

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology & Toxicology

Student: Jana Kucková

Supervisor: PharmDr. Marie Vopršalová, CSc.

Title of diploma thesis: Testing antioxidant properties of selected
acetylcholinesterase inhibitors

Very widespread Alzheimer's disease is typical by a complex pathology. Its causality is not clearly understood. There is increasing discussion due to the negative impact of free radicals on this disease formation. There are testing new substances that have also antioxidant properties, in addition to their classical effects.

The aim of this diploma thesis is spectrophotometric testing of antioxidant properties of selected acetylcholinesterase inhibitors. It is based on DPPH test where the presence of antioxidants with antiradical activity causes the reduction of the color stable 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical to a colorless molecule. The principle of the method is the measurement of decrease in absorbance (decolorization) of selected substances that are directly proportional to the antioxidant (antiradical) efficacy of the analyzed inhibitors. It focuses on twelve samples, Phenothiazine, which is the leader structure of new inhibitors synthesis, and two standards. Antioxidant activity is expressed as the effective concentration of the antioxidant which is able to reduce DPPH to 50 % (EC₅₀).

Test compounds showed low antioxidant activity at high concentrations. In compliance with standards that have antioxidant activity above 80%, most substances are up to more than half active less. The best of all was substance 1 with antioxidant activity 54.07% and worst substance 9 with antioxidant activity 6.54%

In any case, it is still necessary to examine the properties of the new substances to improve the current therapeutic options in the treatment of Alzheimer's disease.

Key words : Alzheimer's disease, acetylcholinesterase inhibitors, DPPH test, antioxidant