



MEDICAL COLLEGE, TRAKIA UNIVERSITY

STATEMENT

by Assoc. Prof. Dr. Toncho Gospodinov Dinev,

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Scientific specialty: "Microbiology", professional field. 4. Biological Sciences.*

Subject: Competition for the academic position of "Associate Professor" in the scientific specialty of "Microbiology", professional field 4.3. Biological sciences, field of higher education 4. Natural sciences, mathematics and computer science.

1. Information about the competition

The competition is announced for the needs of the Medical College at Trakia University (TrU), Stara Zagora in the State Newspaper - issue 13/15.02.2022.

Reason for submitting the statement: Participation in the composition of the scientific jury of the competition, according to Order № 1031 / 12.04.2022 of the Rector of TrU. As a member of the scientific jury, I declare that I have no common articles with the candidate.

2. Brief information about the candidates in the competition.

There is one candidate in the competition - Assistant Professor Dr. Nedelina Stoyanova Kostadinova from Institute of Microbiology "Stefan Angelov", BAS.

Brief biographical data: Dr. Nedelina Kostadinova was born on 10.08.1981. In the period of 2000-2004 she graduated with a Bachelor's degree with a specialty "Biologist" and pedagogical qualification "Biology Teacher". In 2004-2006 she graduated from Plovdiv University "Paisii Hilendarski" with a Master's degree in "Microbial and Plant Biotechnology", majoring in "Biologist". In the period of January 2008-2012 she was a PhD student at the Institute of Microbiology "Stefan Angelov", BAS. She defended her thesis on "Cellular response to low temperature stress in Antarctic fungi" on 22.05.2013. From June 2011 to June 2014 she was appointed as Assistant Professor at the Institute of Microbiology, BAS, and in July 2014 until now as Chief Assistant Professor at the same Institute.

3. Fulfillment of the requirements for the academic position of Associate Professor.

Chief Assist. Prof. Dr. Nedelina Kostadinova has exceeded the requirements for the group of indicators C, D, E and F according to Annex 8.3. for the Minimum National and Additional Requirements for the Scientific and Teaching Activity of Candidates for the Academic Position of Associate Professor.

- ✓ Criterion "A" - Successfully defended PhD Thesis - 50 points (50 points required).
- ✓ Criterion "B" - Habilitation Thesis - scientific publications in journals that are refereed and indexed in world-known databases of scientific information (Web of Science and Scopus) - publications No. 8, 11, 14, 15, 19 and 21 from the list of publications - 115 points (required 100 points).
- ✓ Criterion D: points 6, 7 and 8 - 322 points (200 points required)

P. 6. Published book based on a defended PhD Thesis or DSc Thesis - 20 pts.

Publication № 33 from the list of publications

P. 7. Scientific publication in journals that are refereed and indexed in world-known databases of scientific information (Web of Science and Scopus), outside the Habilitation Thesis - 242 pts.

Publications No. 5, 6, 7, 9, 10, 12, 13, 16, 17, 18, 20 and 22 from the list of publications

- Three articles (No. 5, 6, 7) in a Q1 journals
- Seven articles (No. 9, 10, 12, 13, 16, 17 and 18) in a journals with Q2
- One article (No. 20) in journals with Q3
- One article (No. 22) in journals with Q4

P. 8. Published chapter of a collective monograph - 60 pts.

Publications No. 23, 24, 25 and 26 from the list of publications

- ✓ Criterion "E" 105 citations without autocitations (Web of Science and Scopus) - 210 pts. in total (50 pts. required)

Citations in other databases - 84.

Total citations in all databases - 189.

- ✓ Criterion F - Total points: 260.8 points (0 points required)

T. 14. Participation in a national scientific or educational project - 140 pts.

T. 15. Participation in an international scientific or educational project - 100 pts.

T. 16. Supervision of a national scientific or educational project - 20 pts.

T. 18. Funds raised in projects led by the applicant - 1 point for every 5000 BGN - 0.8 points.

The total IF of the submitted publications is **31.61**

The citation index (h-index, according to SCOPUS) of the candidate in the competition for the academic position of Associate Professor is **7.00**.

