

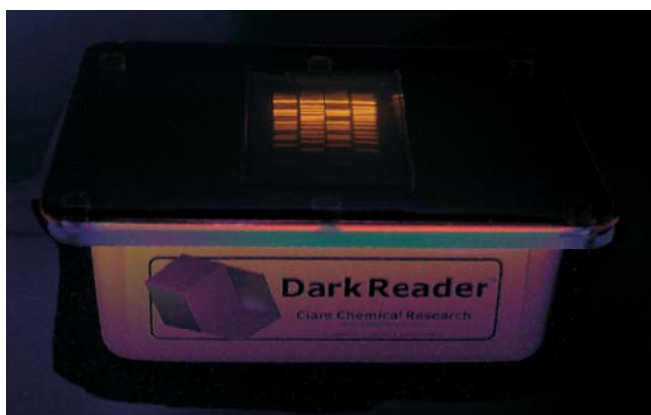
Can't Clone It? Try This.

Cut DNA Damage and Enhance Cloning Efficiency when Viewing DNA in Gels

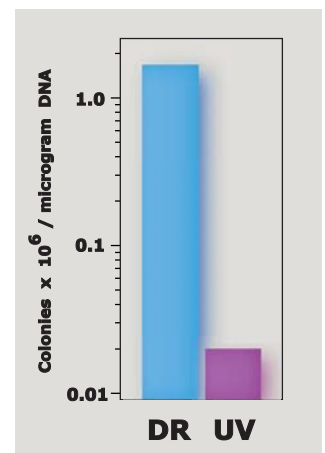
Dark Reader® Transilluminators

Scientists at Clare Chemical Research have developed a revolutionary new optical system for transilluminators using pure blue light as the fluorescence excitation source. And the benefit is? - No nasty ultra-violet radiation!

UV light rapidly degrades DNA. Even during the few seconds that it takes to excite a DNA band from a gel, the damage incurred by exposure to UV can reduce transformation, transcription and PCR efficiencies by 2 orders of magnitude or more.



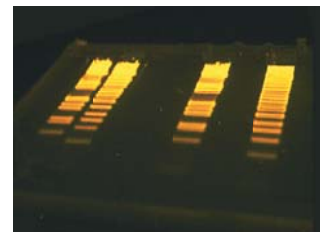
The graph below shows the results of experiments performed by researchers at Epicentre Technologies: by replacing a UV transilluminator with a blue light Dark Reader (DR), the efficiency of transformation was increased from 20,000 colonies per microgram of DNA to over 1,700,000 !



These results show that the use of a Dark Reader can lead to huge improvements in the efficiency of DNA cloning.

How does the Dark Reader work?

The light from the blue lamps used in Dark Reader devices is blocked by the amber screen. The only light reaching the viewer is the green, yellow or red fluorescence from the sample. Using a Dark Reader transilluminator, bright sample fluorescence can be viewed in an almost black background environment.



Dark Reader transilluminators, hand lamps and electrophoresis units are ideal for the highly sensitive detection of many popular fluorescent dyes including GEL Green, SYBR Gold, GelStar, SYPRO Ruby, GFP variants and fluorescein, just to name a few. To provide a brief example: it is possible to detect as little as 10 pg of SYBR Gold-stained DNA using a Dark Reader!

SYBR and SYPRO are trademarks of Molecular Probes, GelStar is a trademark of Cambrex.

Clare Chemical Research
www.clarechemical.com

Can't See It? Try This.

High Sensitivity Viewing of Green and Red Fluorescent Proteins

Dark Reader™ Hand Lamps

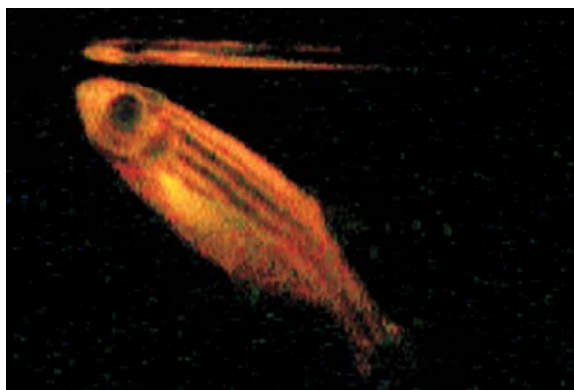
The unique series of Dark Reader Hand Lamps and Transilluminators use visible blue light to excite fluorescence. The use of blue light provides a much better match than UV for the maximum stimulation of many important fluorophores including

Green and Red Fluorescent Proteins such as EGFP, EYFP and dsRed or RFP.



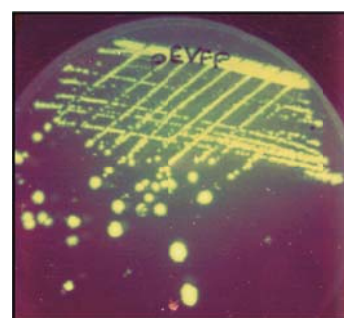
The blue light is masked by a pair of amber viewing glasses so the only light reaching the viewer is the green, yellow or red fluorescence from the sample or specimen.

