OPINION

by Assoc. Prof. Dr. Maria Hristova Petrova,
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Regarding: Competition for the academic position of "Associate Professor" at the Institute of Molecular Biology "Acad. Rumen Tsanev", BAS (IMB-BAS), announced in the State Gazette No. 24/21.03.2025.

By Order No. 64-OB/31.03.2025 of the Director of IMB-BAS, I was appointed as a member of the scientific jury in connection with a competition for the academic position of "Associate Professor" at the same institute in the professional field 4.3. Biological Sciences, scientific specialty "Molecular Biology", for the needs of the section "Regulation of Gene Activity".

At the first meeting of the scientific jury, held on 18.06.2025, I was assigned to prepare an opinion on the procedure.

For participation in the announced competition, documents were submitted by a single candidate – Assistant Professor Kiril Todorov Kirilov, PhD.

All required documents according to the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), as well as by the Regulations for its implementation at IMB-BAS. The presence of all the necessary documents and the holding the academic position of "Assistant Professor" since 2011 makes the candidate legitimate for participation in the announced competition.

Brief Biographical Data

- In 2001, Dr. Kirilov received a Master's degree in Biotechnology Engineering from the University of Chemical Technology and Metallurgy, Sofia.
- In 2014, he obtained a Ph.D. in Molecular Biology, field 4.3. Biological Sciences, from IMB-BAS, with a dissertation titled "Codon Usage in Bacteria and Animal Mitochondria," supervised by Corresponding Member Prof. Ivan Ivanov.
- Between 2007 and 2022, he consecutively held positions as specialist, research associate III rank, and assistant professor at IMB-BAS.

- From 2022 to 2024, he was an assistant professor at New Bulgarian University, Department of Natural Sciences, Faculty of Undergraduate Studies.
- Since the beginning of 2025, he has once again held the position of assistant professor at IMB-BAS.
- The candidate has completed two international specializations: in 2003 in bioinformatics at the International Centre for Genetic Engineering and Biotechnology, Trieste, Italy, as well as in 2013 at Carleton University, Ottawa, Canada.
- Dr. Kirilov was the coordinator of the FEBS Advanced Lecture Course "Sofia School of Protein Sciences: Structure and Dynamics of Biological Macromolecules."

Scientometric Indicators and Compliance with LDASRB Regulations

According to the documents provided by the candidate, his scientific activity includes co-authorship in 25 scientific publications indexed in Scopus/Web of Science, with a total impact factor of 45.3 (Web of Science) and 91 citations (Scopus).

For this competition, he has submitted 12 of these, distributed as follows: Q1 – 4, Q2 – 2, Q3 – 5, one unclassified, along with 3 book chapters and 2 patents.

According to the candidate's CV, he has participated in 5 national research projects (4 completed and 1 ongoing).

The table below presents the compliance of Dr. Kirilov's scientometric indicators (groups A–E) with the national minimum requirements, adjusted for BAS:

Indicator Group	Minimum Required Points	Candidate's Points
A	50	50
B	100	100
C	200 (220 for BAS)	220
D	50 (60 for BAS)	60
E	Not required	50
Total	430	480

As can be seen from the table, the candidate fully meets the required number of points according to the LDASRB regulations of BAS and in particular of IMB-BAS.

Scientific and Applied Contributions

The candidate's main contributions from the submitted publications can be attributed to the following research areas:

- **Integration of computational bioinformatics methods in drug discovery research** – The publications emphasize the importance of molecular modeling, structural docking, quantum-chemical calculations, and virtual screening as drivers of innovation in discovering new active molecules, reducing costs and time. These *in silico* tools are essential in the development of new pharmaceuticals and nutraceuticals.
- **Codon usage and context analysis in prokaryotic and mitochondrial genomes** – The research includes the development and public dissemination of specialized bioinformatics tools such as Gene Triplet Analysis (GTA). Large-scale codon usage analyses reveal key similarities and differences among bacterial groups and gene types, contributing to understanding gene expression regulation and evolutionary mechanisms. Experimental findings confirm the influence of codon pairs on translational efficiency, offering new strategies for gene engineering. All data and tools are freely available, supporting future applications in synthetic biology and biotechnology.
- **Development of a new algorithm and software tool for automated analysis of DNA fiber labeling images** – The application offers both automatic ("factory mode") and manually adjustable modes with configurable user profiles, ensuring flexibility and reproducibility across experimental setups. It is free, cross-platform, and independent of commercial software.
- **Research contributions on glycation and related biochemical processes in *Escherichia coli* and *in vitro* systems** – The work reveals new enzymatic functions and biochemical regulators, establishing *E. coli* as a model for glycation-related aging. These findings enhance understanding of molecular mechanisms of protein damage, cellular homeostasis, and identification of potential therapeutic targets.
- **Patent contributions include the development of a training kit for chemistry and environmental education in Bulgarian schools** – The kit aims to facilitate the learning process, improve educational quality, and spark student interest. It includes chemical reagents, lab equipment, and a manual, with versions for both basic mandatory experiments and extended learning.

Teaching Activity

Dr. Kirilov has taught Bioinformatics course in several faculties of the Technical University of Sofia (Faculty of Computer Systems and Control, Faculty of Applied Mathematics and Informatics, English and German Engineering Education Faculties), as well as a course in Bacterial Genetics and over 10 other biology-related courses at New Bulgarian University in Sofia. *This demonstrates his ability not only to develop but also to effectively deliver a variety of courses, adapting content to the needs and interests of diverse student audiences.*

CONCLUSION

After reviewing the submitted documents and conducting a thorough analysis, I confirm that Dr. Kiril Kirilov's scientific achievements and scientometric indicators meet the requirements of the LDASRB, the respective application regulations, and the internal rules of IMB-BAS for occupying an academic position in the relevant scientific field and professional area. Based on the above, I recommend that the scientific jury support Dr. Kirilov's selection to the position of "Associate Professor" at IMB-BAS.

Data: August 5, 2025

Prepared by:

(Assoc. Prof. Maria Petrova, PhD)