

## Opinion

by Prof. Dr. Iskra Vitanova Ivanova,

*member of the National Council according to Order No. I-162/26.11.2024 of the Institute of Microbiology "Stefan Angelov" at the Bulgarian Academy of Sciences in a competition for the academic position "Associate Professor", published in the State Gazette, issue 84 of 04.10.2024 in the field of higher education - 4 "Natural Sciences, Mathematics, Informatics"; 4.3. "Biological Sciences"; (specialty Microbiology/Enzymology)*

*In the competition for "associate professor" for the needs of the Department of "General Microbiology", Laboratory of "Microbial Biochemistry", the only candidate is Senior Assistant Professor Dr. Yana Gancheva Gocheva.*

### Brief biographical information and evaluation of publication activity

Senior Assistant Professor Yana Gocheva graduated from the Faculty of Biology of Sofia University "St. Kliment Ohridski" in 1993 with a degree in "Biotechnological Processes". In the period between 1997-2001, she was a full-time doctoral student at the Department of "General and Industrial Microbiology", developing a dissertation on the topic "Studies on the role of calcium-binding proteins in the differentiation of *Streptomyces hygroscopicus picus 155*", which she defended in 2001 and obtained the educational and scientific degree "doctor". From 2016 to the present, she has been a senior assistant professor at the Institute of Microbiology.

### General description of the materials submitted for the competition

The materials submitted by the sole candidate, Senior Asst. Prof. Dr. Yana Gancheva Gocheva, fully meet the requirements of the competition and present the specific evidentiary part regarding the required criteria for the competition, as well as present the candidate's overall production, both through lists of publications and citations, and through the text of the submitted contributions, the CV, etc. The submitted documentation is extremely well arranged and detailed, including digital copies of the publications related to the participation in this competition, as well as their summaries in Bulgarian and English.

The materials submitted by Dr. Yana Gocheva for participation in the competition for the academic position of "associate professor" include 32 scientific publications. Three of the works are publications related to Dr. Gocheva's dissertation work and are not subject to review. The materials submitted for participation in the competition for the academic position of "associate professor" include 29, of which 28 are scientific articles, 5 of which are review articles and 1 is a collective monograph. Twenty (20) of the scientific articles are publications in publications with an impact factor or impact rank, which are referenced and indexed in the databases of scientific information - Web of Science and Scopus, which are distributed by quartiles as follows: Q 1 – 5 articles; Q 2– 8 articles; Q 3– 3; Q 4– 6 articles. Two of the publications are without SJR, but are published in refereed and indexed publications in Scopus. The remaining 6 publications were published in non-refereed scientific journals.

All of Dr. Gocheva's works are collective. In 8 of them she is the first author. For participation in the competition, a list of 112 citations of her publications is submitted, which cover both the

minimum and additional requirements for the position of "associate professor". The total number of citations for the entire scientific career of Dr. Gocheva is 195 (Scopus), respectively 166 (excluding self-citations), with an h-index of 7 (Scopus) and 8 (Google Scholar). total impact factor 41.502.

Senior Asst. Prof. Dr. Gocheva has participated in 9 scientific forums, of which 3 international (with 2 reports and 2 poster presentations) and 6 national (with 2 reports and 5 poster presentations). She has participated in 8 scientific projects, two of which are personal participations in projects external to the Institute of Microbiology.

The review of the submitted documents for participation in the competition shows that Dr. Gocheva not only meets, but also significantly exceeds (with almost 63% higher number of points than required) the minimum national requirements for the academic position of "associate professor", set by the Law on the Qualification of Academicians and Academicians of the Republic of Bulgaria, as follows:

- Indicator A: an abstract of a dissertation work for the award of the educational and scientific degree "doctor" is presented - 50 points;
- Indicator B: 125 points (5 articles with Q1 x 25 points);
- Indicator D: 252 points (minimum requirements 200 points);
- Indicator D: 224 points From the group of indicators D (citations, minimum required points 50) - Dr. Gocheva presents a list of 112 citations in refereed journals (x 2 points) = 224 points.

Dr. Gocheva meets and also exceeds the additional requirements of the Institute of Microbiology for the position of "Associate Professor", as follows:

- Number of publications in journals with IF/SJR, monographs, chapters of monographs, proceedings of international forums, published in full text, patents: 21+2 (in refereed and Scopus-indexed publications without IF/SJR) 21+2 (in refereed and Scopus-indexed publications without IF/SJR). In 7 articles he is the first author (20 required and 5 for first author);
- Citations for the entire scientific career: 166 (with 100 required);
- IF for the entire scientific career: 41.502 (with 20 required);
- h-index for the entire scientific career scopus: 7 (with 5 required);
- Participation in projects: 5 (with 3 required).

The presented scientific contributions of the research are entirely in the field of modern microbiology and enzymology and are related to the study of current fundamental and applied scientific challenges. The scientific research in which Dr. Gocheva participated has yielded results that are of a contributing nature with scientific and scientific-applied significance.

