

## OPINION

**REGARDING:** For participation in a competition for the academic position of "docent" in the field of higher education by professional direction 4.3. Biological sciences (Microbiology), announced in SG, no. 56 of 30.06.2023

**by Assoc. Prof. Dr. Adriana Georgieva Gousterova**

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On the basis of Article 4 and Article 25 of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Article 57(1) and (2) of the Regulations for the Implementation of the RASRB, Article 108(1) and (3) from the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at SU "St. Kliment Ohridski" and decision of the Faculty Council of the Faculty of Medicine, Protocol No. 118/ 04.09.2023. a scientific jury was appointed to conduct a competition for the occupation of the academic position of "associate professor" in the professional direction 4.3. Biological sciences, (Microbiology) announced in the Official Gazette, no. 56 of 30.06.2023.

As a member of this jury, I declare that I have no common publications, projects or any form of conflict of interests according to the art. 1, paragraphs 3 and 5 of LDASRB with the only assessed candidate in the competition chief assistant professor from the Department of Mycology. Chief Assistant Dr. Lubomira Dimitrova Yocheva.

The presented documents are in accordance with the directions published in the Regulations for application of LDASRB.

### **1. Brief information about the candidates in the competition:**

Chief Assistant Dr. Lyubomira Dimitrova Yocheva, currently Chief Assistant in Microbiology at the Faculty of Medicine, Sofia University "St. Kl. Ohridski" is the only candidate in the competition for the academic position of "ASSISTANT PROFESSOR", by professional direction 4.3. Biological sciences, (Microbiology) announced in the Official Gazette, no. 56 of 30.06.2023 .

Ch. assistant Dr. Lyubomira Dimitrova Yocheva completed her higher education in the period 1981-1986 at SU "St. Kliment Ohridski", Faculty of Biology, Department of "General and Industrial Microbiology". She graduated in "Molecular and Functional Biology".

It was followed by regular doctoral studies in the period 15.01.1988 - 30.11.1993 at SU "St. Kliment Ohridski", Faculty of Biology, Department of "General and Industrial Microbiology". Diploma for Educational and scientific degree Doctor received on 26.05.1997 specialty Microbiology (code: 01.06.12).

Dissertation topic: "Biological characterization of a strain of *Streptomyces galbus* (F) subsp. *achromogenes* 695, chemical nature of antibiotic 695 and optimization of the conditions for its biosynthesis" supervisor: Prof. Lyubomir Kominkov, Ph.D. In the period 1996 - 1998, she held the position of technologist-microbiologist at the Institute of Cereals and Forage Industry; 2001 - 2006 - senior research assistant at the Institute of Cryobiology and Food Technologies (ICHT) at the National Center for Agrarian Sciences (NCAS) and from 2007 - he is currently the main assistant at the Department of "Biology, Medical Genetics and microbiology" at the Faculty of Medicine, SU "St. Kliment Ohridski".

## **2. Fulfillment of the requirements for occupying the academic position "associate professor"**

The only candidate for the academic position of "associate professor" under the competition submits a Reference on the fulfillment of the national requirements of the Act on individual indicators and a Reference on the fulfillment of the additional requirements for occupying the position of "Associate Professor", according to the Regulations, with a list of general publications included in it scientific journals: 55, of which 26 in journals with impact factor or impact rank.

**Publications in refereed journals and indexed in world-renowned databases of scientific information submitted for participation in a competition for "docent" - 23 articles**

**Total number of citations until now: according to Scopus – 135; compared to Web of Science – 142; compared to Google Scholar – 286**

Educational materials issued: 3

Participation in national and international scientific forums: 45

Participation in scientific projects: 15. Of them:

participation in projects and programs at the Ministry of Education and Culture - 3

participation in institutional projects at the "Scientific Research" Fund at SU "St. Kliment Ohridski" and at the Agricultural Academy - 8

• management and participation in institutional projects at the "Scientific Research" Fund at SU "St. Kliment Ohridski" - 4.-

**Total IF: 16.215; Individual IF: 1.926**

**H-index: 3 (Scopus); 3 (Web of Science)**

## **3. Fulfillment of the minimum national requirements according to ZRASRB**

It is clear from the tender documents that Ch. Assistant Professor Dr. Lyubomira Dimitrova Yocheva fulfills and exceeds the minimum national requirements as follows:

**According to indicator A – 50 points**

The candidate received a Diploma for the educational and scientific degree "Doctor" on 26.05.1997, successfully defending a dissertation in the Department of "General and Industrial Microbiology" at the SU "St. Kliment Ohridski", Faculty of Biology, on the topic "Biological characteristics of a strain of *Streptomyces galbus* (F) subsp. 695, chemical nature of antibiotic 695 and optimization of the conditions for its biosynthesis" with scientific supervisor: Prof. Dr. Lyubomir Kominkov.

