Ambenonium chloride

Cat. No.: HY-100919

CAS No.: 115-79-7

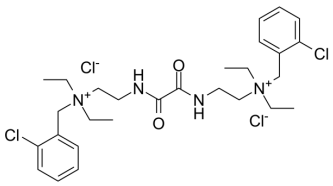
Molecular Formula: $C_{28}H_{42}Cl_4N_4O_2$

Molecular Weight: 608.47

Target: Cholinesterase (ChE)

Pathway: Neuronal Signaling

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Ambenonium (WIN 8077) chloride is an orally active and reversible inhibitor of Acetyicholinesterase (AChE) with high affinity. Ambenonium chloride inhibits human AChE with an IC_{50} value of 0.7 nM (hAChE)[1][2].

IC_{50} & Target	Acetylcholinesterase 0.7 nM (IC_{50})	Acetylcholinesterase 0.12 nM (Ki)	Butyrylcholinesterase 7 μM (IC_{50})

In Vitro	Ambenonium chloride inhibits Acetyicholinesterase (AChE) in a rapidly reversible method, and shows strong inhibition with inhibition constant K_i of 0.12 nM against hAChE[1]. Ambenonium chloride shows inhibitory effect towards BChE with an IC_{50} value of 7 μM (hBChE)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Ambenonium chloride (6 mg/kg; p.o.; daily; 30-60 d) results an adverse effect on neuromuscular transmission in long-term administration, and induces hypersensitivity to stimulation in myasthenia gravis mice modle[3]. Ambenonium chloride (6 mg/kg; p.o.; daily; 14 d) decreases the number of AChR in motorend-plates[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Female Sprague Dawley rats (weight 250 g) with myasthenia gravis[3]
Dosage:	6 mg/kg
Administration:	Oral gavage; daily; 14, 30, 60, 90, 360 days (Stop administration 24 h in advance)
Result:	Resulted general activity decreasing and hypersensity to stimulation in rats during day 30-60, but these behaviors disappeared on day 90. Induced degeneration and simplification of the postsynaptic folds, widening of the synaptic clefts, increased number of the postsynaptic vesicles, and reduction in the number of the AChR in the postsynaptic membrane on days 360.

REFERENCES

[1]. Hodge AS, et al. Ambenonium is a rapidly reversible noncovalent inhibitor of acetylcholinesterase, with one of the highest known affinities. Mol Pharmacol. 1992 May. 41(5):937-42.

[2]. Komloova M, et al. Preparation, in vitro screening and molecular modelling of symmetrical bis-quinolinium cholinesterase inhibitors--implications for early myasthenia gravis treatment. Bioorg Med Chem Lett. 2011 Apr 15. 21(8):2505-9.

[3]. Hazama R, et al. Effects of long-term administration of ambenonium chloride on motor end-plate fine structure and acetylcholine receptor in rat. J Neurol Sci. 1981 Jul. 51(1):69-79.

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