

O P I N I O N



referring to competition for **PROFESSOR** in professional direction **4.2. Chemical Sciences (Processes and Apparatus in Chemical and Biochemical Technology)**

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Candidate **Daniela Ilieva Batovska, PhD, chemist at the Institute of Chemical Engineering – Bulgarian Academy of Sciences (IChE–BAS)**

Opinion prepared by: Assoc. Prof. Konstantza Atanassova Tordova, PhD, IChE–BAS

1. Science indicators about the publications presented

1.1. Implementation of the science indicators acc. to the Regulations on the terms and conditions for the acquisition of scientific degrees and for the occupation of academic positions at the Bulgarian Academy of Sciences

Science indicators for the articles presented in the competition are summarized and grouped into the three required categories as follows: Table 1. Professor – Group B, Table 2. Professor – Group G and Table 3. PhD – Group G.

Table 1. Professor – Group B, index 4.

| № Publication | Number of authors | Place in the order of authors | Q, acc. WoS/SJR | Points awarded |
|--|-------------------|-------------------------------|-----------------|----------------|
| 1. <i>Curr. Clin. Pharmacol., 2010</i> | 2 | 1* | Q1 (SJR) | 25 |
| 2. <i>J. Serbian Chem. Soc., 2011</i> | 4 | 2* | Q3 (SJR) | 15 |
| 3. <i>J. Serbian Chem. Soc., 2016</i> | 5 | 3* | Q3 (SJR) | 15 |
| 4. <i>Malar. J., 2019</i> | 7 | 2 [#] | Q1 (SJR) | 25 |
| 5. <i>BMC Res. Notes, 2020</i> | 6 | 4 | Q2 (SJR) | 20 |
| 6. <i>BMC Res. Notes, 2021</i> | 6 | 5 | Q2 (SJR) | 20 |

* – corresponding author of the publication;

– leading contribution in research and publication.

Professor – Group B, index 4

Total: 120 pt.

Minimum required: 100 pt.

Table 2. Professor – Group G, index 7.

| № | Publication | Number of authors | Place in the order of authors | Q, acc. WoS/SJR | Points awarded |
|----|-----------------------------------|-------------------|-------------------------------|-----------------|-----------------------|
| 7. | <i>Kinet. Catal., 2010</i> | 5 | 4 | Q3 (SJR) | 15 |
| 8. | <i>Int. J. Med. Chem., 2011</i> | 6 | 2* | Q4 (WoS 2017) | 12 |
| 9. | <i>Bulg. J. Agric. Sci., 2013</i> | 5 | 2 | Q3 (SJR) | 10 (само в Scopus) |

1.2. Implementation of the scientific indicators acc. to the Methodology for the promotion of scientists at the Institute of Chemical Engineering/ 23.11.2022

The specific requirements of IChE–BAS have been met, and indicators related to the quality of scientific production, such as publications indexed in world-recognized scientific databases and citations, have been exceeded several times. I especially note the *h-index* of Dr. Batovska, which is **14**, acc. to WoS and Scopus, excluding all self-citations. At IChE–BAS, the recommended index in the competition for the position of "professor" is 8.

2. Basic scientific and scientific-applied contributions

The first and main group of presented developments are in the field of pharmacologically active chalcones, their design and synthesis, study of their activity in a wide spectrum, scientific substantiation of the "structure-activity" relationship, as well as pharmacological tests in "*in vitro*" and "*in vivo*" models. The following contributions and innovations stand out here in particular:

- Enzyme-catalyzed synthesis of chalcone, for the first time using lipase. The reaction shows high stereoselectivity toward the chalcone (**Publ. 3**).
- Research and scientific substantiation of the relationship "structure – antioxidant activity" on the example of 16 synthesized hydroxychalcones (**Publ. 1, 2**).
- Preparation and study of chalcones with antimalarial activity. A chalcone was obtained with 13 times higher antimalarial activity compared to a reference one, as well as a higher selectivity in terms of cellular action compared to traditionally used preparations, such as chloroquine and quinine (**Publ. 4**, Dr. Batovska has a major contribution to the concept and conduct of the study). Investigation of the mechanism of action of promising chalcones on the malaria parasite "*in vitro*" (**Publ. 5**) and "*in vivo*" (**Publ. 6, 14, 19**).
- Investigation of promising chalcones for their action in multidrug resistance in mouse lymphoma cells. Summary of experimental data and quantum chemical calculations to reveal the most suitable substituents in chalcone (**Publ. 8**).

A second group of the presented publications refers to the adaptation and automation of spectrophotometric methods for the determination of antiradical activity in the microscale. A method was developed to determine antioxidant activity towards $O_2^{\cdot-}$ (**Publ. 9, 11, 12**). The mechanism of antioxidant action of chalcones with peroxide radicals was investigated by chemiluminescence (**Publ. 7**).

A third significant group of publications is united around the ever-current topic of analysis of medicinal plants and their products. Here are included articles on the identification of the composition of medicinal plants (**Publ. 10**), research on the antibacterial activity of extracts of *Potentilla reptans* L. (**Publ. 13**), a comparative study of the composition and pharmacological effects of Bulgarian lavender oil (**Publ. 17**), as well as a patent for paper products enriched with aromatic and/or flavoring substances with a terpene profile similar to cannabis (**US 11,346,051 B2**). Publications in this group refer to preparation for future work of the candidate on the study of secondary metabolites of *gentian* species with a view to their medicinal properties, as well as for plant protection purposes (**Publ. 15, 16, 18**), as well as a **Chapter of a book** on plants of the genus *Arum* with a focus on the poorly studied phytochemicals they contain and their pharmacological activity.

3. Critical notes and recommendations

I have no critical notes. I note my satisfaction with the well-organized and systematized application materials.


4. Personal impressions of the candidate

Until now, I do not know Dr. Batovska personally.

C O N C L U S I O N

Based on the indisputable scientific quality of this candidacy, which convinced me that Dr. Daniela Batovska is a built scientist with a wide and deep expertise in the knowledge of natural substances and the design of their analogues in order to obtain substances with improved properties for medical application, *I recommend the Honorable Scientific Jury to approve the candidacy of Dr. Daniela Ilieva Batovska for the academic position "Professor" in the professional field 4.2. Chemical Sciences (Processes and Apparatus in Chemical and Biochemical Technology)* at the Laboratory "Biochemical engineering" of the Institute of Chemical Engineering – Bulgarian Academy of Sciences.

Date: 30. 10. 2023

Opinion prepared by: .....
/Assoc. Prof. Konstantza Tonova, PhD/