

Phc2 Cas9-KO Strategy

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Project Overview

Project Name

Phc2

Project type

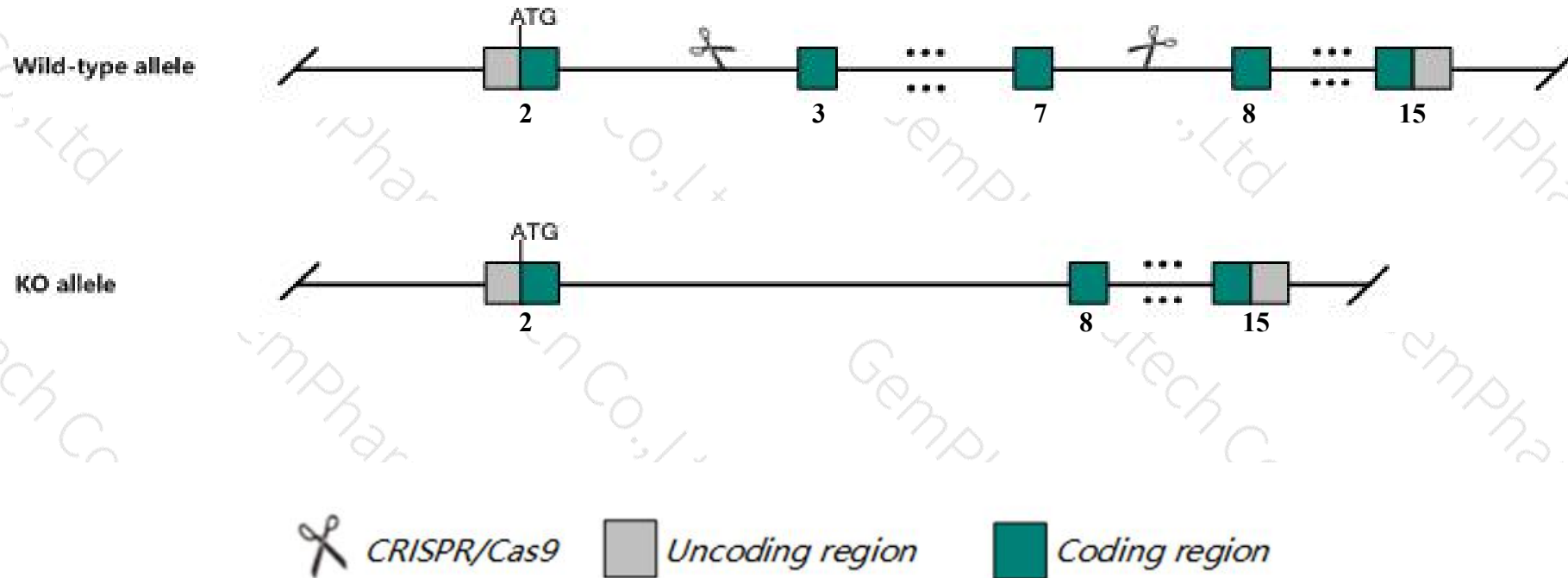
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Phc2* gene. The schematic diagram is as follows:



- The *Phc2* gene has 12 transcripts. According to the structure of *Phc2* gene, exon3-exon7 of *Phc2-201* (ENSMUST00000030588.12) transcript is recommended as the knockout region. The region contains 790bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Phc2* gene. The brief process is as follows: CRISPR/Cas9 system v

- According to the existing MGI data, Mice homozygous for a knock-out allele have normal skulls but exhibit posterior homeotic transformations of the axial skeleton. Cultured mouse embryonic fibroblasts show defects in proliferation and premature senescence.
- The *Phc2* gene is located on the Chr4. 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)

Phc2 polyhomeotic 2 [*Mus musculus* (house mouse)]

