

Nicotinic Cholinergic Modulation: Galantamine as a Prototype

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ABSTRACT

Nicotinic acetylcholine receptor pharmacology is becoming increasingly important in the clinical symptomatology of neurodegenerative diseases in general and of cognitive and behavioral aspects in particular. In addition, the concept of allosteric modulation of nicotinic acetylcholine receptors has become a research focus for the development of therapeutic agents. In this review the scientific evidence for changes in nicotinic acetylcholine receptors in Alzheimer's disease is described. Within this context, the pharmacology of galantamine, a recently approved drug for cognition enhancement in Alzheimer's disease, is reviewed along with preclinical studies of its efficacy on learning and memory. Galantamine modestly inhibits acetylcholinesterase and has an allosteric potentiating ligand effect at nicotinic receptors. The data collected in this review suggest that the unique combination of acetylcholinesterase inhibition and nicotinic acetylcholine receptor modulation offers potentially significant benefits over acetylcholinesterase inhibition alone in facilitating acetylcholine neurotransmission.