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In vitro effects of new caffeine derivatives on isolated rat synaptosomes

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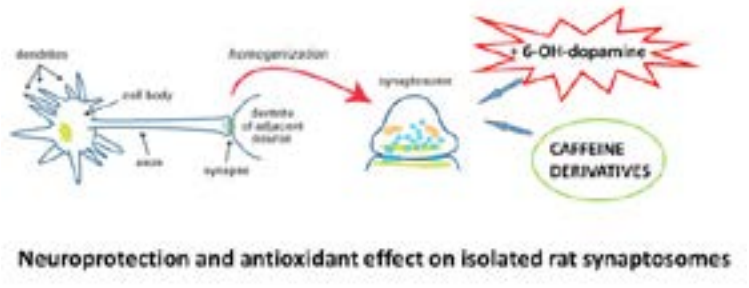
Oxidative stress is connected with the pathogenesis of many diseases like neurodegenerative disorders (Parkinson`s and Alzheimer`s disease), atherosclerosis, diabetes and cancer. Oxidative stress leads to disabilities, because free radicals damage a number of structures such as lipids, proteins and DNA. Oxidative stress plays an important role in physiological adaptation and regulation of the signaling cellular transduction as well. The treatment of isolated rat brain synaptosomes with 6-OH-dopamine (6-OHDA) is a convenient *in vitro* sub-cellular system for the investigation of processes, which play role in the neurodegenerative disease, including Parkinson's and Alzheimer's diseases. The mechanism of 6-OH-dopamine neurotoxicity includes the formation of ROS and reactive metabolites, as a result of its metabolism in mitochondria of the nerve cells. In this study, we investigate the effects of 6 newly synthesized caffeine derivatives on isolated rat synaptosomes. The main parameters: Synaptosomal viability and GSH depletion, determined in the model of 6-hydroxydopamine (6-OHDA)-induced toxicity (a model of oxidative stress), were investigated. In conditions of 6-OH-dopamine-induced oxidative stress (at concentration 150 μM) on isolated rat synaposomes, all 6 compounds (at concentration 100 μM) revealed statistically significant neuroprotective effect by preservation of synaptosomal viability, measured by MTT-test and GSH deletion. The compound 4d showed statistically significant higher neuroprotective and antioxidant activity in this model, compared to the other 5 compounds.



Neuroprotection and antioxidant effect on isolated rat synaptosomes

Biography

Borislav Angelov is a 4th year Pharmacy Student in Medical University of Sofia. Although he graduated in Language High School, he has always been interested in Medical Science, especially Pharmacology and Toxicology. He was accepted into University with impressive results. The medical school offers him great opportunities to develop his interests. During the last few years, he has taken part in various activities related to pharmacy and he has also received certificates from different scientific symposiums and seminars. His experience in the field of pharmacy increases with his new work and research in Neuropharmacology.

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