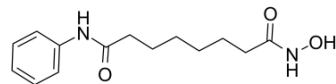


Vorinostat

Cat. No.:	HY-10221		
CAS No.:	149647-78-9		
Molecular Formula:	C ₁₄ H ₂₀ N ₂ O ₃		
Molecular Weight:	264.32		
Target:	HDAC; Autophagy; Mitophagy; Filovirus; Apoptosis		
Pathway:	Cell Cycle/DNA Damage; Epigenetics; Autophagy; Anti-infection; Apoptosis		
Storage:	Powder	-20°C	3 years
		4°C	2 years
	In solvent	-80°C	6 months
		-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : ≥ 100 mg/mL (378.33 mM)
 * "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	3.7833 mL	18.9165 mL	37.8329 mL
	5 mM	0.7567 mL	3.7833 mL	7.5666 mL
	10 mM	0.3783 mL	1.8916 mL	3.7833 mL

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

In Vivo

- Add each solvent one by one: 5% DMSO >> 40% PEG300 >> 5% Tween-80 >> 50% saline
Solubility: ≥ 2.5 mg/mL (9.46 mM); Clear solution
- Add each solvent one by one: 5% DMSO >> 95% (20% SBE-β-CD in saline)
Solubility: ≥ 2.5 mg/mL (9.46 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil
Solubility: ≥ 2.08 mg/mL (7.87 mM); Clear solution

BIOLOGICAL ACTIVITY

Description	Vorinostat (SAHA) is a potent and orally active pan-inhibitor of HDAC1, HDAC2 and HDAC3 (Class I), HDAC7 (Class II) and HDAC11 (Class IV), with ID ₅₀ values of 10 nM and 20 nM for HDAC1 and HDAC3, respectively. Vorinostat induces cell apoptosis [1][4]. Vorinostat is also an effective inhibitor of human papillomaviruse (HPV)-18 DNA amplification [7].			
IC₅₀ & Target	HDAC1 10 nM (ID50)	HDAC3 20 nM (ID50)	HDAC2	HDAC7
	HDAC11	Autophagy	Mitophagy	
In Vitro	Vorinostat efficiently suppresses MES-SA cell growth at a low dosage (3 μM) already after 24 hours treatment. HDACs class I (HDAC2 and 3) as well as class II (HDAC7) are preferentially affected by this treatment. Vorinostat significantly increases p21 WAF1 expression and apoptosis in MES-SA cells [1]. Vorinostat inhibits SK-N-SH and SK-N-Be(2)C with the IC ₂₅ values of 1 μM and 0.5 μM, respectively [2]. Vorinostat is an effective inhibitor of HPV-18 DNA amplification, reduces oncoproteins E6 and E7 activities and triggers apoptosis in HPV-infected, differentiated cells [7]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.			
In Vivo	Vorinostat (50 mg/kg/day) reduces tumor growth by more than 50% in nude mice injected with 5×10 ⁶ MES-SA cells [1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.			

PROTOCOL

Cell Assay [1]	Cell lysates are prepared by using RIPA buffer (25 mM Tris-HCl pH 7.6, 150 mM NaCl, 1% NP-40, 1% sodium deoxycholate, 0.1% SDS), and the protein concentration is determined by Bio-Rad DC Protein Assay. Protein lysates are separated by SDS-PAGE and transferred to nitrocellulose membrane. Following antibodies and dilutions are used: rabbit anti HDAC1 (1 μg/mL); rabbit anti HDAC2 (1 μg/mL); rabbit anti HDAC3 (9 μg/mL); rabbit anti HDAC7 (3 μg/mL); mouse anti p21WAF1 (0.5 μg/mL). As secondary antibodies, the rabbit anti-mouse and swine anti-rabbit HRP-coupled antibodies at a final concentration of 1 μg/mL. An overnight incubation at 4°C is used for all primary antibodies, followed by washing and 2-hours incubation at RT with secondary antibodies. Specific protein bands are visualized by enhanced chemiluminescence assay. To demonstrate equal loading of protein samples all western blots are probed for β-tubulin. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [1]	Twelve weeks old male mice (n=14) are anesthetized with Isofluran and 5×10 ⁶ MES-SA cells are injected subcutaneously into the right flank of the animal. Mice from a control group receives placebo containing 300 μL of empty HOP-β-CD (2-hydroxypropyl-β-cyclodextrin) vesicles. Another group of mice receives vorinostat dissolved in HOP-β-CD at a concentration of 50 mg/kg/day. Both, empty vesicles and vorinostat are administered intraperitoneally, starting on the day 4 after the injection of MES-SA tumor cells. Mice body weight and tumor size ($w^2 \times l \times 0.52$; measured by caliper) are estimated twice a week. All mice are treated for 21 days and afterwards sacrificed by cervical dislocation. Each tumor is isolated as a whole and different tumor parameters are determined. Finally, tumor slices are cryo preserved and formalin fixed (4%) for further analyses. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Mol Psychiatry. 2017 May;22(5):711-723.

- Nat Commun. 2021 Mar 3;12(1):1407.
- Nat Commun. 2017 Dec 20;8(1):2207.
- Cell Syst. 2019 Jul 24;9(1):35-48.e5.
- Oncogene. 2021 Mar 12.

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 - [2]. Lautz TB, et al. The effect of vorinostat on the development of resistance to NSC 123127 in neuroblastoma. PLoS One. 2012;7(7):e40816.
 - [3]. Richon VM, et al. A class of hybrid polar inducers of transformed cell differentiation inhibits histone deacetylases. Proc Natl Acad Sci U S A. 1998 Mar 17;95(6):3003-7.
 - [4]. Xu WS, et al. Histone deacetylase inhibitors: molecular mechanisms of action. Oncogene. 2007 Aug 13;26(37):5541-52.
 - [5]. Pérez-Cañamás A, et al. Sphingomyelin-induced inhibition of the plasma membrane calcium ATPase causes neurodegeneration in type A Niemann-Pick disease. Mol Psychiatry. 2017 May;22(5):711-723.
 - [6]. Wang J, et al. Snail determines the therapeutic response to mTOR kinase inhibitors by transcriptional repression of 4E-BP1. Nat Commun. 2017 Dec 20;8(1):2207.
 - [7]. Banerjee NS, et al. Vorinostat, a pan-HDAC inhibitor, abrogates productive HPV-18 DNA amplification. Proc Natl Acad Sci U S A. 2018 Nov 20;115(47):E11138-E11147.
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Caution: Product has not been fully validated for medical applications. For research use only.

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