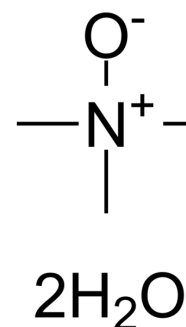


Trimethylamine N-oxide dihydrate

Cat. No.:	HY-108915												
CAS No.:	62637-93-8												
Molecular Formula:	C ₃ H ₁₃ NO ₃												
Molecular Weight:	111.14												
Target:	Endogenous Metabolite; NOD-like Receptor (NLR); Reactive Oxygen Species; TGF-beta/Smad												
Pathway:	Metabolic Enzyme/Protease; Immunology/Inflammation; NF-κB; Stem Cell/Wnt; TGF-beta/Smad												
Storage:	<table border="0"> <tr> <td>Powder</td> <td>-20°C</td> <td>3 years</td> </tr> <tr> <td></td> <td>4°C</td> <td>2 years</td> </tr> <tr> <td>In solvent</td> <td>-80°C</td> <td>6 months</td> </tr> <tr> <td></td> <td>-20°C</td> <td>1 month</td> </tr> </table>	Powder	-20°C	3 years		4°C	2 years	In solvent	-80°C	6 months		-20°C	1 month
Powder	-20°C	3 years											
	4°C	2 years											
In solvent	-80°C	6 months											
	-20°C	1 month											



SOLVENT & SOLUBILITY

In Vitro	H ₂ O : 100 mg/mL (899.77 mM; Need ultrasonic)				
		Solvent Concentration	Mass		
	Preparing Stock Solutions		1 mg	5 mg	10 mg
		1 mM	8.9977 mL	44.9883 mL	89.9766 mL
		5 mM	1.7995 mL	8.9977 mL	17.9953 mL
	10 mM	0.8998 mL	4.4988 mL	8.9977 mL	
Please refer to the solubility information to select the appropriate solvent.					
In Vivo	1. Add each solvent one by one: PBS Solubility: 120 mg/mL (1079.72 mM); Clear solution; Need ultrasonic				
	2. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 2.5 mg/mL (22.49 mM); Clear solution				
	3. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.5 mg/mL (22.49 mM); Clear solution				
	4. Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 2.5 mg/mL (22.49 mM); Clear solution				

BIOLOGICAL ACTIVITY

Description	Trimethylamine N-oxide dihydrate is a gut microbe-dependent metabolite of dietary choline and other trimethylamine-containing nutrients. Trimethylamine N-oxide dihydrate induces inflammation by activating the ROS/NLRP3 inflammasome. Trimethylamine N-oxide dihydrate also accelerates fibroblast-myofibroblast differentiation and induces cardiac fibrosis by
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	activating the TGF- β /smad2 signaling pathway ^{[1][2][3]} .		
IC₅₀ & Target	Human Endogenous Metabolite	NLRP3	Microbial Metabolite
In Vitro	<p>The size and migration of fibroblasts are increased after Trimethylamine N-oxide (TMAO) dihydrate treatment compared with non-treated fibroblasts in vitro. Trimethylamine N-oxide dihydrate increases TGF-β receptor I expression, which promotes the phosphorylation of Smad2 and up-regulates the expression of α-SMA and collagen I. The ubiquitination of TGF-βRI is decreased in neonatal mouse fibroblasts after Trimethylamine N-oxide dihydrate treatment. Trimethylamine N-oxide dihydrate also inhibits the expression of smurf2^[2].</p> <p>?Trimethylamine N-oxide is frequently found in the tissues of a variety of marine organisms that protects against the adverse effects of temperature, salinity, high urea and hydrostatic pressure^[3].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>		
In Vivo	<p>Trimethylamine N-oxide (TMAO) dihydrate contributes to cardiovascular diseases by promoting inflammatory responses. C57BL/6 mice are fed a normal diet, high-choline diet and/or 3-dimethyl-1-butanol (DMB) diet. The levels of Trimethylamine N-oxide dihydrate and choline are increased in choline-fed mice. Left ventricular hypertrophy, pulmonary congestion, and diastolic dysfunction are markedly exacerbated in heart failure with preserved ejection fraction (HFpEF) mice fed high-choline diets compared with mice fed the control diet. Myocardial fibrosis and inflammation were markedly increased in HFpEF mice fed high-choline diets compared with animals fed the control diet^[1].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>		

CUSTOMER VALIDATION

- Phytomedicine. 2022 Mar 21;100:154067.
- Clin Chim Acta. 2023 Dec 16:117726.

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REFERENCES

- [1]. Wei Shuai, et al. High-choline Diet Exacerbates Cardiac Dysfunction, Fibrosis, and Inflammation in a Mouse Model of Heart Failure With Preserved Ejection Fraction. *J Card Fail.* 2020 May 14;S1071-9164(19)31802-0.
- [2]. Wenlong Yang, et al. Gut Microbe-Derived Metabolite Trimethylamine N-oxide Accelerates Fibroblast-Myofibroblast Differentiation and Induces Cardiac Fibrosis. *J Mol Cell Cardiol.* 2019 Sep;134:119-130.
- [3]. Manuel T Velasquez, et al. Trimethylamine N-Oxide: The Good, the Bad and the Unknown. *Toxins (Basel).* 2016 Nov 8;8(11):326.

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA