Nystatin

Cat. No.: HY-17409

CAS No.: 1400-61-9

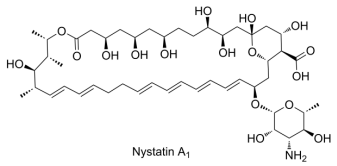
Molecular Formula: $C_{47}H_{75}NO_{17}$

Molecular Weight: 926.09

Target: Fungal; Antibiotic; Apoptosis; Bacterial

Pathway: Anti-infection; Apoptosis

Storage: -20°C, sealed storage, away from moisture and light
* The compound is unstable in solutions, freshly prepared is recommended.



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (53.99 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	1.0798 mL	5.3990 mL	10.7981 mL
	5 mM	0.2160 mL	1.0798 mL	2.1596 mL
	10 mM	0.1080 mL	0.5399 mL	1.0798 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: 2.5 mg/mL (2.70 mM); Suspended solution; Need ultrasonic
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (2.70 mM); Clear solution
3. Add each solvent one by one: 5% DMSO >> 95% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (2.70 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Nystatin is an orally active polyene antifungal antibiotic effective against yeast and mycoplasma. Nystatin increases the permeability of plasma membranes to small monovalent ions, including chloridion[1][2]. Nystatin is a cholesterol-sequestering agent[3], partially prevents Oxaliplatin-induced lipid raft aggregation, DR4 and DR5 clustering, and thereby reduces apoptosis[5].

IC_{50} & Target

Anti-fungal[1]

In Vitro

Nystatin results in a significant reduction in buccal epithelial cell adhesion of all six Candida species[1].
Nystatin is an antibiotic that increases the permeability of plasma membranes to small monovalent ions, including

	chloridion. Nystatin increases apical chloridion permeability to the point where transepithelial chloridion transport is limited by transport across the basolateral membrane of tracheal epithelial cells, which reflects primarily the activity of the cotransporter. Nystatin (400 units/mL) increases the basal level of transepithelial 36Cl flux approximately 1.5-fold and eliminates UTP stimulation of this flux. Nystatin treatment also abolishes UTP stimulation of saturable, basolateral [^{3}H]bumetanide binding, a measure of functioning Na-K-Cl cotransporters in these cells; isoproterenol stimulation of binding is only mildly inhibited by nystatin treatment[2]. Nystatin significantly enhances endostatin uptake by endothelial cells through switching endostatin internalization predominantly to the clathrin-mediated pathway. Nystatin-enhanced internalization of endostatin also increases its inhibitory effects on endothelial cell tube formation and migration[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Nystatin combined with endostatin selectively enhances endostatin uptake and biodistribution in tumor blood vessels and tumor tissues but not in normal tissues of tumor-bearing mice, ultimately resulting in elevated antiangiogenic and antitumor efficacies of endostatin in vivo[3]. Liposomal Nystatin, at doses as low as 2 mg/kg of body weight/day, protects neutropenic mice against Aspergillus-induced death in a statistically significant manner at the 50-day time point compared to either the no-treatment, the saline, or the empty-liposome group[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Adv Funct Mater. 2020, 2004940.
- Adv Sci (Weinh). 2023 Apr 20;e2301230.
- J Am Chem Soc. 2018 Dec 12;140(49):17234-17240.
- Biomaterials. 13 January 2022, 121373.
- Biomaterials. 10 August 2021, 121062.

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REFERENCES

[1]. Ellepola AN, et al. Adhesion of oral Candida species to human buccal epithelial cells following brief exposure to nystatin. Oral Microbiol Immunol. 1999 Dec;14(6):358-63.

[2]. Haas M, et al. Na-K-Cl cotransport in nystatin-treated tracheal cells: regulation by isoproterenol, apical UTP, and [Cl]i. Am J Physiol. 1994 May;266(5 Pt 1):C1440-52.

[3]. Chen Y, et al. Cholesterol sequestration by nystatin enhances the uptake and activity of endostatin in endothelium via regulating distinct endocytic pathways. Blood. 2011 Jun 9;117(23):6392-403

[4]. Wallace TL, et al. Activity of liposomal nystatin against disseminated Aspergillus fumigatus infection in neutropenic mice. Antimicrob Agents Chemother. 1997 Oct;41(10):2238-43

[5]. Xu L, et al. Oxaliplatin enhances TRAIL-induced apoptosis in gastric cancer cells by CBL-regulated death receptor redistribution in lipid rafts.FEBS Lett. 2009 Mar 4;583(5):943-8.

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