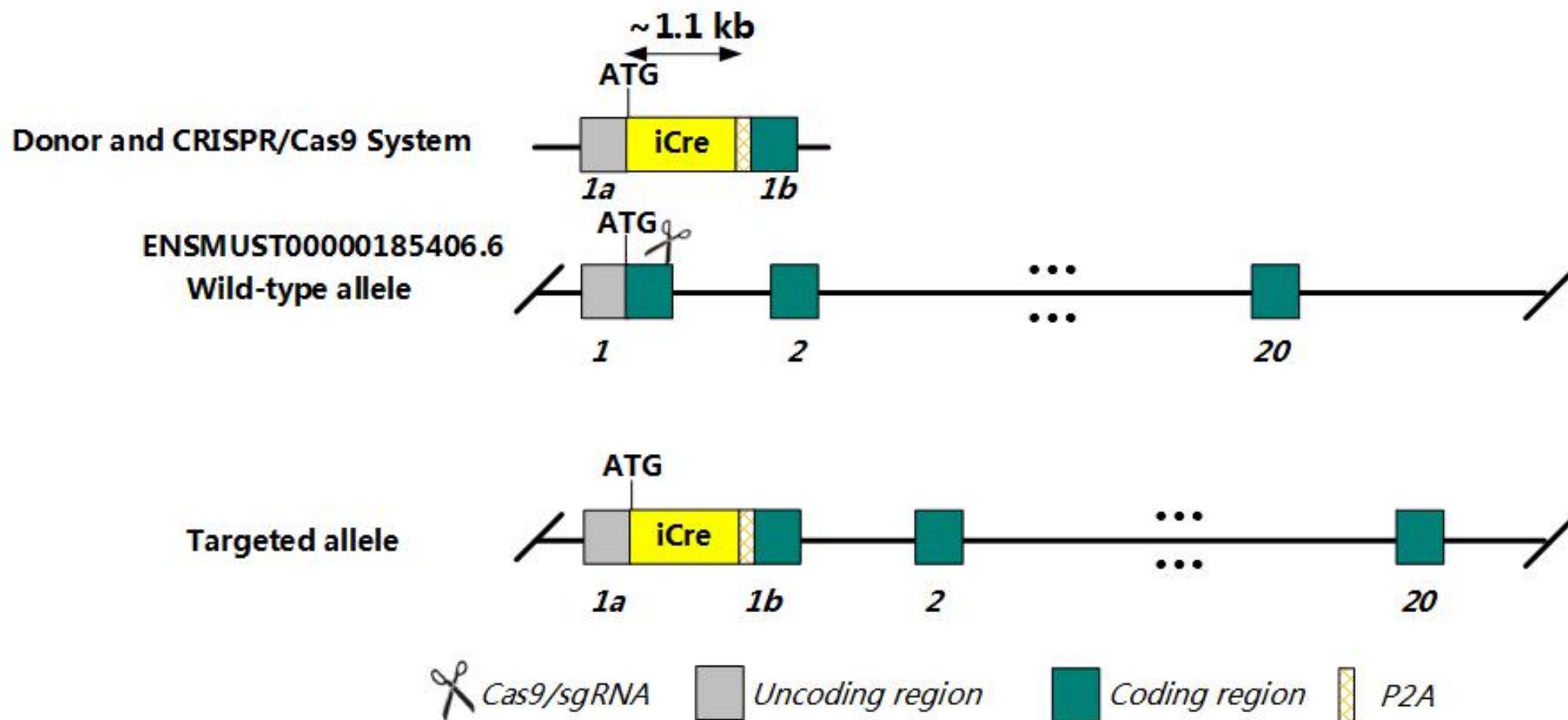
**Cas9-KI**

**Strain background**

**C57BL/6JGpt**

# Knockin strategy

This model will use CRISPR/Cas9 technology to edit the *Muc2* gene. The schematic diagram is as follows:



- The *Muc2* gene has 8 transcripts. According to the structure of *Muc2* gene, *Muc2-204*(ENSMUST00000185406.6) is selected for presentation of the recommended strategy.
- *Muc2-204* gene has 20 exons, with the ATG start codon in exon1.
- We make *Muc2-P2A-iCre* knockin mice via CRISPR/Cas9 system. Cas9 mRNA, sgRNA and donor will be co-injected into zygotes. sgRNA direct Cas9 endonuclease cleavage near start coding(ATG) of *Muc2* gene, and create a DSB(double-strand break). Such breaks will be repaired, and result in P2A-iCre after start coding(ATG) of *Muc2* gene by homologous recombination. The pups will be genotyped by PCR, followed by sequence analysis.

