
Ready-to-use SYTOGreen 9 Live Cell Nucleic Acid Stain (5 mM)

Cat. No.: R1511488 | Pack size: 100 µL | Storage: Protected from light, Store at -20°C

Overview

Ready-to-use SYTOGreen 9 Nucleic Acid Stain is a ready-to-use, membrane-permeable green fluorescent nucleic acid dye that requires no DMSO solubilization or concentration calibration, specially designed for nucleic acid visualization in prokaryotes and eukaryotes. Core Principle: The dye molecules can penetrate intact cell membranes into viable cells and intercalate specifically with DNA/RNA, resulting in a significant enhancement of fluorescent signal (quantum yield <0.01 in the unbound state, increased to over 0.4 in the bound state). The nucleic acid content and biological activity in samples can be directly reflected by the fluorescence intensity. It features excellent optical properties with an excitation maximum at 485 nm and an emission maximum at 498 nm, matching the FITC channel of conventional fluorescence detection equipment, and its fluorescence intensity has a linear correlation with nucleic acid content. Compatible with flow cytometry, fluorescence microscopy, microplate readers and other platforms, it enables one-stop nucleic acid visualization applications such as microbial viability discrimination, real-time live cell imaging and proliferation monitoring.

In life science research and industrial testing, the core demand is to obtain nucleic acid and biological activity information rapidly, accurately and conveniently, which is effectively addressed by the launch of Ready-to-use SYTOGreen 9. Its ready-to-use property greatly shortens experimental preparation time; with the advantages of low toxicity and strong fluorescent activity, it achieves both viable cell protection and high-sensitivity detection; its compatibility with a variety of experimental technologies breaks the barrier of dye replacement in different scenarios. In the field of microbiology, its unique membrane-permeable property allows it to be used in combination with Propidium Iodide (PI) for rapid discrimination of viable and dead bacteria in food and water samples, replacing time-consuming culture methods. In cell biology, it provides a stable fluorescent labeling tool for dynamic monitoring of live cells, serving as a key reagent to upgrade nucleic acid detection towards high efficiency, convenience and universal applicability. For in vitro research use only. Not for clinical diagnosis or treatment.

Note: Performance equivalent to Thermo Fisher SYTO® 9-Fluorescent Nucleic Acid Stain (S34854). SYTO® is a trademark and registered trademark of Thermo Fisher.

Application Scope

1. Microbiology Applications: Viability discrimination of Gram-positive/Gram-negative bacteria, fungal activity detection, rapid screening of microbial contamination in water/food, quantification of viable bacteria in biofilms;
2. Cell Biology Applications: Fluorescent imaging of mammalian live cells, dynamic monitoring of cell proliferation and apoptosis, tracking of nucleic acid content during stem cell differentiation, evaluation of drug effects on cell metabolism;
3. Industrial Quality Control Applications: Monitoring of microbial activity in fermentation broth, rapid detection of microbial limits in cosmetics/pharmaceuticals, screening of pathogenic microorganisms in environmental samples.

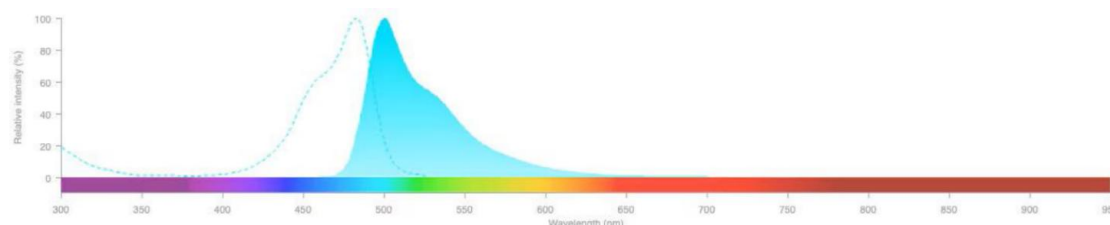
Product Features

1. Significant fluorescent signal enhancement: Over 40-fold fluorescence enhancement upon nucleic acid binding, molar extinction coefficient $>60,000 \text{ cm}^{-1}\text{M}^{-1}$;
2. Low cytotoxicity: No impact on cell activity at low concentrations, suitable for long-term dynamic observation of living samples;
3. Wide applicability: Compatible with various detection equipment including flow cytometers and fluorescence microscopes, no exclusive instrument required;
4. Excellent combinatorial compatibility: Can be efficiently combined with membrane-impermeable dyes such as PI to achieve accurate discrimination of live/dead cells (bacteria) without signal crosstalk;
5. Simple and efficient operation: No fixation, membrane lysis or washing steps required; direct incubation for 15-20 min before loading, greatly shortening the experimental cycle.

Product Parameters

1. Ex/Em upon DNA binding: 485/498 nm.
2. Ex/Em upon RNA binding: 486/501 nm.

Spectral Characteristics (Absorption/Emission Spectrum of SYTO9-DNA Complex)



Product Components

Component	Specification (100 Tests)
Ready-to-use SYTOGreen 9 Nucleic Acid Stain (5 mM)	100 μ L

Note: The number of uses is calculated based on bacterial staining with 1 mL staining solution at a concentration of 5 μ M.

