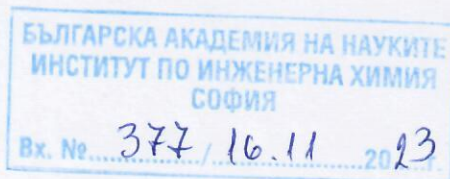


REVIEW



In a competition for occupying the academic position "Associate Professor"

By Scientific area 4.2. Chemical science (Unit operations in chemical and biochemical industry),
announced in the State newspaper issue 65 from 28.07.2023,

With candidate Assist. Prof. Dr. Diana Ivanova Ivanova

Reviewer: Prof. Dr. Eng. Evgeni Borislavov Simeonov

1.Short biographical data and characteristics of the candidate scientific interests.

Assist. Prof. Dr. Diana Ivanova Ivanova was born in 1965. She has graduated from Sofia university "St. Kliment Ohridski" (master degree), specialty "Chemical physics and theoretical chemistry". She has defended the scientific degree "doctor", specialty: Code 010510 "Bioorganic chemistry, chemistry of natural and physiologically active substances" in November 2010 by Higher Commission of Certification, Specialized Scientific council in Pharmacy. The thesis of her dissertation is "Design, synthesis and antitumor in vitro activity of new retinoids and other physiologically active substances." She speaks English, German and Russian. Computer skills - Excel, MS Word, PowerPoint.

2.General characteristic of the candidate research and scientifically applied activity.

The fields in which Dr. Ivanova works are: Obtaining bioactive plant extracts and researching the conditions for extraction of antiproliferative substances from raw materials. Bulgarian and foreign types of juniper with high content of podophilotoxin have been investigated, with possible application in pharmacy as an alternative natural resource for synthesizing of antitumor substances. Investigations have been conducted in the mechanism of activity of synthesized analogues of natural substances, which can be used as model compounds for creating

new antitumor medicines. The extraction of selected plant raw materials for obtaining extracts with high bioactivity and content of bioactive substances, aiming at reaching a maximum degree of extraction of a chosen bioactive component or maximum value of the total polyphenol content and antioxidant activity at varied: solvent, temperature and hydromodule. Obtaining synthetic analogues of natural substances such as: ligands of bioactive proteins with potential application in biotechnologies; Application of metronomic therapy with cytostatics with plant origin or synthetic antimetabolites in combination with hormonotherapy when clinically tested. Clinical investigation shows fast reach of continuous remission without considerable toxicity or other side effects of the therapy.

Diana Ivanova participates in 1 contract with “Scientific investigations” fund, 3 contracts with international participation, 3 specializations in international contracts. She has 2 grants for short term specializations and 2 participations in scientific conferences abroad.

Dr. Diana Ivanova has 6 years and 4 months work experience in the specialty at The Institute of Chemical Engineering – BAS and 2 years and 8 months as an assistant professor at the same institute.

3. Evaluation of the presented materials.

The candidate has the following scientometric indicators: in total have been presented - 21 articles, from which with impact factor (IF) and impact ranking (SJR) are 20. Those which have been reviewed for the competition for Associate Professor 17. The results of the scientific investigations of Dr. Ivanova, have been published in foreign journals such as: Molecules, Plants, Applied Sciences, Journal of Pharmaceutical Research and also in our renowned ones like Bulgarian Chemical Communications. The personal contribution of the candidate in 13 of the publications is that she takes the first place, in 1 the second and in the rest at a later place in order. Meeting the requirements for acquiring the academic position of “Docent” in The Institute of Chemical Engineering – BAS:

№	Criterion, regulatory document	IChE - ABS	Candidate

1	Educational and scientific degree “doctor”, LDAS	Yes	Yes
2	Work experience as “associate professor”(LDAS-B.III b&g)	2 years	Yes
3	The number of publications after acquiring Dr.	15	17
4	Total number of publications	20	21
5	Number of publications in referenced journals	15	20
6	Number of publications in ISI Impact Factor journals	5	20
7	Total number of noticed citations of all works	20	50
8	H - index	4	9

4.Main scientific and scientifically applied contributions.