With plenary papers and posters Chief Assist. Prof. Nedelina Kostadinova has participated in 53 national scientific forums in the country and 27 international scientific forums. She is a member of the Union of Scientists in Bulgaria, the Bulgarian Microbiological Society and is part of the network of the Federation of European Microbiological Societies (FEMS). She has done 2 specializations abroad and was awarded the prize for "Best Scientific Work of a Young Microbiologist" for 2012 by the Foundation of Acad. prof. Stefan Angelov. She has participated in 5 courses and workshops and has 152 registered gene sequences in the National Center for Biotechnology Information NCBI database.

The applicant's total score across all criteria is 957.8 (400 required).

The established number of points of the candidate fully covers and even exceeds many times the minimum number of points for the individual criteria, therefore the scientific production of the candidate meets the requirements of the Law on Research and Development and Annex 8.3. for the position of Associate Professor. There are no requirements unfulfilled.

4. Evaluation of teaching activities

Chief Assist. Prof. Dr. Nedelina Kostadinova has so far taught courses in cell biology (cytology). Under her supervision 1 student successfully defended Graduation Thesis for Bachelor Degree.

5. Brief description of the presented scientific works and synthesized evaluation of the main scientific and applied contributions

The scientific research activity and scientific contributions in the works of Chief Assist. Prof. Dr. Nedelina Kostadinova can be thematically grouped into the following 5 main areas:

- ✓ **Adaptation of fungi to low temperatures. Oxidative stress and antioxidant protection of fungi to low temperatures. Oxidative stress and antioxidant protection of cells due to low temperature and other stresses**

Important contribution are, as follows: a total of more than 100 fungal isolates were obtained from the region of Livingstone Island, Antarctica. The concept of metabolic adaptation of Antarctic fungi to low temperatures was investigated by comparing the activities of several key enzymes. The role of stress proteins in adaptation to low temperatures in fungi of different temperature classes was investigated. New information was obtained on differences in the physiological response of fungi belonging to

different temperature classes isolated from Livingstone Island, Antarctica. New information was obtained on a mesophilic fungal strain, *Aspergillus glaucus* 363, isolated from Antarctica as a good producer of low temperature active SOD. A study was carried out with the model strain *P. griseofulvum* P29 to detect and sequence catalase genes to determine whether these genes are associated with cell survival at low temperatures. Evidence was obtained on the relationship between tolerance to extremely high concentrations of Cu and Zn ions and different cellular response in fungi isolated from metal-contaminated soils. The effect of increasing concentrations of cadmium ions (Cd) on the growth and morphology of *A. fumigatus* 3₂ was examined, as well as the involvement of oxidative stress in metal-induced toxicity. The response of fungi against the combined toxicity of mixtures of heavy metals (Cu, Cd, Ni and Zn) and the occurrence of oxidative stress was compared in two fungal strains. The significance of the antioxidant enzymes SOD and KAT in the tolerance of cultures of *Humicola lutea* strain 103 at different growth phases to elevated Cu-ion concentrations was investigated. Soil samples from the Bulgarian Antarctic Station on Livingstone Island were examined and fungi synthesizing catalase enzyme were isolated. The effect of heat stress on *Aspergillus niger* strain 26 and its response in terms of antioxidant defence was investigated. The effects of subchronic intracerebroventricular (ICV) treatment (14 days) with the dipeptide kyotorphin on behavioral, biochemical, and histological changes in a streptozotocin (STZ-ICV)-induced rat model of sporadic Alzheimer's disease were investigated. The effects of the antihypertensive angiotensin AT1 receptor antagonist losartan on type 2 diabetes mellitus (T2DM)-induced changes in exploratory behavior, anxiety, oxidatively damaged protein levels, nociception, and short-term memory were examined in normotensive Wistar and spontaneously hypertensive rats (SHRs). A laboratory technology for efficient production of low-temperature active SOD from the strain *A. glaucus* 363 was developed. A simple and efficient procedure for the purification of low-temperature active SOD was proposed. The observed sharp increase in SOD (2.3-fold) and CAT (1.5-fold) activity compared to the control at exposure to 200 and 300 mg/mL for Cu and Zn ions, respectively, shows the strain *A. fumigatus* 3₂ as a potential good producer of these enzymes in future biotechnological developments. The observed tolerance to heavy metals in both two model fungal strains, *A. fumigatus* 3-2 and *A. fumigatus* G, is a prerequisite for their potential use in bioremediation processes. An improved laboratory technology in 3 L bioreactors for the synthesis of SOD based on the relationship between heat stress treatment and antioxidant enzyme protection was developed. An efficient laboratory technology for the production of low-temperature active catalase was developed based on changing the oxidative stress level by increasing the oxygen concentration in the bioreactor.

