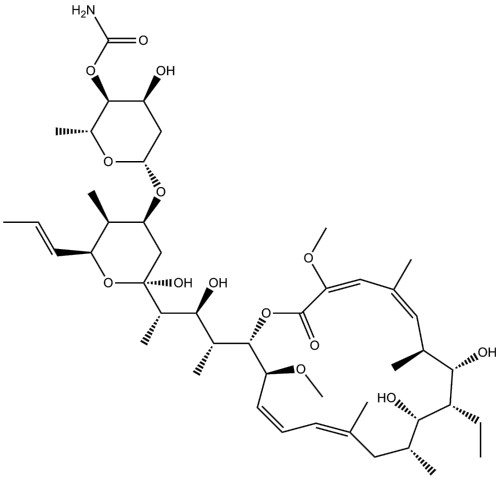
Product Data Sheet

Product Name: Concanamycin A
Cat. No.: GC17519

Chemical Properties

Cas. No.	80890-47-7		
Chemical Name	(3Z,5E,7R,8R,9S,10S,11R,13E,15E,17S,18R)-18-[(1S,2R,3S)-3-[(2R,4R,5S,6R)-4-[[4-O-(aminocarbonyl)-2,6-dideoxy-β-D-arabino-hexopyranosyl]oxy]tetrahydro-2-hydroxy-5-methyl-6-(1E)-1-propen-1-yl-2H-pyran-2-yl]-2-hydroxy-1-methylbutyl]-9-ethyl-8,10-dihydroxy-3,		
SMILES	CCC1C(C(CC(=CC=CC(C(OC(=O)C(=CC(=CC(C1O)C)C)OC)C(C)C(C(C)C2(CC(C(C(O2)C=CC)C)OC3CC(C(C(O3)C)OC(=O)N)O)O)O)OC)C)C)O		
Formula	$C_{46}H_{75}NO_{14}$	M.Wt	866.09
Solubility	Methanol : Soluble; DMSO : Soluble; Acetonitrile: Soluble	Storage	Store at -20°C, protect from light, Avoid solvent evaporation.
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure			

Protocol

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

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Cell experiment [1]:	
Cell lines	Peritoneal macrophages from C57/BL6 mice
Preparation Method	Peritoneal macrophages were cultured in RPMI-1640 medium, supplemented 10% heat-inactivated fetal bovine serum at 37°C in an incubator with 5% CO_2. Cells were seeded in a 6-well plate at a density of 3×10^5 cells/well overnight. Cells were treated with different concentrations of Concanamycin A (0, 3, 6, 9, and 12nM) for 4h. After 4h, 1μg/ml of LPS was added and incubated for 12h. The LPS-induced nitric oxide production was measured.
Reaction Conditions	0, 3, 6, 9, and 12nM; 4h
Applications	Concanamycin A treatment reduced LPS-induced nitric oxide production within peritoneal macrophages in a dose-dependent manner.

References:

[1] Eswarappa S M, Basu N, Joy O, et al. Folimycin (concanamycin A) inhibits LPS-induced nitric oxide production and reduces surface localization of TLR4 in murine macrophages[J]. Innate Immunity, 2008, 14(1): 13-24.

Background

Concanamycin A, a macrolide antibiotic, is a specific inhibitor of vacuolar-type ATPase (V-ATPase) with an IC_{50} value of 10nM[1]. Concanamycin A counteracts the HIV accessory protein Nef, reversing the MHC-I downregulation mediated by Nef, thereby enhancing the clearance of HIV-infected primary lymphocytes by cytotoxic T lymphocytes (CTL)[2]. Concanamycin A has been widely used to block growth of *Neurospora crassa* in medium adjusted to pH 7 [3].

In vitro, Concanamycin A (12nM) pretreatment for 4 hours significantly inhibited the production of

nitric oxide in mouse peritoneal macrophages induced by Lipopolysaccharide (LPS) (1μg/ml), reduced the expression of TLR4 molecules on the cell surface, and decreased the activation of NF-κB[4]. Treatment with 2nM Concanamycin A for 48 hours triggered apoptosis in human submandibular gland ductal carcinoma cells, accompanied by nuclear condensation, DNA fragmentation, and a decrease in the level of heat shock protein 27 (HSP27)[5]. Treatment with 10nM Concanamycin A for 24 hours restrained the growth of RAW 264.7 cells and disrupted the mitochondrial membrane potential[6]. 3nM Concanamycin A treatment for 24 hours upregulated the tyrosinase activity in FM3 and B16-G4F cells, promoting melanin production[7].

References:

[1] Huss M, Ingenhorst G, König S, et al. Concanamycin A, the specific inhibitor of V-ATPases, binds to the Vo subunit c[J]. Journal of Biological Chemistry, 2002, 277(43): 40544-40548.

[2] Painter M M, Zimmerman G E, Merlino M S, et al. Concanamycin A counteracts HIV-1 Nef to enhance immune clearance of infected primary cells by cytotoxic T lymphocytes[J]. Proceedings of the National Academy of Sciences, 2020, 117(38): 23835-23846.

[3] Bowman E J, O'Neill F J, Bowman B J. Mutations of pma-1, the gene encoding the plasma membrane H+-ATPase of Neurospora crassa, suppress inhibition of growth by concanamycin A, a specific inhibitor of vacuolar ATPases[J]. Journal of biological chemistry, 1997, 272(23): 14776-14786.

[4] Eswarappa S M, Basu N, Joy O, et al. Folimycin (concanamycin A) inhibits LPS-induced nitric oxide production and reduces surface localization of TLR4 in murine macrophages[J]. Innate Immunity, 2008, 14(1): 13-24.

[5] Aiko K, Tsujisawa T, Koseki T, et al. Involvement of cytochrome c and caspases in apoptotic cell death of human submandibular gland ductal cells induced by concanamycin A[J]. Cellular signalling, 2002, 14(8): 717-722.

[6] Hong J J, Nakano Y, Yokomakura A, et al. Nitric oxide production by the vacuolar-type (H+)-ATPase inhibitors bafilomycin A1 and concanamycin A and its possible role in apoptosis in RAW 264.7 cells[J]. The Journal of pharmacology and experimental therapeutics, 2006, 319(2): 672-681.

[7] Ancans J, Thody A J. Activation of melanogenesis by vacuolar type H+-ATPase inhibitors in

amelanotic, tyrosinase positive human and mouse melanoma cells[J]. FEBS letters, 2000, 478(1-2): 57-60.