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GelGreen® Nucleic Acid Gel Stain

GelGreen® is a sensitive, non-mutagenic and environmentally safer green fluorescent DNA gel stain.



Product attributes

Format	10,000X in water, 10,000X in DMSO
Assay type/options	DNA/RNA gel staining

Product Description

GelGreen® is a highly sensitive, non-toxic green fluorescent nucleic acid dye designed for staining DNA in agarose gels.

- Non-mutagenic, for safer handling and easy disposal
- Much more sensitive than EtBr, SYBR® Safe, and others
- Extremely stable for storage at room temperature & microwaving in agarose
- Simple precast or post-electrophoresis gel staining
- Use with UV transilluminator or blue light gel reader
- Compatible with downstream gel purification, restriction digest, sequencing and cloning

GelGreen®: A Superior Green Fluorescent DNA Gel Stain

GelGreen® is far more sensitive than SYBR® Safe. Unlike SYBR® dyes, which are known to be unstable, GelGreen® is very stable, both hydrolytically and thermally. GelGreen® is compatible with a 254 nm UV transilluminator, and can be imaged using a SYBR® Green or GelStar® filter. It also can be used with visible blue light excitation imagers (blue LED light box or Dark Reader®). With blue light illuminators, researchers can avoid exposure to UV irradiation for themselves and their DNA samples, for a safer work environment and higher cloning efficiency.

Non-Mutagenic and Safer for the Environment

A series of safety tests have confirmed that GelGreen® is noncytotoxic, nonmutagenic and nonhazardous at concentrations above those used for gel staining. As a result, working strength GelGreen® can be safely disposed of down the drain or in regular trash, providing convenience and reducing cost in waste disposal. For detailed test results, you may download a complete GelRed®/GelGreen® Safety Report.

How Safe is Your Gel Stain?

Many so-called “safe” DNA dyes like SYBR® Safe, Midori Green, GreenSafe, SafeView™, and RedSafe™ not only have low sensitivity, but also readily penetrate living cells to bind DNA, and some are cytotoxic. Unlike these dyes, GelGreen® is cell membrane-impermeant, so it cannot enter living cells to interact with their DNA. See our Gel Stains Comparison Flyer or Gel Stains Comparison White Paper for details.

Your Top GelRed® and GelGreen® Questions Answered

Choose the Right Stain for Your Application

For new users, we recommend GelGreen® 10,000X in water (catalog no. 41005), our latest formulation that eliminates the hazards of handling DMSO for better safety. We continue to offer GelGreen® 10,000X solution in DMSO for established users who do not wish to change their existing laboratory protocols. We also offer GelGreen® Agarose for convenient and safer preparation of precast gels. Also see GelRed® Nucleic Acid Gel Stain, our safer replacement for ethidium bromide. GelGreen® can be used to stain ssDNA and RNA, but we recommend GelRed® for this application because it is five times more sensitive for single stranded nucleic acids than GelGreen®. Also learn about DNAzure® 2.0 Visible Blue DNA Gel Stain Kit for visualizing DNA bands with the naked eye with no need for a UV light source. DNAzure® 2.0 delivers excellent sensitivity, detecting as little as ~1 ng of double-stranded DNA in both agarose and polyacrylamide gels.

Product / Method	Procedure	Advantages	Disadvantages	Recommended for
DNA staining with EMBER™ Ultra DNA Gel Kit	Agarose is supplied pre-coated with EMBER™ Ultra Dye, just dissolve, heat, and pour.	• Safer and more convenient, no need to handle concentrated dye • Superior sensitivity, detect as little as ≤1 ng DNA • No need for post-electrophoresis staining • Optimal for blue LED gel imagers	• Not suitable for PAGE, DGGE, EMSA, or PFGE gels • Dye may cause band migration issues when loading larger amounts of DNA (more than ~200 ng/band), or for some restriction digests	• Routine agarose gels

