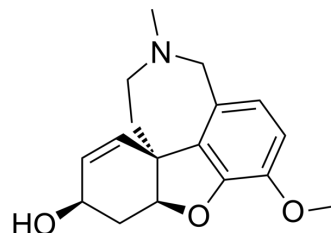


## Galanthamine

Cat. No.:	HY-76299		
CAS No.:	357-70-0		
Molecular Formula:	C <sub>17</sub> H <sub>21</sub> NO <sub>3</sub>		
Molecular Weight:	287.35		
Target:	Cholinesterase (ChE); Apoptosis		
Pathway:	Neuronal Signaling; Apoptosis		
Storage:	Powder	-20°C	3 years
		4°C	2 years
	In solvent	-80°C	6 months
		-20°C	1 month



### SOLVENT & SOLUBILITY

#### In Vitro

DMSO : ≥ 59 mg/mL (205.32 mM)  
 1M HCl : 50 mg/mL (174.00 mM; ultrasonic and adjust pH to 1 with HCl)  
 \* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Solvent Concentration	Mass		
		1 mg	5 mg	10 mg
	1 mM	3.4801 mL	17.4004 mL	34.8008 mL
	5 mM	0.6960 mL	3.4801 mL	6.9602 mL
	10 mM	0.3480 mL	1.7400 mL	3.4801 mL

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

#### In Vivo

- Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline  
 Solubility: ≥ 2.5 mg/mL (8.70 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)  
 Solubility: ≥ 2.5 mg/mL (8.70 mM); Clear solution
- Add each solvent one by one: 10% DMSO >> 90% corn oil  
 Solubility: ≥ 2.5 mg/mL (8.70 mM); Clear solution

### BIOLOGICAL ACTIVITY

#### Description

Galanthamine is a potent acetylcholinesterase (AChE) inhibitor with an IC<sub>50</sub> of 500 nM.

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

AChE

#### In Vitro

Galanthamine inhibits AChE and BChE with IC<sub>50</sub> of 0.5 and 8.5 μM<sup>[1]</sup>. Galanthamine acts as a positive allosteric modulator

(PAM) of human  $\alpha 4\beta 2$  AChRs expressed in permanently transfected HEK 293 cells. Galanthamine increases the response of ( $\alpha 4\beta 2$ ) $\alpha 5$  AChRs to 1  $\mu$ M ACh by up to 220% with very low concentration ( $EC_{50}=0.25$  nM). Only small potentiation (20%) of either  $\alpha 4\beta 2$  or ( $\alpha 4\beta 2$ ) $\beta 3$  AChRs is detected using FLEXstation assays. Galanthamine at concentrations of 1  $\mu$ M and above inhibits all three AChR subtypes<sup>[2]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

#### In Vivo

Acute administration of Galantamine (0.3-3 mg/kg, i.p.) increases IGF2 mRNA levels in the hippocampus, but not in the prefrontal cortex, in time- and dose-dependent manner. Galantamine (3 mg/kg, i.p.) causes a transient increase in fibroblast growth factor 2 mRNA levels and a decrease in brain-derived neurotrophic factor mRNA levels in the hippocampus, while it does not affect the mRNA levels of other neurotrophic/growth factors. The Galantamine-induced increase in the hippocampal IGF2 mRNA levels is blocked by Mecamylamine, a nonselective nicotinic acetylcholine (ACh) receptor (nAChR) antagonist, and Methyllycaconitine, a selective  $\alpha 7$  nAChR antagonist, but not by Telenzepine, a preferential M1 muscarinic ACh receptor antagonist. Moreover, the selective  $\alpha 7$  nAChR agonist PHA-543613 increases the IGF2 mRNA levels, while Donepezil, an acetylcholinesterase inhibitor, does not. Galantamine also increases hippocampal IGF2 protein, which is blocked by Methyllycaconitine<sup>[2]</sup>.

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## PROTOCOL

#### Animal Administration <sup>[2]</sup>

Mice<sup>[2]</sup>

Eight-week-old male ddY mice are housed in cages (24 cm $\times$ 17 cm $\times$ 12 cm) in each group of five to six animals under controlled environmental conditions (22 $\pm$ 1 $^{\circ}$ C; 12:12-h light-dark cycle, lights on at 0800 hours, food and water ad libitum) for 1 week before use in the experiments. 453 mice are used in total and in single use for each purpose. The following drugs are used: mecamlamine, methyllycaconitine, oxotremorine, and telenzepine, and Galantamine, Donepezil, and PHA-543613. All drugs are dissolved in saline (0.9 % solution of NaCl). Drugs are administered in a volume of 10 mL/kg intraperitoneally (i.p.) (Galantamine, Donepezil, Mecamylamine, Methyllycaconitine, Oxotremorine) or subcutaneously (s.c.) (PHA-543613, Telenzepine).

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

## CUSTOMER VALIDATION

- Free Radic Biol Med. 2019 Dec;145:20-32.
- Antioxidants (Basel). 2022, 11(7), 1228.
- Antioxidants (Basel). 2022 Feb 14;11(2):385.
- Biochem Pharmacol. 2020 Oct;180:114139.
- Microorganisms. 2022, 10(10), 2089.

See more customer validations on [www.MedChemExpress.com](http://www.MedChemExpress.com)

## REFERENCES

- [1]. Melanie-Jayne R. Howes, et al. Acetylcholinesterase inhibitors of natural origin. International Journal of Research in Pharmaceutical and Biomedical Sciences 3(SI 1):67-86.
- [2]. Kuryatov A, et al. Roles of accessory subunits in alpha4beta2(\*) nicotinic receptors. Mol Pharmacol. 2008 Jul;74(1):132-43.
- [3]. Kita Y, et al. Galantamine increases hippocampal insulin-like growth factor 2 expression via  $\alpha 7$  nicotinic acetylcholine receptors in mice. Psychopharmacology (Berl).

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: [tech@MedChemExpress.com](mailto:tech@MedChemExpress.com)

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA