

Report

**prepared by Prof. Galya Marcheva Staneva, PhD
Institute of Biophysics and Biomedical Engineering-BAS,**

on the materials presented for participation in the competition for the academic post of "Professor" for the needs of QSAR and Molecular modeling Department at the Institute of Biophysics and Biomedical Engineering-BAS in Natural sciences, Mathematics and Informatics, professional field 4.3. Biological Sciences (scientific specialty "Application of the principles and methods of cybernetics in various fields of science (*in silico* study of bioactive compounds)"). The competition for "Professor" has been announced in the State Gazette, issue 18, page 32, 28/02/2020.

The only candidate in the competition for "Professor" is Associate Professor Dr. Ivanka Milosheva Tsakovska.

The review of the submitted documents shows that the procedure for opening and conducting the competition has been followed as the documents have been prepared in accordance with the requirements of the Academic Staff Development Act in the Republic of Bulgaria, the Regulations for its implementation and the Regulations for scientific staff positions in IBPhBME-BAS. The candidate has attached in a very diligent and logical form the full set of required documents.

Scientific profile of Assoc. Prof. Ivanka Tsakovska

Professional Development

Ivanka Tsakovska graduated with a master's degree in "Chemical Engineer" at the University of Chemical Technology and Metallurgy-Sofia, Bulgaria in 1995. Ivanka Tsakovska obtained her PhD in 2003 in the area of "Pharmacology" on the topic "Quantitative structure-activity dependences of selected classes of biologically active compounds". During this period Ivanka Tsakovska was a scholarship holder of the Alexander von Humboldt Foundation. During the period 2005-2006, Dr. Tsakovska carried out a postdoctoral internship at the Joint Research Center of the European Commission in Ispira, Italy on research in the field of computational toxicology and expert work in chemical risk assessment. Since 1996 until 2010, Ivanka Tsakovska passed through the positions of chemist, assistant, senior assistant and associate professor (2010) at the Central Laboratory of Biomedical Engineering "Prof. Ivan Daskalov", later merged with the Institute of Biophysics-BAS and renamed IBPhBME-BAS. The candidate is distinguished by many years of experience in research and teaching in higher education and work with 24 years of experience.

Research activity

Assoc. Prof. Ivanka Tsakovska participates in the competition for "Professor" with a total of 66 scientific papers, 24 of them were published after acquiring the academic position "Associate Professor". 17 of these 24 publications have a total impact factor 65.65. 14 falls into scientific journals in category Q1; 3 publications are in journals with SJR; 1 publication is in a conference proceeding (without impact factor / SJR) and 3 are book chapters. The document for fulfillment of the minimum requirements for the academic post "professor" shows that according to indicators B, D, E and E the candidate exceeds the required number of points determined by

IBPhBME-BAS, as well as the minimum number of 15 publications in journals with IF, according to the specific requirements of the institute for acquiring the academic position of "professor". The overall impact factor of the presented publications is extremely high (65.65), which defines Assoc. Prof. Tsakovska as a scientist of high international level, who is able to lead research from the formulation of the scientific task, through the implementation and the defense of research to international reviewers. The applicant submitted a total of 610 citations, mainly from foreign authors, for which evidence was provided. The scientific activity of assoc. Prof. Ivanka Tsakovska, measured by the Hirsch-index so far amounts to 12, which determines the high scientific quality of her research through the recognition of the international scientific community by the positive citations of her works.

Assoc. Prof. Tsakovska participated in 8 and managed 3 research projects from the National Science Fund (NSF). The motivation of the applicant to participate and coordinate international projects such as COST actions, a project under the 7th EU Framework Program (HEALTH program), bilateral agreements with Italy and France, etc. are extremely impressive. This fact also shows that Assoc. Prof. Ivanka Tsakovska and the research group in which she works have been sought for joint work by international research teams.

Assoc. Prof. Tsakovska has successfully supervised 2 doctoral students and 2 graduate students, and has worked together with a large number of young scientists from the institute.

