REVIEW

From: Prof. Stephka Chankova - Petrova PhD, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (retired), member of the National Council, according to the order No. 85 -OB/22.04.2026 of the Director of the Institute of Molecular Biology "Acad. Rumen Tsanev", Bulgarian Academy of Sciences

Re: Competition for the academic position of "Professor", professional field "4.3. Biological Sciences", scientific specialty "Molecular Genetics", for the needs of the section "Regulation of Gene Activity", announcement in the State Gazette, issue 16/02/2026.

1. Eligibility and brief biographical data of the candidate:

Assoc. Prof. Galina Simeonova Radeva, PhD is the only scientist submitted documents and applied for the announced competition for the academic position of "Professor" at the Institute of Molecular Biology "Acad. Rumen Tsanev", section "Regulation of Gene Activity".

All submitted documents are prepared in accordance of the Low on the Development of Academic Staff in the Republic of Bulgaria and the procedures for opening and announcing the competition.

Galina Simeonova Radeva was born in 1961 in Sofia. She graduated her secondary education at 19 Sophia High School "Elin Pelin".

In 1984 she was graduated as a "master" in "General and Industrial Microbiology, with Virology" at the Faculty of Biology of Sofia University "St. Kl. Ohridski".

The entire professional career of Galina Radeva carried out at the Institute of Molecular Biology "Acad. Rumen Tsanev - Bulgarian Academy of Sciences.

In the range of 1984 and 1996 she had a position as a biologist-specialist. In 1996, he successfully graduated PhD on the topic "Molecular - genetic characterization of bacteria of the genus Rhizobium and construction of strains with increased symbiotic activity" as a student in independent training under the supervision of Corresponding Member Kalcho Markov.

After graduation as a "Candidate of Biological Sciences", currently equivalent to the educational and scientific degree "PhD", she started scientific carrier at the Institute of Molecular Biology "Acad. Rumen Tsanev - Bulgarian Academy of Sciences, successively as a research assistant II degree, research assistant I degree, and in 2010 - senior researcher II degree, today equivalent to "Associate Professor".

During this period she developed her scientific competence and went insight the problems in the field of molecular ecology of microbial communities.

She specialized in a number of prestigious scientific institutions that contributed to the high extend for her scientific competence:

- ✓ *Postdoctoral Fellowship at the Molecular Microbiology Group, Institute of Radiochemistry, FZR, Dresden, Germany, 1999-2000;*
- ✓ *Grant from European Science Foundation (ESF), GPoll program, FZR, Institute of Radiochemistry, Dresden, Germany,1999;*
- ✓ *Fellowship, UMIST, Dept. Biomolecular Sci, Manchester, UK, financial support by Welcome Trust, 1998;*
- ✓ *Dept. of Genetics, University of Bayreuth, Germany,1995;*
- ✓ *FEMS fellowship Dept. Applied Chemistry and Microbiology, University of Helsinki, Finland,1994;*

- ✓ *Exchange fellowship between Bulgarian Academy of Sciences and Academy of Finland, Dept. Applied Chemistry and Microbiology, University of Helsinki, 1993;*
- ✓ *Specialization in All-Russia Research Institute for Agricultural Microbiology, St. Petersburg-Pushkin, Russia, 1987*

Assoc. Prof. Galina Radeva posses a wide range of methodological tools and computer techniques - cultivation of microorganisms and yeast; recombinant DNA techniques; methods for isolation and analysis of nucleic acids; methods for analysis of proteins and lipopolysaccharides - spectrophotometric analysis, SDS PAGE; tests for antibacterial activity; bio-informatics tools for processing and analysis of DNA sequences; Microsoft Office - Word, Excel, PowerPoint, Adobe Acrobat; Adobe Illustrator 2022; Graph Pad Prism 8; Rotor-Gene 600 Software; BioEdit v 7.7; MEGA *5.*

Her many official commitments and memberships in scientific organizations *(Chairman of the Scientific Counsel of the Institute of Molecular Biology, Bulgarian Academy of Sciences (since 2014 till now); Member of the Scientific Council of the Institute of Molecular Biology BAS (since 2014 till now); Responsible for Supervision and Safety of Work with GMO (since 2013 till now); Member of the General Assembly of the Bulgarian Academy of Sciences (2019-2020); Member of the Bulgarian Peptide Society (BPS); Member of the Bulgarian Union of Scientists)* did not abrogate her enthusiasm as a researcher, teacher and head of the scientific team.

