SCIENTIFIC OPINION

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Subject: Evaluation of the candidate Daniela Ilieva Batovska, a participant in the competition for a professorship at ICHEE-BAS, specialty "Processes and devices in chemical and biochemical technology", professional direction 4.2. Chemical Sciences

1. Information about the competition

The competition is in professional direction 4.2. Chemical Sciences (Processes and Apparatus in Chemical and Biochemical Technology), for the needs of the "Biochemical Engineering" Laboratory of IChE-BAN. It was announced in the State Gazette no. 67 of 08/04/2023, and I am a member of the Scientific Jury according to the order RD No. 15-467/09/25/2023 of the Director of IChE-BAS.

2. Information about the candidate

The only candidate in the competition for professorship is Dr. Daniela Ilieva Batovska, a chemist in the "Biochemical Engineering" Laboratory at the Institute of Chemical Engineering - BAS. Dr. Batovska graduated from the Faculty of Chemistry of the SU «St. Kl. Ohridski" with a specialty in "Organic and Analytical Chemistry" in 1992.

She holds a doctorate in the scientific specialty "Bioorganic Chemistry, Chemistry of Natural and Physiologically Active Substances" with a dissertation on the topic "Synthesis and biological activity of sterol derivatives". He successively held the positions of chemist, and research assistant 2nd and 1st degree at IOHTCF-BAS, and from 2010 to 2017 he was a senior research assistant (associate professor) at the same institute.

3. Teaching Activity

In the period 2009-2010, Daniela Batovska was engaged in leading lectures and exercises on Steroid Chemistry and Bioorganic Chemistry in South-West University

"Neofit Rilski". She is the supervisor of several graduates in the Department of Organic Chemistry of the Faculty of Chemistry and Pharmacy, SU "St. Kliment Ohridski". She supervised a PhD student from the Institute of Medical Education and Research, Chandigarh, India.

4. Fulfillment of the requirements for occupying the academic position

Dr. Daniela Batovska participated in the competition with 22 scientific works, of which 20 are scientific publications, one chapter of a book, and a world/US patent. Of the presented publications, 19 are in English and were printed in refereed and indexed SCOPUS/WOS journals, and one is in Bulgarian.

According to the report, the candidate fulfills, and in some indicators significantly exceeds the minimum requirements of the ZRASRB and the Regulations for its application for holding the position of "professor". According to indicator A, the points are the necessary 50, according to indicator B – with a mandatory 100, Dr. Batovska presents articles forming 120 points, according to indicator G – with a minimum of 220 (according to the PPZRASRB of the BAS), Daniela Batovska's points are 274, according to indicator D – 766 (required 120). Three of the articles forming the indicators are ranked first quartile (Q1), nine are ranked Q2, five are ranked Q3, and four - are ranked Q4. When fulfilling indicator D, the candidate limited himself to presenting citations of the articles participating in the competition, and only from scientific publications referenced and indexed in WOS and Scopus (383 x 2 points). This limitation implies that the actual number of citations of the candidate would be many times higher if the citations of her other articles and the citations in non-refereed publications are taken into account. According to indicator E, Dr. Batovska scored 160 points (with a requirement of 150) as the head of the Bulgarian partner in an international project and as the leading PhD student.

The candidate for "professor", Dr. Batovska, also fulfills the minimum requirements for holding the position at the Institute of Engineering Chemistry. With a requirement for a total number of publications of 40, the applicant's list includes 60 titles; with the required 7 (of those presented for the competition) with an impact factor, Dr. Batovska participated with 19; with a requirement of 50 citations, she submits a list of 383. In the

ICHEE for "Professor" a recommended Hirsch Index of 8, Dr. Batovska's Hirsch Index according to Web of Science is 16.

4. Scientific topics

Dr. Batovska's subject is focused on the design and synthesis of pharmacologically active chalcone pigments with diverse biological properties. A novelty in research is the enzymatic synthesis of chalcones (from benzaldehyde and acetophenone), the reaction being catalyzed by lipase or acylase enzymes.

Among the chalcones with new properties, those with antioxidant activity are particularly valuable. Among the most promising newly synthesized molecules are 16 chalcones with hydroxycinnamic substitution motifs, with the best high activity for binding free radicals being the chalcones with a catechol structure, that is, with two adjacent hydroxyl groups at p- and m-position in ring B, as well as chalcones with a p-hydroxyl group in the same ring and two adjacent methoxyl groups.

Dr. Batovska's research on chalcones with antimalarial properties is of greatest importance to medicine and pharmacy. This group of compounds contains 2',5'-dimethoxy-, 2',4',6'- and 3',4',5'-trimethoxy- groups and exhibit antimicrobial activity and strong cytotoxicity towards tumor cell lines, and some of them are promising antimalarial agents.

Another direction in Dr. Batovska's research is related to the synthesis of chalcones, which are inhibitors of the overexpression of glycoproteins in tumor cells. The synthesized one 3,3'-dihydroxy-4,4'-dimethoxychalcone is structurally analogous to curcumin, and the team showed that both compounds inhibited the expression of the glycoprotein Gp170 in human bladder cancer cell lines. Similar to the first, 15 more chalcones have been synthesized, active in multidrug resistance (MDR) in murine lymphoma cells with the potential of future drugs.

Apart from the main direction in Dr. Batovska's scientific activity, over the years she also worked seriously on the development of structural analysis with spectral methods (1D and 2D-NMR, MS, IR, UV). Some of her works are devoted to the analysis of plant extracts and essential oils; the development and validation of methods for quantitative determination of biologically active substances and determination of their radical-binding ability; structure-activity relationship analysis for natural and synthetic

compounds; analysis of the interaction of secondary plant metabolites with fungal pathogens and insects.

5. Participation in specializations and scientific awards

As a postdoctoral fellow, Daniela Batovska specialized in Japan, at the Toyama Biotechnology Center (2002-2003) and the Hokkaido Agricultural Academy (2003-2004). For both specializations, Dr. Batovska received a JSPS grant for foreign scientists.

6. Conclusion

The summary of Dr. Batovska's long-term scientific activity reveals that she is a purposeful researcher with high goals. The applicant's scientific performance indicators exceed the minimum criteria for holding the position of "professor", and the materials submitted for participation fully meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Rules for its Implementation and the PPZRASRB of the BAS, as well as of the relevant Regulations for the application of ZRAS in the Institute of Chemical Engineering - BAS. My opinion is entirely positive and I strongly recommend that the Scientific Council of IEES elect Dr. Daniela Ilieva Batovska as "Professor" in professional direction 4.2. Chemical sciences, scientific specialty "Processes and devices in chemical and biochemical technology", at the Institute of Chemical Engineering - BAS.

11/10/2023 Signature: 

(Prof. Penka Petrova, DSci)