

**TO THE CHAIRMAN OF THE SCIENTIFIC JURY
DETERMINED BY ORDER № RD 38-454 / 21.09.2021
OF THE RECTOR OF SU "ST. KLIMENT
OHRIDSKI"**

OPINION

Of Assoc. Prof. Velichka Yordanova Andonova, Ph.D.

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**Member of the scientific jury, determined by order № RD 38-454 / 21.09.2021 of the Rector
of Sofia University "St. Kliment Ohridski"**

Subject: competition for the academic position "Associate Professor" in the field of higher education 7. "Health and Sports," in professional field 7.3. "Pharmacy" (Technology of dosage forms) in the Department of Engineering Chemistry and Pharmaceutical Engineering of the Faculty of Chemistry and Pharmacy of Sofia University "St. Kliment Ohridski," published in the State Gazette, issue 63 / 30.07.2021

Based on order № RD 38-454 / 21.09.2021 of the Rector of Sofia University "St. Kliment Ohridski," I have been appointed a member of the Scientific Jury to evaluate a candidate for the academic position "Associate Professor," professional field 7.3. "Pharmacy" (Technology of dosage forms). I was chosen to prepare an opinion at the first meeting of the Scientific Jury.

The only candidate in the announced competition is Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D., is currently Chief Assistant Professor in the Department of Engineering Chemistry and Pharmaceutical Engineering, Faculty of Chemistry and Pharmacy, Sofia University "St. Kliment. Ohridski". Therefore, all documents submitted by the applicant fully fulfill the requirements of the Act on Development of the Academic Staff (ADAS) in the Republic of Bulgaria, the Regulations on the implementation of the Development of Academic Staff in the Republic of Bulgaria, and the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions in Sofia University "St. Kliment Ohridski."

I. BRIEF INFORMATION ABOUT THE APPLICANT

Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D., graduated from the Faculty of Pharmacy at MU-Sofia in 2009. In 2014 he acquired the educational and scientific degree "Doctor" under the doctoral program "Theoretical Chemistry and Macrokinetics" in professional field 4.2 "Chemical Sciences" at Sofia University "St. Kliment Ohridski." In 2021 he acquired the educational and scientific

degree “Doctor” in professional field 7.3 “Pharmacy” (Technology of dosage forms and biopharmacy), Sofia University “St. Kliment Ohridski.” The professional path of Chief Assist. Prof. Zahari Vinarov, Ph.D. started even before graduating from the Faculty of Pharmacy at the Medical University of Sofia, in 2008, as a chemist in the Department of Engineering Chemistry at the Faculty of Chemistry at Sofia University “St. Kliment Ohridsk” to this day shows sustainable development, marked by significant research and teaching success. In the period 2008-2011, he held the above position; from 2014 to 2016, he was an assistant in the Department of Engineering Chemistry and Pharmaceutical Engineering at the Faculty of Chemistry and Pharmacy at SU “St. Kliment Ohridski,” and from 2016 until now he has been a chief assistant professor in the same department. In 2019-2021 he was a postdoctoral fellow, Drug Delivery and Disposition, Department of Pharmaceutical and Pharmacological Sciences, KU Leuven, Leuven, Belgium. Chief Assist. Prof. Zahari Vinarov, Ph.D., speaks English (C2), Russian (C1), and French (B2). He was a member of the European Federation of Pharmaceutical Sciences (EUFEPS) from 2013 to 2018. He is currently a member of the American Association of Pharmaceutical Researchers (AAPS) and the Expert Group 13H (Oils and Derivatives, Polymers) of the European Pharmacopoeia (EDQM) (from 2019 to the present), as well as four editorial boards – Journal of Pharmacy and Pharmacology (Wiley / Royal Pharmaceutical Society, IF = 3.8), Molecules (MDPI, IF = 4.4), Frontiers in Drug Delivery (Frontiers) and Pharmaceutics (MDPI, IF = 6.3).

The academic development of Chief Assist. Prof. Zahari Vinarov, Ph.D., defines him as an established teacher and scientist with the necessary professional knowledge, skills, and competencies for his further professional development.

