OPINION

on a competition for the academic position of "Professor"
at the Institute of Molecular Biology "Academician Rumen Tsanev" – Bulgarian Academy of Sciences (IMB-BAS),
professional field 4.2 Chemical Sciences,
scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Biologically Active Substances", announced in State Gazette No. 114/24.12.2025

by Prof. Silvia Emilova Angelova, PhD, Institute of Optical Materials and Technologies "Acad. J. Malinowski" – Bulgarian Academy of Sciences, member of the scientific jury, appointed by Order No. 47-OB/27.01.2026 of the Director of IMB-BAS

In the competition announced in the "Biochemical Pharmacology and Drug Design" department of IMB-BAS for the academic position of "Professor" in professional field 4.2 Chemical Sciences, scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Biologically Active Substances", one candidate applied — Assoc. Prof. Nikolay Tzvetkov Tzvetkov, PhD.

The documents submitted by the candidate on electronic media are in compliance with the requirements of the Development of the Academic Staff in the Republic of Bulgaria Act (DASRBA) and the Regulations for the Implementation of DASRBA at IMB-BAS. Assoc. Prof. Nikolay Tzvetkov is registered in the Register of Academic Staff in the Republic of Bulgaria, maintained by the National Centre for Information and Documentation (https://ras.nacid.bg/dissertation-preview/47431), where there is information on his PhD degree acquired abroad and recognized by IMB-BAS, as well as his current academic position of "Associate Professor" at IMB-BAS. Assoc. Prof. Nikolay Tzvetkov has been working at IMB-BAS since 2017, having held the position of "Assistant" for a brief period (October 2017 – June 2018) and "Associate Professor" from July 2018. Prior to joining IMB-BAS, during the period 2000–2017, he held positions at Bielefeld University, Germany, where he defended his dissertation for the PhD degree in 2005, on the topic: "Photoreaktionen tricyclischer Cyclopropylketone: Aufbau von Polyquinanen und analoger Ringsysteme" ("Photoreactions of Tricyclic Cyclopropyl Ketones: Construction of Polyquinanes and Analogous Ring Systems").

Assoc. Prof. Nikolay Tzvetkov is a co-author of 101 publications, of which 59 were published in the period 2020–2025. He has participated in 30 filed (13 granted) patent applications with international (WIPO, EPO, and others) and national patent offices (USPTO, DPMA, CNIPA, etc.). In the current competition, he participates with 20 scientific works published in peer-reviewed and indexed journals with an impact factor, which are outside his PhD dissertation and were published after taking up the academic position of "Associate Professor." The citations of these 20 publications exceed 312. In total, across all of the candidate's publications, over 6,000 citations have been recorded (according to *Scopus*). He is a co-author of

a publication cited over 4,500 times — Atanasov, A.G., Zotchev, S.B., Dirsch, V.M. et al. Natural products in drug discovery: advances and opportunities. *Nat Rev Drug Discov* 20, 200–216 (2021). The Hirsch index (h-index) of Assoc. Prof. Nikolay Tzvetkov, according to *Scopus* data, is 25. Results from scientific research conducted with his participation have been presented at a total of 62 scientific forums. Assoc. Prof. Nikolay Tzvetkov has participated in international scientific projects funded under European programmes or by foreign funding organizations. He has led two national scientific projects and a Bulgarian team in an international scientific project, all funded by the Bulgarian National Science Fund and successfully completed.

For participation in the competition, the candidate has submitted an expanded habilitation review of the scientific contributions in the scientific publications included in the group of indicators "C" and "D". In accordance with the requirements, it includes an introduction describing the essence of the scientific problems investigated and their place among the research of other researchers in the specific field, as well as a bibliography in which the articles with which the candidate participates in the competition are clearly distinguished from the candidate's other articles and from the articles of other authors.

The habilitation review under indicator "C" summarizes results published in 5 scientific works (publications No. 31, 32, 34, 50, and 72 from the general list of publications), which present the candidate's activity in the field of developing therapeutic agents for neurodegenerative diseases, and in particular for Parkinson's disease. The main scientific contributions of the candidate, reflected in the habilitation review under this indicator, are grouped into three main topics:

- Development of (pyrrolo-pyridin-5-yl)benzamides as reversible MAO-B inhibitors (No. 31);
- Development and comparative analysis of carboxamides and methanimines using a combined methodology including X-ray structural analysis, elucidation of interactions at the binding site, photophysical studies, and biological evaluation of (indazol-5-yl)methanimines as inhibitors of MAO-B and acetylcholinesterase (No. 32);
- Development of short-chain analogues of neurotensin(8–13) as dual-active ligands of neurotensin receptors NTS1 and NTS2 with established effects in a mouse model of Parkinson's disease (No. 50, 72).

