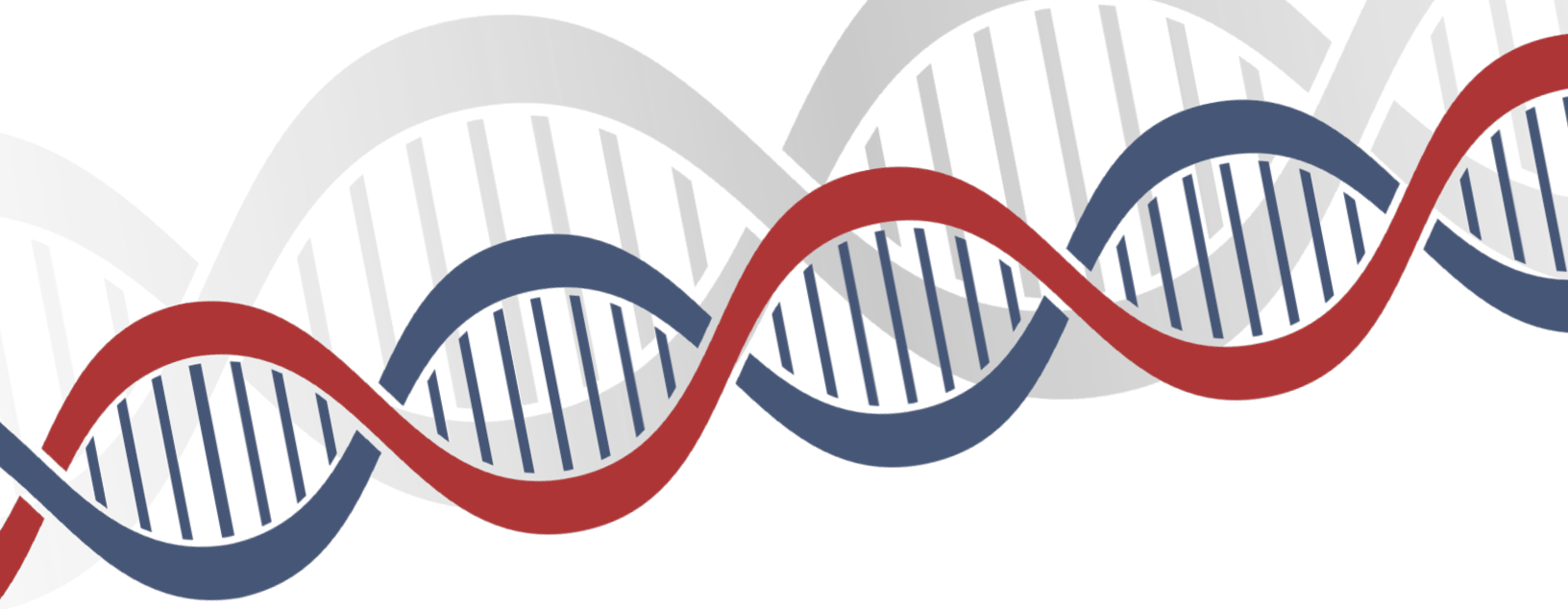




NEXT-GEN VIABILITY PCR (vPCR)

SOLUTIONS FOR PRECISION PATHOGEN DETECTION

Traditional vPCR Limitations

- ⚠ High light-sensitivity
- ⚠ Unreliable results
- ⚠ Dead cell DNA interference
- ⚠ Hook effect artifacts

Standard PCR assays often overestimate microbial presence because they amplify DNA from both live *and* dead cells. Viability PCR (vPCR) solves this problem by first neutralizing dead-cell DNA with membrane-impermeant intercalating dyes so that only genomes from intact, viable microbes are amplified. vPCR is now indispensable in food-safety testing, clinical diagnostics, environmental surveillance and antimicrobial-resistance research.

