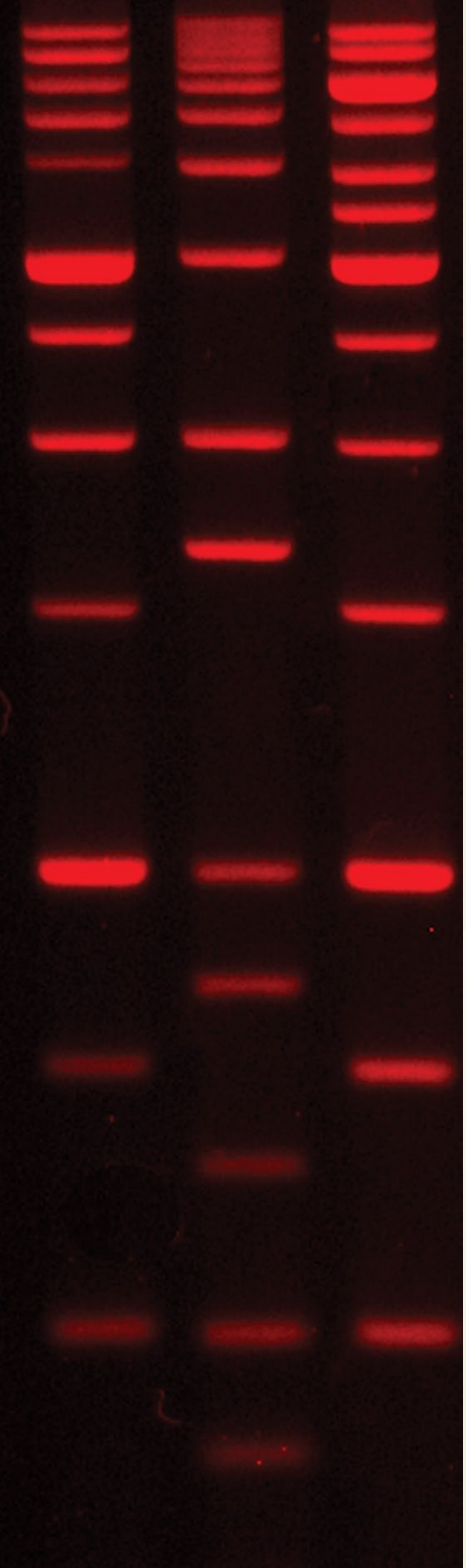


GelRed™ Teaching Lab Guide Booklet

GOLDBIO®

Introduction

DNA visualization is a foundational skill in molecular biology education. However, the safety concerns surrounding traditional DNA stains like ethidium bromide (EtBr) have created challenges for teaching labs. GelRed™ offers a safer alternative without compromising sensitivity or ease of use. This guide provides the essential information needed to adopt GelRed™ confidently and responsibly in educational environments.

This booklet is intended for instructors, teaching assistants and lab coordinators in high school and biology undergraduate programs.

We designed this book to introduce you to the structure, function and benefits of GelRed™, evaluate whether it's right for your lab, provide protocols, answer common questions, and so much more.

