

## STATEMENT

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Academy of Sciences

**Concerning:** Statement about the candidate's application for the academic position "Associate Professor" in the professional field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. Biological Sciences, in the scientific specialty "Microbiology", at the Medical College, Thracian University, Stara Zagora, Published in the State Gazette issue no. 13 / 15.02.2022

### 1. General information of the received materials

By order № 1031 / 12.04.2022, Stara Zagora, Based on Art. 4 (3), (4) of the Law of the Development of the Academic Compositions in the Republic of Bulgaria and its regulations, Art. 5 (3), (4) of the additional requirements for the position of "Associate Professor" at the Faculty of Medicine, Thracian University, Stara Zagora and decision of the Academic Council, order № 25/06.04.2022, I have been appointed a member of the Scientific Jury of the competition for the academic position of "Associate Professor" in the field of higher education 4. Natural Sciences, mathematics and informatics, professional field 4.3. Biological Sciences, in the scientific specialty "Microbiology", at the Medical College, Thracian University, Stara Zagora, Published in the State Gazette no. 13/15.02.2022.

The only candidate for participation in the announced competition is Assistant Professor Nedelina Stoyanova Kostadinova, PhD who works as a assistant professor in the Department of Mycology at the Stephan Angeloff Institute of Microbiology, BAS.

The entire documentation, presented by Dr. Kostadinova is in accordance with the Law of the Development of the Academic Compositions in the Republic of Bulgaria and its regulations and includes all required documents accompanied by appropriate evidence. As a member of this jury, I declare, that I do not have any common publications, projects or conflict of interests within the meaning of para. 1 items 3 and 5 according to the Law of the Development of the Academic Compositions in the Republic of Bulgaria with the only candidate for the Academic Position "Associated Professor" - Dr. Nedelina Stoyanova Kostadinova.

### 2. Briefly biographical data and assessment of the publication activity

Assistant Professor Nedelina Stoyanova Kostadinova graduated her master's degree in "Microbial and Plant Biotechnology" at the Faculty of Biology, Plovdiv University "Paisii Hilendarski" in 2006 and received a PhD degree in 2013 at the Stephan Angeloff Institute of Microbiology, BAS with the PhD thesis: "Cellular response to low-temperature stress in Antarctic fungi". From 2014 till now she is an assistant professor in the Department of Mycology at the Stephan Angeloff Institute of Microbiology, BAS. During the dissertation period, as well as until now, the candidate participates intensively in various national and international projects, leads students, and participates in scientific forums. Since 2015 she is a leading lecturer in discipline "Cell Biology" at the Department of Cell Biology and Developmental Biology, Faculty of Biology, Sofia University "St. Kliment Ohridski". All of these activities lead to the acquisition of significant teaching experience and high qualifications and skills with long-term perspective and career growth.

### 3. Implementation of the requirements for holding the academic position of "Associate Professor"

The candidate gives documentation for the implementation of the national requirements based on the groups of indicators from The Law of the Development of the Academic Compositions in the Republic of Bulgaria and documentation for the implementation of the additional requirements for holding the position of "Associate Professor" at the Faculty of Medicine, Thracian University, Stara Zagora. According to indicator A, the candidate has submitted a Short Book Description of a PhD thesis with a total number of 50 points.

The candidate has a total of 33 publications for the entire scientific career; in this competition she participated with 29 publications. All articles are distributed as follows:

- 18 are referenced and indexed in the world-famous scientific databases Web of Science and / or Scopus: 4 - in journals with Q1, 10 - in journals with Q2, 3- in journals with Q3, 1 - in journal with Q4
- 4 are book chapters in unreported and edited collective volumes,
- 6 are publications without IF,
- 1 published book based on a defended dissertation

According to indicator B, the candidate has 6 publications with a total of 115 points. By group G, indicator 7, 12 publications were presented with a total of 242 points, and a total of 322 points for group the entire group G. Dr. Kostadinova is the first author in 7 scientific papers, second author in 6 scientific papers, third and next author in the remaining. The report on criteria Group D shows a sufficient number of citations in referenced and indexed databases (113 citations without self-citations in Scopus, 226 points). According to indicator E, the candidate presents evidence of attracted funds for projects, participation and management of projects with a total activity, which is reflected through 260 points. The publications presented in this competition, classified by indicators, define Dr. Kostadinova as a young, intensively working scientist.

#### 4. Scientific topics

The publications presented in the competition include research focused on the study of the physiological responses of filamentous fungi, added to the normative conditions and subjected to the influence of stress factors. Changes in antioxidant defenses of the cells that produce and characterize the enzymes of filamentous fungi have been studied. They are important components of the cellular response in these organisms. The possibility of their potential application is discussed. The Antioxidant activity of various plant extracts has been studied.