The contributions of Assoc. Prof. Nikolay Tzvetkov in these publications are unquestionable: in two of them the candidate appears simultaneously as first author and corresponding author, while in the remaining three — as corresponding author. This unambiguously testifies to his leading role in the conceptualization, execution, and presentation of the research. The total number of citations of these five articles, published in the period 2019–2023, is 148, which is indicative of their scientific significance and international impact. Particularly impressive is the reception of the publication in *Frontiers in Molecular Neuroscience*, which has been cited over 100 times — a result confirming its high impact on the scientific community and its contribution to the advancement of the field.

The review of scientific contributions under indicator "D" describes 15 publications in peer-reviewed and indexed journals with an impact factor: 10 in the Q1 category and 5 in the Q2 category. The articles were published in the period 2018–2024 and present the candidate's research activity in the field of pharmaceutical chemistry. The majority of the publications are of an applied scientific nature and are related to *in vitro* or *in vivo* studies of natural extracts, low-molecular-weight organic compounds, and short-chain peptides with potential applications in the treatment of cancer, neurodegenerative, and autoimmune diseases. The second main research direction encompasses the application of *in silico* approaches for molecular modelling and quantum-chemical computational methods — independently or in combination with experimental studies — in the prediction and visualization of protein-ligand complexes. The contributions of Assoc. Prof. Nikolay Tzvetkov in these publications are evident: in two of the articles he is first author and corresponding author, in four he is corresponding author, and in another four he is the last (senior) author. The review adequately reflects the candidate's scientific contributions in this broader area of research.

A positive impression is made by the inclusion in the review of directions for the candidate's future research activity, based on his extensive experience in the creation of biologically active compounds, accumulated through his work in the pharmaceutical industry and in an academic environment. The outlined directions for future research activity encompass three main areas: the development of bi- and trifunctional molecules and short-chain peptide mimetics with multi-target action on mechanisms associated with neurodegenerative, cancer, and autoimmune diseases; conducting theoretical-experimental studies in the field of tautomer-based drug design with a view to predicting the biological activity of low-molecular-weight compounds and peptides; and the application of *in silico* methods for molecular modelling and virtual screening, including through the combined SCXRD/HYDE platform and virtual libraries.

A review of the submitted materials shows that the scientific interests of Assoc. Prof. Nikolay Tzvetkov are directed towards the development of biologically active compounds with potential therapeutic application in neurodegenerative, cancer, and autoimmune diseases. His research activity combines the synthesis and structural characterisation of low-molecular-weight organic compounds and peptide mimetics with their biological evaluation through in vitro, in vivo, and in silico methods. The candidate applies an interdisciplinary approach, integrating methods of pharmaceutical chemistry, molecular modelling, and structural analysis in addressing current problems in medicinal chemistry. The results obtained contribute to deepening the understanding of the molecular mechanisms of socially significant diseases and to expanding the arsenal of potential therapeutic agents, while simultaneously creating a scientific foundation for the development of new drug candidates with an improved efficacy and safety profile.

I have no critical remarks regarding the materials submitted for the competition. The documentation presented has been prepared with precision and in full compliance with the requirements of the DASRBA and the IMB-BAS Regulations. The scientific works have been selected so as to best represent the broad research profile of the candidate, and the habilitation review is structured clearly and with well-reasoned arguments. The scientific achievements of Assoc. Prof. Nikolay Tzvetkov convincingly demonstrate his scientific maturity and independence.

CONCLUSION

From the submitted review of the fulfilment of the minimum requirements for acquiring academic degrees and holding academic positions at IMB-BAS, it is evident that under indicator "A," Assoc. Prof. Nikolay Tzvetkov has the required number of points, while under all other indicators this number significantly exceeds the minimum requirements. The candidate's total score is 1,338 against a minimum threshold of 640. The total number of publications of which Assoc. Prof. Nikolay Tzvetkov is a co-author (101) considerably exceeds the number of works submitted for the competition (20). The scientific achievements of Assoc. Prof. Nikolay Tzvetkov are of a high standard and fully correspond to the subject matter of the announced competition. He possesses the necessary scientific qualification and proven research potential for successful advancement in the promising field in which he works.

The submitted scientific works, the number of citations, and the participation in and leadership of projects not only meet the requirements for holding the academic position of "Professor" in accordance with the DASRBA, its implementing regulations, and the IMB-BAS Regulations, but exceed them significantly. I confidently give a positive assessment of the candidate and recommend that the members of the Scientific Council of IMB-BAS elect Assoc. Prof. Nikolay Tzvetkov as "Professor" in professional field 4.2 Chemical Sciences, scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Biologically Active Substances."

Sofia
14.04.2026

/Prof. Silvia Angelova, PhD/