

# ***Tmpo Cas9-CKO Strategy***

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# Project Overview

**Project Name**

***Tmpo***

**Project type**

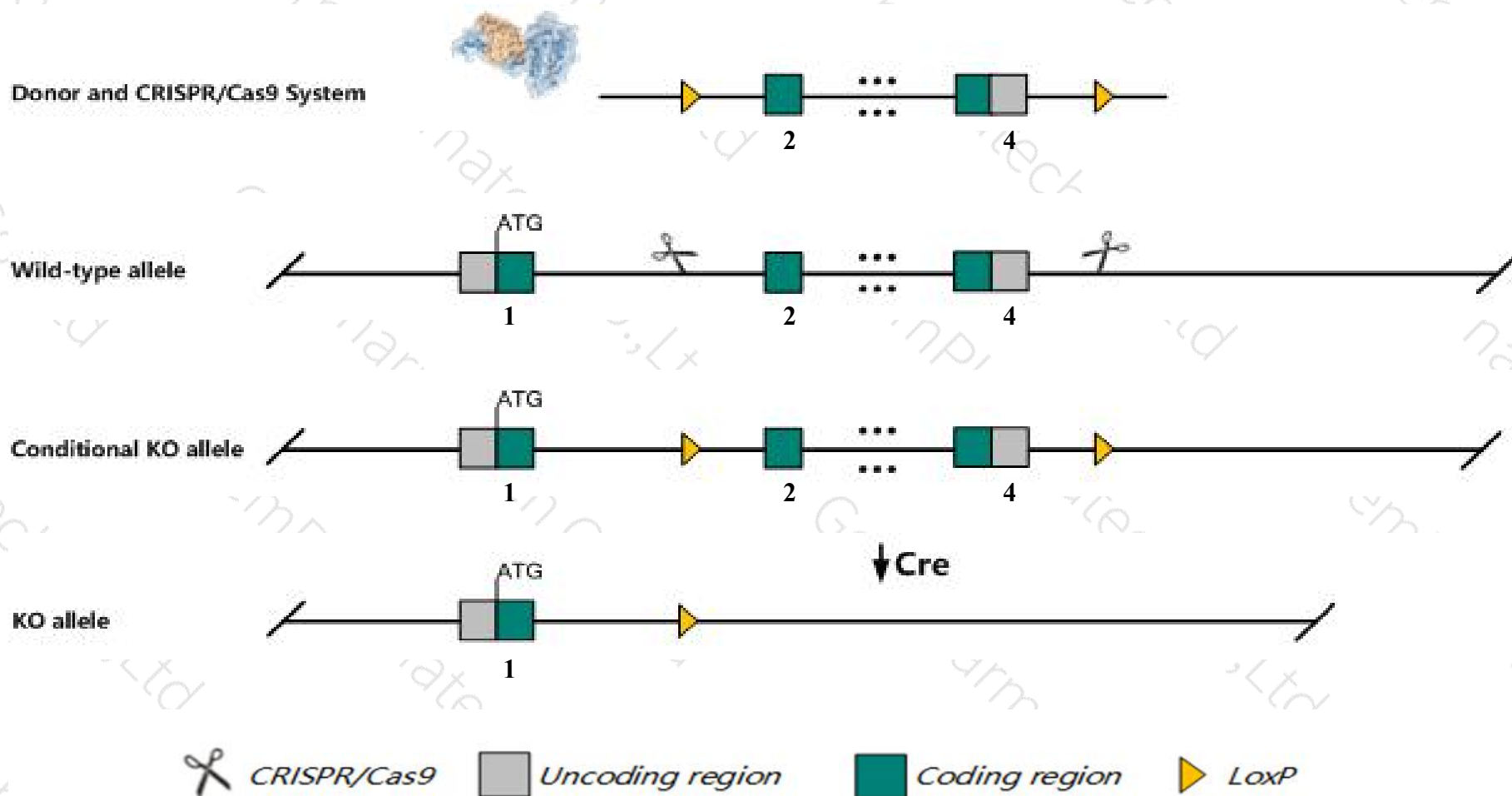
**Cas9-CKO**

**Strain background**

**C57BL/6JGpt**

# Conditional Knockout strategy

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



# Technical routes

- The *Tmpo* gene has 13 transcripts. According to the structure of *Tmpo* gene, exon2-exon4 of *Tmpo-201* (ENSMUST00000020123.6) transcript is recommended as the knockout region. The region contains most of the coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tmpo* 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 sequencing. A stable F1 generation mouse model was obtained by mating positive F0 generation mice with C57BL/6JGpt mice.
- 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.

- According to the existing MGI data, Mice homozygous null for a protein isoform generated from this locus have hyperproliferation of epidermal and erythroid progenitor cells that leads to thickened paws and increased crypt lengths in the colon.
