Dbp Cas9-CKO Strategy

Designer: Ruirui Zhang
Reviewer: Huimin Su

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集萃药康 GemPharmatech
GemPharmatech Co.,Ltd

Project Overview

Project Name	***Dbp***
Project type	**Cas9-CKO**
Strain background	**C57BL/6JGpt**

Conditional Knockout strategy

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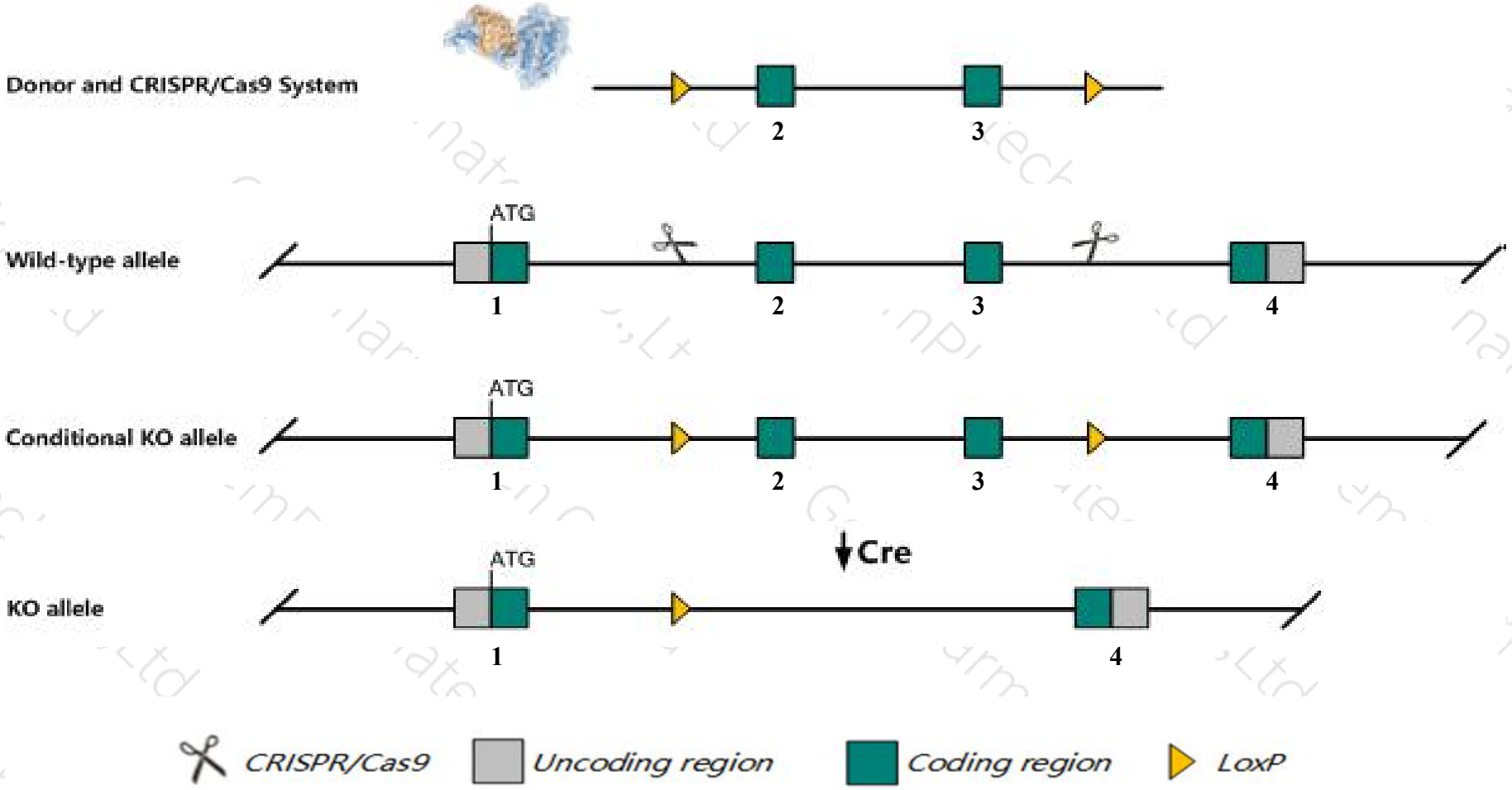
This model will use CRISPR/Cas9 technology to edit the *Dbp* gene. The schematic diagram is as follows:



Technical routes

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- The *Dbp* gene has 5 transcripts. According to the structure of *Dbp* gene, exon2-exon3 of *Dbp-201* (ENSMUST00000080885.11) transcript is recommended as the knockout region.The region contains 623bp coding sequence. Knock out the region will result in disruption of protein function.

