

# GelRed™ and GelGreen™

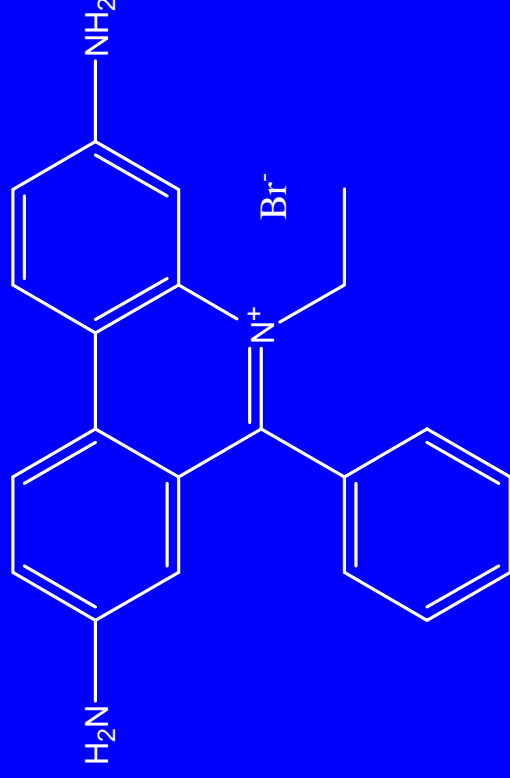
Safe and highly sensitive nucleic acid gel  
stains for replacing toxic EtBr

# Ethidium Bromide (EtBr)

## –gel stain of the past

Problems:

- Highly toxic (mutagenic)!
- Expensive to dispose
- High background signal (destaining may be necessary)
- Limited sensitivity



# GelRed and GelGreen Are the Perfect Replacements for EtBr

## Five Simple Reasons

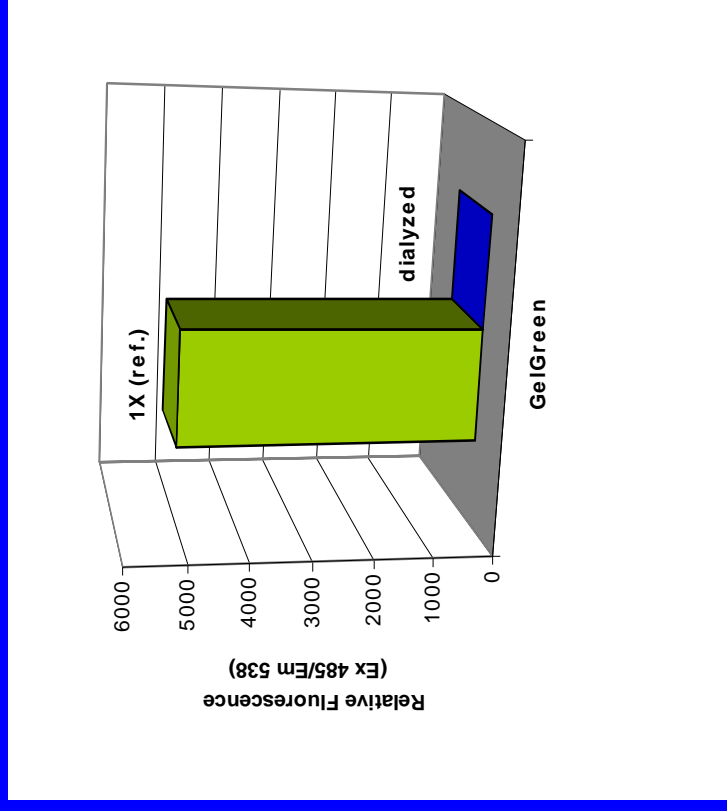
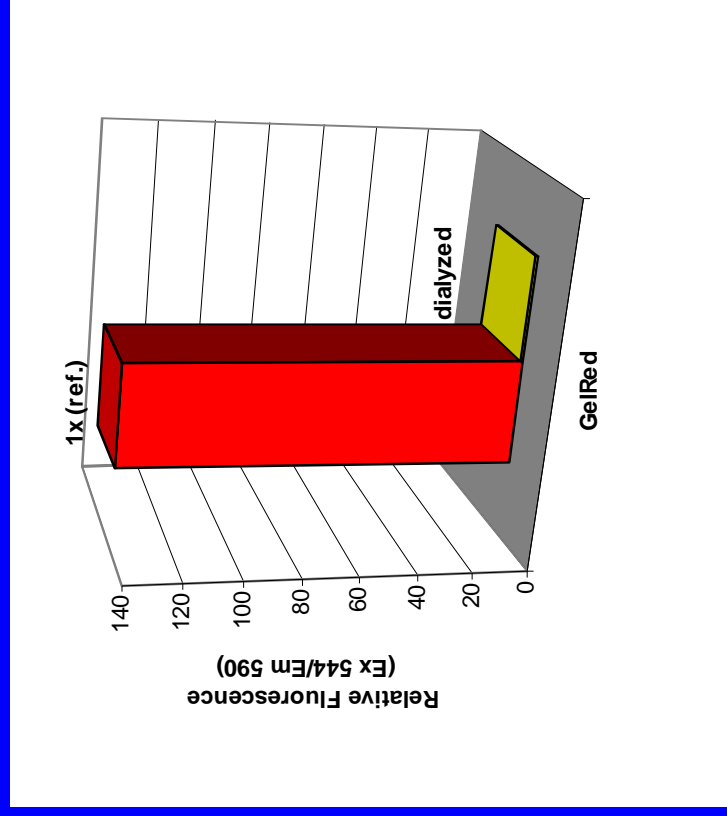
1. **Safety:** Nonmutagenic and noncytotoxic
2. **Easy disposal:** Safe to dispose in the drain
3. **Compatibility:** Spectrally compatible with existing instruments
4. **Sensitivity:** Higher signal but lower background
5. **Stability:** can be stored at RT and microwavable

