Revised: January 8, 2019

Product Information

PMA-Lite™ LED Photolysis Device

Catalog Number: E90002

Specifications

Dimensions (WxDxH)	8.25 x 6.25 x 2.625 in. (21 x 15.9 x 6.7 cm)
Weight	3 lb. 10.7 oz. (1.66 kg)
Frequency Range	50~60Hz
Power Range	100~240VAC
Maximum Power	60W
LED Output Wavelength	465-475nm

Product Description

PMA-Lite™ LED Photolysis Device is specifically designed for photoactivation of propidium monoazide (PMA), PMAxx™, EMA and other photoreactive dyes. It can also function as a general photolysis device to provide continuous illumination to 1.5-2 mL-sized vials in a controlled manner. The device can hold up to 18 vials. Multiple LED lights are positioned to provide even and maximal illumination from both the sides and bottom to all vials. An internal fan is used to reduce the heat generated from the lights to ensure near room temperature photolysis. The device has a timer that can be set for 10, 15, 20 or 30 minutes of continuous photolysis.

Features:

- Provides even and maximal illumination to up to 18 1.5-2 mL-sized vials.
- Internal fan to ensure a temperature of <37°C.
- Four timer settings for 10, 15, 20 or 30 minutes of continuous illumination.
- Long-lasting LED lights with 465-475 nm emission for efficient activation of PMAxx™, PMA, EMA or other similar azido dyes.
- Unit has 120/240V internal converter and is provided with a universal outlet adaptor for customers outside of North America.
- Purchase of device includes sample of PMAxx™ (50uL, 40069-T).

Figure 1. PMA-Lite™ LED Photolysis Device.

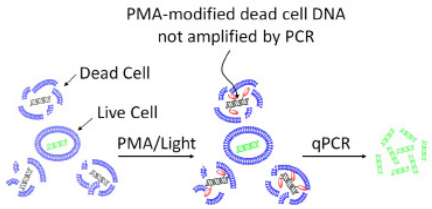

Figure 2. Principle of PMA modification for quantitation of viable bacteria by qPCR. The cell membrane-impermeable PMA dye selectively inhibits amplification of DNA from dead bacteria, permitting selective quantitation of viable bacteria. See Figures 4 and 5 for example data.

Application Notes

Viability PCR (v-PCR) is a powerful technology for the sensitive and rapid detection of viable microorganisms. Unlike time-consuming culturing methods, qPCR is a fast and sensitive method of detection. However, normal PCR does not distinguish between live and dead cells. With v-PCR using PMAxx™ or PMA, you get the speed, sensitivity and specificity of PCR, plus quantifiable viability.

PMAxx™ and PMA are photoreactive dyes with high affinity for DNA. The dyes intercalate into dsDNA and form a covalent linkage upon exposure to intense visible light (Figure 2). The reaction inhibits PCR amplification of modified DNA templates by a combination of removal of modified DNA during purification and inhibition of template amplification by DNA polymerases. Because the dyes are cell membrane-impermeable, when a sample containing both live and dead bacteria is treated with dye, only dead bacteria with compromised cell membranes are susceptible to DNA modification. In a real-time PCR reaction, dead cell DNA will show delayed amplification and higher Ct than live cells (Figures 4 & 5). In a mixed population, v-PCR permits quantitation of cell viability.

Protocol for use

The following is a protocol for using the PMA-Lite™ LED Photolysis Device to treat cultured laboratory strains of bacteria with PMAxx™ or PMA. Treatment of complex biological or environmental samples such as feces or soil may require optimization of sample dilution, dye concentration, and light treatment time. Please see the Product Information sheets for PMAxx™ (40069) and PMA (40013 and 40019) for detailed experimental protocols.

1. Turn the PMA-Lite™ LED Photolysis Device over and use the switches to set the length of time for photolysis (Figure 3). We recommend using 15 minutes photolysis time as a starting point and optimizing photolysis time as needed. Different cell types or sample types may require shorter (as few as 5 minutes) or longer photolysis times.
2. Place samples (in clear 1.7 mL microcentrifuge or 2 mL screw top tubes) in the PMA-Lite™ LED Photolysis Device.
3. Turn the PMA-Lite™ LED Photolysis Device on using the switch on the back of the unit.
4. The LEDs will automatically shut off after the amount of time set in Step 1. Turn the unit off and remove samples for further processing or use the Restart button to begin the photolysis cycle again on fresh samples.

