B6.Cg-Tg(Slc32a1-COP4*H134R/EYFP)8Gfg/J

Stock No: 014548 | VGAT-ChR2-EYFP line 8

Congenic, Transgenic

PLACE ORDER

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

Overview
Also Known As: VGAT-ChR2-EYFP line 8

Mice carrying this transgene (also known as VGAT-ChR2-YFP BAC) may be useful in optogenetic studies for rapid control of motor behavior by addition or removal of light, for ex vivo and in vivo studies of neural circuitry/connectivity following illumination, and for fluorescent labeling of GABAergic interneuronal populations.

Donating Investigator
Guoping Feng, Massachusetts Institute of Technology

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tr>
<td>?+N4F2</td>
<td>(2019-03-01 00:00:00)</td>
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Tg(Slc32a1-COP4*H134R/EYFP)8Gfng

Allele Type
Transgenic (Reporter)

RESEARCH APPLICATIONS

Research Tools
Neurobiology Research
Sensorineural Research

BASE PRICE
Starting at:

- $255.00 Domestic price for female
- $333.51 Domestic price for breeder pair

Details

Mice hemizygous for this transgene (also known as VGAT-ChR2-YFP BAC transgene) are viable and fertile, with expression of the
mhChR2::YFP fusion protein directed to GABAergic interneuronal populations by the mouse vesicular GABA transporter (VGAT or Scl32a1) promoter/enhancer regions on the BAC transgene. The mhChR2::YFP fusion protein is composed of a mammalian codon-optimized Chlamydomonas reinhardtii-derived channelrhodopsin-2 that was modified to harbor a gain-of-function H134R substitution (mhChR2; also called hChR2-H134R) fused in-frame with an enhanced yellow fluorescent protein (EYFP). The mhChR2 is designed to cause larger stationary photocurrents compared to ChR2. The bacterial opsins are retinal-binding proteins that provide light-dependent ion transport and sensory functions to a family of halophilic bacteria; and this mhChR2 functions as a blue light-driven cation channel that depolarizes the cell and causes action potentials. As such, illuminating mhChR2-expressing neurons with blue light (450-490 nm) leads to rapid and reversible photostimulation of action potential firing/neural activity in these cells.

The donating investigator reports that EYFP expression is visible by direct fluorescence (epifluorescence microscope). VGAT-ChR2-YFP mice derived from founder line 8 exhibit strong EYFP expression in olfactory bulb (glomerular and mitral cell layers), thalamic reticular nucleus, superior colliculus, inferior colliculus, brainstem, and molecular layer of cerebellum. Moderate EYFP expression is found in cortex, hippocampus, thalamus, and granule cell layer of olfactory bulb. GAD67 co-staining shows the mhChR2-EYFP expressing neurons are GABAergic interneurons. High EYFP fluorescence is also observed for gray matter in transverse section of the spinal cord.

These VGAT-ChR2-YFP BAC transgenic mice may be useful for rapid control of motor behavior by addition or removal of light, for ex vivo and in vivo studies of neural circuitry/connectivity following illumination, or for fluorescent labeling of GABAergic interneuronal populations.

This optogenetic strain is one of many from the same transgene creator/donating investigator with light-inducible neurobiology applications; including

- Thy1-ChR2-YFP line 18 (Stock No. 007612),
- Thy1-ChR2-YFP line 9 (Stock No. 007615),
- Thy1-enpHR-YFP line 2 (Stock No. 012332),
- Thy1-enpHR-YFP line 4 (Stock No. 012334),
- Thy1-vChR1-YFP line 1 (Stock No. 012341),
- Thy1-vChR1-YFP line 4 (Stock No. 012344),
- Thy1-vChR1-YFP line 8 (Stock No. 012348),
- Thy1-mhChR2-YFP line 20 (Stock No. 012350),
- Prv-mhChR2-YFP Line 15 (Stock No. 012355),
- ChAT-ChR2-YFP line 5 (Stock No. 014545),
- ChAT-ChR2-YFP line 6 (Stock No. 014546),
- and Tph2-ChR2-YFP line 5 (Stock No. 014555).
Genotyping Protocols
QPCR: Fluorescent Proteins -- Generic GFP
Probe: Fluorescent Proteins (Generic GFP)
Standard PCR: Fluorescent Proteins (Generic GFP)
High Resolution Melting: Tg(Slc32a1-COP4*H134R/EYFP)
Standard PCR: Tg(Slc32a1-COP4*H134R/EYFP)
Genotyping resources and troubleshooting

Breeding Considerations
When maintaining a live colony, hemizygous mice may be bred with wildtype (noncarrier) mice from the colony or with C57BL/6J inbred mice (Stock No. 000666).

Additional Breeding and Husbandry Support

Mating System
Hemizygote x Noncarrier
Noncarrier x Hemizygote

Citation
When using the YGAT-COP4*EYFP line 8 mouse strain in a publication, please cite the originating article(s) and include JAX stock #014548 in your Materials and Methods section.

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

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<th>AGE</th>
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<th>GENOTYPE</th>
<th>PRICE</th>
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Breeder Pair

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Related Products and Services

| Frozen Mouse Embryo | $2,595.00 per straw or vial |

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Terms of Use

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Phone: 207-288-6470
Email: TechTran@jax.org

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Related Strains

- All
- By Allele
- By Gene
- By Collection

All Related Strains