# Reason #1. Safety

- GelRed and GelGreen are structurally engineered to minimize chances of interacting with genomic DNA in live cells

# GelRed and GelGreen are impenetrable to latex gloves

Glove Penetration Test: 48 hr dialysis against 5X GelRed or GelGreen

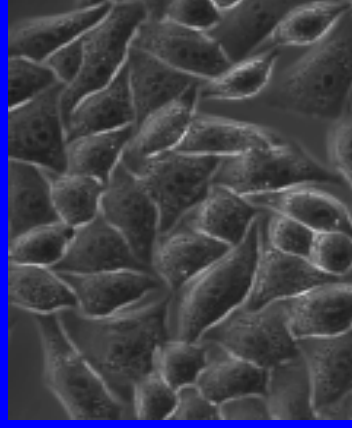


Conclusion: handling GelRed or GelGreen with latex glove is safe.

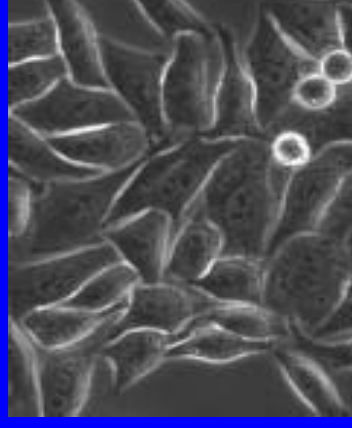
# GeRed and GelGreen are impenetrable to cell membranes

HeLa cells were stained with 1X SYBR Safe, GeRed or GelGreen in PBS for 30 minutes. Images were taken on an Olympus mercury arc lamp microscope using appropriate filters.

