

## **Abstract**

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Title of diploma Thesis: **Enzyme assays with bound cholinesterase to characterize drugs for Alzheimer's disease.**

Alzheimer's disease is a progressive and irreversible neurodegenerative brain disease, which is globally connected with the most common cause of dementia.

The pathophysiology of the disease is not yet fully understood. Treatment of this disease is for the time being only symptomatic and is represented by inhibitors of the acetylcholinesterase. The acetylcholinesterase inhibitors are at present practically the only active substances that mitigate the effects of the Alzheimer's disease.

In this thesis, we have investigated the ability to inhibit already known AChE inhibitors (rivastigmine, donepezil, galantamine, tacrine), that have been tested for their activity. We tested the effectiveness of the inhibitors with loose acetylcholinesterase (via the reference method) and subsequently with the immobilised acetylcholinesterase in clear gelatine, but also with added netted agents. (glutaraldehyd, EDC).

For the purposes of our experimental research we have utilized the spectrophotometric determination of activities of cholinesterases, with the aid of well known Ellman's method. The absorbance of the solution with AChE has been measured with the wavelength of 412 nm. The index IC<sub>50</sub> has been established to assess the efficiency of the inhibitors.

With our testing, we tried to advert the benefits of the immobilisation of AChE into gelatine. The goal of our research has been to prepare the enzyme in an immobilised format, which, if necessary, could be used repeatedly, for example: after washing.

Key terms: acetylcholinesterase, the inhibitors of acetylcholinesterase, Ellman's method, Alzheimer's disease, the immobilisation of acetylcholinesterase.