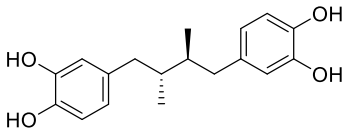
Product data sheet

MedKoo Cat#: 201562 Name: INSM-18 CAS#: 500-38-9 Chemical Formula: $C_{18}H_{22}O_4$ Exact Mass: 302.15181 Molecular Weight: 302.36488	
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:

INSM-18, also known as nordihydroguaiaretic acid, NDGA and masoprocol, is a naturally occurring antioxidant dicatechol originally derived from the creosote bush Larrea divaricatta with antipromoter, anti-inflammatory, and antineoplastic activities. NDGA directly inhibits activation of two receptor tyrosine kinases (RTKs), the insulin-like growth factor receptor (IGF-1R) and the c-erbB2/HER2/neu receptor, resulting in decreased proliferation of susceptible tumor cell populations.

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	78.33	259.06
Ethanol	80.0	264.58

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.31 mL	16.54 mL	33.07 mL
5 mM	0.66 mL	3.31 mL	6.61 mL
10 mM	0.33 mL	1.65 mL	3.31 mL
50 mM	0.07 mL	0.33 mL	0.66 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. Ryan CJ, Zavodovskaya M, Youngren JF, Campbell M, Diamond M, Jones J, Shiry L, Allan G, Maddux BA, Goldfine ID. Inhibitory effects of nordihydroguaiaretic acid (NDGA) on the IGF-1 receptor and androgen dependent growth of LAPC-4 prostate cancer cells. Prostate. 2008 Aug 1;68(11):1232-40. doi: 10.1002/pros.20789. PMID: 18491370; PMCID: PMC7305632.
2. Blecha JE, Anderson MO, Chow JM, Guevarra CC, Pender C, Penaranda C, Zavodovskaya M, Youngren JF, Berkman CE. Inhibition of IGF-1R and lipoxygenase by nordihydroguaiaretic acid (NDGA) analogs. Bioorg Med Chem Lett. 2007 Jul 15;17(14):4026-9. doi: 10.1016/j.bmcl.2007.04.092. Epub 2007 Apr 29. PMID: 17502145; PMCID: PMC2253493.

In vivo study

1. Han L, Bittner S, Dong D, Cortez Y, Dulay H, Arshad S, Shen WJ, Kraemer FB, Azhar S. Creosote bush-derived NDGA attenuates molecular and pathological changes in a novel mouse model of non-alcoholic steatohepatitis (NASH). Mol Cell Endocrinol. 2019 Dec 1;498:110538. doi: 10https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273809/.1016/j.mce.2019.110538. Epub 2019 Aug 12. PMID: 31415794; PMCID: PMC7273809.
2. Zhang H, Shen WJ, Li Y, Bittner A, Bittner S, Tabassum J, Cortez YF, Kraemer FB, Azhar S. Microarray analysis of gene expression in liver, adipose tissue and skeletal muscle in response to chronic dietary administration of NDGA to high-fructose fed

dyslipidemic rats. Nutr Metab (Lond). 2016 Sep 29;13:63. doi: 10.1186/s12986-016-0121-y. PMID: 27708683; PMCID: PMC5041401.

7. Bioactivity

Biological target:

Nordihydroguaiaretic acid is a 5-lipoxygenase (5LOX) (IC50=8 μM) and tyrosine kinase inhibitor.

In vitro activity

The present studies now demonstrate that NDGA inhibits androgen-stimulated growth of LAPC-4 prostate cancer cells by several potential mechanisms. One mechanism, as observed in other cells, is direct inhibition of IGF-1R tyrosine kinase activity. Another potential mechanism of NDGA inhibition is attenuation of androgen stimulation of IGF-1R expression. FRET analysis of the AR suggests that the NDGA effect on AR action occurs after androgen-induced conformational changes in the AR. These findings with NDGA and other IGF-1R inhibitors, support the hypothesis that inhibition of the IGF-1R tyrosine kinase can modulate the androgen response on prostate cancer cell proliferation.

Reference: Prostate. 2008 Aug 1; 68(11): 1232–1240. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7305632/

In vivo activity

In conclusion, these studies suggest 16 weeks HTF (high trans-fat, high cholesterol and high fructose) diet fed mice exhibit obesity, insulin resistance, hepatic steatosis, fibrosis, inflammation, ER stress, oxidative stress, and liver injury (Fig. 7). These metabolic changes were significantly attenuated by simultaneous dietary administration of NDGA. This study further provides evidence that dietary administration of NDGA to HTF-fed mice improves hepatic dyslipidemia and NASH pathology by upregulating PPARα gene expression, increasing fatty acid oxidation via the peroxisomal β-oxidation pathway and attenuating ER stress, inflammation, fibrosis and progenitor cell activity. Thus, NDGA might have substantial therapeutic potential in the clinical management of NASH and associated fibrosis.

Reference: Mol Cell Endocrinol. 2019 Dec 1; 498: 110538. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273809/

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.