

Statement

From Prof. Biliana Pancheva Nikolova, PhD Institute of Biophysics and Biomedical Engineering, BAS

According to the competition for the academic position of "associate professor" in scientific direction 4.3 Biological sciences (Biophysics), announced in SG no. 69 dated 16.08.2024, for the needs of the "Lipid-protein interactions" department, at the IBFBMI-BAS.

With the only one candidate who submitted documents for participation: Assistant Professor Rusina Lachezarova Hazarosova, Ph.D.

By order No. 1350 dated 14.10.2024 of the director of IBFBMI-BAN, I have been appointed as a member of the scientific jury in the competition described above.

At the first meeting of the scientific jury, we got acquainted in detail with the materials provided by Assistant Professor Rusina Hazarosova and we found that they meet the requirements of the law on the development of the academic staff of the Republic of Bulgaria.

Assistant professor Hazarosova obtained the scientific and educational degree "Doctor" in the scientific specialty "Biophysics" in 2016 based on a dissertation on the topic "Influence of biologically active molecules on membrane organization" with supervisors: Prof. Dr. Galya Staneva and prof., PhD Albena Momchilova.

In the materials submitted for participation in the competition, the distribution of the scientific assets of Associate Professor Hazarosova on points according to the minimum national requirements of the Law for the Development of the Academic staff of the Republic of Bulgaria.

As is clear from the presented documents, the results achieved by the candidate cover, and in some indicators exceed, the requirements laid down in the law.

For participation in the "associated professor" competition, 19 scientific publications in referenced and indexed in world-renowned scientific information databases (Web of Science and Scopus) are submitted, of which 14 in journals with an impact factor (5 in Q1, 5 in Q2, 3 in Q3 and 1 in Q4) and 5 in SJR journals (2 in Q3 and 3 in Q4). Overall quartile distribution: 5 in Q1, 5 in Q2, 5 in Q3 and 4 in Q4. Total impact factor of the 19 publications presented in the competition: 41,019. The total number of observed citations is 48 (without self-citations of all authors). H-index of the candidate based on the publications included in the scientific information database is 5.

In group of indicators B (habilitation work), six publications are presented, which carry 117 points, while 100 points are required according to the regulations of IBFBMI-BAS.

In indicator group G (scientific publications that are referenced and indexed in world-renowned scientific information databases), 13 scientific publications are presented, which carry 231 points out of the required 220. As 3 of them were published in journals with rank Q1, 3 in journals Q2, 4 in Q3 and 3 in Q4. Of the papers, 9 were published in IF journals and the remaining 4 were published in SJR journals. The data for the IF and SJR values of the journals are correctly presented.

In group of indicators D (citations in scientific publications, monographs, collective volumes and patents) with minimum requirements laid down in the Regulations for the Implementation of the Law on the Development of the Academic Staff of IBFBMI - BAS 60 points a list of 48 citations (carrying 96 points) is presented, distributed by articles.

The presented scientific contributions of Hazarosova are grouped as follows:

I. Contributions from the habilitation work;

II. Contributions of scientific works according to indicator G7 (scientific publications in publications that are referenced and indexed in world-renowned databases).

I. Contributions from the habilitation work

The habilitation work unites 6 publications in refereed international publications, distributed by Q categories as follows: categories Q1 (2 publications), Q2 (2 publications), Q3 (1 publication) and Q4 (1 publication). Publications are out of print in the period 2022-2024.

The contributions are united around the detailed study and proof of new aspects in the mechanism of action of natural antioxidant agents. All five publications included in the list were reviewed.

1.1 The effect of miconoside on normal, canine epithelial kidney cells (MDCKII) was investigated, a dose-dependent effect was demonstrated. Myconoside interacts with the cell plasma membrane and apical adhesive complexes, and a potential mechanism of action of myconoside has been proposed. Publication 2 [B4].