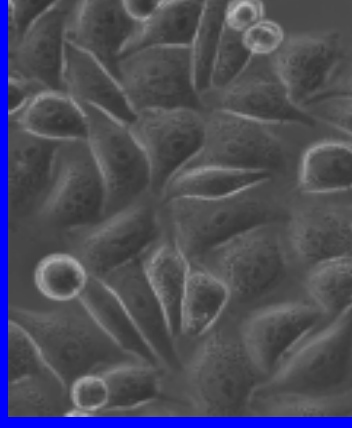
SYBR Safe



GeRed

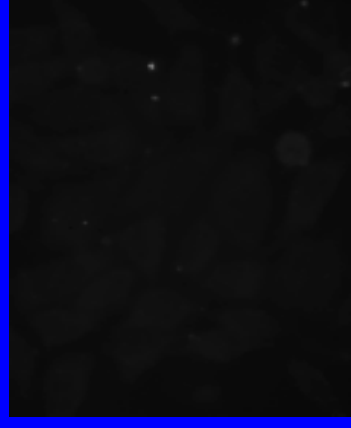
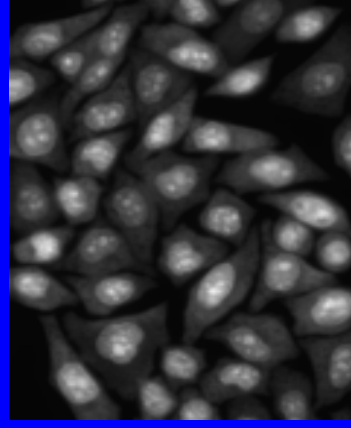


