Scientific opinion

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Subject: Evaluation of a candidate, a participant in a competition for Associate professor for the needs of the Department of General and Industrial Microbiology, Faculty of Biology, Sofia University "St. Kliment Ohridski"

1. Information about the competition

The competition is in the professional direction 4.3. Biological Sciences (Microbiology—General Microbiology and Phytopathogenic Bacteria) and was announced in SG No. 55/28.06.2024. My participation in NJ is in accordance with order No. RD38-460/22.07.2024 of the Rector of SU "St. Kliment Ohridski," Prof. Dr. Georgi Valchev.

2. Information about the candidate

The only candidate in the competition for the Associate Professor is Dr. YOANA KRASIMIROVA KIZHEVA, PhD, Assistant-Prof. in Microbiology at the Faculty of Biology of Sofia University "St. Clement of Ohridski". Since 2017, Dr. Kizheva has been teaching Bachelor's and Master's students. Dr. Kizheva obtained her doctoral dissertation as a full-time PhD student at the Department of General and Industrial Microbiology in 2014 on the topic "Phytopathogenic bacteria of the genus *Xanthomonas* from Solanum lycopersicum".

3. Fulfillment of the requirements for occupying the academic position

A check of the Scopus database shows that Assist. Professor Yoana Kizheva is a co-author of 23 publications, 21 of which are in refereed journals in microbiology with an impact factor (Journal citation report), and two reports are printed in full text.

Dr. Ioana Kizheva participated in the competition with 18 scientific publications, of which 14 were referenced in Scopus and WOS. She is the first or last author of 11 scientific papers, which shows her leading role in their development and publication. The total Impact Factor of the articles is 30.503. Scientific works form points according to the indicators of PPZRASRB as follows: Indicator A - 50 points (dissertation for ONS "Doctor", indicator B: 100 points (4 articles with Q1 x 25 points), indicator Г: 221 points, if necessary 200 pts which are formed by 4 articles with Q2 = 80 pts, 7 third quartile articles

Q3 each carrying 15 pts = 105 pts and 3 fourth quartile articles carrying 12 pts each = 36 pts From a group of indicators D (citations, minimum required points: 50), Dr. Kizheva presents a list of 96 citations in refereed journals (x 2 items) = 192 items.

H-index of the candidate, although optional as an indicator, can be noted: h-index (Scopus and WOS) - 7, Google Scholar - 9.

According to the reference and the supporting evidence, the candidate significantly exceeds the minimum requirements of the Law and the Regulations for its application for holding the position of "Associate Professor", as well as the additional requirements of SU "St. Kliment Ohridski" for the position of "Associate Professor".

4. Scientific topics

The main scientific directions in which Joana Kizheva works are the following: (1) molecular identification of phytopathogenic bacteria, (2) isolation and characterization of bacteriophages for biocontrol of plant diseases, (3) characterization of lactic acid bacteria isolated from different habitats and development of probiotic nutritional supplements, (4) virulence potential and antibiotic resistance of opportunistic pathogenic bacteria, (5) new substances with potential as antibacterial agents.

There are scientific achievements in all developed subjects, and the most important of them are the molecular genetic approaches for the identification of bacteria of the genus *Xanthomonas*. An RFLP-based approach for identification of four bacterial species causing the bacterial scab disease of tomato and pepper was developed. A novel pulsed gel electrophoresis (PFGE) method was applied and genetic heterogeneity within the *X. vesicatoria* species was demonstrated. With molecular methods such as the creation of pWG5 vectors, research has been done on the demonstrated ability of plants to limit bacterial infection. It has been shown that *X. euvesicatoria* is the causative agent of the tomato bacterial scab disease and that pathogenic strains of *Curtobacterium flaccumfaciens* represent an agricultural hazard.

Since she has a wonderful knowledge in the field of virology, Assist.-Professor Kizheva created the first laboratory collection of bacteriophages with the potential for biocontrol of plant diseases, e.g. of bacterial scab caused by *X. euvesicatoria* in vivo.

In the field of studying lactic acid bacteria, Dr. Kizheva is engaged in the development of methods for grouping and rapid identification of species. For the first

time, the lactic acid microflora of the gastrointestinal tract (GIT) of a garden snail and many fermented foods has been studied.

The research of Joana Kizheva in the field of cross-pathogens: human pathogens that adapt to life in plants without losing their virulence towards humans. The original scientific and applied contributions in this direction are the study of the prevalence of genetically determined antibiotic resistance and virulence among enterococci strains isolated from food, and on the other hand, the testing of new substances with potential as antibacterial agents, e.g. hemocyanin.

5. Participation in scientific forums and scientific contracts

Assist.-Professor Kizheva has presented a long list of participations in scientific forums. She has participated in 40 congresses, conferences, and seminars, with 34 plenary, oral and poster presentations. Of them – 19 abroad. She is the winner of scientific awards (for "Best Work of a Young Microbiologist" of the "Stephan Angeloff" Foundation in 2018) and first place for best posters at scientific conferences.

The candidate has a key role in the implementation and management of a large number of scientific projects - 18 in total, funded by the Scientific Research Fund, the COST Program, the National Plan for Recovery and Sustainability, the National Scientific Program "Healthy Foods for a Strong Bioeconomy and Quality of Life", "Young scientists and postdoctoral fellows" program of the Ministry of Education and Culture, etc.

6. Teaching work and administrative work

Parallel to his scientific activity, Ch. Associate Professor Ioana Kizheva intensively teaches students. She leads numerous courses in the Department of "General and Industrial Microbiology" for various specialties in the BF of SU: Microbiology, Microbiology and Virology, Microbiology and Microbiological Methods of Purification, Biological Hazards in Food, Microbial Metabolism, Metabolism of Prokaryotes, Food Microbiology, Microbiological Control of food and food products, Sanitary microbiology, Phytopathogenic bacteria, etc.

She is the supervisor of 22 MS and Batchelor's degree theses.

J. Kizheva is the Scientific secretary of the Department and a member of the Mandate Committee at the General Assembly of the Faculty of Biology, SU. He participates

in numerous committees and is responsible for the departments: "PhD students", "Scientific research activity" and "SDC". She is a guest editor at MDPI's journal Pathogens.

7. Conclusion

In conclusion, Dr. Yoana Kizheva, assistant professor, is one of the excellent scientists in the Department of General and Industrial Microbiology of the Faculty of Biology, SU. She has significant scientific achievements, but she is also indispensable as a teacher. She has an excellent knowledge of the problems he is working on and brings enthusiasm and sensitivity to particularly significant research for science and society. Based on the presented materials and analysis of the achievements, I give a completely POSITIVE assessment to the candidate and I strongly support the occupation of the academic position "Associate Professor" by Dr. Joana Krasimirova Kizheva.

20.10.2024 Signature:

(Prof. Penka Petrova, DSci)