

## REVIEW



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Of the materials submitted for participation in a competition for the academic position of ‘Associate Professor’ in the field of higher education 7. “Healthcare and sports”, Professional field 7.1 “Medicine”, Scientific specialty ‘Hygiene’ (for the needs of the “Chemical factors” department of the “Analytical and Laboratory Activities” directorate at the National Center of Public Health and Analyses), published in SG, issue # 14/19.02.2021, p. 213.

Within the legal deadline only one candidate has submitted an application and the accompanying documentation for participation in the competition – assist. prof. Vera Tsvetanova Pavlova, PhD.

Assist. prof. Vera Pavlova has submitted all required documents in accordance with the Act for the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, the Regulations for the terms and conditions for acquiring academic degrees and occupying academic positions of the NCPHA. The presented documentation has been prepared correctly, meticulously, and in accordance with all requirements and recommendations.

### **I. Candidate’s personal and professional data**

Assist. prof. Vera Tsvetanova Pavlova, PhD was born in 1974 in the town of Montana. In 1998 she obtained the "Master of Chemistry" educational qualification degree in the specialty of "Applied Chemistry", at the Faculty of Chemistry, Sofia University "St. Kliment Ohridski". In the 2003-2007 period she was a PhD student in NCPHA and has developed her thesis on "Hygiene and analytical aspects of the presence of microcystins in surface waters". In 2007 she was awarded the educational-scientific degree "Doctor" in the scientific specialty 03.01.32 Hygiene by the Higher Attestation Commission. The scientific specialty of the doctoral dissertation that the candidate defended fully corresponds with the scientific specialty in which the competition has been announced.

Assistant Professor Vera Pavlova has nearly 16 years of specialized work experience. Her professional career began in 2000 as a chemist at NCHMEN. From 2008 to 2011, she worked at Laborex PLC as a chemist specialist. From 02.06.2011 onwards she has worked at NCPHA occupying the positions "senior expert" and "assistant professor" in the "Chemical factors" department. She has headed the department since 2017.

In the 2004-2013 period she has completed four short-term fellowships: Masaryk University, May 2004 and April 2006, Brno, Czech Republic; Michigan State University, Institute of International Health, October 1 - November 15, 2005, Michigan, USA; Abo Akademi, University of Turku, 05.02 - 22.02.2013, Turku, Finland.



## II. General characteristics of the scientific, applied science, and teaching activities

As participation in this competition, assist. prof. Vera Pavlova has presented 25 publications in scientific journals and proceedings of scientific conferences ((11 publications published in scientific journals, referenced and indexed in world-famous databases; 14 publications and reports published in non-peer-reviewed journals with scientific review or in edited collective volumes). The information is summarized in tabular form as follows:

Number and content of the indicators	Min number of points	Score Vera Pavlova
<b>Group of indicators A</b>		
<b>Indicator 1.</b> PhD thesis	<b>50</b>	<b>50</b>
<b>Group of indicators B</b>	<b>100</b>	<b>105,5</b>
<b>Indicator 4.</b> Habilitation work / monograph or publications in scientific journals, referenced and indexed in world-famous databases of scientific information (at least 10)		105,5
<b>Group of indicators Г</b>	<b>200</b>	<b>235</b>
<b>Indicator 7.</b> Publications and papers published in scientific journals, referenced and indexed in world-famous databases of scientific information		60
<b>Indicator 8.</b> Publications and papers published in non-refereed scientific peer reviewed journals or in peer-reviewed collective volumes		175
<b>Group of indicators Д</b>	<b>50</b>	<b>310</b>
<b>Indicator 10.</b> Citations or reviews in scientific journals, referenced and indexed in world-famous databases of scientific information or in monograph and collective volumes		285
<b>Indicator 11.</b> Citations in monographs and collective volumes with scientific peer review		10
<b>Indicator 12.</b> Citations or reviews in non-referenced scientific peer-reviewed journals		15
<b>Group of indicators E</b>	<b>-</b>	<b>210</b>
<b>Indicator 15.</b> Acquired medical specialty		40
<b>Indicator 16.</b> Participation in a national scientific or educational project		90
<b>Indicator 17.</b> Participation in an international scientific or educational project		20



<b>Indicator 18.</b> Leadership of a national scientific or educational project		30
<b>Indicator 22.</b> Training of interns, postgraduates and doctoral students (seminars and practical classes)		30

With a needed a minimum of 400 points (Groups of indicators A ÷ Д) the scientific output presented by assist. prof. Vera Pavlova amounts to 700.5 points and coupled with the indicators from group E (optional for associate professor) reaches 910.5 points.

The fact that V. Pavlova is the first author in 11 of the 25 (44%) scientific publications submitted for the contest makes a very good impression. The articles published in journals with impact factor are 6, and she is the first author of 2 of them.

There were 23 citations on publications submitted for participation in the competition, according to the statement presented by the applicant. There are 19 citations in scientific journals, referenced and indexed in world-famous scientific information databases (Scopus and Web of science); 1 in monographs and collective volumes with scientific peer review, and 3 in unreferenced journals with scientific review. According to a reference from the Central Medical Library, 30 citations were found in Bulgarian sources from the CMB fund.

The report on scientific contributions is written concisely and clearly outlines Vera Pavlova's personal contributions. The achieved results with which the candidate participates in the competition are divided into three areas: (1) Studies for the presence of blue-green algae toxins (cyanotoxins) - chromatographic determination and ELISA determination (also including toxins other than microcystins algal toxins, such as saxitoxins, cylindrospermopsin, anatoxin-a) in aqueous samples. (2) Determination of anions (chlorides, nitrates, nitrites, sulphates, phosphates, bromates) by ion chromatography. (3) HPLC – determination of organic contaminants in waters.

Vera Pavlova is the head of 1 topic from the scientific plan of NCPHA "Study of the presence of cyanotoxins in water and biomass - analytical and hygienic problems", which has been going on since 2012; participant in 3 other scientific subjects on similar topics - study of the presence of some specific pollutants in drinking water, species identification and detection by PCR of toxic microalgae, assessment of the safety of biotoxins from natural sources by applying in silico and in vitro methods.

Assistant professor Vera Pavlova's vast activity in projects on current scientific and applied problems in the field of water, quality and safety of the environment and food, risk factors for the quality of life and health of the people in Bulgaria is noteworthy. Between 2010-2021, she participated in 8 projects (7 national, one international scientific project under COST program); and is the leader of 1 national project with national co-financing by COST "Cyanobacterial blooms and toxins in water bodies: Presence, impact, management"

Vera Pavlova promotes the achieved scientific results by actively participating in national and international conferences - she has 37 participations in 23 scientific conferences with 19 papers and 18 posters. She is the initiator and organizer of a seminar for PhD students and young scientists "Contemporary aspects of public health and ecology", a joint event of NCPHA, "Union of Chemists in Bulgaria" and the Faculty of Chemistry and Pharmacy at Sofia University „St. Kl.



Ohridski" (2017-2018). This enables experts in similar fields to exchange scientific information in informal work meetings, which helps with the training of the young staff.

The 2014-2020 study load is 151 class hours, according to the Reference for teaching load in NCPHA. The large number of hours devoted to working with young fellow chemists is impressive. In the period 2010-2020, 1 diploma thesis was defended under her guidance, she was a consultant to 1 graduate and a reviewer of 2 diploma theses, she has participated in the training of 2 interns. Assist. prof. V. Pavlova is the head of and lecturer in continuing education courses and individual trainings under the NCPHA Training Programs; she is a lecturer in basic training courses for acquiring the specialty "Medical Sanitary Chemistry"; supervisor of 2 trainees in this specialty.

The applicant has provided data on membership in professional organizations in the field of chemistry and public health: Union of Chemists in Bulgaria, Bulgarian Public Health Association, European Public Health Association, Bulgarian Toxicological Society, TC 15 "Environmental Protection" at the Bulgarian Institute of Standardization (chair since 2013).

### **III. Major scientific contributions**

The scientific activity of assist. prof. Vera Pavlova is mainly in the field of analytical chemistry and is associated with the development and validation of analytical methods for determination of pollutants to evaluate the quality and safety of water for which the Ministry of Health is a competent authority - drinking water, mineral water, water for recreation and water sports. The candidate's analytical expertise is mainly in the field of liquid (HPLC) and ion chromatography (IC).

