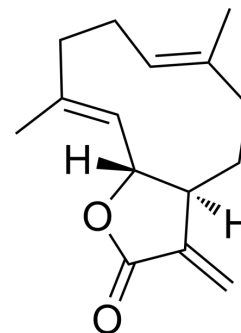


## Costunolide

|                           |  |
|---------------------------|--|
| <b>Cat. No.:</b>          | HY-N0036   |
| <b>CAS No.:</b>           | 553-21-9   |
| <b>Molecular Formula:</b> | C <sub>15</sub> H <sub>20</sub> O <sub>2</sub>   |
| <b>Molecular Weight:</b>  | 232.32   |
| <b>Target:</b>            | Apoptosis; Endogenous Metabolite   |
| <b>Pathway:</b>           | Apoptosis; Metabolic Enzyme/Protease   |
| <b>Storage:</b>           | -20°C, sealed storage, away from moisture and light<br>* 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<br>Concentration | Mass      |            |            |
|------------------------------|--------------------------|-----------|------------|------------|
|                              |                          | 1 mg      | 5 mg       | 10 mg      |
| Preparing<br>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
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.08 mg/mL (8.95 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.08 mg/mL (8.95 mM); Clear solution

### BIOLOGICAL ACTIVITY

|                                     |  |            |             |                |  |                  |          |         |   |            |             |                |                                 |                  |          |         |  |            |             |                |                                 |                  |                   |         |  |            |             |                |                                 |                  |          |         |   |
|-------------------------------------|--|------------|-------------|----------------|--|------------------|----------|---------|---|------------|-------------|----------------|---------------------------------|------------------|----------|---------|--|------------|-------------|----------------|---------------------------------|------------------|-------------------|---------|--|------------|-------------|----------------|---------------------------------|------------------|----------|---------|---|
| <b>Description</b>                  | 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 <sup>[1][2][3]</sup> .  |            |             |                |  |                  |          |         |   |            |             |                |                                 |                  |          |         |  |            |             |                |                                 |                  |                   |         |  |            |             |                |                                 |                  |          |         |   |
| <b>IC<sub>50</sub> &amp; Target</b> | Human Endogenous Metabolite  |            |             |                |  |                  |          |         |   |            |             |                |                                 |                  |          |         |  |            |             |                |                                 |                  |                   |         |  |            |             |                |                                 |                  |          |         |   |
| <b>In Vitro</b>                     | <p>Costunolide inhibits the colony formation, migrative and invasive abilities of the H1299 cells in a dose? or time dependent manner<sup>[2]</sup>.</p> <p>?Costunolide (6.7-215.2 μM; 24 hours) inhibits the viability of H1299 cells in a dose-dependent manner, with an IC<sub>50</sub> of 23.93 μM<sup>[2]</sup>.</p> <p>?Costunolide (12.0-48.0 μM; 48 hours) induces apoptosis in H1299 cells<sup>[2]</sup>.</p> <p>?Costunolide (12-48.0 μM; 6-12 hours) regulates metastasis- and proliferation-associated mRNA expression<sup>[2]</sup>.</p> <p>?Costunolide regulates epithelial-to-mesenchymal transition (EMT)-associated protein expression<sup>[2]</sup>.</p> <p>?Costunolide regulates c-Myc mediated apoptosis signaling and 14-3-3-mediated signaling pathways in breast cancer cells<sup>[3]</sup>.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> <p>Cell Viability Assay<sup>[2]</sup></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<sup>[2]</sup></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<sup>[2]</sup></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<sup>[2]</sup></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. |
| 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.  |            |             |                |  |                  |          |         |   |            |             |                |                                 |                  |          |         |  |            |             |                |                                 |                  |                   |         |  |            |             |                |                                 |                  |          |         |   |
| <b>In Vivo</b>                      | Costunolide (20?mg/kg; i.p; daily; for 30 days) inhibits breast cancer through c-Myc/p53 and AKT/14-3-3 pathway <sup>[3]</sup> .   |            |             |                |  |                  |          |         |   |            |             |                |                                 |                  |          |         |  |            |             |                |                                 |                  |                   |         |  |            |             |                |                                 |                  |          |         |   |

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

|                 |  |
|-----------------|--|
| Animal Model:   | 4 weeks old female BALB/c nude mice, MDA-MB-231 cells xenograft mouse models <sup>[3]</sup>              |
| 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.
- Phytomedicine. 2025 Feb 26.
- Molecules. 2020 Jun 19;25(12):2840.
- ACS Omega. 2024 Feb 28;9(10):11870-11882.
- Gene. 2018 Dec 15;678:261-269.

See more customer validations on [www.MedChemExpress.com](http://www.MedChemExpress.com)

## 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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