

Pdyn Cas9-KO Strategy

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Project Overview

Project Name

Pdyn

Project type

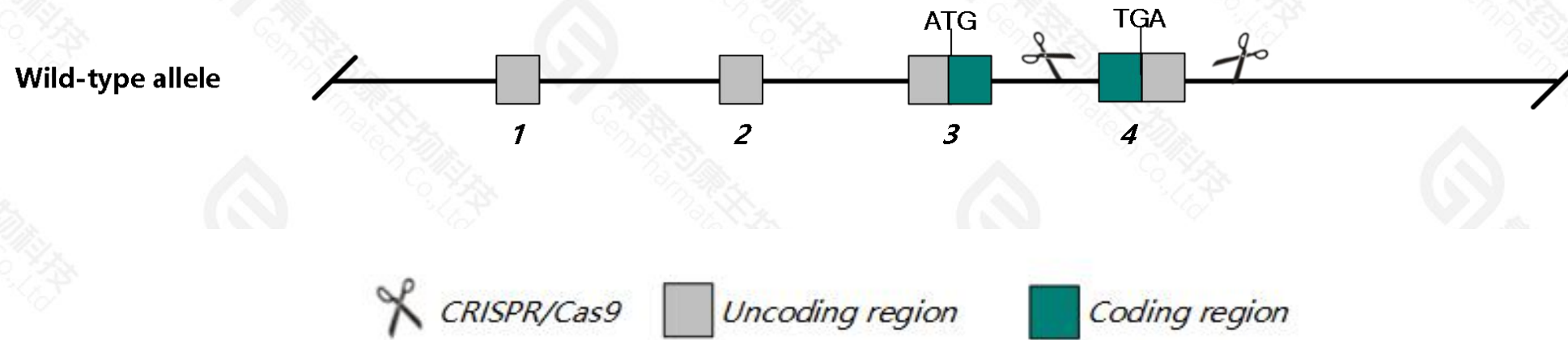
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

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



- The *Pdyn* gene has 3 transcripts. According to the structure of *Pdyn* gene, exon4 of *Pdyn-201*(ENSMUST00000028883.12) transcript is recommended as the knockout region. The region contains most of coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Pdyn* gene. The brief process is as follows: CRISPR/Cas9 system 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.

- According to the existing MGI data, homozygotes for targeted null mutations exhibit high postnatal mortality, impaired thermoregulation, and loss of white fat. Survivors show ketosis, microvesicular fat accumulation, elevated serum lipids, and behavioral abnormalities.
- The Pdyn gene is located on the Chr2. 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)

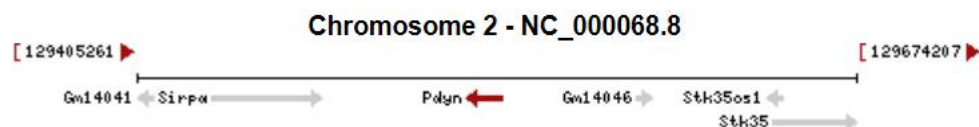
Pdyn prodynorphin [*Mus musculus* (house mouse)]

Download Datasets

Gene ID: 18610, updated on 22-Aug-2021

Summary

Official Symbol	Pdyn provided by MGI
Official Full Name	prodynorphin provided by MGI
Primary source	MGI:MGI:97535
See related	Ensembl:ENSMUSG00000027400
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	Dy; Dyn
Summary	This gene encodes a preproprotein that is proteolytically cleaved to yield a number of active opium-like peptides. These peptides are the endogenous ligands for the Kappa-opioid receptor and similar G-protein-coupled receptors and are thought to function as the body's natural way to control addiction. These peptides have been associated with depression, stress, anxiety, response to pain, and maintenance of homeostasis via circadian rhythms and control of appetite. Mutations in the related human gene have been linked to the neurodegenerative disease spinocerebellar ataxia. Alternative splicing results in multiple transcript variants. [provided by RefSeq, Nov 2013]
Expression	Biased expression in cortex adult (RPKM 4.6), CNS E18 (RPKM 3.1) and 4 other tissues See more
Orthologs	human all