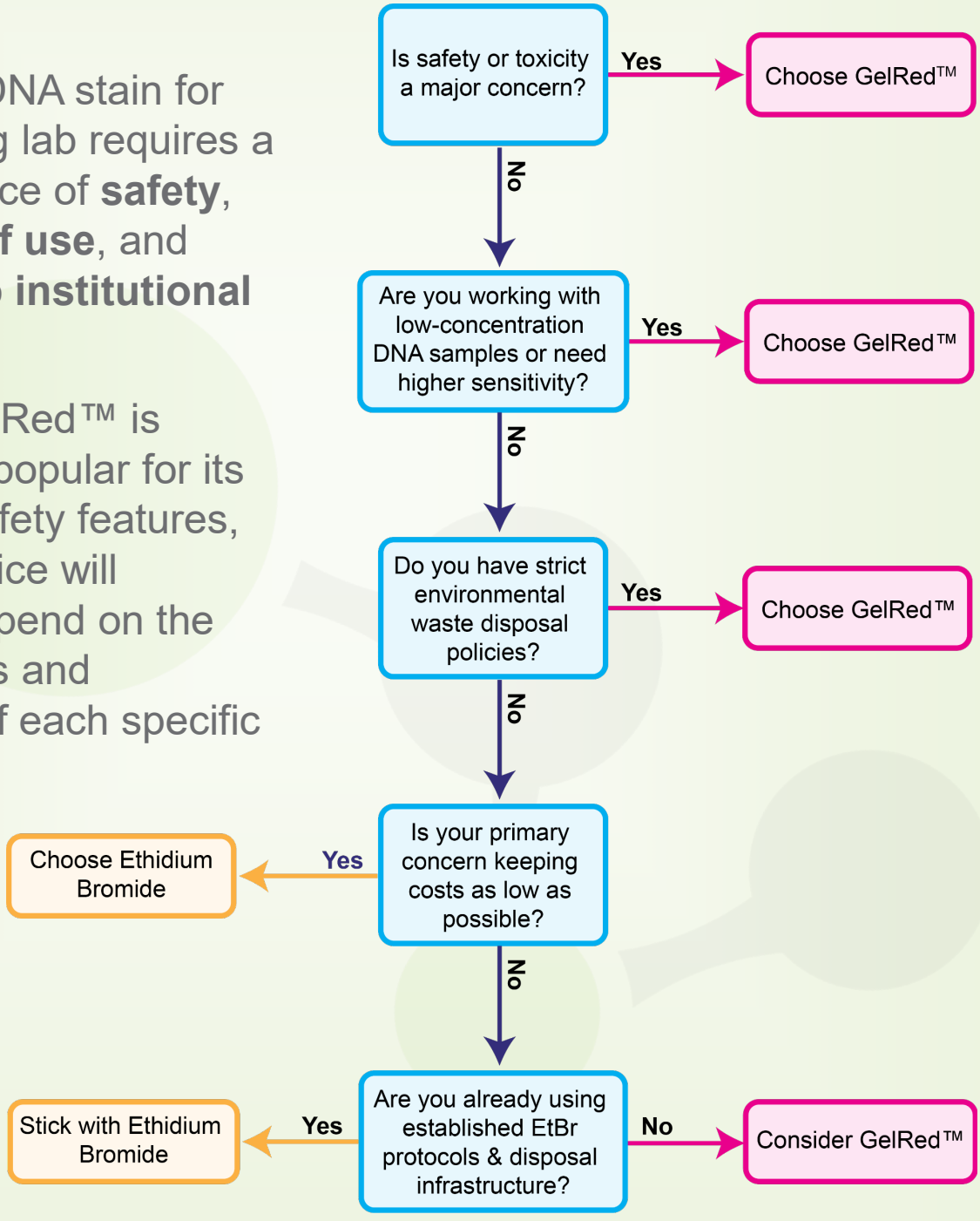
GOLDBIO®

Table of Contents

Is GelRed™ Right For Your Lab?

Selecting a DNA stain for your teaching lab requires a careful balance of **safety**, **cost**, **ease of use**, and adherence to **institutional policies**.

Although GelRed™ is increasingly popular for its enhanced safety features, the ideal choice will ultimately depend on the unique needs and constraints of each specific lab.



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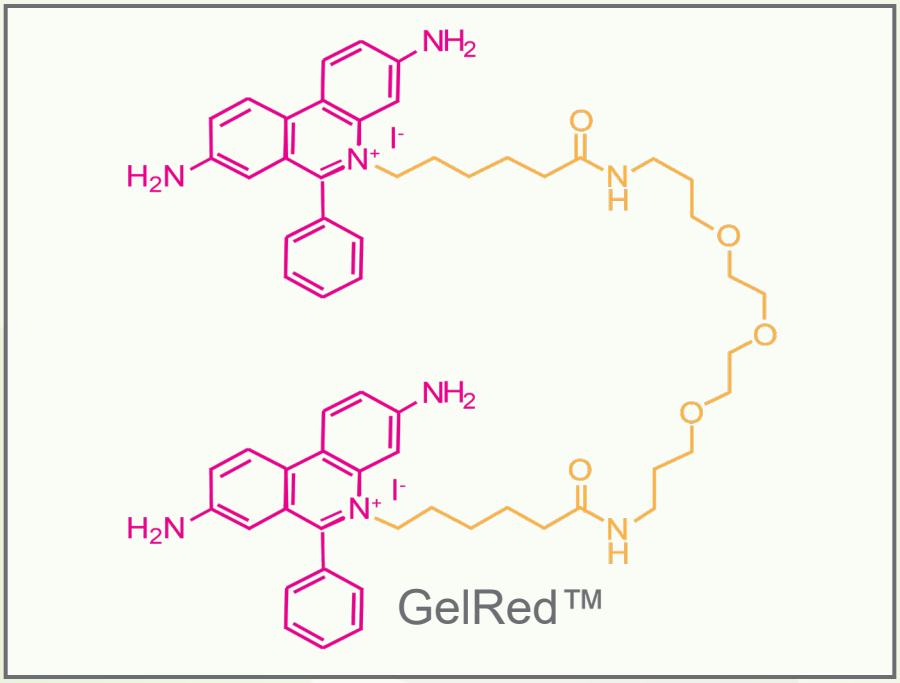
GelRed™ Lab Checklist

Consideration	Yes	No	Maybe
Does our institution restrict or discourage EtBr use?			
Do we lack easy access to hazardous waste disposal?			
Do we teach students or trainees in shared lab spaces?			
Do we need high sensitivity for low DNA quantities?			
Are we willing to test or adjust current staining protocols?			
Do we have funding flexibility to support safer reagents?			

Answering “yes” suggests GelRed™ might be suitable for your lab

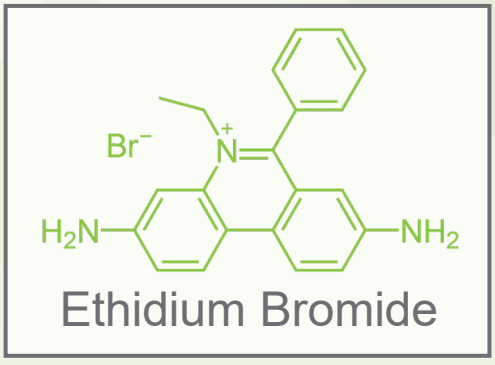
GOLDBIO®

Why GelRed™ Is Safer



- GelRed™ consists of two ethidium subunits connected by a polyethylene glycol (PEG) spacer chain. This dimeric structure increases the dye's size and hydrophilicity, preventing it from penetrating cell membranes.

- In contrast, ethidium bromide (EtBr) is a smaller molecule that can enter cells and intercalate with chromosomal DNA, raising mutagenic concerns.



