

# *Prdm5* Cas9-KO Strategy

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**Reviewer:**

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**2020-3-24**

# Project Overview

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**Project Name**

*Prdm5*

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**Project type**

**Cas9-KO**

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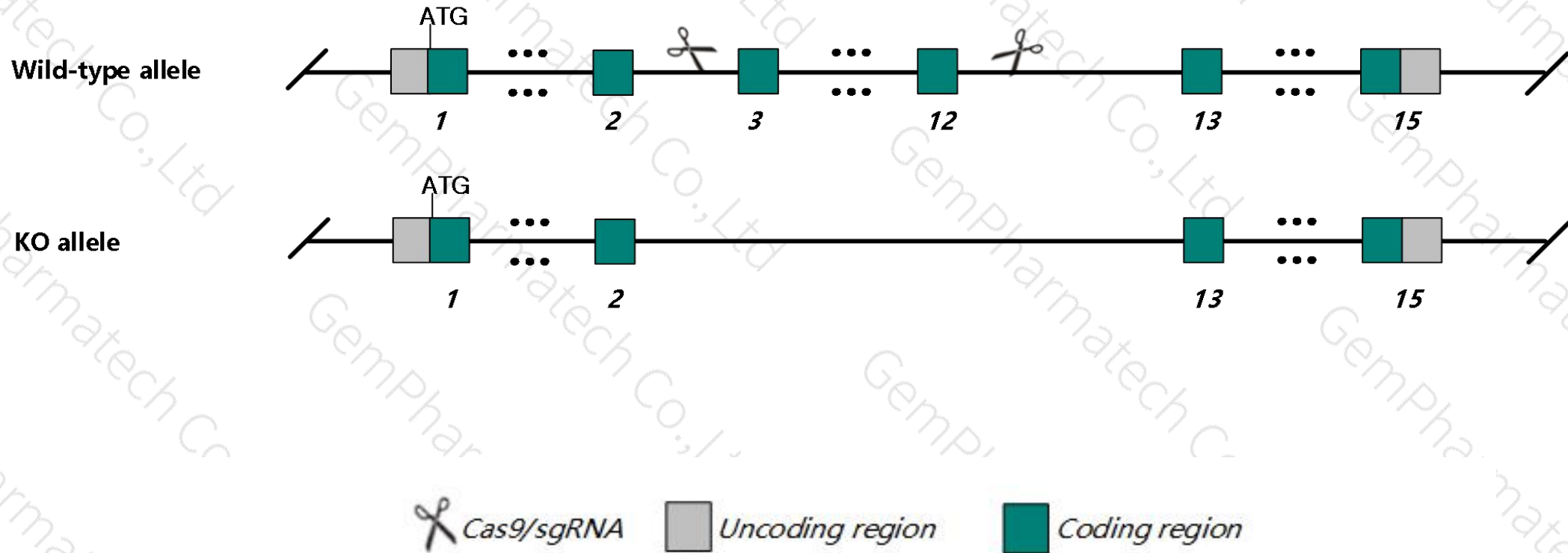
**Strain background**

**C57BL/6JGpt**

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# Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Prdm5* gene. The schematic diagram is as follows:



- The *Prdm5* gene has 7 transcripts. According to the structure of *Prdm5* gene, exon3-exon12 of *Prdm5-202* (ENSMUST00000031976.13) transcript is recommended as the knockout region. The region contains 1267bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Prdm5* gene. The brief process is as follows: CRISPR/Cas9 system w

- According to the existing MGI data, Mice homozygous for a hypomorphic allele display delayed bone ossification with reduced collagen fibril formation, total bone area, bone mineral content and bone mineral density.
- The flox region contain the Gm20445 and Gm23543 gene, which may delete it after Cre.
- The *Prdm5* gene is located on the Chr6. 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)

