

# ***Pvalb-IRES-iCre* Cas9-KI Strategy**

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**Design Date:**

**2019-8-16**

**Reviewer**

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# Project Overview

**Project Name**

***Pvalb-IRES-iCre***

**Project type**

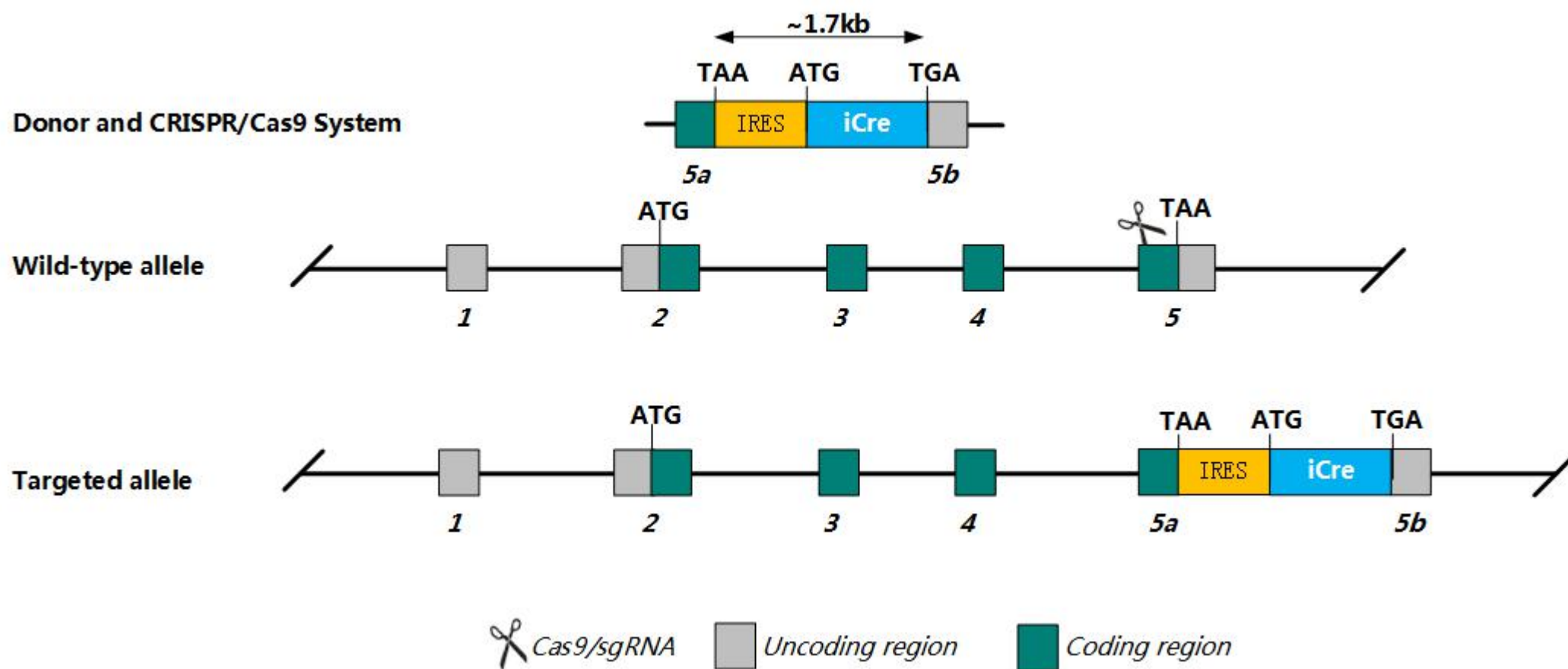
**Cas9-KI**

**Strain background**

**C57BL/6J**

# Knockin strategy

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



- The *Pvalb* gene has 2 transcripts. According to the structure of *Pvalb* gene, *Pvalb*-202(ENSMUST00000120592.1) is selected for presentation of the recommended strategy.
- *Pvalb*-202 gene has 5 exons, with the ATG start codon in exon2 and TAA stop codon in exon5.
- We make *Pvalb-iCre* knockin mice via CRISPR/Cas9 system. Cas9 mRNA, sgRNA and donor will be co-injected into zygotes. sgRNA direct Cas9 endonuclease cleavage at exon 5 near the stop codon TAA , and create a DSB(double-strand break). Such breaks will be repaired, and result in *IRES-iCre* inserted after the stop codon by homologous recombination. The pups will be genotyped by PCR, followed by sequence analysis.

- According to the existing MGI data, Mice homozygous for deletion of this marker show slower cotraction-relaxation of fast twitch muscle and and increased force generation. Abnormalities are also reported in Purkinje cell morphology.
- Expression of Pvalb-Cre may be mainly expressed in parvalbumin-expressing neurons (such as interneurons in the brain and proprioceptive afferent sensory neurons in the dorsal root ganglia).
- The Pvalb gene and iCre gene linked by IRES are expressed by the same promoter. The transcription level is consistent but translated independently. Usually the translation level of the latter gene is lower than that of the former gene.
- Insertion of iCre may affect the regulation of the 3' end of the *Pvalb* gene.
- There will be 1 to 2 amino acid synonymous mutation in exon5 of *Pvalb* gene in this strategy.
- The *Pvalb* gene is located on the Chr15. If the knockin 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 gene transcription and translation processes, all risks cannot be predicted under existing information.