GelGreen



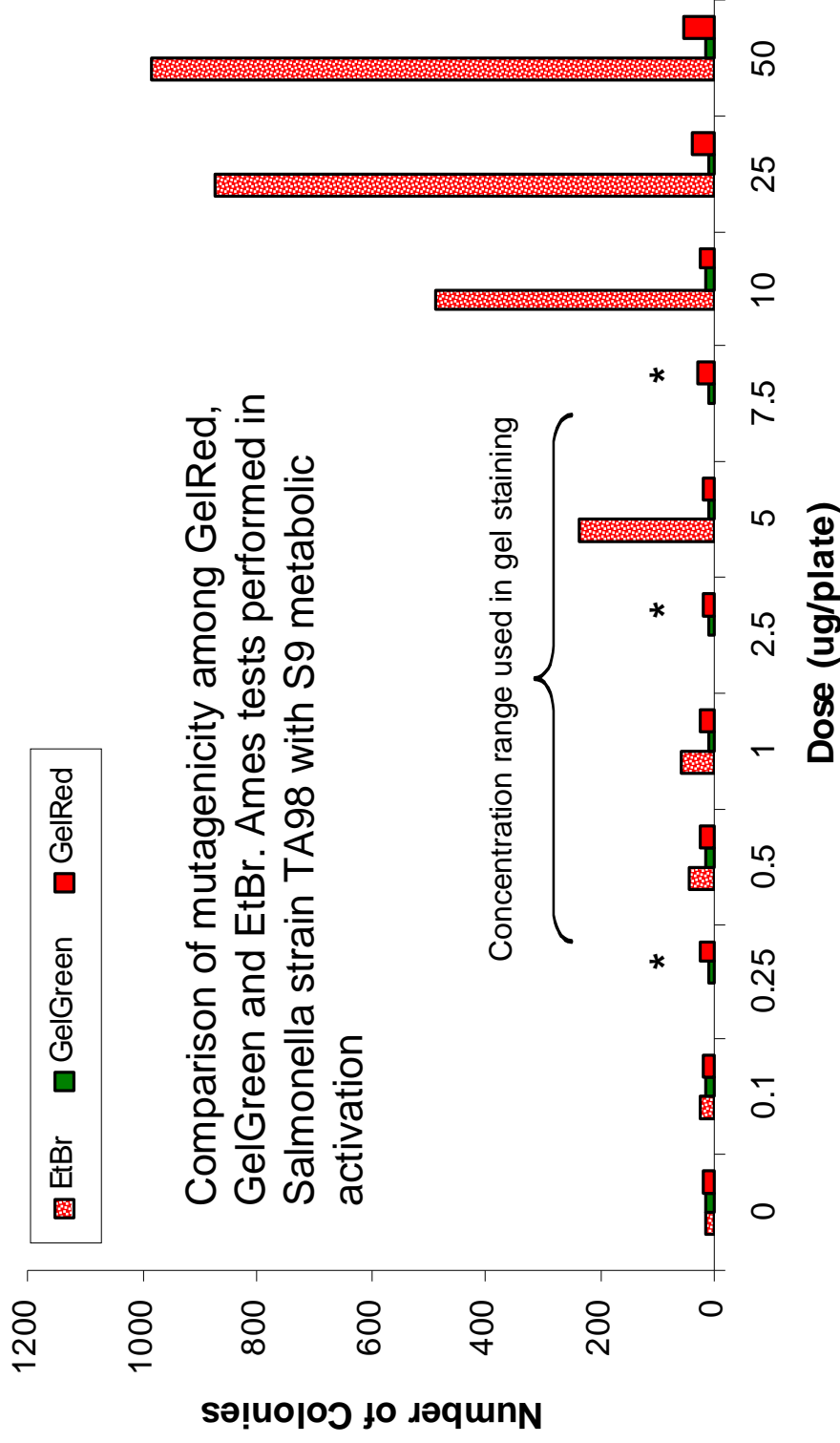
Bright  
Field view

Fluorescence  
Field view



# GelRed and GelGreen Are Nonmutagenic

– Largely a consequence of cell membrane impermeability



\* EB not tested at these concentrations

(More Ames test results in GelRed/GelGreen Safety Report)

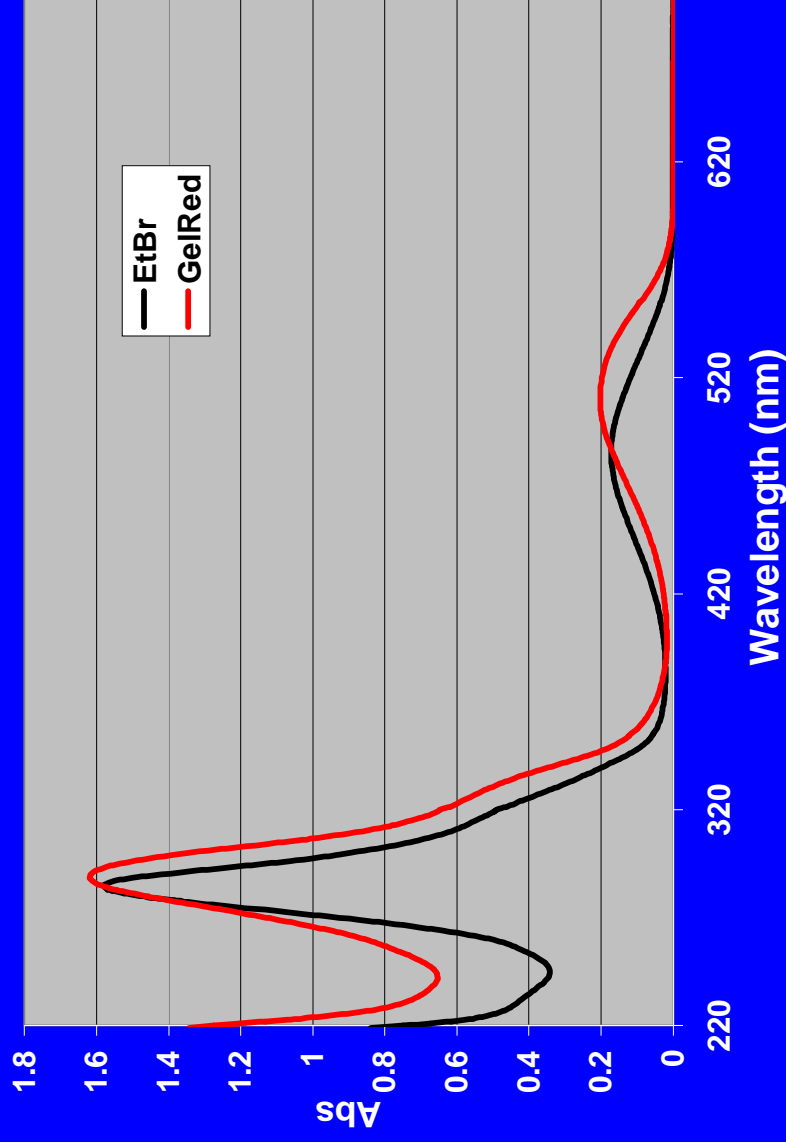
## Reason #2. Easy Disposal

- GelRed and GelGreen successfully passed the Aquatic Toxicity Test (CCR Title 22) based on the EPA/600/4-85/013 protocol; thus, they can be disposed safely down the drain  
(See safety report for detailed results)



