

Bacteria stains

Fluorescent dyes and kits

Fluorescent bacteria stains:

- Live cell stains
- Dead cell stains
- Fluorescent Gram stains
- DNA dyes
- Membrane and cell wall dyes
- Combination staining kits

Live Cell Stains

- BactoView™ Live Red and BactoView™ Live Green all-bacteria stains
- DNA dyes such as DAPI, Hoechst, RedDot™1, DMAO, and Thiazole Orange
- Membrane dyes such as SynptoGreen™ and SynptoRed™
- CellBrite™ Fix fixable membrane dyes, available in green, red, and far-red

Dead Cell Stains and Viability Kits

- Live-or-Dye™ Fixable Viability Staining Kits are amine-reactive, fixable, and dead-cell-specific (Fig. 1)
- For flow cytometry and microscopy. Available in 9 bright, photostable colors
- Dead cell specific DNA dyes such as EthD-III and RedDot™2
- The Viability/Cytotoxicity Assay Kit for Bacteria features dual staining: DMAO (green) for live cells, and EthD-III (red) for dead cells (Fig. 2)

Fluorescent Gram Stains

- Wheat Germ Agglutinin (WGA) is a carbohydrate-binding lectin that preferentially binds to gram-positive bacteria (Fig. 3). Available in 13 colors
- Other dyes that preferentially stain gram-positive bacteria include MemBrite™ Fix and Calcofluor White surface stains, NucSpot® Live DNA stains, and ViaFluor® fixable cytoplasmic stains
- The Bacterial Viability and Gram Stain Kit features three dyes: CF@488A WGA (green) for Gram staining, DAPI (blue) for live cells, and EthD-III (red) for dead cells (Fig. 4)

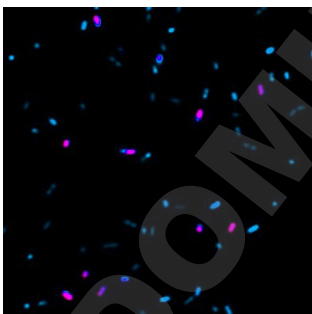


Figure 1. Live and heat-killed *E. coli* stained with Live-or-Dye™ 568/583 (red, appears pink in merge) and DAPI (blue).

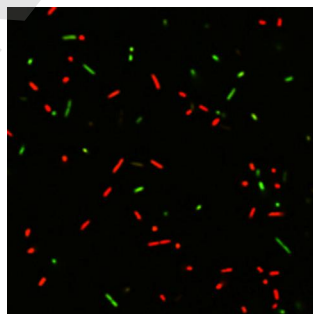


Figure 2. Live and heat-killed *E. coli* stained with DMAO, marking live cells (green) and EthD-III, marking dead cells (red).

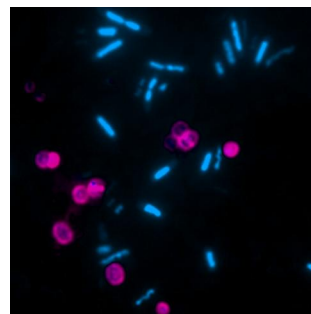


Figure 3. *E. coli* and *Staphylococcus* stained with CF@633 WGA (magenta) and DAPI (blue).

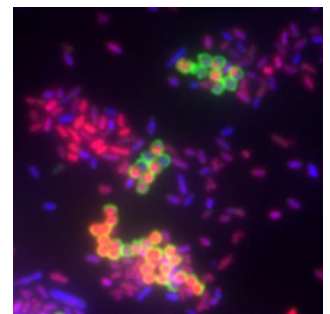


Figure 4. Bacterial Viability and Gram Stain Kit. CF@488A WGA (green), EthD-III (red) and DAPI (blue).

Viability PCR: better alternative to culturing

A dead-cell dye covalently attaches to DNA, which causes qPCR amplification of the dead cell DNA to be inhibited. Only live cell DNA is amplified efficiently.

Advantages of viability PCR:

- Fast! Results in just a few hours
- Quantitative and sensitive! Viability measured by qPCR
- Flexible! Works with any cell type

Biotium innovations:

- Original inventor of PMA and PMAxx™ for viability PCR
- PMAxx™ gives better live/dead separation than older dyes, EMA and PMA
- Enhancer improves live/dead separation of gram-negative bacteria

Viability PCR Starter Kits

The customizable Viability PCR Starter Kits are the easiest way to get started in v-PCR.