- According to the existing MGI data, Homozygotes for a point mutation have soft feces at weaning and develop diarrhea associated with malabsorption syndrome. Homozygous null mutants pass blood in their feces at 6 months, and 65% of null mutants have intestinal tumors at 1 year.
- The P2A-linked gene drives expression in the same promoter and is cleaved at the translational level. The gene expression levels are consistent, and the before of P2A expressing gene carries the P2A-translated polypeptide.
- Insertion of iCre may affect the regulation of the 5' end of the *Muc2* gene.
- There will be 1 to 2 amino acid synonymous mutation in exon1 of *Muc2* gene in this strategy.
- The *Muc2* gene is located on the Chr15. If the knockin 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 gene transcription and translation processes, all risks cannot be predicted under existing information.



# Gene information (NCBI)

## Muc2 mucin 2 [ *Mus musculus* (house mouse) ]

Gene ID: 17831, updated on 9-Apr-2019

Summary

- Official Symbol

Muc2 provided by [MGI](#)
- Official Full Name

mucin 2 provided by [MGI](#)
- Primary source

[MGI:MGI:1339364](#)
- 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

MCM; wnn; 2010015E03Rik
- Annotation information

Annotation category: suggests misassembly  
Annotation category: partial on reference assembly
- Expression

Biased expression in colon adult (RPKM 1294.7), large intestine adult (RPKM 306.2) and 2 other tissues [See more](#)
- Orthologs

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

Genomic context

Location:

7 F5; 7 87.1 cM

See Muc2 in [Genome Data Viewer](#)

Exon count:

46

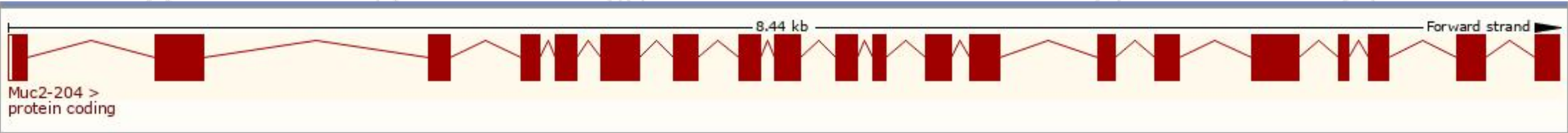
Annotation release	Status	Assembly	Chr	Location
<a href="#">106</a>	current	GRCm38.p4 ( <a href="#">GCF_000001635.24</a> )	7	NC_000073.6 (141690340..141754694)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	7	NC_000073.5 (148876261..148890250) , (148930517..148940598)

