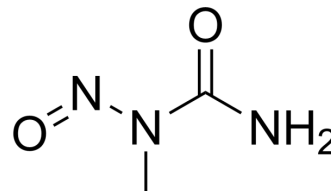


N-Nitroso-N-methylurea

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|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Cat. No.: | HY-34758 |
| CAS No.: | 684-93-5 |
| Molecular Formula: | C ₂ H ₅ N ₃ O ₂ |
| Molecular Weight: | 103.08 |
| Target: | DNA Alkylator/Crosslinker |
| Pathway: | Cell Cycle/DNA Damage |
| Storage: | -20°C, protect from light, stored under nitrogen * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light, stored under nitrogen) |



SOLVENT & SOLUBILITY

In Vitro

DMSO : 250 mg/mL (2425.30 mM; Need ultrasonic)
H₂O : 50 mg/mL (485.06 mM; Need ultrasonic)

| Preparing Stock Solutions | Solvent Concentration | Mass | | |
|---------------------------|-----------------------|-----------|------------|------------|
| | | 1 mg | 5 mg | 10 mg |
| | 1 mM | 9.7012 mL | 48.5060 mL | 97.0120 mL |
| | 5 mM | 1.9402 mL | 9.7012 mL | 19.4024 mL |
| | 10 mM | 0.9701 mL | 4.8506 mL | 9.7012 mL |

Please refer to the solubility information to select the appropriate solvent.

In Vivo

- Add each solvent one by one: PBS
Solubility: 10 mg/mL (97.01 mM); Clear solution; Need ultrasonic and warming and heat to 60°C
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.08 mg/mL (20.18 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.08 mg/mL (20.18 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.08 mg/mL (20.18 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

N-Nitroso-N-methylurea (NMU;MNU;NMH) is a potent carcinogen, mutagen and teratogenand. N-Nitroso-N-methylurea is a direct-acting alkylating agent that interacts with DNA. N-Nitroso-N-methylurea targets multiple animal organs to cause various cancer and/or degenerative disease. N-Nitroso-N-methylurea is also a precursor in the synthesis of diazomethane^{[1][2][3][4]}.

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| In Vitro | <p>N-Nitroso-N-methylurea (NMU; 5 μM) treatment increases the cellular NF-κB activity in human malignant keratinocytes. N-Nitroso-N-methylurea also increases the amount of I-κBα phosphorylation^[5].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> |
| In Vivo | <p>N-Nitroso-N-methylurea can be used in animal modeling to construct rat tumor models. N-Nitroso-N-methylurea (NMU) gives intravenously to rats at age 50 days induced mammary carcinomas in 89% of BUF/N, 73% of Sprague-Dawley, and 89% of F344 females. Latent periods are, respectively, 77, 86, and 94 days. Doubling times of NMU-induced primary and transplanted carcinomas are similar to 7 days. Cachexia ensues at the 5th week from the onset of the first tumor. When the tumor is larger than 15 g, hypercalcemia is usually observed^[1].</p> <p>1. Induction of Gastric Cancer^[6]</p> <p>Background</p> <p>N-Methyl-N-nitrosourea (MNU) is a direct-acting alkylating agent that interacts with DNA. Accumulation of mutations may enhance cancer risk in target organs or cause cell death in susceptible tissues or cells when excessive DNA damage is not repaired. MNU targets various organs in a variety of animal species^[2].</p> <p>Specific Modeling Methods</p> <p>Rats: albino Wistar • male • 5-6-week-old; 110-140 g</p> <p>Administration: 100 mg/kg • ig • thrice in a week for 16 weeks</p> <p>Note</p> <p>(1)Dissolved in citrate buffer and 5% saline thrice in a week via intragastric route for 16 wk.(3)The level of cancer induction was identified by specific biochemical markers such as serum gastrin level, TBARS, and glutathione followed by histopathological analysis at two-time periods for 8 and 16 week.</p> <p>Modeling Indicators</p> <p>Individual phenotypic changes: showed a significant decrease in body weight, water intake, and feed intake.</p> <p>Molecular changes: increased the mean serum gastrin level, increased level of lipid peroxidation and decreased reduced glutathione level in gastric tissues.</p> <p>Tissue changes: MNU-induced rats disclosed that the non-glandular stomach epithelium was hypertrophic with vacuolations and orthokeratotic hyperkeratosis after 16 wk of MNU induction but vacuolations and hyperkeratosis were not that much observed at 8 wk of MNU induction.</p> <p>2. Induction of Breast Cancer^[7]</p> <p>Background</p> <p>Specific Modeling Methods</p> <p>Rats: Albino Wistar • female • 35-day-old; 110-140 g</p> <p>Administration: 50 mg/kg • ip • at 50, 65, and 80 days of age</p> <p>Modeling Indicators</p> <p>Molecular changes: increased cyclin D1 expression, and showed p21^{Cip1} overexpression.</p> <p>Tissue changes: observed breast tumors, and increased the mean volumes of tumors.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p> |

CUSTOMER VALIDATION

- Adv Sci (Weinh). 2023 Oct 12:e2301977.
- Int Immunopharmacol. 2023 Sep 10;124(Pt A):110902.
- Int Immunopharmacol. 2023 Jul 22;122:110641.

- J Ethnopharmacol. 31 October 2022, 115885.
- Mol Cell Biol. 2021 Jul 6;MCB0030321.

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 - [2]. Ashrafi M, et al. Effect of Crocin on Cell Cycle Regulators in N-Nitroso-N-Methylurea-Induced Breast Cancer in Rats. *DNA Cell Biol*. 2015 Nov;34(11):684-91.
 - [3]. Gullino PM, et al. N-nitrosomethylurea as mammary gland carcinogen in rats. *J Natl Cancer Inst*. 1975 Feb;54(2):401-14.
 - [4]. Tsubura A, et al. Review: Animal models of N-Methyl-N-nitrosourea-induced mammary cancer and retinal degeneration with special emphasis on therapeutic trials. *In Vivo*. 2011 Jan-Feb;25(1):11-22.
 - [5]. Johnson EM, et al. Effects of N-nitroso-N-methylurea on enzymatic ontogeny associated with teratogenesis. *Teratology*. 1968 May;1(2):179-91.
 - [6]. Silvia Garbarino, et al. One-pot synthesis of α -haloketones employing a membrane-based semibatch diazomethane generator. *Journal of Flow Chemistry* volume 6, pages211-217(2016).
 - [7]. Moon KY. N-nitroso-N-methylurea and N-nitroso-N-ethylurea induce upregulation of cellular NF-kappa B activity through protein kinase C-dependent pathway in human malignant keratinocytes. *Arch Pharm Res*. 2010 Jan;33(1):133-9.
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Caution: Product has not been fully validated for medical applications. For research use only.

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