B6;129St6(Rosa)26Sor\textsuperscript{tm1Acoh}

Stock No: 028678 | Floxopatch, Optopatch2, Ai130

Congenic, Targeted Mutation

CRYO RECOVERY

PLACE ORDER

Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.
Also Known As: Floxopatch, Optopatch2, Ai130

Floxopatch (also called Optopatch) mice are a sensitive, fast optogenetic tool for targeted, simultaneous optical perturbation and measurement of membrane voltage. Animals express variants of a near-infrared archaerhodopsin-based voltage indicator (QuasAr2-dark mOrange2; QuasAr2 is near infrared fluorescent, dark mOrange2 is non-fluorescent) and a blue light-gated channelrhodopsin actuator (CheRiff-EGFP; green fluorescent) in the cell plasma membrane after cre-mediated excision of a floxed Stop cassette.

Donating Investigator

Adam E. Cohen, Harvard University

GENETIC OVERVIEW

<table>
<thead>
<tr>
<th>Genetic Background</th>
<th>Generation</th>
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<tbody>
<tr>
<td>Gt(ROSA)26Sor^m1Acoh</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Allele Type</th>
<th>Gene Symbol</th>
<th>Gene Name</th>
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</thead>
<tbody>
<tr>
<td>Targeted (Conditional ready (e.g. floxed), Reporter)</td>
<td>Gt(ROSA)26Sor</td>
<td>gene trap ROSA 26, Philippe Soriano</td>
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RESEARCH APPLICATIONS

Neurobiology Research
Research Tools

BASE PRICE

Starting at:

$2,854.50 Domestic price Cryo Recovery

Floxopatch (also called Ai130, or Optopatch) is a cre-dependent mouse line that incorporates the Optopatch2 (optogenetic)
construct which enables simultaneous optical perturbation and optical readout of membrane potential. The animals express a blue-shifted channelrhodopsin actuator (CheRiff-EGFP) and a near infrared Archaerhodopsin-derived voltage indicator (QuasAr2-dark mOrange2) via a targeted floxed-Stop knock-in of the Gt(ROSA)26Sor gene.

Neurons from Floxopatch mice crossed with a variety of cre driver lines report spontaneous and optically-evoked activity in vitrō, in acute brain slice, and in vivo in somatosensory ganglia.

QuasAr2 and CherRiff show greatly improved performance for all-optical electrophysiology. Neuronal excitation can be probed across spatial and temporal scales - from single dendritic spines to fields containing dozens of neurons measured in parallel, and from microsecond delays associated with action potential propagation to days-long changes in excitability.

The CheRiff construct shows good expression and membrane trafficking in cultured rat hippocampal neurons. Under typical neural culture conditions, CheRiff passes a photocurrent of 1 nA at a whole-cell illumination intensity of 22±/−10 Mw/cm2 (9-fold lower than is required for channelrhodopsin 2 (ChR2) H134R). CheRiff shows twofold larger maximal photocurrents than ChR2 H134E or ChIEF. CheRiff has an opening rate twofold faster than that of ChR2 H134R and fourfold faster than that of ChIEF. CheRiff has a similar closing rate to that of ChIEF and is 1.5-fold faster than ChR2 H134R.

Floxopatch mice were crossed with central nervous system (CNS)-specific cre driver lines, including parvalbumin-cre (Stock No. 008069), somatostatin-RES-Cre (Stock No. 013044), and CAG-CreEr (Stock No. 004682). Histology shows patterns of EGFP fluorescence matching expression patterns reported in the Allen Brain Atlas. Examination at cellular resolution reveals that each cre line drives expression in cells with distinct locations and morphology. Expression in the soma membrane and throughout the dendritic arbor is demonstrated.

The Optopatch2 construct is safe to express in neuronal sub-populations, but not at a high level throughout the whole animal. Mice derived from crosses of the Floxopatch mice with CAG-CreEr (Stock No. 004682) and induced with tamoxifen grow more slowly after induction, have smaller body and organ sizes, and typically die between 7 and 9 days after induction. Tissues from these mice show intense EGFP fluorescence throughout the body. Littermates carrying only CAG-CreER (and not Octopatch2) show no ill-effects following tamoxifen injection.

Parvalbumin-cre (Stock No. 008069) was also used to test expression in the peripheral nervous system (PNS). Near predicted levels of expression were observed in dorsal root ganglia (DRG) neuron subtypes.

Animals homozygous for the Floxopatch allele and heterozygous for the Nav1.8-cre (Scn10a-cre) allele show a blue light threshold for triggering spikes that are 36% lower than that of mice heterozygous for both Floxopatch and Nav1.8-cre. The signal-to-noise ratio of spikes in QuasAr2 fluorescence is approximately twice as high in homozygous Floxopatch/heterozygous Nav1.8-cre mice.

+ Development
+ Expression Data
+ Control Suggestions
+ Selected References
+ Genetics
+ Gt(ROSA)26Sor^{tm1Acoh}
+ Disease/Phenotype
Genotyping Protocols

Standard PCR: Generic mOrange
Separated PCR: Gt(ROSA)26Sor<tm1Acoh>

Genotyping resources and troubleshooting

Breeding Considerations

Homozygotes and heterozygotes are viable and fertile.

Additional Breeding and Husbandry Support

Mating System

Homozygote x Homozygote

Citation

When using the Floxopatch, Optopatch2, Ai130 mouse strain in a publication, please cite the originating article(s) and include JAX stock #028678 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

Typically mice are recovered in 10-14 weeks. Contact Customer Service to place an order or for more information.

We will fulfill your order by providing at least two carriers for each strain ordered. The total number, sex, and genotypes provided will vary, although typically 8 or more animals are provided. Please check genotypes which will be recovered. While the genotypes of all animals produced will be communicated to you prior to scheduling shipment, the genotypes of animals provided may not reflect the mating scheme and genotypes described in the strain description. Animals are typically ready to ship in 11-14 weeks. If a second...
recovery is required to produce the minimum number of animals, then delivery time would increase to approximately 25 weeks. If we fail to produce animals of the correct genotype, you will not be charged. We cannot guarantee the reproductive success of mice shipped to your facility. If the mice are lost after the first three days (post-arrival) or do not produce progeny at your facility, a new order and fee will be necessary.

Cryorecovery to establish a Dedicated Supply for greater quantities of mice. Mice recovered can be used to establish a dedicated colony to contractually supply you mice according to your requirements. Price by quotation.

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**Related Products and Services**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Strain/Type</th>
<th>Price</th>
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<tbody>
<tr>
<td>Frozen Mouse Embryo</td>
<td>B6;129S6-Gt(ROSA)26Sor&lt;tm1Acoh&gt;/J Frozen Embryo</td>
<td>$2595.00</td>
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</tbody>
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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 rendered are expected within the payment terms indicated on the invoice or stated by contract. Invoices and account balances in arrears of stated terms may result in The Jackson Laboratory pursuing collection activities including but not limited to outside agencies and court filings.

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**Questions About Terms Of Use**

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**Licensing Information**

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

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All

By Allele

By Gene

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All Related Strains