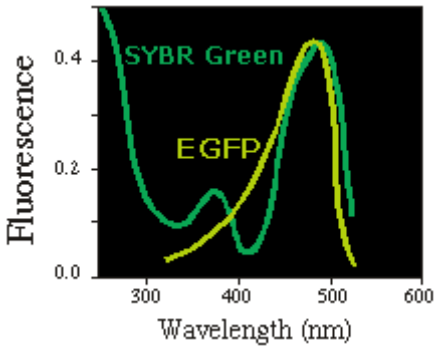
Theory
How Dark Reader Technology Works

Many Fluorophors Absorb Visible Light



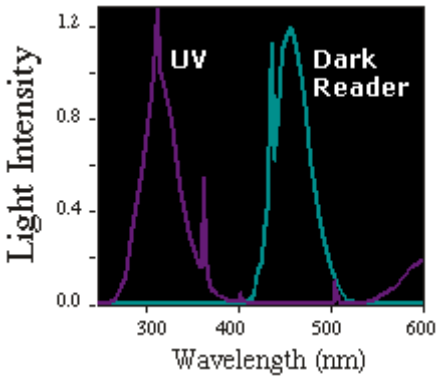
The excitation maxima for many popular dyes, including SYBR Green and red-shifted GFPs, are around 500 nm – **not** in the UV. This wavelength corresponds to blue-green light which is well within the visible light spectrum.

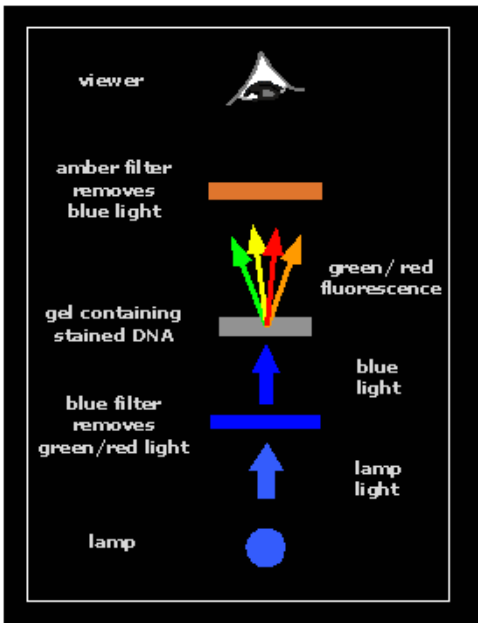
The excitation spectra of DNA stained with SYBR Green and of EGFP

A comparison of the output of the Dark Reader and a 312 nm UV transilluminator

The Dark Reader uses Visible Light

The lamp in the Dark Reader generates maximum light output between 400 and 500 nm - close to where dyes such as SYBR Green, SYPRO Orange, fluorescein and red-shifted GFPs are excited. UV transilluminators, on the other hand, typically output light around 300 nm, well removed from the absorption maxima of most common dyes.





If visible light is used for excitation of a fluorophor, any fluorescence from the sample is not directly detectable by the naked eye due to the large amount of incident light from the light source itself that reaches the observer.

The Dark Reader achieves the removal of incident light in 2 steps. The first filter is between the light source and the DNA. This removes any green and red components from the lamp and allows through to the DNA only blue excitation light.

A second filter is placed between the DNA and observer that removes the blue incident light but allows passage of the red and green fluorescent components.

Nous contacter

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