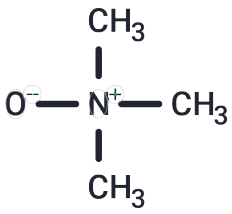
Data Sheet (Cat.No.T41245)

TargetMol

Trimethylamine N-oxide

Chemical Properties



CAS No. : 1184-78-7

Formula: C3H9NO

Molecular Weight: 75.11

Storage: Keep away from moisture,Store under nitrogen
Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	Trimethylamine N-oxide (TMAO) is a gut microbiota-dependent metabolite derived from dietary choline, betaine, and carnitine. It induces inflammation by activating the ROS/NLRP3 inflammasome and promotes fibroblast differentiation through the activation of the TGF-β/Smad2 signaling pathway. TMAO is commonly used to induce cardiac fibrosis models.
Targets(IC50)	Reactive Oxygen Species,NOD-like Receptor (NLR),TGF-beta/Smad
In vitro	In vitro, the treatment of fibroblasts with Trimethylamine N-oxide (TMAO) results in an increase in both the size and migration of fibroblasts compared to untreated fibroblasts. TMAO induces an elevation in TGF-β receptor I expression, leading to the phosphorylation of Smad2 and an up-regulation in the expression of α-SMA and collagen I. Concurrently, the ubiquitination of TGF-βRI is decreased in neonatal mouse fibroblasts following Trimethylamine N-oxide treatment. Additionally, Trimethylamine N-oxide inhibits the expression of smurf2 [3]. Trimethylamine N-oxide is commonly found in the tissues of various marine organisms, where it serves as a protective factor against the adverse effects of temperature, salinity, high urea, and hydrostatic pressure [2].
In vivo	Trimethylamine N-oxide can be utilized in animal modeling to establish a model of cardiac fibrosis.

Solubility Information

Solubility	DMSO: 125 mg/mL (1664.23 mM),Sonication is recommended. H2O: 10 mg/mL (133.14 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 2 mg/mL (26.63 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	13.3138 mL	66.569 mL	133.1381 mL
5 mM	2.6628 mL	13.3138 mL	26.6276 mL
10 mM	1.3314 mL	6.6569 mL	13.3138 mL
50 mM	0.2663 mL	1.3314 mL	2.6628 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

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.
Manuel T Velasquez, et al. Trimethylamine N-Oxide: The Good, the Bad and the Unknown. Toxins (Basel). 2016 Nov 8;8(11):326.
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.