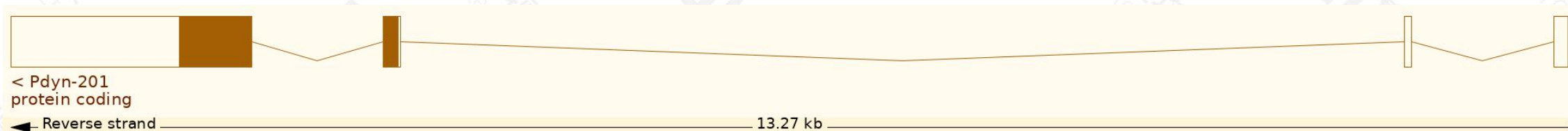


Transcript information (Ensembl)

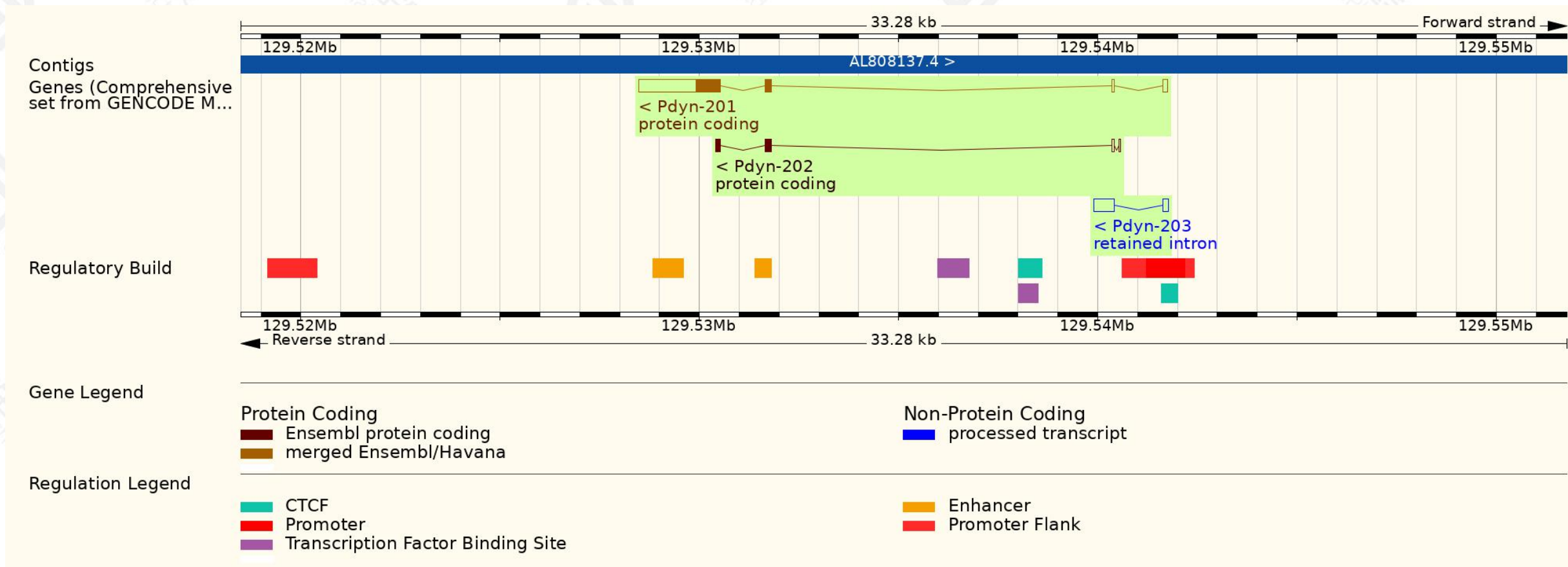
The gene has 3 transcripts, all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt Match	Flags
Pdyn-201	ENSMUST00000028883.12	2386	248aa	Protein coding	CCDS38239	O35852	GENCODE basic APPRIS P1 TSL:1
Pdyn-202	ENSMUST00000130608.2	369	84aa	Protein coding	-	A2ANF0	TSL:3 CDS 3' incomplete
Pdyn-203	ENSMUST00000152113.2	647	No protein	Retained intron	-	-	TSL:1

