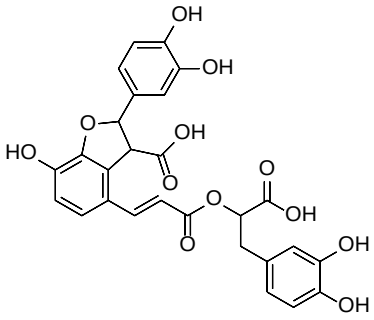
Product data sheet

MedKoo Cat#: 599019 Name: Lithospermic acid CAS: 28831-65-4 Chemical Formula: $C_{27}H_{22}O_{12}$ Exact Mass: 538.1111 Molecular Weight: 538.461	
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:
Lithospermic acid is a polyphenol that has been found in S. miltiorrhiza and has diverse biological activities. It inhibits xanthine oxidase (IC50 = 5.2 µg/ml) and scavenges DPPH radicals in cell-free assays (IC50 = 23.2 µg/ml). It also inhibits the production of reactive oxygen species (ROS) induced by phorbol 12-myristate 13-acetate (PMA) in isolated human neutrophils in a concentration-dependent manner. Lithospermic acid inhibits 3'-processing and 3'-joining to target DNA by HIV-1 integrase in cell-free assays (IC50s = 0.83 and 0.48 µM, respectively). It also inhibits acute HIV-1 infection of H9 human lymphoma cells (IC50 = 2 µM) without inducing cytotoxicity. Lithospermic acid (100 mg/kg) prevents carbon tetrachloride-induced hepatic necrosis in mice.

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	55.71
DMSO	80.0	148.57
Ethanol	30.0	55.71
PBS (pH 7.2)	5.0	9.29
Water	66.67	123.82

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	1.86 mL	9.29 mL	18.57 mL
5 mM	0.37 mL	1.86 mL	3.71 mL
10 mM	0.19 mL	0.93 mL	1.86 mL
50 mM	0.04 mL	0.19 mL	0.37 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. Zhang M, Wei L, Xie S, Xing Y, Shi W, Zeng X, Chen S, Wang S, Deng W, Tang Q. Activation of Nrf2 by Lithospermic Acid Ameliorates Myocardial Ischemia and Reperfusion Injury by Promoting Phosphorylation of AMP-Activated Protein Kinase α (AMPKα). Front Pharmacol. 2021 Nov 26;12:794982. doi: 10.3389/fphar.2021.794982. PMID: 34899356; PMCID: PMC8661697.

2. Chan KW, Ho WS. Anti-oxidative and hepatoprotective effects of lithospermic acid against carbon tetrachloride-induced liver oxidative damage in vitro and in vivo. Oncol Rep. 2015 Aug;34(2):673-80. doi: 10.3892/or.2015.4068. Epub 2015 Jun 16. PMID: 26081670.

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In vivo study

1. Zhu S, Wen H, Wang W, Chen Y, Han F, Cai W. Anti-hepatitis B virus activity of lithospermic acid, a polyphenol from Salvia miltiorrhiza, in vitro and in vivo by autophagy regulation. J Ethnopharmacol. 2023 Feb 10;302(Pt A):115896. doi: 10.1016/j.jep.2022.115896. Epub 2022 Nov 2. PMID: 36334815.

2. Lin YL, Tsay HJ, Lai TH, Tzeng TT, Shiao YJ. Lithospermic acid attenuates 1-methyl-4-phenylpyridine-induced neurotoxicity by blocking neuronal apoptotic and neuroinflammatory pathways. J Biomed Sci. 2015 May 28;22(1):37. doi: 10.1186/s12929-015-0146-y. PMID: 26018660; PMCID: PMC4445499.

7. Bioactivity

Biological target:

Lithospermic acid ((+)-Lithospermic acid) is a plant-derived polycyclic phenolic carboxylic acid isolated from Salvia miltiorrhiza, and has the anti-oxidative and hepatoprotective activity on carbon tetrachloride (CCl4)-induced acute liver damage in vitro and in vivo.

In vitro activity

To further explore the role of LA (lithospermic acid) in H9C2 cells, in vitro experiments were performed with the HR model (Supplementary Figure S3). In addition, LA attenuated HR-induced upregulation of GP91 and p67 phox and triggered the transcription of SOD2 in H9C2 cells (Supplementary Figure S4).

Reference: Front Pharmacol. 2021 Nov 26;12:794982. https://pubmed.ncbi.nlm.nih.gov/34899356/

In vivo activity

LA (lithospermic acid) reduced HBV DNA, HBsAg/HBeAg, and HBcAg levels in the serum/liver tissues of HBV-HDI C57BL/6 mice during the 3-week treatment and suppressed the withdrawal rebound of HBV DNA and HBsAg in the mice serum. LA inhibited the activation of AKT and mammalian target of rapamycin (mTOR) induced by HBV, which was reversed by IGF-1 (an agonist of the PI3K/AKT/mTOR signaling pathway), indicating that LA elicited autophagy through hampering the PI3K/AKT/mTOR signaling pathway.

Reference: J Ethnopharmacol. 2023 Feb 10;302(Pt A):115896. https://pubmed.ncbi.nlm.nih.gov/36334815/

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.