
SYTO9

Cat. No.: S1508862 | Pack size: 1 mg, 5 mg | Storage: Protected from light, Store at -20°C, Desiccated

Overview

SYTO 9 is a cell-permeable fluorescent dye that binds nucleic acids and emits bright green fluorescence. It exhibits excellent cell permeability, and its quantum yield increases dramatically upon binding to nucleic acids. SYTO 9 is compatible with fluorescence microscopy, flow cytometry, PCR and other assays. Featuring low PCR inhibition, high signal-to-noise ratio and superior sensitivity, it serves as an ideal alternative to SYBR Green I. Our SYTO 9 green fluorescent nucleic acid dye is supplied as high-purity powder. Users can prepare working solutions at custom concentrations for flexible operation and broad application scope.

Product Applications

This product is a research reagent widely used in cell biology, molecular biology, pharmacology and other scientific research fields. It is strictly prohibited for human clinical use. As a green fluorescent nucleic acid stain, SYTO 9 can be applied in the following scenarios: 1. Cell staining: SYTO 9 possesses membrane permeability, readily penetrating the membranes of prokaryotic and eukaryotic cells. It broadly binds DNA and RNA within the nucleus, cytoplasm and mitochondria, generating intense green fluorescence.

2. Live/dead bacterial staining: SYTO 9 is commonly combined with propidium iodide (PI) to distinguish live and dead bacteria, enabling evaluation of bacterial viability or the antibacterial effects of compounds.

3. RT-PCR, DNA melting curve analysis and Loop-Mediated Isothermal Amplification (LAMP): As a sensitive DNA-binding dye, SYTO 9 can replace SYBR Green I for PCR-based amplification experiments such as RT-PCR.

Protocols (Adapted from published literature for reference only)

1. Stock Solution Preparation

Take 1 mg powder as an example: add 655 μ L DMSO and dissolve completely to prepare a 5 mM stock solution. Aliquot the finished stock, store at -20 °C protected from light, and it remains stable for 1 year.

2. Recommended Staining Concentrations & Incubation Conditions

Staining parameters of SYTO 9 vary across sample types. Recommended protocols are listed in Table 1.

Table 1 Recommended working concentrations and incubation conditions of SYTO 9 for different cell samples

Cell Type	SYTO 9 Concentration	Incubation Conditions
Bacteria	50 nM ~ 20 μ M	Vortex thoroughly, incubate for 1–30 min
Eukaryotic cells	10 nM ~ 5 μ M	Incubate for 10–120 min
Microarray	50 nM in TE buffer	Incubate for 5 min, wash and air-dry afterward

3. Cell Staining

- (1) Prepare working solution: Dilute the 5 mM stock solution to the target concentration with PBS or cell culture medium (refer to Table 1 for parameters).
- (2) Harvest cells and rinse 1–2 times with PBS or culture medium.
- (3) Add an appropriate volume of SYTO 9 staining working solution (adjust concentration and incubation time per Table 1).
- (4) Incubate in the dark, then perform fluorescence detection (Ex/Em: ~485/498 nm) or microscopic observation directly.

4. Live/Dead Bacterial Staining

- (1) Prepare mixed working solution: Dilute SYTO 9 and PI to final concentrations of 33.4 μ M and 400 μ M, respectively.
- (2) Collect 1 mL bacterial suspension by centrifugation, then resuspend the pellet in PBS.
- (3) Add 50 μ L each of SYTO 9 and PI working solution to reach final concentrations of 1.67 μ M (SYTO 9) and 20 μ M (PI).
- (4) Incubate for 15 min at room temperature in the dark, then immediately analyze via fluorescence microscopy or flow cytometry.

5. RT-PCR and DNA Melting Curve Analysis

- (1) Prepare standard qPCR reaction mixture containing primers, template, dNTPs, Taq DNA polymerase and buffer.
- (2) Add SYTO 9 to a final concentration of 2 μ M (optimization is recommended).
- (3) Perform PCR amplification, and collect fluorescence signals during the extension step.
- (4) Run melting curve program after amplification (e.g., 60–95 °C, signal acquisition every 0.5 °C) to analyze T_m values.

6. Loop-Mediated Isothermal Amplification (LAMP)

- (1) Prepare LAMP reaction mixture containing primers, strand-displacement DNA polymerase, dNTPs, template and buffer.
- (2) Add SYTO 9 to a final concentration of 0.5–10 μ M.

(3) Carry out isothermal reaction at constant temperature (e.g., 63–65 °C) for 60 min, collect fluorescence signals every 30–60 s (Ex/Em = 485/498 nm).

(4) Judge amplification results based on fluorescence curves: positive samples generate characteristic S-shaped curves.

Solution Preparation

Stock Solution Preparation	Mass			
	Solvent Volume			
	Concentration	1 mg	5 mg	10 mg
	1 mM	2.1712 mL	10.8561 mL	21.7122 mL
	5 mM	0.4342 mL	2.1712 mL	4.3424 mL
	10 mM	0.2171 mL	1.0856 mL	2.1712 mL

Important Notes

- After initial opening, aliquot the reagent into PP/PE tubes according to single-use volume, store at –20 °C protected from light, and avoid repeated freeze-thaw cycles. If the remaining volume is low before use, perform a brief quick spin for several seconds to fully settle the liquid.
- SYTO 9 readily adsorbs to glass surfaces; use plastic (PP/PE) labware throughout the experiment and avoid glass containers.
- Phosphate-free buffers are recommended for optimal staining performance.
- Keep away from fluorescence quenchers: azides, EDTA at concentrations above 10 mM, and thiol-containing buffers (e.g., DTT, β-mercaptoethanol).
- Rinse labware sequentially with mild detergent, hot tap water, and deionized water several times to thoroughly eliminate residual fluorescent background contaminants.
- This product is non-sterile. For sterile experiments such as cell culture, pre-sterilize the reagent via filtration through a 0.22 μm membrane to prevent contamination.
- Wear a lab coat and disposable gloves during operation for personal safety and health protection.
- Our company only provides partial information for some products and does not warrant the authority of the provided data. All data above are for reference and research communication only.

Specifications

Item	Information
Synonyms	SYTO 9 Nucleic Acid Dyes SYTO 9 Green dye SYTO9 Green nucleic acid stain SYTO 9 Green
Molecular Weight	460.57

Item	Information
Solubility	DMSO: >1.527 mg/mL (5 mM); insoluble in water
Specifications & Purity	BioReagent, ≥98%(HPLC)
Stability And Storage	Store at -20°C long term (36 months). Store in the dark. Desiccated.
Storage	Protected from light, Store at -20°C, Desiccated
Shipped In	Ice chest + Ice pads. This product requires cold chain shipping. Ground and other economy services are not available.
Purity	≥98%(HPLC)

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Limitations & Disclaimer

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