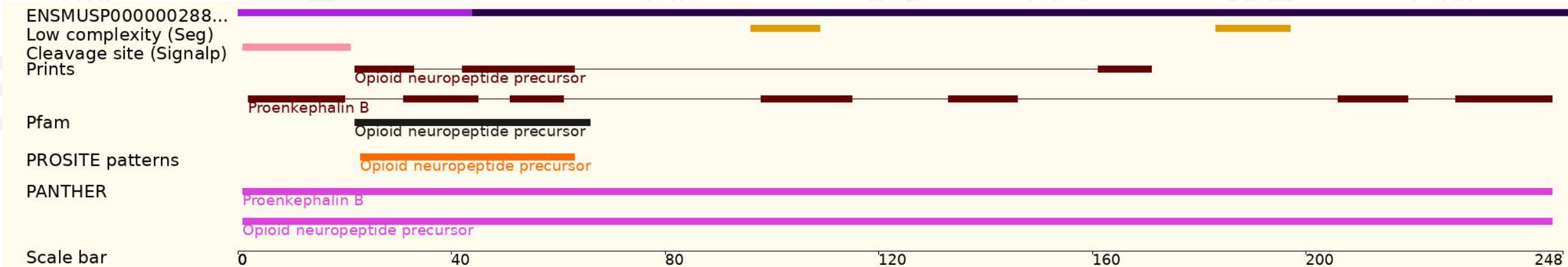
The strategy is based on the design of *Pdyn-201* transcript, the transcription is shown below:



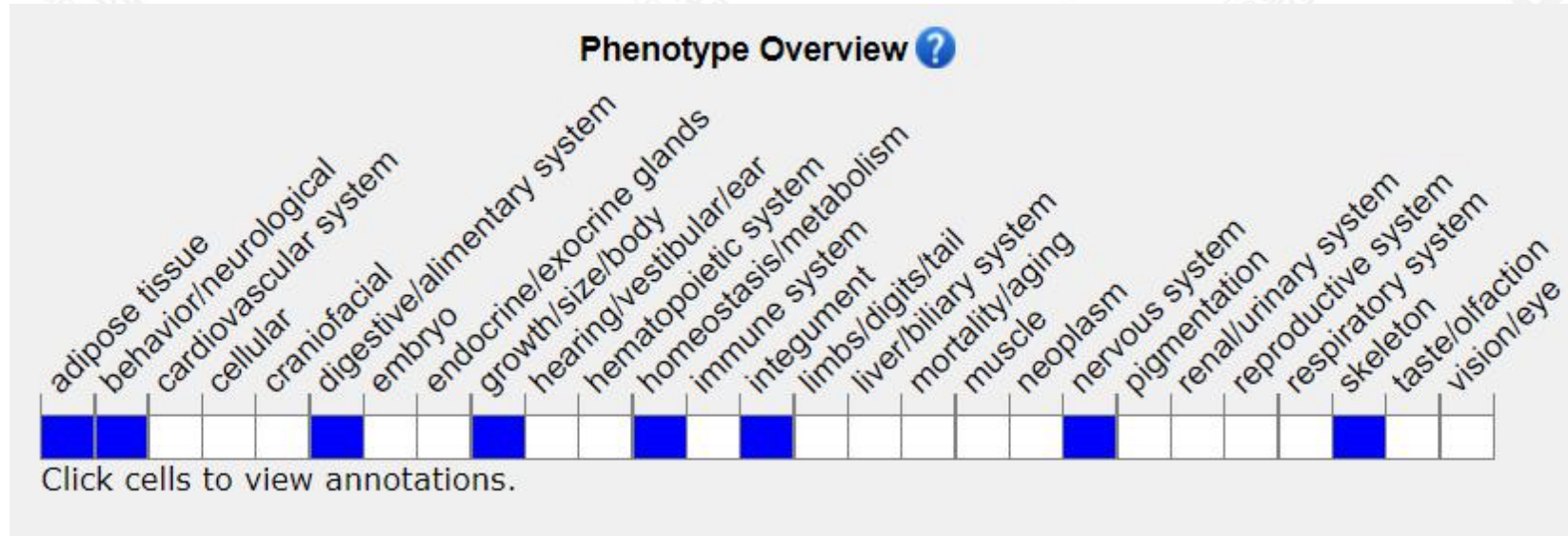
Genomic location distribution



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/>).

Homozygotes for targeted null mutations exhibit high postnatal mortality, impaired thermoregulation, and loss of white fat. Survivors show ketosis, microvesicular fat accumulation, elevated serum lipids, and behavioral abnormalities.

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

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