- In this project we use CRISPR/Cas9 technology to modify *Dbp* gene. The brief process is as follows:CRISPR/Cas9 system and Donor 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.

- The flox mice will be knocked out after mating with mice expressing Cre recombinase, resulting in the loss of function of the target gene in specific tissues and cell types.

Notice

- According to the existing MGI data,Mice homozygous for a null mutation display a shortened circadian period and decreased acvtivity during the dark phase.

- Knockout the region may affect the 3 terminal regulation function of *Sphk2* gene.

- The *Dbp* gene is located on the Chr7. 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 loxp insertion on gene transcription, RNA splicing and protein translation cannot be predicted at existing technological level.

Gene information （NCBI）

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Dbp D site albumin promoter binding protein [*Mus musculus* (house mouse)]

Gene ID: 13170, updated on 17-Sep-2019

Summary

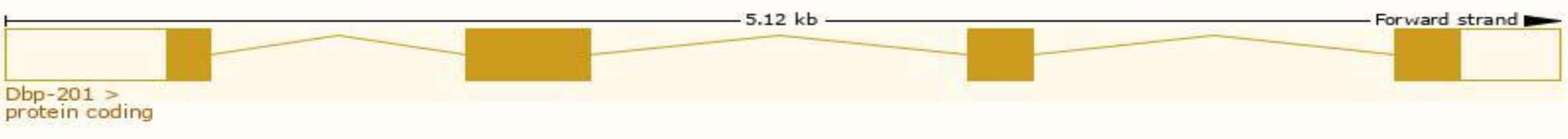
Official Symbol	Dbp provided by MGI
Official Full Name	D site albumin promoter binding protein provided by MGI
Primary source	MGI:MGI:94866
See related	Ensembl:ENSMUSG00000059824
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Summary	The protein encoded by this gene is a member of the Par bZIP transcription factor family and binds to specific sequences in the promoters of several genes, such as albumin, Cyp2a4, and Cyp2a5. The encoded protein can bind DNA as a homo- or heterodimer and is involved in the regulation of some circadian rhythym genes. [provided by RefSeq, Feb 2014]
Expression	Biased expression in adrenal adult (RPKM 215.0), bladder adult (RPKM 83.9) and 10 other tissues See more
Orthologs	human all

