Pde1c Cas9-KO Strategy

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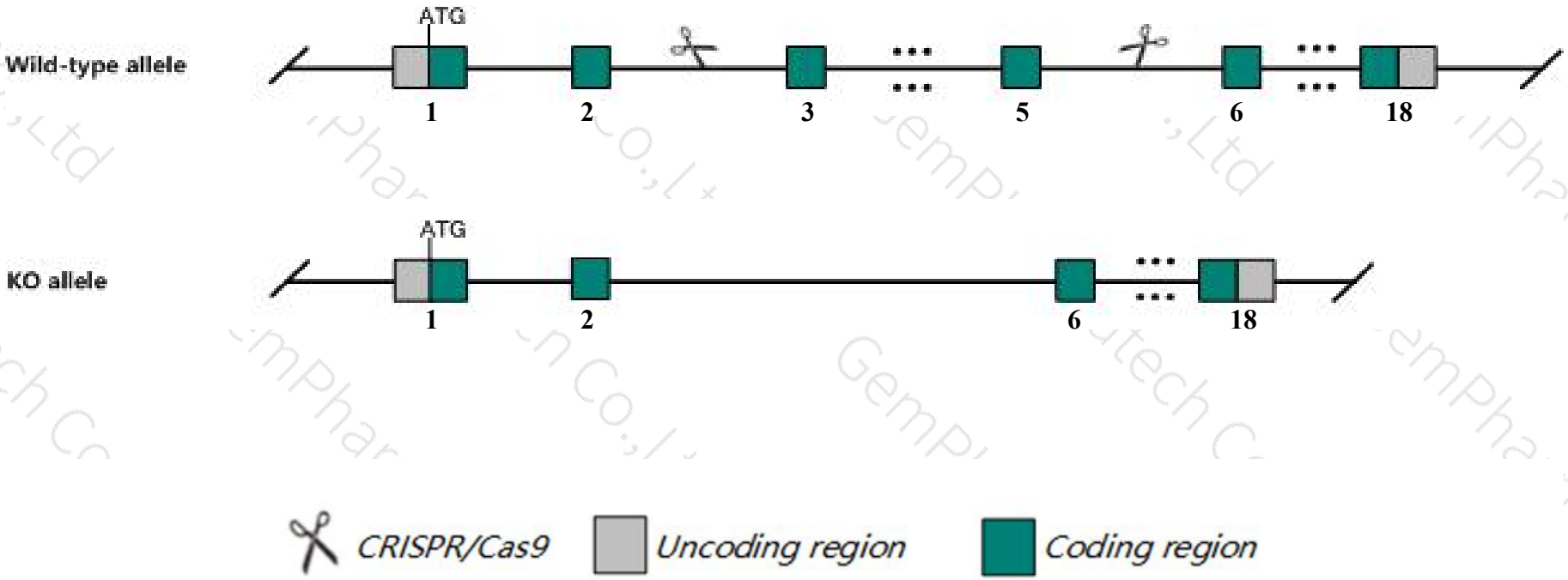
Design Date: 2019-7-22

Project Overview

Project Name	***Pde1c***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Pde1c* gene. The schematic diagram is as follows:



Technical routes

➢ The *Pde1c* gene has 14 transcripts. According to the structure of *Pde1c* gene, exon3-exon5 of *Pde1c-201* (ENSMUST00000044505.13) transcript is recommended as the knockout region.The region contains 364bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Pde1c* gene. The brief process is as follows: gRNA was transcribed in vitro.Cas9 and gRNA 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.

