



Fund “Nauka” Project № 21015 Resume – Competition-Based Session 2021:

“Molecular mechanisms of action of Cytodeox: new data in support of neuroprotective and antioxidant effects”

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The presented project is multidisciplinary, clinically oriented and will be implemented in collaboration between two faculties of the Medical University - Varna: the Faculty of Pharmacy and the Faculty of Medicine.

The aim of the project is to study the neuroprotective and antioxidant effects of the dietary supplement Cytodeox in the recovery process of patients with acute ischemic brain stroke and as a prophylactic agent in support of antioxidant and cognitive status in healthy volunteers.

Cytodeox is a food supplement containing citicoline (CDF-choline) in combination with standardized extracts of rose hips, chokeberry and green tea.

The selection of the plant extracts was based on the long-term scientific experience of the Department of Biochemistry, Molecular Medicine and Nutrigenomics in studies of medicinal plants biological effects. The idea of the presented project is based on the scientific interest in neuroprotective and antioxidant effects of well-known active ingredients, brought together in a unique combination with clinical significance.

The methods and technologies that will be applied in the course of the project implementation are well established and successfully used in previous studies and in the diagnostics.

Expected results from the successful implementation of the project will be new data revealing the antioxidant and neuroprotective effects of Cytodeox. Specific markers for assessment of the redox status and neuronal metabolism will be measured.

All members of the scientific team have the required qualification and experience for successful completion of the scientific program. A doctoral student and a student in medicine are also members of the team. The results obtained within the project will be included in a dissertation for acquiring of a PhD.

The successful implementation of the project is expected to provide new data on the effect of Cytodeox as an adjunctive therapy in patients with acute ischemic brain stroke, by assessing the markers of neuroprotective and antioxidant effects.

Data about the effect of Cytodeox in healthy volunteers will reveal the potential of the product as a prophylactic agent in support of antioxidant and cognitive status.

The change in the concentration of glutathione, total thiols, malone dialdehyde and total antioxidant capacity of plasma will be monitored as markers for assessing the antioxidant effect of the supplement following a six-month intervention. Levels of gene expression of dopamine receptors and sirtuin 1 in peripheral blood mononuclear cells will be monitored as markers for assessing neuroprotective effects. Chromatographic measurements of cardiolipin and arachidonic acid levels will also be performed.

The obtained results demonstrated that six-month Cytodeox supplementation improved lipid profile parameters, reduced lipid peroxidation markers, and positively influenced redox homeostasis in healthy volunteers. In patients with ischemic stroke, activation of endogenous cytoprotective pathways associated with increased SIRT1 expression was observed, together with evidence supporting the role of arachidonic acid metabolism and oxidative stress in disease pathogenesis.

The developed analytical method for arachidonic acid quantification provides a reliable and applicable tool for future clinical and experimental investigations. The project contributes to the advancement of molecular medicine, nutrigenomics, and innovative preventive and supportive therapeutic approaches in neurological and cardiovascular diseases.