

OPINION
by Prof. Iliya Nikolov Iliev, PhD,
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member of the scientific jury, according to the order of the rector of Plovdiv University No. PD-38-93/14.02.2024.
regarding the materials submitted for participating in the competition for occupying the academic position “Professor” in University of Sofia “St. Kliment Ohridski”,

In Area of higher education: 4. Natural Sciences, Mathematics and Informatics
Professional Field: 4. 3. Biological Sciences
scientific specialty Microbiology, for Department
of General & Applied Microbiology in Sofia University “St. Kliment Ohridski”

By order No. RD-38-93 of 14.02.2024 of the Rector of SU "St. Kliment Ohridski" I have been selected as a member of the scientific jury, in a competition for the academic position of "professor" at the Sofia University "St. Kliment Ohridski", by field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences (Microbiology - Antibacterial effect of nanomaterials). In the competition for "professor", announced in the Official Gazette no. 103 of 12.12.2024 and on the website of the Sofia University "St. Kliment Ohridski", as the only candidate participated Assoc. Dr. Iliyana Atanasova Ivanova from the Department of "General and Industrial Microbiology" of the Sofia University "St. Kliment Ohridski".

1. General overview of the procedure and the candidate

The set of materials (in electronic form) presented to me by Assoc. Dr. Iliyana Ivanova is in accordance with the ZRASRB and the Regulations for the Development of the Academic Staff of the Sofia University "St. Kliment Ohridski" and includes all necessary documents for participation in the competition.

The materials submitted by Prof. Dr. Iliana Ivanova for participation in the competition for the academic position of "professor" include a total of 22 publications (of which 15 were published in journals, referenced and indexed in global databases), 1 monograph, 1 chapter of book, 1 textbook, which were not used to acquire the ONS "doctor" and the academic positions "principal assistant" and "associate professor". Scientific works include 6 publications in journals with an impact factor of Q2; 8 publications in publications with an impact factor of Q3; 1 publication in a non-quartile journal and 1 book chapter, which are the result of the candidate's scientific activity after occupying the academic position of "associate professor".

Brief biographical data

Associate Professor Dr. Iliana Atanasova Ivanova graduated from higher education in 1986 with a Master's degree in "Biochemistry and Microbiology" from the University of St. Kliment Ohridski". Since 1986, he worked successively as a specialist-biologist and ecologist-biotechnologist at the Institute of Genetics and Algology of the Bulgarian Academy of

Sciences and the Department of "Plant Physiology" at the SU "St. Kliment Ohridski. Since 1997, he has held the academic positions of assistant (1997-1999), senior assistant (1999-2002), chief assistant (2002-2014). Since 2014, he has been an associate professor at the University of St. Kliment Ohridski".

The scientific activities presented by Prof. Ivanova correspond to the minimum national requirements for PN 4. 3. Biological Sciences.

For criterion A (min. 50 p.) - 50 points

In 1994, she obtained a doctorate from the National Academy of Sciences in the scientific specialty "Microbiology". on the topic "Microflora of the oil field "Tyulenovo" and possibilities for its practical application, before the Specialized Scientific Council for Microbiology, Virology and Immunology, specialty microbiology, code 06.01.12.

For criterion B (min. 100 p.) - 100 points

Presented monographic work Biological effects of nanomaterials, ISBN:978-954-9897-56-2, Amadeus Print, 2022; second edition - University Publishing House, 2023, Sofia, Bulgaria, 204 pages, which was not used to obtain the educational and scientific degree "Doctor" and to occupy the academic position "Docent".

For criterion G (min. 200 p.) – 255 points

Includes 6 publications in journals with an impact factor of Q2; 8 publications in publications with an impact factor of Q3; and 1 book chapter

For criterion D (min. 100 p.) – 314 points

Includes 157 citations in scientific publications, monographs, collective volumes and patents, referenced and indexed in world-renowned databases of scientific information (Web of Science and Scopus).

For criterion E (min. 150 p.) – 155 points

Assoc. Prof. Iliana Ivanova is the co-supervisor of a successfully defended doctoral student. He has participated in a total of seven projects. She published a textbook "Ecotoxicology and Nanotechnology" 2018 University Publishing House, 324 pages ISBN 978-954-07-4402-5.