Traditionally used vPCR dyes such as PMA (Propidium Monoazide) are photoreactive, membrane-impermeable, and have a high affinity for DNA. However, they are often associated with unreliable results, high light-sensitivity, underestimation of live cells and hook effect arising from non-specific dead cell DNA amplification.

MycoLight™ vPCR Dyes Advantages

- ✓ Room-light stable
- ✓ Enhanced specificity
- ✓ Inhibits dead cell DNA amplification
- ✓ Broad compatibility
- ✓ Seamless protocol integration

Mycolight™ vPCR Dyes

Selective DNA amplification for live cells only

AAT Bioquest proudly introduces the MycoLight™ family of next-gen vPCR dyes—**MycoLight™ vPCR 350** and **MycoLight™ vPCR Star**. vPCR 350 retains the familiar light-activated mechanism but is far less light-sensitive than PMA, so it can be handled comfortably on the benchtop; UV light then covalently locks dead-cell DNA and blocks its amplification. vPCR Star offers the same membrane-exclusion specificity in a formulation that bonds to exposed DNA without the need for lamps, dark rooms, or concern about UV-induced damage. Both reagents slot seamlessly into existing PMA workflows and work across bacteria, eukaryotes, viruses, and fungi—giving labs a choice between precise photo-control and a streamlined, light-free protocol.

How It Works

MycoLight™ vPCR 350 is a photo-reactive dye that binds tightly to DNA. When exposed to visible light, it covalently attaches to the DNA, preventing PCR amplification. Notably, MycoLight™ vPCR350 is designed to be impermeable to intact cell membranes, so it only affects DNA in dead cells with compromised membranes. This selective targeting eliminates PCR signals from dead cells, ensuring precise discrimination between live and dead bacteria. MycoLight™ vPCR350 is compatible with all existing PMA protocols, offering a more reliable alternative for accurate live/dead bacterial assessment.

MycoLight™ vPCR Star follows the same principle as MycoLight™ vPCR350, but unlike its counterpart, it covalently binds to dead cell DNA *without requiring photo-activation*, resulting in a simpler workflow.

