STANDPOINT

Considering the competition for the academic position "Professor" in the area of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences, scientific specialty "Biophysics", announced in the State gazette issue 41 dated May 5, 2019

For the needs of the department "Biomacromolecules and biomolecular interactions", Institute of biophysics and biomedical engineering, Bulgarian Academy of Sciences

by Prof. DSc Stefka Germanova Taneva, Institute of biophysics and biomedical engineering, Bulgarian Academy of Sciences

The only candidate in the competition is **Assoc. Prof. Dr. Sashka Boychova Krumova**.

Education & Training

Assoc. Prof. Krumova completed her higher education in 2001 at the Faculty of Biology at Sofia University “St. Kliment Ohridski” and is a Master Biotechnologist with a specialization in Molecular Biotechnology. Since 2001 she had been working on her PhD Thesis as a full-time doctoral student at the Institute of Biophysics, BAS, and conducted a part of the research work related to her dissertation at the Institute of Plant Biology, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary. She received her PhD for a dissertation work titled "Temperature stability of pigment-protein complexes in thylakoid membranes of higher plants. Thermo-Optical Effect ".

In 2009 Dr. Krumova was appointed as a specialist at the Institute of Biophysics-BAS. From 2010 to 2013 she took the position of a senior assistant at the Institute of biophysics and biomedical engineering-BAS. In 2013 was elected as an Associate Professor in the department "Biomacromolecules and biomolecular interactions" where she has been working so far. Currently she is Scientific Secretary of the Institute of biophysics and biomedical engineering-BAS.

She specialized in the Institute of Plant Biology, Biological Research Center at the Hungarian Academy of Sciences, Szeged, Hungary (2005-2007) and was a postdoctoral fellow at the University of Wageningen, The Netherlands (2008-2009). Her research work at these leading research centers was highly appreciated.

She also participated in Postgraduate Training on "Time-resolved microspectroscopy in the life sciences”, Marie Curie programme “From FLIM to FLIN”, The Netherlands, (2008) and on "Modern method in computational chemistry, synthetic organic chemistry and fluorescence spectroscopy”, Marie Curie programme “From FLIM to

FLIN", Institute of organic chemistry and fluorescence spectroscopy, Czech Academy of Sciences (2008).

Scientific & teaching activities

Scientific indicators

Assoc. Prof. Dr. Krumova has published over 50 research articles, cited 276 times (WEB of Sci) and has an h-index of 13 (WEB of Sci).

Assoc. Prof. Krumova participates in the competition with a total of 21 articles published after her habilitation as Assoc. Professor.

8 of the publications are for habilitation work on the topic "Calorimetric markers for detection and monitoring of patients diagnosed with multiple myeloma".

Publications apart from the habilitation work (13 in total) are related to studies of the macro-organization and stability of the light harvesting complex of photosystem 2 (CCK2) (publications № 12, 13, 14, 19), and the photosynthetic apparatus of cyanobacteria (publication № 20); the effect of exogenous growth regulators (brassinosteroids, cytokinin and auxin) on the structure and function of photosynthetic membranes (publications № 10, 16, 21); the energy and mechanism of binding of the flavin-adenine-dinucleotide cofactor and the substrate deoxyuridine monophosphate to thymidylate synthase by thermophilic (Thermotoga maritima) and mesophilic (Paramecium bursaria chlorella virus-1) organisms (publication № 15); morphological changes and stability of hemoglobin and the major proteins of the cytoskeleton and the plasma membrane upon erythrocyte aging (publication № 18); and also the application of microcalorimetry to study normal and tumor cells and their isolated nuclei (publication № 17).

18 of the publications with which Assoc. Prof. Krumova participates in the competition are with total IF 51.4, 1 with SJR and 2 in international journals without IF; 10 publications fall in journals with rank Q1, 7 with Q2 and 1 with Q3. According to the information provided, the publications have been cited 137 times after her habilitation as Assoc. Professor. The total number of points on indicators A, B, G, D, and E is 1021 points, while the national requirement for occupying the academic position of "professor" is 600 points.
The scientific indicators show the high level of the scientific results of Dr. Krumova.

