

Product Data Sheet

Product Name: Scopolamine (Hyoscine)

Cat. No.: GC31046

Chemical Properties

Cas. No. 51-34-3

SMILES O=C([C@@H](C1=CC=CC=C1)CO)O[C@H]2C[C@H]3[C@@H]4O[C@@H]4[C@H](N3C)C2

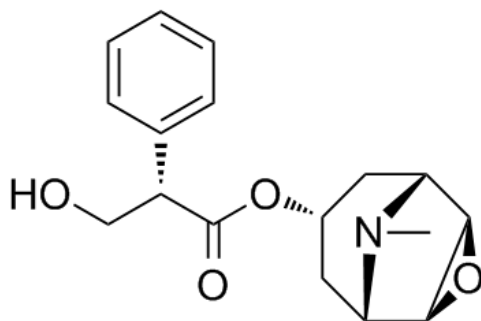
Formula $C_{17}H_{21}NO_4$ M.Wt 303.35

Solubility DMSO : 100mg/mL 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



Protocol

Animal experiment [1]:

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Animal models Adult male ICR mice

Mice in the Scopolamine-treated groups were intraperitoneally injected with 1mg/kg of Scopolamine, once daily, for 1-4 weeks. The control mice were injected with the same volume of saline (pH 7.4). The mice were then sacrificed after 1-, 2-, 3- and 4-week treatment. In addition, to label the mitotic cells in the dentate gyrus (DG), control and 4 weeks-Scopolamine-treated mice were intraperitoneally injected with 50mg/kg BrdU for twice at a 8h interval on days 6, 13, 20 and 27 during the experiment.

Dosage form 1mg/kg/day; 1-4 weeks; i.p.

The numbers of Ki-67-positive cells was significantly decreased in the DG at 4 weeks after Scopolamine treatment compared with the other groups. The arborization of Doublecortin-immunoreactive processes in the DG was much worse and less in number than that in the control group at 4 weeks after Scopolamine treatment.

References:

[1]Yan B C, Park J H, Chen B H, et al. Long-term administration of scopolamine interferes with nerve cell proliferation, differentiation and migration in adult mouse hippocampal dentate gyrus, but it does not induce cell death[J]. Neural Regeneration Research, 2014, 9(19): 1731-1739.

Background

Scopolamine (Hyoscine) is a natural tropane alkaloid and a high-affinity competitive muscarinic acetylcholine receptor (mAChRs) antagonist^[1]. Scopolamine reversibly inhibits 5-HT₃ receptor responses with an IC₅₀ value of 2.09μM^[2]. Scopolamine reduces the effects of the neurotransmitter acetylcholine (ACh) by blocking central and peripheral cholinergic signaling and is clinically used to

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prevent and treat motion sickness and postoperative nausea and vomiting (PONV)^[3]. Scopolamine can be used to induce cognitive impairment in experimental models because it easily penetrates the blood-brain barrier^[4].

In vivo, Scopolamine (1mg/kg) treated by intraperitoneal injection in adult male ICR mice for 4 weeks significantly interfered with the proliferation, differentiation and migration of neurons in the dentate gyrus of the mouse hippocampus, but did not induce cell death^[5]. Scopolamine (25µg/kg) treated by intraperitoneal injection in adult SD rats rapidly increased mammalian target of rapamycin complex 1 (mTORC1) signaling in prefrontal cortex (PFC) neurons and increased the number of spinal synapses in PFC neurons^[6].

References:

- [1] Bubser M, Byun N, Wood M R, et al. Muscarinic receptor pharmacology and circuitry for the modulation of cognition[J]. Muscarinic receptors, 2012: 121-166.
- [2] WINK M. Universität Heidelberg, Institut für Pharmazeutische Biologie, Im Neuenheimer Feld 364, D-69120 Heidelberg, Germany[J]. Bioactive Natural Products (Part B): V21, 2000, 21: 3.
- [3] Coluzzi F, Rocco A, Mandatori I, et al. Non-analgesic effects of opioids: opioid-induced nausea and vomiting: mechanisms and strategies for their limitation[J]. Current Pharmaceutical Design, 2012, 18(37): 6043-6052.
- [4] Chen W N, Yeong K Y. Scopolamine, a toxin-induced experimental model, used for research in Alzheimer's disease[J]. CNS & Neurological Disorders-Drug Targets (Formerly Current Drug Targets-CNS & Neurological Disorders), 2020, 19(2): 85-93.
- [5] Yan B C, Park J H, Chen B H, et al. Long-term administration of scopolamine interferes with nerve cell proliferation, differentiation and migration in adult mouse hippocampal dentate gyrus, but it does not induce cell death[J]. Neural Regeneration Research, 2014, 9(19): 1731-1739.
- [6] Voleti B, Navarria A, Liu R J, et al. Scopolamine rapidly increases mammalian target of rapamycin complex 1 signaling, synaptogenesis, and antidepressant behavioral responses[J]. Biological psychiatry, 2013, 74(10): 742-749.

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