Vanillin

Cat. No.: HY-N0098

CAS No.: 121-33-5

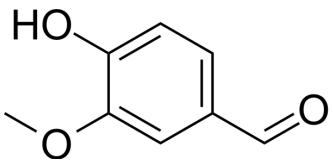
Molecular Formula: $C_8H_8O_3$

Molecular Weight: 152.15

Target: Endogenous Metabolite

Pathway: Metabolic Enzyme/Protease

Storage: 4°C, stored under nitrogen
* In solvent : -80°C, 6 months; -20°C, 1 month (stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (657.25 mM; Need ultrasonic)
H_2O : 25 mg/mL (164.31 mM; ultrasonic and warming and heat to 60°C)

Preparing Stock Solutions

Concentration \ Solvent \ Mass	1 mg	5 mg	10 mg
1 mM	6.5725 mL	32.8623 mL	65.7246 mL
5 mM	1.3145 mL	6.5725 mL	13.1449 mL
10 mM	0.6572 mL	3.2862 mL	6.5725 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 (16.43 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (16.43 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (16.43 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Vanillin (p-Vanillin) is a single molecule extracted from vanilla beans and also a popular odor used widely in perfume, food and medicine.

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Vanillin recovers UVA-induced reduction of proliferation in a dose dependent manner. Vanillin has no apoptotic effects at the tested concentrations. In addition, the reduced expression levels of OCT4, NANOG, and SOX2 caused by UVA irradiation are all increased by Vanillin treatment, suggesting that Vanillin attenuates the effects of UVA irradiation on hAMSCs. Based

	on a luciferase reporter assay, Vanillin increases the reduced activity of HRE-luciferase reporter caused by UVA irradiation. In addition, treatment with Vanillin attenuates the reduced expression of HIF-1α caused by UVA irradiation. The results reveal that treatment of hAMSCs with Vanillin results in significant decrease in the production of PGE_2 and cAMP when compare to UVA-irradiated controls[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Following antidepressant treatment for 4 weeks, immobility time in the stress+Vanillin and stress+fluoxetine groups is significantly decreased [F(4,42)=34.73, P<0.01; F(4,42)=13.55, P<0.01, respectively]. Treatment with Vanillin or fluoxetine remarkably alleviates the decrease in sucrose consumption in CUMS model animals [F(4,42)=12.32, P<0.01; F(4,42)=5.65, P<0.01, respectively]. In CUMS model rats, 5-HT level in the stress+Vanillin and stress+fluoxetine groups is significantly increased when compare with the stress group [F(4,42)=4.846, P=0.030; F(4,42)=4.846, P=0.036, respectively], whereas noradrenaline (NE) in the two groups is elevated but not significantly [F(4,42)=6.977, n.s.]. Dopamine (DA) is also significantly increased in the stress+Vanillin group compare with the stress group [F(4.42)=6.174, P=0.041][2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]	hAMSCs are irradiated with the indicated doses of UVA and then incubated with the indicated concentrations of Vanillin for three days under serum-free conditions. After the incubation, the concentrations of PGE_2 or cAMP in the culture supernatant are measured using ELISA kits. Culture supernatants are added into 96 well plates. Alkaline phosphatase conjugated PGE_2 or cAMP and antibodies to PGE_2 or cAMP are added to sample wells and incubated at room temperature for 2 h. The sample wells are then washed with PBS and p-nitrophenyl phosphate (pNpp) substrate solution is added. Finally, the samples are incubated at room temperature for 1 h and their absorbance values are read according to the manufacturer's instructions[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Cell Assay [1]	hAMSCs are irradiated with the indicated doses of UVA and then incubated with 1 to 100 μM of Vanillin for three days under serum-free conditions (in DMEM devoid of serum, at 37°C with 5% CO_2). After three days, cell proliferation is measured using BrdU incorporation assay[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
Animal Administration [2]	Male Sprague-Dawley rats (200 to 250 g) are used in this study. The animals are divided into three groups with 8 to 10 rats per group: the stress+fluoxetine group; the stress+Vanillin aromatherapy group and the stress (untreated) group. For the stress+fluoxetine group, the animals are administered a daily oral dose (10 mg/kg/d, diluted in distilled water) of the SSRI fluoxetine each morning. For the stress+Vanillin group and the bulbectomy+Vanillin group, Vanillin is administrated in a Plexiglas cylinder 50 cm tall and 35 cm diameter with two layers separated by a porous Plexiglas board. The rat still in its cage is gently placed on the upper layer, and 5 mL of 600 mg/L Vanillin (in distilled water) sprayed on to the floor of the lower layer. Rats in the stress and the control groups receive similar handling to the stress+Vanillin group, but without any odor administrated[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Neuroscience. 8 March 2022.
- AAPS Open. 2023 Apr 14.

See more customer validations on www.MedChemExpress.com

REFERENCES

[1]. Lee SY, et al. Vanillin attenuates negative effects of ultraviolet A on the stemness of human adipose tissue-derived mesenchymal stem cells. Food Chem Toxicol. 2016 Oct;96:62-9.

[2]. Xu J, et al. Vanillin-induced amelioration of depression-like behaviors in rats by modulating monoamine neurotransmitters in the brain. Psychiatry Res. 2015 Feb 28;225(3):509-14.

Tel: 609-228-6898 Fax: 609-228-5909 E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA