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Pabpc4 Cas9-CKO Strategy

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Reviewer: Zihe Cui

Design Date: 2022-08-23

Overview

Target Gene Name

- Pabpc4

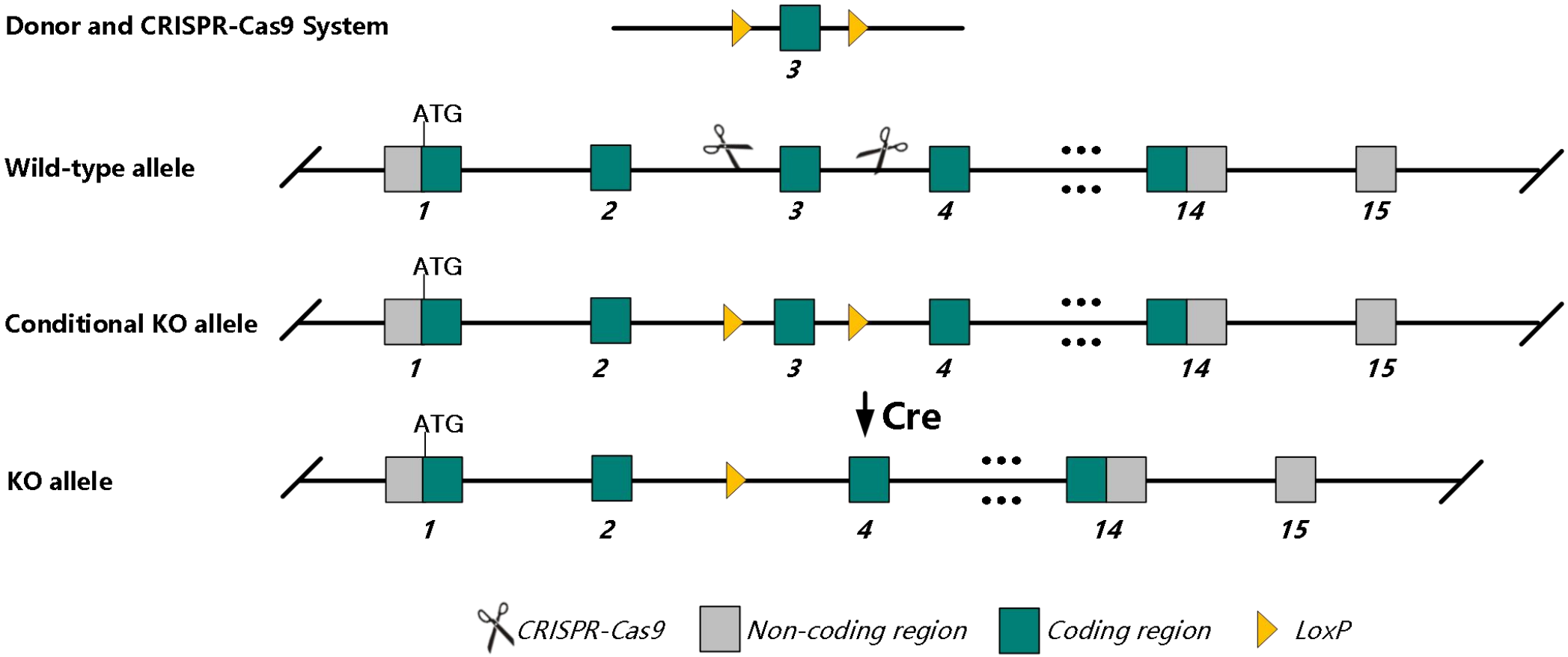
Project Type

- Cas9-CKO

Genetic Background

- C57BL/6JGpt

Strain Strategy

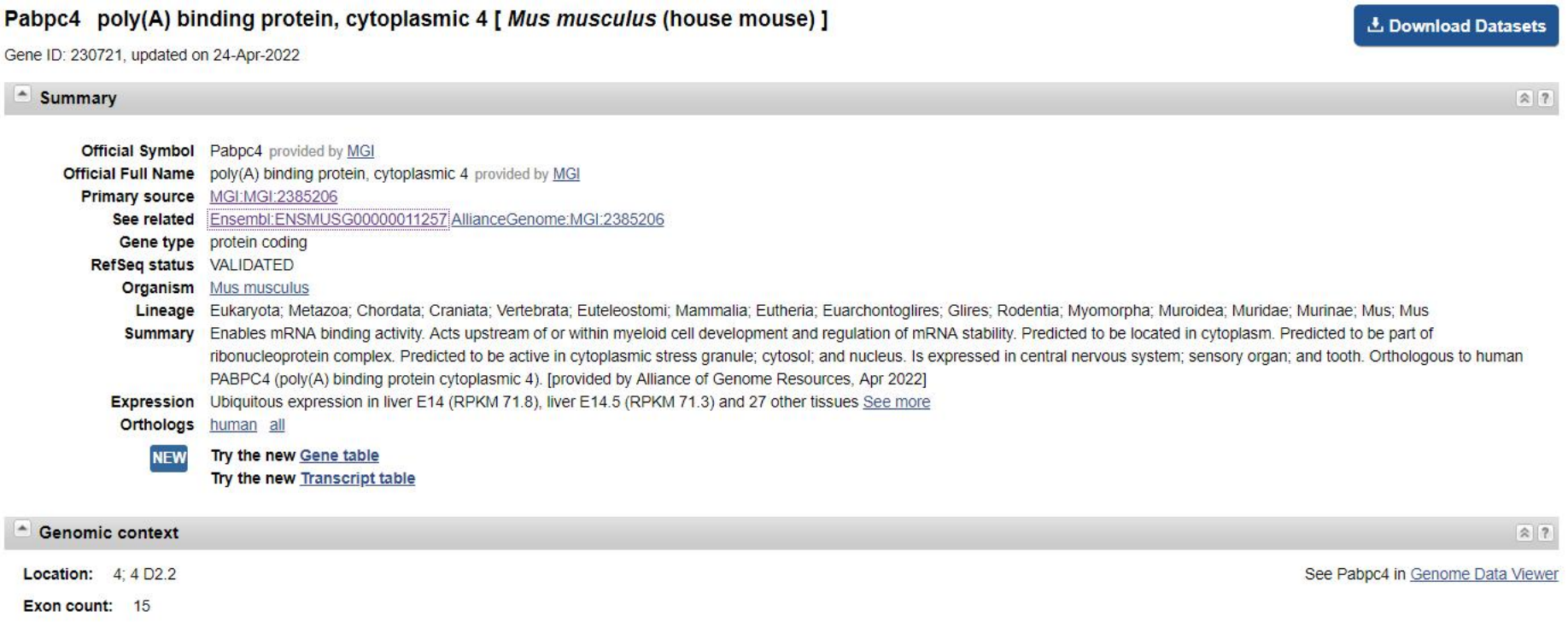


Schematic representation of CRISPR-Cas9 engineering used to edit the *Pabpc4* gene.

Technical Information

- The *Pabpc4* gene has 8 transcripts. According to the structure of *Pabpc4* gene, exon3 of *Pabpc4*-202 (ENSMUST00000080178.13) transcript is recommended as the knockout region. The region contains 116bp of coding sequences. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Pabpc4* gene. The brief process is as follows: CRISPR-Cas9 system and Donor 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 on-target amplicon sequencing. A stable F1-generation mouse strain was obtained by mating positive F0-generation mice with C57BL/6JGpt mice and confirmation of the desired mutant allele was carried out by PCR and on-target amplicon sequencing.
- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Gene Information



Pabpc4 poly(A) binding protein, cytoplasmic 4 [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 230721, updated on 24-Apr-2022