- Transcript *Tmpo*-206&207&210 may not be affected.
- The *Tmpo* gene is located on the Chr10. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.



# Gene information (NCBI)

## Tmpo thymopoietin [ *Mus musculus* (house mouse) ]

Gene ID: 21917, updated on 5-Jan-2020

### Summary

- Official Symbol** Tmpo provided by [MGI](#)
- Official Full Name** thymopoietin provided by [MGI](#)
- Primary source** [MGI:MGI:106920](#)
- See related** [Ensembl:ENSMUSG00000019961](#)
- 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** TP; LAP2; AI195756; AI606875; AW214352; AW547477; 5630400D24Rik
- Expression** Broad expression in CNS E11.5 (RPKM 41.2), limb E14.5 (RPKM 32.4) and 27 other tissues [See more](#)
- Orthologs** [human](#) [all](#)

### Genomic context

**Location:** 10 C2; 10 45.66 cM See Tmpo in [Genome Data Viewer](#)

**Exon count:** 12

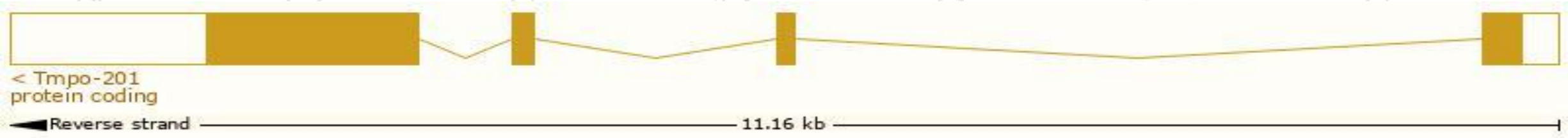
Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_0000001635.26</a> )	10	NC_000076.6 (91147571..91181752, complement)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_0000001635.18</a> )	10	NC_000076.5 (90610316..90634327, complement)