# Transcript information (Ensembl)

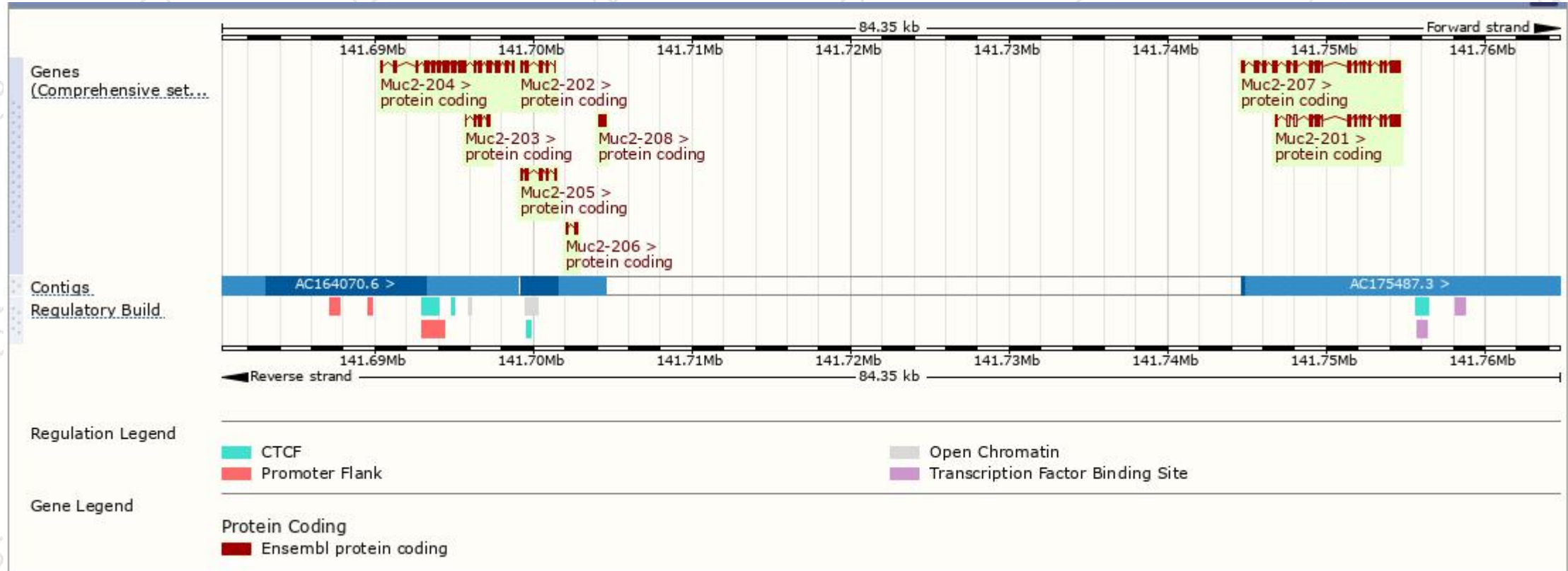
The gene has 8 transcripts, and all transcripts are shown below :

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Muc2-201	<a href="#">ENSMUST00000026590.8</a>	2032	<a href="#">483aa</a>	Protein coding	-	<a href="#">A0A140T8I8</a>	TSL:1 GENCODE basic APPRIS P1
Muc2-202	<a href="#">ENSMUST00000167366.2</a>	711	<a href="#">237aa</a>	Protein coding	-	<a href="#">F6QGV1</a>	TSL:5 GENCODE basic
Muc2-203	<a href="#">ENSMUST00000179227.1</a>	399	<a href="#">132aa</a>	Protein coding	-	<a href="#">Q9R1L0</a>	TSL:1 GENCODE basic
Muc2-204	<a href="#">ENSMUST00000185406.6</a>	2690	<a href="#">887aa</a>	Protein coding	-	<a href="#">A0A087WSG8</a>	CDS 3' incomplete TSL:5
Muc2-205	<a href="#">ENSMUST00000185823.6</a>	823	<a href="#">274aa</a>	Protein coding	-	<a href="#">A0A087WS13</a>	CDS 5' and 3' incomplete TSL:3
Muc2-206	<a href="#">ENSMUST00000187789.1</a>	241	<a href="#">80aa</a>	Protein coding	-	<a href="#">A0A087WQU6</a>	CDS 5' and 3' incomplete TSL:5
Muc2-207	<a href="#">ENSMUST00000187945.6</a>	2926	<a href="#">923aa</a>	Protein coding	-	<a href="#">A0A087WSP1</a>	CDS 5' incomplete TSL:1
Muc2-208	<a href="#">ENSMUST00000191587.1</a>	447	<a href="#">149aa</a>	Protein coding	-	<a href="#">A0A087WP72</a>	CDS 5' and 3' incomplete TSL:NA

The strategy is based on the design of *Muc2-204* transcript, The transcription is shown below

