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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.

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®.

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 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.

References

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

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