2. General characteristics of the activity of candidate

Assoc. Dr. Iliana Ivanova actively participates and shares her knowledge and skills both in the conduct of scientific research in the department and the faculty, as well as in the training of students and doctoral students.

Scientific and scientific-applied results

1. The main scientific interests of the candidate are in the field of establishing the antimicrobial activity of nanomaterials and nanocomposites, including newly synthesized ones, and clarifying the molecular mechanisms of their action.

The scientific and scientific-applied contributions of Prof. Iliana Ivanova are on the topic of the competition, which I would summarize as follows:

In the presented monographic work, the emphasis is on the antimicrobial action of nanoparticles, one of the aspects of which is the possibility of inhibiting biofilm formation through surface modification. The potential advantages of nanomaterials as antimicrobial agents compared to antibiotics are discussed and the possibility of combining classical antibiotics with nanomaterials is discussed.

2. In the direction "Antimicrobial action of metal, metal oxide and non-metal newly synthesized nanomaterials", the candidate has defined contributions of theoretical and applied importance:

- Analysis of the antimicrobial effect of new nanomaterials and nanoparticles against Gram-positive (*S. aureus*, *S. epidermidis*, *B. cereus*), Gram-negative (*E. coli*, *S. enterica*, *P. putida*) bacteria and yeasts (*Candida*, *Saccharomyces*) and clarification of the mechanisms of antimicrobial action;

- Proving the pro-oxidant and antioxidant activity and cytotoxicity of the new nanomaterials;

3. In the thematic direction "Inhibition of adhesion and biofilm formation by nanocomposites, the following main contributions can be noted:

- New composites have been developed with the inclusion of the polysaccharide fucoidan and antioxidants in siloxane polymers, which have anti-adhesive properties and inhibit biofilm formation;

- Established the ability of the polysaccharide fucoidan to inhibit the growth of Gram-positive and Gram-negative bacteria on medical siloxane coatings of catheters and implants;

- Different antioxidants have been shown to change the surface characteristics in different ways, resulting in different effects on bioadhesion and bacterial growth.

4. In the thematic direction "Obtaining thin films with antimicrobial action", their antimicrobial activity against Gram-positive and Gram-negative bacteria and cytotoxic activity was analyzed. Complete inhibition of bacterial growth on TiO₂:Ag:Cu thin films was reported.

The developed thin films have potential for application as an antibacterial coating for various medical devices and surfaces.

Teaching activities

Assoc. Dr. Iliana Ivanova has extensive professional experience as a lecturer in microbiology at the Faculty of Biology of SU "St. Kliment Ohridski". Conducts lecture courses on the disciplines "General microbiology with virology", "Microbiology" (mandatory), "Bioethics", "Ecotoxicological tests for environmental control" (elective) in OCS "bachelor" and "Sanitary microbiology", "Physico-chemical and biochemical control" (mandatory) in the OCS "master".

She independently developed three new lecture courses - "Physico-chemical control of food and food products (45 hours; mandatory for the Master's program "Food Quality and Safety"); "Sanitary Microbiology" (30 hours; mandatory for the Master's program "Microbiology and Microbiological Control"); "Nanomaterials and interaction with cells" (30 hours; optional for PhD students from all Sofia University specialties).

Prof. Ivanova is the author of the textbook "Ecotoxicology and nanotechnologies" (224 pages) of the University Publishing House "St. Kliment Ohridski", which is intended for students from all majors of the Faculty of Biology of the SU.

Assoc. Dr. Ivanova is the supervisor of 12 graduates in the OCS "Bachelor" and OCS "Master" and co-supervisor of 1 doctoral student who successfully defended his defense in 2019. He is currently the scientific supervisor of an active doctoral student.

CONCLUSION

The documents and materials presented by Assoc. Prof. Dr. Iliana Atanasova Ivanova meet all the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the specific additional requirements of Sofia University "St. Kliment Ohridski", and the publications and scientific activities exceed the minimum national requirements for occupying the academic position of "professor". The candidate's works contain original scientific and applied contributions that have received international recognition through their publication in scientific journals and collections issued by international academic publishing houses. Undoubtedly, the very active teaching activity of Prof. Ivanova should also be added. Based on all of this, I give my positive assessment and support the candidacy of Assoc. Dr. Iliana Atanasova Ivanova for the academic position of "Professor" at Sofia University "St. Kliment Ohridski".

09.04.2024 г.

Plovdiv

Opinion issued by:

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