

OPINION

by Associate Professor Dr. Anife Ismailova Ahmedova

SU "St. Kliment Ohridski" - Faculty of Chemistry and Pharmacy, member of the scientific jury according to an order of the Director of IOCCP - BAS – ПД-09-114 / 17.05.2021

Regarding the dissertation of Assoc. Prof. Dr. VANYA NIKOLOVA MANTAREVA

entitled "Phthalocyanine photosensitizers for photodynamic method in drug resistance" for obtaining the scientific degree DOCTOR OF SCIENCES in the professional field: 4.2 "Chemical Sciences", scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Substances" for the needs of the lab. "HBPE" at IOCCP -BAS

Dr. Vanya Mantareva has been an associate professor at IOCCP-BAS since March 2014 with major scientific achievements in the field of synthesis and biological activity of phthalocyanine complexes for photodynamic therapy. This opinion was prepared after a detailed review of the materials provided by the dissertation author – dissertation, abstract in Bulgarian and English, and a reference to the implementation of the minimum national requirements under Art. 2b of Law for the development of the academic staff in Bulgaria for professional field 4.2 Chemical Sciences, as well as those of IOCCP-BAS.

The DISSERTATION is written on 195 pages, of which I. Introduction - 3 pages, II. Literary review - 40 pages, III. Goals and objectives - 2 pages, IV. Results and discussion - 118 pages, V. Experimental part - 24 pages, VI. Contributions - 2 pages and VII. Appendices - 4 pages. The appendices contain a list of publications on the dissertation (21 copies), information on citations as of April 2021 (128 copies), a list of research projects (5 copies), a list of participants in scientific conferences (12 copies), and a list of dissertations for the PhD degree (1 issue). All scientific results are published in the period 2015 - 2020. The dissertation contains 63 figures, 14 tables and 25 diagrams.

THE ABSTRACT is written on 72 pages and follows the structure of the dissertation, without the literature review and the experimental part. A variant is also presented in English, according to the legal requirements. The abstract reliably reflects the main scientific results described in the dissertation and the conclusions made.

THE REFERENCE correctly reflects the scientific achievements of the dissertation included in the dissertation and fully meets the legal requirements and those of IOCCP-BAS. It is noteworthy that the included publications and the points they summarize in criterion D exceed almost 2.5 times the requirements of the IOCCP-BAS. All articles have been published in peer-reviewed international journals and one book chapter. About 29% of the articles are in Q1 journals and correspond to the high level of reported scientific results.

THE CONTRIBUTIONS are summarized in 5 points with an emphasis on basic methodologies that have been developed and applied in the described studies. 40 new

phthalocyanine complexes with different metal ions and with different type and number of substituents in the phthalocyanine ligand were obtained and studied in detail. The applicability of the new substances for photodynamic inactivation of cancer and bacterial cell cultures was evaluated.

The recommendations, I would make, concern the layout of the presentation of the results, including the way of formulation and numbering of some of the subchapters in the dissertation. The developed method for pharmacokinetic studies based on chemical extraction and measurement of fluorescence signal intensity with quantification of accumulation (Contribution number 4) I would recommend to be supported by a purely analytical atomic spectral method, which is not affected by the matrix and which would be particularly suitable for the systems under investigation due to the presence of a heavy element (metal ion) in their composition. In this sense, my main question to the dissertation author is - have additional fluorescent measurements been made in order to take into account the effects of the environment on quantitative measurements and whether the standard addition method will not be more appropriate than the standard curve method?

The recommendations and questions made do not underestimate the achieved scientific results.

IN CONCLUSION, I consider that the presented dissertation work fully meets the definitions and criteria set in the Law for the development of the academic staff in Bulgaria. All accompanying scientific achievements cover and strongly exceed the legal minimum requirements, as well as the recommended requirements of the IOCCP-BAS. There is no evidence of plagiarism.

What has been said gives me grounds to **express a positive opinion on the presented dissertation and I propose to the scientific jury to award the scientific degree "DOCTOR OF SCIENCES" to Assoc. Prof. Dr. VANIA NIKOLOVA MANTAREVA**

Sofia
04.08.2021

Signature:
/A. Ahmedova