

THE EFFECT OF SELECTED ANTIOXIDANTS ON THE LEVEL OF APOPTOSIS AND THE CONTENT OF ATP IN CELLS TREATED WITH ENVIRONMENTAL TOXINS

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Apoptosis is a physiological death of the cell and occurs throughout the whole development and lifespan of the organism deciding about balance between proliferation and mortality of cells. The key role in this process is played by mitochondria that supports cell with energetic reserves. The disturbance of mitochondria potential and depletion of ATP level may directly affect on cell death. Numerous environmental agents induce formation of reactive oxygen species, change morphology and enzymatic activities of the cell and also cause its apoptosis

The examples of such substances are environmental toxins formed in the result of chemical processing (allyl alcohol) and also be the products of metabolism of living organisms (microcystin-LR). Allyl alcohol is an unsaturated primary alcohol used to produce derivatives for the industrial manufacturing of perfumes, flavorings and pharmaceutical agents. It is metabolized by cytosolic alcohol dehydrogenase to the toxic acrolein). Microcystin-LR is a cyclic, toxic peptide, produced by at least by three genera of cyanobacteria including *Microcystis aeruginosa*, *Anabena sp.*, *Nodularia sp.* and *Oscillatoria*. This toxic effect may be abolished by the action of antioxidants.

In this study the protective effect of antioxidants like vitamin C, trolox and melatonin on the level of apoptosis and the content of ATP in cells HaCaT i Hep3B treated with microcystin-LR (MC-LR) and allyl alcohol (A-A) was evaluated. MC-LR was used at concentrations of 380 nM and 480 nM for HaCaT cells and Hep 3B cells, respectively while allyl alcohol at the concentration of 0.5 mM for both cell lines. Antioxidants were used in the concentration range of 50–500 μ M. The percent of apoptosis was determined by the use of fluorescent microscope with Hoechst 33258 and propidium iodide. The content of ATP was measured using luminometric method with luciferin and luciferase.

The study revealed protective effects of antioxidants in both cell lines indicating that oxidative stress is involved in the mechanism of apoptosis induced by both environmental toxins.