

# Phorbol myristate acetate (PMA)

NF- $\kappa$ B Activator

Catalog code: tlr1-pma, tlr1-pma-2

<https://www.invivogen.com/pma>

For research use only

Version 23L06-MM

## PRODUCT INFORMATION

### Contents

- Phorbol myristate acetate (PMA) is available in two quantities
  - 5 mg PMA: tlr1-pma
  - 10 mg (2 x 5 mg) PMA: tlr1-pma-2
- 1.5 ml endotoxin-free water

### Storage and stability

- PMA is provided as a translucent film and is shipped at room temperature. Store at -20°C. Protect from light as PMA is photosensitive.
- Upon resuspension, prepare aliquots of PMA and store at -20°C. Protect from light and avoid repeated freeze-thaw cycles.
- Resuspended product is stable for at least 1 year at -20°C when properly stored.

### Quality control

- Purity:  $\geq 98\%$  (UHPLC)
- The biological activity has been validated using cellular assays.

## DESCRIPTION

Phorbol 12-myristate 13-acetate (PMA), also known as 12-O-tetradecanoylphorbol 13-acetate (TPA), is a specific activator of Protein Kinase C (PKC) and hence activates nuclear factor-kappa B (NF- $\kappa$ B). NF- $\kappa$ B is a transcription factor that regulates numerous physiological functions and is involved in the pathogenesis of various diseases. It has been identified as a potential therapeutic target in inflammatory processes, cancer, and autoimmune diseases<sup>1</sup>.

PMA is the most common and potent phorbol ester. It is active at nanomolar concentrations and activates NF- $\kappa$ B in a dose-dependent manner<sup>1</sup>. PMA causes a wide range of effects in cells and tissues, and is a very potent mouse skin tumor promoter<sup>2,3</sup>. InvivoGen's PMA is designed to study the NF- $\kappa$ B pathway in cellular assays.

1. Hellweg C.E. *et al.*, 2006. Activation of nuclear factor kappa B by different agents: influence of culture conditions in a cell-based assay. *Ann N Y Acad Sci.* 1091:191-204. 2. Chang MS. *et al.*, 2005. Phorbol 12-myristate 13-acetate upregulates cyclooxygenase-2 expression in human pulmonary epithelial cells via Ras, Raf-1, ERK, and NF-kappaB, but not p38 MAPK, pathways. *Cell Signal.* 17(3):299-310. 3. Fürstenberger G. *et al.*, 1981. Skin tumor promotion by phorbol esters is a two-stage process. *PNAS.* 78(12):7722-6.

## CHEMICAL PROPERTIES

CAS number: 16561-29-8

Formula: C<sub>36</sub>H<sub>56</sub>O<sub>8</sub>

Molecular weight: 616.8 g/mol

Solubility: DMSO (5 mg/ml)

## METHODS

**Working concentrations:** 10 ng/ml - 1  $\mu$ g/ml (for NF- $\kappa$ B activation with InvivoGen's cell-based assays)

*Note:* The working concentration of PMA will vary depending upon the application and will need to be optimized accordingly.

### Preparation of stock solution (5 mg/ml)

- Add 1 ml of DMSO and vortex until completely dissolved.
- Prepare serial dilutions using endotoxin-free water.

*Note:* PMA solutions may remain cloudy.

### PMA-induced activation of NF- $\kappa$ B

PMA can be used as a positive control with NF- $\kappa$ B reporter cell lines. Alternatively, PMA can be used to test the efficacy of NF- $\kappa$ B reporter plasmids, such as the pNiFty plasmids. These plasmids carry a reporter gene, such as secreted embryonic alkaline phosphatase (SEAP) or the secreted Lucia luciferase, under the control of an NF- $\kappa$ B-inducible promoter. For more information, visit <https://www.invivogen.com/innate-immunity-pnifty>.

- Transfect your cell line with a pNiFty plasmid or any NF- $\kappa$ B reporter plasmid.
- Twenty-four to forty-eight hours after transfection, stimulate cells with 10 ng/ml to 1  $\mu$ g/ml PMA for 6 to 24 hours.
- Determine PMA-induced activation of NF- $\kappa$ B by assessing reporter gene expression using the appropriate detection system.

## RELATED PRODUCTS

| Product                    | Description                       | Cat. Code   |
|----------------------------|-----------------------------------|-------------|
| HEK-Blue™ hTLR4 Cells      | Human TLR4 reporter cells         | hkb-htr4    |
| HEK-Blue™ Detection        | SEAP detection medium             | hb-det1     |
| pNiFty2-N-SEAP-Zeo         | SEAP reporter plasmid             | pnf2-sp     |
| pNiFty2-N-Lucia-Zeo        | Lucia luciferase reporter plasmid | pnf2-lc     |
| QUANTI-Blue™ Solution      | SEAP detection reagent            | rep-qbs     |
| QUANTI-Luc™ 4 Lucia/Gussia | Luciferase detection reagent      | rep-qlc4lg1 |

For a complete list of InvivoGen's Reporter Cell Lines please visit <https://www.invivogen.com/reporter-cells>.

## TECHNICAL SUPPORT

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