Rab18 Cas9-KO Strategy

Designer: Huan Wang

Reviewer: Huan Fan

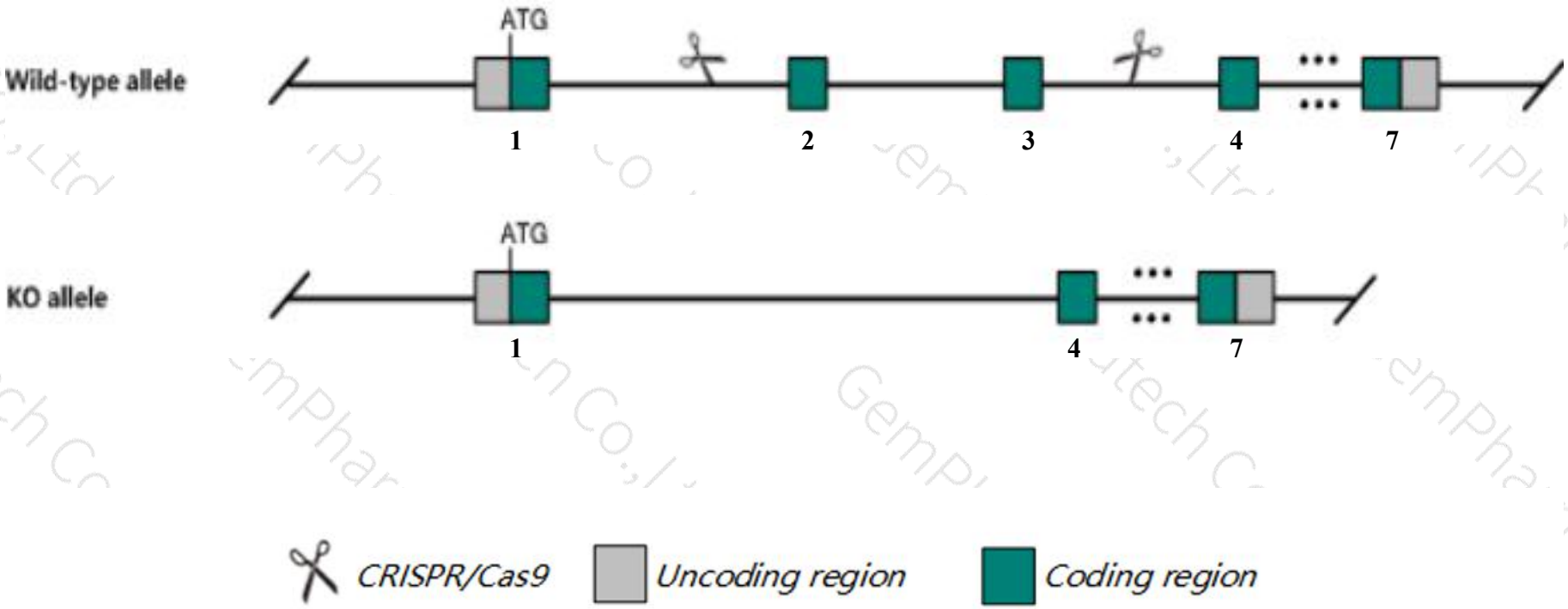
Design Date: 2020-4-23

Project Overview

Project Name	***Rab18***
Project type	**Cas9-KO**
Strain background	**C57BL/6JGpt**

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Rab18* gene. The schematic diagram is as follows:



Technical routes

➢ The *Rab18* gene has 5 transcripts. According to the structure of *Rab18* gene, exon2-exon3 of *Rab18-205* (ENSMUST00000234810.1) transcript is recommended as the knockout region.The region contains 118bp coding sequence. Knock out the region will result in disruption of protein function.