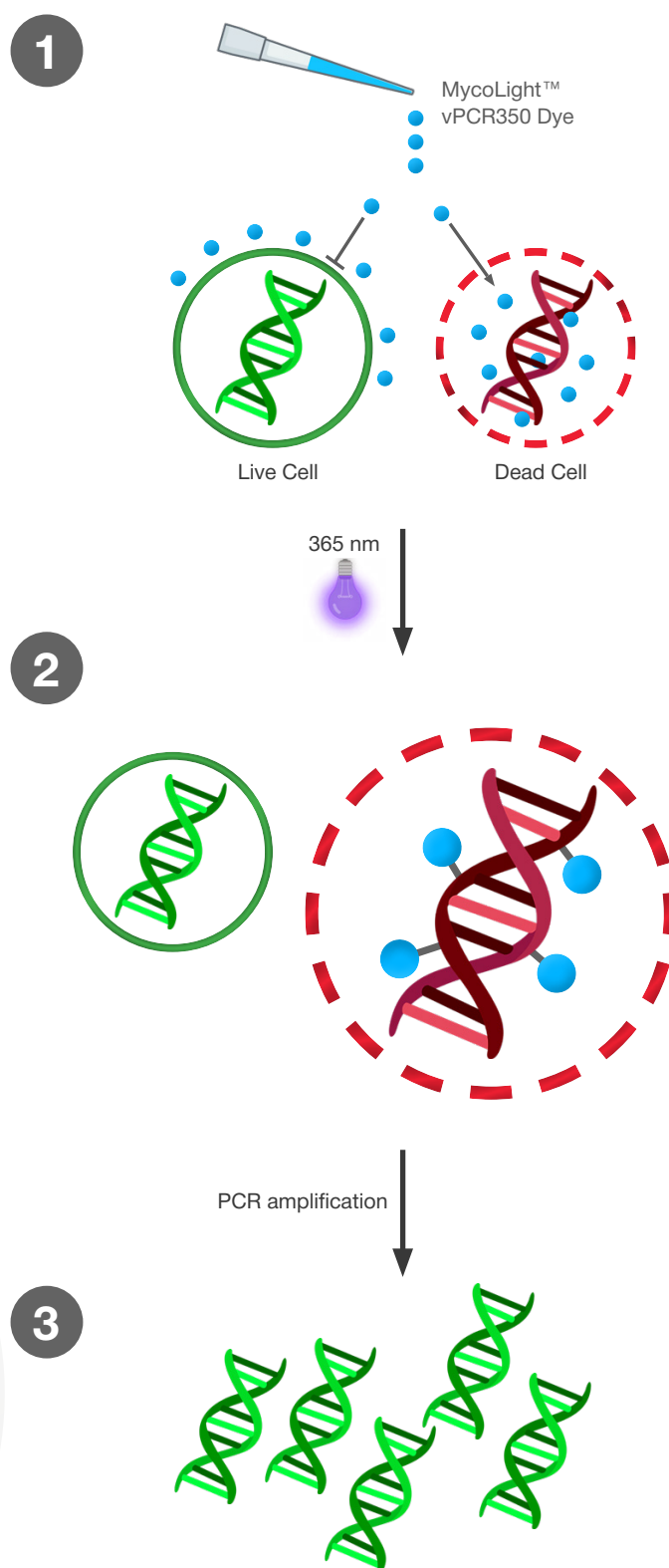


Figure 1. Overview of the MycoLight™ vPCR350 labeling protocol:

(1) Bacterial samples are prepared and treated with MycoLight™ vPCR350. The dye selectively enters only dead cells with compromised membranes. (2) Samples are then exposed to light, causing the dye covalently bond DNA, preventing PCR amplification. (3) Subsequent PCR amplifies live cell DNA only.

Key Performance Data

In a viability PCR experiment comparing live and heat-inactivated *E. coli*, MycoLight™ vPCR350 was used alongside uidA gene primers to produce normalized qPCR curves.

MycoLight™ vPCR350:

- ✓ **Did not interfere** with DNA amplification in live *E. coli*
- ✓ **Significantly delayed** amplification from dead *E. coli* DNA
- ✓ **Resolved** viable cells from non-viable ones with high sensitivity ($\Delta C_t = 14.6$)