The sole candidate in the competition, Dr. Ivanova has presented all the materials in the necessary type and volume, in accordance with the Law for Development of the Academic Staff and the Regulations for its application. In accordance with the Law, the candidate must have a published monograph or equivalent publications. A list of 17 scientific works has been presented, from which 4 (100 p.) are equivalent to a habilitation work, 12 are (223 p.) publications in journals and are referenced and indexed in renowned international database with scientific information (Web of Science & Scopus), beyond the habilitation work. There are 100 p. from 50 selected citations in Web of Science и Scopus. The scientific production of Dr. Ivanova is up to date, her personal contribution is indisputable as is her realized practical application of a big part of it. The scientific production of the candidate can be synthesized in:

- Bulgarian and foreign types of juniper with high content of podophilotoxin have been investigated, and through mass-spectrum analysis antitumor substances have been identified.

A wide range of activity of the certain extracts have been established. It has been shown that the antiproliferative properties of the types of juniper are due to the synergistic activity of a great variety of lignans (podofilotoxin, deoxipodofilotoxin, (peltatin, yatein, matairezinol, anhidropodorizol). The obtained results can have possible application in pharmacy as an alternative natural resource for extracting precursors for industrial synthesizing of antitumor substances [3].

- Experimentally the extraction kinetics of juniper leaves has been obtained at normal pressure in an extractor with stirring and the necessary equilibrium time of the process has been defined. It has

been proved through supercritical extraction or through extractor (accelerated solvent extractor) for rapid extraction, a higher content of the aimed component has been obtained [4].

- The synthetic silicon artinoid analogues of the natural substance retinoic acid have been investigated. The possibility to be used as model compounds for obtaining new antitumor medicines has been proved [1,2].

- The influence of different technological parameters (solvent, temperature and hydromodule) on the extraction process intensity regarding the maximum yield of selected bioactive component or the maximum value of the total polyphenol content and antioxidant activity, has been established [4,12,15,16,17].

- New heterocyclic and polycyclic retinals, analogues of the natural substance retinal (vitamin-A-aldehyd) as potential ligands for obtaining bacteriorhodopsin analogues, have been synthesized. The obtained pigments have a potential application in biotechnologies as artificial photoreceptors [6,7].

- The application of the metronome therapy with cytostatics with plant origin or synthetic antimetabolites in combination with hormone therapy, has been investigated. The clinical research shows rapid reach of continuous remission without considerable toxicity or other side effects of the therapy. The different mechanism of the activity of the hormone antitumor substances such as aromatase inhibitors (anastrozole, letrozole, exemestane) has been clarified as a new class of antitumor medicines [13,14].

6. Reflection of the scientific publications in the Bulgarian and foreign literature.

The relevance of the scientific production is illustrated with more than 250 number of citations.

7. Critical notes and recommendations.

No significant critical notes. I would recommend to the candidate to be more active in his teaching activity

8. The reviewer personal impressions of the candidate.


I do not know Dr. Ivanova in person but from the presented materials in the competition for "Associate Professor" I can say she is an accomplished expert in the field of chemical engineering in terms of her scientific production and her expert activity for practical implementation of the obtained results, as well.

CONCLUSION

From the presented materials and results and as far as my opinion is concerned Dr. Ivanova meets all the quantity indicators in accordance with the Regulations for Acquiring Academic positions and occupying academic positions in the Institute of Chemical engineering – BAS as well as with the Law for Development of the Academic Staff.

All this gives me the confidence to give a **positive** evaluation to the sole candidate in the competition. I suggest to the members of the Scientific jury to choose Dr. Diana Ivanova Ivanova for "Associate Professor" in the field of higher education 4.2 Chemical sciences (Unit operations in chemical and biochemical industry).

14.11.2023

Reviewer: 

/Prof. Dr. Eng. E. Simeonov/