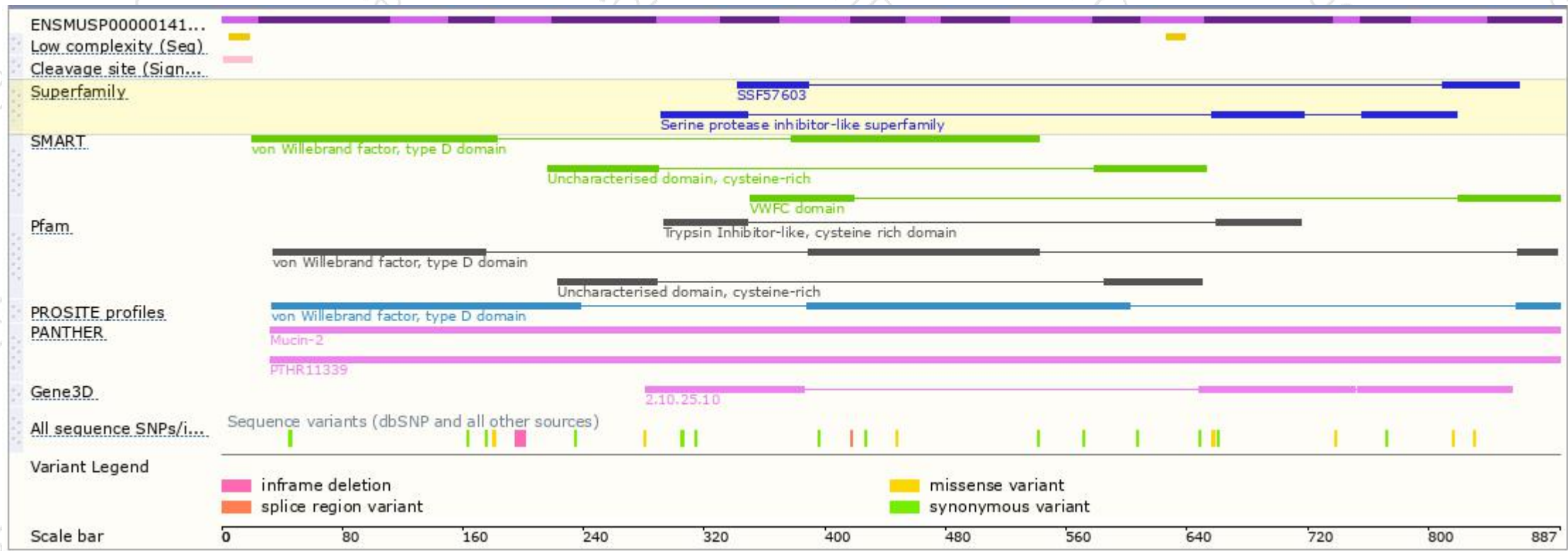


# Genomic location distribution

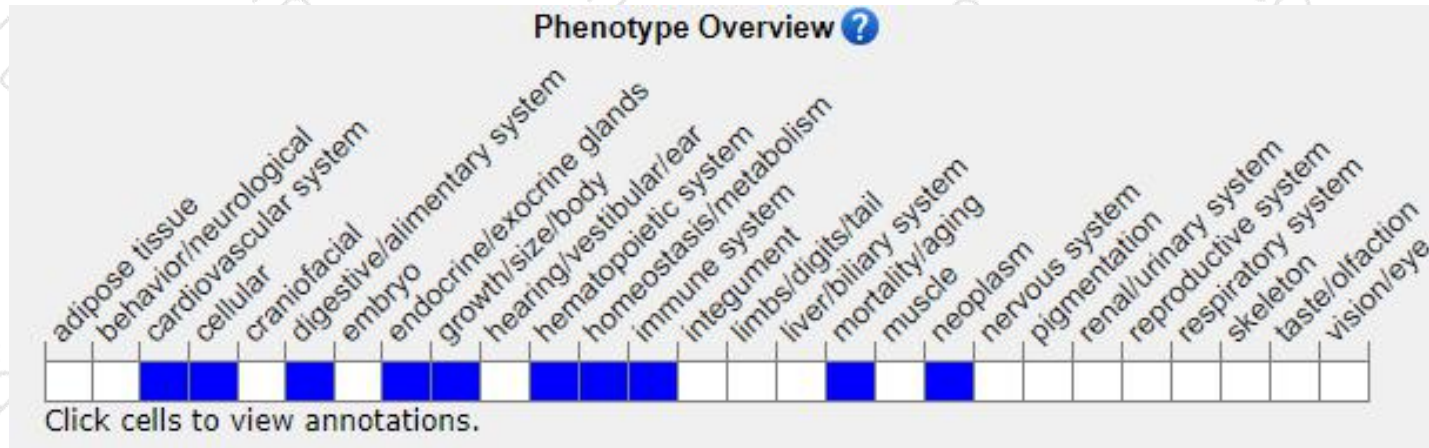




# Protein domain



# Mouse phenotype description(MGI)



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/marker/MGI:109517>) .*

Homozygotes for a point mutation have soft feces at weaning and develop diarrhea associated with malabsorption syndrome. Homozygous null mutants pass blood in their feces at 6 months, and 65% of null mutants have intestinal tumors at 1 year.

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