Product data sheet



| | | - | | |
|--|--|---|--|--|
| MedKoo Cat#: 574021 | | | | |
| Name: Monotropein | | | | |
| CAS: 5945-50-6 | | | | |
| Chemical Formula: $C_{16}H_{22}O_{11}$ | | | | |
| Exact Mass: 390.1162 | | | | |
| Molecular Weight: 390.341 | | | | |
| Product supplied as: | Powder | 1 | | |
| Purity (by HPLC): | $\geq 98\%$ | | | |
| 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:

Monotropein is an iridoid glycoside. It increases cell viability and migration of bone marrow-derived endothelial progenitor cells (BM-EPCs), inhibits apoptosis, and reduces levels of matrix metalloproteinase-3 (MMP-3) and MMP-13 in chondrocytes. It inhibits LPS-induced nuclear translocation of NF-KB and reduces COX-2, inducible nitric oxide synthase (iNOS), TNF-a, and IL-16 mRNA expression in RAW 264.7 cells. Monotropein also reduces colonic myeloperoxidase (MPO) activity, COX-2 and iNOS mRNA expression, and disease severity in a mouse model of ulcerative colitis induced by dextran sulfate sodium (DSS). It increases bone mineral content, bone mineral density, and improves bone microstructure in ovariectomized mice when administered at doses of 40 or 80 mg/kg. Monotropein decreases macrophage infiltration and wound healing time and increases blood vessel formation in a rat model of wound healing.

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.

2 Solubilit- Jat-

| 5. Solubility data | | | | | |
|--------------------|-----------------|--------------|--|--|--|
| Solvent | Max Conc. mg/mL | Max Conc. mM | | | |
| DMSO | 78.0 | 199.83 | | | |
| Water | 54.63 | 139.94 | | | |

4. Stock solution preparation table:

| Concentration / Solvent Volume / Mass | 1 mg | 5 mg | 10 mg | | | |
|---------------------------------------|---------|----------|----------|--|--|--|
| 1 mM | 2.56 mL | 12.81 mL | 25.62 mL | | | |
| 5 mM | 0.51 mL | 2.56 mL | 5.12 mL | | | |
| 10 mM | 0.26 mL | 1.28 mL | 2.56 mL | | | |
| 50 mM | 0.05 mL | 0.26 mL | 0.51 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

1. Wang F, Wu L, Li L, Chen S. Monotropein exerts protective effects against IL-1β-induced apoptosis and catabolic responses on osteoarthritis chondrocytes. Int Immunopharmacol. 2014 Dec;23(2):575-80. doi: 10.1016/j.intimp.2014.10.007. Erratum in: Int Immunopharmacol. 2023 Mar;116:109633. PMID: 25466264.

2. Jiang F, Xu XR, Li WM, Xia K, Wang LF, Yang XC. Monotropein alleviates H2O2-induced inflammation, oxidative stress and apoptosis via NF-κB/AP-1 signaling. Mol Med Rep. 2020 Dec;22(6):4828-4836. doi: 10.3892/mmr.2020.11548. Epub 2020 Sep 29. PMID: 33173962; PMCID: PMC7646929.

In vivo study

Product data sheet



1. Fang Z, Wei W, Jiang X. Monotropein attenuates doxorubicin-induced oxidative stress, inflammation, and arrhythmia via the AKT signal pathway. Biochem Biophys Res Commun. 2023 Jan 1;638:14-22. doi: 10.1016/j.bbrc.2022.11.058. Epub 2022 Nov 19. PMID: 36436337.

2. Zhang Q, Hu S, He Y, Song Z, Shen Y, Zhao Z, Zhang Q, Qin L, Zhang Q. Monotropein Protects against Inflammatory Bone Loss and Suppresses Osteoclast Formation and Bone Resorption by Inhibiting NFATc1 via NF-κB and Akt/GSK-3β Pathway. Nutrients. 2022 Sep 24;14(19):3978. doi: 10.3390/nu14193978. PMID: 36235631; PMCID: PMC9571677.

7. Bioactivity

Biological target:

Monotropein is an iridoid glycoside isolated Morinda officinalis.

In vitro activity

The anti-apoptotic and anti-catabolic effects of monotropein on rat OA chondrocytes treated by IL-1 β were investigated in vitro. In cultured chondrocytes, monotropein attenuated apoptosis in a dose-dependent manner in response to IL-1 β stimulation. Moreover, treatment with monotropein, the expressions of MMP-3 and MMP-13 were significantly decreased, the expression of COL2A1 was increased.

Reference: Int Immunopharmacol. 2014 Dec;23(2):575-80. https://pubmed.ncbi.nlm.nih.gov/25466264/

In vivo activity

This study aimed to explore the role of MON (monotropein) in doxorubicin (DOX)-induced cardiotoxicity. This study showed that MON treatment mitigated DOX-induced myocardial damage and improved cardiac dysfunction. In addition, DOX-treated mice displayed higher levels of inflammation and oxidative stress, while MON treatment also reversed these pathological changes. Moreover, DOX-treated mice were more susceptible to ventricular fibrillation, whereas MON reduced ventricular fibrillation incidence.

Reference: Biochem Biophys Res Commun. 2023 Jan 1;638:14-22. https://pubmed.ncbi.nlm.nih.gov/36436337/

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.