Kits include:

- Your choice of PMAxx™ or PMA viability dye
- EvaGreen® qPCR Master Mix
- 5X PMA Enhancer for Gram-Negative Bacteria (for use with gram-negative strains only)

Not included but required:

- Primers to amplify DNA from your cell type of interest

Example data from the Salmonella Viability PCR Kit

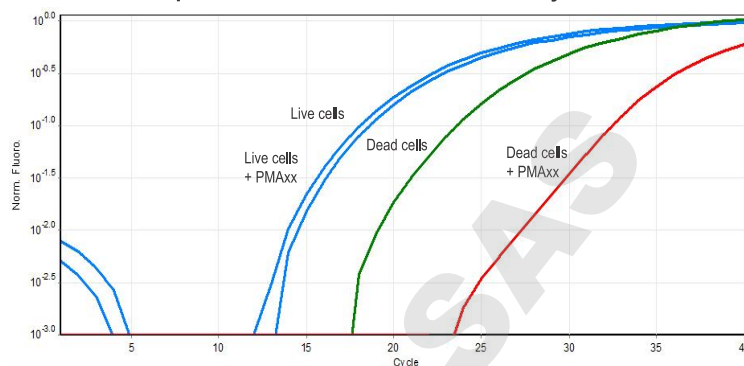


Figure 5. Live and dead *Salmonella enterica* were either left untreated or treated with 10 uM PMAxx™ viability dye, followed by light treatment with the PMA-Lite™. DNA from each sample was used as the template in a qPCR reaction using the *Salmonella*-specific invA primers that are provided in the Salmonella Viability PCR Kit. Treatment with PMAxx™ causes a drastic reduction in the amplification of dead cell DNA but has no effect on live cell DNA.

Strain-specific viability PCR kits

Ready-to-use Real-Time PCR Bacterial Viability Kits for the detection of specific bacterial strains.

Kits include:

- PMAxx™ or PMA viability dye
- Forget-Me-Not EvaGreen® qPCR Master Mix
- PMA Enhancer (gram-negative strains only)
- Validated PCR primers for the indicated strain

Bacteria Stains Ordering Information

| Cat. # | Product |
|---------------------|---|
| 40101, 40102 | BactoView™ Live Bacterial Stains |
| 30088-30090 | CellBrite™ Fix Fixable Membrane Stains |
| 70020, 70022 | SynaptoGreen™ C4 Membrane Dye |
| 70021, 70027 | SynaptoRed™ C2 Membrane Dye |
| 40046 | Hoechst Blue DNA Dye |
| 40012 | DMAO Green DNA Dye |
| 40060 | RedDot™1 Far-Red DNA Dye |
| 32002-32009 | Live-or-Dye™ Fixable Viability Staining Kits |
| 40051 | Ethidium Homodimer III (EthD-III) Dead Cell DNA Dye |
| 40061 | RedDot™2 Far-Red Dead Cell DNA Dye |
| 30027 | Viability/Cytotoxicity Assay Kit |
| 29021...29076 | CF® Dye WGA Fluorescent Gram Stains |
| 32001 | Bacterial Viability and Gram Stain Kit |
| 30092-30104 | MemBrite™ Fix Cell Surface Stains (gram+ only) |
| 40081, 40082 | NucSpot® Live DNA Dyes (gram+ only) |
| 30050, 30068, 30086 | ViaFluor® Cytoplasmic Stains (gram+ only) |

Viability PCR Ordering Information

| Cat. # | Product |
|--------------|--|
| 40069 | PMAxx™, 20 mM in water |
| 40019 | PMA dye, 20 mM in water |
| 31075, 31076 | Viability PCR Starter Kits |
| 31038 | PMA Enhancer for Gram-Negative Bacteria |
| E90002 | PMA-Lite™ LED Photolysis Device |
| E90004 | Glo-Plate™ Blue LED Illuminator |
| 31033 | Real-Time Bacterial Viability Kit, <i>Salmonella enterica</i> |
| 31034 | Real-Time Bacterial Viability Kit, <i>M. tuberculosis</i> |
| 31035 | Real-Time Bacterial Viability Kit, <i>S. aureus</i> |
| 31036 | Real-Time Bacterial Viability Kit, <i>MRSA</i> |
| 31037 | Real-Time Bacterial Viability Kit, <i>E. coli O157:H7</i> |
| 31050 | Real-Time Bacterial Viability Kit, <i>E. coli</i> |
| 31051 | Real-Time Bacterial Viability Kit, <i>Listeria monocytogenes</i> |
| 31053 | Real-Time Bacterial Viability Kit, <i>Legionella pneumophila</i> |