## Reason #3. Instrument Compatibility

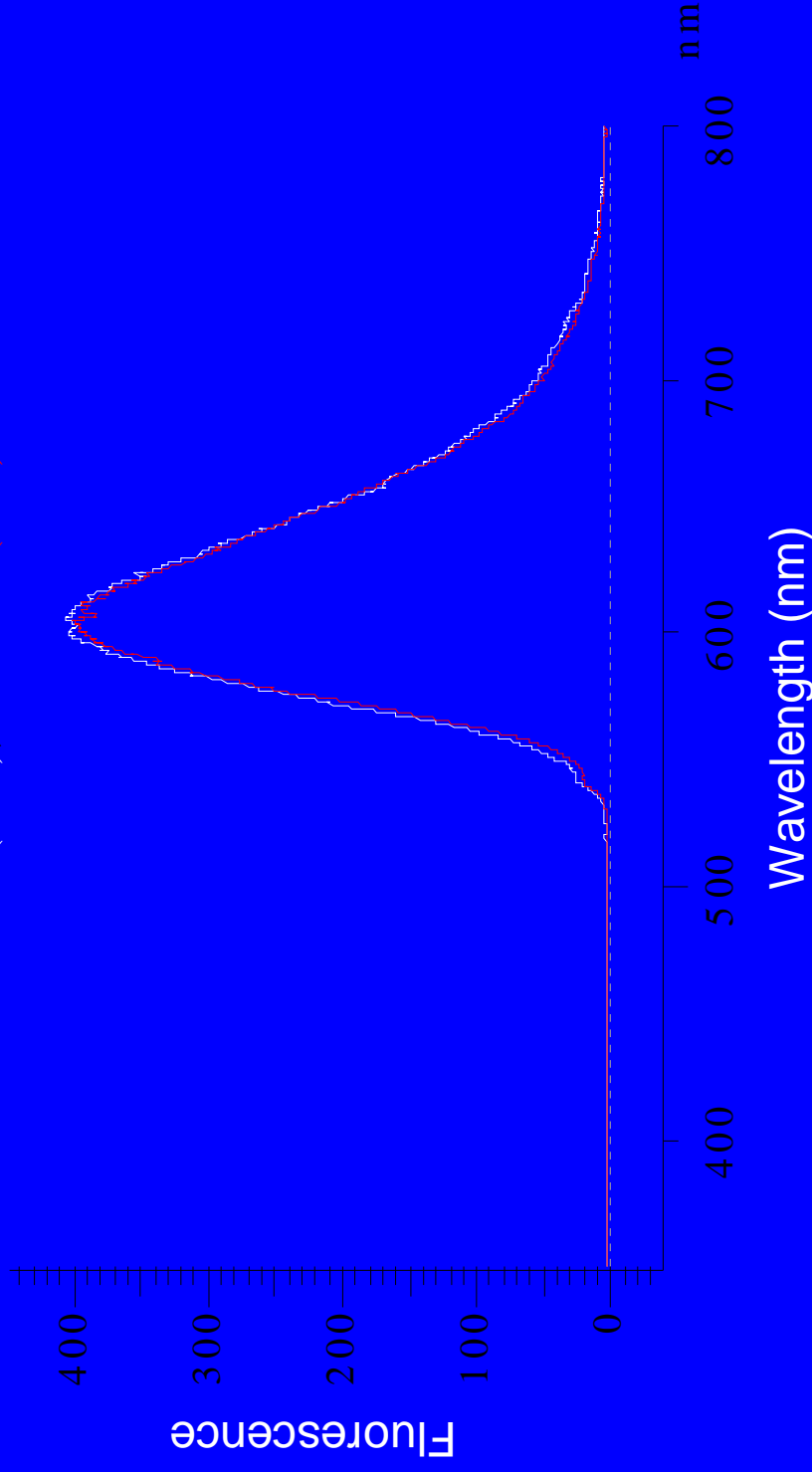
- GelRed and EtBr have similar absorption spectra



