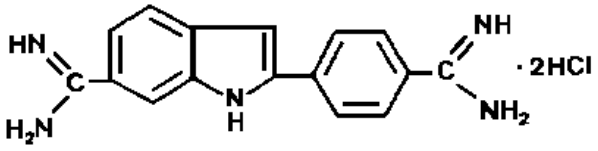
4',6-Diamidino-2-phenylindole • 2 HCl (DAPI) Cat. no. 18860



$C_{16}H_{15}N_5$ 2 HCl - MG 350.3

$C_{16}H_{15}N_5$ - MG 277.4 79.2%

Absorption maximum: 344 nm - Fluorescence maximum: 449 nm

Properties

DAPI was originally synthesized as a potential trypanocide by Dann and his colleagues (1) in 1971. Williamson and Fennell (2) later showed DAPI to be a fluorescent dye which selectively complexes with double-stranded (ds) DNA to give a product that fluoresces at 465 nm (approx. 20 times the fluorescence of the free heterocycle). DAPI has specific DNA-binding properties with preference for adenine-thymine (AT)-rich sequences (3).
DAPI forms fluorescent complexes with ds DNA but not with ds RNA and it forms a much weaker fluorescent complex with single-stranded DNA (4). This property was made use of, to develop staining procedures for the selective visualization of ds DNA on gels after electrophoresis (5).

Application

The property of DAPI as an AT-specific DNA ligand has been utilized to visualize yeast mitochondrial DNA (3), to visualize nucleotides of chloroplast DNA (6), to discriminate between living and dead Schistosoma mansoni (7), for detecting and identifying malarial infections (12) by fluorescence microscopy, for fluorometric assay of alkali-treated DNA in human epidermis (8), for the purification of mitochondrial DNA from Brassicae by CsCI-DAPI gradient centrifugation (9),for the cytofluorometric determination of nuclear DNA in living and preserved algae (10), for quantitating extremely low levels of DNA strand breaks and DNA superhelicity (11). The strong fluorescence of DAPI-DNA complexes has been employed for the quantitative determination of DNA per cell at the picogram level (13).
DAPI has been used for the detection of mycoplasmic contamination in cell cultures (4).
Cells grown on coverslips are treated with a solution of DAPI (0.1 µg/ml at 37 °C for 15 - 30 min, then examined in a fluorescence microscope.

Stability

Solutions of DAPI (solubility in water up to ca. 2.5%) can be stored at + 4 °C for weeks without being affected by microorganisms. Turbidity indicates the start of hydrolysis. Multivalent anions like sulfate or phosphate ions at high concentrations can precipitate the less soluble amidinium salts of these anions.

Literature

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SERVA Electrophoresis GmbH ● Carl-Benz-Str.7 ● D-69115 Heidelberg
Telefon: +49 6221 13840-0 ● E-Mail: info@serva.de ● Internet: www.serva.de