

Abstract

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Title of Thesis: **Preparation of modulators of cholinesterases and N-methyl-D-aspartate receptors**

Alzheimer's disease (AD) is a complex, multifactorial disorder with a complicated pathophysiology. The current treatments focus on only one of the various subpathologies associated with AD and have not yet been successful in finding a disease-modifying treatment. The purpose of this thesis was to develop new compounds, so called dual modulators, that would aim on inhibition of cholinesterases (ChEs) and *N*-methyl-d-aspartate (NMDA) receptors and could be potentially used in the treatment of AD. Overall 18 products were synthesized. These compounds consisted of biphenyl-based structures connected to *N*-benzylethyl fragment *via* alkyl chain of different length (2–6 methylene units). All final products were evaluated for their activity against acetylcholinesterase, butyrylcholinesterase and NMDA receptors. Additionally, their antiproliferative activity as well as ability to cross the blood-brain barrier by passive diffusion were assessed.

Key words: Alzheimer's disease, neurodegeneration, cholinesterases, *N*-methyl-d-aspartate receptor, multi-target drugs, biphenyl compounds