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GelRed™ Vs Ethidium Bromide (EtBr) Chart

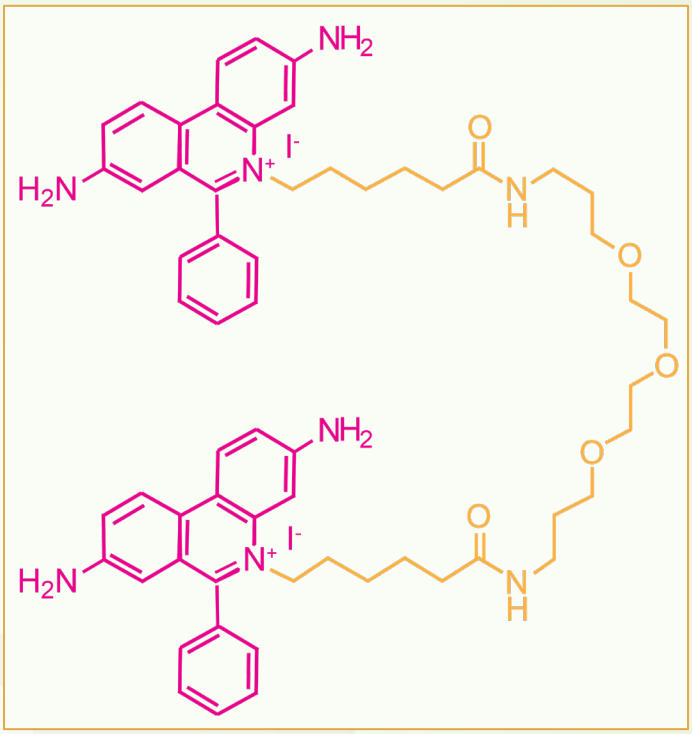
Feature	GelRed™	Ethidium Bromide
Molecule	Large dimer with PEG spacer	Small monomer
Cell Membrane Penetration	Cannot cross intact membranes	Can enter cells
Mutagenicity	Non-mutagenic (Ames test negative)	Known mutagen
PPE Requirements	Standard lab gloves and eye protection	Gloves, goggles, and enhanced handling protocols
Disposal Handling	Routine disposal under most guidelines	Requires hazardous waste disposal and documentation

How GelRed™ Works

GelRed™ is a fluorescent nucleic acid dye that works by intercalating between the base pairs of DNA, just like ethidium bromide. However, it does so with enhanced binding strength thanks to its dimeric structure.

Structurally, GelRed™ consists of two ethidium-like units joined by a linear oxygenated spacer chain.

Once GelRed™ is bound to DNA, it fluoresces brightly under UV, enabling clear visualization of DNA bands during gel electrophoresis.



Compatible Applications:

- ❑ Double-stranded DNA (high sensitivity)
- ❑ Single-stranded DNA and RNA (moderate sensitivity)
- ❑ Agarose and polyacrylamide gels
- ❑ Standard imaging systems

Pro-Tip: You can often switch from EtBr to GelRed™ without changing your imaging equipment. However, some adaptations as well as slight adjustments in the protocol can help improve results.

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GelRed™ FAQs

1. Can GelRed™ replace ethidium bromide in my existing protocol?

Yes. GelRed™ is designed to be a direct replacement and can be used in most standard agarose or polyacrylamide gel protocols. You may need to adjust staining concentration or imaging exposure slightly for best results.

2. Do I need special filters or a new imaging system?

No. GelRed™ is compatible with standard UV transilluminators and EtBr filter sets.

3. Can GelRed™ be used to stain RNA or single-stranded DNA?

Yes. GelRed™ stains double-stranded DNA with the highest sensitivity, but also works for ssDNA and RNA, though with moderately lower signal intensity.

4. Will GelRed™ affect downstream applications like cloning or PCR?

When used properly, GelRed™ has no known negative effects on common downstream workflows. Post-stained DNA can typically be gel extracted and used in cloning or amplification reactions.

5. Is GelRed™ safer than EtBr?

Yes. GelRed™ has been tested and shown to be non-mutagenic, non-cytotoxic, and unable to enter live cells. It is also not classified as hazardous waste under federal U.S. regulations (at the time of writing).

6. Can I reuse GelRed™ post-staining solutions?

Yes. The post-stain solution can be reused 3–5 times, depending on gel thickness and DNA load. Store the used stain in the dark to preserve fluorescence.

Optimizing GelRed™ for Better Results

1. Use Post-Staining When Possible

Post-staining (after electrophoresis) reduces potential band distortion and ensures more uniform DNA visualization. This is especially helpful when exact band size or intensity matters.

2. Avoid Adding GelRed™ to the Running Buffer

GelRed™ should not be included in the electrophoresis running buffer. Doing so may reduce migration clarity or introduce background staining.

3. Optimize Concentration

While 1X is standard, you may find better results with 0.5X to 2X depending on gel thickness and DNA load. Slight adjustments can improve sharpness or brightness.

4. Adjust Imaging Parameters

When switching from EtBr, you may need to adjust exposure time or filters slightly.

Teaching Tip: Run a test gel before student labs begin to dial in your optimal settings.

GOLDBIO®

GelRed™ Nucleic Acid Gel Stain, 10,000X in Water

GelRed™ is an ultra-sensitive, extremely stable and environmentally safe fluorescent nucleic acid dye designed to replace ethidium bromide (EtBr) for staining dsDNA, ssDNA or RNA in agarose gels or polyacrylamide gels. It offers greater sensitivity than EtBr without requiring destaining and is fully compatible with standard imaging systems.

The dye works for post-staining and is compatible with downstream applications such as restriction digest, sequencing, and cloning. Safety tests confirm GelRed™ is noncytotoxic, nonmutagenic, and nonhazardous at working concentrations, allowing safe disposal in regular trash or down the drain.

GelRed™ Nucleic Acid Gel Stain, 10,000X in Water is the latest formulation that eliminates the hazards of handling DMSO for better safety. The performance and stability of GelRed™ 10,000X is comparable in both the water and DMSO formulations.