**Conclusion:** Just like EtBr, GelRed can be perfectly excited by an UV transilluminator.

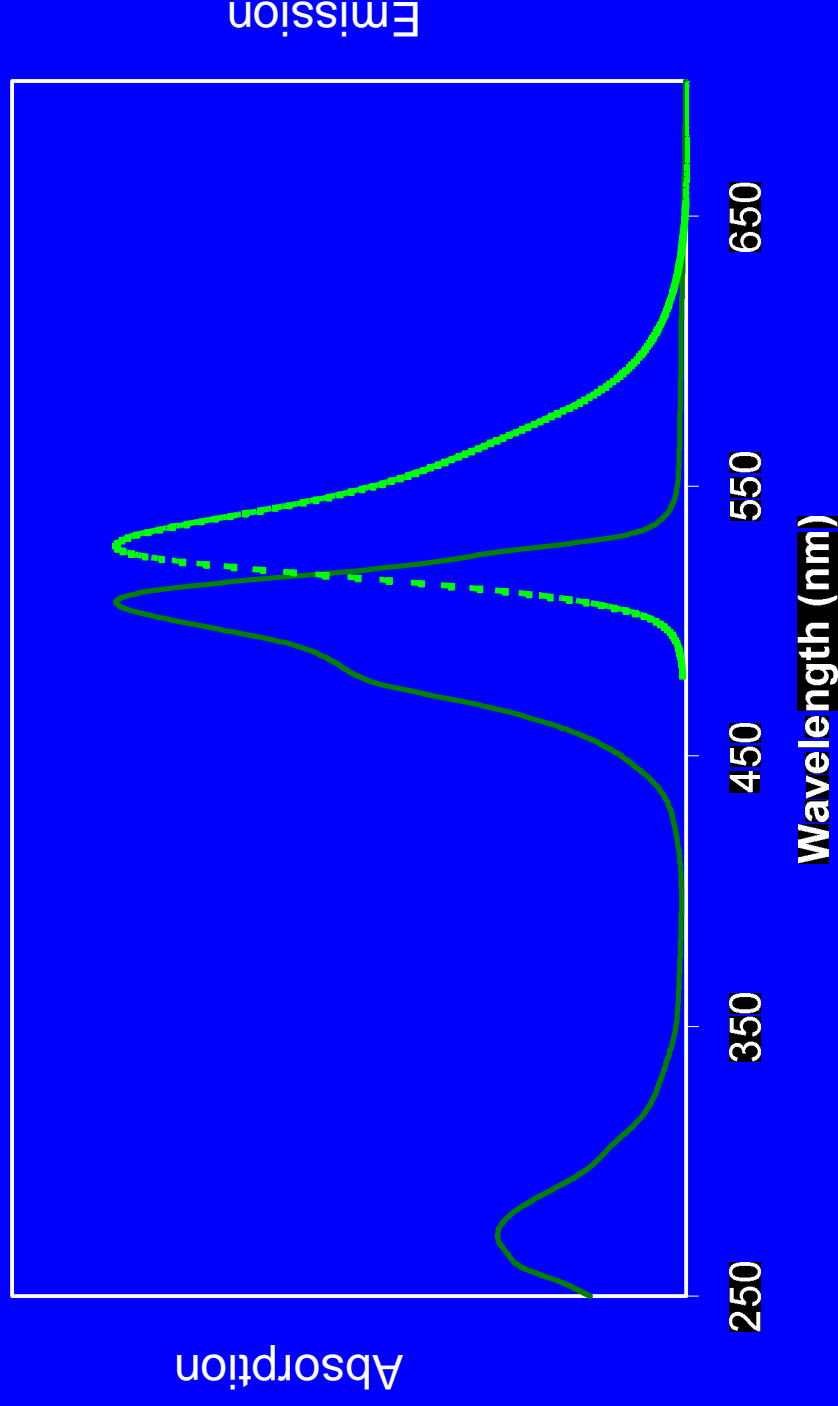
# GeIRed and EtBr Have Nearly Identical Emission Spectra

EtBr(EM), GeIRed(EM)