Assoc. Prof. Tsakovska is a member of authoritative professional organizations such as the Union of Scientists in Bulgaria and The Cheminformatics and QSAR Society.

The candidate has reviewed PhD thesis, research projects, papers and monographs in prestigious scientific journals as well as is a member of editorial boards.

Assoc. Prof. Tsakovska was awarded three prestigious prizes: 1) Prize from the NSF / Ministry of Education and Science for the best youth project in the competition "Young Scientists" in 2002; 2) National Award "Marin Drinov of BAS for young scientists in 2003; 3) Eureka Award of the Eureka Foundation for excellence in science. All these awards are a consequence of the deeply dedicated efforts of the candidate in the field of molecular modeling over the years and achieved high scientific metrics.

The main scientific contributions of Assoc. Prof. Ivanka Tsakovska have been formulated in two groups, which definitely have a fundamental and applied character, formulation and proving of new hypotheses, obtaining of new facts as well as creating of new theories and approaches:

- (1) Scientific contributions in the Extended habilitation work, which is presented through the publications in indicator B4 of the detailed document for fulfillment of the requirements for the academic position "Professor", as the contributions are described in more details by the author and are illustrated with relevant figures (point 2 of the Extended habilitation work);
- (2) Scientific contributions outside the habilitation work (the publications in indicators G7 and 8) - a short author's reference of the main contributions is presented (point 3 of the Extended habilitation work).

The scientific contributions of Assoc. Prof. Ivanka Tsakovska, presented in the Extended habilitation work are in the field of computer-aided drug design and computational toxicology, which combine ligand- and structure-based *in silico* approaches, methodology for developing toxicological / pharmacological pathways leading to a given effect, as well as new mathematical approaches to decision making in the development of new drug compounds. The objects of her research include important target biomacromolecules, such as the transport protein P-gp and the nuclear receptors ER α and PPAR γ , as well as their ligands, which have been evaluated for their pharmacological / toxic effects. On this basis, Assoc. Prof. Tsakovska has formulated her future research, which is extremely promising for solving key issues related to certain socially significant diseases and improving human health. Her future research career will focus on

research modeling interactions with transport proteins and nuclear receptors, given their role as attractive targets in a number of therapies; research on natural products as promising structures for the purposes of targeted drug design, as well as the development of sustainable models for predicting toxic effects with a focus on important substances for the users, e.g. those that are part of cosmetics and food supplements. The scientific product generated by the work of Assoc. Prof. Tsakovska is characterized by proven contributions, whose originality lies in the priority areas of development in Bulgaria and the European Union, which outlines an extremely positive forecast for the future scientific activity of the candidate.

Expert activity

The high scientific value of the research of Assoc. Prof. Tsakovska defines her as a sought-after scientist in various expert activities such as: member of the General Assembly of BAS, member of the Scientific Council of IBPhBME-BAS, member of the Expert Council for Evaluation of Priority substances at the Ministry of Environment and Water, expert in various international commissions related to the effects of different types of substances on the environment and human (EU Technical Committee for New and Existing Substances), etc.

Personal view

Over the years, Assoc. Prof. Ivanka Tsakovska has proven to be a fair, tolerant, responsible colleague who is always ready to cooperate with all acquired knowledge both as a person and as a scientist.

Conclusions

Based on what has been said so far, I conclude that the significant contributions of the scientific publications presented in the competition, their repercussions in the scientific literature and the clearly defined scientific profile define Assoc. Prof. Ivanka Tsakovska as a dedicated, highly qualified, established and enterprising scientist who meets all requirements for achieving the academic position "Professor" for the needs of QSAR and Molecular modeling Department at the Institute of Biophysics and Biomedical Engineering-BAS in Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences (scientific specialty "Application of the principles and methods of cybernetics in various fields of science (*in silico* study of bioactive compounds)").

Therefore, I strongly recommend to the Scientific Jury to award the academic position "Professor" to Assoc. Prof. Ivanka Milosheva Tsakovska.

10/09/2020

/Prof. Galya Staneva, PhD/