Precautions

1. Protect from light and avoid repeated freeze-thaw: Aliquot into single-use volumes upon first opening and store at $-20\text{ }^{\circ}\text{C}$ in the dark.
2. Centrifuge before use if volume is low: For small remaining volumes, brief centrifugation for a few seconds before use is recommended to ensure complete sedimentation of the solution prior to pipetting.
3. Dilute in plastic containers: The dye is prone to adsorption to glass containers; use PP/PE tubes throughout the process.
4. Avoid quenchers: Do not use buffers containing azides, EDTA $>10\text{ mM}$ or thiols; phosphate-free buffers are preferred.
5. Limit detergent concentration: Final concentration of SDS/Triton X-100 $\leq 0.1\%$; avoid concentrations $>0.5\%$ which may damage the dye structure.
6. Clean vessels thoroughly: Rinse several times with mild detergent \rightarrow hot water \rightarrow deionized water to eliminate residual fluorescent background.
7. Avoid strong light during operation: Protect from natural light and strong LED light during solution preparation, staining and storage to ensure stable signal.
8. This product is for research use only and shall not be stored in ordinary residential premises.

9. For your safety and health, comply with the general laboratory safety regulations of your institution.

Instructions for Use

1. When staining eukaryotic cells with SYTOGreen 9, in addition to nuclear staining, the cytoplasm usually shows a diffuse labeling signal, and nucleoli exhibit a strong fluorescent labeling effect.
2. SYTOGreen 9 is membrane-permeable and carries a net positive charge under neutral pH conditions, which may result in mitochondrial staining. For example, staining of viable yeast cells primarily labels mitochondria within the cells.
3. This product is a 5 mM DMSO solution; dilute to the working concentration with an appropriate buffer and incubate for staining before use.
4. The staining concentration and incubation time of SYTOGreen 9 are recommended to be adjusted according to different sample types. Recommended staining conditions:

Sample Type	SYTOGreen 9 Staining Concentration	Staining Conditions
Bacteria	50 nM-20 μ M	Incubation: 1 min-30 min
Eukaryotic Cells	10 nM-5 μ M	Incubation: 10 min-120 min
Microarray	50 nM (in TE buffer)	Incubation: 5 min, rinse and air-dry

Frequently Asked Questions (FAQs)

1. Q: What is the difference between SYTOGreen 9 and the commonly used DAPI and Hoechst33342?

A: SYTOGreen 9 has stronger membrane permeability and wider sample applicability (especially for bacteria), and is compatible with multiple detection platforms. In contrast, DAPI and Hoechst33342 focus on specific DNA binding with low background, making them more suitable for nuclear staining of eukaryotic cells or analysis of fixed samples.

Comparison Index	SYTOGreen 9	DAPI	Hoechst33342
Staining Specificity	Binds DNA and RNA without sequence preference	Specifically binds to AT-rich regions of DNA (no RNA binding)	Specifically binds to AT-rich regions of DNA (no RNA binding)

Comparison Index	SYTOGreen 9	DAPI	Hoechst33342
Membrane Permeability	Penetrates viable/dead bacteria and eukaryotic cells, no membrane lysis required	Poor permeability to live eukaryotic cells (fixation + membrane lysis mostly required); bacterial permeabilization needed	Penetrates live eukaryotic cells, weak permeability to bacteria
Excitation Light & Fluorescence Intensity	Blue light excitation, ~40-fold fluorescence enhancement upon nucleic acid binding	UV light excitation, ~20-fold fluorescence enhancement upon nucleic acid binding	UV light excitation, ~10-fold fluorescence enhancement upon nucleic acid binding
Cytotoxicity	No impact on cell activity at low concentrations, suitable for long-term observation of living samples	UV excitation + inherent dye toxicity, not suitable for long-term culture of living samples	Lower toxicity than DAPI, applicable for live cell staining but concentration needs to be controlled
Applicable Sample Types	Bacteria, fungi, yeast, animal and plant cells (viable/fixated)	Fixed cells, tissue sections, nuclear staining (bacterial permeabilization needed)	Viable/fixated eukaryotic cells, nuclear staining (rarely used for bacteria)

2. Q: Why is the staining effect of SYTOGreen 9 significantly different for various bacteria?

A: The differential staining effect on various bacteria is affected by multiple factors, the main ones being as follows: Gram-negative bacteria usually show weaker staining than Gram-positive bacteria due to the outer membrane barrier of bacterial cells; the growth state and phase of bacteria also have a significant impact, with the best staining effect observed in logarithmic-phase bacteria; the optimal dye concentration varies among different bacterial strains.

Specifications

Attribute	Value
Synonyms	Ready-to-use SYTOGreen 9 Live Cell Nucleic Acid Stain
Specifications & Purity	BioReagent, ready-to-use, Biological Stain, for fluorescence analysis, for microscopy, sterile, 5 mM
Stability And Storage	Store at -20°C long term (12 months). Store in the dark.
Storage Conditions	Protected from light, Store at -20°C

Attribute	Value
Shipped In	Ice chest + Ice pads This product requires cold chain shipping. Ground and other economy services are not available.

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Whether you have a technical question, need help with a quotation, or want to inquire about an order, our regional teams are ready to assist. Please contact the office for your region; for general inquiries, the North American office is the corporate primary.

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Limitations & Disclaimer

- For Research Use Only (RUO). Not for use in human or animal diagnostics, therapeutics, or in vivo applications. Not for food, cosmetic, or household use.
- This product is not a CE-marked in vitro diagnostic device under IVDR (EU) 2017/746 and is not an FDA-cleared device under 21 CFR. Use is restricted to verified businesses, institutions, and qualified professionals for research and development purposes.
- Where any kit component is classified as hazardous under CLP (EC) 1272/2008 or OSHA HCS (29 CFR 1910.1200), the product Safety Data Sheet (SDS) takes precedence over this document for handling, storage, and disposal information.
- Performance depends on sample type, sample condition, handling, and operator technique. Users are responsible for validating the kit for their specific application.
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