

FVB/NJ-Tg(ACTA1-PRKAG1*R70Q)3Lwit/LjgJ

Stock No: **027389** | AMPK R70Qy1 , γ 1R70Q TG , γ 1TG , AMPK R70Q gamma1 , muscle-specific constitutively active (CA) AMPK- γ 1^{R70Q} , ACTA1-HA-R70Qy1

 Coisogenic, Transgenic

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directing expression of the human R70Qy1 protein. This results in chronic AMPK activation predominantly in fully differentiated skeletal muscle with some expression in cardiac myocytes.

Donating Investigator

Laurie J. Goodyear, Brigham and Women's Hospital and Harvard Medical School

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GENETIC OVERVIEW

Genetic Background

Generation

Tg(ACTA1-PRKAG1*R70Q)3Lwit

Alele Type

Transgenic (Inserted expressed sequence, Humanized sequence)

VIEW GENETICS

RESEARCH APPLICATIONS

Cell Biology Research
Cardiovascular Research
Research Tools

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BASE PRICE

Starting at:

\$2,854.50 Domestic price Cryo Recovery

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Details

Detailed Description

The ACTA1-HA-R70Q γ 1 transgene has the human skeletal muscle α -actin promoter regions directing expression of a hemagglutinin epitope-tagged, human AMP-activated protein kinase non-catalytic γ 1 variant made constitutively active by the R70Q amino acid substitution (AMPK- γ 1^{R70Q}). Transgenic mice are also called HA-R70Q γ 1, AMPK R70Q γ 1, γ 1R70Q TG, γ 1TG or muscle-specific constitutively active (CA) AMPK- γ 1^{R70Q} mice.

Hemizygous mice from founder line 3 have AMPK- γ 1^{R70Q} expression predominantly in fully differentiated skeletal muscle, and some expression also observed in cardiac myocytes. This muscle-specific AMPK- γ 1^{R70Q} expression results in chronic AMPK activation (~threefold higher than wildtype) and increased muscle glycogen content. Specifically, AMPK- γ 1^{R70Q} mice exhibit a small, but significant, increase in muscle glycogen synthase (GSY) activity associated with an increase in the muscle expression of the liver isoform GSY2. The increase in glycogen content is accompanied by an increase in exercise capacity.

Despite activated AMPK, basal p38 MAPK phosphorylation was not different than wildtype. Hemizygotes show significantly blunted muscle contraction-induced p38 MAPK phosphorylation compared to wildtype.

In addition, the donating investigator reports that sedentary AMPK- γ 1^{R70Q} mice show a 2.6-fold increase in type IIa/x fibers, a significant increase in hexokinase II and an ~25% increase in citrate synthase activity compared to wildtype, but had no further increases with exercise training.

Hemizygotes are viable and fertile, with normal locomotive activity, rate of oxygen consumption, rate of carbon dioxide generation, food consumption and water consumption.

Of note, when AMPK- γ 1^{R70Q} mice are bred to also have the RyR1^{Y524S} mutation (*Ryr1*^{tm1Slh}), presence of the ACTA1-HA-R70Q γ 1 transgene did not rescue the lethality of heat-sensitive RyR1^{Y524S} heterozygotes.

Development

Expression Data

Control Suggestions

Selected References

Genetics

[+](#) [Tg\(ACTA1-PRKAG1*R70Q\)3Lwit](#)

[-](#) Disease/Phenotype

[+](#) [Disease Terms](#)

[+](#) [Research Areas By Phenotype](#)

[+](#) [Mammalian Phenotype Terms by Genotype](#)

[+](#) [References](#)

[-](#) Technical Support

C O N T A C T T E C H N I C A L S U P P O R T

Genotyping Protocols

Standard PCR: [Tg\(ACTA1-PRKAG1*R70Q\)3Lwit](#)

Sanger sequencing: [Tg\(ACTA1-PRKAG1*R70Q\)3Lwit SEQ](#)

[Genotyping resources and troubleshooting](#)

Breeding Considerations

When maintaining a live colony, hemizygous mice may be bred to wildtype (noncarrier) siblings or to FVB/NJ inbred mice (Stock No. [001800](#)). The donating investigator has not attempted to generate homozygous mice to date (May 2015).

[Additional Breeding and Husbandry Support](#)

Mating System

Noncarrier x Hemizygote

Hemizygote x Noncarrier

Citation

When using the AMPK R70Q γ 1 , γ 1R70Q TG , γ 1TG , AMPK R70Q gamma1 , muscle-specific constitutively active (CA) AMPK- γ 1^{R70Q} , ACTA1-HA-R70Q γ 1 mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #027389 in your Materials and Methods section.

Animal Health Reports

[Facility Barrier Level Descriptions](#)

Production of mice from cryopreserved embryos or sperm occurs in a maximum barrier room, [G200](#)

➔ Pricing & Availability



Cryo
Recovery

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CRYORECOVERY - DOMESTIC PRICING

SERVICE/PRODUCT	DESCRIPTION	PRICE
Cryo Recovery	Hemizygous or Non Carrier for Tg(ACTA1-PRKAG1*R70Q)3Lwit	\$2,854.50

RELATED PRODUCTS AND SERVICES

Frozen Mouse Embryo	FVB/NJ-Tg(ACTA1-PRKAG1*R70Q)3Lwit/LjgJ Frozen Embryo	\$2595.00
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