

# *Mpp1* Cas9-KO Strategy

Designer: Xueting Zhang

Reviewer: Yanhua Shen

Date: 2020-02-19

# Project Overview

**Project Name**

*Mpp1*

**Project type**

**Cas9-KO**

**Strain background**

**C57BL/6JGpt**

# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Mpp1* gene. The schematic diagram is as follows:



- The *Mpp1* gene has 10 transcripts. According to the structure of *Mpp1* gene, exon2-exon7 of *Mpp1-201* (ENSMUST00000033775.8) transcript is recommended as the knockout region. The region contains 682bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Mpp1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a knock-out allele display defects in neutrophil polarity and chemotaxis and produce small litters of pups.
- The *Mpp1* gene is located on the ChrX. 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)

## Mpp1 membrane protein, palmitoylated [ *Mus musculus* (house mouse) ]

Gene ID: 17524, updated on 10-Oct-2019

### Summary

Official Symbol	Mpp1 provided by <a href="#">MGI</a>
Official Full Name	membrane protein, palmitoylated provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:105941</a>
See related	<a href="#">Ensembl:ENSMUSG00000031402</a>
Gene type	protein coding
RefSeq status	REVIEWED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	p55; 55kDa; C130070C03Rik
Summary	This gene encodes a protein localized to the cell membrane. The protein serves as a scaffold for the assembly of the actin cytoskeleton, and plays a role in regulating apico-basal cell polarity. [provided by RefSeq, May 2015]
Expression	Ubiquitous expression in large intestine adult (RPKM 47.7), liver E14 (RPKM 39.1) and 27 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

### Genomic context

Location: X A7.3; X 38.15 cM

See Mpp1 in [Genome Data Viewer](#)

Exon count: 12

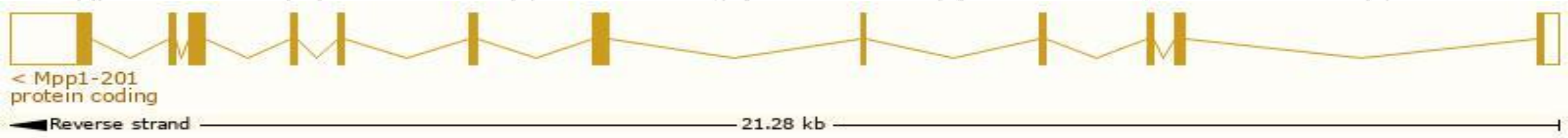
Annotation release	Status	Assembly	Chr	Location
<a href="#">108</a>	current	GRCm38.p6 ( <a href="#">GCF_000001635.26</a> )	X	NC_000086.7 (75109733..75131016, complement)
Build 37.2	previous assembly	MGSCv37 ( <a href="#">GCF_000001635.18</a> )	X	NC_000086.6 (72355072..72376288, complement)

