

Evaluation Report

by Associate Professor Lyubomir Lyubomirov Traykov, PhD

Medical University-Sofia, Faculty of Medicine; Department of "Medical Physics and Biophysics", Sector "Biophysics"

Appointed as a member of the scientific jury by Order of the Rector of Burgas State University
"Prof. Dr. Asen Zlatarov" No. RD-269/23.07.2025

Competition for the academic position "Associate Professor" one place

Candidate: Senior Assistant Miglena Antonova Koprinarova

Department of Molecular Biology of the Cell Cycle at the Institute of Molecular Biology - BAS, Sofia,

The competition was announced following a decision of the academic council of Burgas State University "Prof. Dr. Asen Zlatarov" and was published in the State Gazette No. 42 /23.05.2025

In the competition for the academic position of "Associate Professor" in Biological Sciences in the scientific specialty of "Genetics". With a single candidate, Senior Assistant Miglena Antonova Koprinarova from the Department of Molecular Biology of the Cell Cycle at the Institute of Molecular Biology - BAS, Sofia,

The documents required for the competition have been precisely prepared and submitted by the candidate, fully meeting the requirements of the Regulations for the Application of the ZRASRB (Art. 60, 61, 62) and the PZRASZRB. (AS dated 26.01.2023)

For the competition, Senior Asst. Miglena Antonova Koprinarova has submitted correctly prepared lists of her scientific works, copies of scientific works and summaries, participation with reports in scientific events in our country and abroad, references for noted citations, general impact factor, participation in scientific juries and reviews, as well as academic workload.

Professional development

Miglena Antonova Koprinarova graduated from Sofia University "St. Kliment Ohridski", Faculty of Biology, with an OCS Master's degree in Cell Biology and Developmental Biology

The professional career of Senior Asst. Assistant Professor Miglena Antonova Koprinarova began her work in the field of molecular biology in 2004 when she joined the Department of Molecular Biology of the Cell Cycle at the Institute of Molecular Biology - BAS, Sofia. In 2004, Miglena Koprinarova was enrolled as a doctoral student at the Institute of Molecular Biology of BAS.

She successfully defended her dissertation at the specialized scientific council on "Molecular Biology, Biochemistry and Biophysics at the Higher Attestation Commission. The Higher Attestation Commission awarded Miglena Koprinarova the educational and scientific degree "Doctor" in Molecular Genetics based on a defended dissertation on the topic: "Dynamics

of Histone H4 Acetylation and Repair of Interstrand Splicing in the Cell Cycle" and she received her doctoral degree in 2008.

Her work during this period was focused on the role of post-translational acetylation of histones in cell cycle progression and in the repair of various DNA lesions. After receiving her doctoral degree, Miglena continued to work hard and obtained interesting results related to the mechanism of cisplatin and DSB repair in higher eukaryotic cells. Dr. Koprinarova is familiar with most modern techniques in cell and molecular biology, such as cell culture, DNA labeling and fractionation, Southern and Western blotting, PCR, FACS analysis, etc.

During her work at the Department of Molecular Biology of the Cell Cycle at the Institute of Molecular Biology - BAS, Miglena Koprinarova has 12 specializations to increase the level of qualification, namely:

Specialization in in vitro diagnostics and food safety, Anatolia Geneworks, Istanbul, Turkey. Specialization in RT-PCR detection of pathogens in food samples. GeneScan Technologies, Freiburg, Germany, LEAN for leaders. Laboratory management, Future-oriented leadership Luxembourg-city, Luxembourg

Specialization in food microbiology-InLab, Dortmund, Germany, Specialization in microRNA-based multiple myeloma research, Universitätsklinikum Würzburg, Germany

Specialization in nanotechnology, nano-epigenetics, University College Dublin, Ireland. Specialization in nanotechnology, nanotoxicology. University College Dublin, Ireland

Certified course "Practical Implementation and Use of the Centralized Electronic Procurement System (CAIS-EOP)"

Certified course "Safe Transport and Handling of DRY ICE"; Sofia, Bulgaria

Certified course "ICH GOOD CLINICAL PRACTICE E6 (R2)"

Certified training for verification of microbiological methods based on ISO 16140-3:2021; Barbara Gerten

Certified training for Group Code of Ethics, Eurofins Academy

Certified training for quality assurance of culture media - ISO 11133 - Microbiology of food, feed and water - Preparation,

Miglena Koprinarova is a project manager of a total of 6 scientific projects, a participant in six international projects and a participant in 8 national projects.

Scientific activity

The scientific activity of Ch. Assoc. Prof. Miglena Koprinarova is known for the diverse topics of the many projects in which she has participated, both as a leader and a participant.

