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## ***In vitro* effects of newly derivatives of caffeine-8- $\alpha$ -methyl thioglycolic acid on neuroblastoma cell line SH-SY5Y**

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Certain asymmetrically substituted xanthines (propentofylline) are used to treat CNS disorders such as dementia in Alzheimer's disease. In the present study, we investigated the toxicity of 14 newly synthesized derivatives of caffeine-8- $\alpha$ -methyl thioglycolic acid (Ja-0 to Ja-13) on human neuroblastoma derived cells *in vitro*. The protective effects of the less cytotoxic compounds were also studied in 6-hydroxydopamine (6-OHDA) induced oxidative stress in neuroblastoma SH-SY5Y cells. To evaluate the effects of the treatment, SH-SY5Y cells viability (measured by MTT-test) was used as markers of oxidative damage. SH-SY5Y cells are often used for studying the processes of neurotoxicity and neurodegenerative diseases, such as Parkinson's. The cells possess the ability to synthesize dopamine and express dopamine transporter (DAT), a protein expressed only in dopaminergic neurons within the central nervous system. Administered alone, all compounds revealed statistically significant toxic effects, compared to the control (untreated cells). Three of the compounds, Ja-6, Ja-7 and Ja-9, had lower neurotoxic effects: Ja-6 decreased cell viability by 10 %, Ja-7 –by 15% and Ja-9–by 14% (vs. control). All other compounds showed higher cytotoxicity towards SH-SY5Y, decreasing cell viability in the range of 18% to 29%. In a model of 6-OHDA-induced oxidative stress on SH-SY5Y only Ja-7 and Ja-9 (100  $\mu$ M) revealed statistically significant neuroprotective effects, shown by preservation of the cell viability. In particular, Ja-9 preserved the cell viability by 150% and Ja-7– by 91%, compared to 6-OHDA. Ja-6 had no statistically significant protective effect, compared to 6-OHDA.

### **Biography**

Alexandra Kasabova received his Master's degree in Faculty of Pharmacy at Medical University–Sofia, in November 2014. She is a PhD student at the Department of Pharmacology, Pharmacotherapy and Toxicology, Medical University-Sofia from November 2015 until now. She has interests in the field of neuropharmacology and has experimental works on neuronal cell line SH-SY5Y and synaptosomal fraction in normal state and in condition of 6-OHDA–induced oxidative stress.

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