Besides enhanced sensitivity, another advantage of the Dark Reader optical system is that the visible excitation light passes easily through glass and plastic (unlike UV light). This means that fluorescent samples can be easily seen in tubes, 96-well plates, Petri dishes, gels between plates, or even in an aquarium. For example, the image below is taken from a Quicktime movie (available on our web site) and shows a transgenic zebrafish expressing RFP.



Detecting bacterial colonies expressing GFP in a Petri dish is a simple exercise using a Dark Reader Hand Lamp or transilluminator.

The absence of harmful UV radiation from Dark Reader units may be important to the genetic integrity or longevity of living organisms expressing GFPs.



In this context, it should also be noted that cloning efficiencies can be increased over 100-fold if a Dark Reader is used to isolate DNA samples rather than a UV device. (See Newsletter No.1)

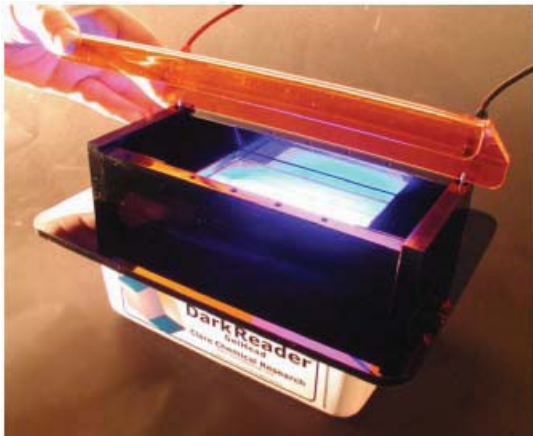
The Dark Reader Spot Lamp (above left) is a particularly handy and portable tool that can be powered by a standard 9 V battery, allowing it to be used away from the lab in locations such as the greenhouse or in the field. Mariana Franco, Stephanie Morgan and Dr. Trino Ascencio at NCSU provided the photograph below of *Arabidopsis* seedlings expressing GFP7. Expression is driven by the mas promoter which is preferentially expressed in the root.



Dark Reader technology is the subject of US patents 6198107, and 6512236 as well as patents pending.

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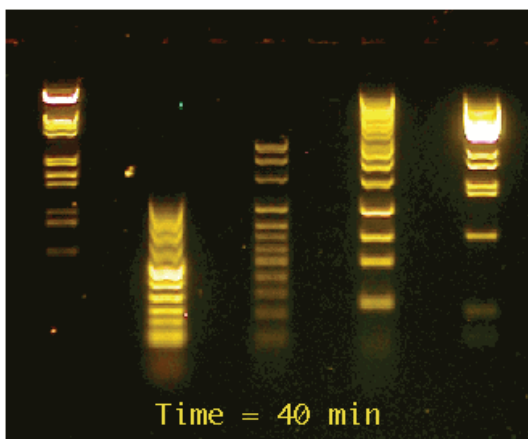
Dark Reader GelHead™



The Dark Reader GelHead (DG345) is a unique electrophoresis unit that contains an integral Dark Reader transilluminator. This allows DNA fragments to be directly viewed as they migrate down the gel.

Using the Dark Reader GelHead, the researcher can continuously monitor the progress of a DNA fractionation, and so a gel only needs to be run until the DNA bands of interest are separated. Depending on the complexity of the sample, this can occur in 30 minutes or less

Monitor DNA in Real Time



Using GelStar, GelGreen, SYBR Safe or ethidium bromide as an 'in-agarose' stain, the Dark Reader GelHead allows DNA bands to be watched in real time as they migrate through a gel.

Left: Several DNA samples were loaded on a 1% agarose gel containing GelStar stain in a Dark Reader GelHead and run at 5 V/cm using 1 x TAE running buffer. The extent of migration of the DNA fragments was recorded using a CCD camera at 2 min intervals.

(The animation file size is about 300 kb and will take about 2 min to download using a 56 k modem.)

Very Safe

Because Dark Readers emit no UV radiation, there is essentially zero risk of eye or skin damage, the extent of DNA sample damage is drastically reduced, and cloning efficiency is increased over 100-fold.

Very Versatile

The Dark Reader visible light source is particularly effective for viewing fluorophors through glass and plastic, and even in transgenic plants and animals

Visible Light

Dark Reader Transilluminators and Hand Lamps reveal fluorescent DNA, RNA, and proteins using a revolutionary combination of a VISIBLE blue light source and two color filters.

Very Sensitive

Dark Reader apparatus is at least as sensitive as UV for the detection of many fluorophors and can be used to see, directly by eye, less than 100 pg of stained



Clare Chemical Research

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