II. RESEARCH AND DEVELOPMENT ACTIVITIES

The scientific topic of Chief Assist. Prof. Zahari Vinarov, Ph.D. is focused on the following areas: oral delivery of low-soluble drugs; digestion of lipids and *in vitro* models of the digestive tract; surfactants and surface phenomena; emulsions. The scientific production of Chief Assist. Prof. Zahari Vinarov, Ph.D., is impressive in his quality.

For fulfillment of the minimum national requirements under Art. 2b of the ADAS, the field of higher education 7. "Health and Sports," professional field 7.3 Pharmacy, the candidate for the academic position of "Associate Professor" Zahari Penkov Vinarov presents as follows:

Group of indicators A – Indicator 1: Dissertation work for awarding the educational and scientific degree “Doctor” (50 points) - In 2021, Zahari Penkov Vinarov acquired the educational and scientific degree “Doctor” in professional field 7.3 “Pharmacy” (Technology of dosage forms and biopharmacy), SU “St. Kliment Ohridski” with the topic of the dissertation “Improvement of the solubility of hydrophobic drugs by solubilization in surfactant micelles” and certified with a diploma № SU 2021-24 / 25.03.2021, with which the requirement is met.

Group of indicators B – Indicator 3: Habilitation work – monograph (100 points) – the candidate presents a monograph "Solubilization: fundamental principles and biopharmaceutical applications," with which the requirement is met.

Group of indicators C – Indicator 6: Published book based on a defended dissertation for the award of educational and scientific degree "Doctor" (40 points) and Indicator 7: Publications in scientific journals, referenced and indexed in world-famous databases with scientific information (SCOPUS, Web of Science) (163 points). Zahari Vinarov presents 20 scientific publications, two books, and two popular science articles for participation in the competition. All scientific publications are published in journals with impact factors (Journal Citation Reports, Clarivate®), and the majority of them (85%, 17 out of 20) are in the leading journals in the field (Q1 & Q2, Journal impact factor quartiles, Clarivate®). The total impact factor is 113, and the individual is 18. The candidate is the first author of a review article in the prestigious journal *Advanced Drug Delivery Reviews* (IF = 15.47), which is ranked fourth out of 275 journals with an impact factor in the category "Pharmacology and Pharmacy" (Pharmacology & Pharmacy, SCIE). The candidate is the first author (in 6 of the 17 mentioned with IF) and / or author for correspondence in 70% of his publications, confirming his ability to plan and conduct research and present their results independently. It is noteworthy that most of the publications collaborate with foreign researchers, which shows that Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D., is recognizable in his scientific field and has the necessary skills for teamwork. The scientific results are presented as oral presentations or poster presentations at 40 national and international forums. The scientific production of the candidate according to the indicators from group D forms a total of 203 points, with which the requirements are met.

Group of indicators D – Indicator 10: Citations or reviews in scientific journals, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes. When preparing the documents for the competition, 319 citations were noticed in the described scientific publications (without taking into account the auto-citations of all authors). According to Scopus®, Elsevier BV, the h-index of the candidate is 10. Therefore, the points formed by a group of indicators D are 4785, which meets the requirement.

Group of indicators E – Indicator 16: Participation in a national scientific or educational project (15 points); Indicator 17: Participation in an international scientific or educational project (340 points); and Indicator 18: Management of a national scientific or educational project (30 points). Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D., has participated or is participating in 19 projects. Fifteen of them are funded by industrial partners – Unilever (13 projects), BLOKIT R&D, Spain (1 project), and Productora Alysa SPA (1 project), which shows the applicability of its research work and the high appreciation of the partners. In addition, the applicant is a member of the core group and co-chair of working group 3 – Advanced formulations in project COST CA16205 "European Network for Understanding the Processes Related to Resorption in the Gastrointestinal tract" with over 500 members from 32 countries. The project activity of Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D., and his participation in international teams once again prove his recognition in the relevant scientific field, his qualities as a researcher and organizer, and his abilities for teamwork. A total of 385 points are formed by a group of indicators E, with which the requirement is met.

