

Product data sheet



MedKoo Cat#: 328060 Name: Imperatorin CAS: 482-44-0 Chemical Formula: C ₁₆ H ₁₄ O ₄ Exact Mass: 270.0892 Molecular Weight: 270.284		
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:

Imperatorin, also known as Pentosalen, Marmelosin, is a furocoumarin and a phytochemical that has been isolated from *Urena lobata* L. (Malvaceae), *Angelica archangelica*, etc. Imperatorin has many documented pharmacological properties which make it a candidate for possible drug development. Imperatorin showed the activity on the central nervous system, anticancer and antiviral, and the cardiovascular system.

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
DMF	30.0	110.99
DMF:PBS (pH 7.2) (1:3)	0.25	0.92
DMSO	41.33	152.93
Ethanol	10.0	37.0

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.70 mL	18.50 mL	37.00 mL
5 mM	0.74 mL	3.70 mL	7.40 mL
10 mM	0.37 mL	1.85 mL	3.70 mL
50 mM	0.07 mL	0.37 mL	0.74 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

- Kim T, Hyun CG. Imperatorin Positively Regulates Melanogenesis through Signaling Pathways Involving PKA/CREB, ERK, AKT, and GSK3β/β-Catenin. *Molecules*. 2022 Oct 2;27(19):6512. doi: 10.3390/molecules27196512. PMID: 36235048; PMCID: PMC9571183.
- Lin W, Chen G, Mao Y, Ma X, Zhou J, Yu X, Wang C, Liu M. Imperatorin Inhibits Proliferation, Migration, and Inflammation via Blocking the NF-κB and MAPK Pathways in Rheumatoid Fibroblast-like Synoviocytes. *ACS Omega*. 2022 Aug 16;7(34):29868-29876. doi: 10.1021/acsomega.2c02766. PMID: 36061691; PMCID: PMC9434770.

In vivo study

- Kowalczyk J, Nakos-Bimpos M, Polissidis A, Dalla C, Kokras N, Skalicka-Woźniak K, Budzyńska B. Imperatorin Influences Depressive-like Behaviors: A Preclinical Study on Behavioral and Neurochemical Sex Differences. *Molecules*. 2022 Feb 10;27(4):1179. doi: 10.3390/molecules27041179. PMID: 35208969; PMCID: PMC8875245.

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2. Lv M, Xu Q, Zhang B, Yang Z, Xie J, Guo J, He F, Wang W. Imperatorin induces autophagy and G0/G1 phase arrest via PTEN-PI3K-AKT-mTOR/p21 signaling pathway in human osteosarcoma cells in vitro and in vivo. *Cancer Cell Int.* 2021 Dec 19;21(1):689. doi: 10.1186/s12935-021-02397-7. PMID: 34923996; PMCID: PMC8684670.

7. Bioactivity

Biological target:

Imperatorin is an effective of NO synthesis inhibitor ($IC_{50}=9.2 \mu\text{mol}$), which also is a BChE inhibitor ($IC_{50}=31.4 \mu\text{mol}$). Imperatorin is a weak agonist of TRPV1 with EC_{50} of $12.6\pm 3.2 \mu\text{M}$.

In vitro activity

Imperatorin also activated the expression of melanogenic enzymes, such as tyrosinase (TYR) and tyrosinase-related proteins TYRP-1 and TYRP-2. Mechanistically, imperatorin increases melanin synthesis through the cyclic adenosine monophosphate (cAMP)-dependent protein kinase (PKA)/cAMP-responsive element-binding protein (CREB)-dependent upregulation of microphthalmia-associated transcription factor (MITF), which is a key transcription factor in melanogenesis. Furthermore, imperatorin exerted melanogenic effects by downregulating extracellular signal-regulated kinase (ERK) and upregulating phosphatidylinositol 3 kinase (PI3K)/protein kinase B (AKT)/glycogen synthesis kinase-3 β (GSK-3 β). Moreover, imperatorin increased the content of β -catenin in the cell cytoplasm and nucleus by reducing the content of phosphorylated β -catenin (p- β -catenin).

Reference: *Molecules.* 2022 Oct 2;27(19):6512. <https://pubmed.ncbi.nlm.nih.gov/36235048/>

In vivo activity

The study revealed that only males responded to imperatorin (1 and 5 mg/kg) treatment and caused an antidepressant effect, such as with respect to depressive-like behaviors, lowering immobility time and increasing immobility latency.

Reference: *Molecules.* 2022 Feb 10;27(4):1179. <https://pubmed.ncbi.nlm.nih.gov/35208969/>

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.