

OPINION

By Assoc.Prof. Konstantina Valery Kocheva, PhD

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Member of the Scientific Jury according to Order No. 1352/14.10.2024

of the Director of IBPhBME, BAS

Regarding: Competition procedure for filling the academic position of "Associate Professor" in the area of higher education 4. "Natural Sciences, Mathematics and Informatics" in professional field 4.3. Biological Sciences, scientific specialty "Biophysics", announced by Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences (IBPhBME, BAS) for the needs of "Photoexcitable membranes" Department.

Information about the competition: The announcement appeared in "State Gazette" Issue 69 from August 16, 2024, pg. 28-29.

Candidate: Senior Assistant Professor Georgi Dimitrov Rashkov, PhD

Information about the candidate

As evidenced from his CV, Georgi Rashkov graduated from higher education in 2002 acquiring a Masters' degree in specialty "Nuclear techniques and energetics" at the Faculty of Physics of Sofia University "St. Kliment Ohridski". Since 2006 he has been working at the Institute of Biophysics and Biomedical Engineering, Bulgarian Academy of Sciences (IBPhBME, BAS) and during the period 2014-2019 he was a PhD student on independent training at the "Photoexcitable Membranes" Department with scientific supervisor Prof. Emilia Apostolova and topic of the dissertation work: "Possibilities for the application of photosynthetic membranes as a bioreceptor for pesticide registration". The candidate obtained the scientific and educational degree "PhD" in 2019, and from 2021 until now he holds the scientific position "Senior Assistant Professor" at IBPhBME, BAS.

Scientific metrics

For participation in the competition, 16 scientific publications are presented which appear in journals with the following quartiles: 11 publications in journals with quartile Q1, 2 publications in journals with quartile Q2, 1 publication in a journal with quartile Q3, and 2 publications in journals

with quartile Q4, of which 100 points are collected for indicator B and 254 points for indicator G (out of 220 required).

Main fields of scientific research

In the research work of Dr. Rashkov, two main thematic fields are clearly outlined:

- mechanisms of adaptation to different types of abiotic stress, related to the functional state of the photosynthetic apparatus in higher plants, one green alga and one cyanobacterium species;
- influence of nitric oxide, brassinosteroids and nanoparticles on the efficiency of the photosynthetic apparatus under normal and abiotic stress conditions.

The impact of several types of abiotic stress on a plethora of photosynthetic organisms have been studied, including three herbaceous plant species, two hybrid lines of the tree species *Paulownia*, a unicellular green alga, and a cyanobacterium species. The effects of salinity on the functional activity of the photosynthetic apparatus have been examined in C3 (pea) and C4 (sorghum and maize) type of herbaceous plants, as well as in *Paulownia*. Drought stress induced by increasing concentrations of PEG 6000 and its effect on photosystem II (PS2) efficiency was investigated in maize and sorghum plants. The sensitivity of PS2 to UV radiation and oxidative stress was explored in the cyanobacterium *Synechocystis salina* and in the green alga *Chlorella vulgaris*, while the temperature stability of PS2 was determined in thylakoid membranes isolated from pea leaves.

Regarding the second thematic field of research, a notable protective effect was established of exogenous sodium nitroprusside (in sorghum and maize), as well as synthetic zinc oxide nanoparticles (in pea), with respect to PS2 efficiency under salt stress. Foliar treatment of pea seedlings with 24-epibrassinolide was shown to induce structural and functional changes in the characteristics of isolated thylakoid membranes which might be involved in stress tolerance.

Contributions

The candidate has significant personal contributions in the accomplished scientific research, including measurement and analysis of data from the chlorophyll fluorescence and oxygen evolution of samples. By implementing these novel and informative methods, significant fundamental results have been obtained and practical achievements have been realized, which substantially improve our understanding of photosynthetic performance under normal and stress conditions. The presented output and scientific indicators of Dr. Rashkov are in accordance with

the announced topic of the competition and represent unequivocal proof for the establishment of a successful research profile.

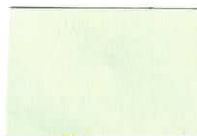
CONCLUSION

Acquaintance with submitted documents and materials for the Competition discloses that the candidate fulfills all requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations for Application of ADASRB, as well as the specific requirements of IBPhBME, BAS for occupying the academic position "Associate Professor" in the professional field 4.3. "Biological sciences", specialty Biophysics.

All of the above-mentioned considerations provide me with strong arguments to support the present application and to confidently recommend to the respected members of the Scientific Board of IBPhBME, BAS to award Senior Assistant Professor Dr. Georgi Rashkov with the academic position "Associate Professor" at "Photoexcitable membranes" Department of IBPhBME, BAS.

Sofia,

15.11. 2024



/Assoc. Prof. Konstantina Kocheva, PhD/