Assoc. Prof. G. Radeva has a good language training that contributes also to the fruitful research and popularization of the results of her scientific work - she is fluent in English, French and Russian.

2. Scientometric indicators of the candidate:

The scientific research activity of Assoc. Prof. Galina Radeva includes 61 scientific papers, and three sequences deposited in GENBANK. In this competition, she takes part with 22 original scientific articles, as follows: 21 published in journals with IF and Q (Scopus, Web of Science), 1 book chapter, and 265 sequences of 16S rRNA gene in GENBANK - 3.

The habilitation thesis (B4) is based on 6 scientific articles referenced and indexed in the world-renowned databases of scientific information (Web of Science and Scopus) journals.In these articles Assoc.Prof. Galina Radeva was the first or corresponding author(Water, Air &Soil Pollution - Q1, Archaea- Q1, Toxics-Q1, Biotechnology & Biotechnological Equipment - Q3, Comptes Rendus de l'Académie Bulgare des Sciences -Q2, Comptes Rendus de l'Académie Bulgare des Sciences - Q3).

15 scientific articles different from these included in habilitation thesis are also included in current competition. These articles are also referenced and indexed in the world-famous databases of scientific information (Web of Science and Scopus) - Ecotoxicology and Environmental Safety - Q1, Environmental Science and Pollution Research - Q1, Plant, Soil and Environment- Q2, Archives of Microbiology - Q2, Ecologia Balkanica- Q4, BioRisk - Q2, Comptes Rendus de l'Académie bulgare des sciences -Q2, Q3, etc.).

Assoc. Prof. Galina Radeva is the first and corresponding author of one book chapter G8

Articles distribution by quartile is as follows - Q1 -5; Q2-7; Q3- 5; Q - 4.The total IF of Assoc. Prof. G. Radeva is 44.347, and the IF of the scientific articles, included in this competition is 24.8.

These scientific articles have been cited 210 times in refereed articles in Scopus and Web of Science. It should be mentioned that some of them have been sited repeatedly:

Г7_1 *Kenarova A., Radeva G., Traykov I., Boteva S. 2014. Community Level Physiological Profiles of Bacterial Communities Inhabiting Uranium Mining Impacted Sites. Ecotoxicology and Environmental Safety, 100, 226-232. https://doi.org/10.1016/j.ecoenv.2013.11.012. - 100 пъти*

B4_1 *Radeva G., Kenarova A., Bachvarova V., Flemming K., Popov I., Vassilev D., Selenska Pobell S. 2013. Bacterial Diversity at Abandoned Uranium Mining and Milling Sites in Bulgaria as Revealed by 16S rRNA Genetic Diversity Study. Water, Air &Soil Pollution, 224, (11), p. - 1748. https://doi.org/10.1007/s11270-013-1748-1. - 26 пъти*

B4_2 *Radeva G., Kenarova A., Bachvarova V., Flemming K., Popov I., Vassilev D., S. SelenskaPobell S. 2014. Phylogenetic diversity of Archaea and the archaeal ammonia monooxygenase gene in uranium mining-impacted locations in Bulgaria. Archaea, vol. 2014, Article ID 196140 doi: 10.1155/2014/196140. - 20 пъти.*

3. Articles submitted to this competition:

Scientific achievements of Assoc. Prof. Galina Radeva are included in the "Habilitation Extended Reference", based on 22 articles fulfilling the required indicators from group B (B4) from 1 to 6, as well as the indicators from group D (D7_1 to D7_15 and D8_1). The data are presented accurately in a table.

As it was noted previously, a long-term scientific activity of Assoc. Prof. Galina Radeva has been held at the Institute of Molecular Biology "Acad. R. Tsanev", BAS.

Due to the knowledge in the field of molecular genetics of microorganisms under the supervision of Corresponding Member Kalcho Markov, and later due to the knowledge obtained during various fellowships and especially these due to the long-term cooperation with the Molecular Microbiology group at the Institute of Resource Ecology, Helmholtz-Zentrum Dresden Rossendorf (HZDR), she managed to create and develop the new scientific problem "environmental microbiology". From ecological point of view, this scientific problem is particularly promising, taking into account the constantly changing ecological situation as a result of the increased anthropogenic impact and climate change. This problem corresponded to the problems of bio-remediation, soil microorganisms and the status of their habitats, the interactions between microorganisms and ecosystems.

Over the past 10-11 years, she has been developing this area in the section “Regulation of Gene Activity”, in the research group she created.