Summary

Official Symbol	Pabpc4 provided by MGI
Official Full Name	poly(A) binding protein, cytoplasmic 4 provided by MGI
Primary source	MGI:MGI:2385206
See related	Ensembl:ENSMUSG00000011257 AllianceGenome:MGI:2385206
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
Summary	Enables mRNA binding activity. Acts upstream of or within myeloid cell development and regulation of mRNA stability. Predicted to be located in cytoplasm. Predicted to be part of ribonucleoprotein complex. Predicted to be active in cytoplasmic stress granule; cytosol; and nucleus. Is expressed in central nervous system; sensory organ; and tooth. Orthologous to human PABPC4 (poly(A) binding protein cytoplasmic 4). [provided by Alliance of Genome Resources, Apr 2022]
Expression	Ubiquitous expression in liver E14 (RPKM 71.8), liver E14.5 (RPKM 71.3) and 27 other tissues See more
Orthologs	human all

NEW Try the new Gene table
Try the new Transcript table

Genomic context

Location: 4; 4 D2.2 — See Pabpc4 in Genome Data Viewer

Exon count: 15

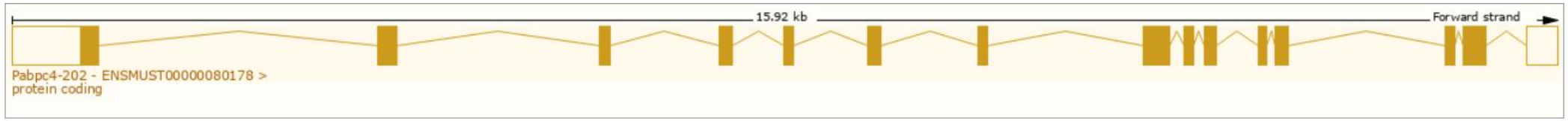
Source: https://www.ncbi.nlm.nih.gov/

Transcript Information

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

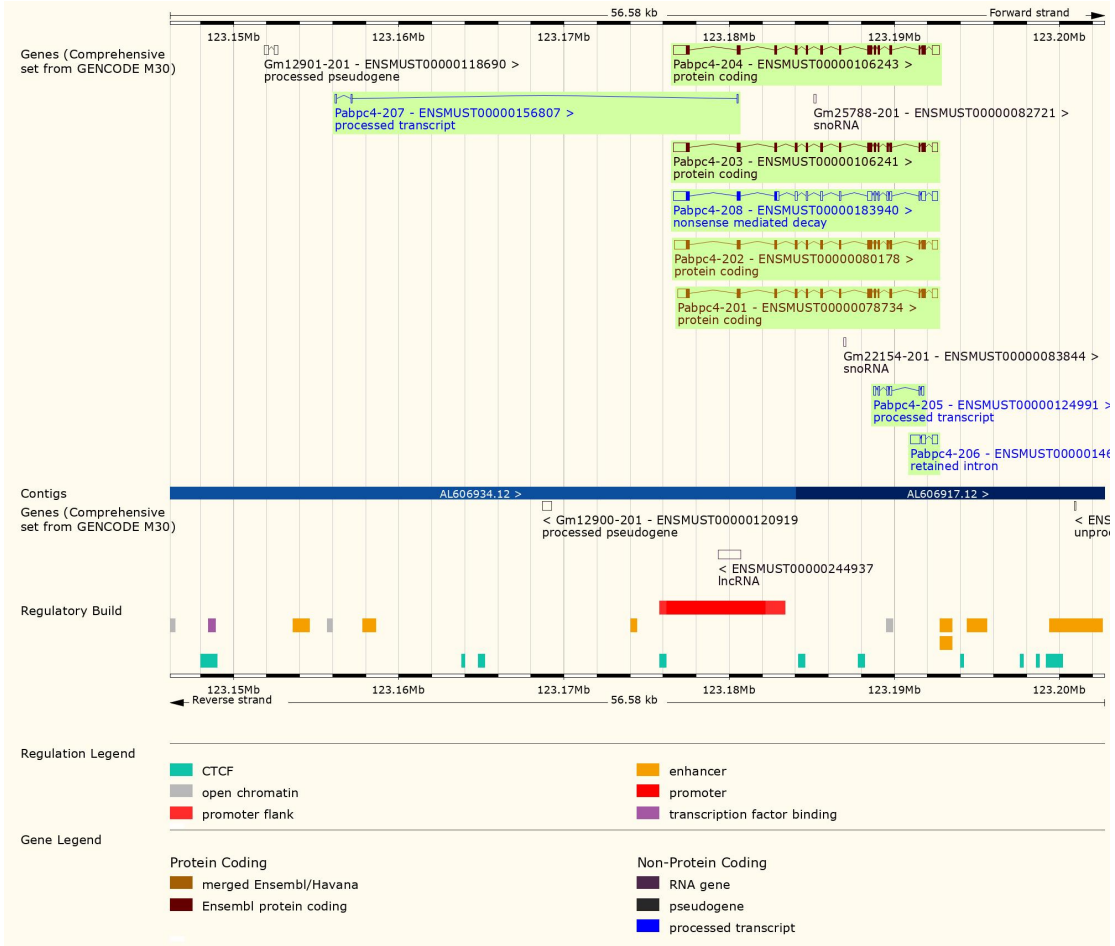
Transcript ID	Name	bp	Protein	Biotype	CCDS	UniProt Match	Flags
ENSMUST00000080178.13	Pabpc4-202	3019	660aa	Protein coding	CCDS18614	Q6PHQ9	Ensembl Canonical GENCODE basic TSL:1
ENSMUST00000106243.8	Pabpc4-204	3111	631aa	Protein coding		A3KFU5	GENCODE basic APPRIS P1 TSL:5
ENSMUST00000106241.8	Pabpc4-203	3050	644aa	Protein coding		A3KFU8	GENCODE basic TSL:5
ENSMUST00000078734.12	Pabpc4-201	2700	615aa	Protein coding	CCDS18615	Q91YZ8	GENCODE basic TSL:1
ENSMUST00000183940.8	Pabpc4-208	3166	168aa	Nonsense mediated decay		V9GXG3	TSL:1
ENSMUST00000124991.2	Pabpc4-205	692	No protein	Processed transcript		-	TSL:2
ENSMUST00000156807.2	Pabpc4-207	245	No protein	Processed transcript		-	TSL:5
ENSMUST00000146156.2	Pabpc4-206	1146	No protein	Retained intron		-	TSL:2