➢ In this project we use CRISPR/Cas9 technology to modify *Rab18* gene. The brief process is as follows: CRISPR/Cas9 system

Notice

- According to the existing MGI data,homozygous null mice show partial perinatal lethality and abnormal eye development, and develop nuclear cataracts, atonic pupils, progressive limb weakness, disruption of neuronal cytoskeleton, and accumulation of neurofilament and microtubule proteins in synaptic terminals.
- The *Rab18* gene is located on the Chr18. 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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Rab18 RAB18, member RAS oncogene family [Mus musculus (house mouse)]

Gene ID: 19330, updated on 13-Mar-2020

Summary

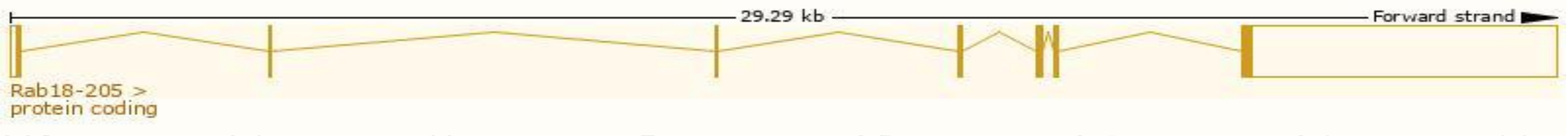
Official Symbol	Rab18 provided by MGI
Official Full Name	RAB18, member RAS oncogene family provided by MGI
Primary source	MGI:MGI:102790
See related	Ensembl:ENSMUSG00000073639
Gene type	protein coding
RefSeq status	REVIEWED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Also known as	AA959686
Summary	This gene encodes a member of the Ras-related small GTPases, which regulate membrane trafficking in organelles and transport vesicles. This protein is expressed predominantly in lipid droplets, organelles that store neutral lipids, and is proposed to play a role in lipolysis and lipogenesis. In humans mutations in this gene are associated with Warburg micro syndrome type 3. A pseudogene of this gene is located on chromosome X. Alternative splicing results in multiple transcript variants encoding different isoforms. [provided by RefSeq, Jun 2013]
Expression	Ubiquitous expression in bladder adult (RPKM 20.0), CNS E18 (RPKM 19.1) and 25 other tissuesSee more
Orthologs	human all

Transcript information（Ensembl）

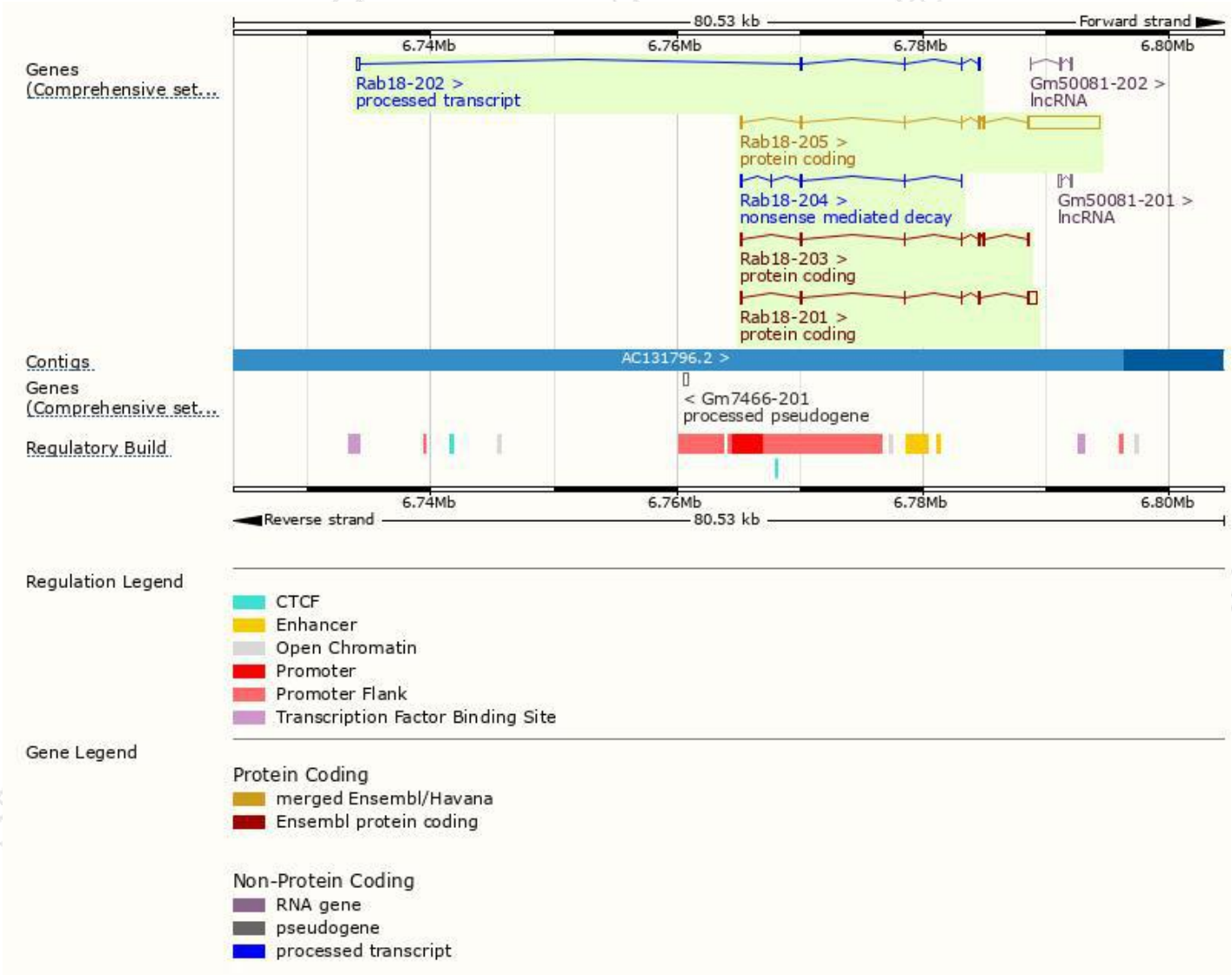
The gene has 5 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Rab18-205	ENSMUST00000234810.1	6515	206aa	Protein coding	CCDS29044	P35293 Q0PD38	GENCODE basic APPRIS is a system to annotate alternatively spliced transcripts based on a range of computational methods to identify the most functionally important transcript(s) of a gene. APPRIS P1
Rab18-201	ENSMUST00000097680.6	1184	194aa	Protein coding	-	A0A452J8C1	TSL:1 GENCODE basic
Rab18-203	ENSMUST00000234626.1	729	212aa	Protein coding	-	A0A3Q4EI12	GENCODE basic
Rab18-204	ENSMUST00000234720.1	354	41aa	Nonsense mediated decay	-	A0A3Q4EIF7	
Rab18-202	ENSMUST00000234356.1	535	No protein	Processed transcript	-	-	