The focus of the scientific research of Assoc. Prof. Galina Radeva and the research group she leads are three main areas: Biodiversity; Functions and ecology of microorganisms in anthropogenically polluted soils and agricultural lands; Soil enzyme activities for assessing soil health.

In the first direction named "*Taxonomic diversity and composition of microbial communities in anthropogenically influenced soils and agricultural lands"*

the focus of the research is on soils affected by the mining and metallurgical industries, tailings ponds, mainly contaminated with radionuclides and U, Zn, Cu, Pb, Mn, Sr, As. The studied soils and agricultural areas are situated in different parts of the country (B4_1, B4_2, B4_3, B4_6).

The huge amount of experimental work done resulted to practically significant findings regarding identification of reliable biomarkers for evaluation of soil contamination and pollution degree.

The identification of specific organisms - bio-indicators, living at polluted soils, provides a reliable tool for soil bio-monitoring and assessing the current state of soil ecosystems (heavily polluted soils - Gemmatimonadota and Planctomycetota and their classes Gemmatimonadetes and Planctomycetia; in slightly polluted soils - Vicinamibacteria and Thermoleophilia, and in moderately polluted soils - the divisions Proteobacteria and Bacteroidota, and the classes Alphaproteobacteria, Gammaproteobacteria, Bacilli and Bacteroidia, respectively).

The lower taxonomic diversity of archaeal communities in radionuclides-contaminated soils was found to be dominated by representatives of the Crenarchaeota division (genus Nitrososphaera), which includes mainly ammonia-oxidizing archaea.

Having in mind the taxonomic diversity of fungi, despite their plasticity, is lower than that of bacteria, key taxa with different adaptability to heavy metals have been identified: resistant - the classes Eurotiomycetes and Leotiomycetes; tolerant - Sordariomycetes, Dothideomycetes and Tremellomycetes and sensitive - Pezizomycetes and Saccharomycetes.

These findings are of great importance for both the screening and monitoring of anthropogenically loaded soils, as well as agricultural lands, and directly relates to applied ecology, ecological agriculture and can partly be considered as a basis for solving some problems of remediation.

The second direction “Functional potential of microbial communities” could be split in three sub-directions and included articles labeled as B4_3, B4_4, G7_1, G7_2, G7_5, G7_6, G8_1:

- ✓ Predicted functional pathways of bacterial communities related to resistance to heavy metals (B4-3);
- ✓ Functional profile of cultivable soil bacterial communities (G7_1, G7_5, G7_6 and G8_1);
- ✓ Soil enzyme activities for assessing soil health (B4_4, G7_2).

Analyzing articles included in this area it should be pointed out their importance for solving problems related to both theoretical and applied ecology. As a result of multidisciplinary investigations data have been obtained allowing the prediction, assessment of functional changes in bacterial communities and identification of metabolic pathways for detoxification of heavy metals present in anthropogenically heavily loaded soils. It reveals the possibilities for local bacterial species to be included in remediation procedures, for improving soil “health” and sustainable agriculture.

The third area “Soil enzyme activities for soil health assessment” is based on publications B4_5, G7_3, G7_4, G7_5, G7_13, G7_14 and focuses on the interrelationship between abiotic factors in the environment (inorganic ions, total carbon content, soil pH, soil texture, soil moisture, etc.) and the diversity of microbial communities under conditions of chronic soil loading with heavy metals. The results

obtained are significant from the point of view of applied ecology, shedding light in two aspects:

- ✓ the indicated abiotic factors could modify the effect of heavy metals and the stress response of microorganisms in chronically contaminated soils;
- ✓ chronic pollution can reduce bacterial abundance and strongly decrease microbial activity, allowing the identification of bio-indicators capable to live in highly contaminated soils.

A little bit aside, but also very interesting are the results obtained from three other studies.

- ✓ The first of them concerns the abundance and diversity of pelagic bacterial communities inhabiting Lake Salzata (G7_14) depending on the temperature and trophic structure of the lake. Based on the great diversity of different ecotype, the authors suggest that extreme and dynamically changing conditions could be a prerequisite for stimulating micro-evolutionary processes in the ecosystem.
- ✓ The results of the second study are described in 6 articles (Г7_7, Г7_8, Г7_9, Г7_10, Г7_11, Г7_12), and investigated the effect of the fungicide QuadrisR on soil microbial communities. It was shown that high doses of the fungicide have a stronger effect on the functional profiles and enzymatic activity of bacterial communities (Г7_10, Г7–11). This fact is interesting from the point of view of functional ecology, soil health and good agricultural practices.
- ✓ One publication (Г7_15) provides information on the antibacterial action of protein and peptide fractions isolated from snails and crustaceans, which reveals long-term perspectives for their future application in bio-medicine.

