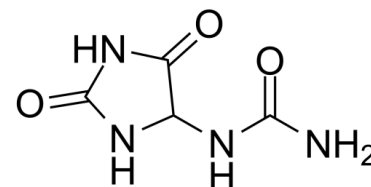


Data Sheet

Product Name:	Allantoin
Cat. No.:	CS-7741
CAS No.:	97-59-6
Molecular Formula:	C ₄ H ₆ N ₄ O ₃
Molecular Weight:	158.12
Target:	Endogenous Metabolite; Imidazoline Receptor
Pathway:	GPCR/G Protein; Metabolic Enzyme/Protease; Neuronal Signaling
Solubility:	DMSO : 50 mg/mL (316.22 mM; Need ultrasonic); H ₂ O : 3.85 mg/mL (24.35 mM; Need ultrasonic)



BIOLOGICAL ACTIVITY:

Allantoin is a skin conditioning agent that promotes healthy skin, stimulates new and healthy tissue growth. IC₅₀ & Target: Imidazoline Receptor^[1] **In Vitro:** Allantoin is a well-known cosmetic ingredient reported to have anti-oxidative and anti-inflammatory activities^[1]. Allantoin attenuates apoptosis and cytotoxicity and increased the viability of STZ-induced β-cells in a dose-dependent manner. Allantoin decreases the level of caspase-3 and increases the level of phosphorylated B-cell lymphoma 2 (Bcl-2) expression. Allantoin has been demonstrated to activate imidazoline 3 (I3) receptors^[2]. **In Vivo:** The subchronic administration of allantoin (1, 3 or 10 mg/kg, for 7 days) significantly increases the latency time measured during the passive avoidance task in scopolamine-induced cholinergic blockade and normal naive mice. Allantoin treatment (3 or 10 mg/kg, for 7 days) also increases the expression levels of phosphorylated phosphatidylinositol 3-kinase (PI3K), phosphorylated protein kinase B (Akt) and phosphorylated glycogen synthase kinase-3β (GSK-3β). Allantoin significantly increases the neuronal cell proliferation of immature neurons in the hippocampal dentate gyrus region^[1]. Daily injection of allantoin for 8 days in STZ-treated rats significantly lowers plasma glucose and increases plasma insulin levels^[2]. Allantoin decreases blood pressures in SHR at 30 minutes, as the most effective time. Also, this antihypertensive action is shown in a dose-dependent manner from SHR treated with allantoin. Moreover, in anesthetized rats, allantoin inhibits cardiac contractility and heart rate. Also, the peripheral blood flow is markedly increased by allantoin^[3].

PROTOCOL (Extracted from published papers and Only for reference)

Cell Assay: ^[2]Pancreatic β-cells are treated with 1, 10, 100 μM of allantoin before 30 min prior to the addition of 5 mM STZ and incubated for 6 h. Cell viability is measured using the ApoTox-Glo triplex assay^[2]. **Animal Administration:** Allantoin is dissolved in 0.9% sodium chloride^[3].

Allantoin is dissolved in 10% Tween 80 solution^[1].

^[1]^[3]Rat: Animals are randomly assigned into four groups: (I) the control group treated with the vehicle, saline; (II) the allantoin group treated by intravenous injection of allantoin at 0.5 mg/kg; (III) the allantoin+efaroxan group treated with allantoin at the most effective dose (0.5 mg/kg, i.v.) and efaroxan at effective dose (1.5 mg/kg, i.v.) 30 minutes before injection of allantoin; and (IV) the allantoin treated SHR group treated by intravenous injection of allantoin at various dose for desired time. After treatment of allantoin, the rats are placed into a holder for the determination of the mean blood pressure^[3].

Mouse: For memory ameliorating study, mice are administered vehicle solution, allantoin (1, 3 or 10 mg/kg, p.o.) or donepezil (5 mg/kg, p.o.) at the same time (10:00-12:00 a.m) and same place for 7 days. For memory enhancing study, mice are administered vehicle solution, allantoin (1, 3 or 10 mg/kg, p.o.) or piracetam (200 mg/kg, i.p.). The final administration of allantoin, donepezil or

piracetam is performed 1 h before an acquisition trial in the passive avoidance task^[1].

References:

- [1]. Ahn YJ, et al. Effects of allantoin on cognitive function and hippocampal neurogenesis. Food Chem Toxicol. 2014 Feb;64:210-6.
- [2]. Amitani M, et al. Allantoin ameliorates chemically-induced pancreatic β -cell damage through activation of the imidazoline I3 receptors. PeerJ. 2015 Aug 6;3:e1105.
- [3]. Chen MF, et al. Antihypertensive action of allantoin in animals. Biomed Res Int. 2014;2014:690135.

CAIndexNames:

Urea, N-(2,5-dioxo-4-imidazolidinyl)-

SMILES:

O=C(N)NC(C(N1)=O)NC1=O

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

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