

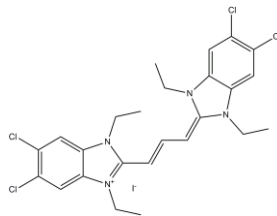
JC-1

(5,5',6,6'-tetrachloro-1,1',3,3'-tetraethyl-benzimidazolyliocarboyanine Iodide)

CATALOG #: 1130-5

AMOUNT: 5 mg

STRUCTURE:



MOLECULAR FORMULA: C₂₅H₂₇Cl₄IN₄

MOLECULAR WEIGHT: 652.23

APPEARANCE: Brown-red solid

SOLUBILITY: Soluble in DMSO and DMF

PURITY: >98% by HPLC

STORAGE CONDITION: Store at -20°C, protected from light.

EXTINCTION COEFFICIENT: ε = 190,000 M⁻¹cm⁻¹ (505 nm; in MeOH)

APPLICATION:

JC-1 is a mitochondrial dye that stains mitochondria in living cells in a membrane potential-dependent fashion. JC-1 monomer is in equilibrium with so called J-aggregates, which are favored at higher mitochondrial membrane potential. The monomer JC-1 has green fluorescence ($\lambda_{em} = 527$ nm), while the J-aggregates have red fluorescence ($\lambda_{em} = 590$ nm). Therefore, it has been possible to use fluorescence ratioing technique to study mitochondrial membrane potential. JC-1 is particularly useful for apoptosis studies. In apoptotic cells, the dye stays in the cytoplasm and fluoresces green, while in healthy cells, the dye aggregates in the mitochondria and fluoresces red.

REFERENCES:

- Smiley, S.T., *et al.* (1991) *PNAS* **88**:3671.
- Reers, M., *et al.* (1991) *Biochemistry* **30**:4480.

FOR RESEARCH USE ONLY! Not to be used in humans!

SUGGESTED WORKING CONCENTRATIONS:

Table 1. JC-1 cell staining conditions.

Cell Type	Adherent or Dissociated	Incubation Conditions			Analysis Method
		Dye Concentration	Temperature	Time	
Neurons (rat) ¹	Adherent	2.0 µg/mL	37°C	20-30 min	Confocal microscope
Neurons (rat) ²	Adherent	1.0 µg/mL	37°C	20 min	Confocal microscope
Human diploid fibroblasts ³	Adherent	0.3 µg/mL	37°C	10 min	Confocal microscope
O-2A oligodendrocytes (rat) ⁴	Adherent	10 µg/mL	37°C	10 min	Wide-field microscope
PC12 ⁵	Adherent	10 µg/mL	37°C	10 min	Confocal microscope
Colo-205 ⁶	Dissociated	10 µg/mL	37°C	10 min	Flow cytometer
U937 ⁷	Dissociated	10 µg/mL	22°C	10 min	Flow cytometer
Cardiac myocytes (rat) ⁸	Dissociated	10 µg/mL	37°C	10 min	Wide-field microscope

1. *J Neurosci* 16, 5688 (1996); 2. *Neuron* 15, 961 (1995); 3. *Am J Physiol* 274, C615 (1998); 4. *J Physiol* 508, 413 (1998); 5. Neuronal precursor cell line, *J Neurosci* 18, 932 (1998); 6. Human colon adenocarcinoma, *J Cell Biol* 138, 449 (1997); 7. Human premonocytic cell line, *Proc Natl Acad Sci USA* 93, 6458 (1996), *Biochem Biophys Res Comm* 197, 40 (1993); 8. *J Physiol* 486, 1 (1995).

RELATED PRODUCTS:

- Apoptosis Detection Kits & Reagents
- Cell Fractionation System
- Cell Proliferation & Senescence
- Cell Damage & Repair
- Signal Transduction
- Adipocyte & Lipid Transfer
- Molecular Biology & Reporter Assays
- Growth Factors and Cytokines
- Monoclonal and Polyclonal Antibodies