OPINION

by **Professor Genoveva Atanasova Nacheva** PhD, Institute of Molecular Biology – Bulgarian Academy of Sciences

Regarding: the competition for the academic position of ***Associate Professor*** in professional field 4.3. Biological Sciences, specialty ***Molecular Biology***, announced for the needs of the Section *Regulation of Gene Activity* at the Institute of Molecular Biology "Roumen Tsanev" at BAS

Dr. Rositsa Georgieva Tsekovska is the sole candidate in the competition, announced in State Gazette No. 66/12.08.2025. The documents have been prepared in accordance with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and its Implementing Regulations.

Brief Biographical Data

Rositsa Tsekovska obtained her Master's degree as a chemical engineer in 1999 at the University of Chemical Technology and Metallurgy (UCTM). In 2005 she defended her doctoral dissertation as a part-time PhD student at the Section *Regulation of Gene Activity* at IMB-BAS, on the topic *"Non-enzymatic glycosylation of proteins in Escherichia coli"*. Following this, she was appointed as Senior Assistant Professor (Research Associate II rank) in the same section, where she continues to work to this day.

Scientometric Indicators, Research Areas, and Contributions

Dr. Tsekovska participates in the competition with 19 publications, which are beyond the five publications included in the abstract of her doctoral dissertation. Of these, 16 articles have been published in journals indexed in JCR (or SJR) with a total impact factor of **53.138**, reported according to the year of publication by Thomson Reuters, as well as 3 book chapters. The candidate's works have been cited **168 times** in international journals indexed in Web of Science and/or Scopus. In 8 of the works submitted for the competition, Tsekovska is the first author, which demonstrates her leading role.

To date, Tsekovska has published a total of 27 papers and has an h-index of 7. The results of her research have been presented through posters or oral communications at 23 international scientific forums.

In terms of thematic scope, the publications of Senior Assistant Professor Tsekovska fully correspond to the specialty *Molecular Biology* of the present competition. Her entire scientific career to date has taken place at IMB-BAS, which has enabled her to work and develop within a clearly defined scientific direction, beginning with her dissertation and continuing to the present, namely the processes of non-enzymatic glycosylation, or the Maillard reaction. After establishing the reaction in prokaryotes, Tsekovska expanded her research to the products of prokaryotes, their proteins and nucleic acids, as well as the role of the process in human physiology. Within this field, the following **original scientific contributions** can be distinguished:

1. Establishing the role of non-enzymatic glycosylation on the structure and function of recombinant human interferon-gamma (rhIFN-γ) and identifying approaches for

its suppression (publications 16, 13, 14). Evidence was obtained that the process leads to aging in prokaryotes, both in the exponential and stationary phases, due to endogenous bacterial glycation agents (publications 19, 15, and 20), and that the enzyme phosphoglucose isomerase of *E. coli* exhibits deglycating activity (publications 3 and 5).

2. Regarding the role of non-enzymatic glycosylation in human health, it has been shown that in patients with chronic kidney disease, serum levels of N^{ε}-carboxymethyl(lysine) (CML), one of the main advanced glycation end-products, are higher than in patients with type 2 diabetes mellitus (publication 1).

In connection with this research direction in Tsekovska's work, the following **confirmatory contributions** can be highlighted:

1. On model animal proteins, it has been demonstrated that oxidative stress acts as a modulating factor for non-enzymatic glycosylation (publications 17 and 18).
2. The anti-glycation properties of acetylsalicylic acid, aminoguanidine, arginine, thiamine, pyridoxine, pyridoxal 5'-phosphate, pyridoxamine, resveratrol, theophylline, xanthine, theobromine, and hypoxanthine have been confirmed, as well as the ability of arginine to inhibit glycation and protein aggregation (publications 6, 7, 13, and 14).
3. The biomarker potential of CML in patients with chronic kidney disease and of fructosamine in patients with diabetic nephropathy has been confirmed (publications 1 and 2).

To this scientific direction of Dr. Tsekovska, albeit somewhat tangentially, can also be attributed her studies on allenic acids and the demonstration of their function as DNA nucleases (publication 8). In my opinion, these results represent an **original scientific contribution**.

A new line of research in the candidate's work is the development and application of reliable strategies for grouping and risk assessment of nanomaterials. In this field, she has published 4 papers (publications 4, 9, 11, and 12), all in Q1 journals.

From the analysis of Dr. Tsekovska's works, it can be concluded that she has accumulated substantial experimental experience and scientific erudition.

Project Activity

In addition to her extensive experience in experimental and research work, the candidate also has experience in leading a scientific project funded by the National Science Fund (NSF), through which significant financial resources were attracted. After defending her doctoral dissertation, she participated in three more research projects, one of which was funded by the European Union.

Teaching Activity

Tsekovska has served as a consultant for the diploma thesis of one student from Sofia University "St. Kliment Ohridski."

Compliance with the Law on the Development of the Academic Staff in the Republic of Bulgaria and its Implementing Regulations

In the table below, I have presented the compliance of Dr. Tsekovska's group of indicators from A to E with the national minimum requirements, adjusted for BAS under indicators G and D. As can be seen from the table, the total number of points of the candidate exceeds almost twice the required minimum. This is due to the overall scientific, applied research, and project activity of the candidate. Although points under indicator E are not required for the academic position of *Associate Professor*, they are indicative of the candidate's activity and contributions in the development of scientific projects.

Group of Indicators	**Minimum Required Points**	**Candidate's Points**
A	50	50
B	100	107
C	200 (220 for BAS)	225
D	50 (60 for BAS)	336
E	–	120
Total	**400**	**838**

Conclusion: From the submitted documents it is evident that the overall scientific output of the candidate, her scientific contributions, and her experience in attracting funding for research fully meet the requirements of to the Law on the Development of the Academic Staff in the Republic of Bulgaria and the criteria for acquiring the academic position of *Associate Professor* at the Institute of Molecular Biology, BAS, in professional field 4.3. Biological Sciences, specialty *Molecular Biology*. Through her scientific works, Dr. Rositsa Georgieva Tsekovska demonstrates high creative potential, extensive research experience, and original scientific thinking, all of which are essential for an independent scientific career. Taking all of this into account, I will confidently vote in favour of awarding Dr. Tsekovska the academic position of *Associate Professor*.

Sofia, 14.11.2025 Signature:

/Prof. G. Nacheva/