

OPINION

by Prof. Dr. Tsonko Dekov Tsonev, appointed according to Order No. RD-38-661/03.12.2024 of the Rector of Sofia University "St. Kliment Ohridski" as a member of the scientific jury

***Subject:* competition for the selection of Associate Professor in Biophysics, professional field 4.3. "Biological Sciences", according to the announcement in the State Gazette, issue 88 of 18.10.2024 with candidate chief assistant prof., Dr. Elitsa Lyubomirova Pavlova**

Ch. assistant prof. Dr. Elitsa Pavlova participates in the announced competition for "associate professor" as the only candidate. The submitted documents are in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and the Regulations on the terms and conditions for acquiring scientific degrees and occupying academic positions at Sofia University "St. Kliment Ohridski".

Brief biographical data and career development of the candidate

Dr. Elitsa Pavlova received the Master of Science degree in Biology with a specialization in "Cell Biology and Developmental Biology", as well as the Master of Science degree in Biology and Chemistry from Sofia University "St. Kliment Ohridski", Faculty of Biology in 2001 and 2002 respectively. In 2007, she received the scientific and educational degree "PhD" in the scientific specialty "Animal and Human Physiology" after a defended dissertation on the topic "Assessment of Biomarkers of Oxidative Stress" at Sofia University "St. Kliment Ohridski". Since 2005, she has been working at the Faculty of Physics of Sofia University "St. Kliment Ohridski" successively as a chemist, assistant, senior assistant and since 2011 she is a chief assistant in biophysics in the Department of "Optics and Spectroscopy". She specialized at Lenox Hill Hospital, New York, USA.

Research activity

The scientific activity of Dr. Pavlova is mainly focused on the study and evaluation of the pro- and antioxidant activity of various substances (plant extracts, chemical compounds and drugs) used for the prevention and treatment of various infectious diseases. The safety/toxicity of newly synthesized nanoparticles and nanomaterials has also been studied by evaluating their pro- and antioxidant activity and elucidating the mechanisms of their interaction with living systems, using various modern biophysical and biochemical methods. Dr. Pavlova is also actively involved in studies to evaluate on biomarkers about COVID, clarification on the mechanisms on disability at this disease and prevention on complications.

As a result of the research, in which Chief Assistant Professor Dr. Elitsa Pavlova participated, a number of scientific and methodological contributions have been achieved. Some of them are related to the important medical problem of the therapy of influenza virus infection, as well as other viral diseases. A synergistic effect has been shown in the antiviral and antioxidant action of a combination of oseltamivir, isoprinosine and ellagic acid in the therapy of influenza. It has been established that the triple combination significantly improves survival, reduces lung pathology and oxidative stress compared to monotherapy and double combinations. The preventive effect of polyphenolic extract of red geranium on drug metabolism has been assessed, which confirms the possibility of using the extract in therapy and modulation of drug metabolism during influenza virus infection.

Of the studies related to the assessment of the safety or toxicity of various nanomaterials and nanoparticles, the most significant, in my opinion, are the established bactericidal effect of nanocomposite thin layers of $\text{TiO}_2\text{:Cu}$ on the bacterium *Pseudomonas putida*, which suggests potential applications of the studied nanomaterial for antibacterial coatings in medical practice. In studies of the prooxidant and antimicrobial activity of nanoparticles of iron (Fe_3O_4) and titanium oxide (TiO_2), it was found that Fe_3O_4 has strong antioxidant properties, while TiO_2 exhibits a moderate prooxidant effect under neutral and alkaline conditions, and the combination with talcarypine enhances antibacterial activity against gram-positive and gram-negative bacteria. It has also been shown that graphene composites with added ZnO and Cu demonstrate strong antibacterial activity against *Escherichia coli* and *Staphylococcus epidermidis*, while composites with ZnO and Ag show stable antioxidant properties at physiological pH.

Scientific publications and scientometric indicators

According to the submitted documents and the additional explanations requested by the jury, Chief Assistant Professor Pavlova meets the minimum requirements of the Law on Academic Affairs of the Republic of Bulgaria and the Regulations for its implementation for holding the academic position of "associate professor".

Regarding indicator B.4. Scientific publications in publications that are refereed and indexed in world-renowned databases of scientific information, the candidate in the competition has submitted 7 scientific articles (1 of them is in a journal with Q1, 3 with Q2 and 1 with Q4; 2 are in journals with SJR), published in the period 2018-2020. In 3 of these publications, Dr. Pavlova is the first author, and the points from her publications cover the necessary legal requirements - 117 points, with a minimum required of 100 points.

To meet the requirements under indicator D, 13 scientific articles published in the period 2020-2024 were submitted. Of these, 5 are with Q1, 3 are with Q2, 4 with Q3 and 1 with SJR. In 5 of these publications, Ch. Asst. Prof. Pavlova is the first author. The total sum of the points on the indicators in group D of the candidate is 255 points with a required

minimum of 200 points, according to the requirements of the Regulations for the implementation of the law on the development of the academic staff in the Republic of Bulgaria for holding the academic position of "associate professor".

The total number of citations of Chief Assistant Professor Elitsa Pavlova, according to the reference she submitted, is 341. For the competition for associate professor, the candidate has submitted 147 citations. (Scopus), thus meeting the requirements in group D.

Results of the candidate's research have been presented in 60 poster and oral presentations at national and international scientific forums. Ch. Asst. Prof. Dr. Pavlova has an active participation in competitively funded research projects: leader or participant in a total of 19 national and international scientific projects. In group E of project participation, she collects 167 points.

Teaching and learning activities

Ch. Asst. Prof. Dr. Elitsa Pavlova has the necessary teaching and learning workload, which according to the attached report for the last five years amounts to an average of 546.2 hours of total and 507.3 hours of classroom work per year. She has been a scientific supervisor or consultant to 12 successfully graduated graduates from the Faculty of Physics and two from the Faculty of Chemistry of Sofia University "St. Kliment Ohridski".

Note: I recommend that the candidate fill out the evidence tables more precisely so that additional clarifications are not required.

Conclusion:

The analysis of the presented materials allows me to make a reasoned conclusion that Ch. Asst. Prof. Dr. Elitsa Pavlova is a well-established scientist, working in a relevant field of modern science, such as biophysics. Dr. Pavlova has presented creative materials of sufficient volume and content that meet all the requirements of the LDASRB, the Regulations for its implementation and the Regulations of the Sofia University "St. Kliment Ohridski", for participation in a competition for associate professor. All this gives me reason, as a member of the Scientific Jury of the competition, to give a POSITIVE assessment of her candidacy and to confidently recommend to the Scientific Jury and the Scientific Council of the Biological Faculty to vote positively for the election of Ch. Asst. Prof. Dr. ELITSA LYUBOMIROVA PAVLOVA to the academic position of "ASSOCIATE PROFESSOR" in the scientific specialty of Biophysics.

10.02.2025
Sofia

Signature:
/Prof. Dr. Tsonko Tsonev/