

Product Data Sheet

Product Name: (±)-Jasmonic Acid methyl ester

Cat. No.: GC16375

Chemical Properties

Cas. No. 39924-52-2

Chemical Name 3-oxo-2-(2-penten-1-yl)-cyclopentaneacetic acid, methyl ester

SMILES O=C1[C@@](C/C=C\CC)([H])[C@](CC(OC)=O)([H])CC1

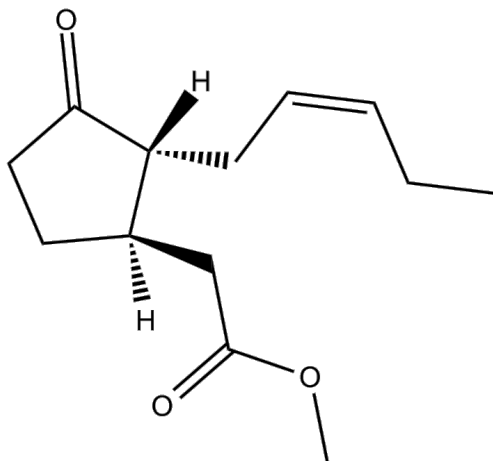
Formula $C_{13}H_{20}O_3$ M.Wt 224.3

Solubility $\leq 30\text{mg/ml}$ in ethanol; 15mg/ml in DMSO; 25mg/ml in dimethyl formamide Storage Store at RT

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]:

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Cell lines	PC-3 cells (human prostate adenocarcinoma cell line)
Preparation Method	PC-3 cells were maintained in RPMI-1640 supplemented with 10% fetal bovine serum (FBS) and 1% penicillin-streptomycin at 37°C in a humidified, 5% CO ₂ atmosphere. PC-3 cells were treated with (±)-Jasmonic Acid methyl ester at concentrations of 0.5-2.0mM and/or exposed to γ-radiation (7.6Gy) for 24 hours.
Reaction Conditions	0.5-2.0mM; 24h.
Applications	(±)-Jasmonic Acid methyl ester suppressed the radiation-induced anti-apoptotic Bcl-2 protein expression and elevated caspase-3 activity in irradiated PC-3 cells. (±)-Jasmonic Acid methyl ester also increased apoptosis in the combined treatment group compared to the irradiated group or the untreated control.

Animal experiment [2]:

Animal models	Male Swiss mice
Preparation Method	Mice were given (±)-Jasmonic Acid methyl ester (5-20mg/kg), imipramine (10mg/kg) or vehicle (10mL/kg) intraperitoneally for 7 days. On day 7, treatment was carried out 30min prior to i.p injection of LPS (830µg/kg). Twenty four hours after LPS administration, tail suspension, forced swim and sucrose preference tests were carried out.
Dosage form	5-20mg/kg; i.p.; 7 days

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Applications (±)-Jasmonic Acid methyl ester reduced the duration of immobility in LPS-treated mice in the tail suspension and forced swim tests, reversed LPS-induced reduction in sucrose preference, decreased serum corticosterone and brain TNF- α levels, and reduced oxidative stress parameters (elevated MDA and decreased GSH) in the brains of LPS-treated mice.

References:

- [1] Ezekwudo D, Shashidharamurthy R, Devineni D, et al. Inhibition of expression of anti-apoptotic protein Bcl-2 and induction of cell death in radioresistant human prostate adenocarcinoma cell line (PC-3) by methyl jasmonate. *Cancer Lett.* 2008 Nov 8;270(2):277-85.
- [2] Adebisin A, Adeoluwa OA, Eduviere AT, et al. Methyl jasmonate attenuated lipopolysaccharide-induced depressive-like behaviour in mice. *J Psychiatr Res.* 2017 Nov;94:29-35.

Background

(±)-Jasmonic Acid methyl ester is an important natural plant signaling molecule and phytohormone that possesses diverse biological activities. (±)-Jasmonic Acid methyl ester is used in research related to cancer, inflammatory responses, and other areas^[1-4].

In vitro, (±)-Jasmonic Acid methyl ester (1-2mM) was used to treat the human neuroblastoma cell lines SK-N-SH and BE(2)-C for 6-24h. (±)-Jasmonic Acid methyl ester significantly inhibited cell viability and downregulated the expression of proliferating cell nuclear antigen (PCNA), while inducing apoptosis and downregulating the expression of X-linked inhibitor of apoptosis protein (XIAP) and survivin^[5]. (±)-Jasmonic Acid methyl ester (0.5-2.0mM) was used to treat the human prostate adenocarcinoma cell line PC-3 exposed to 7.6Gy γ -radiation for 24 hours. (±)-Jasmonic Acid methyl ester significantly suppressed the expression of the anti-apoptotic protein Bcl-2, induced apoptosis, and enhanced caspase-3 activity^[6].

In vivo, (±)-Jasmonic Acid methyl ester (60mg/kg; once daily) was administered intraperitoneally to female BALB/c mice bearing 4T1 breast cancer for 10 days. (±)-Jasmonic Acid methyl ester inhibited tumor growth and caused grade 1 hepatotoxicity^[7]. (±)-Jasmonic Acid methyl ester (5-20mg/kg) was administered intraperitoneally to male Swiss mice treated with intraperitoneal LPS (830 μ g/kg) for 7

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days. (±)-Jasmonic Acid methyl ester significantly reduced LPS-induced depressive-like behaviors, reversed anhedonia, and decreased corticosterone, TNF- α levels, and oxidative stress^[8].

References:

- [1] Li H, Lv L, Wu C, et al. Methyl Jasmonate Protects Microglial Cells Against β -Amyloid-Induced Oxidative Stress and Inflammation via Nrf2-Dependent HO-1 Pathway. *Neuropsychiatr Dis Treat*. 2020 Jun 4;16:1399-1410.
- [3] Zhang M, Zhang MW, Zhang L, et al. Methyl jasmonate and its potential in cancer therapy. *Plant Signal Behav*. 2015;10(9):e1062199.
- [4] Yang DK, Tungalag T, Lee SJ, et al. Methyl Jasmonate-induced Increase in Intracellular Magnesium Promotes Apoptosis in Breast Cancer Cells. *Anticancer Res*. 2024 Mar;44(3):1087-1095.
- [5] Tong QS, Jiang GS, Zheng LD, et al. Methyl jasmonate downregulates expression of proliferating cell nuclear antigen and induces apoptosis in human neuroblastoma cell lines. *Anticancer Drugs*. 2008 Jul;19(6):573-81.
- [6] Ezekwudo D, Shashidharamurthy R, Devineni D, et al. Inhibition of expression of anti-apoptotic protein Bcl-2 and induction of cell death in radioresistant human prostate adenocarcinoma cell line (PC-3) by methyl jasmonate. *Cancer Lett*. 2008 Nov 8;270(2):277-85.
- [7] Yousefi S, Darvishi P, Yousefi Z, et al. Effect of methyl jasmonate and 3-bromopyruvate combination therapy on mice bearing the 4 T1 breast cancer cell line. *J Bioenerg Biomembr*. 2020 Apr;52(2):103-111.
- [8] Adebessin A, Adeoluwa OA, Eduviere AT, et al. Methyl jasmonate attenuated lipopolysaccharide-induced depressive-like behaviour in mice. *J Psychiatr Res*. 2017 Nov;94:29-35.

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