Transcript information（Ensembl）

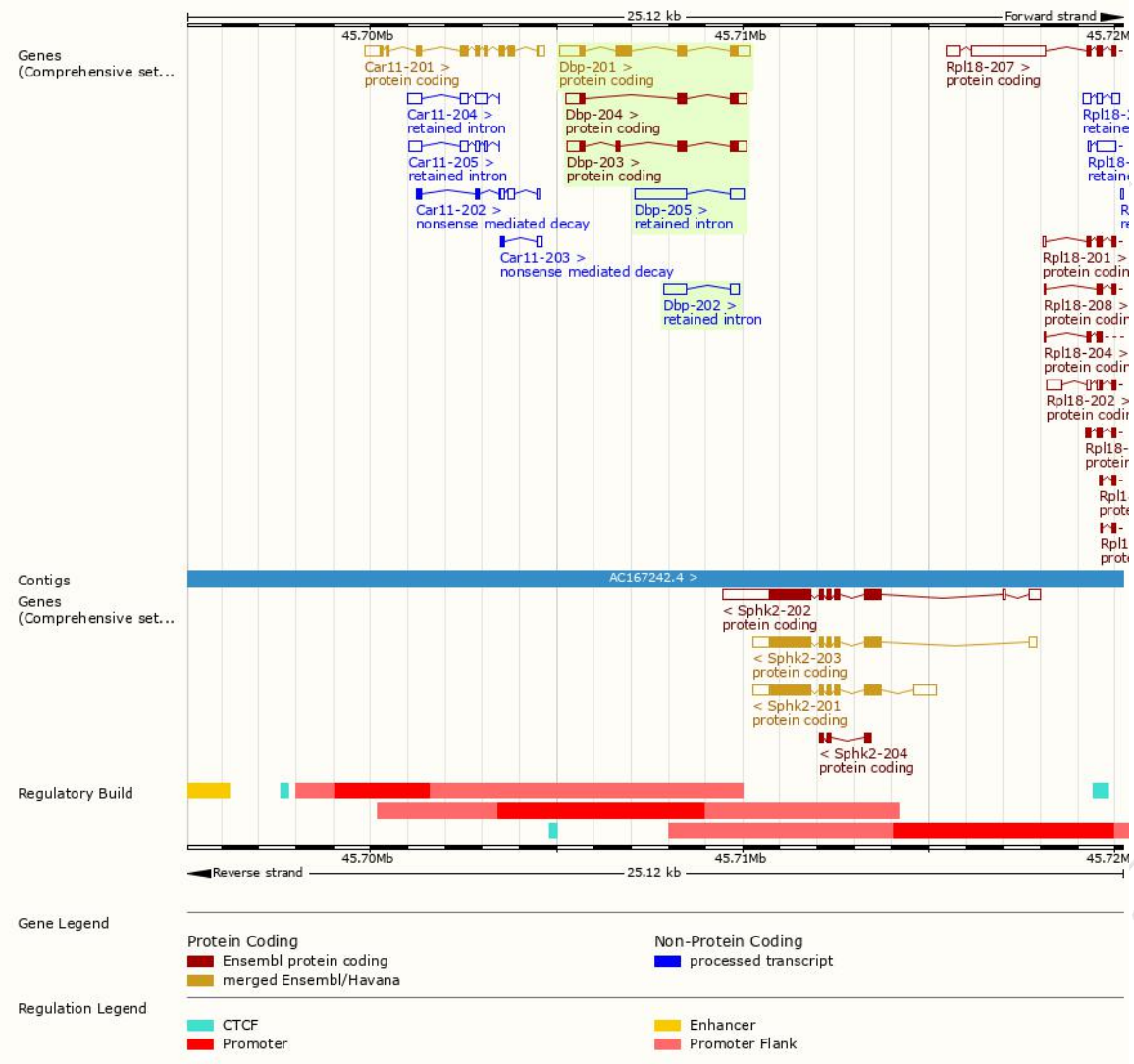
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Dbp-201	ENSMUST00000080885.11	1837	325aa	Protein coding	CCDS21260	Q60925	TSL:1 GENCODE basic APPRIS P1
Dbp-203	ENSMUST00000211357.1	1252	225aa	Protein coding	-	A0A1B0GR32	TSL:5 GENCODE basic
Dbp-204	ENSMUST00000211513.1	1156	188aa	Protein coding	-	A0A1B0GS46	TSL:5 GENCODE basic
Dbp-205	ENSMUST00000211748.1	1732	No protein	Retained intron	-	-	TSL:1
Dbp-202	ENSMUST00000210120.1	815	No protein	Retained intron	-	-	TSL:1