# Gene information (NCBI)



## Pvalb parvalbumin [ *Mus musculus* (house mouse) ]

Gene ID: 19293, updated on 13-Aug-2019

### Summary

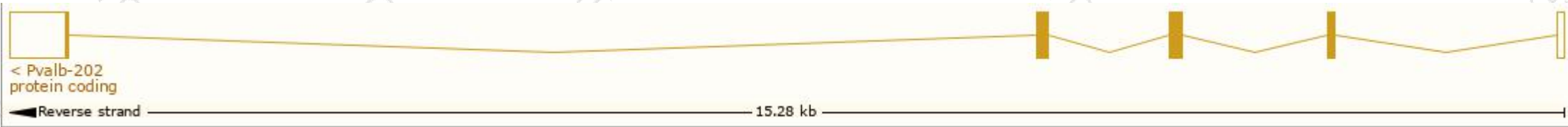
Official Symbol	Pvalb provided by <a href="#">MGI</a>
Official Full Name	parvalbumin provided by <a href="#">MGI</a>
Primary source	<a href="#">MGI:MGI:97821</a>
See related	<a href="#">Ensembl:ENSMUSG000000005716</a>
Gene type	protein coding
RefSeq status	VALIDATED
Organism	<a href="#">Mus musculus</a>
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	PV; Pva; Parv
Expression	Biased expression in cerebellum adult (RPKM 192.6), mammary gland adult (RPKM 147.4) and 2 other tissues <a href="#">See more</a>
Orthologs	<a href="#">human</a> <a href="#">all</a>

# Transcript information (Ensembl)

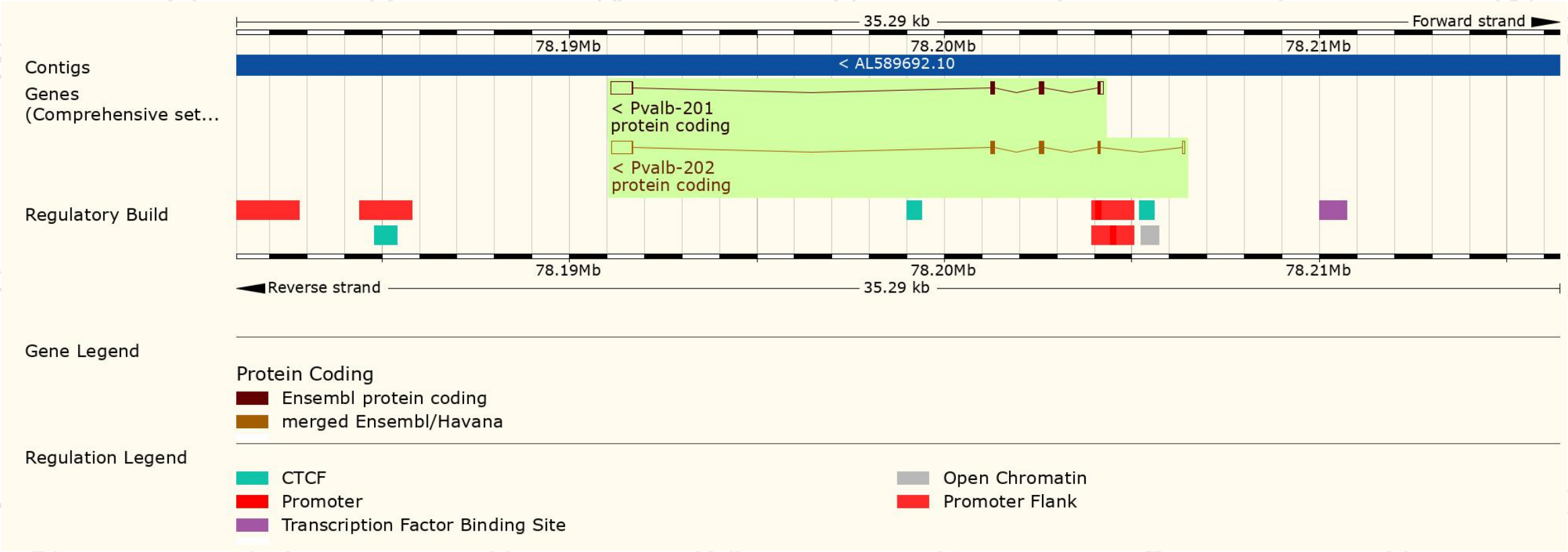
The gene has 2 transcripts, and all transcripts are shown below :

