



# B 6 N ; 1 2 9 - T g ( C A G - C H R M 3 \* , - m C i t r i n e )

Stock No: 026220 | CAG-LSL-Gq-DREADD , R26-LSL-Gq-DREADD , R26-LSL-hM3D...

Transgenic



AVAILABLE

P L A C E O R D E R

Live mice available in varying quantities. Ask Customer Service for details.

## Overview

Also Known As: CAG-LSL-Gq-DREADD , R26-LSL-Gq-DREADD , R26-LSL-hM3Dq-DREADD, R26-hM3Dq/mCitrine, STOCK  $Gt(ROSA)26Sor^{tm2(CAG-CHRM3^*,mCitrine)Ute/J}$

The CAG-LSL-Gq-DREADD allele (formerly called R26-LSL-Gq-DREADD) allows Cre recombinase-inducible expression of a CAG

promoter-driven HA-hM3Dq-pta-mCitrine. Following *cre*-mediated removal of an upstream floxed-STOP cassette, expression of HA-tagged hM3Dq and mCitrine yellow fluorescent protein is observed. hM3Dq is a mutant G protein-coupled receptor (GPCR) that induces the canonical G<sub>q</sub> pathway specifically following administration of the pharmacologically inert molecule clozapine-*N*-oxide (CNO). These CAG-LSL-Gq-DREADD mice may be useful for chemogenetic/pharmacogenetic studies to express an activating DREADD that effectively induces firing of neurons.

**Important Note: The CAG-LSL-Gq-DREADD allele (formerly called R26-LSL-Gq-DREADD) was originally designed as a targeted insertion into the *Gt(ROSA)26Sor* locus. In 2017 The Jackson Laboratory confirmed the Rosa-CAG-LSL-HA-hM3Dq-pta-mCitrine construct randomly integrated into the mouse genome as a transgene, rather than at the *Gt(ROSA)26Sor* locus. To the best of our knowledge based on peer reviewed literature published to date (March 2017), the random integration event has not adversely affected the functionality of the allele.**

## Donating Investigator

Dr. Ute Hochgeschwender, Central Michigan University

Bryan L Roth, University of North Carolina at Chapel Hill

[READ MORE +](#)

## GENETIC OVERVIEW

Genetic Background

Generation

[N4+pN1F9](#)

(2020-01-20 00:00:00)

### [Tg\(CAG-CHRM3\\*, -mCitrine\)1Ute](#)

Allele Type

Gene Symbol

Gene Name

Targeted (Conditional ready (e.g. floxed), No functional change)

Tg(CAG-CHRM3\*, -mCitrine)1Ute

transgene insertion 1, Ute Hochgeschwender

[VIEW GENETICS](#)

## RESEARCH APPLICATIONS

Research Tools

Neurobiology Research

Diabetes and Obesity Research

Immunology, Inflammation and Autoimmunity Research

Cell Biology Research

Cancer Research

[VIEW ALL RESEARCH APPLICATIONS](#)

## BASE PRICE

Starting at:

\$255.00 Domestic price for female 4-week

## Details

### Important Note

**Important Note:** The CAG-LSL-Gq-DREADD allele (formerly called R26-LSL-Gq-DREADD) was originally designed as a targeted insertion into the *Gt(ROSA)26Sor* locus. In 2017 The Jackson Laboratory confirmed the Rosa-CAG-LSL-HA-hM3Dq-pta-mCitrine construct randomly integrated into the mouse genome as a transgene, rather than at the *Gt(ROSA)26Sor* locus. To the best of our knowledge based on peer reviewed literature published to date (March 2017), the random integration event has not adversely affected the functionality of the allele.

### Detailed Description

**Important Note:** The CAG-LSL-Gq-DREADD allele (formerly called R26-LSL-Gq-DREADD) was originally designed as a targeted insertion into the *Gt(ROSA)26Sor* locus. In 2017 The Jackson Laboratory confirmed the Rosa-CAG-LSL-HA-hM3Dq-pta-mCitrine construct randomly integrated into the mouse genome as a transgene, rather than at the *Gt(ROSA)26Sor* locus. To the best of our knowledge based on peer reviewed literature published to date (March 2017), the random integration event has not adversely affected the functionality of the allele.

