

Product Data Sheet

Product Name: Ondansetron

Cat. No.: GC16142

Chemical Properties

Cas. No. 99614-02-5

Chemical Name 9-methyl-3-[(2-methylimidazol-1-yl)methyl]-2,3-dihydro-1H-carbazol-4-one

SMILES CC1=NC=CN1CC2CCC3=C(C2=O)C4=CC=CC=C4N3C

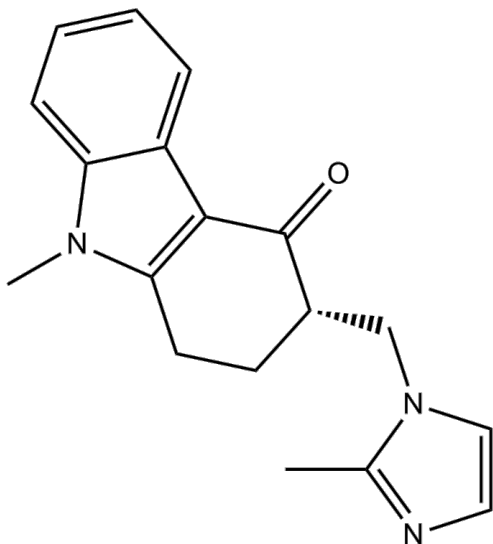
Formula $C_{18}H_{19}N_3O$ M.Wt 293.36

Solubility $\geq 7.3\text{mg/mL}$ in DMSO Storage Store at RT, protect from light

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

Cell experiment [1]:

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Cell lines	REH cells
Preparation Method	REH cells were cultured in RPMI-1640 medium supplemented with 100µg/ml streptomycin, 100µg/ml penicillin, and 10% fetal bovine serum, at 37°C in an incubator with 5% CO ₂ . REH cells in the logarithmic growth phase were cultured in 24-well culture plates at cell concentrations of 2×10 ⁴ cells/ml (1ml/well) in RPMI-1640 Medium. After 24h, cells were treated with different concentrations of Ondansetron (0, 10, 20, 30, 40, and 50µM) for 72h and cell viability was measured.
Reaction Conditions	0, 10, 20, 30, 40, and 50µM; 72h
Applications	Ondansetron reduced cell viability in REH cells in a dose-dependent manner.

Animal experiment [2]:

Animal models	Male Wistar rats
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Preparation Method	Male Wistar rats (250±20g; 12-week-old) were housed in groups of 6, under controlled temperature (23±1°C), relative humidity (55±10%), and lighting conditions (12/12 hours light/dark) and fed standard pelleted chow and water ad libitum. Rats were randomly divided into the following groups of 6 rats in each: (I) TNBS-control group: 2 hours subsequent to induction of colitis, normal saline was administered intraperitoneally (i.p.); (II) normal group: rectal cannulation proceeded without induction of colitis, receiving normal saline (0.25ml/rat) in lieu of TNBS; (III) Dexamethasone group: 2 hours subsequent to induction of colitis, dexamethasone (1mg/kg) was administered i.p.; (IV) Ondansetron group: 2 hours subsequent to induction of colitis, Ondansetron (2mg/kg; i.p.) was given, and continued daily for six days. Rats were sacrificed by means of ether inhalation on day 6. The abdomen was opened and the colon was then examined.
Dosage form	2mg/kg/day; 6 days; i.p.
Applications	Ondansetron treatment reduced colonic damage, neutrophil infiltration and colonic levels of pro-inflammatory cytokines in the TNBS model of rat colitis.
References: [1] Prada J, Shalapour S, Pfau M, et al. Antiproliferative effect of the serotonin receptor antagonist ondansetron in the acute lymphoblastic leukemia cell line REH[J]. Acta Oncologica, 2011, 50(4): 591-592. [2] Motavallian-Naeini A, Minaiyan M, Rabbani M, et al. Anti-inflammatory effect of ondansetron through 5-HT ₃ receptors on TNBS-induced colitis in rat[J]. EXCLI journal, 2012, 11: 30.	

