

OPINION

n the competition for the academic position of “Professor” in Professional Field 4.6 “Informatics and Computer Sciences”, Scientific Specialty “Informatics (Informatics Tools in Biomedicine)”

The opinion has been prepared by **Prof. Evdokia Nikolaeva Sotirova, PhD**, Burgas State University “Prof. Dr. Asen Zlatarov”, in my capacity as a member of the Scientific Jury appointed by Order No. 695 of 15 July 2026.

1. General Overview of the Procedure and the Candidate

The competition for the academic position of “Professor” in Professional Field 4.6 “Informatics and Computer Sciences”, Scientific Specialty “Informatics (Informatics Tools in Biomedicine)”, was announced in the State Gazette, Issue No. 54 of 12 June 2026, for the needs of the Section of “Bioinformatics and Mathematical Modelling” at the Institute of Biophysics and Biomedical Engineering of the Bulgarian Academy of Sciences (IBPhBME–BAS).

Only one candidate submitted documents for participation in the competition - **Assoc. Prof. Lyudmila Pavlova Todorova, PhD**, from the Institute of Biophysics and Biomedical Engineering of the Bulgarian Academy of Sciences (IBPhBME–BAS).

Assoc. Prof. Lyudmila Todorova, PhD, holds a Master's degree in Engineering in “Automation and Telemechanics” from the Technical University of Sofia. Following the successful defence of her doctoral dissertation entitled “A System for Assessing the Condition of Patients During Weaning from Prolonged Mechanical Ventilation”, she was awarded the educational and scientific degree of “Doctor” (Higher Attestation Commission, Diploma No. 31056/02.02.2007). Her professional career has been consistently associated with research institutions of the Bulgarian Academy of Sciences. Since 2011, she has held the academic position of Associate Professor at IBPhBME–BAS (Certificate No. 000053/22.11.2011). Her scientific expertise combines informatics, mathematical modelling, statistical analysis, and biomedical applications.

According to the submitted habilitation report, the overall scientific output of Assoc. Prof. Lyudmila Todorova comprises **110** scientific publications, including **78** articles in peer-reviewed journals and **32** full-text conference papers published in proceedings.

A total of **34** scientific publications, all co-authored, have been submitted for the present competition. The publications are relevant to the scientific scope of the competition and have not been used in previous procedures for obtaining the educational and scientific degree of “Doctor” or for appointment to the academic position of “Associate Professor”. Of these, **16** are publications in journals with an impact factor, distributed by quartile as follows: **3** in Q1 and **13** in Q4; **11** are publications in journals or other scientific outlets with a SJR.

A total of **598** citations, excluding self-citations, have been reported for her overall scientific activity, including **520** citations to the publications submitted for the present competition. These indicators demonstrate sustained publication activity, considerable scientific interest in the research conducted, and good recognition of the results within the scientific community. *h-индексът* на кандидатката е **6** в базата данни Scopus (без самоцитирания) и **5** в Web of Science.

2. Compliance with the Requirements for the Academic Position

According to the submitted report on the fulfilment of the required indicators, the candidate has achieved the following results: Group A: **50** points out of the required 50; Group B: **144** points

out of the required 100; Group C: **248** points against the institutional requirement of 220; Group D: **2184** points out of the required 120; and Group E: **190** points out of the required 150.

The candidate also meets the specific requirements of IBPhBME-BAS, including at least **15** publications in journals with an impact factor and the successful supervision of at least one doctoral student who has defended their dissertation.

Based on the submitted materials, I consider that Assoc. Prof. Lyudmila Todorova, PhD, meets the minimum national requirements and the specific institutional requirements for the academic position of „Professor”, significantly exceeding the required minimum thresholds in several groups of indicators.

3. Evaluation of the Candidate’s Scientific and Applied Scientific Contributions and Academic Activities

The scientific activities of Assoc. Prof. Lyudmila Todorova, PhD, cover several clearly defined research areas.

(1) Significant contributions have been made in research related to the theory of intuitionistic fuzzy sets, including the introduction of new orderings, relations, and operators, as well as approaches for evaluating the information contained in Kaplan–Meier curves. These results contribute to the extension of the mathematical framework for processing uncertain and incomplete information, which is characteristic of biomedical data.