Catalog ID	Size
G-725-100	100 µL
G-725-500	500 µL
G-725-1	1 mL
G-725-2	2 mL
G-725-10	10 mL

GOLDBIO®

GelRed™ Nucleic Acid Gel Stain, 10,000X in DSMO

GelRed™ is an ultra-sensitive, extremely stable and environmentally safe fluorescent nucleic acid dye designed to replace ethidium bromide (EtBr) for staining dsDNA, ssDNA or RNA in agarose gels or polyacrylamide gels. It offers greater sensitivity than EtBr without requiring destaining and is fully compatible with standard imaging systems.

The dye works for post-staining and is compatible with downstream applications such as restriction digest, sequencing, and cloning. Safety tests confirm GelRed™ is noncytotoxic, nonmutagenic, and nonhazardous at working concentrations, allowing safe disposal in regular trash or down the drain.

GelRed™ 10,000X solution in DMSO is for established users of GelRed™ in DMSO who do not wish to change their laboratory protocols. The performance and stability of GelRed™ 10,000X is comparable in both the water and DMSO formulations.

Catalog ID	Size
G-720-500	500 µL
G-720-10	10 mL

GOLDBIO®

6X GelRed™ Prestain Loading Buffer with Orange Tracking Dye

6X GelRed™ Prestain Loading Buffers are gel loading buffers containing density agents, tracking dyes, and GelRed™ dye.

The 6X prestain loading buffer is added to samples in place of gel loading buffer and eliminates the need to add fluorescent DNA dye to the agarose gel during casting.

This loading buffer contains an orange electrophoresis tracking dye that runs at approximately 50 bp in a 1% agarose gel.

Catalog ID	Size
G-735-1	1 mL

GOLDBIO®

Related products: GelGreen™

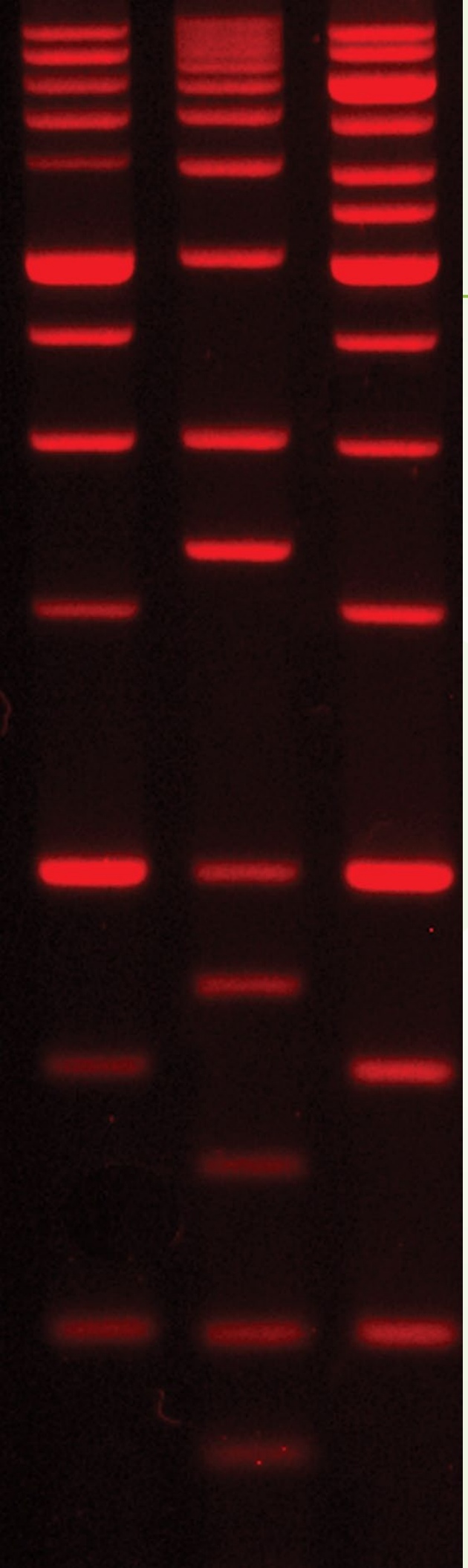
GelGreen™ is a sensitive, stable and environmentally safe green fluorescent nucleic acid dye designed to stain either dsDNA, ssDNA or RNA in agarose gels. GelGreen™ is far more sensitive than SYBR™ Safe. Unlike SYBR™ dyes, GelGreen™ is very stable, both hydrolytically and thermally. GelGreen™ is compatible with either a 254 nm UV transilluminator or a gel reader equipped with visible light excitation.

GelGreen™ can be used for post-electrophoresis gel staining

A series of safety tests have confirmed that GelGreen™ is noncytotoxic, nonmutagenic and nonhazardous at concentrations well above the working concentrations, allowing safe disposal in regular trash or down the drain.

Products	Catalog ID
GelGreen™ Nucleic Acid Stain Gel Stain, 10,000X in Water	G-745
GelGreen™ Nucleic Acid Stain Gel Stain, 10,000X in DMSO	G-740

GOLDBIO®



GelRed™ Protocol and SDS

GOLDBIO®

Protocol

TD-P Revision 3.0

Creation Date: 1/10/2017
Revision Date: 9/3/2025

GelRed™ Nucleic Acid Gel Stain, 10,000X

Procedure for staining dsDNA, ssDNA or RNA in gels

Introduction

GelRed™ is an ultra-sensitive, extremely stable and environmentally safe fluorescent nucleic acid dye designed to replace the highly toxic ethidium bromide (EtBr) for agarose gels or polyacrylamide gels. GelRed™ is far more sensitive than EtBr without requiring a destaining step and since GelRed™ and EtBr have virtually the same spectra, you can easily replace EtBr with GelRed™ without changing your existing imaging system. GelRed™ can be used to stain dsDNA, ssDNA or RNA in agarose gels via post gel staining or can be used to stain polyacrylamide gels via post gel staining. GelRed™ is also compatible with downstream DNA manipulations such as restriction digest, sequencing, and cloning.

