

STOCK Tg(RP23-370F21-RCaMP1.07)B3-3Mik/J

Stock No: **028345** | CHROMus line acta2-RCaMP1.07

 Transgenic

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smooth muscle actin, including smooth muscle cells in blood vessels, lung airways and gut. Upon RCaMP1.07 binding to calcium, increased RFP fluorescence is observed.

Donating Investigator

Michael I Kotlikoff, Cornell University

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GENETIC OVERVIEW

Genetic Background

Generation

Tg(RP23-370F21-RCaMP1.07)B3-3Mik

Alele Type

Transgenic (Reporter)

VIEW GENETICS

RESEARCH APPLICATIONS

Research Tools

Cardiovascular Research

Cell Biology Research

Neurobiology Research

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BASE PRICE

Starting at:

\$2,854.50 Domestic price Cryo Recovery

V I E W P R I C E L I S T

– Details

– Detailed Description

Acta2-RCaMP1.07 transgenic mice express the fluorescent calcium indicator RCaMP1.07 under control of the *Acta2* locus promoter/enhancer regions within the BAC transgene. Acta2-RCaMP1.07 transgenic mice from founder line B3-3 (R24:B3:L3) exhibit high/robust sensor expression (RCaMP1.07 expression) in smooth muscle cells in blood vessels, lung airways and gut. Expression may be present in other smooth muscle containing tissues which have not been examined to date (February 2016). In total, transgene expression is consistent with endogenous Acta2. In the absence of calcium binding, low/baseline RFP fluorescence is observed. Following calcium binding (such as arteriolar vasodilation), a conformational change occurs that results in bright RFP fluorescence at several-fold greater levels than baseline (see RCaMP1.07 details below).

Hemizygous mice are viable and fertile with no reported gross physical or behavioral abnormalities. To date (February 2016), it has not been attempted to make this strain homozygous.

Calcium is a key molecular signal for cell functions including heart, smooth muscle, vessel, and airway contraction, lung secretion, autonomic neurotransmission and immunocyte function. Acta2-RCaMP1.07 transgenic mice may be useful to examine calcium signaling in smooth muscle electrical and chemical signaling both *in vivo* and *in vitro*.

The genetically encoded calcium indicator RCaMP1.07 is a red calcium-sensing molecule that functions at cellular calcium levels (Ohkura *et al.* 2012 PLoS One 7:e39933). RCaMP1.07 is composed of a chicken smooth muscle M13 fragment of myosin light chain kinase, a circularly permuted red fluorescent protein (mApple; with amino acid substitutions designed to increase Ca²⁺-dependent fluorescent change), a rat calmodulin sequence and a self-cleaving peptide (F2A; to increase the Ca²⁺-dependent fluorescent change and facilitate export from the nucleus). In the absence of calcium binding, dim/low/baseline RFP fluorescence is expected. Upon calcium binding, a conformational change occurs that results in bright RFP fluorescence at ~28-fold greater levels than baseline. In the presence of Ca²⁺, RCaMP1.07 has absorbance and emission peaks (~562 nm and ~584 nm, respectively) that are ~80nm red-shifted compared to most GFP-based calcium indicators. Of note, RCaMP1.07 may not be appropriate for imaging of neuronal activity in combination with optogenetic channel activation (*e.g.*, channelrhodopsin 2 [ChR2]). The red fluorescent Ca²⁺ indicator R-GECO1 (from which RCaMP1.07 was derived) is reported to exhibit some blue light-induced photoactivation, which may cause false-positive artifacts in Ca²⁺ imaging traces during optogenetic activation with ChR2. If using red fluorescent Ca²⁺ indicators along with ChR2, the researcher may try to avoid artifacts by using an appropriately low intensity of blue light for ChR2 activation.

This mouse model is available by way of a collaborative effort between Cornell/National Heart Lung Blood Resource for Optogenetic Mouse Signaling (CHROMus) and The Jackson Laboratory.

+ Development

+ Expression Data

+ Control Suggestions

Genetics

[+ Tg\(RP23-370F21-RCaMP1.07\)B3-3Mik](#)

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\(RP23-370F21-RCaMP1.07\)B3-3Mik](#)

[Genotyping resources and troubleshooting](#)

Breeding Considerations

When maintaining a live colony, hemizygous mice may be bred to wildtype (noncarrier) mice from the colony or to C57BL/6J inbred mice (Stock No. [000664](#)). To date (February 2016), it has not been attempted to make this strain homozygous.

[Additional Breeding and Husbandry Support](#)

Mating System

Noncarrier x Hemizygote

Hemizygote x Noncarrier

Citation

When using the CHROMus line acta2-RCaMP1.07 mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #028345 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
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SERVICE/PRODUCT	DESCRIPTION	PRICE
Cryo Recovery	Hemizygous or non-carrier for Tg(RP23-370F21-RCaMP1.07)B3-3Mik	\$2,854.50

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Frozen Mouse Embryo	STOCK Tg(RP23-370F21-RCaMP1.07)B3-3Mik/J Frozen Embryo	\$2595.00
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