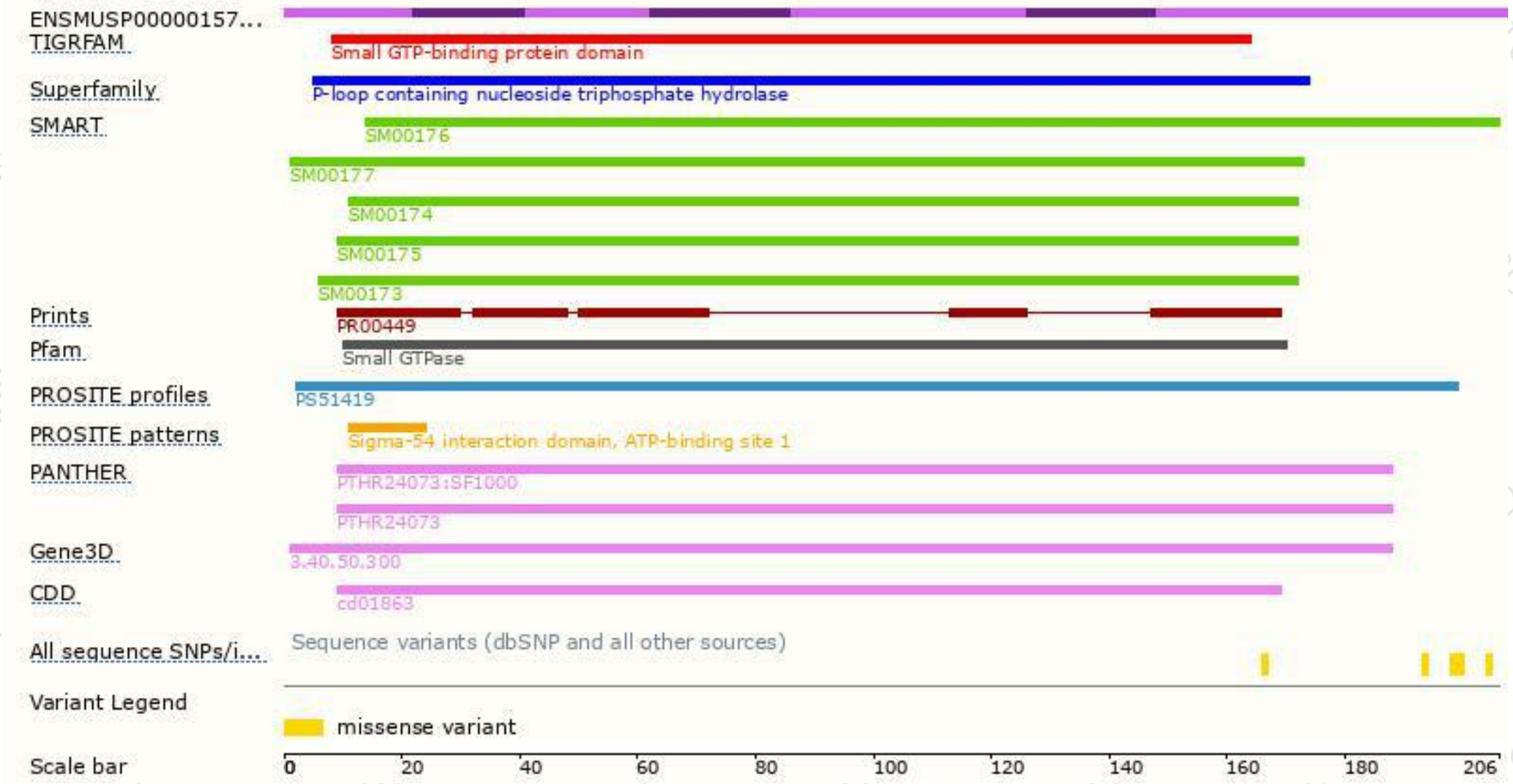
The strategy is based on the design of *Rab18-205* transcript,the transcription is shown below:



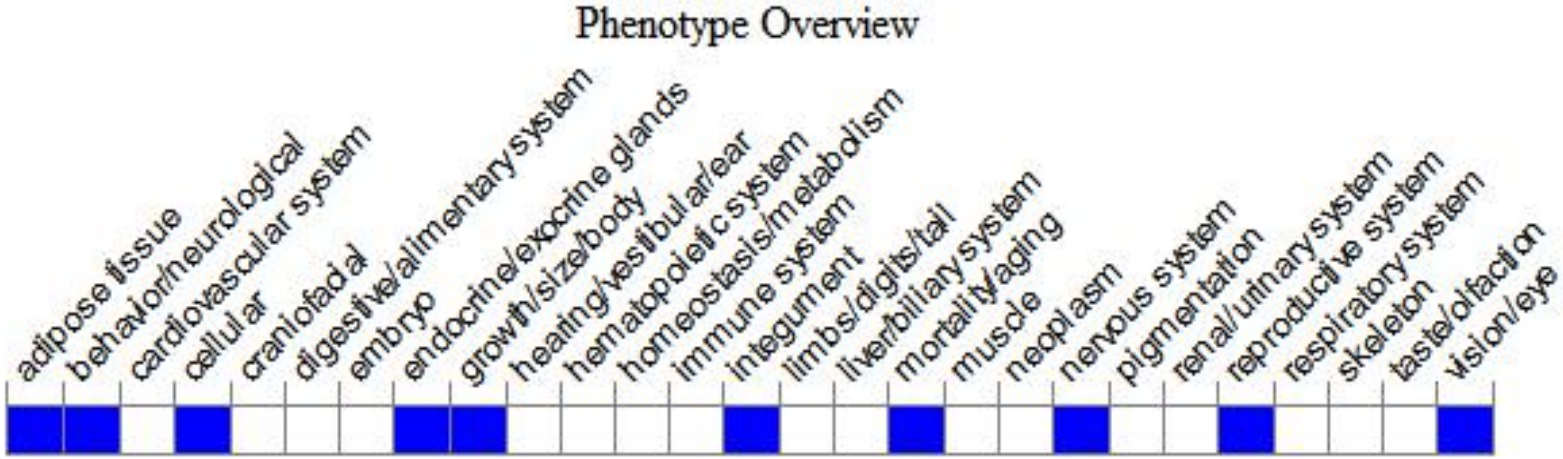
Genomic location distribution



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 null mice show partial perinatal lethality and abnormal eye development, and develop nuclear cataracts, atonic pupils, progressive limb weakness, disruption of neuronal cytoskeleton, ar accumulation of neurofilament and microtubule proteins in synaptic terminals.

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

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