1.2 The effect of miconoside on human adenoma, lung cells A549 and on biomimetic membranes was investigated, a change in membrane organization and actin cytoskeleton was demonstrated, it reorganized lipids in the lipid bilayer and changed the fraction of lipid rafts in a dose-dependent manner. Publication 3 [B4].

1.3 The influence of the biologically active compound resveratrol on sphingolipid metabolism in human lung adenocarcinoma A549 cells was investigated. Differences have been identified in the mechanisms by which changes in the levels of major sphingolipids are induced, namely ceramide (supporting apoptosis), sphingosine-1-phosphate (supporting proliferation),

sphingosine (a precursor of sphingosine-1-phosphate), and the raft-forming sphingomyelin Publication 4 [B4].

1.4 The influence of resveratrol on the structural organization and biophysical properties of two heterogeneous in the degree of fatty acid unsaturation at the sn-2 position of phosphatidylcholine (PC) PC-containing model lipid membranes was investigated. Resveratrol was found to affect lipid ordering differently depending on the degree of unsaturation of the fatty acid at the sn-2 position in the molecule of 1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine (POPC) or 1-palmitoyl-2-docosahexaenoyl-sn-glycero-3-phosphocholine (PDPC) in large unilamellar vesicles. A difference in flexural elasticity was demonstrated between mono- and polyunsaturated PC-containing matrices in the presence of resveratrol. A lipid milieu-dependent mechanism of action of resveratrol has been proposed Publications 1, 5, 6 [B4].

II. Contributions of scientific works under indicator G7 (scientific publications in publications that are referenced and indexed in world-renowned databases).

Outside of the habilitation work, 13 publications in refereed international journals were examined, distributed by Q categories as follows: categorie Q1 (3 publications), Q2 (3 publications), Q3 (4 publications) and Q4 (3 publications). All of them were published in the period 2005 - 2023.

All cited publications were reviewed and the contributions were divided into subgroups as follows:

1. Clarifying the role of the relationship between membrane-bound receptors (associated with lipid rafts) and specific lipid components of the rafts. Tracing their role in the formation and stabilization of cholesterol-rich shelves. Publication 1 [G7].
2. Investigation and elucidation of ultrastructural changes, proliferation and ability of alveolar A549 cells to recover after halothane treatment Publications 2, 3 [G7].
3. Study of the effect of oxidized lipids on membrane organization in mono- and polyunsaturated lipid matrices Publications 4, 5, 7 [G7].
4. Clarification of the molecular mechanism of interaction of chitosan nanoparticles with biological membranes Publication 6 [D7].
5. Study of the effect of oxidized lipids on the lipid arrangement and the activity of the secretory phospholipase A2 Publications 8,13 [D7].
6. Study of the effect of the biologically active VV-hemorphin-5 (valorphin) and its analogs on the structural organization, mechanical and electrical properties of the lipid membrane Publications 9,10 [G7].
7. Study of the effect of nanomaterials on pathogenic bacteria Publication 11 [G7].

8. Elucidation of the importance of biochemical and biophysical structural and functional changes in the lipid membranes of red blood cells in the prognosis and treatment of coronary artery disease Publication 12 [G7].

The scientific contributions presented by Hazarosova correctly reflect the published results. Most of them have a fundamental nature. Part of the contributions would find application in medical practice and biotechnology.

In conclusion, I believe that the scientometric parameters presented above, the derived scientific contributions, as well as the overall work of assistant Rusina Hazarosova fully meet, and in some indicators exceed the requirements for acquiring the academic position "associated professor", laid down in the regulations of the law on the Development of the Academic Staff of the Republic of Bulgaria.

My personal impressions of the candidate's work, as well as the duly submitted documents for the competition, give me reason to confidently recommend to the scientific jury to prepare a proposal to the Scientific Council of IBFBMI-BAN for the election of Rusina Lacheazarova Hazarosova for the academic position of "Associate Professor" in the field of higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences (Biophysics).

15.11.2024

Sofia

Signature:

/prof. B. Nikolova/