**Conclusion:** Replacing EtBr with GeIRed requires no filter change.

# GelGreen Is A Visible Light-excitable And Green Fluorescent Gel Stain

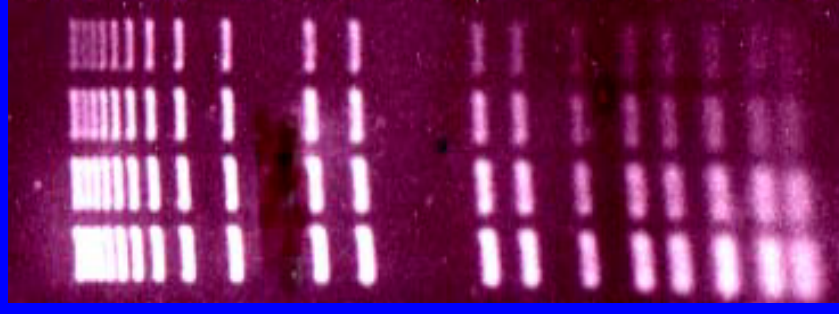


**Conclusion:** 1) Although GelGreen can be excited by UV light, it is ideal for laser-based gel scanners or dark reader using visible light excitation;  
2) Visible light excitation reduces DNA damage

# Reason #4. Superior Sensitivity

Comparison of GeIRed and EtBr in Post Gel Staining

GeIRed



High signal,  
Low background



EtBr

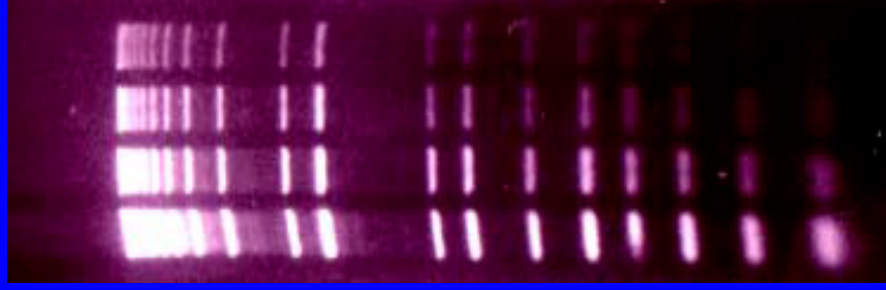


Limited signal,  
High background



# Comparison of GelRed and EtBr in Precast Gel Staining

**GelRed**



High signal,  
Low background

**EtBr**

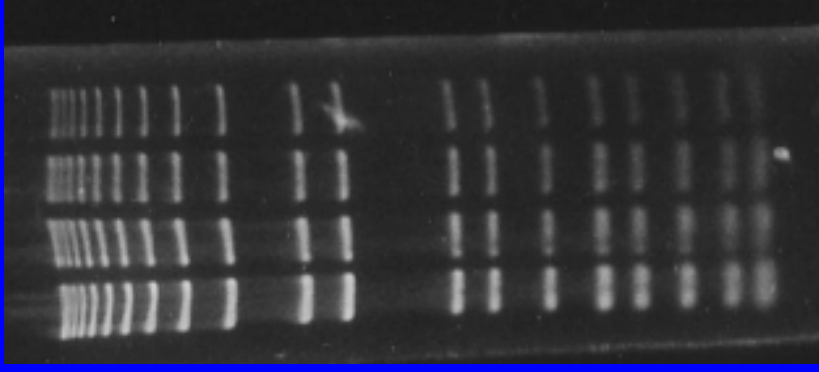


High background  
in high Mwt. DNA  
region

Insensitive to small  
DNA fragments,

# Comparison of GelGreen and SYBR Safe

GelGreen



SYBR Safe



**Conclusion:** GelGreen is far more sensitive than SYBR Safe

## Reason #5. Both GelRed and GelGreen Have Superior Stability

- Stable in water indefinitely
- Can be stored at room temperature
- Can be microwaved or heated in agarose buffers
- GelRed is more photostable than EtBr
- GelGreen is more photostable than SYBR Safe

# Summary

- GelRed is a direct and the best replacement for EtBr
- GelGreen is ideal for gel staining using visible light excitation and requiring post DNA recovery