Revised: May 24, 2024

Product Information

DAPI

Cat. No.	Product	Unit Size	MW
40009	DAPI, dilactate	10 mg	457
40011	DAPI, dihydrochloride	10 mg	350
40043	DAPI, dilactate in H_2O, 10 mg/mL	1 mL	457

Storage and Handling

Store DAPI (solid form) desiccated at 4°C, protected from light. Store DAPI in H_2O at 4°C, protected from light. Product is stable for at least one year from date of receipt when stored as recommended.

Molecular Information

$C_{22}H_{27}N_5O_6$ (DAPI, dilactate)

$C_{16}H_{17}Cl_2N_5$ (DAPI, dihydrochloride)

CAS number

DAPI, dilactate: 28718-91-4

DAPI, dihydrochloride: 28718-90-3

Color and form: Yellow solid (40009, 40011); yellow liquid (40043)
Solubility: Soluble in water
Absorption/Emission: 352/464 nm (with DNA)

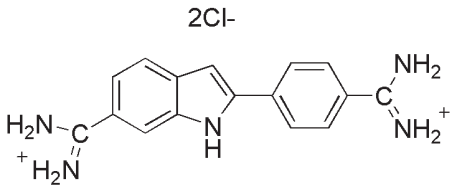

Figure 1. DAPI (4',6-Diamidino-2-Phenylindole), dihydrochloride

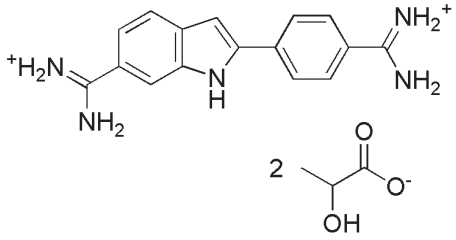

Figure 2. DAPI (4',6-Diamidino-2-Phenylindole), dilactate

Product Description

DAPI is a blue DNA dye that is widely used as a nuclear counterstain for fluorescence microscopy, chromosome staining, and flow cytometry. The dye binds to the minor groove of dsDNA with approximately 20-fold fluorescence enhancement, with higher affinity for A-T rich regions. Because of the potential toxicity of DAPI, we offer DAPI as a ready-to-use solution in water as a safer alternative to weighing out the solid form. DAPI dilactate solid is more water soluble than the dihydrochloride salt of the dye.

At typical staining concentrations (~1 ug/mL) DAPI is impermeant to live cells, but useful as a nuclear counterstain in fixed cells or tissue sections. For live cell staining, we recommend using Hoechst cell-permeant blue DNA dyes (see Related Products).

DAPI and Hoechst have been shown to undergo UV-induced photoconversion, which causes fluorescence in both the blue channel and the FITC or Cy®3 channels. This could interfere with the imaging of other fluorescent probes or labeled antibodies. Biotium's NucSpot® Nuclear Stains (see Related Products) were designed as a convenient alternative to DAPI or Hoechst by offering nuclear-specific staining in 9 different colors, from green to near-IR, for flexible multiplexing.

References

1) Biochemistry 31, 3103 (1992); 2) Biochem Biophys Res Commun 170, 270 (1990); 3) J. Histochem Cytochem 38, 1323 (1990); 4) Methods Enzyme 168, 741 (1989); 5) Biochemistry 26, 4545 (1987); Biotechnic Histochem 70, 220 (1995).

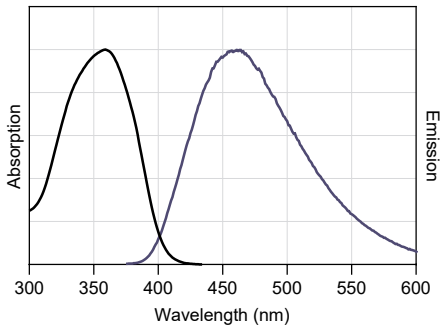

Figure 3. Normalized excitation and emission spectra of DAPI with DNA.

