

OPINION

by

Assoc. Prof. Mariela Todorova Chichova, PhD, Faculty of Biology, Sofia University "St. Kliment Ohridski" – a member of the scientific panel, appointed by the order of the Director of Institute of Biophysics and Biomedical Engineering-BAS № 749/17.09.2025

on

a competition for holding the academic position "Associate Professor" in the Professional Area 4.3. Biological Sciences (Biophysics), announced in the State Gazette №. 58/18.07.2025, for the needs of the Department of Electroinduced and Adhesive Properties at the Institute of Biophysics and Biomedical Engineering-BAS

The competition for holding the academic position "Associate Professor" in the Field of Study in Higher Education 4. Natural Sciences, Mathematics and Computing, Professional Area 4.3. Biological Sciences (Biophysics) is announced for the needs of the Department of Electroinduced and Adhesive Properties at the Institute of Biophysics and Biomedical Engineering (IBFBME)-BAS in the State Gazette № 58/18.07.2025. Documents of **one candidate – Ch. Ass. Prof. KAMELIA TODOROVA HRISTOVA-PANUSHEVA, PhD**, have been submitted within the period regulated by the law. Currently, she works on a permanent employment contract at the same department.

A complete set of documents is presented, prepared in accordance with the requirements of the Low on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Rules for its implementation and the Rules for its implementation at the IBFBME.

1. GENERAL INFORMATION ABOUT THE CANDIDATE

1.1. EDUCATION

The candidate Kamelia Hristova-Panusheva is a graduate of the Faculty of Biology at Sofia University "St. Kliment Ohridski", where she obtained a bachelor's degree in Biology in 2003, and a master's degree in Cell Biology and Pathology in 2005. She was awarded PhD degree in Biophysics from the IBFBME in 2011 after successfully preparing and defending a doctoral dissertation on the topic "Modulated interaction of osteoblast cells with hidroxyapatite materials". During the period 2007-2009 she participated in three doctoral specializations at Martin Luther University, Halle, Germany and the Institute of Bioengineering of Catalonia, Barcelona, Spain.

1.2. PROFESSIONAL CAREER

Kamelia Hristova-Panusheva's research career has begun in 2005 in the Department of Cell Adhesion at the Institute of Biophysics-BAS as an assistant, after which she was enrolled as a full-time doctoral student in the Department of Electroinduced and Adhesive Properties at the IBFBME-

BAS. During the period 2010-2012, she was an assistant in the same department, where she has held the position of chief assistant since 2012. To date, Kamelia Hristova-Panusheva has over 16 years of work experience in the field of biophysics. The candidate's education and professional realization are thematically related to the announced competition.

2. EVALUATION OF THE MATERIALS PROVIDED FOR PARTICIPATION IN THE COMPETITION

2.1. RESEARCH ACTIVITY

In the current competition for the academic position “Associate Professor”, Ch. Ass. Prof. Kamelia Hristova-Panusheva has presented 20 scientific papers – 19 articles refereed and indexed in world-renowned databases of scientific information (Scopus and Web of Science) and 1 chapter of a book (Elsevier Publishing House). Of the included articles, 12 are with IF (total IF 39.893; *h*-index 5 (Scopus)), and their distribution by quartiles is as follows: Q1 – 9, Q2 – 1, Q3 – 2, Q4 – 2, and in journals with SJR, without IF – 5.

Ch. Ass. Prof. Kamelia Hristova-Panusheva has also submitted a separate list of publications on the topic of her dissertation work, which are not included in the materials on the current competition.

The reference in Scopus at the time of documents evaluation has shown an *h*-index 6 and a total of 170 citations of the candidate's scientific publications, excluding self-citations. A list of 50 citations has been submitted for the current competition.

Ch. Ass. Prof. Kamelia Hristova-Panusheva has participated in 6 scientific projects and over 15 scientific forums with oral and poster presentations.

2.2. COMPLIANCE WITH THE MINIMUM NATIONAL REQUIREMENTS FOR HOLDING THE ACADEMIC POSITION “ASSOCIATE PROFESSOR”

The reference on the compliance with the minimum national requirements of the LDASRB for Field of Study in Higher Education 4. Natural sciences, Mathematics and Informatics, Professional Area 4.3. Biological Sciences, shows the following quantitative indicators:

- A.** Dissertation work for the award of PhD degree – **50 p.** (minimum required – 50 p.);
- B.** Habilitation work – scientific publications in editions referenced and indexed in databases with scientific information (Web of Science and Scopus) – 5 publ. Q1 (25 p.; B4.1-B4.5); total **125 p.** (minimum required – 100 p.);
- G.** Scientific publications in editions referenced and indexed in databases with scientific information (Web of Science and Scopus) beyond the habilitation work – 4 publ. Q1 (25 p.; G7.1, G7.9, G7.11, G7.14); 1 publ. Q2 (20 p.; G7.5); 2 publ. Q3 (15 p.; G7.6, G7.7); 2 publ.

