

## REPORT

**by Prof. Dr. Tsonko Dekov Tsonev, appointed according to mandate № 77/16.02.2021 of the Director of the Institute of Biophysics and Biomedical Engineering as a member of the scientific jury**

***Regarding: Competition for academic position “Professor of Biophysics”, according to the announcement in State Gazette, issue 108 / 22.12.2020, for the needs of the department “Photoexcitable Membranes” at IBPBME with candidate the Associate Professor Dr. Anelia Georgieva Dobrikova***

Assoc. Prof. Dr. Anelia Dobrikova participates in the announced competition for "Professor" as the only candidate. The submitted documents are in compliance with the Law on the Development of the Academic Staff in the Republic of Bulgaria and Regulations for its implementation, as well as the regulations for the conditions and the procedure for acquiring academic degrees and occupying academic positions in the Bulgarian Academy of Sciences and the Institute of Biophysics and Biomedical Engineering - BAS.

According to the presented documents, the total volume of the scientific works of Assoc. Prof. Dobrikova covers 50 scientific publications, 41 of which are in journals with impact factor and 4 in book chapters. Assoc. Prof. Dobrikova participates in the competition for Professor with 25 publications, 21 of which are with impact factor (IF = 57.36, 14 in Q1, 5 in Q2, 2 in Q3), 3 are book chapters and 1 without IF. The Reference for the implementation of the minimum national requirements presents 190 citations of these publications.

Assoc. Prof. Dobrikova has active participation in competitively funded research projects: she is participant in 2 international and 3 national research projects at NFNI and 6 international EBR projects. She has been the leader of a project at NFNI and an international research project under the EBR. He is also a participant in the National Scientific Program DSD-3.

The research activity of Assoc. Prof. Dobrikova is mainly focused on research and characterization of photosynthetic membranes and their function in conditions of abiotic stress (high light intensity, extreme temperature, UV-B radiation, salinization, heavy metals and herbicides) with modern biophysical and biochemical methods. Significant attention is paid to the role of the structural organization of the light-harvesting complex of Photosystem 2 (LHC2) for the sensitivity of the photosynthetic apparatus to

temperature and high light intensity. As a result of these studies, a number of contributions have been made, the most significant of which are the following:

- In connection with the analysis of the role of the organization of light-harvesting complexes (LHC) for resistance and adaptation to abiotic stress, it is shown that the oligomerization of LHCII, as well as the reduction of anionic lipids and the increase of lipid MGDG, play a key role in photosynthetic apparatus sensitivity to high and low temperature, as well as to high light intensity.

- The effect of nitric oxide (NO) on the functions of the photosynthetic apparatus under physiological and stress conditions has been studied. The results help to clarify the protective role of increased endogenous NO levels in chloroplasts under oxidative stress.

- The relationship between herbicide sensitivity and the kinetic parameters of oxygen evolution of cyanobacteria, green microalgae and thylakoid membranes from higher plants has been shown for the first time, which may find future application in the development of biosensors.

- In connection with studies on the influence of heavy metals (Cd, Zn) on the structure and functions of the photosynthetic apparatus, the protective role of salicylic acid (SA) is clarified, which is manifested by influencing the kinetic parameters of oxygen-evolving reactions, protecting Mn-cluster from damage, as well as stimulation of cyclic electronic transport around PSI. Increased levels of DELLA proteins in wheat mutant (Rht-B1c) have been shown to play a protective role on the functional activity of the photosynthetic apparatus under Cd stress. It has also been found that the medicinal plant sage (*Salvia sclarea* L.) can accumulate high concentrations of Cd in its tissues, which confirms the potential of sage for phytoremediation or phytoextraction of soils contaminated with Cd and Zn.

- A protective effect of quercetin, naringin and ascorbate on the oxygen-evolving complex against UV-B-induced stress has been established, concluding that their protective effect is a consequence not only of their direct antioxidant action, but also of the structural changes they induce in photosynthetic membranes and Mn-cluster modifications.

Dr. Dobrikova has over 20 years of experience as an associate professor, assistant professor and research associate at the Institute of Biophysics and Biomedical Engineering - BAS, Sofia. She has been scientific consultant to a successfully defended doctoral student, as well as to a master's thesis on Erasmus and to a trainee. She is also actively involved in reviewer and editorial activities: she is a member of the editorial board of 2 international scientific journals and a guest editor of 2 special issues in the journal *Plants* (MDPI).

**Conclusion:**

The analysis of the presented materials, as well as the personal impressions, allow me to make a reasoned conclusion that Assoc. Prof. Dr. Anelia Dobrikova is a built scientist working in a current field of modern science, such as biophysics. Assoc. Prof. Dobrikova has presented enough creative materials in terms of volume and content, which meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the rules of its application and the Rules of the IBPBME, for participation in a competition for a Professor. All this gives me reason, as a member of the Scientific Jury, to give a POSITIVE assessment of her candidacy and convincingly recommend to the Scientific Jury and the Scientific Council of IBPBME to vote positively for the election of Associate Professor Dr. ANELIA GEORGIEVA DOBRIKOVA as "PROFESSOR" in the scientific specialty Biophysics.

Sofia, 21.04.2021

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/Prof. Tsonko Tsonev, PhD/