
DiSBAC2(3) Membrane Potential Fluorescent Probe

Cat. No.: D1454922 | Pack size: 1 mg, 5 mg, 10 mg, 25 mg | Storage: Protected from light; -20 °C; desiccated

Overview

DiSBAC2(3) is a permeable anionic phospholipid fluorescent dye sensitive to membrane potential. Its distribution across the cell membrane depends on the membrane potential; thus, changes in its fluorescence intensity can reflect alterations in membrane potential. Upon cell depolarization, the dye permeates into the cell, increasing intracellular fluorescence intensity. During cell hyperpolarization, the dye is extruded from the cell, resulting in reduced fluorescence intensity.

This probe belongs to slow-response membrane potential probes, whose optical response amplitude is far larger than that of fast-response probes (typically a 1% fluorescence change per mV). Therefore, DiSBAC2(3) penetrates cell membranes faster and exhibits higher sensitivity to shifts in membrane potential. It is suitable for detecting rapid membrane potential fluctuations, such as spontaneous electrical activity, ion channel permeability, average membrane potential variations in non-excitable cells induced by drug binding and other factors. Carrying an overall negative charge, DiSBAC2(3) is excluded by mitochondria, making it more ideal for plasma membrane potential measurement than carbocyanine dyes.

Physical Properties & Specifications

Excitation wavelength (Ex, nm): 538

Emission wavelength (Em, nm): 555

Notes: Solubility data was measured at room temperature; low temperature may impair solubility.

Additional Safety Instructions

For personal safety and health, laboratory coats and disposable gloves must be worn during all handling procedures.

Experimental Protocol (For Reference Only)

1. Cell Preparation

1.1 Adherent cells: Plate cells one day prior to detection. The recommended seeding density for 96-well plates is $4-8 \times 10^4$ cells per well in 100 μ L medium.

1.2 Suspension cells: Centrifuge the cell pellet and resuspend cells in HBSS and MP staining working solution (see Step 2.2 below). Adjust cell density to $1.25-2.5 \times 10^5$ cells per well in 100 μ L for 96-well plates.

2. Preparation of DiSBAC2(3) Staining Working Solution

2.1 Dissolve the dye powder in anhydrous DMSO to prepare a stock solution at a concentration of 10-30 mM DiSBAC2(3).

Caution: Use the prepared stock solution promptly. Aliquot any remaining stock, store at -20 °C protected from light, and avoid repeated freeze-thaw cycles.

2.2 Prepare 2× DiSBAC2(3) dye solution: Equilibrate the dye stock solution to room temperature. Dilute the stock with HHBS or other appropriate buffer to a final concentration of 20-40 μM to obtain 2× DiSBAC2(3) dye solution. Prepare a mixture containing 0.04-0.08% Pluronic F-127 (pH 7) and 2 mM trypan red; thoroughly combine with the 2× dye solution to yield the complete staining working solution. This working solution remains stable for a minimum of 2 hours at room temperature.

3. Membrane Potential Measurement

3.1 Add 100 μL of DiSBAC2(3) staining working solution per well (96-well plate) to the cells.

Note 1: If your screening compounds interfere with culture medium or serum, and cells can grow normally in serum-free medium, replace the growth medium with an equal volume of HHBS buffer before adding DiSBAC2(3) dye.

Note 2: Do not wash cells after staining.

3.2 Incubate cells in a cell incubator for 30-60 minutes.

Caution: Room-temperature incubation for 30-60 minutes may yield superior results under certain experimental conditions.

3.3 Prepare compound plates using HHBS or your required buffer system.

3.4 Quantify membrane potential by measuring fluorescence intensity at Ex/Em = 540/590 nm.

Stock Solution Preparation

Volume Concentration	Mass	1 mg	5 mg	10 mg
1 mM		2.291 mL	11.453 mL	22.907 mL
5 mM		0.458 mL	2.291 mL	4.581 mL
10 mM		0.229 mL	1.145 mL	2.291 mL

Important Warnings

- This product is supplied non-sterile. If used for cell culture, perform pre-treatment to remove pyrogens and bacteria in advance to prevent microbial contamination.
- Only partial technical information can be provided for some products. The company does not warrant the authority or accuracy of the provided data; all values are for research reference and academic communication only.

Specifications

Specifications & Purity	BioReagent, ≥95%(HPLC)
Stability and Storage	Store at -20 °C long term (36 months). Store in the dark. Desiccated.
Storage	Protected from light; store at -20 °C; desiccated
Shipped In	Ice chest + Ice pads. This product requires cold chain shipping. Ground and other economy services are not available.
Purity	≥95%(HPLC)

Names and Identifiers

Canonical SMILES	<chem>CCN1C(=O)C(C(=O)N(C1=S)CC)C=CC=C2C(=O)N(C(=S)N(C2=O)CC)CC</chem>
IUPAC Name	5-[(E)-3-(1,3-diethyl-4,6-dioxo-2-sulfanylidene-1,3-diazinan-5-yl)prop-2-enylidene]-1,3-diethyl-2-sulfanylidene-1,3-diazinane-4,6-dione
InChIKey	VJYNRXFXHKIGLT-MDZDMXLPSA-N
INCHI	1S/C19H24N4O4S2/c1-5-20-14(24)12(15(25)21(6-2)18(20)28)10-9-11-13-16(26)22(7-3)19(29)23(8-4)17(13)27/h9-12H,5-8H2,1-4H3/b10-9+
Isomeric SMILES	<chem>CCN1C(=O)C(C(=O)N(C1=S)CC)/C=C/C=C2C(=O)N(C(=S)N(C2=O)CC)CC</chem>
PubChem CID	23212271
Molecular Weight	436.548
Beilstein	1232950

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Limitations & Disclaimer

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