The CAG-LSL-Gq-DREADD mice (formerly called R26-LSL-Gq-DREADD) have the Rosa-CAG-LSL-HA-hM3Dq-pta-mCitrine conditional allele (R26-hM3Dq/mCitrine). The CAG promoter-driven, *loxP*-flanked STOP cassette and HA-hM3Dq-pta-mCitrine coding region is designed to allow HA-hM3Dq-pta-mCitrine expression to be determined by which tissue(s) express Cre recombinase. Cre recombinase-mediated removal of the floxed-STOP cassette results in expression of two proteins; the yellow-green fluorescent protein mCitrine and the hemagglutinin epitope-tagged, mutant G protein-coupled receptor hM3Dq (a human muscarinic 3 receptor with two amino acid substitutions [Y149C<sup>3,33</sup>/A239G<sup>5,46</sup>]) that abolish receptor affinity for the native ligand, acetylcholine [ACh], but allow receptor binding and subsequent activation by the small pharmacologically inert molecule clozapine-*N*-oxide [CNO]. hM3Dq activation via CNO binding induces the canonical G<sub>q</sub> pathway; leading to neuronal activity/neuronal firing.

The donating investigator reports that CAG-LSL-Gq-DREADD mice do not express HA-hM3Dq or mCitrine prior to introduction of Cre recombinase. Following Cre recombinase exposure, mCitrine expression is detected by fluorescence (in the cytoplasm) and by immunohistochemical staining against the HA tag (in the membrane). The donating investigator has not observed canonical G<sub>q</sub> pathway induction prior to the administration of CNO. CAG-LSL-Gq-DREADD hemizygous mice are viable and fertile, with no reported phenotypic abnormalities. While homozygous mice are expected to be viable and fertile, the generation of homozygous mice has not been attempted to date (January 2015).

Of note, the *FRT* sites flanking the mutation allow for additional targeted replacement of the reporter sequences through *Flp*-mediated recombination if so desired. Similarly, the *attB/attP*-flanked selection cassette may be removed by introduction of the site-specific bacteriophage PhiC31 integrase if so desired.

These CAG-LSL-Gq-DREADD mice may be useful for chemogenetic/pharmacogenetic studies of receptor-specific functions or general downstream cellular signaling emanating from the activated G protein-coupled receptor (GPCR). For example, when bred to a strain expressing Cre recombinase in forebrain neurons (Camk2a-Cre; Stock No. 005359), the resulting CaMKII $\alpha$ -hM3Dq double mutant mice are a model allowing *in vivo* chemical control of neuronal activity, neuronal firing, and non-neuronal signaling.

For CNO protocol, see the [detailed protocol for dissolving CNO](#) obtained from the attachments section of the [Designer Receptors Exclusively Activated by Designer Drugs DREADD](#) wiki webpage.

Fixatives (formalin, paraformaldehyde and glutaraldehyde) may alter tissues, such as brain tissue, and induce autofluorescence in this and other fluorescent protein strains. A protocol to reduce autofluorescence in fixed brain tissue is [available here](#).

Additional information on hM3Dq used in these CAG-LSL-Gq-DREADD mice:

The hM3Dq sequence is a G<sub>q</sub>-coupled human M3 muscarinic DREADD (designer receptor exclusively activated by designer drug). To create the hM3Dq sequence, the wildtype human muscarinic 3 receptor (*CHRM3*) sequence was modified via site-directed mutagenesis to harbor two amino acid substitutions (Y149C<sup>3,33</sup>/A239G<sup>5,46</sup>) that abolish receptor affinity for the native ligand, acetylcholine (ACh), but allow receptor binding and subsequent activation by the small drug-like molecule clozapine-*N*-oxide (CNO). More information on hM3Dq or other DREADDs may be available at [Designer Receptors Exclusively Activated by Designer Drugs DREADD wiki webpage](#).

