

Cdkal1 Cas9-KO Strategy

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Project Overview

Project Name

Cdkal1

Project type

Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Cdkal1* gene. The schematic diagram is as follows:



- The *Cdkal1* gene has 11 transcripts. According to the structure of *Cdkal1* gene, exon4 of *Cdkal1-201* (ENSMUST00000006353.13) transcript is recommended as the knockout region. The region contains 113bp coding sequence. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Cdkal1* gene. The brief process is as follows: CRISPR/Cas9 system

- According to the existing MGI data, Mice homozygous for a targeted allele exhibit impaired tRNA^{Lys} modification. Mice homozygous for a gene trap allele exhibit altered glucose homeostasis and lipid accumulation at early stages when fed a high fat diet.
- The *Cdkal1* gene is located on the Chr13. 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)

Cdkal1 CDK5 regulatory subunit associated protein 1-like 1 [*Mus musculus* (house mouse)]

Gene ID: 68916, updated on 13-Mar-2020

Summary

Official Symbol	Cdkal1 provided by MGI
Official Full Name	CDK5 regulatory subunit associated protein 1-like 1 provided by MGI
Primary source	MGI:MGI:1921765
See related	Ensembl:ENSMUSG00000006191
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	1190005B03Rik; 6620401C13Rik
Expression	Ubiquitous expression in testis adult (RPKM 1.1), bladder adult (RPKM 0.6) and 25 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

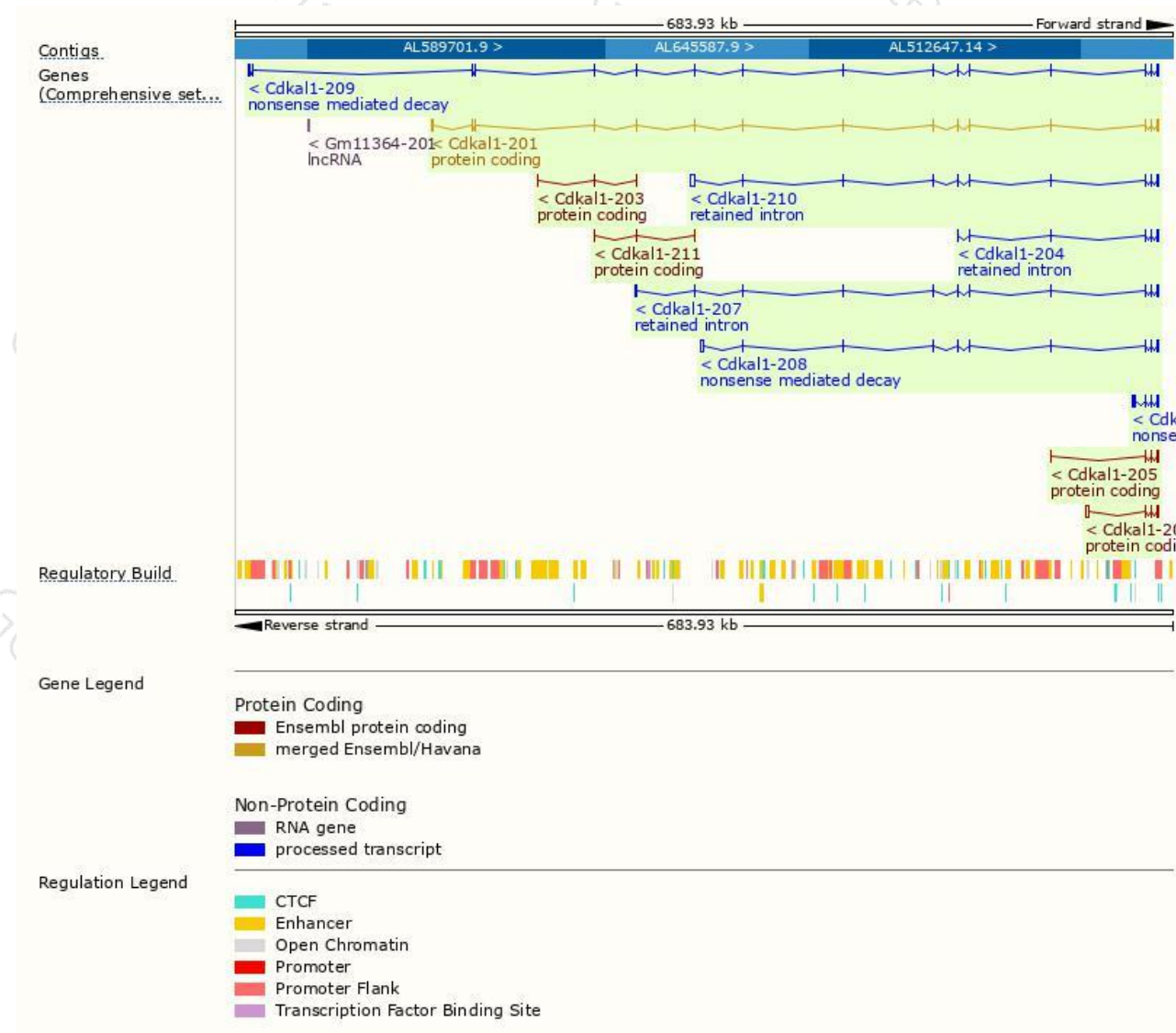
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Cdkal1-201	ENSMUST00000006353.13	2629	578aa	Protein coding	CCDS26412	Q91WE6	TSL:1 GENCODE basic APPRIS P1
Cdkal1-202	ENSMUST00000091674.11	2427	136aa	Protein coding	CCDS84016	Q91WE6	TSL:1 GENCODE basic
Cdkal1-211	ENSMUST00000154209.1	518	107aa	Protein coding	-	F6S0I8	CDS 5' incomplete TSL:2
Cdkal1-205	ENSMUST00000124532.7	430	96aa	Protein coding	-	B7FAT1	CDS 3' incomplete TSL:3
Cdkal1-203	ENSMUST00000110323.2	409	80aa	Protein coding	-	I7HPB3	CDS 5' incomplete TSL:3
Cdkal1-209	ENSMUST00000140278.7	3372	520aa	Nonsense mediated decay	-	Q91WE6	TSL:1
Cdkal1-208	ENSMUST00000137225.7	2519	218aa	Nonsense mediated decay	-	Q91WE6	TSL:1
Cdkal1-206	ENSMUST00000129231.1	694	97aa	Nonsense mediated decay	-	D6RJ19	TSL:5
Cdkal1-210	ENSMUST00000153086.7	4383	No protein	Retained intron	-	-	TSL:1
Cdkal1-207	ENSMUST00000131792.7	2019	No protein	Retained intron	-	-	TSL:1
Cdkal1-204	ENSMUST00000123641.7	907	No protein	Retained intron	-	-	TSL:2