Gene ID: 54383, updated on 24-Dec-2019

Summary

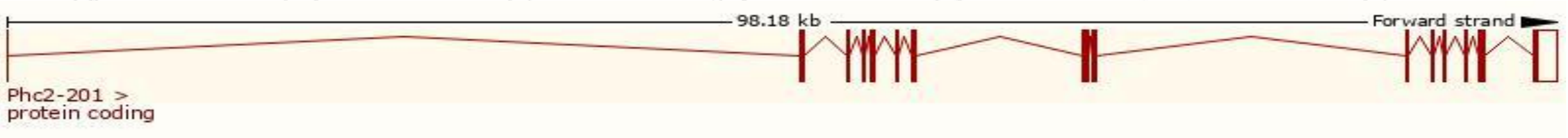
Official Symbol	Phc2 provided by MGI
Official Full Name	polyhomeotic 2 provided by MGI
Primary source	MGI:MGI:1860454
See related	Ensembl:ENSMUSG000000028796
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	p36; Edr2; Mph2; A3galt2; AA415044; D4Ertd810e; D130050K19Rik
Expression	Ubiquitous expression in CNS E11.5 (RPKM 25.0), ovary adult (RPKM 24.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

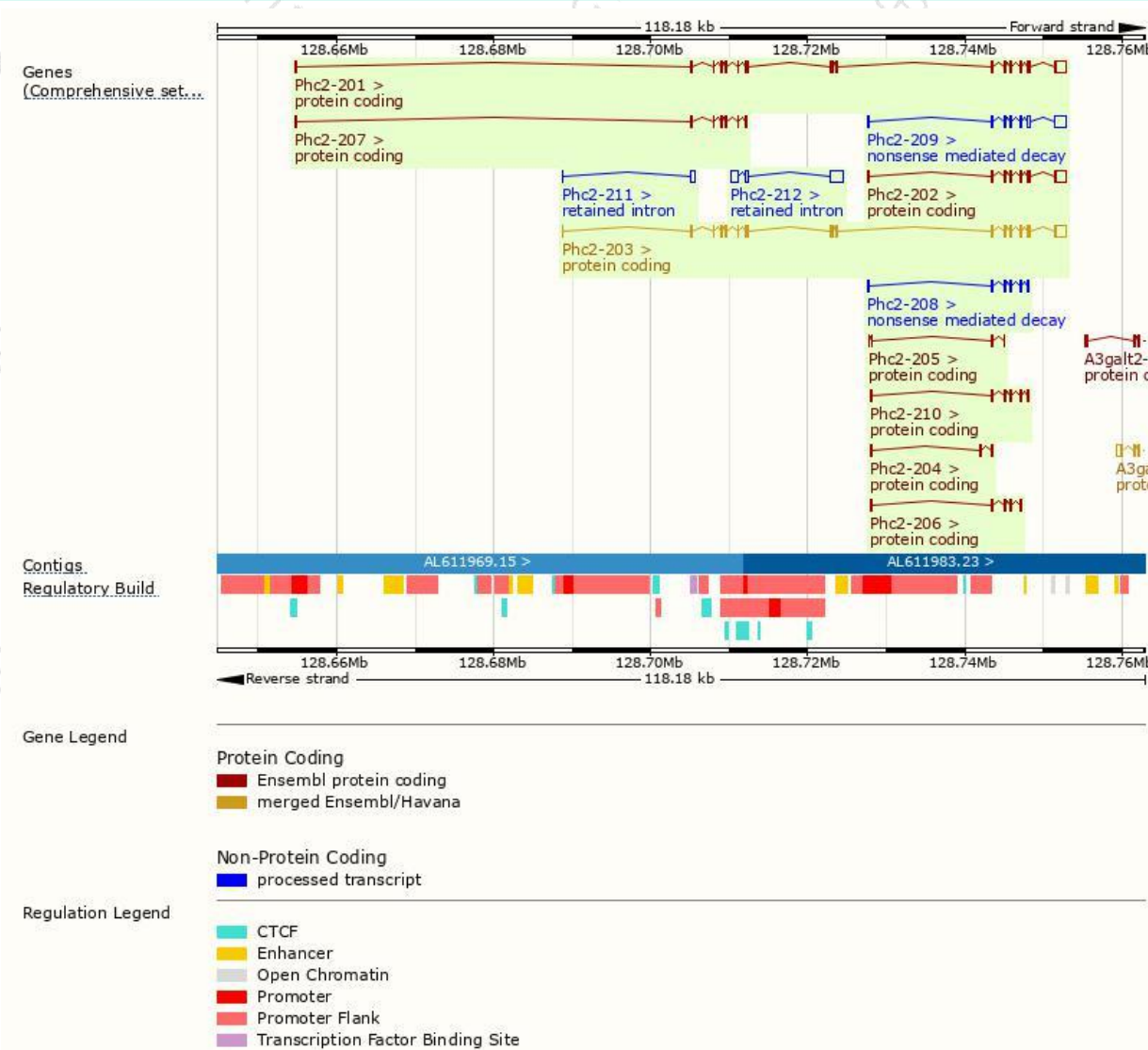
The gene has 12 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Phc2-201	ENSMUST00000030588.12	3949	850aa	Protein coding	CCDS18674	Q9QWH1	TSL:5 GENCODE basic APPRIS P3
Phc2-203	ENSMUST00000106080.7	3885	850aa	Protein coding	CCDS18674	Q9QWH1	TSL:1 GENCODE basic APPRIS P3
Phc2-202	ENSMUST00000106079.9	2535	323aa	Protein coding	CCDS57297	Q9QWH1	TSL:1 GENCODE basic APPRIS ALT2
Phc2-207	ENSMUST00000136377.7	941	269aa	Protein coding	-	B1AS97	CDS 3' incomplete TSL:5
Phc2-210	ENSMUST00000147572.7	924	202aa	Protein coding	-	B1ASA3	CDS 3' incomplete TSL:3
Phc2-206	ENSMUST00000134421.1	620	143aa	Protein coding	-	B1ASA2	CDS 3' incomplete TSL:5
Phc2-205	ENSMUST00000133439.7	484	53aa	Protein coding	-	B1ASA1	CDS 3' incomplete TSL:5
Phc2-204	ENSMUST00000120946.1	438	22aa	Protein coding	-	B1ASA0	CDS 3' incomplete TSL:5
Phc2-209	ENSMUST00000143632.7	2417	40aa	Nonsense mediated decay	-	D6REH8	TSL:1
Phc2-208	ENSMUST00000138445.1	894	40aa	Nonsense mediated decay	-	D6REH8	TSL:3
Phc2-212	ENSMUST00000155653.1	2798	No protein	Retained intron	-	-	TSL:2
Phc2-211	ENSMUST00000148723.1	774	No protein	Retained intron	-	-	TSL:2

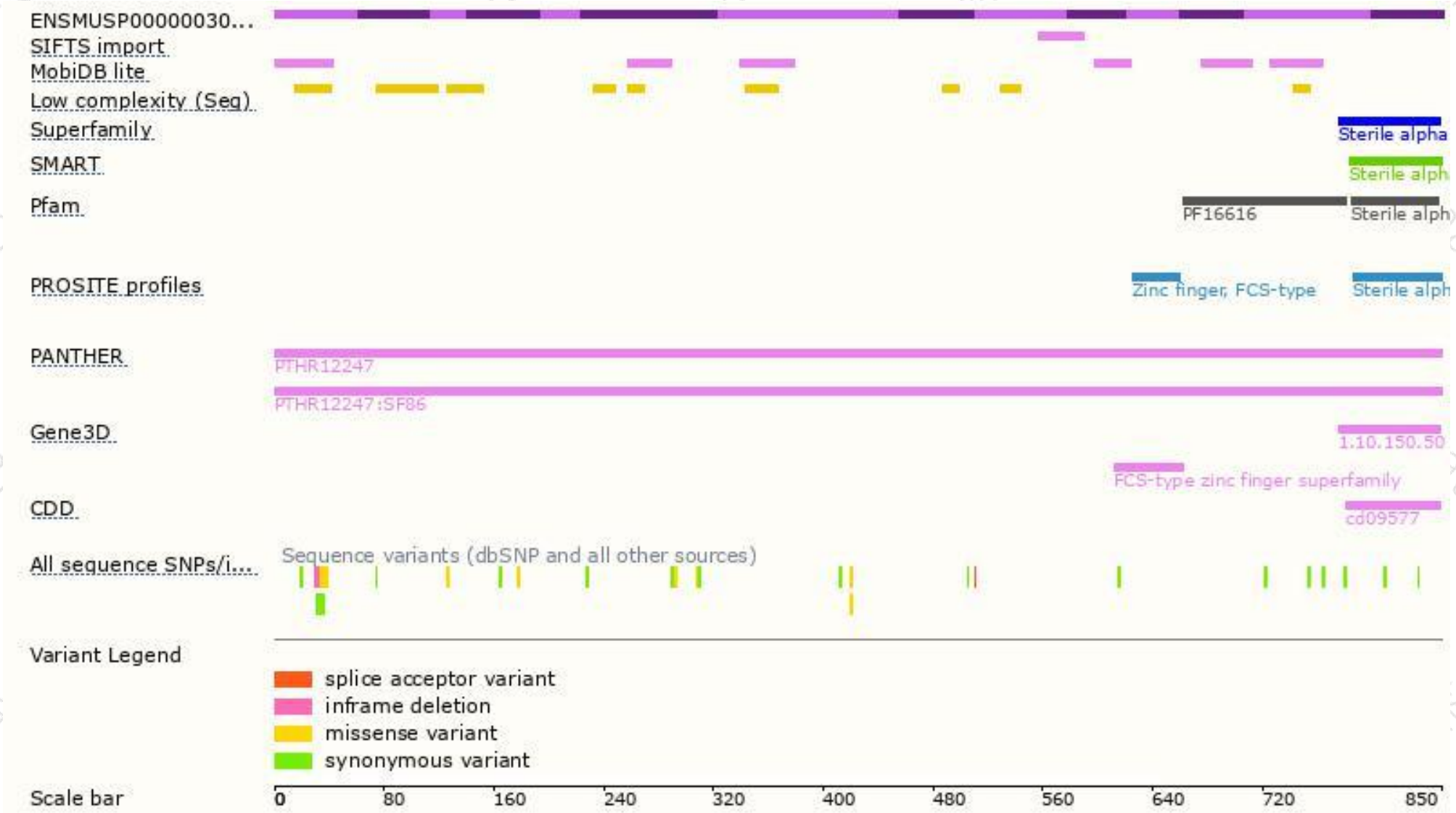
The strategy is based on the design of *Phc2-201* transcript,The transcription is shown below