Staining Protocols

Staining of fixed cells or tissue sections

1 Dilute DAPI to 1 ug/mL in PBS. DAPI can be included together with antibodies or other probes, and can be diluted in buffers with detergent or blocking agents if convenient.

2 Add the staining solution to cells or tissue sections and incubate at room temperature for at least 5 minutes.

3 Image the samples with UV (355 nm) excitation in the DAPI channel.

Notes:

a. Samples can be stored at 4°C after staining and before imaging.

b. DAPI can be included directly in antifade mounting medium for one-step mounting and staining (see Biotium's EverBrite Mounting Media with DAPI under Related Products). When using DAPI in mounting medium, longer incubation times may be required for DAPI to completely penetrate the cell nuclei.

Staining bacteria or yeast

In bacteria, DAPI staining is dim compared to what is observed in mammalian cells. Live or killed bacteria can be stained with 10 ug/mL DAPI in PBS or 150 mM NaCl for 30 minutes at room temperature. DAPI tends to stain dead cells more brightly than live cells.

In *S. cerevisiae*, DAPI preferentially stains dead yeast with nuclear and cytoplasmic staining when used at 10 ug/mL in PBS; in live yeast DAPI shows dim mitochondrial staining.

Related Products

Cat. No.	Product
40083... 41040	NucSpot® Nuclear Stains
40044	Hoechst 33258, 10 mg/mL in H_2O
40045	Hoechst 33258, pentahydrate
40046	Hoechst 33342, 10 mg/mL in H_2O
40047	Hoechst 33342, trihydrochloride trihydrate
40081	NucSpot® Live 488
40082	NucSpot® Live 650
40085	NucSpot® Far-Red
40060	RedDot™1 Far-Red Nuclear Stain
40061	RedDot™2 Far-Red Nuclear Stain
40084	7-AAD Solution, 1 mg/mL
40048	Propidium Iodide in Buffer, 50 ug/mL
23001	EverBrite™ Mounting Medium
23002	EverBrite™ Mounting Medium with DAPI
23003	EverBrite™ Hardset Mounting Medium
23004	EverBrite™ Hardset Mounting Medium with DAPI
23008	Drop-n-Stain EverBrite™ Mounting Medium
23009	Drop-n-Stain EverBrite™ Mounting Medium with DAPI
23016	EverBrite™ Hardset Mounting Medium with NucSpot® 640
30068	ViaFluor® 405 SE Cell Proliferation Kit
30086	ViaFluor® 488 SE Cell Proliferation Kit
70065	LipidSpot™ 488 Lipid Droplet Stain
70069	LipidSpot™ 610 Lipid Droplet Stain
70066	LysoView™ 405 Lysosome Stain
70067	LysoView™ 488 Lysosome Stain
70061	LysoView™ 540 Lysosome Stain
70058	LysoView™ 633 Lysosome Stain
70059	LysoView™ 650 Lysosome Stain
70070	MitoView™ 405 Mitochondrial Stain
70054	MitoView™ Green Mitochondrial Stain
70055	MitoView™ 633 Mitochondrial Stain
70075	MitoView™ 650 Mitochondrial Stain
70068	MitoView™ 720 Mitochondrial Stain
70064	ViaFluor® 405 Live Cell Microtubule Stain
70062	ViaFluor® 488 Live Cell Microtubule Stain
70063	ViaFluor® 647 Live Cell Microtubule Stain
30090	CellBrite® Fix 488 Membrane Stain
30088	CellBrite® Fix 555 Membrane Stain
30089	CellBrite® Fix 640 Membrane Stain
30092-30099	MemBrite® Fix Cell Surface Staining Kits
22023	Paraformaldehyde, 4% in PBS, Ready-to-Use Fixative

Please visit our website at www.biotium.com for information on our life science research products, including novel live cell stains for nuclei, mitochondria, and other organelles, fluorescent CF® Dye antibody conjugates and reactive dyes, apoptosis reagents, fluorescent probes, and kits for cell biology research.