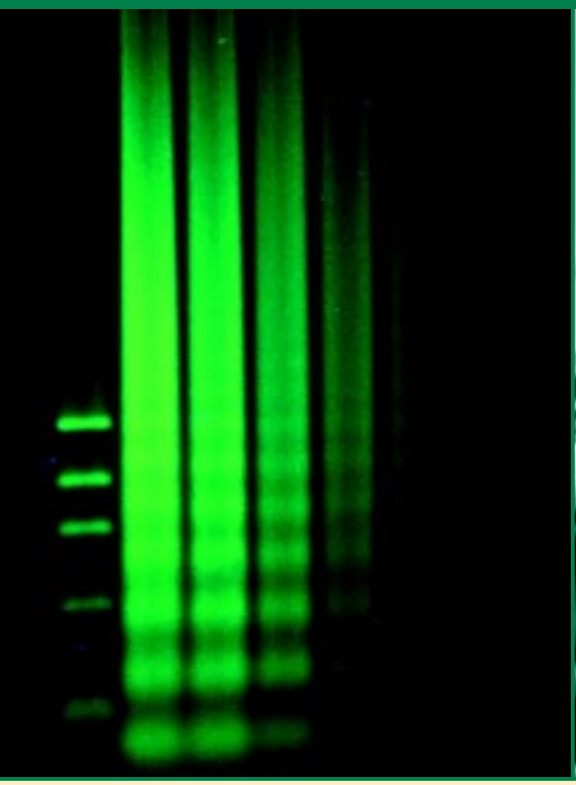
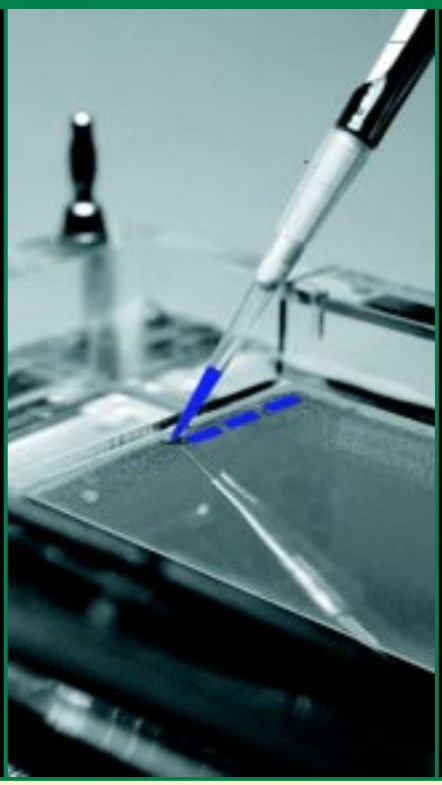
SYBR® Green I

Nucleic Acid Gel Stain

Sensitive fluorescent stain for detecting dsDNA





SENSITIVE	Detect as little as 20 pg dsDNA per band
HIGH CONTRAST	Bright green fluorescence with exceptionally low background
EASY TO USE	No destaining or washing steps
VERSATILE	Can be used with many different electrophoresis platforms
CONVENIENT	Staining does not interfere with DNA modification enzymes
ECONOMICAL	Less expensive than silver staining

Molecular Probes®

Technical Information

SYBR Green I nucleic acid gel stain is ideal for detecting double-stranded DNA (dsDNA) in electrophoretic gels using laser scanners, CCD-based image documentation systems or standard Polaroid® photography. Following electrophoresis, gels are simply stained in buffered dye solution. No destaining or wash steps are required.

SYBR Green I gel stain is a proprietary unsymmetrical cyanine dye that has proven exceptionally useful for assays requiring sensitive nucleic acid detection.[1,2] SYBR Green I stain binds to dsDNA with an 800- to 1000-fold fluorescence enhancement and high quantum yield (0.8). Gels stained with SYBR Green I dye have bright green fluorescent DNA bands and very low background fluorescence. The dsDNA-bound dye is efficiently excited at ~488 nm and ~254 nm, making it especially useful with argon-ion lasers, as well as with short-wavelength UV light sources.

SYBR Green I stain is extremely versatile and easy to use. It is compatible with many different electrophoresis platforms, including native and denaturing agarose [1] and polyacrylamide gel electrophoresis,[2] pulsed field gel electrophoresis [3] and capillary electrophoresis.[4,5] SYBR Green I stain has an exceptionally high affinity for dsDNA, making it possible to stain dsDNA prior to electrophoresis. Furthermore, SYBR Green I stain does not interfere with many enzymes used in molecular biology, including *Taq* DNA polymerase, reverse transcriptase, restriction endonucleases, and T4 DNA ligase. Finally, SYBR Green I stain has been shown to be much less mutagenic than ethidium bromide in Ames tests.