From the presented data, it is clear that the candidate Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D. meets and exceeds the minimum national requirements, as well as the recommended criteria for holding the academic position of "Associate Professor" at SU "St. Kliment Ohridski" for professional field 7.3 "Pharmacy" with a total number of points by groups of indicators 5523.

In the evaluation of the research work of Chief Assist. Prof. Zahari Penkov Vinarov, Ph.D. I cannot fail to note and highly appreciate that he has been a postdoctoral fellow in the "Drug delivery & disposition" group of Prof. Patrick Augustijns at the Catholic University in Leuven, Belgium, for the last two years. The research in this period focuses on the development of robotic methods for biopharmaceutical research, together with the pharmaceutical company Janssen Pharmaceutica, and some of the work results are already applied in the company. In addition, he was a guest researcher at Unilever R&D, Port Sunlight, UK, and Unilever R&D, Colworth Science Park, UK, in 2008 and 2011, respectively.

The candidate's contributions are in three main areas: (A) Improving the aqueous solubility of hydrophobic drugs by solubilization in colloidal aggregates – contribution with scientific and theoretical nature; (B) Lipid dosage forms - excipients, methods of preparation and drug release; and (C) Biopharmaceutical methods for research of excipients and bioactive compounds – contributions with scientific and applied nature.

A) Improving the water solubility of hydrophobic drugs by solubilization in colloidal aggregates (monograph; publications № 5, 7, 9, 10, 11, 12, 15)

The low water solubility of many of the new drugs is one of the main problems facing the modern pharmaceutical industry, requiring various methods to improve it to ensure the oral bioavailability of the respective drugs. The studies of Chief Assist. Prof. Zahari Vinarov, Ph.D., are focused on improving the solubility of drugs by solubilization in colloidal aggregates of surfactants. The candidate's systematic research aims to introduce a new, rational selection of surfactants based on the mechanisms of solubilization and the relationship between the molecular structure of surfactants/drugs and solubilization capacity. The candidate's monograph "Solubilization: fundamental principles and biopharmaceutical applications" is in the same direction, building on the achieved research results of Chief Assist. Prof. Zahari Vinarov, Ph.D., adds new data and comparisons with the literature and gives a comprehensive view of the drug solubilization in colloidal aggregates of surfactants in the context of the Technology of Dosage Forms and Biopharmacy.

B) Lipid dosage forms – excipients, methods of preparation, and drug release (publications № 1, 3, 4, 6, 13)

Lipid dosage forms (LDFs) are one of the modern approaches to increase oral bioavailability. The candidate's contributions in the field of LDFs range from the preparation methods of lipid forms and the selection of excipients to the mechanisms of drug release in the gastrointestinal tract. The influence of the choice of the lipid carrier and the size of the drops, the role of the products of lipolysis of triglycerides and phospholipids on the drug solubilization, the interfacial properties of lipid- and protein-containing natural emulsifiers on the technological and biopharmaceutical characteristics are systematically, purposefully and in detail studied with a view to the rational selection of lipids and achieving maximum drug solubilization in the gastrointestinal tract. Another of the candidate's contributions is related to the development of innovative methods for obtaining emulsions. A fundamentally new approach to the preparation of nanoemulsions by cyclic melting/solidification of a coarse emulsion has been discovered, which can be used to obtain emulsions with a non-spherical droplet shape.

C) Biopharmaceutical methods for the study of excipients and bioactive compounds after oral administration (publications № 2, 8, 14, 16, 17, 18, 19, 20)

The candidate's contributions in this direction consist of developing new biopharmaceutical models for the study of excipients and bioactive compounds after oral administration. In his review publication, the candidate describes in detail the parameters of GIT that affect oral bioavailability and the degree of their variation. In addition, an *in vitro* model of GIT has been developed, which resembles some key *in vivo* conditions, which investigated the effect of calcium ions and saponin extracts on the bioavailability of cholesterol. The results of the *in vitro* model were validated by *in vivo* mouse experiments, which confirmed the trends and showed that oral administration of *Quillaja Saponaria* extracts significantly reduced serum cholesterol. This *in vitro* model of the candidate was also used to study the effects of surfactants and their interactions with bile salts in the small intestine on drug solubility.