**According to indicator 4 in group B – 105 points.**

Habilitation thesis – 6 scientific publications in international journals that are referenced and indexed in world-famous scientific information databases Scopus and Web of Science in the period 2020-2023 (Q1 - 1; Q2 - 1; Q3 - 4);

**According to indicators in group G.7 - 239 items.**

Scientific publications in publications that are referenced and indexed in world-famous databases with scientific information (Scopus and Web of Science), outside of the habilitation thesis from 2001-2023 (Q2 - 1; Q3 - 9; Q4 - 7).

All scientific works are co-authored and are in refereed scientific journals.

**According to the indicators from 11 to the end, group D - 78 points.**

Citations in scientific publications, monographs, collective volumes and patents, referenced and indexed in world-renowned databases of scientific information (WoS and Scopus)-

**According to the indicators from 14 to the end, group E - 57 points.**

F. 14. Participation in a national scientific or educational project - 3 participations in contracts (1995 - 1; 2018 - 1; 2021 - 1)

E-19. Published university textbook or textbook that is used in the school network: 2015 - 1.

E. 20. Published university textbook or textbook that is used on the school network.

3 textbooks (2013 - 1, 2014 - 1, 2016 -1, second edition)

**Total points: 529 points.**

#### **4. Evaluation of the candidate's scientific works presented in the competition for associate professor.**

The main contributions from the activities of the main assistant Dr. Lyubomira Dimitrova Yocheva are formed in a summary as a habilitation reference for the scientific and scientific-applied contributions and in the field of academic education, in the works of 12 pages, giving well systematized information about the performed scientific activity. Contributions from the publications are grouped into 5 main research directions, fully corresponding with the direction of the competition and the unit, as follows:

##### **I. Contributions to the field of antimicrobial activity of naturally produced biologically active substances and nanomaterials**

**A.1. Antimicrobial activity of biologically active substances produced by medicinal plants.**

The antimicrobial spectrum of extracts and fractions from the investigated plant species St. John's wort, Catnip and Ranilitis against a panel of Gram-positive and Gram-negative bacteria and *Candida albicans* was determined.

The minimum inhibitory concentration (MIC) and the minimum bactericidal concentration (MBC) of extracts and fractions of the studied plant species against the sensitive Gram-positive and Gram-negative bacteria were determined.

For the first time, a comparative study of the antimicrobial activity of in situ wild plants, in vitro and ex vitro cultivated plants of the species *S. thracica* Davidov, *S. bulgarica* Degen & Neic and *S. scardica* Griseb was conducted.

##### **A.2. Antimicrobial activity of green microalgae and cyanobacteria**

The spectrum of action of fractions and extracts from the biomass of a newly isolated strain of *Coelastrella* sp was determined. BGV and the culture medium of cyanobacteria: *A. africanum*, *N. commune* and *Chroococcus* sp. R-10 against Gram-positive and Gram-negative bacteria and *Candida albicans*.

The Bulgarian strain *Coelastrella* sp. was studied and characterized. BGV as a potential producer of substances with an antimicrobial effect in addition to the already proven antitumor and antioxidant activity.

##### **B. Antimicrobial potential of lactic acid bacteria**

About 130 strains of lactic acid bacteria (lactobacilli, streptococci and pediococci) and 3 strains of bifidobacteria were screened for inhibitory activity.

Three mechanisms of action were investigated: antimicrobial activity, direct inhibitory effect in co-cultivation with test cultures and co-aggregation.

The safety of the studied strains was proven in terms of their sensitivity to a certain set of antibiotics.

Strains exhibiting at least two mechanisms of antagonistic action have been selected and proposed for the production of probiotic or starter cultures.

The obtained results have served as a justification for the inclusion of these strains in probiotic formulas and their production as preparations for children and adults, including all preparations of the Lactoflor series (Kendy Pharma).

##### **C. Studies on the biology of streptomycetes, producers of biologically active substances**

The chemical composition of an antibiotic complex produced by *Streptomyces flavovirens* strain 67 isolated from Antarctic soils was determined.

The conditions for obtaining and regenerating protoplasts from the strain *Streptomyces albobriseolus* 444, producer of a broad-spectrum antibiotic complex, were optimized.

The taxonomic affiliation of two streptomycete strains, prospective producers of enzyme complexes: trypsin/trypsin-like proteases and a complex of serine and metalloproteases - *Streptomyces chromofuscus* 34-1 and *Streptomyces albobinaceus* 3B - was determined.

