DIR

Cat: IC6110

Storage: Powder: 2-8℃, 2 years; Insolvent (mother liquid): -20℃, 6 months; -80℃, 1 year (protect from light)

Introduction

DiR is a lipophilic, near-infrared fluorescent anthocyanine dye. This dye is commonly used to label cytoplasmic membranes. The two 18-carbon chains of DiR are inserted into the cell membrane, resulting in specific, stable cellular staining with little to no cell-to-cell dye transfer. DiR (near-infrared fluorescent) is used in conjunction with other cell membrane fluorescent dyes such as DiI (orange fluorescent), DiO (green fluorescent), and DiD (red fluorescent) to provide an effective tool for multicolor imaging and flow cytometric analysis.

Fixation with paraformaldehyde (no other reagents such as methanol may be used) can be performed after DiR staining, but the process of permeabilization after staining is not recommended. In addition, plasma membrane staining can be performed well after fixed permeabilization (permeabilization with 0.1% TritonX-100 at room temperature).

Di Series Dyestuffs	Feature
DiO dye (green)	Long-term tracer for living or fixed cells and tissues. The fluorescence intensity is lower than DiI, and the staining effect on some fixed tissues is average.
DiA dye (green)	A cell membrane green fluorescent dye that diffuses through cell membranes faster than DiO and is often used in conjunction with DiI for bicolor labeling of cell membranes for post-staining fixation. It can be fixed after staining.DiA stains fixed cells better than DiO.
DiI dye (orange)	Long-term tracer for living or fixed cells and tissues. In addition to labeling cell membranes, it can also detect cell fusion and adhesion, cell migration, etc.
DiB dye (orange)	A lipophilic anionic fluorescent dye for detecting cell membrane potential, which is non-fluorescent by itself and emits fluorescence when it enters the cell and binds to proteins in the cytoplasm. When it enters the cell, it indicates an increase in intracellular fluorescence intensity, i.e., an increase in membrane potential indicates cell depolarization; conversely, if the intracellular fluorescence intensity decreases, i.e., a decrease in membrane potential indicates cell hyperpolarization.
DiD dye (red)	High staining efficiency, homogeneous, not easy to burst, low cytotoxicity, little background interference.
DiS dye (red)	A cell membrane red fluorescent dye that diffuses through cell membranes

	faster than DiD, allowing for post-staining fixation. DiS stains fixed cells better than DiD.
DiR dye (dark red)	Commonly used to label cell membranes, infrared fluorescence penetrates cells and tissues and is used for tracing in in vivo imaging. DiR allows for post-staining fixation.
Suggestion: DiI, DiO, DiD and DiR can be used to stain living or fixed cells and tissues (please select the appropriate probe according to your needs), DiI is brighter than DiO; DiD and DiR have longer wavelengths and are more suitable for tissue staining.	

Parameters

Ex/Em: 750/780nm

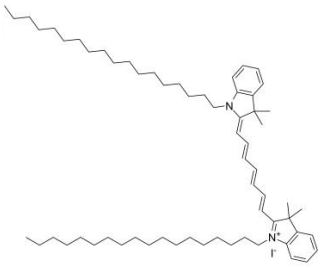
CAS: 100068-60-8

Molecular Formula: $C_{63}H_{101}IN_2$

Molecular Weight: 1013.39

Appearance: Solid

Solubility: Soluble in DMSO(Need ultrasonic)



Protocols *(only for reference)*

Preparation of storage solution

Prepare a 1-5 mM stock solution with DMSO or anhydrous ethanol. Refer to the Dissolution Preparation Table below for preparation.

Note:

a. Unused storage solution is recommended to be stored in portions at -20℃ to avoid repeated freezing and thawing.

b. Moisture-absorbing DMSO has a significant effect on the solubility of the product, use freshly opened DMSO.

Solvent / Mass / Concentration	1mg	5mg	10mg
1mM	0.9868mL	4.9339mL	9.8679mL
5mM	0.1974mL	0.9868mL	1.9736mL
10mM	0.0987mL	0.4934mL	0.9868mL

Preparation of working fluid

Dilute the reservoir solution with a suitable buffer (e.g. serum-free medium or PBS, etc.) to make a working solution of 1-5 μM.

Note:

a. The final concentration of the working solution is recommended to be optimized according to different cell lines and experimental systems.

b. If it is found difficult to dissolve, it can be sonicated to promote dissolution.

c. Please adjust the concentration of the working solution according to the actual situation, and use

immediately after dissolution.

Staining

Suspension of cells

(1) Resuspend the cells by adding an appropriate volume of Staining Working Solution to a density of 1 × 10^6/mL.

(2) Incubate the cells at 37°C for 2~20 min, the optimal incubation time varied for different cells. The optimal incubation time varied from cell to cell. The 20 min can be used as the starting incubation time, after which the system can be optimized to obtain uniform labeling effect.

(3) At the end of incubation, centrifuge the cells at 1000~1500 rpm for 5 min, decant the supernatant, and resuspend the cells again by slowly adding 37℃ preheated growth medium.

(4) Repeat step (3) more than twice.

Adherent cell

(1) Adherent cells were cultured on sterile coverslips.

(2) Remove the coverslip from the medium and aspirate the excess culture solution, but keep the surface moist.

(3) Add 100 μL of dye working solution to one corner of the coverslip and shake gently so that the dye evenly covers all cells.

(4) Incubate the cells at 37℃ for 2~20 min, the optimal incubation time varies for different cells. The optimal incubation time varies from cell to cell. The 20 min can be used as the starting incubation time, after which the system can be optimized to obtain uniform labeling effect.

(5) Drain the dye working solution, wash the coverslip with culture solution 2~3 times, each time cover all the cells with pre-warmed medium, incubate for 5~10 min, then drain the medium, but keep the surface wet.

Results testing

Samples can be assayed in culture media and can be analyzed by fluorescence microscope imaging or flow cytometry.

Flow cytometry assay: Cells labeled with DiO, DiI, DiD, DiS and DiR can be analyzed using conventional FL1, FL2, FL3 and FL4 flow cytometry assay channels, respectively.

Note

1. DiR staining of fixed cell or tissue samples is usually performed using 4% paraformaldehyde formulated in PBS, and the use of other inappropriate fixatives will result in a higher fluorescence background.
2. All fluorescent dyes have quenching problems, please try to avoid light to slow down the fluorescence quenching.
3. For your safety and health, please wear lab coat and disposable gloves.
4. This product is for scientific research use only. Do not use in medicine, clinical diagnosis or treatment, food and cosmetics. Do not store in ordinary residential areas.

Related Literature

[1]. Dandan Ling, Xueli Jia, Ke Wang, Qiucheng Yan, Bochuan Yuan, et al. Cancer cell membrane-coated bacterial ghosts for highly efficient paclitaxel delivery against metastatic lung cancer. Acta Pharmaceutica Sinica B.Volume 14, Issue 1, January 2024, Pages 365-377.（IF：14.5）

Note: For more literature, please visit the Solarbio official website.

Related Related Products

ID3750 DiI Cell Membrane Orange Fluorescent Probes

ID5550 DiA Cell Membrane Green Fluorescent Probes

ID5560 DiD Cell Membrane Red Fluorescent Probes