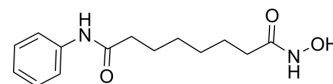


Vorinostat

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; HPV												
Pathway:	Cell Cycle/DNA Damage; Epigenetics; Autophagy; Anti-infection; Apoptosis												
Storage:	<table border="0"> <tr> <td>Powder</td> <td>-20°C</td> <td>3 years</td> </tr> <tr> <td></td> <td>4°C</td> <td>2 years</td> </tr> <tr> <td>In solvent</td> <td>-80°C</td> <td>1 year</td> </tr> <tr> <td></td> <td>-20°C</td> <td>6 months</td> </tr> </table>	Powder	-20°C	3 years		4°C	2 years	In solvent	-80°C	1 year		-20°C	6 months
Powder	-20°C	3 years											
	4°C	2 years											
In solvent	-80°C	1 year											
	-20°C	6 months											



SOLVENT & SOLUBILITY

In Vitro

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

	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
Preparing Stock Solutions	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: 20% HP-β-CD in saline
Solubility: 3.33 mg/mL (12.60 mM); Clear solution; Need ultrasonic
- 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

9. 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), HDAC6 and 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 papillomavirus (HPV)-18 DNA amplification ^[7] .			
IC₅₀ & Target	HDAC1 10 nM (ID50)	HDAC3 20 nM (ID50)	HDAC2	HDAC7
	HDAC11	Autophagy	Mitophagy	
In Vitro	<p>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].</p> <p>Vorinostat inhibits SK-N-SH and SK-N-Be(2)C with the IC₂₅ values of 1 μM and 0.5 μM, respectively^[2].</p> <p>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].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>			
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]	<p>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.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
Animal Administration ^[1]	<p>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.</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

CUSTOMER VALIDATION

- Protein Cell. 2023 Nov 27;pwad056.
- Mil Med Res. 2022 Sep 27;9(1):54.
- Nat Commun. 2020 Apr 14;11(1):1792.
- Nat Commun. 2021 Mar 3;12(1):1407.
- Nat Commun. 2017 Dec 20;8(1):2207.

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- [1]. Hrzenjak A et al. Histone deacetylase inhibitor vorinostat suppresses the growth of uterine sarcomas in vitro and in vivo. *Mol Cancer*. 2010 Mar 4;9:49.
 - [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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