

## Mitochondrial Membrane Potential Detection Kit (JC-1)

## Chemical Properties

CAS No. :

Formula:

Molecular Weight:

Storage: Keep away from direct sunlight

Store at -20°C

Actual storage temperature shall be subject to the COA.

## Biological Description

## Description

TargetMol's Mitochondrial Membrane Potential Detection Kit (JC-1) utilizes JC-1 as a fluorescent probe and is specifically designed for the rapid detection of dynamic changes in mitochondrial membrane potential ( $\Delta\Psi_m$ ). Mitochondrial membrane potential ( $\Delta\Psi_m$ ) refers to the electrical potential difference across the inner mitochondrial membrane. Its formation and maintenance are essential for mitochondrial energy metabolism, substance transport, and cell survival, making it a key indicator of mitochondrial function.

JC-1, formally known as 5,5',6,6'-tetrachloro-1,1',3,3'-tetraethylbenzimidazolylcarbocyanine iodide, is a lipophilic cationic fluorescent probe widely used for detecting mitochondrial membrane potential. It can freely penetrate cell membranes, and its aggregation state changes depending on the mitochondrial membrane potential. The detection principle is as follows:

When the mitochondrial membrane potential is high, JC-1 accumulates in the mitochondrial matrix driven by the transmembrane potential and forms aggregates (J-aggregates) due to the high local concentration. In this state, intermolecular interactions alter its fluorescence properties, and upon excitation, it emits red fluorescence (maximum excitation at 585 nm and emission at 590 nm).

When the mitochondrial membrane potential decreases (e.g., during early apoptosis), JC-1 cannot accumulate in the matrix and remains in its monomeric form. Upon excitation, it emits green fluorescence (maximum excitation at 514 nm and emission at 529 nm). By measuring the ratio of red to green fluorescence intensity in cells, changes in mitochondrial membrane potential can be quantitatively assessed, thereby reflecting cellular states such as apoptosis.

This kit is broadly applicable and compatible with various sample types, including cells, tissues, and isolated mitochondria. It is also suitable for multiple detection platforms, such as fluorescence microscopy, confocal laser scanning microscopy, fluorescence spectrophotometry, and flow cytometry.

**Inhibitor · Natural Compounds · Compound Libraries · Recombinant Proteins**

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