Dr. Krumova coordinated 2 and participated in the development of 17 scientific projects.

Assoc. Prof. Sashka Krumova has extensive professional experience in the field of the competition topic, her research is focused on a contemporary, multidisciplinary field with a high degree of relevance and gaining new knowledge about biological objects of different complexity (pigment-protein complexes, biological energy membranes, plasma / serum proteome) and the mechanisms of their functioning.

Major scientific contributions

The scientific work presented has a significant contribution to:

- establishment of calorimetric markers for the diagnosis and monitoring of various forms of multiple myeloma (secretory and non-secretory) and macroglobulinemia of Waldenstrom, and modification of the network of intermolecular interactions in the plasma proteome in these haematological diseases;
- discovery of the potential of calorimetry to detect unstable monoclonal free light chains in serum of patients with Bence Jones multiple myeloma, namely the presence of a unique endothermic transition in the serum calorimetric profile, the appearance of which is accompanied by the formation of amorphous aggregates of these proteins;
- identification of factors regulating the stability and structural organization of the major light-harvesting pigment-protein complexes in higher plants and cyanobacteria
- determination of specific structural changes in the photosynthetic complexes of photosystems 1 and 2 (CCS1 and CCS2, respectively) related to the processes of photoprotection.

Teaching activities

Dr. Krumova supervised two PhD students – one of them successfully defended and the other is expected to defend within 2 months.

Dr. Krumova delivered a lecture course for PhD students at the Training Center of BAS.

In addition, she conducts laboratory exercises on the application of circular dichroism and differential scanning calorimetry for investigations of biological objects to students at the Faculty of Biology at Sofia University and The University of Chemical Technology and Metallurgy.

Prospects for future research

The main directions for future research outlined by Assoc. Prof. Krumova are in the field of nanotechnology (the role of carbon-based nanomaterials on structural and functional features of photosynthetic apparatus, and optimization of photosynthetic activity under stress conditions and the interaction of 2D nanomaterials with cells and membrane layers); and the application of modern biophysical approaches for the disease diagnosis.

Personal impression

I have known Sashka Krumova as a graduate student, when she joined our research group at the Institute of Biophysics, Bulgarian Academy of Sciences, and later on as a doctoral student. She is a highly qualified scientist in the field of biophysics, distinguished by her high competence and collegiality, very active in the development of scientific projects and guidance for young scientists - PhD students and post-doctoral students. She has the capacity to successfully continue and expand with new aspects the research topics of the department.

She contributed actively to the research investigations and daily running of our department "Biomacromolecules and biomolecular interactions", she has been

involved in the developments of all thematic areas since the creation of the research group, and is a leading contributor to all publishied works, despite not being a leading author.

CONCLUSION

The materials presented by Assoc. Prof. Sashka Krumova meet and significantly exceed the requirements for occupying the academic position of “Professor” according to the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the Regulations for the Application of ADASRB in BAS and the specific requirements of IBPhBME-BAS.

The candidate has achieved productive research output of original papers in peer-reviewed journals of significant impact, she is an established scientist recognized for her professional achievements.
My personal impressions offer a full justification to express my positive opinion for nomination of Assoc. Prof. Dr. Sashka Boychova Krumova for the academic position "Professor."

As a member of the Scientific Board of the announced competition, I declare my assessment and recommend to the members of the scientific board and to the Scientific Council of IBPhBMI-BAS to vote positively and to elect Assoc. Prof. Sashka Bojchova Krumova for the academic position “Professor”' in IBPhBMI-BAS in professional field 4.3. Biological Sciences, scientific Specialty: Biophysics.

26.09.2019

/Prof. Stefka Germanova Taneva, DSc/