## Prdm5 PR domain containing 5 [ *Mus musculus* (house mouse) ]

Gene ID: 70779, updated on 13-Mar-2020

### Summary

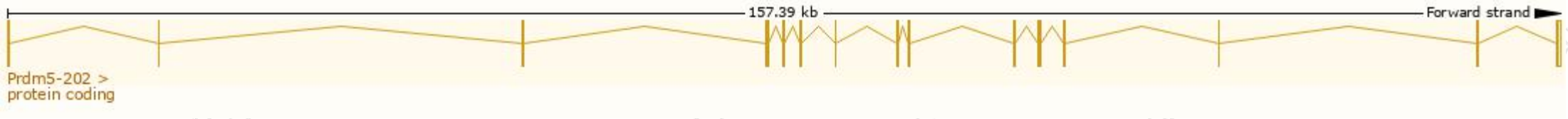
|                    |                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Official Symbol    | Prdm5 provided by <a href="#">MGI</a>                                                                                                                                     |
| Official Full Name | PR domain containing 5 provided by <a href="#">MGI</a>                                                                                                                    |
| Primary source     | <a href="#">MGI:MGI:1918029</a>                                                                                                                                           |
| See related        | <a href="#">Ensembl:ENSMUSG00000029913</a>                                                                                                                                |
| Gene type          | protein coding                                                                                                                                                            |
| RefSeq status      | VALIDATED                                                                                                                                                                 |
| 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      | PFM2; AI197291; 4432417F03Rik; 6530401I24Rik; E130112L17Rik                                                                                                               |
| Expression         | Broad expression in limb E14.5 (RPKM 2.9), CNS E11.5 (RPKM 1.9) and 20 other tissues <a href="#">See more</a>                                                             |
| Orthologs          | <a href="#">human</a> <a href="#">all</a>                                                                                                                                 |

# Transcript information (Ensembl)

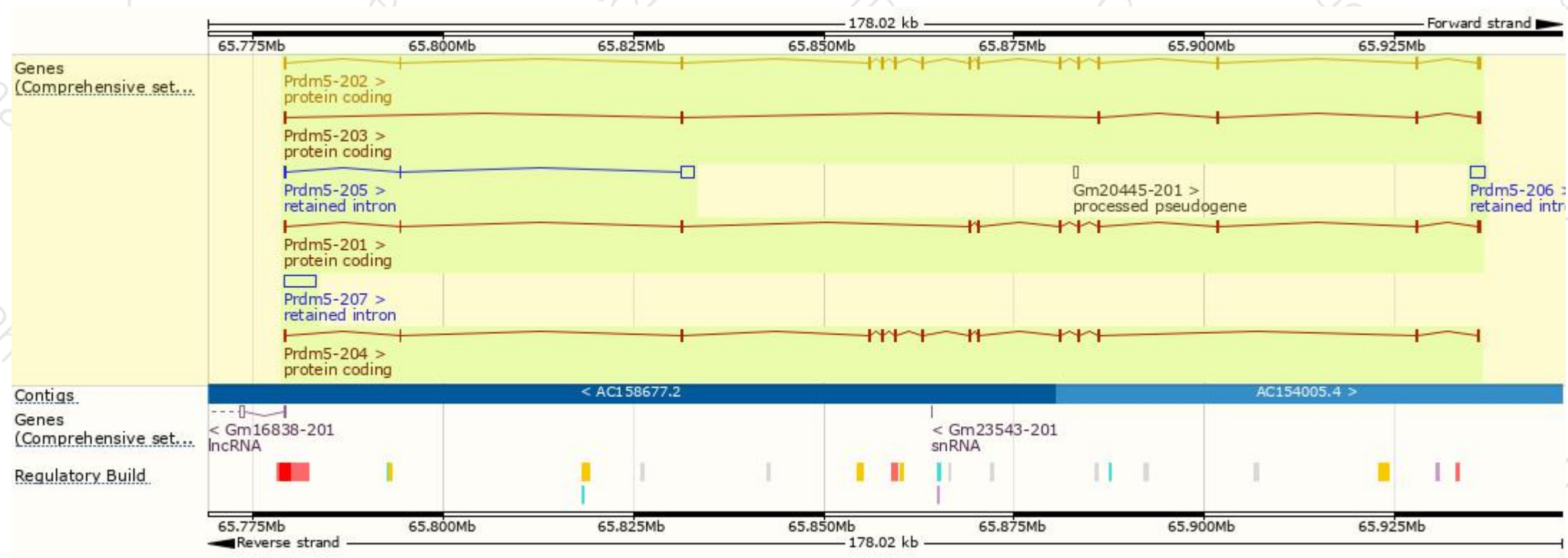
The gene has 7 transcripts,all transcripts are shown below:

| Name      | Transcript ID                          | bp   | Protein               | Biotype         | CCDS                      | UniProt                | Flags                         |
|-----------|----------------------------------------|------|-----------------------|-----------------|---------------------------|------------------------|-------------------------------|
| Prdm5-202 | <a href="#">ENSMUST000000031976.13</a> | 2155 | <a href="#">599aa</a> | Protein coding  | <a href="#">CCDS20208</a> | <a href="#">Q9CXEQ</a> | TSL:1 GENCODE basic APPRIS P1 |
| Prdm5-201 | <a href="#">ENSMUST000000031973.12</a> | 1488 | <a href="#">415aa</a> | Protein coding  | <a href="#">CCDS85059</a> | <a href="#">E9Q707</a> | TSL:1 GENCODE basic           |
| Prdm5-204 | <a href="#">ENSMUST00000172638.1</a>   | 1714 | <a href="#">501aa</a> | Protein coding  | -                         | <a href="#">G3UWU3</a> | TSL:5 GENCODE basic           |
| Prdm5-203 | <a href="#">ENSMUST000000081219.13</a> | 984  | <a href="#">221aa</a> | Protein coding  | -                         | <a href="#">Q9D1T8</a> | TSL:1 GENCODE basic           |
| Prdm5-207 | <a href="#">ENSMUST00000205168.1</a>   | 4168 | No protein            | Retained intron | -                         | -                      | TSL:NA                        |
| Prdm5-205 | <a href="#">ENSMUST00000173538.1</a>   | 1938 | No protein            | Retained intron | -                         | -                      | TSL:1                         |
| Prdm5-206 | <a href="#">ENSMUST00000205155.1</a>   | 1920 | No protein            | Retained intron | -                         | -                      | TSL:NA                        |

The strategy is based on the design of *Prdm5-202* transcript,The transcription is shown below



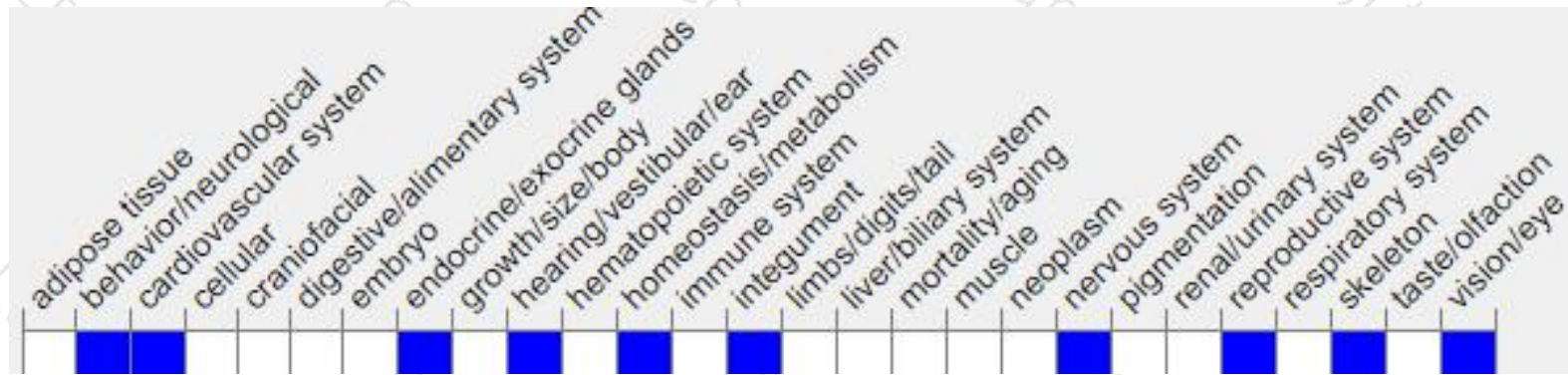
# Genomic location distribution



# 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 for a hypomorphic allele display delayed bone ossification with reduced collagen fibril formation, total bone area, bone mineral content and bone mineral density.

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

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