I accept the contributions made as follows:

1. Studies conducted to study the temperature and oxidative stress in filamentous fungi isolated from Antarctica and the role of the enzymes catalase and oxide dismutase. Based on the study, a diversity of filamentous fungi from Antarctica has been proven, and the results are of theoretical and practical importance. New knowledge has been obtained about the mechanisms of adaptation of filamentous fungi to low temperature stress and their

potential as producers of enzymes with unique characteristics. Dr. Gocheva's works related to this scientific field have been published in authoritative journals and all have been cited, with the total number of their citations being 91.

2. Studies on lactic acid bacteria and their antibacterial activities Data on the metabolic activities of lactic acid bacteria and their specific aroma-forming characteristics have been supplemented, as a prerequisite for their use in functional foods. Publications in this area have been noted by the scientific community and have received 24 citations in publications referenced and indexed in Scopus.
3. The role of the Pac2 protein and the causes of the impaired formation of the quaternary structure of proteins in model eukaryotic organisms - yeasts have been established for the first time. New information of important theoretical significance has been obtained.
4. Contributions related to research on new enzymes and their potential applications from various bacterial and fungal producers include developments of important scientific and scientific-applied significance.
  - A new recombinant enzyme malate quinone oxidoreductase has been constructed and purified with application in the creation of biosensors for monitoring and controlling fermentation in winemaking.
  - New data with theoretical and applied significance in the study of sialidase enzyme in bacteria and fungi have been obtained.
  - For the first time, a sialidase enzyme from the non-pathogenic saprophyte *Oerskovia paurometabola* has been demonstrated, isolated, purified and characterized 129
  - For the first time, data on the inhibitory effect of extracts from *Rosa damascena* and *Origanum vulgare ssp hirtum* and natural compounds on bacterial sialidases obtained from *Vibrio cholerae* non-O1, *Arthrobacter nicotianae* and *Oerskovia paurometabola* have been obtained, with theoretical and applied significance in the development of new antimicrobial therapies and prevention of various diseases.
  - New information of theoretical importance has been obtained on the distribution of the sialidase enzyme in a previously unexplored taxonomic group of microorganisms such as filamentous fungi.
  - The effect of catabolite repression and the mechanisms of regulation of enzyme synthesis in filamentous fungi have been studied for the first time. For the first time, increased sialidase activity as a result of oxidative stress has been demonstrated in a filamentous fungus.
  - A promising strain *P. griseofulvum* P29 has been selected and optimization of the cultivation parameters for the synthesis of the sialidase enzyme has been achieved.
  - A protocol for the purification of the sialidase enzyme produced by the Antarctic strain *Penicillium griseofulvum* P29 has been created.
5. Studies conducted on the degradation of cellulose waste by microorganisms prove the presence of isolated aerobic, anaerobic and microaerophilic communities with cellulolytic activity from different ecological niches. A laboratory procedure for the degradation of cellulose waste has been created.
  - For the first time, the possibility of microbiological degradation of cellulose waste and its transformation into a valuable resource in conditions of Earth gravity and microgravity (space station model) by mixed bacterial communities and pure cultures isolated from different ecological niches has been compared.
6. The microbiome of 5 species of lizards belonging to 3 families was studied, and 24 species of opportunistic bacteria were isolated and identified. New information of

theoretical importance was obtained regarding the microbiome of reptiles from the territory of Bulgaria.

### **Critical remarks and recommendations**

Summarizing all that has been said above, I can summarize that my assessment of Dr. Gocheva's research and teaching activities is strongly positive.

I have a question for Dr. Gocheva:

Bacteria such as *Streptococcus pneumoniae*, *Pseudomonas aeruginosa* in the respiratory tract and *Vibrio cholerae*, *Salmonella Typhimurium* in the intestinal tract can produce sialidase. Could the presence of bacterial sialidase have an impact on viral infections by reducing the specific receptors necessary for viral adsorption?

### **Conclusion**

The documents and materials presented by Senior Asst. Prof. Dr. Yana Gancheva Gocheva meet all the requirements of the Act on the Development of the Academic Staff of the Republic of Bulgaria and the additional requirements of the Institute of Microbiology for the position of "Associate Professor". The achieved scientific and scientific-applied contributions of Dr. Gocheva are at a high professional level, which is confirmed by the list of publications with her participation in journals in the international databases Scopus, citation of results and participation in projects. The analysis shows that Dr. Gocheva participates in the competition with scientific production, which in terms of scientometric indicators significantly exceeds the requirements for occupying the academic position of "Associate Professor".

From the analysis made, I give my positive assessment and support without hesitation the candidacy of Dr. Gocheva 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 (specialty: Microbiology/Enzymology), for the needs of the Laboratory "Microbial Biochemistry", Department of "General Microbiology", Institute of Microbiology "Stefan Angelov" at the Bulgarian Academy of Sciences.

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prof. Dr Habil Iskra Ivanova