3. Scientific contributions:

Over the last 15 years (after her habilitation as an associate professor) тhe scientific research work of Assoc. Prof. Radeva
has been focused on environmental microbiology and corresponds to the European good practices for evaluation both environmental impact, and risk of soil pollution (one of the main matrices of environmental pollution) and the effects on the soil microbiome.

The formulated 12 contributions are the result of extensive experimental work, based on a wide methodological toolkit, combining microbiological, molecular and bio-informatics approaches, and adequate discussion of the results obtained in the context of present understanding.

The contributions are specifically formulated. Both their methodological, theoretical and scientific-applied significance in various aspects of ecology and good practices (remediation, bio-fertilizers, bio-indicators, etc.) is clearly defined.

The analysis of the contributions reveals their significance in a fundamental and applied aspect:

1). Contributions of fundamental importance:

- ✓ The 265 16S rRNA gene sequences deposited in the GenBank database, identified in Bulgarian soils polluted with heavy metals, contribute to the enrichment of the global database for a more precise determination of the taxonomic affiliation of bacterial taxa;
- ✓ Another contribution of fundamental importance for the clarification of the nitrification process in archaea is the documentation of representatives of the genus Nitrososphaera, key ammonia oxidizers in soils contaminated with uranium and heavy metals. The presence of the amoA gene (encoding ammonia monooxygenase) has been confirmed.

Applied contributions:

- For a rapid assessment of the status of chronically loaded soils with radionuclides and heavy metals and assessment of the ecological risk, the following could be used:
- ✓ dehydrogenases, beta glucosidase and alkaline phosphatase as the most sensitive to the concentration of heavy metals and changes in the environment;
- ✓ changes in the functional profiles of bacterial communities - preferences to use carbohydrates, polymers, polyols and amino acids in uncontaminated and slightly contaminated with heavy metals soils, and in contaminated soils - to use carboxylic acids;
- ✓ bacterial divisions Proteobacteria, Acidobacteriota and Actinobacteriota, as a key for soils contaminated with radionuclides and polluted with heavy metals;
- ✓ key taxa in fungal communities with different resistance to heavy metals: resistant - classes Eurotiomycetes and Leotiomycetes, tolerant - Sordariomycetes, Dothideomycetes and Tremellomycetes;
- ✓ the Biolog EcoPlate™ system can successfully assess functional changes in bacterial communities resulting from chronically industrially impacted soils.

- **To assess soil health -** by analyzing the changes in the functional profiles and enzymatic activities of soil bacterial communities after the application of aminoglycoside antibiotics.

- **To improve soil health** and develop bio-fertilizers for soil remediation, local metal-resistant and tolerant bacterial species, effectively restoring the 16S rRNA gene, could be used.

The analysis of the scientific production of Assoc. Prof. Galina Radeva without illustrates the importance of her work as a researcher and group leader. These results contribute significantly to the environmental microbiology - essential branch of ecology.

I'm grateful and agree with the strategy she describes for her future incidence and wish both of them - her researcher's group and herself success in their future endeavors.

4). Project activity of Assoc. Prof. Galina Radeva - during the years after the first habilitation she participated and led more than 15 scientific research projects, funded as follows:

- ✓ National Fond Scientific Investigation;
- ✓ Fond Scientific Investigation of Sofia State University “St.Kl.Ohridski”;
- ✓ National Scientific Program “Innovative Low-Toxic Biologically Active Agents for Precision Medicine BioActiveMed, between the Ministry of Education and Science and the Bulgarian Academy of Sciences;
- ✓ OP “Human Resources Development to the ESF;
- ✓ National Scientific Program “Innovative Low-Toxic Biologically Active Agents for Precision Medicine BioActiveMed, between the Ministry of Education and Science and the Bulgarian Academy of Sciences;
- ✓ Bilateral Cooperation Project with the Hungarian Academy of Sciences;
- ✓ Bilateral Cooperation Project with the Academy of Sciences of the Czech Republic.