(2) Another important research area is the development and application of InterCriteria Analysis. New algorithms and modifications have been proposed for evaluating similarities and dependencies among multiple criteria. The scientific contribution lies in improving analytical tools for multicriteria data processing and comparing the obtained results with traditional statistical approaches. I positively assess the validation of the proposed methods using real medical data.

Significant applied scientific results have been achieved through the development and application of models and methods for supporting clinical decision-making in the fields of neurology, neurosurgery, ophthalmology, urology, and intensive care medicine. Research focused on assessing and predicting the condition of patients with multiple sclerosis, analysing complications associated with ventricular shunts, and modelling the process of weaning from mechanical ventilation demonstrates the interdisciplinary nature of the scientific activities. The developed generalized net models provide a basis for the formal description and subsequent software implementation of diagnostic and rehabilitation procedures.

From a practical perspective, the candidate’s participation in the development of the Rila CogniSoft computer system for the assessment and rehabilitation of cognitive impairments in patients with multiple sclerosis is particularly noteworthy. According to the submitted materials, a new methodology for diagnosis and rehabilitation, along with approaches for evaluating neuropsychological outcomes, has been developed and integrated into a system that has undergone pilot implementation, testing, and validation. I positively assess the focus on the practical implementation of scientific results and their potential application in clinical practice.

The research activities of Assoc. Prof. Lyudmila Todorova, PhD, are further complemented by her participation in two projects under the Operational Programme “Innovation and Competitiveness”, involvement in four research contracts funded by the National Science Fund (with coordination responsibilities in one of them), and participation in three bilateral scientific cooperation agreements. These project activities contribute to collaborative interdisciplinary research and the practical application of scientific results.

The candidate’s academic activities include the supervision of one doctoral student who successfully defended their dissertation in Professional Field 4.6 “Informatics and Computer Sciences” (2018–2024), as well as reviewing scientific publications, doctoral dissertations, and

applications in competitions for the academic position of “Associate Professor”. Participation in 53 scientific conferences and forums has also been reported, further demonstrating her overall scientific and academic activity.

I consider the scientific and applied scientific contributions of Assoc. Prof. Lyudmila Todorova, PhD, to be significant and relevant to the subject area of the announced competition. They combine the development of theoretical methods, the design and improvement of algorithms, and their application to solving specific biomedical problems. I particularly appreciate the connection between theoretical research, the analysis of real clinical data, and the development of practically applicable computer-based solutions.

4. Recommendations

As a recommendation for future research activities, I consider it beneficial to expand the independent validation of the developed methods and software solutions using external clinical datasets.

Some inaccuracies have been identified in the submitted materials, including inconsistent values of the h-index reported for the Scopus database.

These remarks are constructive in nature and do not affect my positive assessment of the candidate’s scientific and applied scientific activities.

5. Conclusion

Based on the analysis of the submitted documents and scientific publications, I positively assess the research and applied scientific activities of Assoc. Prof. Lyudmila Pavlova Todorova, PhD. The candidate has an established professional career in the fields of informatics and mathematical modelling, a significant publication record and citation impact, scientific results with practical applications in biomedicine, participation in research projects, and proven experience in training young researchers. The submitted materials demonstrate compliance with the minimum national requirements and the specific institutional requirements for the academic position of “Professor”. During my review of the submitted scientific publications and competition materials, I found no evidence of plagiarism or improper use of other researchers’ scientific results.

Based on the above, I give a **positive opinion** and recommend that the Scientific Jury propose the appointment of Assoc. Prof. Lyudmila Pavlova Todorova, PhD, to the academic position of “Professor” in Professional Field 4.6 “Informatics and Computer Sciences”, Scientific Specialty “Informatics (Informatics Tools in Biomedicine)”, for the needs of the Section of “Bioinformatics and Mathematical Modelling” at the Institute of Biophysics and Biomedical Engineering of the Bulgarian Academy of Sciences (IBPhBME-BAS).

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Prepared by:...

(Prof. Evdokia Sotirova, PhD)