# Transcript information (Ensembl)

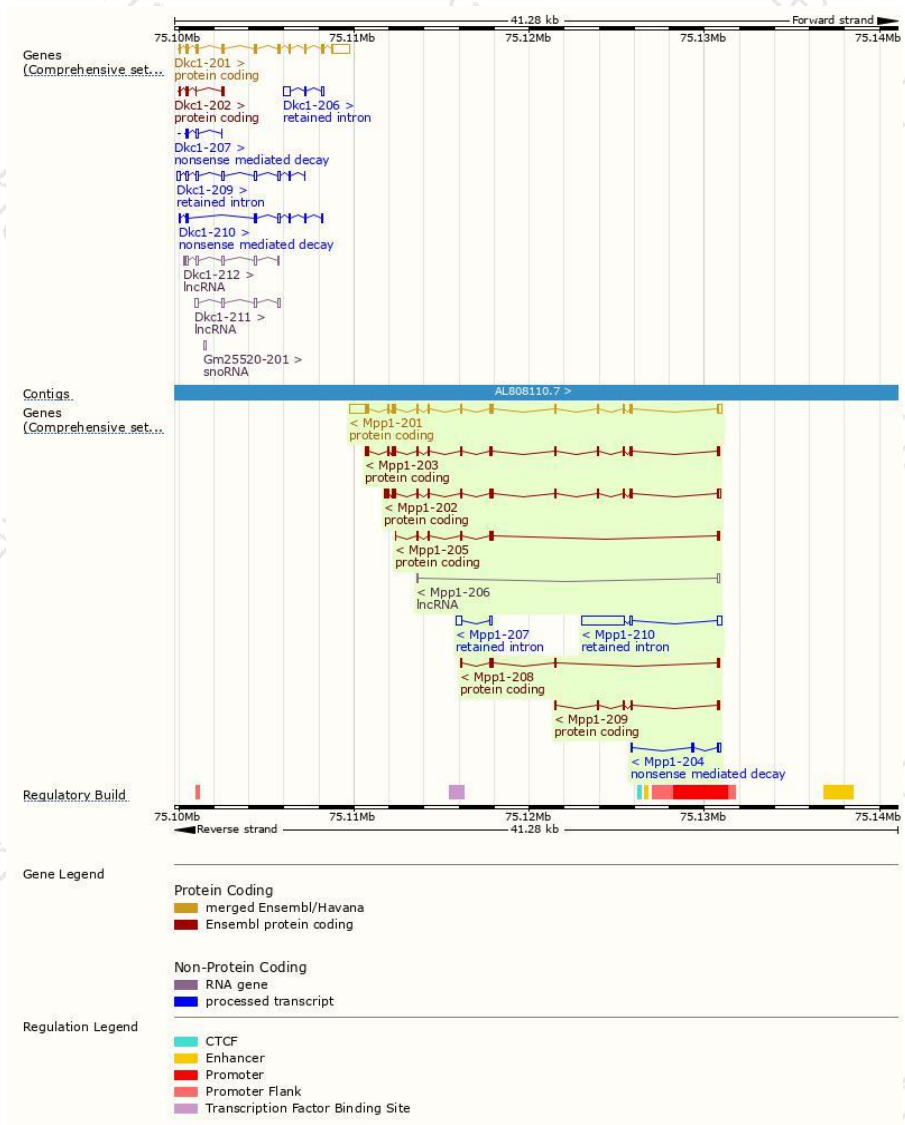
The gene has 10 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Mpp1-201	<a href="#">ENSMUST00000033775.8</a>	2525	<a href="#">466aa</a>	Protein coding	<a href="#">CCDS30236</a>	<a href="#">P70290 Q542P4</a>	TSL:1 GENCODE basic APPRIS P1
Mpp1-202	<a href="#">ENSMUST00000114091.7</a>	1558	<a href="#">452aa</a>	Protein coding	-	<a href="#">A2AN84</a>	TSL:2 GENCODE basic
Mpp1-203	<a href="#">ENSMUST00000114092.7</a>	1378	<a href="#">446aa</a>	Protein coding	-	<a href="#">B7ZCL8</a>	TSL:5 GENCODE basic
Mpp1-205	<a href="#">ENSMUST00000132501.7</a>	645	<a href="#">205aa</a>	Protein coding	-	<a href="#">B7ZCL9</a>	CDS 3' incomplete TSL:5
Mpp1-208	<a href="#">ENSMUST00000153318.7</a>	497	<a href="#">156aa</a>	Protein coding	-	<a href="#">B7ZCM0</a>	CDS 3' incomplete TSL:5
Mpp1-209	<a href="#">ENSMUST00000155742.1</a>	420	<a href="#">130aa</a>	Protein coding	-	<a href="#">B7ZCM1</a>	CDS 3' incomplete TSL:5
Mpp1-204	<a href="#">ENSMUST00000127023.1</a>	368	<a href="#">45aa</a>	Nonsense mediated decay	-	<a href="#">D6RFD5</a>	TSL:3
Mpp1-210	<a href="#">ENSMUST00000156975.1</a>	2849	No protein	Retained intron	-	-	TSL:1
Mpp1-207	<a href="#">ENSMUST00000135285.1</a>	420	No protein	Retained intron	-	-	TSL:3
Mpp1-206	<a href="#">ENSMUST00000132935.1</a>	232	No protein	lncRNA	-	-	TSL:5

The strategy is based on the design of *Mpp1-201* transcript,The transcription is shown below