Background

Ondansetron, a carbazole derivative, is a competitive and selective antagonist of serotonin 5-HT₃

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receptors with an IC_{50} value of 103pM^[1]. Ondansetron inhibits the mobilization of intracellular Ca^{2+} , the production of thromboxane B₂, and the release of ATP by weakening the IP₃ signaling pathway and the MAPK (p38 and ERK2) pathway, which prevents platelet aggregation^[2]. Ondansetron has been widely used as an antiemetic for cancer treatment-induced and anesthesia-related nausea and vomiting^[3].

In vitro, Ondansetron incubation (1μM) for 4 hours significantly reduced the 1μg/ml lipopolysaccharide (LPS)-stimulated production of inflammatory factors (IL-6, IL-1β, TNF-α) and the chemokine receptor CXCR4 in rat neutrophils^[4]. Treatment with 10μM Ondansetron for 3 minutes reduced the activity of the excitatory amino acid transporter 3 (EAAT3) expressed in *Xenopus* oocytes^[5]. Treatment with 10μM Ondansetron for 24 hours increased the secretion of apolipoprotein E (apoE) in mouse astrocytes and elevated the levels of ABCA1 mRNA and protein^[6].

In vivo, Ondansetron treatment via intraperitoneal injection at a dose of 1.5mg/kg/day for 6 days increased the survival time of mice infected with Enterovirus 71 and reduced the viral load in various tissues^[7]. Daily intraperitoneal injection of Ondansetron (2mg/kg) for 6 days alleviated the trinitrobenzene sulfonic acid (TNBS)-induced colitis in rats and reduced the levels of inflammatory cytokines in the colon^[8]. Intraperitoneal injection of Ondansetron (1mg/kg/day) for 5 days improved the cognitive function of epileptic rats, attenuated hippocampal impairment, stabilized the synaptic cytoskeleton structure of the hippocampus, and regulated plasticity^[9].

References:

- [1] Brown A M, Hope A G, Lambert J J, et al. Ion permeation and conduction in a human recombinant 5-HT₃ receptor subunit (h5-HT_{3A})[J]. The Journal of Physiology, 1998, 507(Pt 3): 653.
- [2] Liu F C, Liou J T, Liao H R, et al. The anti-aggregation effects of ondansetron on platelets involve IP₃ signaling and MAP kinase pathway, but not 5-HT₃-dependent pathway[J]. Thrombosis Research, 2012, 130(3): e84-e94.
- [3] Ye J H, Ponnudurai R, Schaefer R. Ondansetron: a selective 5-HT₃ receptor antagonist and its applications in CNS-related disorders[J]. CNS drug reviews, 2001, 7(2): 199-213.
- [4] Tao L, Zhang Z, Li C, et al. The therapeutic targets and signaling mechanisms of ondansetron in

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the treatment of critical illness in the ICU[J]. *Frontiers in Pharmacology*, 2024, 15: 1443169.

[5] Hur W, Lee M K, Park H P, et al. Ondansetron attenuates the activity of excitatory amino acid transporter type 3 expressed in *Xenopus* oocytes[J]. *European Journal of Pharmacology*, 2014, 733: 7-12.

[6] Shinohara M, Shinohara M, Zhao J, et al. 5-HT₃ antagonist ondansetron increases apoE secretion by modulating the LXR-ABCA1 pathway[J]. *International journal of molecular sciences*, 2019, 20(6): 1488.

[7] Li Z, Rui J, Li J, et al. Ondansetron exhibits potent antiviral activity against enterovirus 71 infection in vitro and in vivo[J]. *Virus Research*, 2026: 199771.

[8] Motavallian-Naeini A, Minaian M, Rabbani M, et al. Anti-inflammatory effect of ondansetron through 5-HT₃ receptors on TNBS-induced colitis in rat[J]. *EXCLI journal*, 2012, 11: 30.

[9] Zhang Y, Sun Y, Gao J, et al. Ondansetron reduces seizures and improves cognitive impairment in a rat model of temporal lobe epilepsy[J]. *IBRO Neuroscience Reports*, 2025.

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