Notice

- According to the existing MGI data,Olfactory sensory nerves from homozygous null mice have significantly reduced action potentials in response to odor with slower onset kinetics and a faster response termination.
- Transcript *Pde1c*-210&211&212 may not be affected .
- The knockout region is near to the N-terminal of *Gm44413* gene,this strategy may influence the regulatory function of the N-terminal of *Gm44413* gene.
- The *Pde1c* 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）

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Pde1c phosphodiesterase 1C [Mus musculus (house mouse)]

Gene ID: 18575, updated on 2-Apr-2019

Summary

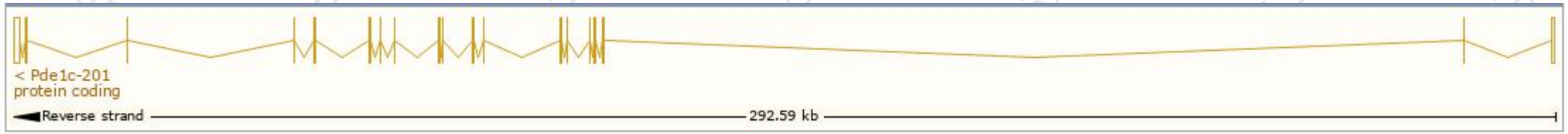
Official Symbol	Pde1c provided by MGI
Official Full Name	phosphodiesterase 1C provided byMGI
Primary source	MGI:MGI:108413
See related	Ensembl:ENSMUSG00000004347
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Biased expression in testis adult (RPKM 4.7), cerebellum adult (RPKM 3.2) and 8 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

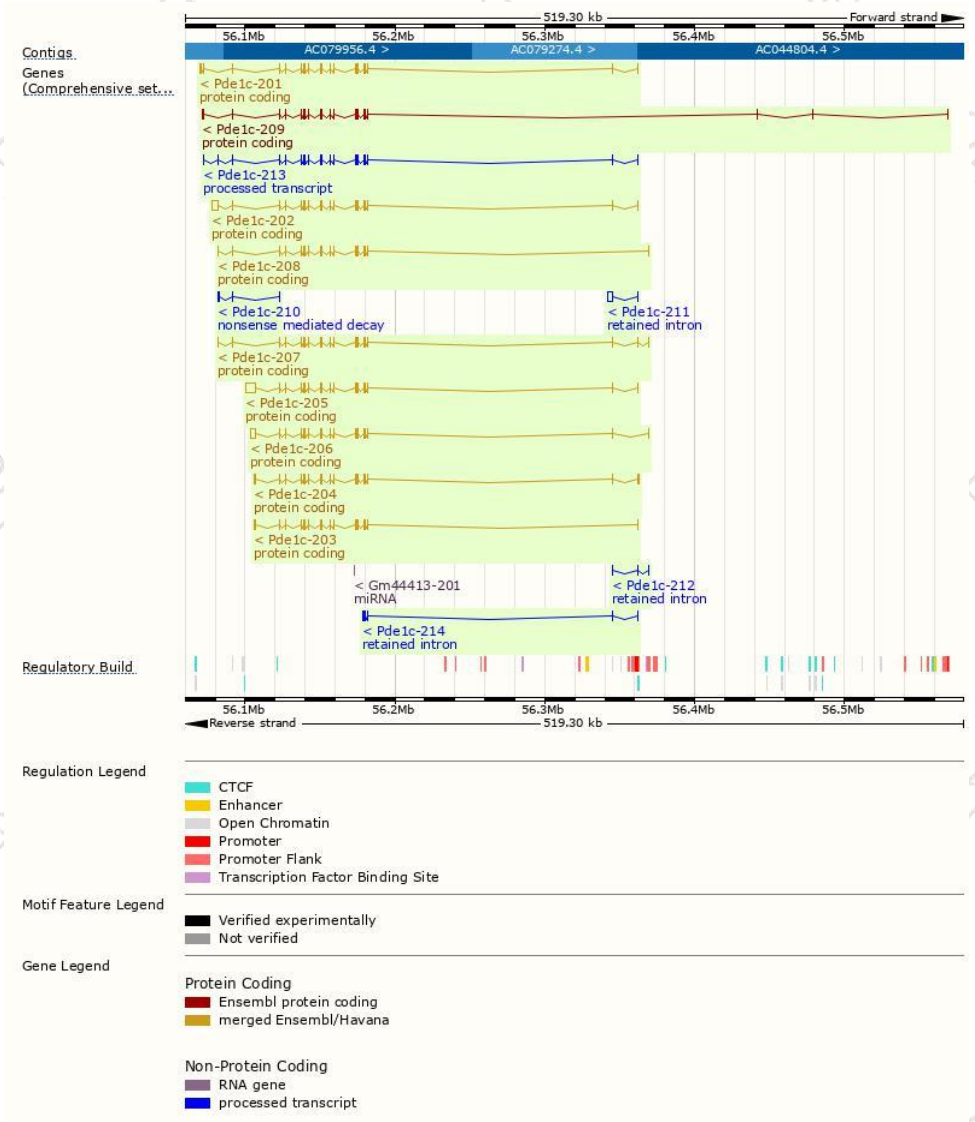
The gene has 14 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Pde1c-205	ENSMUST00000166102.7	8766	631aa	Protein coding	CCDS51785	Q5D0E7 Q64338	TSL:1 GENCODE basic APPRIS ALT1
Pde1c-202	ENSMUST00000114327.8	6821	654aa	Protein coding	CCDS20170	Q64338	TSL:1 GENCODE basic
Pde1c-206	ENSMUST00000166890.7	4728	603aa	Protein coding	CCDS51787	Q8CDV2	TSL:1 GENCODE basic
Pde1c-201	ENSMUST00000044505.13	3907	706aa	Protein coding	CCDS51784	Q64338	TSL:1 GENCODE basic APPRIS P4
Pde1c-204	ENSMUST00000164752.7	3449	631aa	Protein coding	CCDS51785	Q5D0E7 Q64338	TSL:1 GENCODE basic APPRIS ALT1
Pde1c-203	ENSMUST00000164037.2	3068	622aa	Protein coding	CCDS51783	E9Q7V6	TSL:1 GENCODE basic
Pde1c-208	ENSMUST00000170774.7	2132	617aa	Protein coding	CCDS51786	Q9D5W0	TSL:1 GENCODE basic
Pde1c-207	ENSMUST00000168944.7	2126	654aa	Protein coding	CCDS20170	Q64338	TSL:1 GENCODE basic
Pde1c-209	ENSMUST00000203372.2	3147	766aa	Protein coding	-	A0A0N4SWG4	TSL:5 GENCODE basic APPRIS ALT1
Pde1c-210	ENSMUST00000203462.2	442	47aa	Nonsense mediated decay	-	A0A0N4SW87	CDS 5' incomplete TSL:5
Pde1c-213	ENSMUST00000203967.2	2086	No protein	Processed transcript	-	-	TSL:1
Pde1c-211	ENSMUST00000203492.1	3935	No protein	Retained intron	-	-	TSL:1
Pde1c-214	ENSMUST00000204821.1	1429	No protein	Retained intron	-	-	TSL:1
Pde1c-212	ENSMUST00000203689.1	329	No protein	Retained intron	-	-	TSL:3