# Genomic location distribution

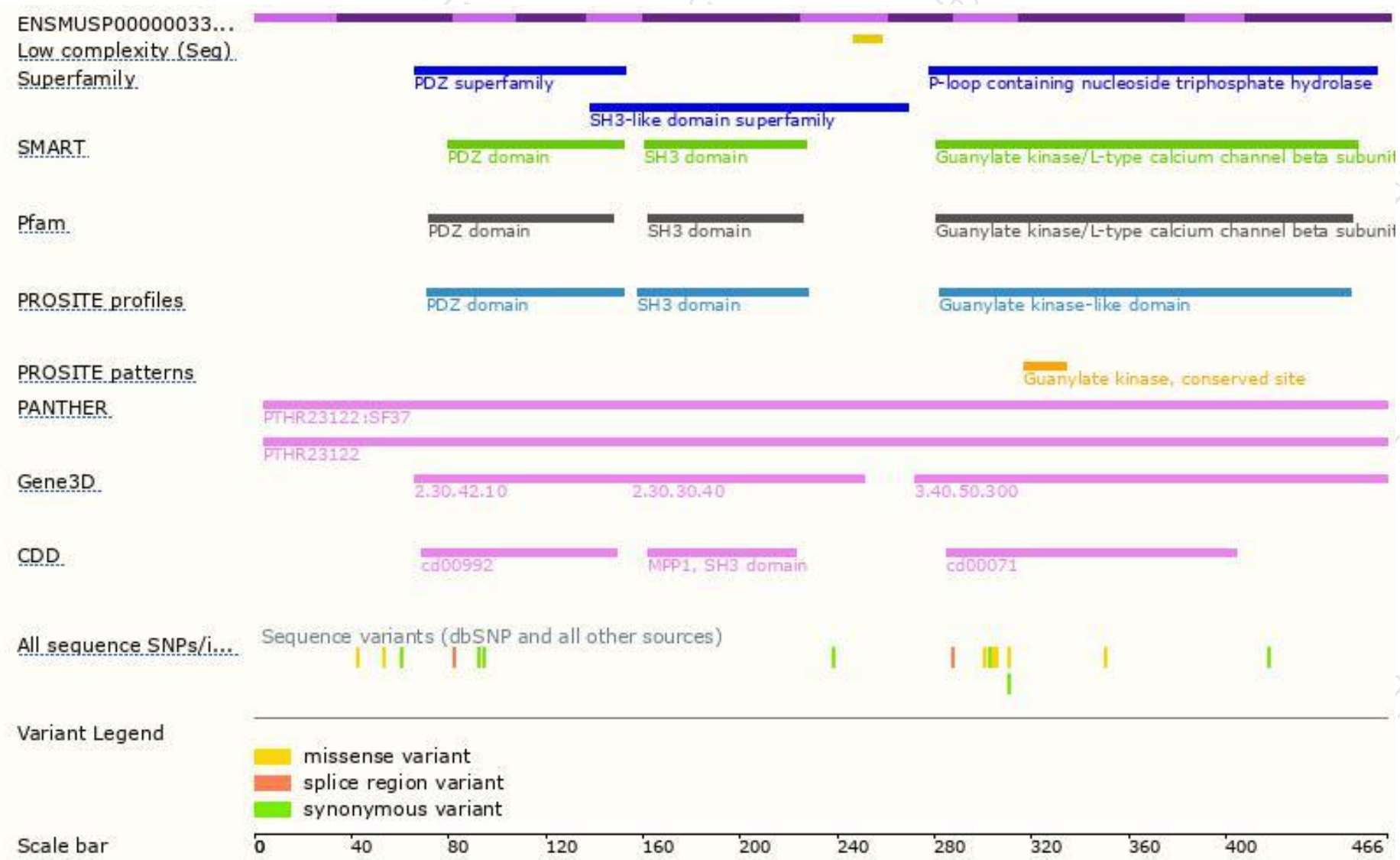




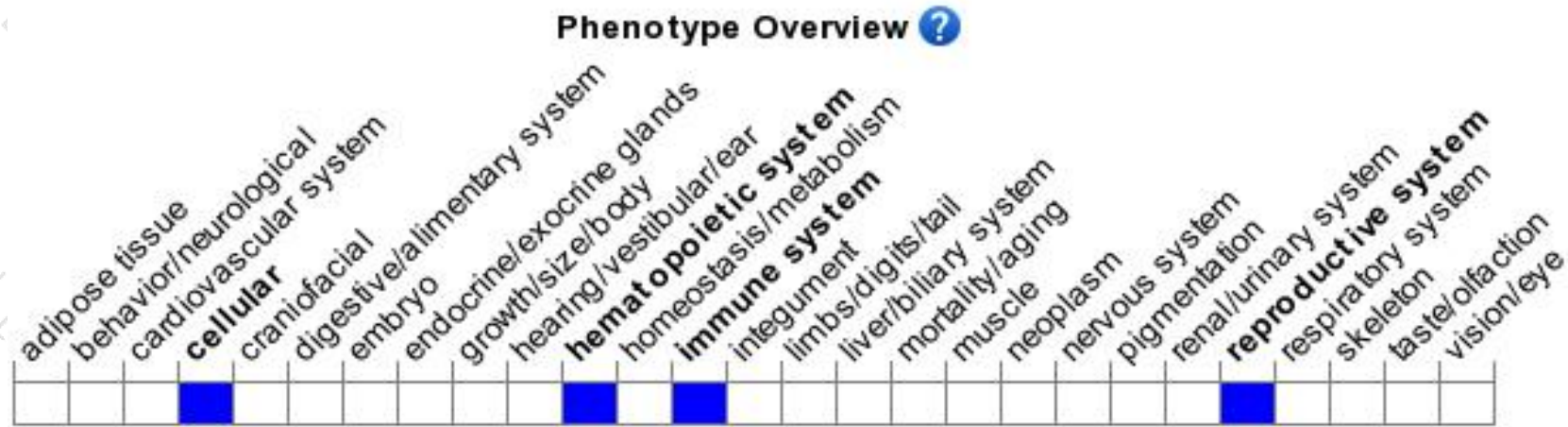
# Protein domain



集萃药康  
GemPharmatech



# 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 for a knock-out allele display defects in neutrophil polarity and chemotaxis and produce small litters of pups.

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

Tel: 400-9660890

