

# GelRed® and GelGreen®

## Safe and sensitive nucleic acid gel stains

### The most safe and sensitive nucleic acid gel stains

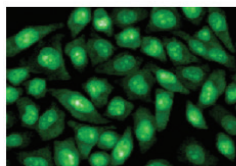
GelRed® and GelGreen® are safe (cell membrane impermeable) nucleic acid gel stains designed to replace highly toxic ethidium bromide (EtBr) and other so-called safe gel stains. Ames tests have confirmed that GelRed® and GelGreen® are nonmutagenic at concentrations well above the concentrations used for gel staining. Furthermore, environmental safety tests showed that GelRed® and GelGreen® are non-toxic to aquatic life, permitting disposal down the drain or in regular trash.

For more information and references, download our white paper, Comparison of Nucleic Acid Gel Stains: Cell Permeability, Safety, and Sensitivity and the complete Safety Report of GelRed® and GelGreen® at [www.biotium.com](http://www.biotium.com).

### Dye Advantages

- Safer than EtBr and other so-called safe gel stain
- Easy disposal
- Superior sensitivity
- Extremely stable
- Simple to use
- Compatible with downstream applications (cloning, etc)

SYBR® Safe



GelRed®

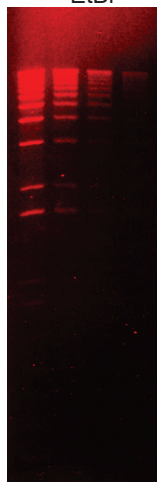


GelGreen®

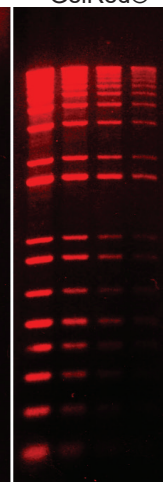


Figure 1. GelRed® and GelGreen® gel stains are safer because they cannot penetrate cell membranes to bind DNA in living cells. HeLa cells were incubated with 1X SYBR® Safe, GelGreen® or GelRed®, respectively. Images were taken following incubation with dye for 30 min using FITC filter set for SYBR® Safe and GelGreen®, and Cy®3 filter set for GelRed®. SYBR® Safe rapidly entered cells and stained nuclei. GelRed® and GelGreen® were unable to cross cell membranes, demonstrated by the absence of fluorescence staining.

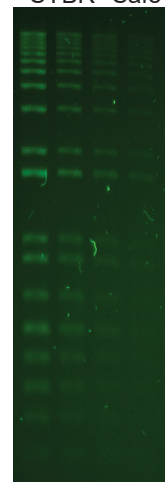
EtBr



GelRed®



SYBR® Safe



GelGreen®

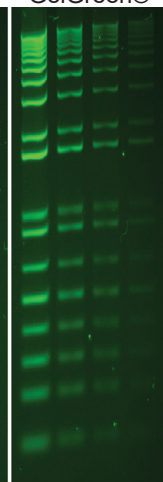


Figure 2. GelRed® and GelGreen® are more sensitive than EtBr and SYBR® Safe. Left: Comparison of GelRed® and ethidium bromide (EtBr) in precast gel staining using 1% agarose gel in TBE buffer. Right: Comparison of GelGreen® and SYBR® Safe in post gel staining using 1% agarose gel in TBE buffer.

### Ordering Information

Cat. #	Product Name
41003-T	GelRed® Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41003	GelRed® Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41003-1	GelRed® Nucleic Acid Gel Stain; 10,000X in water, 10 mL
41002	GelRed® Nucleic Acid Gel Stain; 10,000X in DMSO, 0.5 mL
41002-1	GelRed® Nucleic Acid Gel Stain; 10,000X in DMSO, 10 mL
41001	GelRed® Nucleic Acid Gel Stain; 3X in water, 4 L
41005-T	GelGreen® Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41005	GelGreen® Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41005-1	GelGreen® Nucleic Acid Gel Stain; 10,000X in water, 10 mL
41004	GelGreen® Nucleic Acid Gel Stain; 10,000X in DMSO, 0.5 mL

# PAGE GelRed®

Nucleic acid gel stain for polyacrylamide gels

## The safety and sensitivity of GelRed® now for PAGE gels

A fundamental approach for making a gel stain safe is to minimize the chance for the dye to interact with genomic DNA in living cells. In the design of the original GelRed® and GelGreen® dyes, we achieved the dyes' membrane impermeability mainly by making the dyes physically large. While this produced exceptional gel staining sensitivity for agarose gels, the relatively large sizes of GelRed® and GelGreen® make the dyes difficult to penetrate into the more densely packed polyacrylamide gels, rendering the dyes less optimal for PAGE gel staining. In designing PAGE GelRed® dye, we used a novel approach to make the dye membrane impermeable without making the dye large. Importantly, the new design strategy still ensures that the PAGE GelRed® dye possess essential properties for gel staining, including good sensitivity, stability and compatibility with existing instruments and downstream sample analysis.

## Safer gel stain designed for use in polyacrylamide gels

- Formulated in water and impermeable to latex and nitrile gloves
- Non-toxic and non-mutagenic in AMES test
- Non-toxic to aquatic life, okay for drain disposal by EPA Title 22 hazardous waste test

PAGE GelRed®

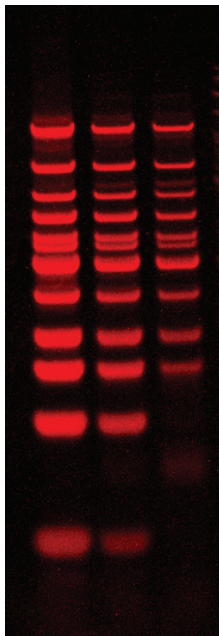
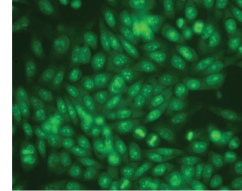


Figure 1. NEB low molecular weight ladder was separated on a 10% acrylamide TBE gel and stained with 1X PAGE GelRed® in water for 30 minutes.

SYBR® Safe



PAGE GelRed®

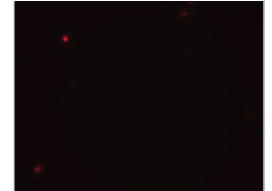


Figure 2. PAGE GelRed® gel stain is safer because it cannot penetrate cell membranes to bind DNA in living cells. HeLa cells were incubated with 1X SYBR Safe or 1X PAGE GelRed®. SYBR® Safe rapidly penetrated cell membranes as evident from the bright green staining of nuclei and cytoplasm. However, PAGE GelRed® was unable to cross cell membranes, as shown by the absence of fluorescence staining in healthy cells.

## Ordering Information

Cat. #	Product Name
41008-T	PAGE GelRed® Nucleic Acid Gel Stain; 10,000X in water, 0.1 mL
41008-500uL	PAGE GelRed® Nucleic Acid Gel Stain; 10,000X in water, 0.5 mL
41014	PAGE GelRed® Nucleic Acid Gel Stain; 1X in water, 4 L