Product data sheet

MedKoo Cat#: 563791	
Name: DMNQ	
CAS: 6956-96-3	
Chemical Formula: $C_{12}H_{10}O_4$	
Exact Mass: 218.0579	
Molecular Weight: 218.208	

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:

DMNQ is a superoxide generating agent. DMNQ mimics high glucose-suppressed SIRT2 and SIRT6 expression.

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	50.0	0.09

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	4.58 mL	22.91 mL	45.83 mL
5 mM	0.92 mL	4.58 mL	9.17 mL
10 mM	0.46 mL	2.29 mL	4.58 mL
50 mM	0.09 mL	0.46 mL	0.92 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. Chacko BK, Zhi D, Darley-Usmar VM, Mitchell T. The Bioenergetic Health Index is a sensitive measure of oxidative stress in human monocytes. Redox Biol. 2016 Aug;8:43-50. doi: 10.1016/j.redox.2015.12.008. Epub 2015 Dec 24. PMID: 26748041; PMCID: PMC4712317.

2. Shi MM, Kugelman A, Iwamoto T, Tian L, Forman HJ. Quinone-induced oxidative stress elevates glutathione and induces gamma-glutamylcysteine synthetase activity in rat lung epithelial L2 cells. J Biol Chem. 1994 Oct 21;269(42):26512-7. PMID: 7929374.

In vivo study

1. Lee SJ, Sakurai H, Koizumi K, Song GY, Bae YS, Kim HM, Kang KS, Surh YJ, Saiki I, Kim SH. MAPK regulation and caspase activation are required in DMNQ S-52 induced apoptosis in Lewis lung carcinoma cells. Cancer Lett. 2006 Feb 20;233(1):57-67. doi: 10.1016/j.canlet.2005.02.042. PMID: 15893420.

2. Kim SH, Kang IC, Yoon TJ, Park YM, Kang KS, Song GY, Ahn BZ. Antitumor activities of a newly synthesized shikonin derivative, 2-hyim-DMNQ-S-33. Cancer Lett. 2001 Oct 30;172(2):171-5. doi: 10.1016/s0304-3835(01)00665-6. PMID: 11566493.

7. Bioactivity

Biological target:

DMNQ is a redox cycling agent that generates both superoxide and hydrogen peroxide.

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In vitro activity

DMNQ decreased monocyte ATP-linked respiration, maximal respiration, and reserve capacity and caused an increase in proton leak and non-mitochondrial respiration compared to monocytes not treated with DMNQ. These data suggest that monocytes are susceptible to oxidative stress mediated by DMNQ and this can be accurately assessed by the BHI (Bioenergetic Health Index).

Reference: Redox Biol. 2016 Aug;8:43-50. https://pubmed.ncbi.nlm.nih.gov/26748041/

In vivo activity

Furthermore, i.p. administration of DMNQ S-52 at 5 mg/kg resulted in a potent inhibition of the growth of LLC cells implanted on the right flank of C57BL/6 mice compared to untreated control. Immunohistochemical analysis revealed the decreased tumor cell proliferation and increased tumor cell apoptosis in DMNQ S-52 treated tumor sections using terminal deoxynucleotidyl transferase-mediated deoxyuridine triphosphate nick-end labeling (TUNEL) and proliferation cell nuclear antigen (PCNA). Taken together, these findings demonstrate that DMNQ S-52 may exhibit anti-tumor activity by inducing apoptosis via caspases and mitogen activated protein (MAP) kinase-dependent pathways.

Reference: Cancer Lett. 2006 Feb 20;233(1):57-67. https://pubmed.ncbi.nlm.nih.gov/15893420/

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.