The research activity and the scientific contributions in the publications of the candidate can be grouped thematically in the following main directions:

1. Adaptation of fungi to low temperatures. Oxidative stress and antioxidant protection of cells due to low temperature and other types of stress

Main contributions: Soil samples from the region of Livingston Island, Antarctica from a Bulgarian expedition (January and February 2007) were analyzed, from which a total of 31 isolates of filamentous fungi were obtained. New information has been obtained on the differences in the physiological response of fungi belonging to different temperature classes. The *Aspergillus glaucus* 363 strain has been selected as the most promising producer of the enzyme superoxide dismutase (SOD). A study with a model strain of *P. griseofulvum* P29 was performed to detect and sequence catalase genes to determine whether these genes are associated with cell survival at low temperatures. Laboratory technology for efficient production of low-temperature active SOD from *A. glaucus* 363 strain has been developed based on the relationship between low temperature treatment and enhanced antioxidant protection in cells.

2. Antioxidant and antifungal activity of plant extracts and other natural products

Main contributions: For the first time the antimicrobial and radical-capturing activities of extracts and fractions of the aboveground and root parts of *G. urbanum* (urban enchantress) were studied, the total phenolic content was determined and new chemical compounds were isolated. New information on the inhibitory effect of white oregano essential oil *O. vulgare subsp. Hirtum* on soil pathogenic fungi on potatoes such as *F. solani*, *F. oxysporum*, *Neocosmospora sp.*, *A. solani*, *A. alternata* and *B. cinerea.*, Initial antioxidant screening of fractions obtained from the mucus of the garden snail *Cornu aspersum* was performed.

3. Lignolytic fungi, enzymes and potential

Main contributions: New data have been obtained on the effect of the increased concentration of copper (Cu) ions on the activity of the lignolytic enzyme complex in *T. trogii* 4<sub>6</sub>, and changes in the antioxidant cellular response have been observed. Improvements in the production process of lignolytic enzymes in *T. trogii* have been achieved by optimizing a number of deep culture parameters such as incubation time, type of cultivation, medium / air volume ratio, inoculum size and addition of inductors.

4. The fungi as a good producer of sialidases

Main contributions: New information has been obtained on the prevalence of sialidase in filamentous fungi from non-clinical isolates. A total of 113 fungal strains were screened, 77 of them were able to synthesize sialidase. The data show that, depending on the habitat, there is a variation in sialidase activity between species, as well as within species, depending on the habitat. The sialidase gene has been identified. The best producer, *P. griseofulvum* P29, was selected from three promising strains, based on

their sialidase production according to the type of cultivation, the composition of the medium and the growth temperature.

#### 5. The fungi as contaminants of various monuments

Main contributions: The first study focused on the biodiversity of fungi, contaminating various materials from historical monuments had been studied. Thirteen samples taken from various tombs in Egypt were analyzed, from which a total of 30 isolates were obtained. Species have been identified; the dominant ones are *Pencillium* and *Aspergillus*. This study is the first report on the taxonomy of fungi in this part of the world cultural heritage.

#### 5. Additional activities - participation in research projects, scientific forums and teaching activities

I have known Dr. Nedelina Kostadinova since she started working at the Stephan Angeloff Institute of Microbiology, BAS. I have extremely good impressions of her research and skills. The accumulated serious experience and high qualification in teaching, organizing various scientific events and her participation in the editorial board of various proceedings of Stephan Angeloff Institute of Microbiology, BAS will help her development as an Associate Professor at the Medical College at Thracian University, Stara Zagora. Her participation in national and international projects and congresses will contribute to new ideas for successful collaboration with Bulgarian and foreign groups and development of the University of Stara Zagora.

#### 6. Critical remarks and recommendations

I have no remarks or recommendations to the candidate. All documents are prepared according to the requirements.

#### 7. Conclusion

The results achieved by the candidate fully cover the minimum national requirements and additional requirements of the Thracian University, Stara Zagora for the academic position of "Associate Professor", as the required points in the groups of indicators directly related to the quality of scientific results (G and D) are significantly exceeded. The candidate's publications contain original scientific and applied contributions, which have received international recognition and most of them have been published in peer-reviewed journals. Doubtless, the scientific qualification of Assistant Professor Dr. Nedelina Stoyanova Kostadinova is higher.

Based on the materials and scientific papers presented in the competition, analysis of their importance and contributions, I give my positive assessment and recommend to the Scientific Jury to give the academic position of "Associate Professor" to the Nedelina Stoyanova Kostadinova in the field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.3. Biological Sciences, in the specialty "Microbiology", at the Medical College, Thracian University, Stara Zagora.

30/05/2022  
Sofia, Bulgaria

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/Assoc. Prof. Violeta Valcheva Ruseva, PhD/