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pvalb-201	<a href="#">ENSMUST00000005860.15</a>	977	<a href="#">110aa</a>	Protein coding	<a href="#">CCDS27609</a>	<a href="#">P32848</a> <a href="#">Q545M7</a>	TSL:1 Gencode basic APPRIS P1
Pvalb-202	<a href="#">ENSMUST00000120592.1</a>	953	<a href="#">110aa</a>	Protein coding	<a href="#">CCDS27609</a>	<a href="#">P32848</a> <a href="#">Q545M7</a>	TSL:1 Gencode basic APPRIS P1

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

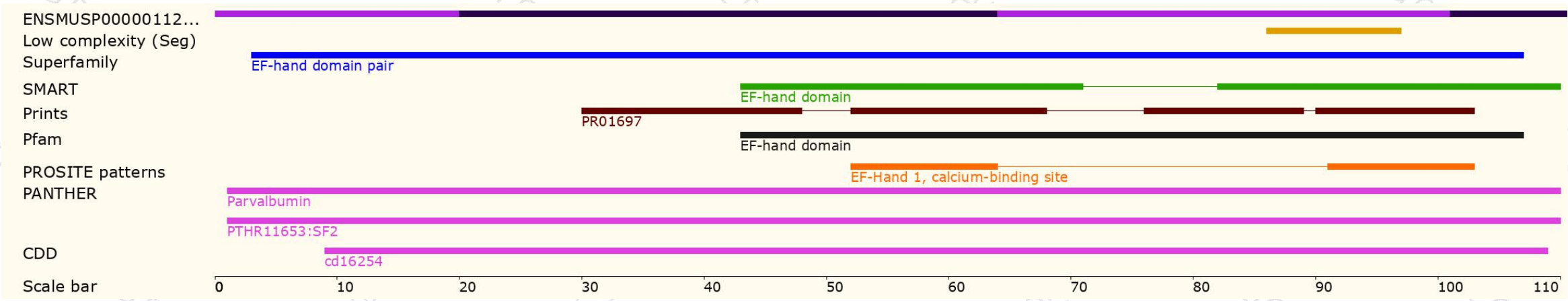


# Genomic location distribution

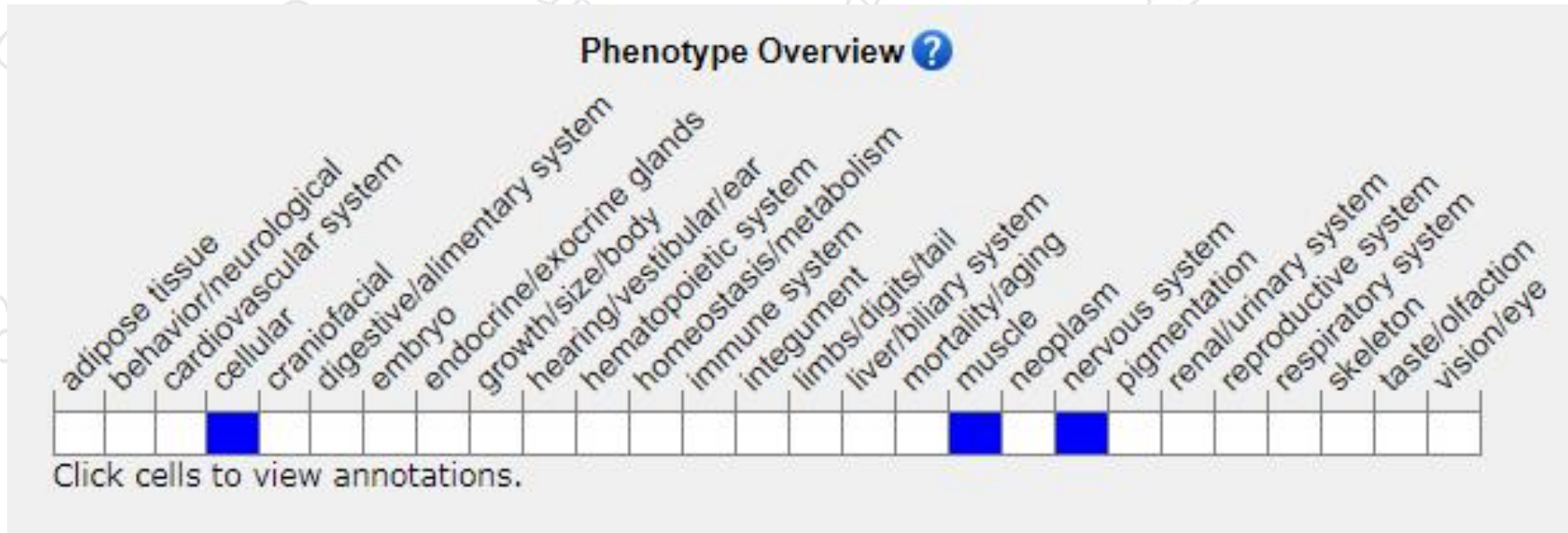




# Protein domain



# Mouse phenotype description(MGI)



*Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/marker/MGI:97821>) .*

Mice homozygous for deletion of this marker show slower cotraction-relaxation of fast twitch muscle and and increased force generation. Abnormalities are also reported in Purkinje cell morphology.

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