✓ **Antioxidant and antifungal activity of plant extracts and other natural products.**

The chemical composition of 6 essential oils of the genus *Rosa* growing in Bulgaria, Moldova and China was determined and their anti-radical and antifungal activities against the fungi *Aspergillus flavus* and *Aspergillus niger* were compared. For the first time are determined the antimicrobial and radical scavenging activities of extracts and fractions from the aerial and root parts of *G. urbanum* (urban honeysuckle), as well as their total phenolic content. New chemical compounds were isolated from them. New information was obtained on the inhibitory effect of white oregano essential oil (*O. vulgare* subsp. *hirtum*) on soil pathogenic fungi such as *F. solani*, *F. oxysporum*, *Neocosmospora* sp., *A. solani*, *A. alternata* and *B. cinerea*. It was found that white oregano essential oil possessed high antibacterial activity against the tested model strains of *P. aeruginosa*, *E. coli* and *B. subtilis*. An initial antioxidant screening of fractions derived from the mucus of the garden snail *Cornu aspersum* was conducted.

✓ **Lignolytic fungi, enzymes and potential.**

Samples of Bulgarian forest soils were examined for the presence of lignolytic fungi. New data were obtained on the effect of increased copper ion concentration on the activity of the ligninolytic enzyme complex in *T. trogii* 46, and changes in the antioxidant cellular response were also monitored. The anaerobic degradation of three types of lignocellulosic wastes (corn stover, wheat straw and barley straw) was studied in a pilot-scale bioreactor under intermittent and continuous operation. A review article was written addressing the aging process, which has already been considered in the context of

various abiotic stresses (water deficit, high temperature, salinity, cold, heavy metals, mechanical injury, UV radiation, etc.). Another review article summarizes information on the status of lignocellulosic debris accumulated during manned space missions away from Earth orbit. Their management by recycling is emphasized. An improvement in the production process of ligninolytic enzymes has been achieved at *T. trogii* by optimizing a number of deep culture parameters such as incubation time, culture type, medium/air volume ratio, inoculum size and addition of inducers.

✓ **Fungi as a good producer of sialidases.**

New information was obtained on the distribution of sialidase in filamentous fungi from nonclinical isolates. The best producer, *P. griseofulvum* P29, was selected among three promising strains based on their sialidase production according to cultivation type, medium composition, and growth temperature.

✓ **Investigation of fungi as contaminants of different monuments.**

A study was conducted focusing on fungi contaminating different materials obtained from Egyptian tombs. A total of 30 isolates from the genera *Penicillium* and *Aspergillus* were obtained. The chemical composition of the pigments and limestone was also investigated. The results can be used to develop conservation methods.

The contributions listed in the five areas are in most cases original or with elements of originality, less often with a confirmatory nature. The applicant has skilfully divided them into scientific contributions and those with applied and scientific nature.

6. Main critical remarks and recommendations

None

7. Conclusion:

The presented scientific production of Chief Assist. Prof. Dr. Nedelina Stoyanova Kostadinova fully and many times meets the requirements for obtaining the academic position of "Associate Professor" specified in Annex 8.3. of the Medical College at TrU. In my opinion, the candidate's research activity has made a number of significant scientific and applied contributions mainly in the field of mycology.

As a member of the Scientific Jury of the aforementioned competition I give my fully positive assessment and recommend the esteemed members of the Scientific Jury and the FC of MC at TrU to award the Chief Assist. Prof. Dr. Nedelina Stoyanova Kostadinova with the academic position of "ASSOCIATE PROFESSOR" in the scientific specialty of "Microbiology", professional field 4.3 "Biological Sciences".

12.05.2022 г.
Stara Zagora Town

Prepared by:.....
/Assoc. Prof. T. Dinev/