

The number of elderly people is increasing, and so is the proportion of people suffering from neurodegenerative diseases. It is a huge social and economic problem. Hence, the prevention and/or slowing down of neurodegeneration processes is currently one of the most important challenges the modern neuroscience is facing. Studies show that the polyphenolic compounds which are synthesized by some plants, have the beneficial, pleiotropic effect in this aspect. One of such examples are stilbene derivatives (eg. piceatannol), which, in addition to strong antioxidant properties, inhibit cytokine secretion and regulate signaling pathways involved in the aging process. In addition, they exhibit strong anti-amyloidogenic properties as they convert conformers formed during amyloid peptide aggregation into non-toxic products.

In the pathogenesis of neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease, protein and peptide aggregation processes play a vital role in contributing to the formation of intracellular and extracellular protein deposits. One of the major components of these deposits is the oxidatively modified glyceraldehyde-3-phosphate dehydrogenase (GAPDH). Recent studies both *in vitro* and *in vivo* have shown that aggregated GAPDH forms accelerate/initiate amyloidogenesis of amyloid beta peptides (A β) and induce neuronal cell death.

Therefore, the purpose of this project is to answer the question whether piceatannol, a naturally occurring stilbene derivative, resveratrol metabolite counteracts and/or slows down oxidative stress-induced GAPDH aggregation, and whether under oxidative stress conditions it can prevent the translocation of GAPDH from the cytoplasm to the cell nucleus, what in consequences counteracts apoptosis in hippocampal cells.

This project, in its first stage, has primarily a cognitive aspect. Identification of a compound that protects GAPDH from aggregation and counteracts the unfavorable translocation of enzyme to the nucleus will be the basis for further research aimed at developing the new strategies of treatment and prevention of age-related diseases.