The strategy is based on the design of *Cdkal1-201* transcript,The transcription is shown below



Genomic location distribution



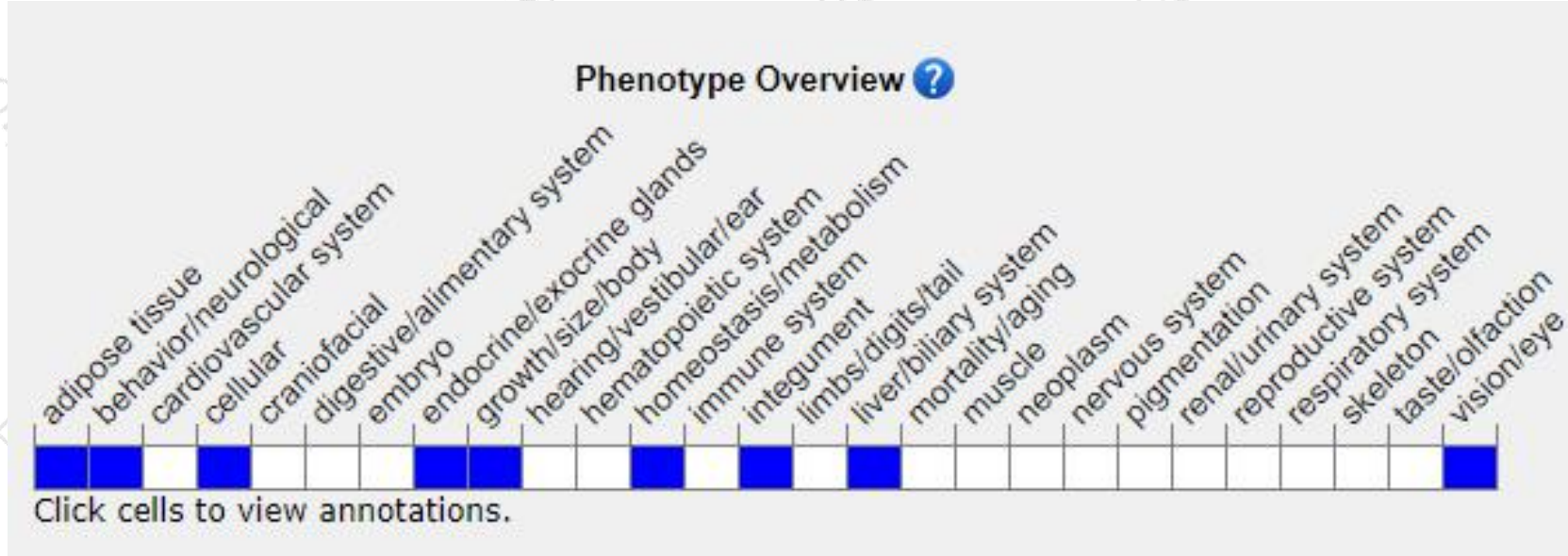
Protein domain



集萃药康
GemPharmatech



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 targeted allele exhibit impaired tRNA^{Lys} modification.

Mice homozygous for a gene trap allele exhibit altered glucose homeostasis and lipid accumulation at early stages when fed a high fat diet.

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

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