Small Molecules

Phorbol 12-myristate 13-acetate

PKC pathway activator; Activates protein kinase C

Catalog # 74042 1 mg
74044 5 mg

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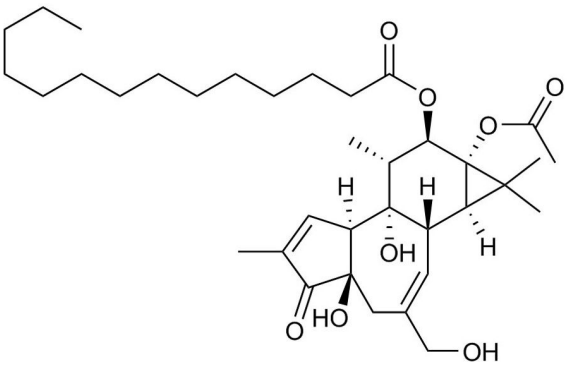
Product Description

Phorbol 12-myristate 13-acetate (PMA), a phorbol ester, is a reversible, highly potent activator of protein kinase C (PKC), including Group A and Group B isoforms (Blumberg). PMA activates PKC isoforms through the binding of the C1 domain (Hurley et al.). PMA can also activate certain mitogen-activated protein (MAP) kinase pathways through PKC (Adams & Parker).

Molecular Name: Phorbol 12-myristate 13-acetate
Alternative Names: 12-O-Tetradecanoylphorbol-13-acetate; PMA; TPA
CAS Number: 16561-29-8
Chemical Formula: $C_{36}H_{56}O_8$
Molecular Weight: 616.8 g/mol
Purity: ≥ 99%
Chemical Name: 12-O-tetradecanoylphorbol-13-acetate
Structure:



Properties

Physical Appearance: A crystalline solid

Storage: Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage store with a desiccant.
Stable as supplied for 12 months from date of receipt.

Solubility:
· DMSO ≤ 40 mM
· Absolute ethanol ≤ 40 mM
For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 162 µL of DMSO.

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

DIFFERENTIATION
· Stimulates cardiac differentiation of mesenchymal stem cells (Seo et al.).
· Promotes hematopoietic differentiation (Clemens et al.).
IMMUNOLOGY
· Stimulates differentiation of IL-15-stimulated lamina propria CD4+ T cells into CXCR5+CD4+ cells when used together with Ionomycin (Catalog #73722) (Sarra et al.).
CANCER RESEARCH
· In combination with AS101, shows anti-leukemic activity and stimulates human leukemia cell lines to differentiate into macrophage-like cells (Glesne & Huberman; Hayun et al.).

References

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Clemens MJ et al. (1992) The role of protein kinase C isoenzymes in the regulation of cell proliferation and differentiation. J Cell Sci 103(4): 881–7.
Glesne D & Huberman E. (2006) Smad6 is a protein kinase X phosphorylation substrate and is required for HL-60 cell differentiation. Oncogene 25(29): 4086–98.
Hayun M et al. (2007) Synergistic effect of AS101 and Bryostatin-1 on myeloid leukemia cell differentiation in vitro and in an animal model. Leukemia 21(7): 1504–13.
Hurley JH et al. (2008) Taxonomy and function of C1 protein kinase C homology domains. Protein Sci 6(2): 477–80.
Sarra M et al. (2013) IL-15 positively regulates IL-21 production in celiac disease mucosa. Mucosal Immunol 6(2): 244–55.
Seo H-H et al. (2016) The role of nuclear factor of activated T cells during phorbol myristate acetate-induced cardiac differentiation of mesenchymal stem cells. Stem Cell Res Ther 7(1): 90.

Related Small Molecules

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This product is hazardous. Please refer to the Safety Data Sheet (SDS).