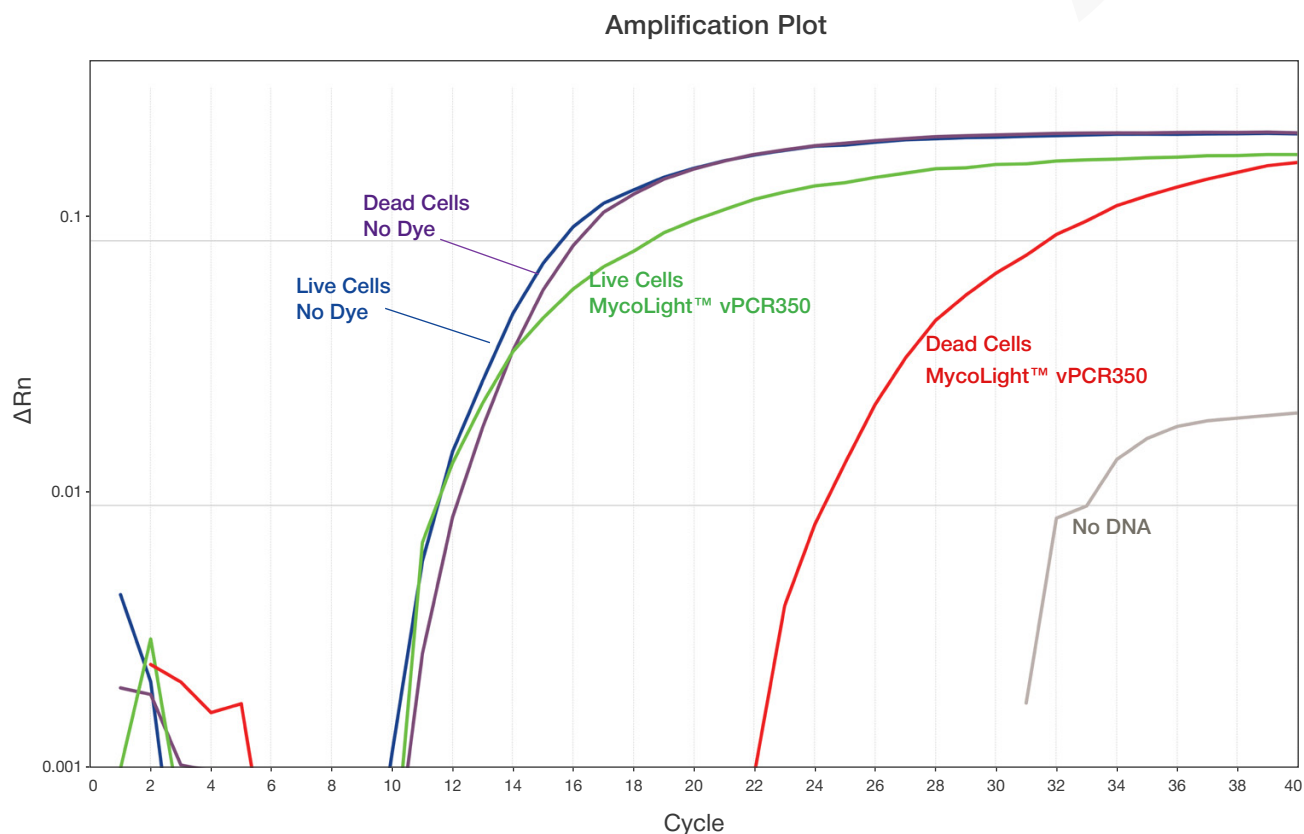


Figure 2. Normalized qPCR curves from a viability PCR experiment comparing live and heat-inactivated *E. coli* treated with MycoLight™ vPCR350. Primers targeting the uidA gene were used for qPCR analysis. MycoLight™ vPCR350 had no effect on DNA amplification from live *E. coli* (green) but caused a notable delay in amplification from heat-killed *E. coli* (red).

Photolyst™ X100: The Optimal Light Source for vPCR



Photolyst™ X100 is a cutting-edge dual-channel LED light source engineered to optimize viability PCR (vPCR) workflows by ensuring uniform illumination for robust dye photoactivation. Specifically designed for MycoLight™ vPCR350 and other dyes such as PMA, PMAxx™ (Biotium), and EMA, this instrument merges advanced technology with user-centric design to elevate the accuracy, reliability, and reproducibility of pathogen detection. Its versatility extends beyond pathogen detection, supporting diverse applications that require precise dye photoactivation.

Key features:

-  **Dual-channel LED** — Choose 365nm or 465nm wavelengths for consistent, targeted activation of vPCR dyes.
-  **PCR Tube Optimized** — Compatible with standard 0.2mL PCR tubes for effortless workflow integration.
-  **Compact Benchtop Design** — Space-saving footprint ideal for any lab environment.
-  **Energy Saving** — Energy-efficient LEDs minimize power consumption and extends lifespan.

Ordering Information

Cat. No.	Product Name	Quantity
24215	MycoLight™ PMA	1 mg
24210	MycoLight™ vPCR350	1 mg
24211	MycoLight™ vPCR Star	1 mg
PLX100	Photolyst™ X100	Each

 Explore our full range of PCR technology at aatbio.com/catalog/polymerase-chain-reaction-pcr

Connect with our experts at sales@aatbio.com for tailored guidance in selecting the optimal solutions for your high-parameter experiments. Let us help you achieve precise and reliable results.