

Product Data Sheet

Product Name: Pimaric Acid

Cat. No.: GC40832

Chemical Properties

Cas. No. 127-27-5

SMILES C=C[C@@]1(C)C=C2CC[C@@]3([H])[C@@](C(O)=O)(C)CCC[C@]3(C)[C@@]2([H])CC1

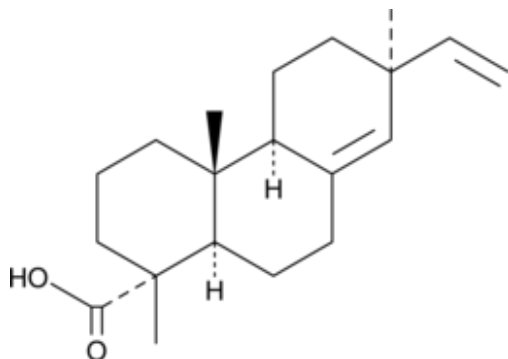
Formula $C_{20}H_{30}O_2$ M.Wt 302.5

Solubility DMSO : 100 mg/mL (330.63 mM; Need ultrasonic) Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



Protocol

Cell experiment [1]:

Cell lines PA-1 cells

Caution: Product has not been fully validated for medical applications. For research use only.

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Preparation Method PA-1 cells were cultured in RPMI-1640 medium supplemented with 10% fetal bovine serum (FBS) and antibiotics (penicillin 100U/ml, streptomycin 0.1mg/ml) under normal conditions (5% CO₂ with 95% humidified air). PA-1 cells (1×10^3) were plated using 96-well plates and subjected to incubation for 12h in a 5% CO₂ incubator. Incubation was followed by treatment with different doses of Pimaric Acid (0, 2.5, 5, 10, 20, 40, 80, 160, and 320μM) for 48h, and cell viability was measured.

Reaction Conditions 0, 2.5, 5, 10, 20, 40, 80, 160 and 320μM; 48h

Applications Pimaric Acid treatment decreased the cell viability of PA-1 cells in a dose of manner.

References:

[1] Li W, Xuemei G, Yilin Z, et al. Anticancer effects of Pimaric acid is mediated via endoplasmic reticulum stress, caspase-dependent apoptosis, cell cycle arrest, and inhibition of cell migration in human ovarian cancer cells[J]. Acta Biochimica Polonica, 2022, 69(1): 245-250.

Background

Pimaric Acid is a modulator of the large conductance Ca²⁺-activated K⁺ channel, which sensitizes the channel to voltage and stabilizes the open state in Kv1.1-Kv2.1^[1]. Pimaric Acid can induce swelling of both mitochondria and endoplasmic reticulum by activating potassium channels, resulting in mitochondrial cristae becoming diffuse^[2]. Pimaric Acid can be used to disrupt the plasma membrane of bacteria and inhibit the growth of Paenibacillus larvae ^[3].

In vitro, Pimaric Acid treatment for 24 hours significantly inhibited the production of NO in BV-2 cells under lipopolysaccharide (LPS) stress, with an IC₅₀ value of 13.6μM^[4]. Treatment with 20μM of Pimaric Acid for 48 hours significantly inhibited the viability of PA-1 cells and altered the morphology,

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promoting the upregulation of endoplasmic reticulum stress-related proteins, including p-PERK, PERK, AT-4, CHOP and IRE-1^[5]. Treatment with 20 μ M of Pimaric Acid for 24 hours reduced the MMP-9 protein level in human aortic smooth muscle cells (HASMC) stimulated by TNF- α , accompanied by decreased expressions of p65, c-Fos, p-c-Jun, p-ATF2, and Jun-D, and inhibition of cell migration^[6].

References:

- [1] Sakamoto K, Suzuki Y, Yamamura H, et al. Molecular mechanisms underlying pimaric acid-induced modulation of voltage-gated K⁺ channels[J]. Journal of Pharmacological Sciences, 2017, 133(4): 223-231.
- [2] Hoa N, Myers M P, Douglass T G, et al. Molecular mechanisms of paraptosis induction: implications for a non-genetically modified tumor vaccine[J]. PloS one, 2009, 4(2): e4631.
- [3] Song H, Kim J, Shin Y K, et al. Antibacterial activity of pimaric acid against the causative agent of American foulbrood, *Paenibacillus larvae*[J]. Journal of Apicultural Research, 2022, 61(2): 219-226.
- [4] Kim C S, Oh J, Subedi L, et al. Structural characterization of terpenoids from *Abies holophylla* using computational and statistical methods and their biological activities[J]. Journal of natural products, 2018, 81(8): 1795-1802.
- [5] Li W, Xuemei G, Yilin Z, et al. Anticancer effects of Pimaric acid is mediated via endoplasmic reticulum stress, caspase-dependent apoptosis, cell cycle arrest, and inhibition of cell migration in human ovarian cancer cells[J]. Acta Biochimica Polonica, 2022, 69(1): 245-250.
- [6] Suh S J, Kwak C H, Chung T W, et al. Pimaric acid from *Aralia cordata* has an inhibitory effect on TNF- α -induced MMP-9 production and HASMC migration via down-regulated NF- κ B and AP-1[J]. Chemico-Biological Interactions, 2012, 199(2): 112-119.

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