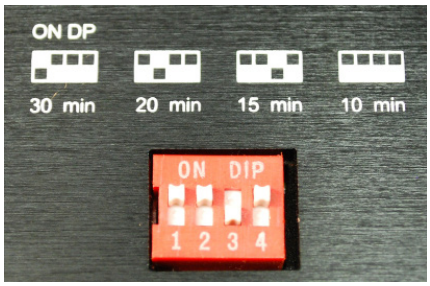

Figure 3. Switch positions for corresponding LED photolysis times. Black squares indicate the position of the switches. With the switch setting shown in this image, photolysis will occur for 15 minutes.

Sample data

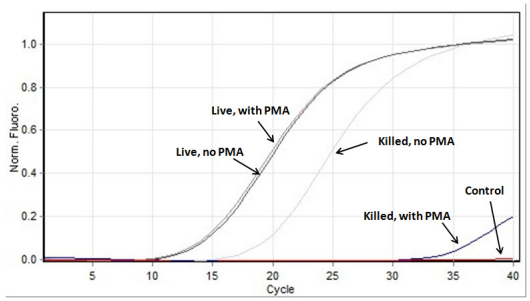

Figure 4. Real time PCR amplification curve of DNA from live or heat-killed *E. coli* +/- PMA subjected to 15 minutes of photolysis with the PMA-Lite™ LED Photolysis Device. Real time PCR was performed with primers against a region of the 16S rRNA gene.

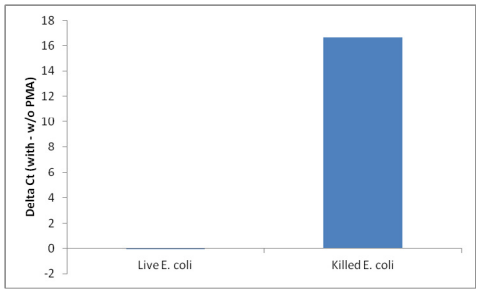

Figure 5. Heat-killed *E. coli* incubated with PMA and photolysed with the PMA-Lite™ LED Photolysis Device show a greatly increased delta Ct value over PMA-treated live E. coli. After real time PCR analysis, Ct values were calculated for duplicate samples. Average Ct values for untreated live or dead E. coli were subtracted from average Ct values for treated live or dead E. coli samples.

Visit our website for an up to date list of references and a list of validated bacteria strains.

Related Products

Catalog number	Product
40069	PMAxx™, 20 mM in H2O
40019	20 mM PMA in H_2O, 100 uL
40013	PMA (Propidium monoazide), 1 mg
31038	PMA Enhancer for Gram Negative Bacteria, 5X Solution
40015	Ethidium Monoazide, Bromide (EMA)
E90004	Glo-Plate™ Blue LED Illuminator
31075	Viability PCR Starter Kit with PMA
31076-X	Viability PCR Starter Kit with PMAxx™ and Enhancer
31041	Forget-Me-Not™ EvaGreen® qPCR Master Mix (2-Color Tracking)
31043	Forget-Me-Not™ Universal Probe qPCR Master Mix
31045	Forget-Me-Not™ EvaGreen® qPCR Master Mix (Low ROX or High ROX)
31033	PMA-PCR bacterial viability kit, Salmonella
31034	PMA-PCR bacterial viability kit, M. tuberculosis
31035	PMA-PCR bacterial viability kit, Staph. aureus
31036	PMA-PCR bacterial viability kit, MRSA
31037	PMA-PCR bacterial viability kit, E. coli O157:H7
31050	PMA-PCR bacterial viability kit, E. coli
31051	PMA-PCR bacterial viability kit, Listeria
31053	PMA-PCR bacterial viability kit, Legionella
32001	Bacterial Viability and Gram Stain Kit
32000	Live Bacterial Gram Stain Kit, 800 assays
30027	Viability/Cytotoxicity Assay Kit for Bacteria Live and Dead Cells, 100-1000 assays

Warranty

Biotium warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of purchase. If a defect is present, Biotium will, at its option, repair, replace, or refund the purchase price of this product at no charge to you, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. For your protection, items being returned must be insured against possible damage or loss. Biotium cannot be responsible for damage incurred during shipment of a repair instrument; It is recommend that you save the original packing material in which the instrument was shipped. This warranty shall be limited to the replacement of defective products. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

Obtaining Service

Contact Biotium Technical Support at 800-304-5357 or send an email to techsupport@biotium.com and describe the problem(s) you are experiencing. Carry out any suggested modifications or tests. DO NOT ship a device to us without first obtaining a Return Authorization from us. If it is determined by the Biotium Technical Support representative that the device should be returned for repair, a Return Authorization number will be assigned and you will receive instructions for the return. If the device is under warranty, Biotium will repair or replace the unit, and pay for return shipment. If the device is not under warranty, Biotium will give you a cost estimate before repairing the unit. Repair and shipping costs both ways are your responsibility if the device is not under warranty.

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