Furthermore, a simpler version of the GIT model developed by the applicant has found application in the study of the effect of excipients (emulsifiers) in LDFs on the lipolysis of triglycerides. From 01.10.2019 to 30.09.2021, the applicant worked on the project "Robotic methods for complete physiological characterization of pharmaceutical action" with a leading organization Janssen Pharmaceutica, funded by the Flemish Fund for Innovation and Entrepreneurship. The results obtained by the candidate include the development of four methods for biopharmaceutical research of oral drugs, which are integrated into the processes of development of oral dosage forms in Janssen Pharmaceutica, which emphasizes their importance and applicability.

The results of the research activity of Chief Assist. Prof. Zahari Vinarov, Ph.D., results from purposeful and systematic work, which is undoubtedly characterized by an innovative approach and in-depth analysis. The necessary contributions have a theoretical and emphasized applied character. He has contributed significantly to the development of pharmaceutical science and, in particular, the Technology of Dosage Forms and Biopharmacy.

III. ACADEMIC AND TEACHING ACTIVITIES

Chief Assist. Prof. Zahari Vinarov, Ph.D. has teaching experience in conducting seminars and exercises in Chemical Kinetics of Bachelors in Chemistry (2011-2013); lectures on Dispersions in Pharmaceutical Technologies for Masters in Chemistry (2013-2019); and preparation of lectures and preparation and conducting of exercises in Technology of Dosage Forms for students of Pharmacy (2014-2019). In 2018, he was a lecturer in the Colloid Science course held at the Unilever Research Center in Bangalore, India. The candidate has participated in the team to prepare for the doctoral program in Technology of Dosage Forms and Biopharmacy at the Faculty of Chemistry and Pharmacy of Sofia University "St. Kliment Ohridski" in 2019-2020. Chief Assist. Prof. Zahari Vinarov, Ph.D. works successfully with students – he has been a supervisor of 4 graduates (2 of which are for international students in the Erasmus program) and one bachelor's thesis and has published seven scientific articles in journals with impact factor in co-authorship with students. In addition, he participated in the organization of short research visits of 2 students majoring in Pharmacy at the University of Southern Denmark and the University of Copenhagen, Denmark, and an internship as a student of Pharmacy at DSM Biomedical the Netherlands. I consider the above indicators, related to the ability to transfer knowledge to students and younger

professionals and to ensure continuity, to be a significant positive attestation for the academic activity of Chief Assist. Prof. Zahari Vinarov, PhD. In addition, the candidate participates in various departmental activities as a safety officer (2015-2019), writing reports on contracts with foreign industrial partners (2011-2019) and preparing technical specifications for the purchase of scientific equipment through public procurement. (2017-2019), which is an indicator of his commitment and responsible attitude to teaching and departmental activities.

The above-summarized assets of Chief Assist. Prof. Zahari Vinarov, Ph.D., are convincing and categorically define him as a well-built and qualified professional and teacher.

CONCLUSION

The materials presented in the competition and the evaluation of the contributions from the research work of Chief Assist. Prof. Zahari Vinarov, Ph.D. show that his scientific indicators meet and exceed the minimum national requirements for holding the academic position of "Associate Professor," defined in the Act on Development of the Academic Staff (ADAS) in the Republic of Bulgaria, the Regulations on the implementation of the Development of Academic Staff in the Republic of Bulgaria and the Rules on the Conditions and Procedure for Acquiring Science Degrees and Holding Academic Positions in Sofia University "St. Kliment Ohridski" and the specific criteria of the Faculty of Chemistry and Pharmacy for professional field 7.3 "Pharmacy."

I am convinced of my positive assessment and strongly recommend to the esteemed members of the Scientific Jury to prepare a report-proposal to the Faculty Council of the Faculty of Chemistry and Pharmacy at Sofia University "St. Kliment Ohridski" for the election of Chief Assist. Prof. Zahari Vinarov, Ph.D. for the academic position "Associate Professor" in the professional field 7.3. "Pharmacy" (Technology of dosage forms).

Varna,

21.11.2021

Opinion prepared by:

/ Assoc. Prof. Velichka Andonova, Ph.D /

