

Product Data Sheet

Product Name: BODIPY 576/589

Cat. No.: GC62873

Chemical Properties

Cas. No. 150173-78-7

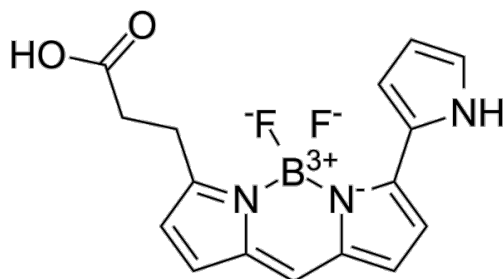
Formula $C_{16}H_{14}BF_2N_3O_2$ M.Wt 329.11

Solubility DMSO : 62.5 mg/mL (189.91 mM); ultrasonic and warming and heat to 60°C) Storage Store at 2-8°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

This protocol is provided as a guideline only and should be modified according to your specific needs.

1. Solution Preparation

(1) Working solution: Dissolve BODIPY 576/589 solid in DMSO to a final concentration of 50mg/mL and filter sterilize.

Caution: Product has not been fully validated for medical applications. For research use only.

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(2) BODIPY 576/589 activation: BODIPY 576/589 is thoroughly mixed with N-hydroxysuccinimide (NHS), 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC) at a molar concentration of 1:1.2:1.5 for 4-6 hours. Activated BODIPY 576/589 was collected using reversed-phase HPLC.

Note: The working solution must be prepared fresh. Before use, it must be activated with N-hydroxysuccinimide and 1-ethyl-3-(3-dimethylaminopropyl)carbodiimide before proceeding with subsequent labeling experiments.

2. Experimental Procedures for Labeling DNA with BODIPY 576/589

(1) Primer preparation: Design and synthesize oligonucleotide primers with a 5' amino modification, ensuring that the primer sequence is complementary to the target DNA.

(2) Purify the primer through a Nensorb 20 column.

(3) Labeling reaction: Dissolve the purified amino-modified primer in 0.25M NaHCO₃-Na₂CO₃ buffer (pH 9.0) to a final concentration of 0.4pmol/μL (adjust according to experimental needs).

(4) Incubation reaction: Incubation reaction: Add activated BODIPY 576/589 (BODIPY 576/589: primers = 1:10) and incubate for 4-16h at room temperature in a dark place. Ethanol precipitation reaction products are added to remove unreacted free dyes and small molecule impurities.

(5) Product purification: Further purify the labeled DNA primer using reverse-phase high-performance liquid chromatography (RP-HPLC). The chromatography column is ABI Aquapore RP-300 (4.6mm × 250mm). The gradient elution conditions are as follows: start with 30% solvent B (acetonitrile) and increase to 100% within 40 minutes at a flow rate of 1.0mL/min.

(6) Verify the labeling efficiency by fluorescence spectroscopy or agarose gel electrophoresis to ensure that the fluorescence intensity matches the DNA concentration.

Notes:

(1) This product is an unactivated fluorescent dye. For labeling peptides and proteins with this product, carboxyl activation is required first.

(2) This protocol provides guidance for using BODIPY 576/589 for DNA labeling experiments. It can be adjusted according to other literature and specific experimental requirements. Operations should

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be conducted in a sterile environment to prevent contamination from interfering with the reaction. Avoid direct contact with the reaction reagents.

References:

- [1] Metzker ML, Lu J, Gibbs RA. Electrophoretically uniform fluorescent dyes for automated DNA sequencing. *Science*. 1996 Mar 8;271(5254):1420-2.
- [2] Wang D, Fan J, Gao X, et al. Carboxyl BODIPY dyes from bicarboxylic anhydrides: one-pot preparation, spectral properties, photostability, and biolabeling. *J Org Chem*. 2009 Oct 16;74(20):7675-83.

Background

BODIPY 576/589 is a red-fluorescent labeling dye with distinctive hydrophobic properties that make BODIPY 576/589 ideal for tagging lipids, membranes, and other lipophilic compounds, BODIPY 576/589 absorption and emission maxima are 576nm and 589nm, respectively, and its extinction coefficient is $83000\text{cm}^{-1}\text{M}^{-1}$. The dye features a high extinction coefficient and fluorescence quantum yield, and BODIPY 576/589 remains relatively insensitive to pH changes and solvent polarity. Owing to its comparatively long excited-state lifetime, BODIPY 576/589 is suitable for fluorescence-polarization-based assays and exhibits a large two-photon cross-section for multiphoton excitation; BODIPY 576/589 is activated to label proteins, DNA, cells, etc.

References:

- [1] Winter S, Kirschstein S, Miller DP. Molecular dynamics of labeled oligonucleotide probes used for the detection of point mutations in DNA. *Nucleosides Nucleotides*. 1999 Mar;18(3):411-23.
- [2] Das S, Dey S, Patra S, et al. BODIPY-Based Molecules for Biomedical Applications. *Biomolecules*. 2023 Nov 30;13(12):1723.

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