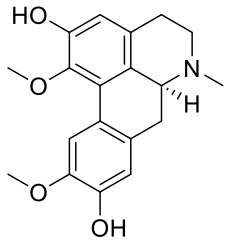
Product data sheet

MedKoo Cat#: 600118 Name: Boldine CAS#: 476-70-0 Chemical Formula: $C_{19}H_{21}NO_4$ Exact Mass: 327.14706 Molecular Weight: 327.37	
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:
Boldine is an alkaloid of the aporphine class that can be found in the boldo tree and in Lindera aggregata. Boldine has antioxidant activity that effectively protects against free radical induced lipid peroxidation or enzyme inactivation. In addition, it has alpha-adrenergic antagonist activities in vascular tissue, and it has also been reported to have hepatoprotective, cytoprotective, antipyretic and anti-inflammatory effects.

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	71.67	218.93
DMSO:PBS (pH 7.2) (1:1)	0.5	1.53
DMF	50.0	152.73
Ethanol	30.0	91.64

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.05 mL	15.27 mL	30.55 mL
5 mM	0.61 mL	3.05 mL	6.11 mL
10 mM	0.31 mL	1.53 mL	3.05 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. Toledo JP, Fernández-Pérez EJ, Ferreira IL, Marinho D, Riffo-Lepe NO, Pineda-Cuevas BN, Pinochet-Pino LF, Burgos CF, Rego AC, Aguayo LG. Boldine Attenuates Synaptic Failure and Mitochondrial Deregulation in Cellular Models of Alzheimer's Disease. Front Neurosci. 2021 Feb 19;15:617821. doi: 10.3389/fnins.2021.617821. PMID: 33679301; PMCID: PMC7933475.
2. Tomšík P, Mičuda S, Muthná D, Čermáková E, Havelek R, Rudolf E, Hroch M, Kadová Z, Řezáčová M, Ćmielová J, Živný P. Boldine Inhibits Mouse Mammary Carcinoma In Vivo and Human MCF-7 Breast Cancer Cells In Vitro. Planta Med. 2016 Nov;82(16):1416-1424. doi: 10.1055/s-0042-113611. Epub 2016 Sep 9. PMID: 27611982.

In vivo study

1. Subramaniam N, Kannan P, Sundaram J, Mari A, Velli SK, Salam S, Krishnan P, Balaraman G, Thiruvengadam D. Potential Chemopreventive role of Boldine against Hepatocellular Carcinoma via modulation of Cell Cycle Proteins in Rat Model. Anticancer Agents Med Chem. 2021 Feb 2. doi: 10.2174/1871520621666210203102854. Epub ahead of print. PMID: 33535961.

2. Ezhilarasan D, Raghunandhakumar S. Boldine treatment protects acetaminophen-induced liver inflammation and acute hepatic necrosis in mice. J Biochem Mol Toxicol. 2021 Apr;35(4):e22697. doi: 10.1002/jbt.22697. Epub 2021 Jan 4. PMID: 33393705.

7. Bioactivity

Biological target:

Boldine is an aporphine isoquinoline alkaloid extracted from the root of Litsea cubeba and also possesses these properties, including antioxidant, anti-inflammatory and cytoprotective effects.

In vitro activity

Quantification of SV2 puncta/20 μm process length showed a significant reduction in SV2 labeling in AβO-treated neurons ($p < 0.05$) and this effect was reduced when the neurons were co-incubated with AβO and 10 μM boldine ($p < 0.05$) (Figure 3B), suggesting a protective effect of boldine against AβO-induced synaptic damage. Moreover, incubation of the hippocampal neurons with 10 μM boldine alone had no effect on the SV2 puncta (Figures 3A,B).

Reference: Front Neurosci. 2021; 15: 617821. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7933475/

In vivo activity

Treatment of boldine protected the rat liver against reactive oxygen species such as hydrogen peroxide, superoxide, protein carbonyl and lipid peroxide during hepatocarcinogenesis by boosted antioxidants-superoxide dismutase (SOD), catalase (CAT). Boldine caused substantial enhanced detoxification process by moderating phase I and II xenobiotic metabolizing enzymes. In addition, the study was found that boldine significantly inhibited the cellular proliferative markers like PCNA and Ki67 and regulated the specific cell cycle associated proteins by up-regulated expression of p21Cip1/Kip1 and p27 Cip1/Kip1 and down-regulated expression of Cyclin D1, CDK 4, Cyclin E1, and CDK 2.

Reference: Anticancer Agents Med Chem. 2021 Feb 2. https://pubmed.ncbi.nlm.nih.gov/33535961/