

Pde10a Cas9-KO Strategy

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Reviewer:

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Project Overview

Project Name

Pde10a

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pde10a* gene. The schematic diagram is as follows:



- The *Pde10a* gene has 14 transcripts. According to the structure of *Pde10a* gene, exon4 of *Pde10a-202* (ENSMUST00000089085.9) transcript is recommended as the knockout region. The region contains 121bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Pde10a* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Homozygous mutation of this gene results in decreased exploratory behavior, hypoactivity, and a delay in the acquisition of conditioned avoidance behavior. A hypomorphic allele results in increased social behavior. Mice homozygous for a knock-out allele exhibit resistance to diet-induced obesity.
- The *Pde10a* gene is located on the Chr17. 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)

Pde10a phosphodiesterase 10A [Mus musculus (house mouse)]

Gene ID: 23984, updated on 7-Apr-2019

Summary



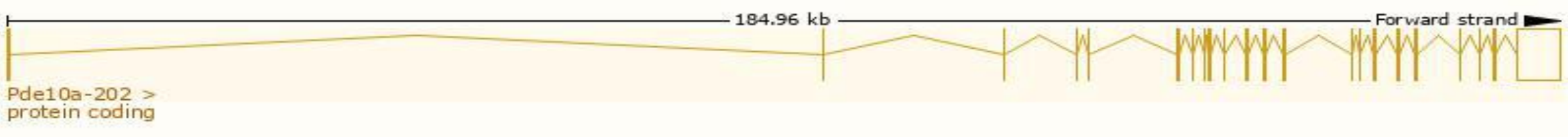
Official Symbol	Pde10a provided by MGI
Official Full Name	phosphodiesterase 10A provided by MGI
Primary source	MGI:MGI:1345143
See related	Ensembl:ENSMUSG00000023868
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in CNS E18 (RPKM 7.5), cortex adult (RPKM 4.9) and 13 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

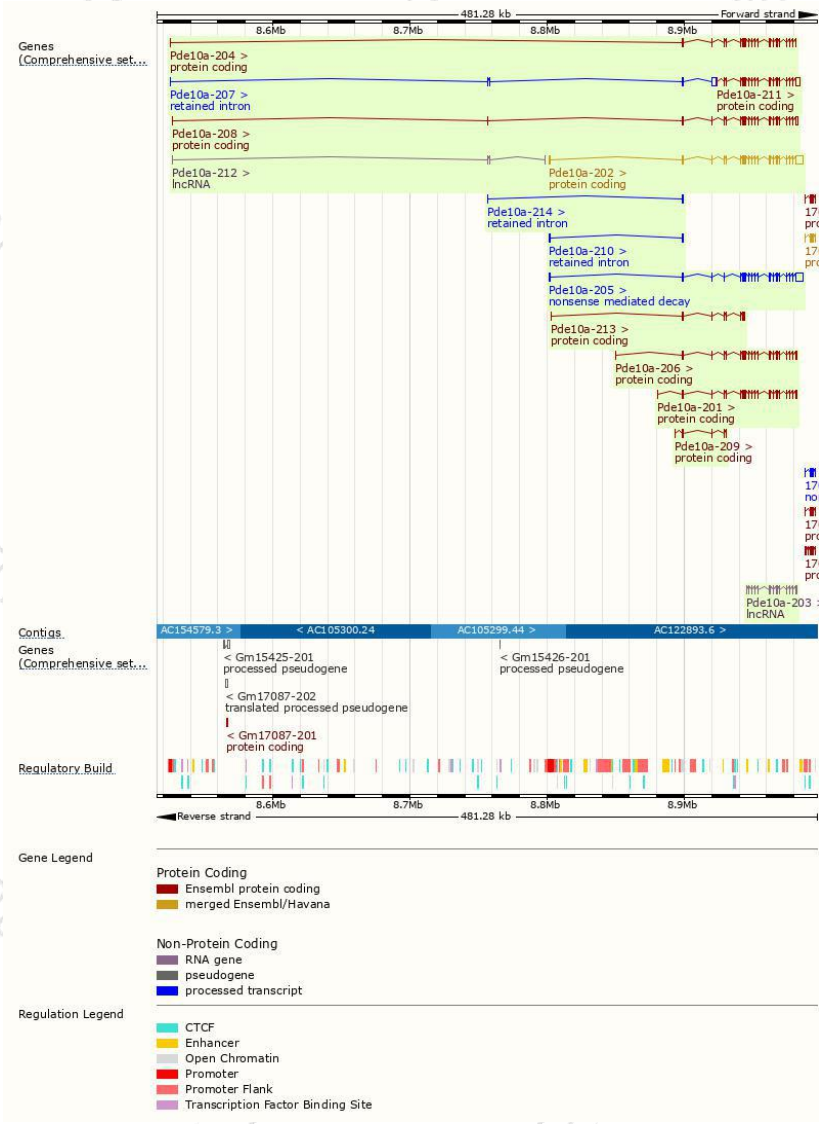
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pde10a-202	ENSMUST00000089085.9	7769	796aa	Protein coding	CCDS28384	Q8CA95	TSL:1 GENCODE basic APPRIS P3
Pde10a-206	ENSMUST00000115720.7	3328	779aa	Protein coding	CCDS84274	Q8CA95	TSL:1 GENCODE basic APPRIS ALT2
Pde10a-211	ENSMUST00000149440.7	4897	727aa	Protein coding	-	Q8CA95	TSL:1 GENCODE basic
Pde10a-208	ENSMUST00000115724.8	3611	850aa	Protein coding	-	A0A384DV92	TSL:5 GENCODE basic
Pde10a-201	ENSMUST00000024647.12	3089	716aa	Protein coding	-	F8WHK3	TSL:1 GENCODE basic APPRIS ALT2
Pde10a-204	ENSMUST00000115715.7	2783	716aa	Protein coding	-	F8WHK3	TSL:5 GENCODE basic APPRIS ALT2
Pde10a-213	ENSMUST00000233052.1	748	238aa	Protein coding	-	A0A3B2W3N3	CDS 3' incomplete
Pde10a-209	ENSMUST00000136160.1	459	123aa	Protein coding	-	A0A3B2WCR8	CDS 3' incomplete TSL:5
Pde10a-205	ENSMUST00000115717.8	7630	151aa	Nonsense mediated decay	-	S4R197	TSL:5
Pde10a-207	ENSMUST00000115722.7	3673	No protein	Retained intron	-	-	TSL:1
Pde10a-210	ENSMUST00000141877.1	782	No protein	Retained intron	-	-	TSL:1
Pde10a-214	ENSMUST00000233652.1	409	No protein	Retained intron	-	-	
Pde10a-203	ENSMUST00000115708.1	2471	No protein	lncRNA	-	-	TSL:1
Pde10a-212	ENSMUST00000233016.1	498	No protein	lncRNA	-	-	

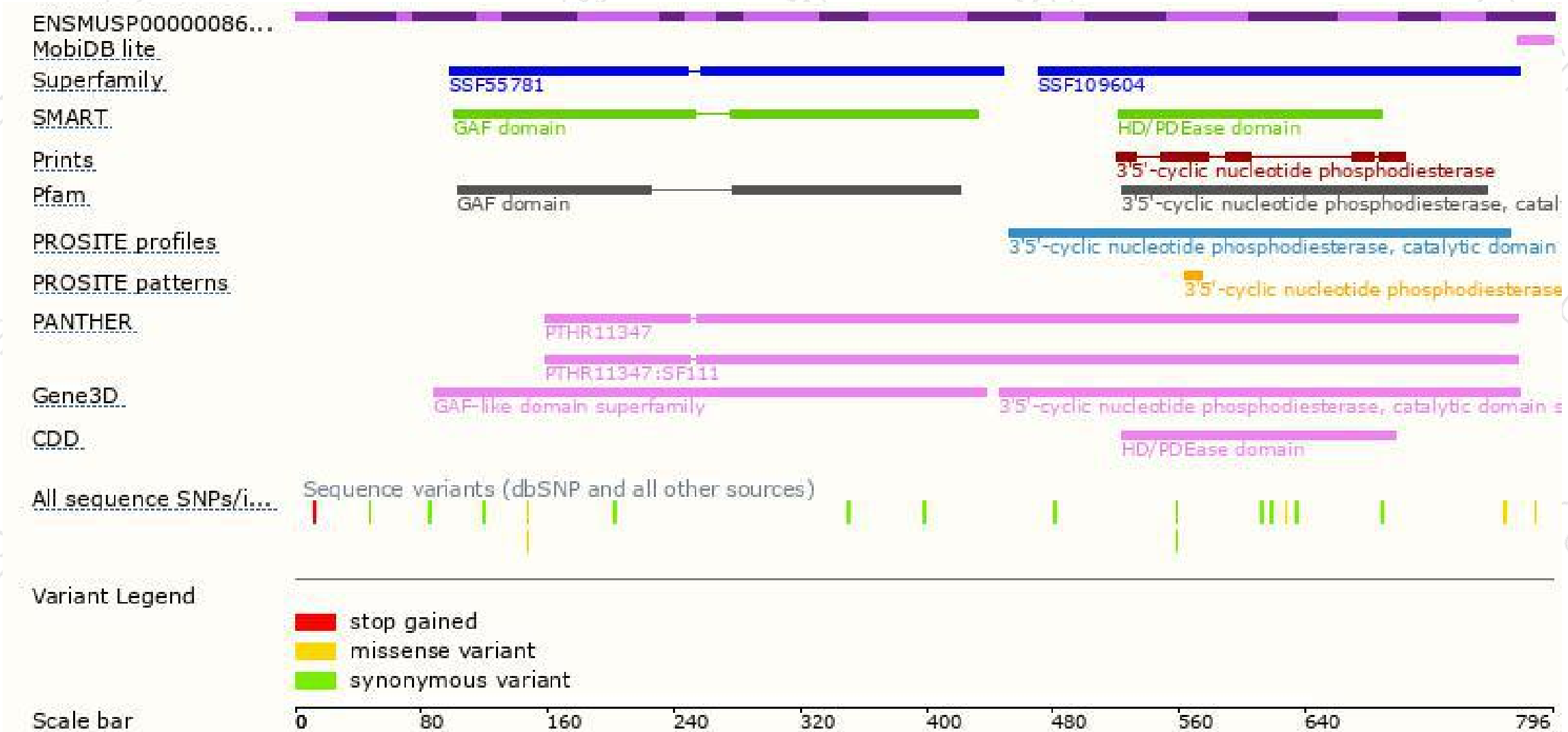
The strategy is based on the design of *Pde10a-202* transcript,The transcription is shown below



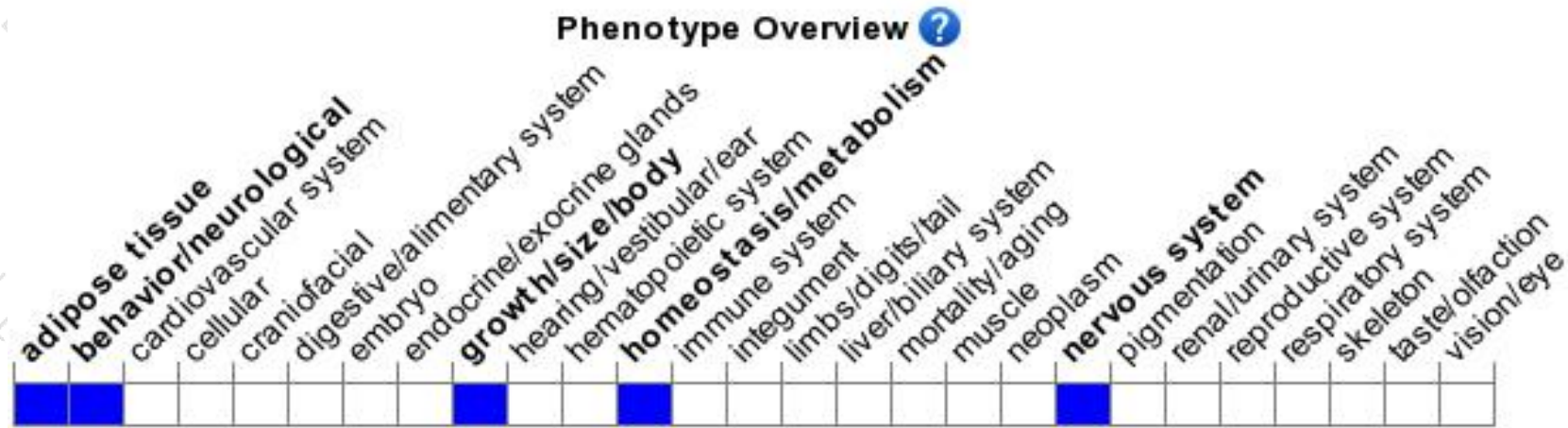
Genomic location distribution



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, Homozygous mutation of this gene results in decreased exploratory behavior, hypoactivity, and a delay in the acquisition of conditioned avoidance behavior. A hypomorphic allele results in increased social behavior. Mice homozygous for a knock-out allele exhibit resistance to diet-induced obesity.

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

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