LC Laboratories
a division of PKC Pharmaceuticals, Inc.

P-8880 4α-Phorbol 12-Myristate 13-Acetate, >99%

[4α-PMA**] [**4α-TPA**] [**4α-12-*O*-Tetradecanoylphorbol 13-Acetate**]**

M.W. 616.84 $C_{36}H_{56}O_8$ [63597-44-4]

Storage: Store at or below -20 ºC. **Solubility:** Soluble in DMSO or ethanol. **Disposal:** A

- Negative control for studies with PMA, . Van Duuren, B.L. *et al. Cancer Res.* **39**: 2644-2646 (1979).
- Please request Technical Note #13 for additional information.
- **IMPORTANT NEW DATA: 4α-Phorbol Ester Activation of TRPV4 Channels!** Though long thought to be a biologically inactive or extremely weak phorbol ester analog (i. e., an ED 50 >25 μM for binding to protein kinase C), 4α-PMA may prove to be a reasonably potent activator of TRPV4 channels, with utility for structure-activity studies of this phenomenon. The supposition of agonist activity for 4α-PMA on TRPV4 channels is based on the potent agonist response elicited by the very similar compound, 4α-PDD, in systems containing human VRL-2 and murine TRP12 channels [H. Watanabe et al., J. Biol. Chem. 277: 13569-13577 (2002)]. **See the entry for 4α-PDD, , for an extensive description of these new and exciting results.**
- **Chemical Structures.** The primary structural difference between 4α-PMA and the highly potent phorbol ester-type PKC activators is the configuration at C4. In the highly active phorbol ester family, the hydroxy group at C4 is in the β configuration, i. e., rising up out of the two-dimensional structure as depicted on paper or a computer monitor. The 4-alpha-phorbol esters such as 4α-PMA, 4α-PDD and 4α-PDBu have the 4-OH group oriented down below the paper or computer screen's two-dimensional plane.
- **Nomenclature.** Unless "4α" is specified, all "phorbol" compounds are automatically defined, by operation of standard chemical nomenclature conventions, as having the 4β -configuration, as part of the intrinsic meaning of the word "phorbol". This is much like the word "cholesterol", which automatically means that its hydroxy group at carbon 3 is in the β configuration; there is no need to specify "3β-cholesterol", whereas a cholesterol derivative with a 3α hydroxy group would require a "3α-cholesterol" specification.

  To avoid confusion in this field, it is useful to note that, technically, 4α-PMA is not a "phorbol ester", it is a "**4α-**phorbol ester", and the structural differences, though minor overall, are quite significant biologically. Given the extreme differences in their biological properties, both on PKC and TRPV4 channel-based phenomena, efforts to maintain distinctive names for members of these two biologically quite distinct classes of compounds appear to be well justified.