Participant and leader of currently active projects:

- ✓ "Integrated advisory system for environmental risk assessment in decision-making for sustainable agricultural practices in vulnerable areas", Contract No. KP-06-N76/2023-2027, FNI, leader Prof. Nikolay Dinev, IPAZR "N. Pushkarov".
- ✓ Holistic approach for modeling short-chain cationic peptides and adjuvants. In silico prediction and in vitro screening for antibacterial potential. Contract No. KP-06-N93/10, 2025-2028, FNI, leader Assoc. Prof. Tamara Paipanova.
- ✓ Structure and function of the soil microbiome in forest ecosystems depending on the altitudinal gradient and vegetation zone", Contract No. KP-06-N91/2, 2025-2028, FNI, leader Assoc. Prof. Galina Radeva

5). Education and teaching - Assoc. Prof. Galina Radeva is the supervisor of two successfully graduated PhD students:

- ✓ Mihaela Rumenova Aleksova, full-time PhD student, title of PhD thesis: *"Microbiological assessment of the resistance and sustainability of soils treated with the fungicide azoxystrobin" (professional field 4.3. Biological Sciences, scientific specialty-Ecology and protection of ecosystems - Ecology of microorganisms) scientific supervisors: Prof. Dr. Anelia Kenarova (Faculty of Biology of Sofia University "St. Kl. Ohridski") and Assoc. Prof. Dr. Galina Radeva; 16.03.2020. Diploma No. SU 2020-34, 30.06.2020.*
- ✓ *Radina Nikolaeva Nikolova, full-time PhD student, title of PhD thesis : Structural and functional characteristics of soil microbial communities in response to long-term heavy metal pollution" (professional field 4.3. Biological Sciences, scientific specialty "Molecular Genetics"), scientific supervisors: Assoc. Prof. Dr. Galina Radeva and Prof. Dr. Anelia Kenarova (Faculty of Biology of Sofia University "St. Kl. Ohridski"); 18.12.2025.*

Over the years, Assoc. Prof. Galina Radeva has been a part-time lecturer at Sofia University "St. Kl. Ohridski":

- ✓ 2007 - Department of Information Technologies, Master's Program "Bio-Medical Informatics", "Introduction to Molecular Biology and Computational Mol. Biology";
- ✓ 2008 - Sofia University "St. Kl. Ohridski", Department of Information Technologies, Master's Program "Bio- and Medical Informatics", "Introduction to Molecular Biology and Computational Mol. Biology";
- ✓ 2011 - Institute of Molecular Biology, Bulgarian Academy of Sciences, "Working with online databases of NCBL, Ensembl Genome Brower and UCSC Genome Browser" and "Electrophoretic separation of DNA and RNA. Techniques for identification of microorganisms based on ribosomal genes (ARDRA, RISA)" under (project BG051PO 001-3.3.04/58)
- ✓ 2007 - 2024 scientific supervisor of 13 successfully defended diplomas from the Faculty of Medicine of Sofia University "St.Kl. Ohridski" (the list is accurately prepared and presented).

In conclusion:

The scientific production presented by Assoc. Prof. Galina Simeonova Radeva, PhD in this competition for academic position "Professor" fulfilled, and over the minimum national scientometric requirements and the specific criteria of the IMB "Acad. Rumen Tsanev", BAS.

Assoc. Prof. Dr. Galina Radeva is a recognized name in the scientific community not only in our country, but also abroad, as evidenced by the number of citations in prestigious scientific journals.

She is not only a good researcher, but also a successful teacher, supervisor of graduate students, PhD students and a wonderful and responsible administrator.

Here should be added my personal impressions of Assoc. Prof. Galina Radeva, as a long-time participant (personally and through her students and PhD students) in the International Seminar on Ecology, held annually by IBEI, BAS and the Section "Biology", SUB. Her professionalism was reflected as a member of the Editorial Board and a reviewer of scientific papers presented at the Seminar and published in two consecutive years in the journal BioRisk.

Everything said so far allows me to make a well-founded conclusion that Assoc. Prof., Galina Simeonova Radeva fully meets the requirements of the Low on the Development of the Academic Staff, for holding the academic position of "Professor", in the professional field "4.3. Biological Sciences", scientific specialty "Molecular Genetics", for the needs of the section "Regulation of Gene Activity", IMB "Acad. Rumen Tsanev"-BAS.

Based on the positive assessment I have expressed for the work of Assoc. Prof., Galina Simeonova Radeva, I confidently propose to the members of the esteemed scientific council of IMB "Acad. Rumen Tsanev"-BAS, to elect Assoc. Prof., Galina Simeonova Radeva to hold the academic position of "Professor".

14. June 2026 REVIEVER:

Sofia /Prof. Stephka Chankova - Petrova/