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EXPERT OPINION

From: Assoc. Prof. Vanya Mantareva, DSc, Institute of Organic Chemistry with Centre of Phytochemistry, Bulgarian Academy of Sciences, according to № RD-15-54/ 03.06.2022 of the Director of IEMPAM – BAS.

About: the evaluation of the PhD thesis of doctor student **Inna Aleksandrovna Sulikovska**, titled: „*Optimization and adaptation of the method for determination of phototoxicity in vitro 3T3 NRU phototoxicity test, towards LED – solar simulator Helios-iO*“, for the educational and scientific degree “PhD” for scientific specialty „Biochemistry“ with code 01.06.10

The thesis presents an original scientific investigation about the actual problems related to the quality of human life and the requirements for the well-being and life-support. The main point of this study concerns the phenomenon and side effects which are resulted from the photocytotoxicity of the photoactive compounds as part of the formulas mainly of drugs, cosmetics, etc., but also including the photosensitizers with the healing photo cytotoxic action. The research and development in this scientific topic have been accelerated because of the increasing numbers of the undesirable side effects on human health, which are provoked by the photochemical and biochemical processes initiated by solar light exposure. The photosensitive compounds as the ingredients of products which are essential for human being and very often they have the absorbance within the solar radiation spectrum. This situation leads to their interaction with environmental light in a harmful way to the human being and need to be kept under control.

The thesis contains 147 pages, all of them are well-ordered and carefully written, with very good quality of the graphical material for visualization of results. The thesis has a standard structure and order of chapters typical for a PhD thesis. It starts with Introduction written on 38 pages which shows a good knowledge of the scientific problems included and the data beyond the specific tasks of the thesis. The aims are well formulated in one paragraph which shows the high level of the understanding of the problems as well as the tasks are described in four points with precision. The experimental part “Materials and methods” consists of well-defined parts such as the light source, the used cell lines, the preparation of culture media, and the studied photoactive compounds divided

as natural and synthetic substances. The author described the studied natural compounds with their *Latin names* according to the nomenclature and with the popular names so that to be readable for the non-specialist researchers. In this chapter, the author includes also the names of the scientists who supported this research by supplying the photoactive compounds. This suggests the personal characteristics of the PhD student to the experienced colleagues with contribution to the present work. This allowed a wide range of chemical structures to be studied and the developed method for safety of the photosensitive compounds at solar spectrum of irradiation to have characteristic of non-specific array for study. The applied variety of methods and scientific approaches belong to biochemistry, molecular biology and the techniques of cellular biology as well as the up-to-date apparatus which settle in good demand the realization of the aim of the thesis. The chapter "Results and discussion" is 44 pages and the obtained results are well described and visualized with spectra, graphs, tables and images in a scientific manner to the used experimental approaches. The critical discussion is presented accordingly and it is in good agreement with the results and towards the literatures (Refs. 322). The scientific achievements are summarized in five points of conclusions. However, two of them (No. 4 and 5) can be described more detailed adding the characteristics of compounds' activity and selectivity for each of the excessive numbers of photosensitive compounds. The contributions are formulated in three paragraphs and the 3th one is more an additional contribution to the main goal of this study. Two publications are published as a result of this thesis and the PhD applicant is a first and leading author in one of both. The results are presented in four scientific meetings with foreign participation presented by the PhD student of this work. Considering the huge experimental work which is included in this thesis, I do believe that some additional papers will be published in advance.

My personal impression about the PhD applicant are limited. However, I have been working last years with her supervisor Assoc. Professor Ivan Iliev having a good collaboration record with high impact paper and participation in several scientific meetings. The presented PhD thesis shows the attention to the details, the wide spectrum of scientific interests as a good basis to develop the scientist. The only recommendation to the applicant and her supervisor is to continue the study with comparison experiments with the "solar simulator" and the natural sun light for irradiation.

The summary of the thesis (Abstract) is presented in 48 pages and it is consisted of all chapters described but in short without the literatures' which covers the requirements.

As a conclusion can be said that the presented thesis is a valuable scientific effort with selected experimental work and the contributions made to the fundamental science and to the practice. In addition, the thesis presents the photosensitizers for usage in photodynamic therapy. I do believe that all the requirements of the law and the rules in the Institute IEMPAM, Bulgarian Academy of Sciences where the thesis is realized, are covered. My vote to the presented PhD thesis „*Optimization and adaptation of the method for determination of phototoxicity in vitro 3T3 NRU phototoxicity test, towards LED – solar simulator Helios-iO*“ is positive or “YES” to be given the educational and scientific degree “PhD” to the doctoral student **Inna Aleksandrovna Sulikovska**, with my recommendations to her for a scientific work in the future.

July, 10th, 2022

Signed:



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(Assoc. Prof. Vanya Mantareva, DSc)