# Transcript information (Ensembl)

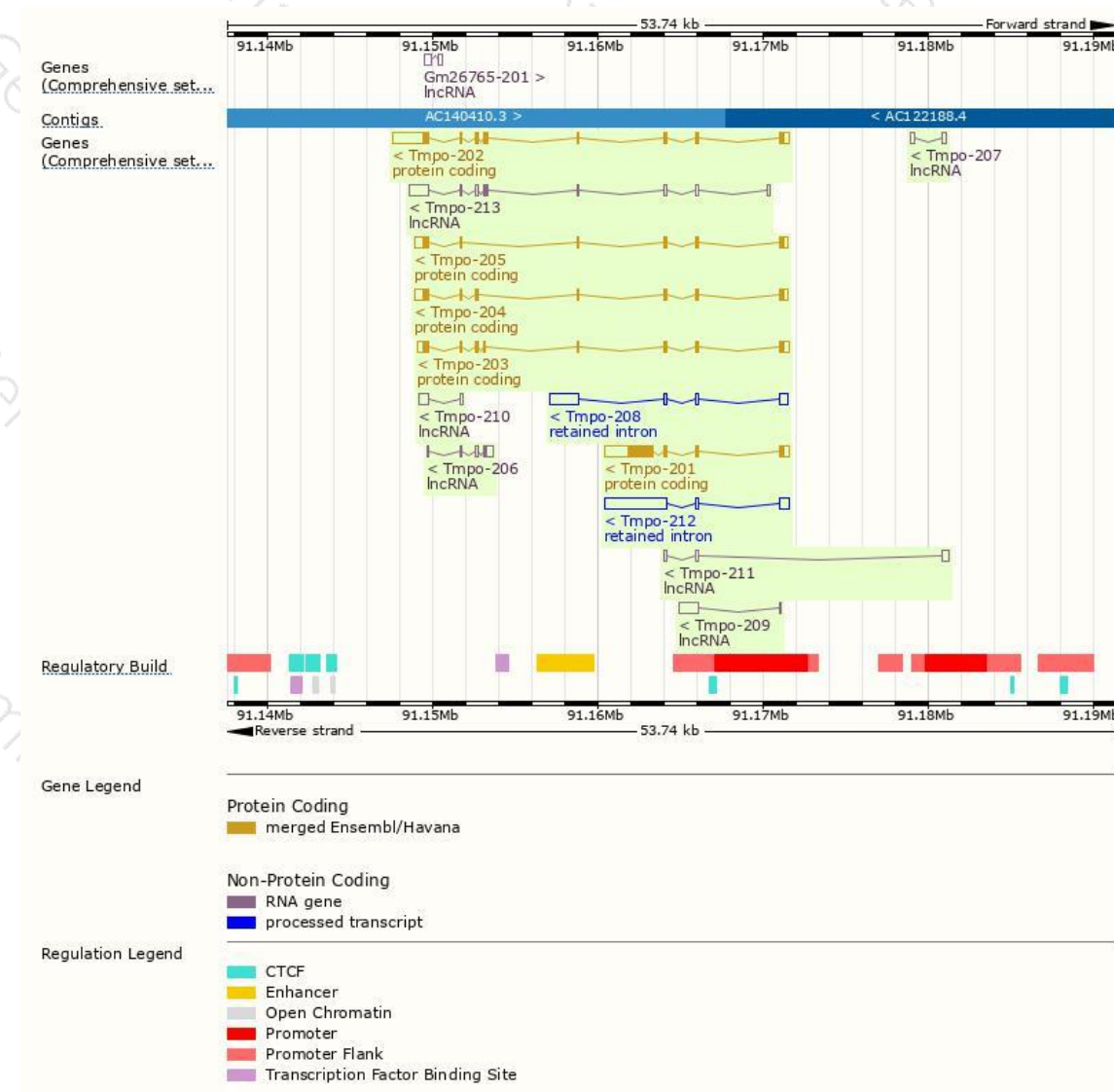
The gene has 13 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tmpo-201	<a href="#">ENSMUST00000020123.6</a>	3772	<a href="#">693aa</a>	Protein coding	<a href="#">CCDS24122</a>	<a href="#">Q61033</a>	TSL:1 GENCODE basic APPRIS P1
Tmpo-202	<a href="#">ENSMUST00000072239.13</a>	3533	<a href="#">452aa</a>	Protein coding	<a href="#">CCDS36035</a>	<a href="#">Q61029</a>	TSL:1 GENCODE basic
Tmpo-204	<a href="#">ENSMUST00000099355.11</a>	1953	<a href="#">380aa</a>	Protein coding	<a href="#">CCDS36033</a>	<a href="#">Q61029</a>	TSL:1 GENCODE basic
Tmpo-203	<a href="#">ENSMUST00000092219.13</a>	1854	<a href="#">412aa</a>	Protein coding	<a href="#">CCDS36034</a>	<a href="#">Q3TNH0 Q61029</a>	TSL:1 GENCODE basic
Tmpo-205	<a href="#">ENSMUST00000105293.10</a>	1842	<a href="#">343aa</a>	Protein coding	<a href="#">CCDS36032</a>	<a href="#">Q61029</a>	TSL:1 GENCODE basic
Tmpo-212	<a href="#">ENSMUST00000216501.1</a>	4441	No protein	Retained intron	-	-	TSL:1
Tmpo-208	<a href="#">ENSMUST00000214391.1</a>	2520	No protein	Retained intron	-	-	TSL:1
Tmpo-213	<a href="#">ENSMUST00000217449.1</a>	2115	No protein	lncRNA	-	-	TSL:1
Tmpo-209	<a href="#">ENSMUST00000215126.1</a>	1213	No protein	lncRNA	-	-	TSL:1
Tmpo-206	<a href="#">ENSMUST00000213262.1</a>	788	No protein	lncRNA	-	-	TSL:1
Tmpo-211	<a href="#">ENSMUST00000216402.1</a>	732	No protein	lncRNA	-	-	TSL:3
Tmpo-210	<a href="#">ENSMUST00000215801.1</a>	654	No protein	lncRNA	-	-	TSL:2
Tmpo-207	<a href="#">ENSMUST00000213270.1</a>	471	No protein	lncRNA	-	-	TSL:2