Q4 (12 p.; G7.12, G7.13); 5 publ. in editions with SJR without IF (10 p.; G7.2-G7.4, G7.8, G7.10); 1 chapter of a book – 15 p.; total **239 p.** (minimum required – 220);

D. Citations in scientific journals referenced and indexed in databases with scientific information (Web of Science and Scopus) – 50 citations excluding self-citations (Scopus); total **100 p.** (minimum required – 60).

The presented scientific metric data completely fulfil and even exceed the minimum national requirements of the LDASRB, the Rules for its implementation and the Rules for its implementation at the IBFBME for holding the academic position "Associate Professor".

2.3. MAIN SCIENTIFIC CONTRIBUTIONS

The contributions of the research activity of Ch. Ass. Prof. Kamelia Hristova-Panusheva, PhD, are of fundamental and applied nature with a focus on the effects of nano- and biomaterials on various cell lines. The main contributions can be summarized as follows:

- Increased biocompatibility of graphene oxide (GO) nanoparticles modified with polyethylene glycol (GO-PEG) has been demonstrated. Irradiation of both types of nanoparticles with a constant-wavelength near-infrared laser has been shown to enhance their overall cytotoxic effects. Data on the effects of these nanomaterials on isolated animal organs, the activity of liver enzymes, and the expression of genes related to apoptosis and cell cycle regulation have also been obtained. [B4.4, B4.5]
- Synergistic effects have been established upon low-intensity femtosecond laser irradiation of GO-PEG and ultrasmall gold nanoparticles, which enables selective cytotoxicity against normal and cancer cells. Data have been obtained that this irradiation enhances the photothermal efficiency of PEG-modified graphene oxide compared to pure GO. [B4.1, B4.2]
- Methods for obtaining and optimizing biomaterials' coatings have been developed, and their biological response in controlling cell adhesion, growth, function and differentiation has been evaluated [G7.2-G7.4, G8.1]. The influence of the mechanical properties of new composite coatings on osteogenic and myogenic differentiation has been studied [G7.5, G7.6, G7.11].
- The effect of GO amination on the mechanisms of cytotoxicity in cancer and normal cells [G7.7, G7.8, G7.9] and on interactions with cellular organelles [G7.13] has been studied.
- The biocompatibility of TiN/TiO₂ multilayer coatings deposited on stainless steel has been confirmed [G7.10]. The safety of a total ethanol extract of *Haberlea rhodopensis* Friv. *in vitro* culture for therapeutic application in cosmetics has been demonstrated by *in vitro* evaluation [G7.14]. Data have been obtained for two novel plant cystatins, dgECP1 and its mutant dgECP1m1, showing their potential to modulate cell adhesion and inhibit cancer metastasis [G7.12].

- The effects of the inhalation anesthetic halothane on the adhesion contacts of lung cells have been studied with the aim of elucidating its mechanisms of action [G7.1].
- Literature data on present anti-tumor therapies based on targeted delivery of anticancer drugs through their incorporation into various types of nanomaterials have been systematized [B4.3].

3. CRITICAL NOTES AND RECOMMENDATIONS

I have no comments or recommendations regarding the materials submitted for the competition and the candidate's research activities.

CONCLUSION

The comprehensive assessment of the materials submitted for the current competition shows that all formal requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its implementation and the Rules for its implementation at the Institute of Biophysics and Biomedical Engineering-BAS have been fulfilled. In terms of volume, content and quality, the scientific output of the candidate meet and even exceed the minimum national requirements for acquiring the academic position "Associate Professor".

This gives me reason to confidently support the candidacy and with conviction to recommend to the esteemed members of the Scientific panel to vote positively for Ch. Assistant Professor Kamelia Todorova Hristova-Panusheva to hold the academic position of "Associate Professor" in the Field of Study in Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Area 4.3. Biological Sciences (Biophysics).

18.11.2025 r.

Signature:



/Assoc. Prof. Mariela Chichova, PhD/