A series of safety tests have confirmed that GelRed™ is noncytotoxic, nonmutagenic and nonhazardous at concentrations well above the working concentrations used in gel staining. As a result, GelRed™ can be safely disposed of down the drain or in regular trash, providing convenience and reducing cost in waste disposal.

Note: The GelRed™ stock in water is an improved product compared to the stock in DMSO. We recommend using **GelRed™ 10,000X in Water** to avoid the potential hazards of handling DMSO, a solvent that can be absorbed through the skin. We continue to offer GelRed™ in DMSO because some users do not wish to alter their established laboratory protocols.

Performance Properties

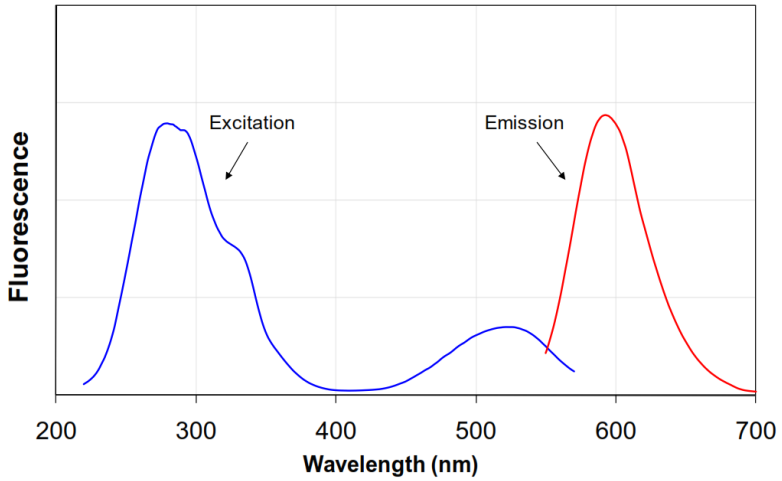


Figure 1. Excitation (left) and emission (right) spectra of GelRed™ bound to dsDNA in TBE.

Gold Biotechnology
St. Louis, MO
Ph: (800) 248-7609
Web: www.goldbio.com
Email: contactgoldbio86@goldbio.com

Materials

- GelRed™ Nucleic Acid Gel Stain, 10,000X in DMSO (Catalog # G-720)
- GelRed™ Nucleic Acid Gel Stain, 10,000X in water (Catalog # G-725)

Method

Because high affinity nucleic acid binding dyes can affect DNA migration during electrophoresis, post-staining of gels is highly recommended. Post-staining with GelRed™ results in superior sensitivity and eliminates the possibility of dye interference with DNA migration. Agarose gels can be precast with GelRed™. However, GelRed™ may affect the migration or resolution of some DNA samples in precast gels. The precast protocol is not recommended for polyacrylamide gels.

GelRed™ can be used to stain dsDNA, ssDNA or RNA. GelRed is twice as sensitive for dsDNA than it is for ssDNA or RNA. Gel staining with GelRed™ is compatible with downstream applications such as sequencing and cloning. GelRed™ is efficiently removed from DNA by phenol/chloroform extraction and ethanol precipitation.

Post-Staining (Recommended) Protocol

1. Run gels according to your standard protocol.

2. Dilute GelRed™ 10,000X stock solution 3,300 fold to make a 3X staining solution in H_2O. Generally 50 ml staining solution is an adequate volume for one minigel.

   Note: Including 0.1M NaCl in the staining solution enhances sensitivity, but may promote dye precipitation if the gel stain is reused.

3. Place the gel in a suitable container such as a polypropylene staining tray. Add a sufficient amount of the 3X staining solution to submerge the gel.

4. Agitate the gel gently at room temperature for ~30 minutes.

   Note: Optimal staining time may vary somewhat depending on the thickness of the gel and the percentage of agarose. For polyacrylamide gels containing 3.5-10% acrylamide, typical staining time is 30 minutes to 1 hour with gels of higher acrylamide content requiring longer staining time.

   Note: Destaining is not required, but the gel can be washed in water to reduce background if necessary.

5. View the stained gel with a standard transilluminator (302 or 312 nm) and image the gel using an EtBr filter. SYBR® or GelStar® filters also may be used for gel imaging with equally good results.

6. Staining solution can be reused at least 2-3 times. Store staining solution at room temperature protected from light.

Precast Protocol for Agarose Gels

1. Prepare molten agarose gel solution using your standard protocol.

   Note: The precast protocol is not recommended for polyacrylamide gels. Polyacrylamide gels can be stained using the post-stain protocol.

2. Dilute the GelRed™ 10,000X stock reagent into the molten agarose gel solution at 1:10,000 and mix thoroughly. GelRed™ may be added while the gel solution is still hot.

3. Cast the gel and allow it to solidify and cool.

4. Load samples and run the gels using your standard protocol.

5. View the stained gel with a standard transilluminator (302 or 312 nm) and image the gel using an EtBr filter. SYBR® or GelStar® filters also may be used for gel imaging with equally good results.

6. Unused agarose containing GelRed™ can be remelted to cast more gels, but it may be necessary to add more dye for optimal signal. We do not recommend storing agarose containing GelRed™ in molten form (i.e., at 50°C) for more than a few days. Precast gels containing GelRed™ can be stored at 4°C for future use.

