

Pin1 Cas9-KO Strategy

Designer: Jia Yu

Reviewer: Yanhua Shen

Design Date: 2023-6-21

Overview

Target Gene Name

- Pin1

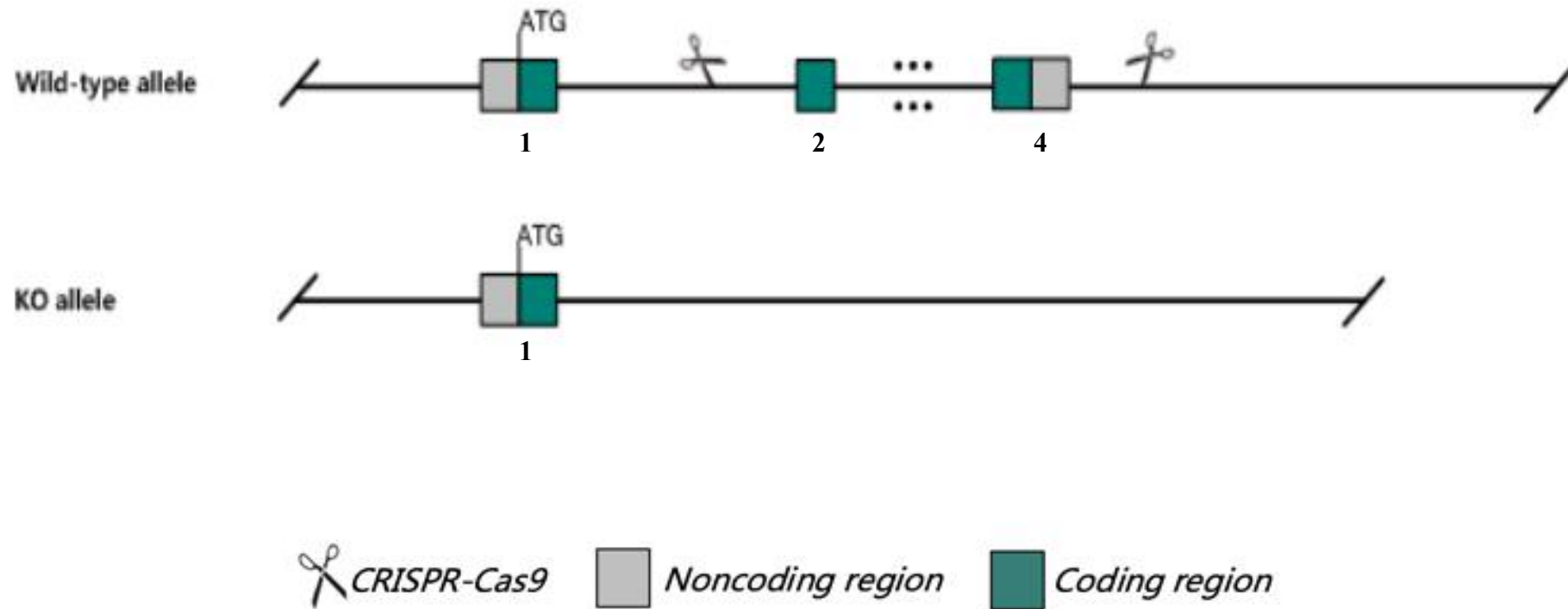
Project Type

- Cas9-KO

Genetic Background

- C57BL/6JGpt

Strain Strategy



Technical Information

- The *Pin1* gene has 1 transcript. According to the structure of *Pin1* gene, exon2-exon4 of *Pin1*-201 (ENSMUST00000034689.8) transcript is recommended as the knockout region. The region contains 440bp coding sequence. Knocking out the region will result in disruption of protein function.
- In this project we use CRISPR-Cas9 technology to modify *Pin1* gene. The brief process is as follows: gRNAs were transcribed in vitro. Cas9 and gRNAs 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.

Gene Information

Pin1 protein (peptidyl-prolyl cis/trans isomerase) NIMA-interacting 1 [Mus musculus (house mouse)]

Gene ID: 23988, updated on 9-Apr-2019

Summary

| | |
|---------------------------|---|
| Official Symbol | Pin1 provided by MGI |
| Official Full Name | protein (peptidyl-prolyl cis/trans isomerase) NIMA-interacting 1 provided by MGI |
| Primary source | MGI:MGI:1346036 |
| See related | Ensembl:ENSMUSG00000032171 |
| 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 | 0610025L01Rik, D9Bwg1161e |
| Expression | Ubiquitous expression in ovary adult (RPKM 15.3), CNS E18 (RPKM 13.4) and 28 other tissues See more |
| Orthologs | human all |