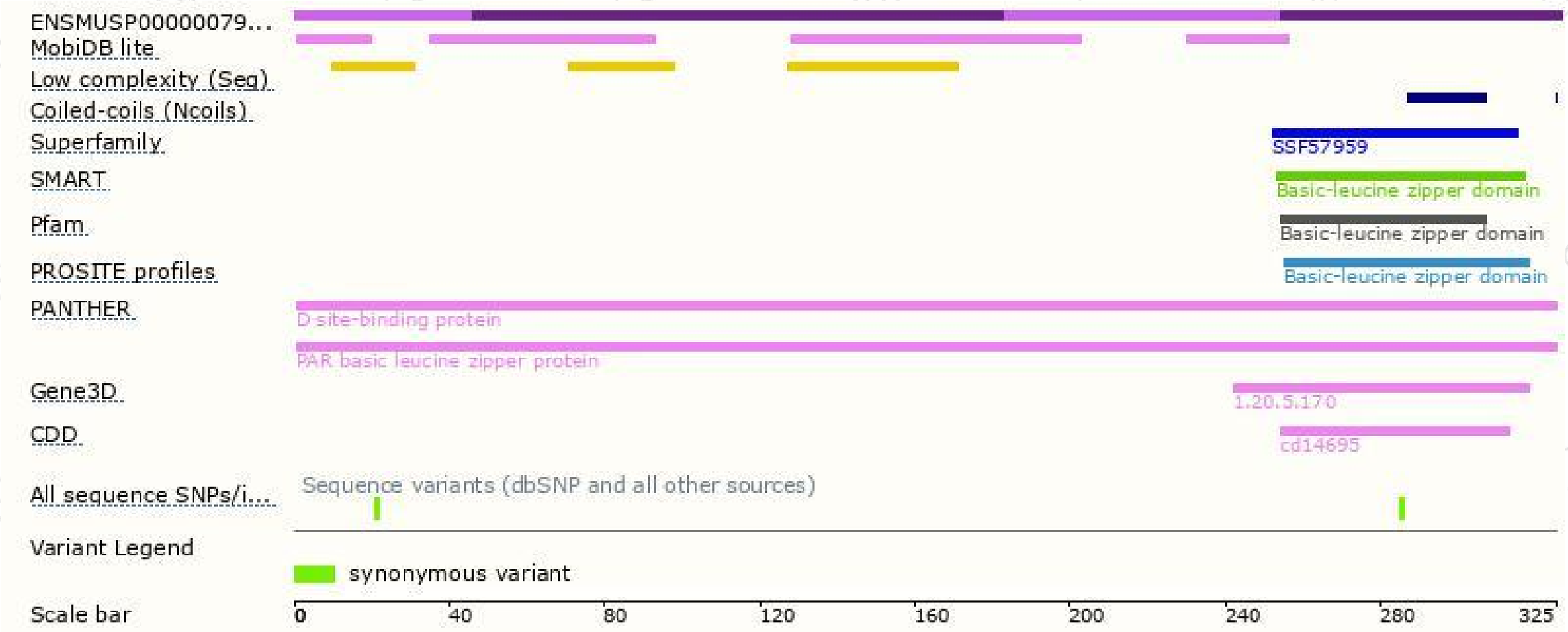
The strategy is based on the design of *Dbp-201* transcript,The transcription is shown below



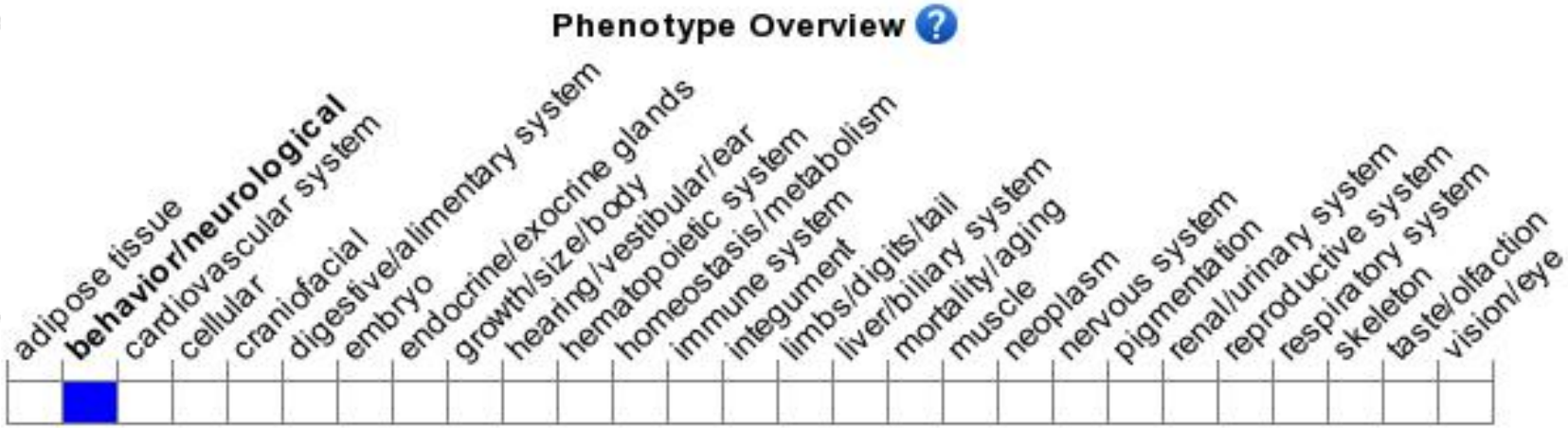
Genomic location distribution



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 null mutation display a shortened circadian period and decreased acvtivity during the dark phase.

集萃药康
GemPharmatech

If you have any questions, you are welcome to inquire.
Tel: 400-9660890

集萃药康生物科技
GemPharmatech Co.,Ltd