Troubleshooting

Observation	Recommendation
Smeared DNA bands in precast gel	– Reduce the amount of DNA loaded by one-half to one-third (<400 ng). GelRed™ is much more sensitive than EtBr. Blown out or smeared bands can be caused by overloading. This is frequently observed with DNA ladders. – Perform post-staining instead of pre-casting. – Pour a lower percentage agarose gel for better resolution of large fragments. – Change the running buffer. TBE buffer has a higher buffering capacity than TAE.

	– Loading buffers containing SDS may contribute to band smearing. If this occurs, use the post-staining protocol for applications requiring SDS-containing loading buffers.
Discrepant DNA migration in pre-cast gel	– GelRed™ is designed to be larger than other dyes to prevent it from entering cells, thus rendering the dye safer. The migration of DNA may be affected depending on the dye:DNA ratio. – Reduce the amount of DNA loaded by one-half to one-third. – Reduce the amount of dye used, i.e. use 0.5X in precast gels. – Post-stain gel in 3X GelRed to avoid any interference the dye may have on migration during electrophoresis.
Weak fluorescence, decreased dye performance over time, or film of dye remains on gel after post-staining	– The dye may have precipitated out of solution. – Heat GelRed™ solution to 45-50°C for two minutes and vortex to redissolve. – Store dye at room temperature to avoid precipitation.

Associated Products

GoldBio Catalog #	Product Name
A-201	Agarose LE (Molecular Biology Grade)
G-735	6X GelRed™ Prestain Loading Buffer with Orange Tracking Dye
D010	1 kb DNA Ladder, 250bp - 10kb - Ready-to-use
D011	1 kb PLUS™ DNA Ladder, 250bp - 25kb - Ready-to-use
D003	100 bp PLUS™ DNA Ladder, 100bp - 3000bp - Ready-to-use
D001	100 bp DNA Ladder, 100bp - 1500bp - Ready-to-use
D100	50 bp DNA Ladder, 50bp - 1500bp - Ready-to-use
D012	VersaLadder™, 100-10,000 bp - Ready-to-use
D015	SuperLadder, (50 bp-25 kb) DNA Ladder - Ready-to-use
P007	BLUEstain™ Protein ladder, 11-245 kDa
P008	BLUEstain™ 2 Protein ladder, 5-245 kDa
G-745	GelGreen™ Nucleic Acid Stain Gel Stain, 10,000X in Water
E-670	EvaGreen® Dye, 20x in Water

Safety Data Sheet

Revision Date: 3/7/2022

Section 1: Chemical Identification

1.1 Chemical Identification

Product Name: GelRed™ Nucleic Acid Gel Stain, 10,000X in Water
Alternative Name:
Catalog Number: G-725

1.2 Relevant Uses and Uses Advised Against

Recommended use: This product is not for use in humans. It is for research purposes only.

1.3 Supplier Contact Information

Distributed by: Gold Biotechnology, Inc.
1328 Ashby Rd.
St. Louis, MO 63132
Phone: (314) 890-8778
Fax: (314) 890-0503
Email: **contactgoldbio86@goldbio.com**

1.4 Emergency Contact Information

Emergency Phone: (800)248-7609 (Monday-Friday, 9:00 a.m. – 5:00 p.m. CST)

Section 2: Hazardous Information

2.1 GHS Classification

This product is not subject to hazardous classification

2.8 HMIS Classification

Health Hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazards:	0

2.9 NFPA Rating

Health Hazard:	0
Fire:	0
Reactivity Hazard:	0

Section 3: Composition/Information on Ingredients

3.1 Composition

Identity: GelRed™ Nucleic Acid Gel Stain
IUPAC:

Synonyms:
CAS Number: [<1.0%]
Molecular Formula:
Molecular Weight:

Identity: Water
IUPAC:

Synonyms:
CAS Number: 7732-18-5 [>99.0%]
Molecular Formula: H_2O
Molecular Weight: 18.02 g/mol

Section 4: First Aid Measures

4.1 Detailed First Aid Measures

Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Skin: Immediately wash skin copiously with soap and water. Take victim immediately to hospital. Consult a physician.

Eye: Immediately rinse out with water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Consult a physician.

Ingestion: Wash out mouth with water. Drink plenty of water. Consult a physician. Never give anything by mouth to an unconscious person.

Notes to Physician: Treat symptomatically and supportively.

4.2 Most Important Symptoms And Effects, Either Acute Or Delayed

The most important known symptoms and effects are described in the labeling (see section2). And /or in section 11.

4.3 Indication of immediate medical attention and special treatment needed

Not available

Section 5: Fire Fighting Measures

5.1 Conditions of flammability:

Not flammable or combustible.

5.2 Suitable extinguishing media:

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.3 Specific hazards arising from the chemical

During a fire, highly toxic gases may be generated by thermal decomposition or combustion – Unknown.

5.4 Specific protective actions for fire-fighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

6.2 Environmental precautions:

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up:

Soak up with absorbent material, discard.

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Always wear personal protective equipment (PPE, see section 8).

7.2 Conditions for safe storage, including and incompatibilities:

Keep container tightly closed.

Store at room temperature. Protect from light.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters:

Contains no substances with occupational exposure limit values.

8.2: Appropriate engineering controls:

Contains no substances with occupational exposure limit values.

8.3 Personal Protective Equipment (PPE):

Eye/Face Protection: Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique - without touching outer surface of glove - to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested

and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Other Protective Clothing or Equipment: Wear appropriate protective clothing to prevent exposure.