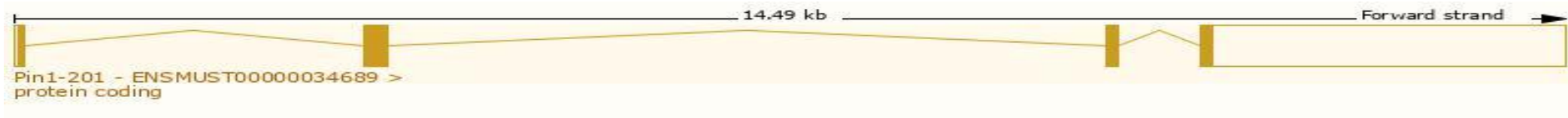
Source: <https://www.ncbi.nlm.nih.gov/>

Transcript Information

The gene has 1 transcript, and the transcript is shown below:

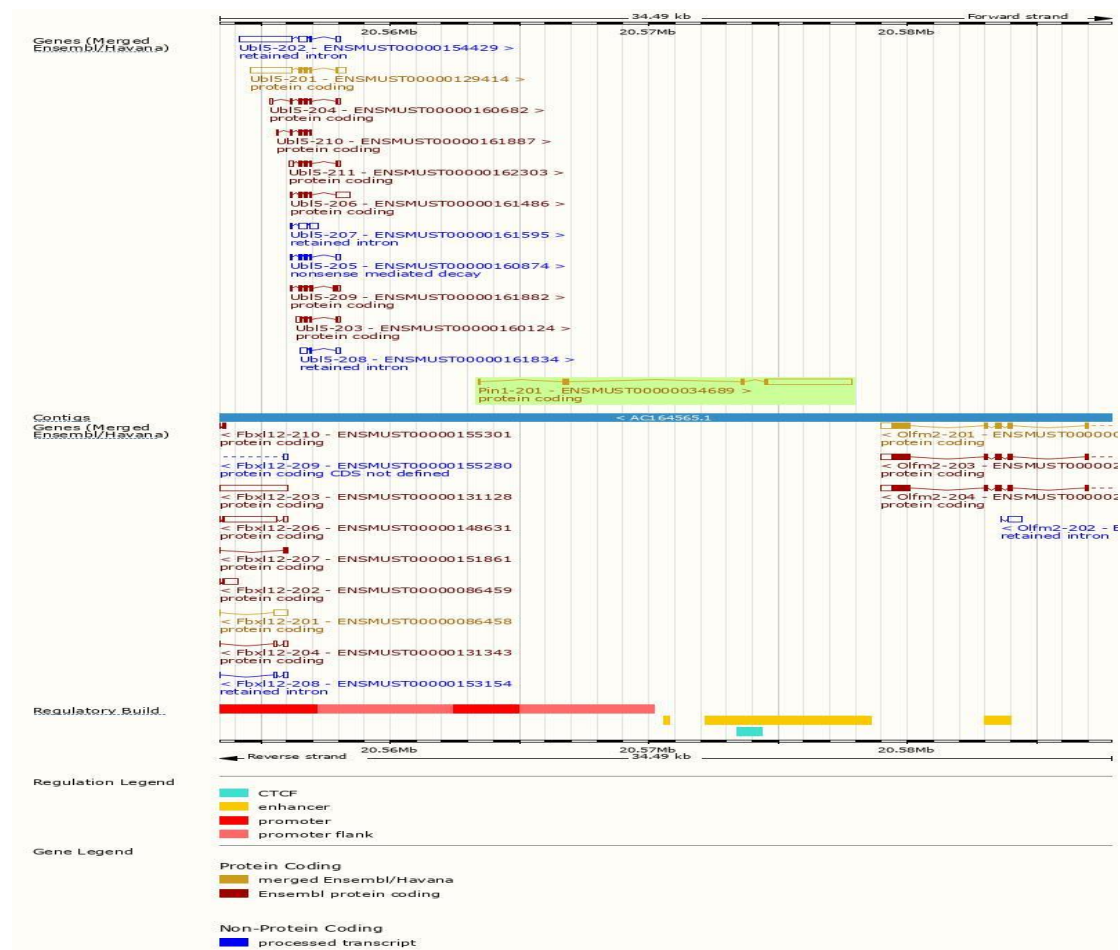
| Name | Transcript ID | bp | Protein | Biotype | CCDS | UniProt | Flags |
|----------|--------------------------------------|------|-----------------------|----------------|---------------------------|------------------------|-------------------------------|
| Pin1-201 | ENSMUST00000034689.7 | 3843 | 165aa | Protein coding | CCDS22882 | Q9QUR7 | TSL:1 GENCODE basic APPRIS P1 |

The strategy is based on the design of *Pin1*-201 transcript, the transcription is shown below:

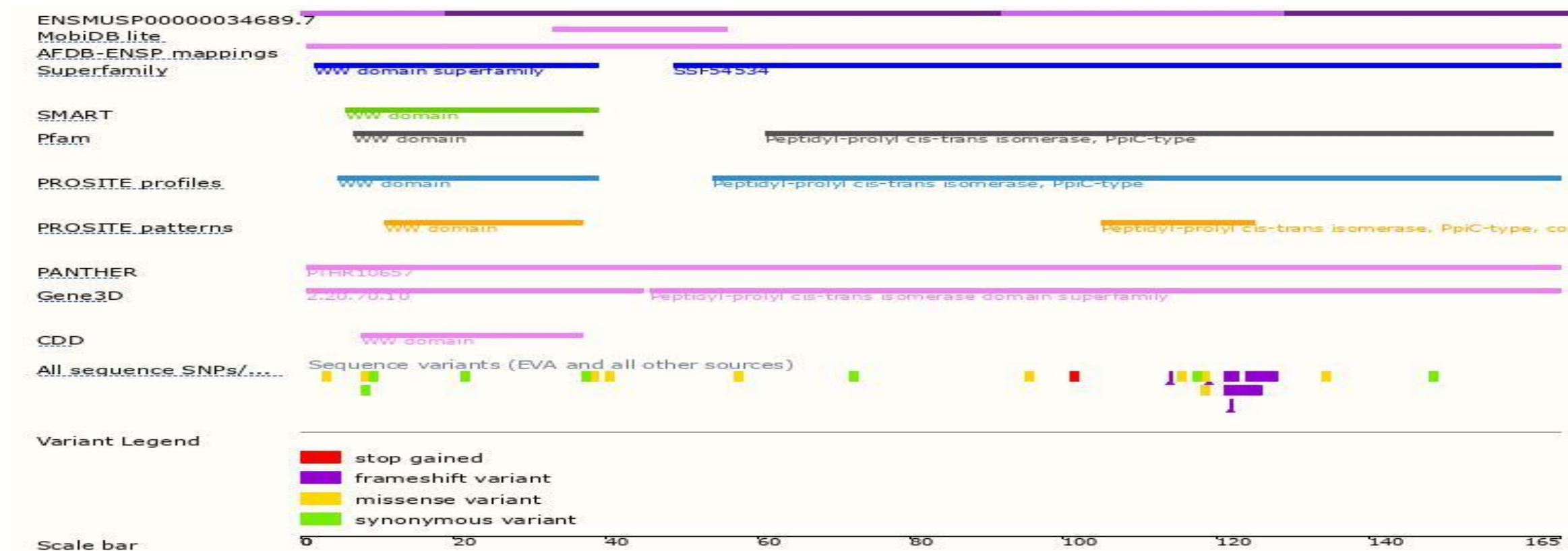


Source: <https://www.ensembl.org>

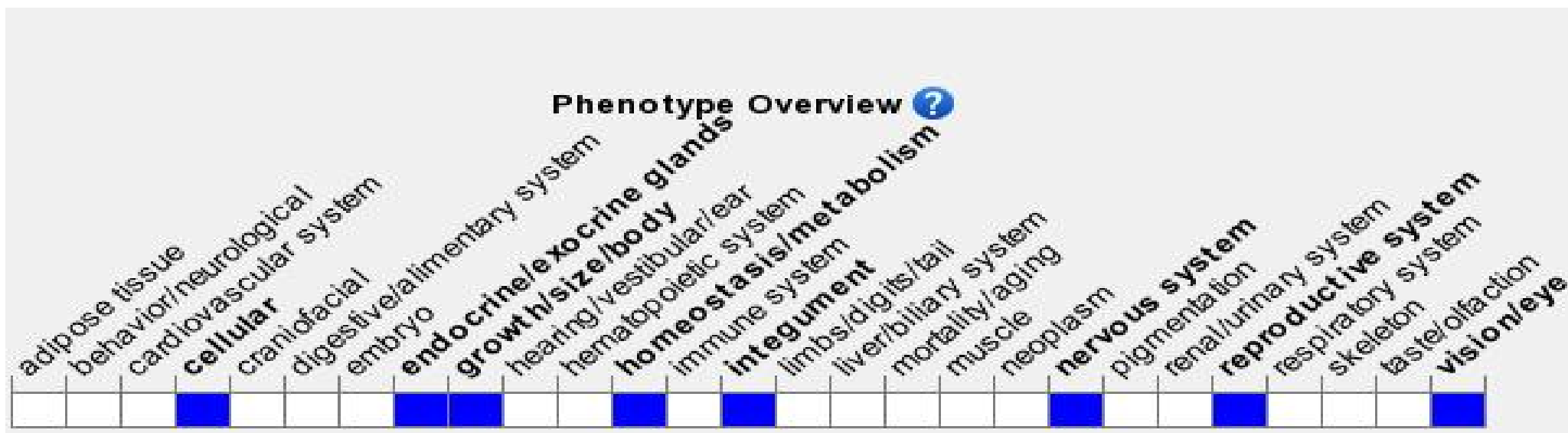
Genomic Information



Protein Information



Mouse Phenotype Information (MGI)



- Homozygotes exhibit cell-proliferation abnormalities, including a late-developing reduction in body weight and progressive testicular and retinal atrophies. Mutant females fail to undergo mammary epithelial duct expansion associated with pregnancy.

Important Information

- *Pin1* is located on Chr9. 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 risks of the mutation on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.