

S C I E N T I F I C O P I N I O N

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Subject: Evaluation of documents of a candidate, participant in a competition for the academic position "Associate Professor" for the needs of the Department of General Microbiology at The Stephan Angeloff Institute of Microbiology, BAS

The competition is in professional field 4.3. Biological Sciences (Microbiology), announced in State Gazette no. 12 / 12.02.21 for the needs of the Laboratory of Cell Microbiology, Department of General Microbiology, Institute of Microbiology, BAS. My participation in NJ is in accordance with order № 30 / 29.03.21 of the Director of The Institute of Microbiology "Stephan Angeloff" at BAS. I have no common articles or projects with the candidate.

1. Information about the candidate

The only candidate in the competition for associate professor is Dr. Tsvetelina Paunova-Krasteva, chief assistant, head of the Laboratory of Cell Microbiology, part of the Department of General Microbiology, IMicB, BAS.

Tsvetelina Paunova-Krasteva was born in 1980 in Sofia. She completed her bachelor's degree in 2003 at the Faculty of Biology at Sofia University "St. Kliment Ohridski", and in 2005 she became a " Master of Microbiology and Microbiological Control" in the Department of General and Industrial Microbiology of the same faculty. She obtained the scientific and educational degree PhD in Microbiology in 2015 at the Institute of Microbiology with PhD Thesis entitled "Phenotypic variations related to polysaccharide antigens in *Escherichia coli* O157".

Her experience in the specialty is over 16.5 years. Dr. Tsvetelina Paunova has received 7 scientific awards, including FEMS Grant for mobility of a young scientist - 2007; One-year grant from the World Federation of Scientists, National Scholarship Competition 2013, Award for "High scientific achievements in dissertations for 2015" of USB; Award for the most successful project, funded by the "Program for Support of Young Scientists and Doctoral Students at BAS - 2017; Award for the best work of a young microbiologist of the "Academician Stephan Angeloff" Foundation in 2014.

2. Fulfillment of the requirements for holding the academic position "Associate Professor"

The candidate has submitted references and lists for compliance with the criteria for the position, as well as evidence to them. In the competition Assistant Prof. Tsv. Paunova included 30 scientific papers. By groups of indicators and the corresponding number of points, as required by PPZRASRB, they are distributed as follows:

According to indicator A, an abstract of a dissertation for PhD degree is presented. According to indicator B, the candidate has presented 7 scientific publications in peer-reviewed journals, 6 of them with quartile 2 (Scopus) and 1 chapter of a book. The sum of the collected points is 125, with a required minimum of 100 under PPZRASRB. Indicator "Г" presents 23 scientific papers, of which 21 publications and 2 chapters from books. According to the Regulations for application of the Law on the Bulgarian Academy of Sciences for BAS, the increased criteria under indicator D require 220 points, and the candidate in the competition scores a total of 249 points. According to indicator D, Dr. Paunova-Krasteva presented 58 citations, corresponding to 116 points with a required minimum of 100. According to indicator E, the candidate presents evidence of attracted funds, forming an asset of 338 points, as she was a manager or participant in a total of 19 projects - international and Bulgarian.

The candidate's indicators cover and exceed the increased criteria of IMicB: Dr. Paunova-Krasteva has presented 16 scientific articles in peer-reviewed journals (apart from those for PhD); 3 articles in non-refereed journals and 5 reports in proceedings, monographs and book chapters. The total IF of the publications is over 22. The total number of citations of the candidate's publications is 111.

3. Scientific topics

The scientific topic on which the candidate for associate professor has been working for the last decade is the study of bacterial biofilms and the effects of various compounds on biofilm formation. These scientific interests of the candidate on the one hand coincide with the topics of the Laboratory of Cellular Microbiology, and on the other hand, would help to solve important problems in healthcare. It is known that the formation of microbial communities in the form of a biofilm is a common cause of chronic and persistent infections in humans. Bacterial biofilms are resistant to the protective mechanisms in the patient's body, as well as to the applied antibiotic therapies. The structure of bacterial biofilms largely determines their drug resistance. As a result of many years of research, Tsv. Paunova-Krasteva has created an optimized and standardized procedure for the study of bacterial biofilms, through a complex methodology including microbiological, spectrophotometric and morphological studies for the analysis of bacterial biofilms. The methodology is standardized for Gram-negative and Gram-positive bacterial species in order to study the effect of newly synthesized natural products on bacterial biofilms. Original scientific data have been obtained on the effect of secretory metabolic products on biofilm formation in various *E. coli* strains (including emerging pathogens).

In the course of the research, original models of biofilm formation were created in a collection of 42 strains (international reference panel) of patients with cystic fibrosis, and the disease was combined with pseudomonad infection. The effects of the composition of the culture media on the dynamics of biofilm formation have been studied in detail. The results of the study were compared with those of tobramycin treatment.

The hypothesis of destruction of mature biofilms by cationic polymer micelles was tested. After screening of newly synthesized micelles, the potential of polymers based on polyamino methacrylates for destruction of mature biofilms by Gram-positive and Gram-negative bacteria was established. Original scientific data have been obtained on the effects of newly synthesized polymer micelles loaded with silver nanoparticles combining biofilm destructive activity with bactericidal action. A new concept has been developed for overcoming the barrier of the biofilm, extracellular matrix by means of polymer micelles, which, after entering the cells, release the antibacterial silver nanoparticles they carry.

4. Teaching activity

Assistant Professor Dr. Tsvetelina Paunova has an active teaching activity: management of two graduates and training of 13 graduates in the program "Student Internships". She teaches students studying at the Faculty of Biology at Sofia University, leading lecture and laboratory courses in "Cell Biology and Pathology" and "Microbiology".

5. Participation in scientific meetings, membership in scientific organizations

The candidate is a member of the Union of Scientists in Bulgaria, Section of Microbiology. She has participated in a large number of scientific forums abroad and in Bulgaria - a total of 16 oral presentations and 46 posters. Dr. Paunova-Krasteva has also participated in the Organizing Committees of five scientific congresses in Bulgaria as a member of the organizing committee.

6. Conclusion

In conclusion, Dr. Paunova-Krasteva is a promising scientist with scientific indicators that exceed the national and additional requirements of The Law for the growth of academic staff in the Republic of Bulgaria, and the relevant Rules of IMicB for the academic position of "Associate Professor" in the Professional field 4.3. Biological Sciences. She is well acquainted with the problems she works on, possesses enthusiasm and a flair for meaningful research on science and public health. This suggests that she can be a generator of many successful future developments together with the team she leads.

Based on the presented documents and analysis of the achievements, I declare a completely POSITIVE assessment of the candidate and I strongly support the occupation of the academic position "Associate Professor" by Assistant Professor Dr. Tsvetelina Paunova-Krasteva.

May 27, 2021

Signature:

(Prof. Penka Petrova, DSci)