Section 9: Physical and Chemical Properties

9.1 General chemical and physical properties

Appearance:	Liquid
Odor:	Not Available
Odor Threshold:	Not Available
pH:	Not Available
Melting Point:	Not Available
Freezing Point:	Not Available
Boiling Point/Range:	Not Available
Flash Point:	Not Available
Evaporation Rate:	Not Available
Lower Explosion Limit:	Not Available
Upper Explosion Limit:	Not Available
Vapor Pressure:	Not Available
Vapor Density:	Not Available
Relative Density:	Not Available
Solubility:	Not Available
Partition Coefficient n-octanol/water:	Not Available
Auto-Ignition Temperature:	Not Available
Decomposition Temperature:	Not Available
Viscosity:	Not Available

Section 10: Stability and Reactivity Data

10.1 Reactivity:

Not available

10.2 Chemical Stability:

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions:

Not available.

10.4 Conditions to avoid:

Incompatible materials.

10.5 Incompatible materials:

Strong oxidizing agents.

10.6 Hazardous decomposition products:

Hazardous decomposition products formed under fire conditions. - Unknown.

Section 11: Toxicological Information

11.1 Toxicological effects

Acute toxicity:

Skin corrosion/irritation:

Not available.

Respitory or skin sensitization:

Not available.

Germ cell mutagenicity:

Not available.

Carcinogenicity:

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity:

Not available.

STOT-single exposure:

Not available.

STOT-repeated exposure:

Not available.

Aspiration hazard:

Not available.

Likely routes of exposure:

Respiratory organs, mouth, skin, and eyes.

Symptoms of exposure:

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12: Ecological Information

12.1 Toxicity:

Not available.

12.2 Persistence and degradability:

Inherent biodegradability.

12.3 Bioacumulative potential:

Does not bioaccumulate.

12.4 Mobility in soil:

Not available.

12.5 Other adverse effects:

None.

Section 13 Disposal Considerations

Dispose of product in accordance with local rules and regulations.

Section 14: Transport Information

14.1 US Department of Transportation (DOT)

This material is considered to be non-hazardous for transport.

14.2 International Maritime Dangerous Goods (IMDG):

This material is considered to be non-hazardous for transport.

14.2 International Air Transportation Association (IATA)

This material is considered to be non-hazardous for transport.

Section 15: Regulatory Information

SARA 302 Components:

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components:

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards:

No SARA Hazards.

Massachusetts Right To Know Components:	CAS - No.
n/a	[<1.0%]
Pennsylvania Right To Know Components:	CAS - No.
n/a	[<1.0%]
New Jersey Right To Know Components:	CAS - No.
n/a	[<1.0%]

California Prop. 65 Components:

This product does not contain any chemical known to the State of California to cause cancer, birth, or any other reproductive defects.

Section 16: Other Information

While Gold Biotechnology, Inc. believes the information contained herein to be true and accurate, it has relied on information provided by others. Gold Biotechnology, INC. makes no warranties, express or implied, as to the accuracy or adequacy of the information contained herein or with respect to the results to be obtained from the use of the product. Gold Biotechnology, Inc. disclaims all liability with respect to the use of this product, including without limitation, liability for injury to the user or third-party persons.

Preparation Information
Gold Biotechnology
Content/Marketing Department
(800) 248-7609
Last updated: 3/7/2022

Safety Data Sheet

Revision Date: 3/7/2022

Section 1: Chemical Identification

1.1 Chemical Identification

Product Name: GelRed™ Nucleic Acid Gel Stain, 10,000X in DMSO
Alternative Name:
Catalog Number: G-720

1.2 Relevant Uses and Uses Advised Against

Recommended use: This product is not for use in humans. It is for research purposes only.

1.3 Supplier Contact Information

Distributed by: Gold Biotechnology, Inc.
1328 Ashby Rd.
St. Louis, MO 63132
Phone: (314) 890-8778
Fax: (314) 890-0503
Email: **contactgoldbio86@goldbio.com**

1.4 Emergency Contact Information

Emergency Phone: (800)248-7609 (Monday-Friday, 9:00 a.m. – 5:00 p.m. CST)

Section 2: Hazardous Information

2.1 GHS Classification

Flammable Liquid (Category 4)

2.2 GHS Label Elements, Including Precautionary statements

Warning

2.3 Hazard Statements

H227: Combustible liquid

2.4 Precautionary Statements

P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking
P280: Wear protective gloves/protective clothing/eye protection/face protection
P403+233: Store in a well ventilated place. Keep container tightly closed
P501: Dispose of contents/container to an approved waste disposal plant

2.5 OSHA Hazards

Target Organ Effect, Combustible liquid

2.8 HMIS Classification

Health Hazard:	0
Chronic Health Hazard:	*
Flammability:	2
Physical Hazards:	0

2.9 NFPA Rating

Health Hazard:	0
Fire:	2
Reactivity Hazard:	0

Section 3: Composition/Information on Ingredients

3.1 Composition

Identity: GelRed™ Nucleic Acid Gel Stain
IUPAC:
Synonyms:
CAS Number: - [<1.0%]
Molecular Formula:
Molecular Weight:

Identity: DMSO
IUPAC:
Synonyms: Dimethyl sulfoxide, Methylsulfinylmethane
CAS Number: 67-68-5 [>99.0%]
Molecular Formula: C_2H_6SO
Molecular Weight: 78.13 g/mol

Section 4: First Aid Measures

4.1 Detailed First Aid Measures

Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Skin: Immediately wash skin copiously with soap and water. Take victim immediately to hospital. Consult a physician.

Eye: Immediately rinse out with water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Consult a physician.

Ingestion: Wash out mouth with water. Drink plenty of water. Consult a physician. Never give anything by mouth to an unconscious person.

