

Product Data Sheet

Product Name: Papaveroline

Cat. No.: GC81320

Chemical Properties

Cas. No. 574-77-6

Formula $C_{16}H_{13}NO_4$

M.Wt 283.28

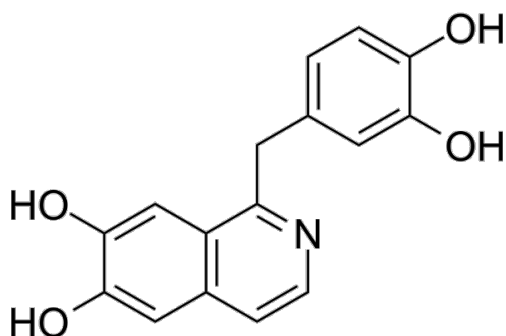
Solubility

Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Background

Papaveroline is a Fyn tyrosine kinase inhibitor, Na⁺, K⁺ -ATPase inhibitor with an IC₅₀ of 0.20 mM, Mg²⁺ -ATPase inhibitor, K⁺ -activated pNPPase inhibitor with an IC₅₀ of 1.51 mM, and apoptosis inducer [1] [2] [3]. Papaveroline binds to the active site of Fyn tyrosine kinase and forms stable interactions with pocket amino acid residues [1]. Papaveroline induces cell apoptosis, produces pycnotic and fragmented cell nuclei, and does not reduce intracellular ATP levels [3]. Papaveroline is

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a dopamine-derived neurotoxin candidate associated with the pathogenesis of Parkinson's disease [3]. Papaveroline can be used in the research of Alzheimer's disease and Parkinson's disease [3].

In Vitro, Papaveroline inhibits rat brain microsomal Na⁺,K⁺-ATPase with an IC₅₀ of 0.20 mM and inhibits rat brain microsomal Mg²⁺-ATPase with an I₅₀ of 0.40 mM^[2]. Papaveroline inhibits rat brain microsomal K⁺-activated pNPPase with an IC₅₀ of 1.51 mM, which is less potent than its inhibition of rat brain microsomal Na⁺,K⁺-ATPase^[2]. Papaveroline (75-100% inhibition; 10 min)-mediated inhibition of rat brain microsomal Na⁺,K⁺-ATPase is freely reversible, as enzyme activity returns to control levels following washing and resuspension of the enzyme^[2]. Papaveroline (200-400 μM) acts as a simple linear noncompetitive inhibitor of rat brain microsomal Na⁺,K⁺-ATPase with respect to ATP, exhibiting an apparent K_i of 380.00 μM^[2]. Papaveroline (300 μM) decreases the apparent affinity of rat brain microsomal Na⁺,K⁺-ATPase for Na⁺ by increasing the K_{0.5} by 65% without altering cooperative binding at the Na⁺ site or the enzyme's V_{max}^[2]. Papaveroline inhibits beef cardiac Na⁺,K⁺-ATPase with an IC₅₀ of 0.76 mM, which is less potent than its inhibition of rat brain microsomal Na⁺,K⁺-ATPase^[2]. Papaveroline (100-500 μM; 18 h) induces apoptosis in the majority of human dopaminergic neuroblastoma SH-SY5Y cells at 100 μM and 250 μM (69.19% and 83.07% apoptotic cells, respectively) and shifts to mostly necrosis at 500 μM (67.88% necrotic cells)^[3]. Papaveroline (250 μM; 3 h) does not significantly reduce intracellular ATP levels in human dopaminergic neuroblastoma SH-SY5Y cells, with a measured concentration of 4.79 nmol/mg protein after 3 h incubation^[3].

References:

- [1]. Bhat SS, et al. Computational Insights into Papaveroline as an In Silico Drug Candidate for Alzheimer's Disease via Fyn Tyrosine Kinase Inhibition. Molecular biotechnology. 2025 Jul;67(7):2743-2757.
- [2]. Meyerson LR, et al. Isoquinoline alkaloids. Inhibitory actions on cation-dependent ATP-phosphohydrolases. Neurochemical research. 1978 Apr;3(2):239-57.
- [3]. Maruyama W, et al. Dopaminergic neurotoxins, 6,7-dihydroxy-1-(3', 4'-dihydroxybenzyl)-isoquinolines, cause different types of cell death in SH-SY5Y cells: apoptosis was induced by oxidized papaverolines and necrosis by reduced tetrahydropapaverolines. Neuroscience letters. 2000 Sep 15;291(2):89-92.

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