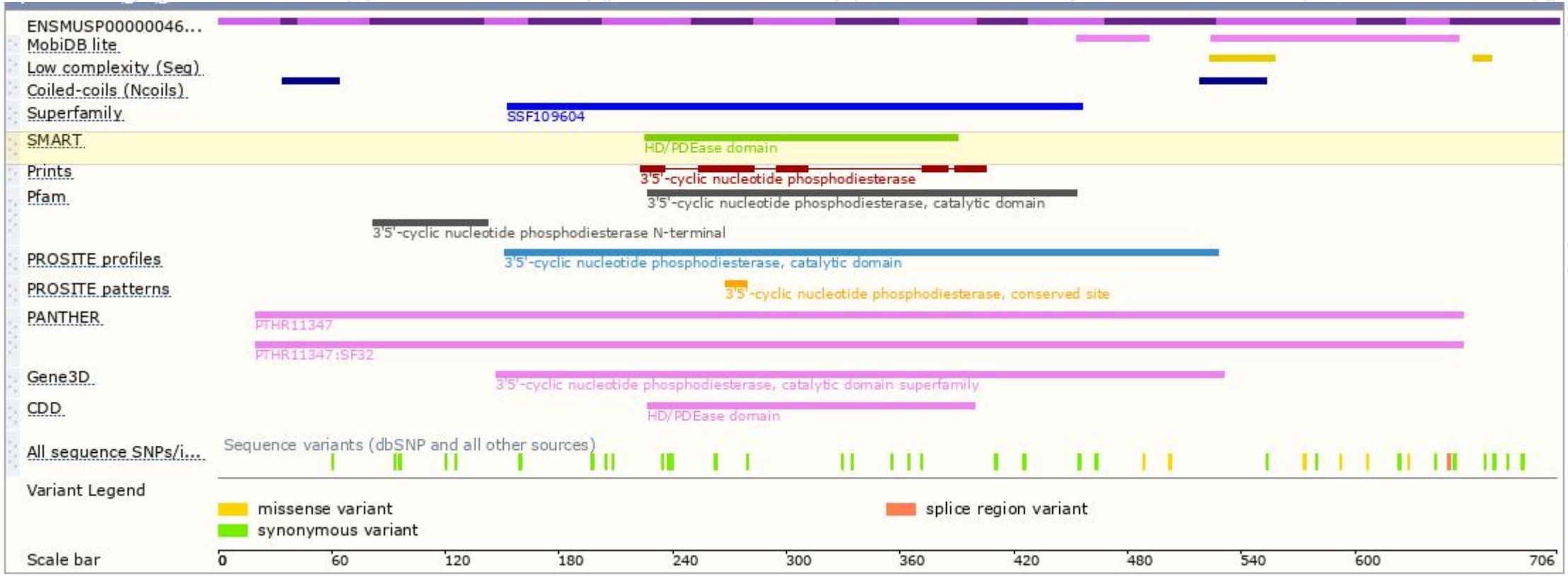
The strategy is based on the design of *Pde1c-201* transcript,The transcription is shown below