Additional information on mCitrine used in these CAG-LSL-Gq-DREADD mice:

mCitrine is a yellow-green variant of Citrine YFP additionally harboring the A206K mutation. mCitrine is a ~5.7 pKa monomer with 516nm excitation and 529nm emission spectra. Compared to wildtype GFP, Citrine harbors the S65G, V68L, Q69M, S72A and T203Y mutations, and mCitrine additionally has the A206K mutation (enhancing its ability to be a stable monomer).

*Of note, several chemogenetic/pharmacogenetic tool strains are available from The Jackson Laboratory Repository; including these Cre-inducible CAG-LSL-Gq-DREADD mice (Tg-hM3Dq/mCitrine; Stock No. 026220), the Cre-inducible R26-LSL-Gi-DREADD mice (R26-hM4Di/mCitrine; Stock No. 026219), the Tet-responsive TRE-hM4Di transgenic mice (Stock No. 024114), the Tet-responsive TRE-hM3Dq transgenic mice (Stock No. 014093) and the adora2A-rM3Ds transgenic mice (Stock No. 017863).*

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## + Development

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## + Expression Data

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## + Control Suggestions

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## + Selected References

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## - Genetics

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## + Tg(CAG-CHRM3\*, -mCitrine)1Ute

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## - Disease/Phenotype

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## + Disease Terms

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## + Research Areas By Genotype

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## + Mammalian Phenotype Terms by Genotype

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## + References

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## - Technical Support

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

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

QPCR: [CHRM3 qPCR](#)

Probe: [Tg\(CAG-CHRM3\\*, -mCitrine\)1Ute](#)

[Genotyping resources and troubleshooting](#)

## Dietary Information

LabDiet® 5K52 formulation (6% fat)

## Breeding Considerations

When maintaining a live colony, hemizygous mice may be bred together, to wildtype (noncarrier) mice from the colony or to C57BL/6NJ inbred animals (Stock No. [005304](#)). While homozygous mice are expected to be viable and fertile, the generation of homozygous mice has not been attempted to date (January 2015).

[Additional Breeding and Husbandry Support](#)

## Mating System

Hemizygote x Noncarrier

Noncarrier x Hemizygote

## Citation

When using the [CAG-LSL-Gq-DREADD](#), [R26-LSL-Gq-DREADD](#), [R26-LSL-hM3Dq-DREADD](#) mouse strain in a publication, please [cite the originating article\(s\)](#) and include JAX stock #026220 in your Materials and Methods section.

## Animal Health Reports

[Facility Barrier Level Descriptions](#)

 [AX12 \(Maximum\)](#)

## ➔ Pricing & Availability



Live mice available in varying quantities. Ask Customer Service for details.

Available

## Domestic **International**

Pricing effective for USA, Canada and Mexico shipping destinations

Live Mouse			
AGE	SEX	GENOTYPE	PRICE
4 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
4 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
5 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
5 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
6 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
6 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
7 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00

7 weeks	SEX	Noncarrier	\$78.51
		Noncarrier	\$78.51
8 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
8 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
9 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
9 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
10 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
10 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
11 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
11 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51
12 weeks	Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
	Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$255.00
12 weeks	Female	Noncarrier	\$78.51
	Male	Noncarrier	\$78.51

Breeder Pair		
SEX	GENOTYPE	PRICE
Female	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	\$333.51
Male	Noncarrier	
Female	Noncarrier	\$333.51
Male	Hemizygous for Tg(CAG-CHRM3*, -mCitrine)1Ute	

Related Products and Services		
Frozen Mouse Embryo	B6N; 129-Tg(CAG-CHRM3*, -mCitrine)1Ute/J	\$2595.00

## Payment Terms and Conditions

Terms are granted by individual review and stated on the customer invoice(s) and account statement. These transactions are payable in U.S. currency within the granted terms. Payment for services, products, shipping containers, and shipping costs that are

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