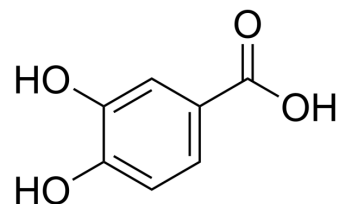


## Protocatechuic acid

<b>Cat. No.:</b>	HY-N0294		
<b>CAS No.:</b>	99-50-3		
<b>Molecular Formula:</b>	C <sub>7</sub> H <sub>6</sub> O <sub>4</sub>		
<b>Molecular Weight:</b>	154.12		
<b>Target:</b>	Endogenous Metabolite		
<b>Pathway:</b>	Metabolic Enzyme/Protease		
<b>Storage:</b>	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 (648.85 mM; Need ultrasonic)  
 H<sub>2</sub>O : 10 mg/mL (64.88 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	6.4885 mL	32.4423 mL	64.8845 mL
	5 mM	1.2977 mL	6.4885 mL	12.9769 mL
	10 mM	0.6488 mL	3.2442 mL	6.4885 mL

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

#### In Vivo

- Add each solvent one by one: PBS  
Solubility: 16.67 mg/mL (108.16 mM); Clear solution; Need ultrasonic
- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
Solubility: ≥ 2.5 mg/mL (16.22 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
Solubility: ≥ 2.5 mg/mL (16.22 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
Solubility: ≥ 2.5 mg/mL (16.22 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Protocatechuic acid is a phenolic compound which exhibits neuroprotective effect.

#### IC<sub>50</sub> & Target

Microbial Metabolite

<b>In Vitro</b>	Protocatechuic acid inhibits the aggregation of A $\beta$ and $\alpha$ S and destabilizes their preformed fibrils. Protocatechuic acid prevents the death of PC12 cells triggered by A $\beta$ - and $\alpha$ S-induced toxicity <sup>[3]</sup> . MCE has not independently confirmed the accuracy of these methods. They are for reference only.
<b>In Vivo</b>	Protocatechuic acid is able to prevent stress induced immobility time in forced swim test without altering locomotor activity in mice. Further, Protocatechuic acid treatment attenuates the elevation of serum corticosterone, lipid peroxidation and restores enzymatic antioxidants in cerebral cortex and hippocampus in ARS mice <sup>[1]</sup> . Rat administered cadmium and treated with prostigmine and doses of Protocatechuic acid (10 20 mg/kg) has significantly reduced BChE activity. Cadmium and either Prostigmine or Protocatechuic acid (10 20 mg/kg) treated rats shows significant reduction in MDA level <sup>[2]</sup> . MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## PROTOCOL

<b>Kinase Assay</b> <sup>[2]</sup>	AChE activity investigation is carried out in a reaction mixture containing 50 $\mu$ L of tissue homogenate, 50 $\mu$ L of 5, 5'-dithiobis-(2-nitrobenzoic) acid (DTNB), 1175 $\mu$ L of 0.1 M phosphate-buffered solution, pH 8.0. After incubation for 20 min at 25°C, 25 $\mu$ L of acetylthiocholine iodide solution is added as the substrate. The AChE activity is determined as changes in absorbance reading at 412 nm for 3 min at 25°C and using a UV/Visible spectrophotometer. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
<b>Cell Assay</b> <sup>[3]</sup>	Dilutions of Protocatechuic acid (2, 5, 10, 20, 50, and 100 $\mu$ M) are prepared from stock solutions, with serum-free culture medium. Equal volumes of each solution are mixed with A $\beta$ 1-42 (10 $\mu$ M), then incubated for 24 h on a thermoblock, with continuous agitation, and then exposed to PC12 cells for 24 h to test whether Protocatechuic acid can prevent cell death triggered by A $\beta$ . Cell viability is determined by MTT reduction assay. Cells are treated with 200 $\mu$ L per well of MTT solution (final concentration, 0.5 mg/mL in DMEM-Glutamax medium) for 3 h, at 37°C, with 5% CO <sub>2</sub> . The dark blue formazan crystals that formed are solubilized with 100 $\mu$ L per well of DMSO, for 30 min. Absorbance is measured at 540 nm, with a microplate reader. Results are expressed as the percentage of MTT reduction in relation to the absorbance of control cells at 100%. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## CUSTOMER VALIDATION

- Food Chem. 2022: 134807.
- J Neurosci Res. 2019 Dec;97(12):1689-1705.
- Pharm Biol. 2023 Dec;61(1):737-745.
- Biochem Biophys Res Commun. 2018 Sep 3;503(1):297-303.
- Acta Pharm. 70 (2020) 539-549

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## REFERENCES

- [1]. Thakare VN, et al. Attenuation of acute restraint stress-induced depressive like behavior and hippocampal alterations with protocatechuic acid treatment in mice. *Metab Brain Dis.* 2016 Oct 26
- [2]. Adefegha SA, et al. Alterations of Na<sup>+</sup>/K<sup>+</sup>-ATPase, cholinergic and antioxidant enzymes activity by protocatechuic acid in cadmium-induced neurotoxicity and oxidative stress in Wistar rats. *Biomed Pharmacother.* 2016 Oct;83:559-568
- [3]. Hornedo-Ortega R, et al. Protocatechuic Acid: Inhibition of Fibril Formation, Destabilization of Preformed Fibrils of Amyloid- $\beta$  and  $\alpha$ -Synuclein, and Neuroprotection. *J*

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