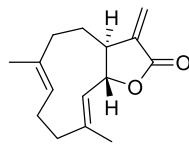


# Product data sheet



MedKoo Cat#: 326737 Name: Costunolide CAS#: 553-21-9 Chemical Formula: C <sub>15</sub> H <sub>20</sub> O <sub>2</sub> Exact Mass: 232.1463 Molecular Weight: 232.323		
Product supplied as:	Powder	
Purity (by HPLC):	≥ 98%	
Shipping conditions	Ambient temperature	
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years. In solvent: -80°C 3 months; -20°C 2 weeks.	

## 1. Product description:

Costunolide, also known as (+)-Costunolide, CCRIS 6754 and NSC 106404, is a naturally occurring sesquiterpene lactone, first isolated in *Saussurea costus* roots in 1960. It is also found in lettuce. Costunolide has been reported for the wide spectrum of biological effects, including anti-inflammatory, anticancer, antiviral, antimicrobial, antifungal, antioxidant, antidiabetic, antiulcer, and anthelmintic activities. In recent years, it has caused extensive interest in researchers due to its potential anti-cancer activities for various types of cancer, and their anti-cancer mechanisms, including causing cell cycle arrest, inducing apoptosis and differentiation, promoting the aggregation of microtubule protein, inhibiting the activity of telomerase, inhibiting metastasis and invasion, reversing multidrug resistance, restraining angiogenesis has been studied.

## 2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

## 3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	26.93	115.92
DMF	1.6	6.89
DMF:PBS (pH 7.2) (1:2)	0.3	1.29
Ethanol	29.31	126.16

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.30 mL	21.52 mL	43.04 mL
5 mM	0.86 mL	4.30 mL	8.61 mL
10 mM	0.43 mL	2.15 mL	4.30 mL
50 mM	0.09 mL	0.43 mL	0.86 mL

## 5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

## 6. Recommended literature which reported protocols for in vitro and in vivo study

### In vitro study

- Huang H, Yi JK, Lim SG, Park S, Zhang H, Kim E, Jang S, Lee MH, Liu K, Kim KR, Kim EK, Lee Y, Kim SH, Ryoo ZY, Kim MO. Costunolide Induces Apoptosis via the Reactive Oxygen Species and Protein Kinase B Pathway in Oral Cancer Cells. *Int J Mol Sci.* 2021 Jul 13;22(14):7509. doi: 10.3390/ijms22147509. PMID: 34299129; PMCID: PMC8305390.
- Huang H, Yi J, Park S, Zhang H, Kim E, Park S, Kwon W, Jang S, Zhang X, Chen H, Choi SK, Kim SH, Liu K, Dong Z, Lee MH, Ryoo Z, Kim MO. Costunolide suppresses melanoma growth via the AKT/mTOR pathway in vitro and in vivo. *Am J Cancer Res.* 2021 Apr 15;11(4):1410-1427. PMID: 33948365; PMCID: PMC8085867.

### In vivo study

# Product data sheet



1. Li X, Liu Q, Yu J, Zhang R, Sun T, Jiang W, Hu N, Yang P, Luo L, Ren J, Wang Q, Wang Y, Yang Q. Costunolide ameliorates intestinal dysfunction and depressive behaviour in mice with stress-induced irritable bowel syndrome via colonic mast cell activation and central 5-hydroxytryptamine metabolism. *Food Funct.* 2021 May 11;12(9):4142-4151. doi: 10.1039/d0fo03340e. PMID: 33977961.

2. Lv Q, Xing Y, Dong D, Hu Y, Chen Q, Zhai L, Hu L, Zhang Y. Costunolide ameliorates colitis via specific inhibition of HIF1 $\alpha$ /glycolysis-mediated Th17 differentiation. *Int Immunopharmacol.* 2021 Aug;97:107688. doi: 10.1016/j.intimp.2021.107688. Epub 2021 Apr 28. PMID: 33932695.

## 7. Bioactivity

### Biological target:

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Costunolide ((+)-Costunolide) is a naturally occurring sesquiterpene lactone, with antioxidative, anti-inflammatory, antiallergic, bone remodeling, neuroprotective, hair growth promoting, anticancer, and antidiabetic properties.

### In vitro activity

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As shown in Figure 3B, the effective doses of CTD (costunolide) that inhibited 50% growth (IC<sub>50</sub>) in YD-10B, Ca9-22 and YD-9 are 9.2, 7.9, and 39.6  $\mu$ M, respectively. Additionally, the result of the in vitro toxicity assay of CTD on healthy oral epithelial cell (hOMF) showed that CTD began to significantly reduce cellular viability of normal cells at a concentration of 20  $\mu$ M (Figure 3C).

Reference: *Int J Mol Sci.* 2021 Jul; 22(14): 7509. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8305390/>

### In vivo activity

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COS (costunolide) administration relieved intestinal dysfunction and depression-like behaviours in IBS mice. Improvements in low-grade colon inflammation and intestinal mucosal permeability, inhibition of the activation of mast cells, upregulation of colonic Occludin expression, and downregulation of Claudin 2 expression were also observed.

Reference: *Food Funct.* 2021 May 11;12(9):4142-4151. <https://pubmed.ncbi.nlm.nih.gov/33977961/>

*Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.*