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gk^{lox} - Mouse Strain RES193

Mouse Information

Common Name:	gk^{lox}
MGI Official Name:	$Gck^{tm1.1Mgn}$
Description:	Gk^{lox} mice may be used to generate cell specific knock-outs of glucokinase, depending which cre-expressing transgenic mouse is used. In humans, glucokinase gene mutations cause maturity onset diabetes of the young (MODY-GK), a disease that is characterized by early onset and persistent hyperglycemia. Thus, these mice are useful in determining how diminished experssion of glucokinase in specific cells causes hyperglycemia.
Categories:	Cre-lox floxed alleles

Genetic Alterations

1) Targeted Mutagenesis

Type of Allele	Conditional Null
Targeted Gene	Glucokinase (Gck - NCBI GeneID:103988)
Targeted Allele	targeted mutation 1.1 ($Gck^{tm1.1Mgn}$ - MGI:2177709)
Description of Targeting Vector	A gene targeting strategy was used to flank exons 9 and 10 in the glucokinase gene with two tandomly-oriented loxP sites. This strain allows for the tissue specific knock-out of glucokinase to be made. For example, crossing the $gk^{lox/lox}$ mice with an insulin-cre transgenic mouse generates a beta cell specific knock-out of glucokinase. Genotype by DNA PCR using primers 5'-TGT CTC AAT TTG CTG TGT CCT CCA-3' and 5'-TCT GTT AAT GCA AAT GCT CGT GTT-3'. A 710 bp band will be amplified for the gk^{lox} allele and a 605 bp band for the wild type allele. Homozygous $gk^{lox/lox}$ mice are viable but have a blood glucose concentrations slightly higher than wild types (194 +/- 3 mg/dl vs. 175 +/- 8 mg/dl). This finding suggests that the insertion of a loxP site (and some flanking sequences) between exons 8 and 9 may have caused a slight attenuation in glucokinase gene expression compared to mice with two wild type alleles.
Targeting Vector Genbank File	pBOB.gb

Citations

PubMedID	Citation
9867845	Dual roles for glucokinase in glucose homeostasis as determined by liver and pancreatic beta cell-specific gene knock-outs using Cre recombinase. (1999) *J Biol Chem* **274**: 305-15 (Added 2013-01-31 11:20:30.719499)

Strain Information

Strain Type:	Congenic Strain
Chimera/Founder Genetic Background:	129S6/SvEvTac
Current Genetic Background:	C57BL/6J (date recorded: 01/31/2013)
Strain Description:	After achieving germline transmission mice carrying the gk^{lox} allele were backcrossed for ten generations into a C57Bl/6J background.

Access Status

This resource is publicly viewable.

Request this Resource

Request from a repository

Primary contributor: Magnuson Lab

Resource Tags

Gck, $Gck^{tm1.1Mgn}$, gk^{lox}, mouse, mouse strain, My tags

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Resource History & Actions

Approved on Feb 02, 2007
Last modified on Jan 31, 2013

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BCBC

No matching resources

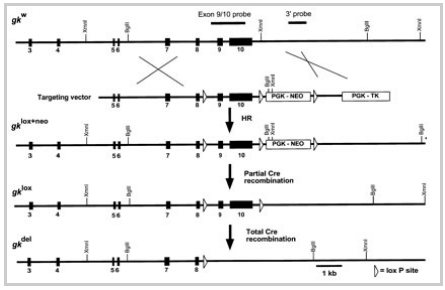
Other Consortia

No matching resources

Data courtesy of dkCOIN. Only public resources are displayed.

Associated Images

Image 1



Description:
Gene targeting and Cre deletion events. Top, a partial map of the wild type gk^{w} allele. Exons are indicated as solid rectangles. Middle, a map of the GK gene targeting vector is shown. The vector contains a phosphoglycerol kinase-neomycin resistance gene cassette (neoR), a phosphoglycerol kinase-herpes simplex virus type I thymidine kinase gene cassette, and three loxP sequences (represented as triangles). Two of the loxP sites flank neoR , and the third is located between exons 8 and 9 in the GK gene. The $gk^{lox+neo}$ allele was created by homologous recombination (HR) in ES cells. Bottom, the gk^{lox} allele was derived from the $gk^{lox+neo}$ allele through partial Cre recombination. Exons 9 and 10 and neoR were excised by Cre DNA microinjection or cell-specific Cre expression in transgenic mice.

Reference:
9867845

Repositories

MMRRC

Request via www.mmrrc.org website

Stock #: 011949-UNC
Availability Notes: *Not provided*

BCBC members may Login to request this resource.

Contact Information

Preferred Contact	
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Associated Publications

Publication	Citation
9867845	Postic C, Shiota M, Niswender KD, Jetton TL, Chen Y, Moates JM, Shelton KD, Lindner J, Cherrington AD, Magnuson MA Dual roles for glucokinase in glucose homeostasis as determined by liver and pancreatic beta cell-specific gene knock-outs using Cre recombinase. (1999) *J Biol Chem* **274**: 305-15 (Added January 31, 2013)

Comments

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