The applicant's research interests are mainly focused on studies of the presence of blue-green algae toxins (cyanotoxins) in water and algal biomass. Highly sensitive analytical methods have been developed in collaboration with laboratories from Masaryk University, Brno, Czech Republic and Michigan State University, USA. Research has been conducted on Bulgarian reservoirs. The first national data on this problem has been obtained and published in a reputable journal (*Acta Hydrochim. Hydrobiol.*). Vera Pavlova defended her PhD thesis based on the results of the development. Research on the problem continues. In recent years, systematic studies of water bodies in the region of Sofia have been conducted, on a scientific topic of the NCPHA, of which she is the head. In addition to chromatographic methods, another contribution is the introduction of ELISA determination in aqueous samples not only of microcystins, but also of other algal toxins, such as saxitoxins, cylindrospermopsin, anatoxin-a. Joint studies and experiments have been conducted with the Faculty of Biology of Sofia University "St. Kl. Ohridski", BAS and other departments in NCPHA. Proved beyond doubt is the presence of the most toxic microcystin-LR, it has been reported in a large percentage of the analyzed samples, and the presence of the microcystins -RR and -YR has also been established.

The significance of the algal blooms and toxins produced by them was assessed by including the carcinogenic hepatotoxins microcystin-LR as a "chemical parameter" with maximum permissible value of 1 µg/l in the new European Directive 2020/2184 on the quality of water intended for human consumption. The transposition of the directive into our national legislation is forthcoming. Through the pioneering work of the teams in which assistant professor Vera Pavlova is an active participant as a researcher and leader, NCPHA occupies a leading position in the system of the Ministry of Health (and in the country) in terms of the determination of microcystins.



Another area in which the candidate has scientific interests is the determination of anions (chlorides, nitrates, nitrites, sulfates, phosphates, bromates) by ion chromatography. A study of the content of bromates (obtained as by-products of ozonation and the use of concentrated hypochlorite solutions for disinfection of drinking water) in table, mineral and drinking water was done for the first time in Bulgaria. Excessive content was not detected, but the presence of values close to the MRL of  $10 \mu\text{g}/\text{dm}^3$  suggests the need for more extensive and in-depth studies.

HPLC determination of organic contaminants in waters is an area in which the candidate has a significant contribution and is one of the best specialists at NCPHA. An HPLC - fluorimetric method for determination of 12 polyaromatic hydrocarbons (PAHs) was developed and was applied for determination of PAHs in aqueous samples from field studies, 6 PAHs were detected in trace amounts. An analytical procedure for quantitative determination in surface waters of triazines (pesticides in agriculture and environmental pollutants) with solid-phase extraction and HPLC has been developed, optimizations have been made in order to improve the analytical parameters as well as the preliminary preparation.

Another aspect of the rich scientific activity of V. Pavlova is research activity related to the development of HPLC analytical methods and participation in tests for determination of cyclic oligomers migrating from materials in contact with food; development of HPLC method for determination of pharmaceuticals such as diclofenac in aqueous medium, together with UCTM, etc.

I find it extremely positive that the studies were carried out in different research institutions at home and abroad, with participation in interdisciplinary teams with diverse research interests. The leading role of assist. prof. Vera Pavlova in the organization of the study, the interpretation of the results obtained and the preparation of scientific publications is unquestionable.

The main scientific contributions in the works of assistant prof. V. Pavlova can be split in the following categories: (i) new scientific results; (ii) expanding existing scientific knowledge; (iii) scientific achievements in practice.

I do not find information about proven plagiarism in the scientific works of the candidate assist. prof. Vera Tsvetanova Pavlova, PhD.

#### **IV. Personal impressions**

My professional contact with Vera Pavlova allows me to characterize her as a conscientious, thorough and productive researcher. I appreciate her professionalism and responsible attitude to work.

#### **CONCLUSION**

The scientific production submitted for the competition by assist. prof. Vera Tsvetanova Pavlova, PhD significantly exceeds the quantitative criteria for the academic position of "Associate Professor", according to Annex 1 of the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions in NCPHA. It is indisputable to me that assist. prof. Vera Pavlova, MD is a highly qualified specialist who is well-positioned to lead



and conduct research. The actuality and perspective of the topics of her research and publishing activity, her participation in research projects, as well as my personal impressions of her allow me to give a positive evaluation and to strongly recommend to the Scientific Council of NCPHA to award academic title "Associate Professor" to assist. prof. Vera Tsvetanova Pavlova, PhD in Professional Field 7.1 "Medicine", specialty "Hygiene".

Sofia, 11.06.2021

Assoc. prof. Rossitsa Georgieva, PhD

