

REPORT

on the materials submitted for a competition for the academic position of professor in the field of higher education 4. "Natural Sciences, Mathematics and Informatics", professional field 4.3

"Biological Sciences", scientific specialty "Biophysics", for the needs of Department "Photoexcitable membranes", Institute of Biophysics and Biomedical Engineering-BAS,

announced in SG, no. 108 / 22.12.2020

by Prof. Dr. Maya Yaneva Velichkova,

Institute of Biophysics and Biomedical Engineering at BAS

In the competition for academic positions "professor" for the purposes of section "Photoexcitable membranes" announced by the Institute of Biophysics and Biomedical Engineering - BAS (SG, no. 108 / 12.22.2020) participates only one candidate - Assoc. Dr. Anelia Georgieva Dobrikova. All required documents are presented, which meet the requirements of ZRASRB and the Regulations for the terms and conditions for acquiring scientific degrees and holding academic positions in IBFBMI - BAS.

Brief biographical data

Associate Professor Anelia Dobrikova graduated from the Faculty of Biology at Sofia University "St. Kl. Ohridski" with a master's degree in Biotechnology. After graduation she started working as a specialist - biotechnologist at the Institute of Biophysics at BAS (now IBFBMI) and in 1996 she was enrolled as a doctoral student in independent training in the section "Excitable Membranes" at the Institute of Biophysics at BAS. In 1999 he successfully defended her doctoral dissertation on "Surface electrical properties of thylakoid membrane fragments". In 2010, after a competition, she was elected associate professor in the scientific specialty "Biophysics" at the Institute of Biophysics. Since her graduation, Dr. Dobrikova's entire scientific activity is related to the developed scientific topics in the section "Photoexcitable Membranes" of IBFBMI and is presented in 50 scientific publications, reflected in the scientific community with over 250 independent citations.

Scientific metrics

Assoc. Prof. Dobrikova presented a detailed report on the minimum national requirements for holding the academic position of "professor", which correctly reflects its scientific output and shows that these requirements are not only met but also significantly exceeded.

For the competition Assoc. Prof. Dobrikova presented a list of 25 scientific papers, 21 of which are articles in scientific journals with impact factor (total impact factor 57.36, personal 10.64), three book chapters and one article in a journal without impact factor and without SJR. It should be noted that most of the publications with impact factor are in prestigious international scientific journals, which are in the first quarter of the journals in the field - 14 are in Q1 quartile, 5 are in Q2 and 2 are in Q3. In ten of the materials Assoc. Prof. Dobrikova is a leading or corresponding author, including one standalone article which unequivocally shows its role in the conducted research, proposed hypotheses and analyzes. A significant part of the publications (12 issues) with which Assoc. Prof. Dobrikova participates in the competition are from the last 5 years. The citations of the publications submitted for the competition are 131. After excluding the self-citations of all authors, the Hirsch index of Dr. Dobrikova is 10 (Scopus). These scientific metrics unequivocally define Dr. Dobrikova as an established scientist with active research.

Assoc. Prof. Dobrikova is a scientific consultant of a successfully defended doctoral student, supervisor of the master's thesis of a foreign student, supervisor of student practice.

Over the years, she has participated in the development of 12 national and international research projects, leading two of them. The collaboration with research teams from Hungary, Slovakia, India, Greece, as well as with teams from Bulgaria, is extremely fruitful and the results are published in prestigious journals.

Dr. Dobrikova has an active expert activity as a reviewer for international scientific journals, participation in editorial boards, reviews of dissertations for ONS "Doctor", which shows recognition of her expertise both in Bulgaria and by the international scientific community.

Research activity and scientific contributions of the candidate

Dr. Dobrikova's research activity is in the field of biophysics of photosynthesis, structural and functional characterization of photosynthetic membranes in conditions of abiotic stress caused by adverse environmental factors such as high light intensity, higher UV radiation doses, high temperature, herbicides, salinization.

The presented extended habilitation report convincingly and arguably presents the topicality and significance of this topic not only for the basic science, but also from the point of view of ecology. The report on the scientific contributions has been prepared in detail and precisely and correctly reflects the achievements of the scientific activity of Dr. Dobrikova. The contributions from the publications presented as a habilitation thesis are related to an extensive and in-depth study of the effects of Cd stress on the photosynthetic apparatus, as well as various approaches to minimize its negative effects. For the first time, the protective role of DELLA proteins for photosynthetic activity in wheat plants under cadmium stress was experimentally established; it has been shown that in the case of cadmium stress in rice plants, the protective effect of salicylic acid also includes an effect on the kinetic parameters of the oxygen-releasing complex. These studies are significant scientific contributions to understanding the effects of high concentrations of cadmium and the defense mechanisms of the photosynthetic apparatus. In terms of ecology I would mention the contribution associated with research on the properties of medicinal plant *Salvia sclarea* L., namely its ability to accumulate cadmium, thus determining its potential to be used for phytoremediation of contaminated soil.

The findings and conclusions of scientific papers included in the indicator G are summarized in eight contributions, from which I would like to emphasize these related to the study of structural functional conditionality of the primary processes of photosynthesis, specifically the role of oligomeric form of light harvesting complex of photosystem II and the lipid composition for the resistance of the photosynthetic apparatus to abiotic stress. In addition, research on the relationship between the kinetic parameters and the redox state of Mn cluster and herbicide sensitivity in various photosynthetic organisms - higher plants, cyanobacteria, algae are a significant contribution not only to basic science, but also have potential for future practical application in development of biosensors. Contributions to the understanding of signaling mechanisms in plant cells and the activity of the oxygen-evolving complex are the studies related to nitric oxide and its action in chloroplasts (presented in one review, a chapter of a book that have found a wide response), as well as those related to the use of various signaling molecules (24-epibrasinolide, salicylic acid, DELLA proteins) and their role in abiotic stress resistance. Assoc. Prof. Dobrikova's research in the field of biophysics of photosynthesis, the structural and functional conditionality of the efficiency of the primary processes of photosynthesis and the tolerance of photosynthetic apparatus to environmental stressors are significant scientific contributions and represent original scientific achievements in understanding regulatory mechanisms of photosynthesis.

The outlined guidelines for future research are a logical continuation of previous scientific work, updated with the latest advances in science, including in the field of methodology.

I would recommend to the candidate in the future to intensify her activity in the training of masters and doctoral students.

Conclusion

The presented materials convincingly show that Dr. Dobrikova is an established scientist working in the appropriate and meaningful direction of modern science, demonstrates leadership skills and develops topics that are included in the main scientific strategy IBFBMI. Most of her research is of an original nature and contributes to the basic science, and some of them have the potential for practical application. Dr. Dobrikova's national and international contacts show that she is a sought-after partner for scientists from Bulgaria and abroad for joint research projects. Dr. Dobrikova's scientific metric indicators fully cover and exceed both the national and the IBFBMI criteria for holding the academic position "professor".

I positively evaluate the candidacy of Assoc. Prof. Dobrikova for the academic position of "professor" and I will vote FOR. I recommend to the members of the esteemed Scientific Jury to propose to the members of the Scientific Council of IBFBMI to elect Assoc. Prof. Dobrikova to the academic position "professor" in the professional field ".4.3. "Biological Sciences", scientific specialty "Biophysics".

April 12th, 2021

Signature:

/Prof. M. Velitchkova/