

JC-1

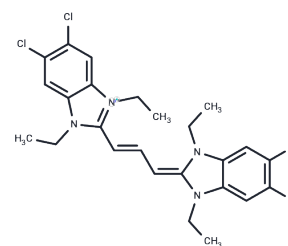
Chemical Properties

CAS No. : 3520-43-2

Formula: C₂₅H₂₇Cl₄N₄

Molecular Weight: 652.23

Storage: Keep away from direct sunlight, Store at low temperature, Keep away from moisture
 Powder: -20°C for 3 years | In solvent: -80°C for 1 year
 Actual storage temperature shall be subject to the COA.



Biological Description

Description	JC-1 (CBIC2) is a fluorescent lipophilic carbonyl cyanine dye. JC-1 is used to measure mitochondrial membrane potential. When the mitochondrial membrane potential is relatively high, JC-1 converges in the matrix to form a polymer, which can produce red fluorescence ($\lambda_{ex}=585$ nm, $\lambda_{em}=590$ nm). When the mitochondrial membrane potential is low, JC-1 cannot accumulate in the mitochondrial matrix and exists in the form of monomers to produce green fluorescence ($\lambda_{ex}=510$ nm, $\lambda_{em}=527$ nm).
Targets(IC50)	Others
In vitro	JC-1 fluorescence is usually excited by the 488nm laser wavelength common in flow cytometers[1]. JC-1 (2.5 μ M) exposed to murine L1210 lymphoblasts, can be detected the presence of both cytoplasmic JC-1 monomer and mitochondrial J-aggregates in these cells. Fluorescent labeling of mitochondria with either JC-1 (1 μ g/mL, 15 min), reveals that are distributed irregularly, resulting in regions of high and low mitochondrial content within astrocytes[2]. JC-1 is avidly accumulated in sensitive K562 cells where it displays both a green cytoplasmic and red mitochondrial fluorescence. JC-1 is poorly accumulated in resistant K562 cells, which displays only a slight green fluorescence[4]. JC-1 has been shown to interact with α -synuclein at the acidic C-terminal region with a Kd of 2.6 μ M. JC-1 itself does not accelerate the protein aggregation of α -synuclein in the absence of iron, instead, it decelerates the aggregation process by extending the lag phase approx[3].
Cell Research	<p>Instructions</p> <p>I. Solution preparation</p> <ol style="list-style-type: none"> 1. Stock solution preparation: JC-1 is dissolved in DMSO to prepare a stock solution. The concentration of the stock solution is usually 5 mg/ml. Please refer to the manufacturer's instructions for the specific concentration. 2. Working concentration: The working concentration of JC-1 is usually 1-20 μg/ml, but the optimal concentration may need to be optimized depending on the cell type and experimental conditions. 3. Dilution: Dilute the stock solution with cell culture medium or appropriate buffer before use. <p>II. Staining cells</p> <ol style="list-style-type: none"> 1. Cell preparation: Culture the cells to be tested under appropriate conditions (e.g., 37°

Cell Research	<p>C, 5% CO₂).</p> <p>2. Incubation with JC-1: Add the diluted JC-1 working solution to the cells. Depending on the cell type and experimental conditions, incubate for 15-30 minutes.</p> <p>3. Washing: After incubation, wash the cells 1-2 times with preheated cell culture medium or PBS to remove excess dye.</p> <p>3. Fluorescence detection</p> <p>1. Fluorescence microscopy: Use a fluorescence microscope equipped with appropriate filters to detect green (monomer JC-1) and red (aggregate JC-1) fluorescence. The excitation wavelength of green fluorescence is usually 485-490 nm, and that of red fluorescence is 525-530 nm, with emission peaks at 535 nm (green) and 590 nm (red), respectively.</p> <p>2. Flow cytometry: Flow cytometry can also be used for quantitative analysis. Use appropriate filters (e.g., 525/40 nm for green fluorescence and 585/42 nm for red fluorescence) for detection.</p> <p>3. Data interpretation: An increase in red fluorescence indicates a higher mitochondrial membrane potential, while an increase in green fluorescence indicates a loss or decrease in membrane potential.</p> <p>The above information is based on published literature. Experimental procedures should be appropriately modified to meet specific research demands.</p>
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Solubility Information

Solubility	DMSO: 14 mg/mL (21.46 mM), Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
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Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	1.5332 mL	7.666 mL	15.332 mL
5 mM	0.3066 mL	1.5332 mL	3.0664 mL
10 mM	0.1533 mL	0.7666 mL	1.5332 mL
50 mM	0.0307 mL	0.1533 mL	0.3066 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

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- Wang X, Shi W, Wang K, et al. Rationally Designed Nonapeptides with Great Skin Photoprotective Effect through Producing Type 1 Collagen and Blocking the mTOR Pathway. *Journal of Medicinal Chemistry.* 2023
- Zhang Y, et al. CircSPG21 ameliorates oxidative stress-induced senescence in nucleus pulposus-derived mesenchymal stem cells and mitigates intervertebral disc degeneration through the miR-217/SIRT1 axis and mitophagy. *Stem Cell Res Ther.* 2025 Feb 7;16(1):49.
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- Salvioli S, et al. JC-1, but not DiOC6(3) or rhodamine 123, is a reliable fluorescent probe to assess delta psi changes in intact cells: implications for studies on mitochondrial functionality during apoptosis. *FEBS Lett.* 1997 Jul 7;411(1):77-82.

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