

STANDPOINT

Considering the competition for **the academic position "Associate Professor"** in the field of professional direction 4.3. "Biological Sciences", scientific specialty "Plant Physiology", for the needs of the Laboratory "Experimental and Applied Algology" at Institute of Plant Physiology and Genetics - Bulgarian Academy of Sciences, announced in "State Gazette", issue 44, published on May 26, 2023

Reviewer: Prof. Dr. Emilia Lyubomirova Apostolova, Institute of Biophysics and Biomedical Engineering – Bulgarian Academy of Sciences, member of the Scientific Jury according to order No. № ПД-01-44 / 17.07.2023 by the Director of IPPG - BAS.

For participation in the announced competition for **the academic position, "Associate Professor"** one candidate has submitted documents: **Senior Assist. Prof. Dr. Juliana Georgieva Ivanova, PhD**. The candidate has attached all the necessary documents in accordance with the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria as well as the Regulations for its application approved by BAS and IPPG-BAS. The materials presented by the candidate are precisely prepared and well arranged.

Education and career development

Dr. Juliana Ivanova graduated with a master's degree in the specialty "Biotechnology with specialization in microbiological processes" at the Faculty of Biology of the Sofia University "St. Kliment Ohridski" in 1992. She defended a dissertation and received the educational and scientific degree "doctor" in 2006. The title of her dissertation is "Physiological-biochemical characterization of *Rhodella reticulata* and its interaction with a bacterial pathogen". Dr. Ivanova's scientific career began at the Institute of Plant Physiology – BAS (now IPPG - BAS) in 1994 and she was a specialist-biologist, assistant and senior assistant professor. She currently holds the academic position of senior assistant professor in the Laboratory "Experimental and Applied Algology" at IPPG - BAS. The candidate has many years of experience in scientific research (26 years). Dr. Ivanova's research is in the field of physiology and biochemistry of microalgae.

Research activity

Dr. Ivanova has 50 scientific publications, of which 6 are included in the author's abstract for receiving the educational and scientific degree "doctor". For the participation in the competition for **the academic position, "Associate Professor"** Dr. Ivanova has presented 19 scientific publications with IF or SJR (Q1 – 2, Q2 – 4, Q3 – 8, Q4 – 5). The total impact factor of the publications is 16.48. Doctor Ivanova is the first or corresponding author of 8 publications. The habilitation reference (group indicator B of the presented reference) includes 7 publications with IF=8.182 (Q2 – 2, Q3 – 4, Q4 – 1). According to the report submitted by the candidate, the total number of points in indicators is 617 points (indicator A - 50, indicator B - 112, indicator G - 223, indicator D – 112, indicator - 120) with a requirement of 540 points.

The candidate has also provided 56 citations (WoS or Scopus). Dr. Ivanova exceeds the minimum national requirements and the regulations for their application approved by the BAS and IPPG-BAS.

Dr. Ivanova has presented materials from her research at 12 scientific forums, 5 of which abroad.

Scientific activity of the candidate and more important results

The scientific investigations included in the habilitation report are divided into two main thematic areas:

Biological activity of metabolites isolated from microalgae

- The effects of extracellular microalgae heteropolysaccharides, from several strains of red microalgae (*Dixoniella grisea*, *Porphyridium sordidum*, *Porphyridium cruentum*), on tumor cell lines were evaluated. Their pharmacological effect and their specificity towards cancer cells have been established, and no side effects have been recorded.
- The bioactive components of several strains of green microalgae (*Chlorella vulgaris* R-06/2; *Scenedesmus acutus* M Tomaselli 8 and *Scenedesmus obliquus* BGP) were characterized under optimal growth conditions. *Chlorella vulgaris* was found to have the highest antioxidant potential.

Optimizing the physiological-biochemical parameters of microalgae cultivation

- Microalgae cultivation conditions have been optimized in order to increase growth and increase the production of algal metabolites. The studies were conducted with the blue-green microalgae *Chroococcus R-10* and the red microalgae *Rhodella reticulata* and *Porphyridium cruentum*. It has been established that the addition of humic acid and thiamine have a beneficial effect on the growth of microalgae and some of their metabolites.
- For the first time, the blue-green microalgae *Chroococcus R-10*, isolated from a hot spring in Southwestern Bulgaria, was introduced into conditions for intensive laboratory cultivation.
- Research related to the immobilization of algal cells is of great importance in order to increase the possibilities for their practical application. Matrices have been proposed that can be used for the immobilization of microbial cells in order to produce various enzymes.
- Research related to the development of strategies involving the cultivation of microalgae for wastewater treatment and the production of bioactive components is very current.

Scientific and applied activity of the candidate

Dr. Ivanova presented a utility model registration certificate from the Patent Office of the Republic of Bulgaria. The utility model relates to a way of treating waste biosludge from biogas installation, in particular the liquid fraction of waste biosludge, for the cultivation of the microalgae. The resulting microalgae biomass can then be used to produce bioproducts, animal feed, etc.

Organizational and educational activity

Doctor Ivanova participated in the development of 6 research projects, one of which he was the head of and 3 of which he was the team leader of a partner organization. Her leadership role in four of the projects demonstrates her organizational skills. A reference for the training activity has not been submitted.

Critical notes and recommendations

I have no critical remarks or recommendations.

Conclusion

The investigations of Dr. Ivanova provide new knowledge about the conditions of microalgae cultivation and the biological activity of metabolites of some strains of microalgae. From the submitted documents for the competition, it is clear that Dr. Ivanova's scientific output and science indicators fully meet and even exceed the recommended requirements for occupying the academic position of "associate professor" according to the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Implementing Regulations of the law in BAS and the specific requirements of IPPG-BAS.

Based on the above, I allow myself to recommend to the members of the Scientific Jury to propose to the Scientific Council of IPG-BAS to elect **Dr. Juliana Ivanova for the academic position "Associate Professor"** in professional direction 4.3. "Biological Sciences", scientific specialty "Plant Physiology".

12.09.2023

Sofia

/Prof. Emilia Apostolova, PhD/