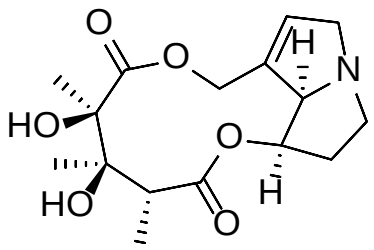
Product data sheet

MedKoo Cat#: 571152 Name: Monocrotaline CAS: 315-22-0 Chemical Formula: $C_{16}H_{23}NO_6$ Exact Mass: 325.1525 Molecular Weight: 325.361	
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:
Monocrotaline is a natural ligand that exhibits dose-dependent cytotoxicity as a pyrrolizidine alkaloid and toxic plant constituent; the alkaloid causes pulmonary artery hypertension, right ventricular hypertrophy, and pathological changes in the pulmonary vasculature. However, it also has therapeutic potential against hepatocellular carcinoma. It acts against p53, HGF and TREM1 proteins, which play a threatening role in causing hepatocellular carcinoma. It is a novel scaffold for liver cancer with superior efficacy and lesser side effects. A

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
Chloroform	5.0	15.37
DMF	1.0	3.07
DMSO	30.33	93.23
Water	2.0	6.15

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.07 mL	15.37 mL	30.74 mL
5 mM	0.61 mL	3.07 mL	6.15 mL
10 mM	0.31 mL	1.54 mL	3.07 mL
50 mM	0.06 mL	0.31 mL	0.61 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. Li P, Song J, Du H, Lu Y, Dong S, Zhou S, Guo Z, Wu H, Zhao X, Qin Y, Zhu N. MicroRNA-663 prevents monocrotaline-induced pulmonary arterial hypertension by targeting TGF-β1/smad2/3 signaling. J Mol Cell Cardiol. 2021 Dec;161:9-22. doi: 10.1016/j.yjmcc.2021.07.010. Epub 2021 Jul 31. PMID: 34339758.
2. Kusuma SS, Tanneeru K, Didla S, Devendra BN, Kiranmayi P. Antineoplastic activity of monocrotaline against hepatocellular carcinoma. Anticancer Agents Med Chem. 2014;14(9):1237-48. doi: 10.2174/1871520614666140715085907. PMID: 25028149.

In vivo study

1. Yang L, Tian J, Wang J, Zeng J, Wang T, Lin B, Linneman J, Li L, Niu Y, Gou D, Zhang Y. The protective role of EP300 in monocrotaline-induced pulmonary hypertension. Front Cardiovasc Med. 2023 Feb 22;10:1037217. doi: 10.3389/fcvm.2023.1037217. PMID: 36910531; PMCID: PMC9992637.

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2. Huang WC, Ke MW, Cheng CC, Chiou SH, Wann SR, Shu CW, Chiou KR, Tseng CJ, Pan HW, Mar GY, Liu CP. Therapeutic Benefits of Induced Pluripotent Stem Cells in Monocrotaline-Induced Pulmonary Arterial Hypertension. PLoS One. 2016 Feb 3;11(2):e0142476. doi: 10.1371/journal.pone.0142476. PMID: 26840075; PMCID: PMC4740504.

7. Bioactivity

Biological target:

Monocrotaline is an pyrrolizidine alkaloid extracted from the seeds of the Crotalaria pallida plant to induce pulmonary hypertension in rodents.

In vitro activity

The in silico docking study has provided an insight and evidence for the antineoplastic activity of monocrotaline against p53, HGF and TREM1 proteins which play a threatening role in causing hepatocellular carcinoma. The in vitro cytotoxicity of monocrotaline was proved at IC50 24.966 µg/mL and genotoxicity at 2 X IC50 against HepG2 cells.

Reference: Anticancer Agents Med Chem. 2014;14(9):1237-48. https://pubmed.ncbi.nlm.nih.gov/25028149/

In vivo activity

In this study, the benefits of induced pluripotent stem cells (iPSCs) and iPSC-conditioned medium (iPSC CM) were explored in monocrotaline (MCT)-induced PAH (pulmonary arterial hypertension) rats. This study demonstrated that both iPSCs and iPSC CM significantly reduced the right ventricular systolic pressure and ameliorated the hypertrophy of the right ventricle in MCT-induced PAH rats in models of both disease prevention and disease reversal. In the prevention of MCT-induced PAH, iPSC-based therapy led to the decreased accumulation of inflammatory cells and down-regulated the expression of the IL-1β, IL-6, IL-12α, IL-12β, IL-23 and IFNγ genes in lung specimens, which implied that iPSC-based therapy may be involved in the regulation of inflammation.

Reference: PLoS One. 2016 Feb 3;11(2):e0142476. https://pubmed.ncbi.nlm.nih.gov/26840075/