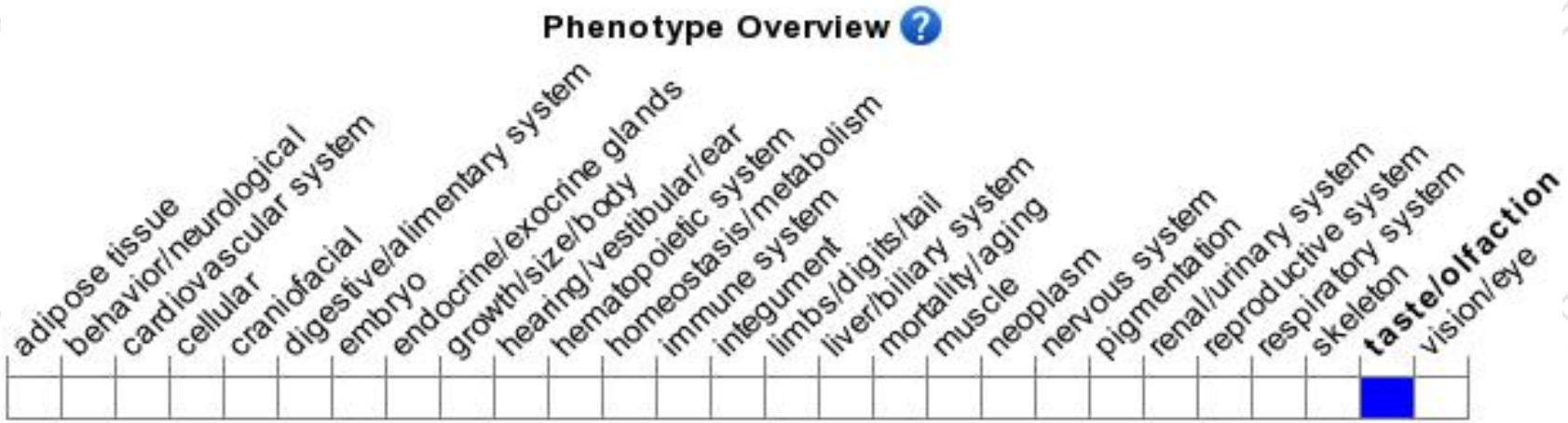
Genomic location distribution



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/).

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

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