

SCIENTIFIC OPINION



for evaluation of the documents of Assistant-Prof. Diana Ivanova Ivanova, Ph.D., a candidate in competition for "Assoc. Prof." at ICHE-BAS, specialty "Processes and devices in chemical and biochemical technology", professional direction 4.2. Chemical Sciences announced in SG no. 65 of 28.07.2023

The opinion was prepared by: Prof. Dr. Kaloyan Kirilov Petrov

The candidate Diana Ivanova Ivanova was born in 1965 in Sofia, in 1988 she completed her higher education at the Faculty of Chemistry of SU "St. Kl. Ohridski", graduating in "Chemical Physics and Theoretical Chemistry". She received the scientific and educational degree Ph.D. from VAK in 2010, defending a dissertation on the topic "Design, synthesis and antitumor in vitro action of new retinoids and other physiologically active substances".

Dr. Ivanova developed her scientific and research activities at IOCCP-BAS (1988-2002), and IBEI-BAS (2012-2015), as well as in the private sector ("Himsnab-Orbel" OOD), where she participated in the development of technologies for the production of medicinal foods. Since February 2016, he has been working at ICHEE-BAN. Separately, the candidate has specializations in molecular biology in France, in organic synthesis of retinoids in Spain and Russia, and in chemical analysis methods (HPLC and supercritical extraction) in Poland. The candidate's scientific interests are related to synthesis, study of the mechanism, and optimization of the action of biologically active substances with application in medicine. In the scientific publications presented at the competition, various sources of substances with biological activity, mainly of plant origin, were studied, the methods for their extraction were developed and optimized, as well as the conditions for increasing their antiproliferative, antioxidant, antitumor, or antibacterial activity. Thematically, these studies fall into an extremely scientifically attractive field in recent decades, related to human health and the use of natural sources to improve its quality.

In the competition for associate professor, Diana Ivanova participated with 17 scientific publications, as she separately presented 4 scientific publications on her doctoral dissertation. Regarding the minimum national requirements for an associate professor (area 4, 4.2. Chemical sciences) according to the regulations of the BAS, the distribution of the presented materials by

indicators is as follows: According to the group of indicators A - a dissertation for a "doctor" giving 50 points is presented, with a requirement of 50 points. ; according to group of indicators B – 4 scientific publications in Q1, giving 100 points if 100 points are required; by group of indicators G - 5 scientific publications in Q1, giving 125 points; 1 post in Q2 giving 20 points; 2 scientific publications in Q3, giving 30 items and 4 scientific publications in Q4, giving 48 items - a total of 223 items, with a requirement of 220 items; according to indicator D, the candidate presented 50 citations referenced in Scopus, giving 100 points, with a requirement of 60 points. The candidate fulfilled the minimum national requirements for all indicators, and according to indicators D and E, she presented materials for more points than necessary.

Regarding the fulfillment of the minimum requirements of ICHEE-BAS for an associate professor, Dr. Ivanova also presented materials exceeding what was necessary. The applicant's Hirsch index is impressive, which is 9, while the recommended requirement is 4. The high citation rate of the presented publications shows that the conducted research is on scientifically relevant topics, with a strong response in the scientific community. Also, out of the 17 publications presented in the competition, in 11 Dr. Ivanova is the first author, and in most - also the corresponding author. This gives me reason to believe that the candidate has a major and major contribution to the materials presented.

The main scientific contributions in the presented materials are the following:

(i) Preparation of bioactive plant extracts and optimization of the extraction process of the biologically active ingredients. This includes a number of publications in which new plant extracts from juniper have been investigated, and the agents contained in them with antiproliferative, antioxidant, and antitumor activity have been identified. The extraction processes are optimized in order to maximize the yield of the bioactive component. These studies have a potential applied contribution in pharmacy, to obtain natural analogues with medicinal action.

(ii) Synthesis of analogs of natural compounds with biological activity. Analogues of retinoic acid - silicon arotinoids - have been synthesized, with the aim of using them as active ingredients in the treatment of leukemia, psoriasis, etc. In other publications, bacteriorhodopsin analogs - heterocyclic and polycyclic retinals - have been synthesized. In this case, the synthesized analogs represent pigments and are used in biotechnology as artificial photoreceptors.

(iii) Application of cytostatics of plant origin in metronomic therapy. In collaboration with scientists from China, a clinical trial was conducted involving cytostatics of plant origin for the treatment of breast cancer. The candidate's contribution is in elucidating the mechanism of action of a new class of antitumor substances - aromatase inhibitors. Their application in the treatment process leads to a long remission without notice of any side effects.

The research in the presented publications has both a scientific contribution - for clarifying the mechanism of action of the considered biologically active substances, and a scientific and applied contribution - in pharmacy and medicine, for finding new drugs based on natural substances.

CONCLUSION

In conclusion, the documents and materials presented by Assist. Professor Diana Ivanova, Ph.D., meets all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LAD), the Regulations for the Implementation of the LAD of the Bulgarian Academy of Sciences, and the relevant Regulations of the Institute of Chemical Engineering for the occupation of the academic position "Associate Professor". In the scientific works of the candidate, there are original scientific and scientific-applied contributions that have received international recognition, and most of them have been published in renowned scientific journals and scientific collections. In conclusion, I give my positive assessment and recommend the IIES Scientific Council to choose Assistant Professor Diana Ivanova Ivanova, Ph.D., for "Assoc. Prof." in professional field 4.2. Chemical sciences, scientific specialty "Processes and devices in chemical and biochemical technology", at the Institute of Chemical Engineering - BAS.

Prepared the opinion:



(Prof. Dr. Kaloyan Kirilov Petrov)

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