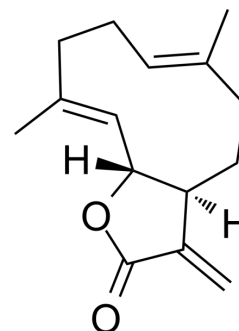


Costunolide

Cat. No.:	HY-N0036
CAS No.:	553-21-9
Molecular Formula:	C ₁₅ H ₂₀ O ₂
Molecular Weight:	232.32
Target:	Apoptosis; Endogenous Metabolite
Pathway:	Apoptosis; Metabolic Enzyme/Protease
Storage:	-20°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 49 mg/mL (210.92 mM)
 Ethanol : 25 mg/mL (107.61 mM); ultrasonic and warming and heat to 60°C
 * "≥" means soluble, but saturation unknown.

	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
Preparing Stock Solutions	1 mM	4.3044 mL	21.5220 mL	43.0441 mL
	5 mM	0.8609 mL	4.3044 mL	8.6088 mL
	10 mM	0.4304 mL	2.1522 mL	4.3044 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

- Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution
- Add each solvent one by one: 10% EtOH >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution
- Add each solvent one by one: 10% EtOH >> 90% corn oil
Solubility: ≥ 2.5 mg/mL (10.76 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.08 mg/mL (8.95 mM); Clear solution
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BIOLOGICAL ACTIVITY

Description	Costunolide ((+)-Costunolide) is a naturally occurring sesquiterpene lactone, with antioxidative, anti-inflammatory, antiallergic, bone remodeling, neuroprotective, hair growth promoting, anticancer, and antidiabetic properties. Costunolide can induce cell cycle arrest and apoptosis on breast cancer cells ^{[1][2][3]} .																																
IC₅₀ & Target	Human Endogenous Metabolite																																
In Vitro	<p>Costunolide inhibits the colony formation, migrative and invasive abilities of the H1299 cells in a dose or time dependent manner^[2].</p> <p>Costunolide (6.7-215.2 μM; 24 hours) inhibits the viability of H1299 cells in a dose-dependent manner, with an IC₅₀ of 23.93 μM^[2].</p> <p>Costunolide (12.0-48.0 μM; 48 hours) induces apoptosis in H1299 cells^[2].</p> <p>Costunolide (12-48.0 μM; 6-12 hours) regulates metastasis- and proliferation-associated mRNA expression^[2].</p> <p>Costunolide regulates epithelial-to-mesenchymal transition (EMT)-associated protein expression^[2].</p> <p>Costunolide regulates c-Myc mediated apoptosis signaling and 14-3-3-mediated signaling pathways in breast cancer cells^[3].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <p>Cell Viability Assay^[2]</p> <table border="1"> <tr> <td>Cell Line:</td> <td>H1299 cells</td> </tr> <tr> <td>Concentration:</td> <td>6.7 μM, 13.5 μM, 26.9 μM, 107.6 μM, 215.2 μM</td> </tr> <tr> <td>Incubation Time:</td> <td>24 hours</td> </tr> <tr> <td>Result:</td> <td>Inhibited the viability of H1299 cells (MTT assay).</td> </tr> </table> <p>Apoptosis Analysis^[2]</p> <table border="1"> <tr> <td>Cell Line:</td> <td>H1299 cells</td> </tr> <tr> <td>Concentration:</td> <td>0 μM, 12.0 μM, 24.0 μM, 48.0 μM</td> </tr> <tr> <td>Incubation Time:</td> <td>48 hours</td> </tr> <tr> <td>Result:</td> <td>Significantly promoted apoptosis at 24.0 μM and 48.0 μM.</td> </tr> </table> <p>RT-PCR^[2]</p> <table border="1"> <tr> <td>Cell Line:</td> <td>H1299 cells</td> </tr> <tr> <td>Concentration:</td> <td>0 μM, 12.0 μM, 24.0 μM, 48.0 μM</td> </tr> <tr> <td>Incubation Time:</td> <td>6 hours, 12 hours</td> </tr> <tr> <td>Result:</td> <td>Regulated the metastasis- and proliferation-associated mRNA levels in a dose-dependent manner.</td> </tr> </table> <p>Western Blot Analysis^[2]</p> <table border="1"> <tr> <td>Cell Line:</td> <td>H1299 cells</td> </tr> <tr> <td>Concentration:</td> <td>0 μM, 12.0 μM, 24.0 μM, 48.0 μM</td> </tr> <tr> <td>Incubation Time:</td> <td>48 hours</td> </tr> <tr> <td>Result:</td> <td>Significantly inhibited the EMT of H1299 cells.</td> </tr> </table>	Cell Line:	H1299 cells	Concentration:	6.7 μM, 13.5 μM, 26.9 μM, 107.6 μM, 215.2 μM	Incubation Time:	24 hours	Result:	Inhibited the viability of H1299 cells (MTT assay).	Cell Line:	H1299 cells	Concentration:	0 μM, 12.0 μM, 24.0 μM, 48.0 μM	Incubation Time:	48 hours	Result:	Significantly promoted apoptosis at 24.0 μM and 48.0 μM.	Cell Line:	H1299 cells	Concentration:	0 μM, 12.0 μM, 24.0 μM, 48.0 μM	Incubation Time:	6 hours, 12 hours	Result:	Regulated the metastasis- and proliferation-associated mRNA levels in a dose-dependent manner.	Cell Line:	H1299 cells	Concentration:	0 μM, 12.0 μM, 24.0 μM, 48.0 μM	Incubation Time:	48 hours	Result:	Significantly inhibited the EMT of H1299 cells.
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In Vivo	Costunolide (20 mg/kg; i.p; daily; for 30 days) inhibits breast cancer through c-Myc/p53 and AKT/14-3-3 pathway ^[3] .																																

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Animal Model:	4 weeks old female BALB/c nude mice, MDA-MB-231 cells xenograft mouse models ^[3]
Dosage:	20 mg/kg
Administration:	Intraperitoneal injection, daily, for 30 days
Result:	Reduced the expression levels of c-Myc and p-AKT and elevated the expression levels of p53 and p-14-3-3.

CUSTOMER VALIDATION

- Cell Mol Biol Lett. 2019 Aug 14;24:52.
- Molecules. 2020 Jun 19;25(12):2840.
- Gene. 2018 Dec 15;678:261-269.

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REFERENCES

- [1]. Dae Yong Kim, et al. Costunolide-A Bioactive Sesquiterpene Lactone with Diverse Therapeutic Potential. Int J Mol Sci. 2019 Jun; 20(12): 2926.
- [2]. Minyan Wei, et al. Costunolide induces apoptosis and inhibits migration and invasion in H1299 lung cancer cells. Oncol Rep. 2020 Jun;43(6):1986-1994.
- [3]. Zhangxiao Peng, et al. Costunolide and dehydrocostuslactone combination treatment inhibit breast cancer by inducing cell cycle arrest and apoptosis through c-Myc/p53 and AKT/14-3-3 pathway. Sci Rep. 2017; 7: 41254.

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

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