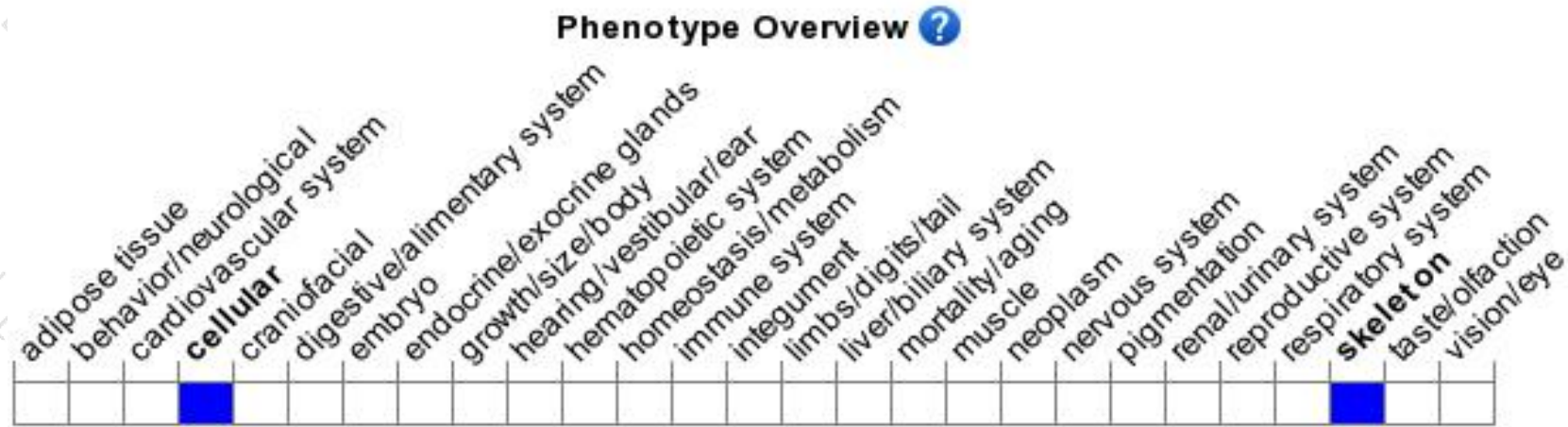
Genomic location distribution



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/>).

According to the existing MGI data, Mice homozygous for a knock-out allele have normal skulls but exhibit posterior homeotic transformations of the axial skeleton. Cultured mouse embryonic fibroblasts show defects in proliferation and premature senescence.

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

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