

OPINION

by Prof. Tsonko Dekov Tsonev, appointed according to mandate No. 322 /12.05.2023 of the Director of the Institute of Biophysics and Biomedical Engineering as a member of the scientific jury

Regarding: Competition for the selection of Associate Professor of Biophysics, professional field 4.3. "Biological Sciences", according to the announcement in the State Gazette, issue 21/07.03.2023, for the needs of the "Photoexcitable Membranes" section at the IBBE with candidate Dr. Martin Angelov Stefanov

Assistant professor Dr. Martin Stefanov participates in the announced competition for "associate professor" as the only candidate. The submitted documents are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at the Institute of Biophysics and Biomedical Engineering - BAS.

Dr. Stefanov's scientific activity is mainly focused on the study and characterization of photosynthetic membranes and their function under abiotic stress, specifically in conditions of salinity, drought, heavy metals, low temperature and high light intensity. The possibilities of protecting the photosynthetic apparatus from these types of stress were investigated, by studying the effects of different signal molecules (nitric oxide, salicylic acid), herbicides and nanoparticles on the photosynthetic membranes. Modern biophysical and biochemical methods have been applied, such as measurement of chlorophyll fluorescence at normal and low temperature (77K), oxidation-reduction properties of P700, photochemical activity of PSII and PSI, oxygen yields under flash and continuous illumination, antioxidant and antiradical activities etc.

As a result of these studies, a number of contributions have been made, the most important of which are the followings:

- Differences are found in the salt tolerance of the photosynthetic apparatus of maize and sorghum plants at 150 mM and 200 mM NaCl, corresponding to highly saline soils. At these concentrations, a stronger effect on the primary photochemistry of PSII was observed in maize than in sorghum plants, corresponding to a reduction in the amount of closed PSII centers, a limitation of the electron flow from QA to the plastoquinone (PQ) pool, and the effective quantum yield of PSII. Inhibition of PSII activity is accompanied by an increase in the quantum yields of regulated and unregulated energy losses in PSII.

- A comparison of the changes in the structure, functions and antioxidant activity of plants with C3 and C4 type of photosynthesis (peas and corn plants) subjected to salt stress is performed. It has been found that the higher sensitivity of pea plants compared to maize plants is due to the fact that maize possesses a larger relative PQ pool size and higher electron transport activity, as well as a lower photosynthetic structure density.
- Studying the effect of salt stress on two *Paulownia* lines has showed the role of carotenoids, as well as the strong increase in the level of flavonoids and proline during the first days of salt stress for the protection of PSA functions and plant adaptation to high salt content. The high content of these substances alleviates the transfer of electrons from the QA to the PQ pool and the photochemical inhibition of both photosystems during short-term NaCl treatment.
- The effects of foliar application of two types of nanoparticles (ZnO and ZnO-Si NPs) on the PSA of pea plants under physiological conditions and salt stress are evaluated. Foliar applications of ZnO NPs at a concentration of 400 mg/L are found to cause oxidative stress followed by some phytotoxic effects, while Si coated NPs (200 and 400 mg/L) has had no phytotoxic effect on plants as well as on PSA functions under physiological conditions, they even have a slight stimulatory effect at the higher concentration.

The fulfillment of the minimum requirements for occupying the academic position "associate professor" from Dr. Stefanov are described by groups of indicators in the table below:

Group Indicators	Content	Minimum requirements in IBBE, BAS for associate professor	Points from the indicators of the Ass. Prof. Martin Stefanov
A	Indicator 1	50	50
B	Indicator 3 or 4	100	120
Г	Sum of indicators from 5 to 10	220	227
Д	Sum of points of Indicator 11	60	106

Regarding indicator C.4. Scientific publications in journals that are referenced and indexed in world-renowned databases of scientific information, the candidate in the competition has submitted 5 scientific articles (4 of them are in journals with Q1 and one with Q2) published in the period 2021-2023. In all of these publications Dr. Stefanov is the first author, and the points from his publications cover the necessary legal requirements - 120 points, with a minimum of 100 points required.

To meet the requirements under indicator D.7. 11 scientific articles published in the period 2016-2023 are presented. Four of them are with Q1, 2 are with Q2, 4 with Q3 and 1 with Q4. In 3 of these publications, Assistant Professor Stefanov is the first author. Regarding to indicator D.8. the candidate is the first author of a chapter in the book *Handbook of Plant and Crop Stress*. The total sum of the points for the indicators in group D of the candidate (D.7.+D.8.) is 227 points with a required minimum of 220 points, according to the requirements of the IBBE for occupying the academic position "associate professor".

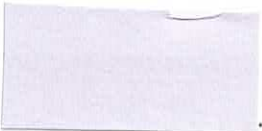
The total number of citations of Assistant Professor Martin Stefanov, according to the report presented by him, is 118 (WoS, Scopus). For the competition for associate professor, the candidate has submitted 53 citations, which provide 106 points under indicator D, that is more than the required 100 points.

Results of the candidate's research have been presented in 39 poster and oral presentations at national and international scientific forums. Assistant Professor Dr. Stefanov is actively involved in competitively funded research projects: a participant in a total of 13 national and international scientific projects.

Conclusion:

The analysis of the presented materials, as well as my personal impressions, allow me to draw a reasoned conclusion that Assistant Professor Martin Stefanov, PhD, is a well-established scientist working in a topical area of modern science, such as biophysics. Dr. Stefanov has presented sufficient volume and content of creative materials that meet all the requirements of the Law on the Development of the Academic Staff, the Rules for its application and the Rules of the IBBE, for participation in a competition for a docent. All this gives me reason, as a member of the Scientific Jury for the competition, to give a POSITIVE evaluation of his candidacy and to confidently recommend to the Scientific Jury and the Scientific Council of IBBE to vote positively for the election of Assistant Professor MARTIN ANGELOV STEFANOV, PhD, to the academic position of "ASSOCIATE PROFESSOR" in the scientific specialty of Biophysics.

6.07.2023 г.
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/Prof. Tsonko Tsonev/