The strategy is based on the design of *Pabpc4*-202 transcript,the transcription is shown below:



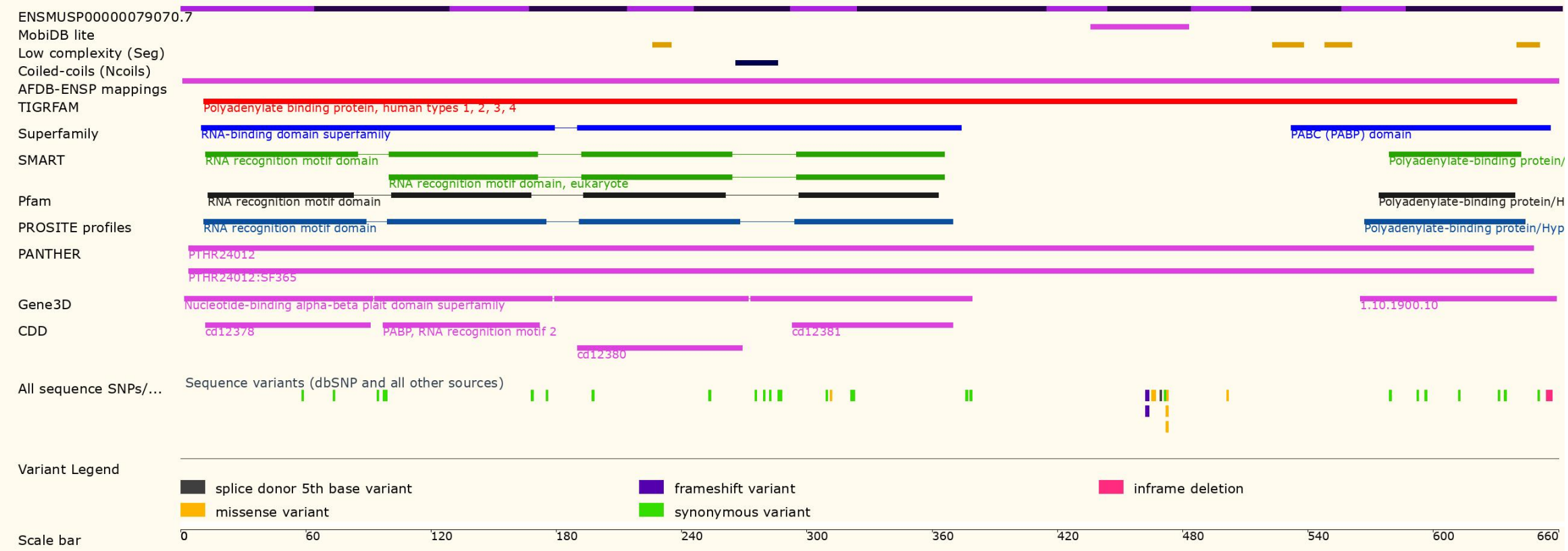
Source: https://www.ensembl.org

Genomic Information



Source: : https://www.ensembl.org

Protein Information



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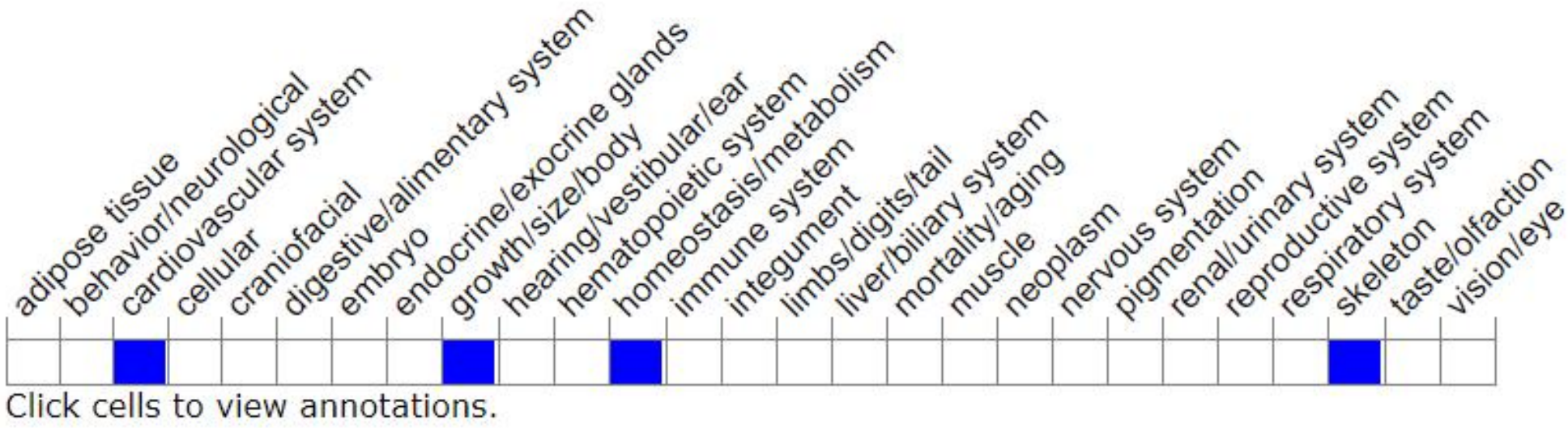
Source: : https://www.ensembl.org

Mouse Phenotype Information (MGI)



Source: https://www.informatics.jax.org

Important Information

- The effect of *Gm25788*-201, *Gm22154* and ENSMUST00000244937.1 gene is unknown.
- *Pabpc4* is located on Chr4. If the knockout mice are crossed with other mouse strains to obtain double homozygous mutant offspring, please avoid the situation that the second gene is 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.