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

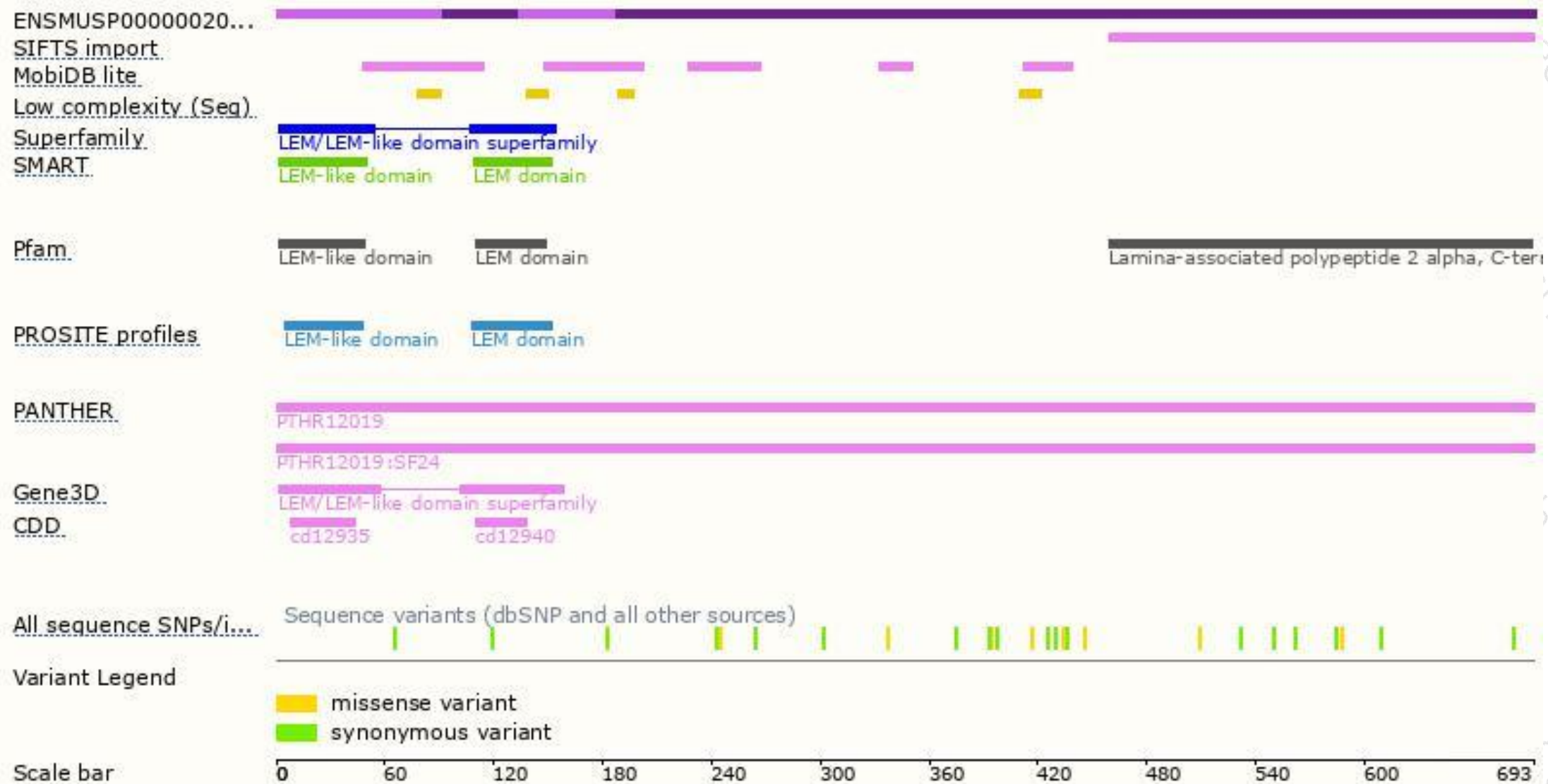


# Genomic location distribution

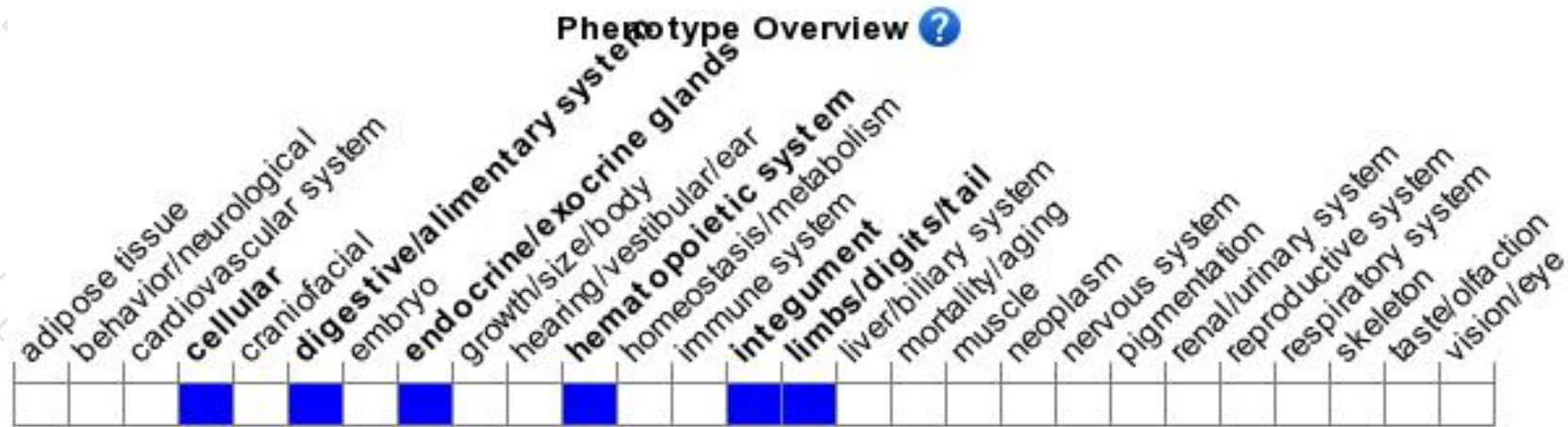




# Protein domain



# 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 null for a protein isoform generated from this locus have hyperproliferation of epidermal and erythroid progenitor cells that leads to thickened paws and increased crypt lengths in the colon.

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

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