

OPINION



by Prof. Svetlozara Petkova, IEMPAM - BAS,  
appointed by Order No. RD-15-54/ 03.06.2022 of the Director of IEMPAM-BAN

Regarding: defense of doctoral student Inna Aleksandrovna Sulikovska, on the topic: "Optimization and adaptation of the method for determining phototoxicity in vitro 3T3 NRU phototoxicity test, to LED - solar simulator Helios-iO", for the award of Educational and Scientific Degree "Doctor", in the scientific specialty "Biochemistry", code 01.06.10

Inna Aleksandrovna Sulikovska holds a Master's degree in Biomedical Engineering from the National Technical University of Ukraine. She is a free doctoral student at the Institute of Experimental Morphology, Pathology and Anthropology with a Museum (IEMPAM) - BAS, with scientific supervisor Prof. Ivan Iliev.

The presented dissertation work is a comprehensive and original scientific study based on the processes resulting from the photocytotoxicity of photoactive compounds. They are part of the composition of medicines, cosmetics and natural products. The topic is also determined by the frequent negative impacts on human health of photochemical and biochemical processes resulting from solar radiation.

The dissertation work is well structured, contains an introduction, literature review, aim and tasks, materials and methods, results and discussion, conclusions and contributions reflecting the results obtained during the research. It consists of 147 standard pages and the obtained results are supported and illustrated by 60 figures and 16 tables. 322 literary sources were used.

The main goal of the dissertation work: optimization and adaptation of methods for determining phototoxicity (in vitro 3T3 NRU phototoxicity test), to LED - solar simulator (Helios-iO, model LE-9ND55-H - 5500K), for faster and qualitative research on the phototoxicity of substances of synthetic and natural origin with potential antitumor activity is clearly and accurately formulated and carried out through specific tasks. A correct set of methods was applied and corresponding results with scientific and scientific-applied significance were obtained. Five conclusions and three original contributions have been formulated, from which I will highlight the following:

Physical characteristics are determined: light spectrum, power and power distribution density of the tested solar simulator similar to natural sunlight. It is concluded that this light source is therefore suitable for performing phototoxicity tests.

The biological experiments carried out: in vitro phototoxicity test, light and fluorescence microscopy, clearly show the presence of a phototoxic effect in the cells treated with Acridine orange and Radachlorin. This proves that the solar simulator is effective and suitable for performing phototoxicity tests.

Phototoxicity tests on substances of natural and synthetic origin demonstrate their photosafety and prospect for application in pharmaceutical and cosmetic products.


The Helios-iO solar simulator has been successfully used in safety testing of natural products and synthetic compounds (4 plant extracts and 18 synthetic substances). No phototoxic effect was observed in any of the tested samples. This allows safe use of the tested substances in the field of cosmetics and pharmacy.

Screening for antitumor activity was performed and several substances with high selectivity were identified, indicating potential for application in oncology therapy with a low level of side effects.

Ina Sulikovska has also presented a report on the fulfillment of the minimum requirements of IEMPAM for the acquisition of the ONS "doctor", as well as two publications reflecting the work performed and the results obtained.

In conclusion, I accept the presented dissertation work as contributing and original. With conviction, I give a positive opinion and vote "YES" for awarding the educational and scientific degree "Doctor" to Inna Aleksandrovna Sulikovska in Professional direction 4.3. "Biological Sciences", Science major "Biochemistry".

14.06.2022

  
Prof. Svetlozara Petkova