Notes to Physician: Treat symptomatically and supportively.

4.2 Most Important Symptoms And Effects, Either Acute Or Delayed

The most important known symptoms and effects are described in the labeling (see

section2). And /or in section 11.

4.3 Indication of immediate medical attention and special treatment needed

Not available

Section 5: Fire Fighting Measures

5.1 Conditions of flammability:

Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

5.2 Suitable extinguishing media:

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.3 Specific hazards arising from the chemical

During a fire, highly toxic gases may be generated by thermal decomposition or combustion – Carbon oxides, Sulfur oxides.

5.4 Specific protective actions for fire-fighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

6.2 Environmental precautions:

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up:

Soak up with absorbent material, discard.

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Always wear personal protective equipment (PPE, see section 8).

7.2 Conditions for safe storage, including and incompatibilities:

Keep container tightly closed.

Store at room temperature. Protect from light.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters:

Contains no substances with occupational exposure limit values.

8.2: Appropriate engineering controls:

Contains no substances with occupational exposure limit values.

8.3 Personal Protective Equipment (PPE):

Eye/Face Protection: Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin Protection: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique - without touching outer surface of glove - to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Other Protective Clothing or Equipment: Wear appropriate protective clothing to prevent exposure.

Control Parameters - Workplace

Component:	CAS-No:	Value:	Control Parameters:	Basis:
DMSO	67-68-5	TWA	250 ppm	USA. Workplace Environmental Exposure Levels (WEEL)

Section 9: Physical and Chemical Properties

9.1 General chemical and physical properties

Appearance:	Liquid
Odor:	Not Available
Odor Threshold:	Not Available
pH:	Not Available
Melting Point:	Not Available
Freezing Point:	Not Available
Boiling Point/Range:	Not Available
Flash Point:	Not Available
Evaporation Rate:	Not Available
Lower Explosion Limit:	Not Available

Upper Explosion Limit:	Not Available
Vapor Pressure:	Not Available
Vapor Density:	Not Available
Relative Density:	Not Available
Solubility:	Not Available
Partition Coefficient n-octanol/water:	Not Available
Auto-Ignition Temperature:	Not Available
Decomposition Temperature:	Not Available
Viscosity:	Not Available

Section 10: Stability and Reactivity Data

10.1 Reactivity:

Not available

10.2 Chemical Stability:

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions:

Not available.

10.4 Conditions to avoid:

Incompatible materials.

10.5 Incompatible materials:

Strong oxidizing agents.

10.6 Hazardous decomposition products:

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sulfur oxides.

Section 11: Toxicological Information

11.1 Toxicological effects

Acute toxicity:

DMSO	Oral:	Rat LD_{50} = 14,500 mg/kg
DMSO	Inhalation:	Rat LC_{50} = 4 h, 40250 ppm
DMSO	Skin:	Rabbit LD_{50} = 5000 mg/kg

Skin corrosion/irritation:

Not available.

Respitory or skin sensitization:

Not available.

Germ cell mutagenicity:

Genotoxicity in vitro - mouse - lymphocyte
Cytogenetic analysis

Genotoxicity in vitro - mouse - lymphocyte
Mutation in mammalian somatic cells

Genotoxicity in vivo - rat - Intraperitoneal
Cytogenetic analysis

Genotoxicity in vivo - mouse - Intraperitoneal
DNA damage

Carcinogenicity:

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity:

Experiments have shown reproductive toxicity effects on laboratory animals (Dimethyl sulfoxide)

STOT-single exposure:

Not available.

STOT-repeated exposure:

Not available.

Aspiration hazard:

Not available.

Likely routes of exposure:

Respiratory organs, mouth, skin, and eyes.

Symptoms of exposure:

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12: Ecological Information

12.1 Toxicity:

Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h

LC50 - Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - 24,600 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae
EC50 - Pseudokirchneriella subcapitata (green algae) - 17,000 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability:

Result : 31% - According to the results of tests of biodegradability this product is not readily biodegradable. (OECD Test Guideline 301D)

12.3 Bioacumulative potential:

Does not bioaccumulate.

12.4 Mobility in soil:

Not available.

12.5 Other adverse effects:

Stability in water - 0.12 - 1.2 h at 30°C
Remarks: Hydrolyses readily.

Section 13 Disposal Considerations

Dispose of product in accordance with local rules and regulations.

Section 14: Transport Information

14.1 US Department of Transportation (DOT)

UN Number: NA-Number: 1993
Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide)
Class:
Packing Group: III
Marine Pollutant:

14.2 International Maritime Dangerous Goods (IMDG):

This material is considered to be non-hazardous for transport.

14.2 International Air Transportation Association (IATA)

This material is considered to be non-hazardous for transport.

Section 15: Regulatory Information

SARA 302 Components:

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components:

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards:

No SARA Hazards.

Massachusetts Right To Know Components:	CAS - No.
DMSO	67-68-5 [>99.0%]
Pennsylvania Right To Know Components:	CAS - No.
DMSO	67-68-5 [>99.0%]
New Jersey Right To Know Components:	CAS - No.
DMSO	67-68-5 [>99.0%]

California Prop. 65 Components:

This product does not contain any chemical known to the State of California to cause cancer, birth, or any other reproductive defects.

Section 16: Other Information

While Gold Biotechnology, Inc. believes the information contained herein to be true and accurate, it has relied on information provided by others. Gold Biotechnology, INC. makes no warranties, express or implied, as to the accuracy or adequacy of the information contained herein or with respect to the results to be obtained from the use of the product. Gold Biotechnology, Inc. disclaims all liability with respect to the use of this product, including without limitation, liability for injury to the user or third-party persons.

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