#### **D. Antimicrobial activity of newly synthesized or commercial nanomaterials**

The antimicrobial activity of newly synthesized zinc oxide nanomaterials as well as those coated with silicon oxide was studied.

A comparative study of the biological activity of original newly synthesized graphene nanocomposites with the participation of nanosized zinc oxide in combination with metal nanoparticles (copper and silver) dispersed in collagen suspensions was conducted.

### **II. Contributions to the isolation and characterization of bacteria of importance in food technology and biotechnology**

#### **A. Microflora of spontaneous fermentation of chickpea grains (*Cicer arietanum* L.)**

The contributions of research in this area are of a scientific-theoretical and applied nature: For the first time, active chickpea yeast has been shown to be a mixed microbial population including representatives of the genera *Clostridium* and *Bacillus*, and the taxonomic position of the isolated strains of both genera has been determined.

The created collection of clostridial strains has made it possible to select and study strains capable of producing larger amounts of butyric acid, which is widely used in the chemical, food, pharmaceutical and fuel industries.

#### **B. Microflora of rye sourdough/dough**

Research was conducted on the microflora of Bulgarian rye sourdough starters from different geographical regions of the country.

Over 180 strains of lactic acid bacteria and over 30 strains of yeast have been isolated and identified by phenotypic characteristics.

#### **C. Microflora of raw dried sausages**

A complete microbiological analysis of naturally fermented Bulgarian raw-dried sausage - Panagyurska lukanka was carried out. The presence of lactobacillus strains producing substances with a bacteriocin-like structure has been proven.

### **III. Contributions in the field of sanitary-microbiological evaluation of water for drinking and domestic needs**

Contributions in this area have a markedly applied nature:

Sanitary and microbiological evaluation of Bulgarian bottled mineral water from three brands for different storage periods. Complete water safety has been established.

When monitoring well and borehole waters in private properties and small settlements, fed by nearby rivers, it was found that these waters do not meet the sanitary-microbiological criteria for drinking water according to BDS and European standards.

### **IV. Contributions in the field of spread of some bacterial and viral infections in Bulgaria and their relationship with inflammatory, allergic or autoimmune diseases**

A study was conducted on the serological prevalence of *Helicobacter pylori* in asymptomatic children.

A statistically reliable tendency for colonization with *Staphylococcus aureus* in the skin lesions of Bulgarian children with atopic dermatitis was established.

### **V. Contributions to Academic Education**

The candidate participates in the development and publication of study materials in Bulgarian and English, prepared in accordance with the established microbiology training program for medical students at the Faculty of Medicine of Sofia University.

In co-authorship, the candidate participated in the writing of a textbook on Food Microbiology. The textbook is intended for students, specialists and doctoral students in microbiology at the Faculty of Biology of the University of St. Kliment Ohridski"

#### **5. Educational and methodological activity.**

The candidate has declared an active teaching and learning activity in the Department of "Biology, Medical Genetics and Microbiology" at the Faculty of Medicine, SU "St. Kliment Ohridski" as chief assistant from 2008/2009 until now.

Leads microbiology exercises for students majoring in "Medicine" and "Medicine in English" at the Faculty of Medicine of the SU; in the Faculty of Physics of the SU from the academic year 2013/2014 until now and in the Faculty of Biology of the SU from the academic year 2007/2008 until now. He is the co-supervisor of three diploma theses.

#### **6. Personal impressions of the candidate.**

I know Ch. assistant professor Lyubomira Dimitrova Yocheva from the Faculty of Biology of Sofia University "St. Kliment Ohridski". I have excellent impressions of her dissertation work and research, her energy, her scientific knowledge in the field of biotechnology, molecular biology and teamwork.

The candidate is a regular member of the "Microbiology" section of the Union of Scientists in Bulgaria since 2014. From the same year until now, he is a member of the Bulgarian Association of Microbiologists.

I am convinced that these qualities and her extremely active educational and teaching activity will be very useful to her as an associate professor at the Faculty of Medicine of Sofia University "St. Kliment Ohridski".

#### **7. Critical notes and recommendations.**

I have no comments or recommendations for the candidate. All documents are prepared as required.

#### **Conclusion**

In terms of volume, content and quality, the scientific production presented and the extremely active teaching and teaching activity, research and organizational activity, professional and scientific experience of the candidate fully correspond to the requirements for occupying the academic position of "associate professor". I confidently give my positive assessment and I **SUGGEST that the candidate Chief Assistant Lyubomira Dimitrova Yocheva take the academic position of "associate professor"** in the discipline "Microbiology" 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological Sciences, in the scientific specialty "Microbiology", at the Faculty of Medicine of Sofia University "St. Kl. Ohridski".

Date

Prof. Dr. Adriana Guscherova

24.10.2022