References

1. Biotechnol Intl 1, 267 (1997); **2**. Biomed Products 19, 68 (1994); **3**. Nucleic Acids Res 25, 2945 (1997); **4**. Clinical Chem 43, 2 (1997); **5**. BioTechniques 23, 58 (1997); **6.** J Virol Meth 55, 153 (1995); **7**. PCR Meth Appl 4, 234 (1995); **8**. BioTechniques 22, 1107 (1997); **9**. BioTechniques 19, 223 (1995); **10**. BioTechniques 22, 976 (1997); **11**. Nature Biotech 16, 91 (1998); **12**. Biochim Biophys Acta 1360, 193 (1997); **13**. Proc Natl Acad Sci USA 94, 12419 (1997); **14**. Meth Cell Sci 17, 1 (1995); **15**. BioTechniques 23, 1029 (1997); **16**. BioTechniques 24, 954 (1998); **17**. BioTechniques 22, 130 (1997); **18**. Anal Biochem 245, 154 (1997); **19**. BioTechniques 22, 176 (1997); **20**. FASEB J 9, A1400 (1995); **21**. Anal Biochem 255, 274 (1998).

Materials Supplied

SYBR Green I stain is supplied as a 10,000X concentrate in anhydrous DMSO. One mL of reagent is sufficient to stain at least 100 minigels. Our SYBR Green Nucleic Acid Gel Stain Starter Kit provides an economical method for first-time users to try SYBR Green gel stains. The kit includes samples of SYBR Green I and II stains and the SYBR Green/Gold gel stain photographic filter.

Ordering Information

S-7563	SYBR® Green I nucleic acid gel stain *10,000X concentrate in DMSO*	500 µL
S-7567	SYBR® Green I nucleic acid gel stain *10,000X concentrate in DMSO*	1 mL
S-7585	SYBR® Green I nucleic acid gel stain *10,000X concentrate in DMSO*	20x50 µL
S-7580	SYBR® Green Nucleic Acid Gel Stain Starter Kit	
S-7569	SYBR® Green/Gold gel stain photographic filter	

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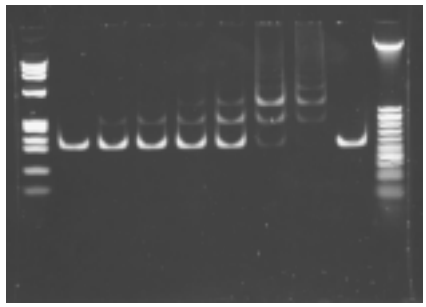

Figure 1. *Bandshift assay using SYBR Green I gel stain. Samples containing 50 ng of a 208 bp DNA fragment and varying amounts of a mutant enzyme (EcoRI/Gln 111) were electrophoresed on a native polyacrylamide gel and stained with SYBR Green I stain. Lanes 1 and 10 contain size markers; lanes 2 through 9 contain 0, 0.05, 0.1, 0.2, 0.4, 0.6, 0.8 and 0 µM EcoRI/Gln 111.*

SYBR Green I stain lets you:

Detect rare PCR products

The superior sensitivity of SYBR Green I stain makes it possible to detect rare amplicons,[6] reduce cycle numbers for PCR and RT PCR and accurately quantitate low numbers of PCR products made during the linear portion of the reaction, facilitating high throughput and competitive PCR analysis.[7,8]

Save money on DNA typing

SYBR Green I stain is a sensitive as silver staining—but less expensive—for human identity determination,[9,10] CAG repeat detection [11] and mtDNA deletion analysis.[12]

Use fewer cells to visualize apoptosis ladders

SYBR Green I stain gives brighter signals and lower background than ethidium bromide, making it possible to visualize DNA ladders from fewer apoptotic cells.[13] (see left image, front)

Perform more sensitive telomerase activity assays

SYBR Green I stain is more sensitive than silver staining for gel-based detection of telomerase activity, allowing simultaneous, non-isotopic measurement of both enzyme activity and processivity.[14,15]

Eliminate radioactivity in DNA damage assays

SYBR Green I stain is as sensitive as ^{3}H-labeled thymidine for detecting DNA damage.[3]

Perform real-time or kinetic PCR analysis

The presence of SYBR Green I stain during PCR does not interfere with *Taq* polymerase or reverse transcriptase, and primers contribute little to the signal, allowing amplification to be monitored in real time.[16-19]

Detect lower amounts of contaminating DNase

SYBR Green I stain is at least ten times more sensitive than ethidium bromide for detecting DNase activity using gel-based [20] or radial diffusion assays.[21]

Detect dsDNA using capillary electrophoresis

The high affinity for dsDNA and the excellent signal to background ratio make SYBR Green I stain the dye of choice for capillary electrophoresis studies.[4,5]