

REPORT

on a competition for associate professor in professional field 4.2. Chemical sciences (Processes and apparatus in chemical and biochemical technology) for the needs of the laboratory "Transport phenomena in multiphase media"

announced in SG No. 65, dated 28.07.2023 г.

with a candidate: Chief assistant professor Diana Ivanova Ivanova
(name, scientific degree, academic position)

reviewer: Assoc. Prof. Dr. Dimitar Peshev
(name, scientific degree, academic position)

1. Brief biographical data and description of the applicant's scientific interests.
2. General characteristics of the candidate's scientific research and applied scientific activity.

Chief assistant professor Dr. Diana Ivanova has demonstrated quality research and applied scientific activity in her career. Her early research was in the design and synthesis of physiologically active substances, including the synthesis of synthetic analogues of natural substances with biological activity. She then conducted specializations in prestigious scientific organizations in Spain and France, during which she increased her expertise in the field of organic synthesis of biologically active substances and deepened her knowledge on the mechanism of action of synthesized analogues of natural substances with antitumor activity.

At this stage, an indication of the scientific-applied character of the candidate's scientific production and expertise is also her industrial experience in the field of developing technologies for the production of food products containing medicinal and aromatic plants.

Continuing her academic development, as an assistant professor and chief assistant professor, Dr. Ivanova directed her scientific research to obtaining bioactive plant extracts and optimizing the conditions for extracting antiproliferative substances and fractions with antioxidant activity from natural raw materials. This topic has great potential for conducting basic scientific research, but also for generating applied scientific results, as demonstrated by the candidate's recent publications on the use of herbal cytostatic therapy in combination with hormone therapy in clinical trials.

In the past five years, Dr. Ivanova has taken part in one research project funded by the "Scientific Research Fund" of the Ministry of Education and Science and in one international research project.

The scientific-research and applied activity of the chief assistant professor Diana Ivanova not only cover, but exceed the average level for the academic degree taken.

3. Evaluation of the presented materials (number and characteristics of the presented works - scientific publications, monographs, research projects, patents, textbooks, etc.).
4. Basic scientific and applied contributions.

The scientific research work of the candidate is of a scientific and applied nature. Scientific contributions can be grouped into three directions.

1. Synthesis and study of the mechanism of action of synthetic, semi-synthetic and natural physiologically active substances;

The content of the biologically active substance podophyllotoxin in Bulgarian and foreign juniper species has been characterized, with the aim of potential application in pharmacy as an alternative natural source for the extraction of precursors for the industrial synthesis of antitumor substances.

Synthetic silicon arotinoids, analogs of the natural substance retinoic acid, have been shown to be effective activators of nuclear retinoid receptors (RXR) and represent starting molecular structures for the design of new antitumor drugs.

2. Optimizing the extraction of biologically active substances from plant origin;

The extraction process of a selected bioactive component (PPT) or total polyphenolic content and antioxidant activity from different types of juniper and Golden Root has been optimized. In the extraction study, solvent, temperature, solvent/raw material (v/w) ratio and process duration were varied. The effect of internal mass transfer and in general the kinetics of extraction were not investigated, since the form in which the plant materials were used for extraction in laboratory conditions assumed reaching equilibrium in a time interval of the order of several minutes.

3. Application of biologically active substances of natural origin in hemoendocrine therapy of a specific carcinoma, with the aim of evaluating the effectiveness and comparison with alternative synthetic cytostatics.

As a result of the clinical study, it has been confirmed that the administration of capecitabine, a synthetic antimetabolite, in combination with aromatase inhibitors in hemoendocrine metronomic therapy of advanced stage hormone-dependent breast cancer leads to rapid achievement of long-term remission without significant toxicity or other side effects of therapy.

The scientific publications presented in the doctoral dissertation focus on the synthesis and structure-activity relationship of retinoic acid analogs.

According to group of indicators B, the candidate has submitted four monograph-equivalent publications that do not repeat those previously submitted for the acquisition of scientific degree(s) and/or habilitation. The formally presented publications comply with the Regulations for the terms and conditions for acquiring scientific degrees and for holding academic positions in the Bulgarian Academy of Sciences. All four have an impact factor and fall into Q1. Thematically, they are united in the field of the preparation of extracts from different species of juniper containing podophyllotoxin and the study of their antiproliferative activity.

The scientific contributions can be qualified as enrichment of existing knowledge and theories in relation to the design and synthesis of physiologically active substances, including synthesis of synthetic analogues of natural substances with biological activity, optimization of the extraction of biologically active substances from plant materials, determination of their biological activity and application in clinical practice.

6. Reflection of the candidate's scientific publications in Bulgarian and foreign literature. Citations are recognized only in scientific publications and in defended dissertations in which the applicant is not a supervisor or consultant. Citation of a scientific publication by a co-author is considered a self-citation and is excluded from the list of citations of each of the co-authors of the scientific publication.

50 citations are presented on a total of eleven of the candidate's 21 scientific works presented. According to the "Methodology for the growth of scientists at IHH - BAS", the total number of noticed citations on all works of the candidate must be a minimum of 20 (twenty), and according to the "Regulations for the implementation of the law on the development of the academic staff in the Republic of Bulgaria" there are 25 The Hirsch index, excluding self-citations, according to the Scopus database, is 8. Obviously, the impact of the candidate's scientific publications in Bulgarian and foreign literature exceeds the legally established minimum requirements.

7. 7. Critical notes and recommendations..

I have no critical notes. I recommend the candidate to participate more actively in research projects, which would also increase the volume of scientific production.


8. Personal impressions of the reviewer about the candidate.

I have no personal impressions of the candidate.

C O N C L U S I O N

As a result of the review and analysis of the submitted documents for the announced competition, I express my positive assessment that the application of the Chief Assistant Professor Dr. Diana Ivanova Ivanova meets all the qualitative and quantitative requirements and I recommend the responsible authority at the Bulgarian Academy of Sciences to choose him as an Associate Professor in professional direction 4.2. Chemical Sciences (Processes and Apparatus in Chemical and Biochemical Technology) for the needs of the "Transport phenomena in multiphase media" laboratory.

Date: 15.11.2023

Reviewer: 

/Assoc. Prof. D. Peshev/