Product / Method	Procedure	Advantages	Disadvantages	Recommended for
RNA staining with EMBER™ Ultra RNA Gel Kit	Agarose is supplied pre-coated with EMBER™ Ultra Dye, just dissolve, heat, and pour.	• Safer and more convenient stain for RNA, no need to handle concentrated dye • Superior sensitivity, detect as little as ≤5 ng RNA • No need for post-electrophoresis staining • Included loading dye contains formamide for denaturing • Optimal for blue LED gel imagers	• Will stain DNA as well as RNA • Dye may cause band migration issues when loading larger amounts of RNA (more than ~200 ng/band)	• Routine RNA gel electrophoresis • Evaluate total RNA integrity and DNA contamination
DNA prestaining with GelRed® Prestain Plus 6X DNA Loading Dye	GelRed® loading buffer is added directly to the DNA sample before loading	• Fast & simple: one-step sample loading & DNA staining • Less concentrated dye for safer handling • Can re-run a gel to use empty lanes	• Not recommended for PAGE, DGGE, EMSA, or PFGE gels • Dye may cause band migration issues when loading larger amounts of DNA (more than ~100 ng/band), or for some restriction digests	• Routine agarose gels • Recommended loading 50-200 ng ladder or 2-5 uL PCR product (~100 ng/band or less)
Precast staining with GelRed® 10,000X in water or GelGreen® 10,000X in water	GelRed® or GelGreen® is mixed with molten agarose before gel casting	Familiar protocol, rapid results		
Precast staining with GelRed® Agarose LE or GelGreen® Agarose LE	Agarose is supplied pre-coated with GelRed® or GelGreen®, just dissolve, heat, and pour	Safer & more convenient, no need to handle concentrated dye		
Post-electrophoresis staining with GelRed® 10,000X in water or GelGreen® 10,000X in water - or - GelRed® 3X in water	No fluorescent dye is added to the gel, it is stained in 3X GelRed® or 3X GelGreen® solution after electrophoresis	• Most accurate sizing/sharpest bands • Staining solution can be re-used • Enhance sensitivity by adding NaCl	Extra staining step (up to 30 minutes) after electrophoresis (some customers report good results after only 5 minutes if dye is not reused)	• Highly accurate band sizing • Gels with more than ~100 ng DNA per band • Analyzing restriction digests
Post-electrophoresis staining with DNAzure® 2.0 Visible Blue DNA Gel Stain Kit	No fluorescent dye is added to the gel, it is stained in DNazure® 2.0 solution and then exposed to a bright light source to generate visible blue DNA bands. We recommend the Glo-Plate™ White Photoactivation Device as a light source for developing DNAzure® 2.0-stained gels	• Allows visualization of DNA bands by the naked eye, no need for a UV light source • Detect as little as ~1 ng DNA • Stained bands are stable in gel for weeks • Also emits near-IR fluorescence (~700 nm) for detection on near-IR imaging systems	Extra staining step (up to 30 minutes) followed by a light exposure step (up to 30 minutes) to generate visible blue DNA bands	• Routine DNA agarose gels • Visualizing gels without the UV light or expensive imaging systems • Recommended loading 50-200 ng DNA per lane
Post-electrophoresis staining of PAGE gels using PAGE GelRed® 10,000X or 1X in water	No fluorescent dye is added to the gel, it is stained in 1X PAGE GelRed® solution after electrophoresis	• Formulated for efficient penetration and staining of polyacrylamide gels • Like the classic GelRed®, it is safe and environmentally friendly	Extra staining step of approx. 30 minutes after electrophoresis	Staining of nucleic acids in PAGE gels

Biotium also offers the Gel-Bright™ Laser Diode Gel Illuminator, a unique laser-diode-based illuminator that offers sensitive staining for both red and green dyes. Also learn about our Go-Go™ Fast DNA Gel Running Buffer for running gels 3X faster than with TAE or TBE buffer.

For more information, view our DNA Stain technology page, and see our GelRed® & GelGreen® FAQs.

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References

Download a list of curated references for GelRed® and GelGreen®.

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