"Metagenomic approach for discovering the microbiome of specific Bulgarian yeast mixtures and improving their quality characteristics" KP-06-N 36/3, December 13, 2019 Project leader for the Institute of Molecular Biology, Bulgarian Academy of Sciences

National Science Foundation, Ministry of Education and Science, "Probiotics and health: mode of action of pre-selected Bulgarian strains of lactic acid bacteria". KP-06-OPR 16.03.19.12.2018 Project leader for the Institute of Molecular Biology, Bulgarian Academy of Sciences

Nuclear Regulatory Agency, Grant No. 124 / 06.03.2018, "Investigation of the effects of accelerated charged particles on skin cancer cells". Participant in an international project

Wilhelm Sander Foundation, September 2015, "Establishment of Dicer1/miRNA as immunoproteasome-modulated cells in myeloma therapy". Participant in an international project

Medical University, Sofia, Grant 2016, No. 6 / 27.05.2016, "Antiangiogenic and cytotoxic mechanisms of hydroxyanthraquinone-aloe-emodin on human brain microvascular endothelial cells". Participant in a national project

Medical University, Sofia, Grant 2015, No. 25 / 16.06.2015, "Oxidative stress as a cofactor for epigenetic changes during cervical carcinogenesis". Participant in a national project

QualityNano TA Application UCD-TAF-484 for access to UCD-TAF under the QualityNano TA project, "Epigenetic effect of low dose amino-modified nanoparticles". Participant in an international project

Medical University, Sofia Grant 2014 №40 / 23.06.2014 "Epigenetic changes in genes related to stress and oncogenesis in patients with type 2 diabetes". Participant in a national project

Medical University, Sofia Grant 2014 №6 / 23.06.2014 "Frequency of mutations in BRAF and KRAS genes and HPV infections in patients with colon cancer". Participant in a national project

Genetic-medical-diagnostic laboratory "Genica", "Development and implementation of a diagnostic method for the detection of methicillin-resistant and methicillin-sensitive strains of *Staphylococcus aureus*". Project leader

QNano TA, UCD-TAF-135 for access to UCD-TAF under the project QNano TA, "Induction of epigenetic, cytotoxic and genotoxic changes in the human brain endothelial cell line hCMEC/D3 by nanoparticles". Participant in an international project

Genetic-medical-diagnostic laboratory "Genica", "Molecular identification of enteric pathogens. Project leader

MARINA Nanoparticle Risk Management, project "Assessment of the potential toxic effects of TiO₂ and SiO₂ nanoparticles on the human brain endothelial cell line hCMEC/D3". European Commission. Participant in an international project

EpitopeMap - Exchange Grant (3670) within the framework of the ESF Activity-titled "Mapping the detailed composition of surface-adsorbed protein layers on biomaterials and nanoparticles". Participant in an international project

Genetic-Medical-Diagnostic Laboratory "Genica", "Genotyping of Antibiotic Resistance in *Streptococcus pneumoniae* and *Haemophilus influenzae*". Project leader

Genetic-Medical-Diagnostic Laboratory "Genica", "Molecular Diagnosis of Acute Respiratory Infections". Project leader

Ministry of Education and Science BG051PO001-3.3.06 "Support for the Development of PhD Students, Postgraduate Students and Young Scientists". Participant in a national project

Bulgarian grant from NSF Do 02-235/2009. The Role of Histone H4 Acetylation in Cell Cycle Progression and Sensitivity to Cisplatin and UV Light. Participant in a national project

Bulgarian grant from NSF Do02-232/17.12.2008. Increasing the Sensitivity of Cancer Cells to Antitumor Agents through Epigenetic Regulation of Cell Cycle Checkpoints. Participant in a national project

Bulgarian grant from NSF G-1/2003 to G.R. Participant in a national project

The entire scientific activity of Senior Asst. Miglena Antonova Koprinarova can be systematized and evaluated in several areas:

1. Study of antioxidant properties and radical-scavenging activity of substances with proven in vitro and/or in vivo antitumor properties. These include unpublished results before the defense of the dissertation, concerning the antioxidant activity of the structural analogs of salicylaldehyde benzoyl hydrazone studied in the dissertation work, and two new compounds - 5-

methoxysalicylaldehyde-benzoylhydrazone (5mSBH) and 5-bromosalicylaldehyde-benzoylhydrazone. Eight (8) publications are included in this thematic area.

2. Epigenetic Studies

Epigenetic changes in type 2 diabetes (T2DM) include changes such as DNA methylation and histone modifications that alter gene expression without altering the DNA sequence itself. These changes are influenced by environmental and lifestyle factors, such as diet and exercise, and may contribute to the development of T2DM and its complications. Although still a matter of debate, some studies suggest that these epigenetic changes may be causal. Studies are investigating epigenetic markers as potential biomarkers for diagnosis and targets for new therapies.

Key epigenetic mechanisms

- **DNA methylation:** Chemical modifications in which methyl groups are added to DNA that can “turn genes on” or “off.” This has been observed to be impaired in T2DM.

- **Histone modifications:** Modifications to the proteins that package DNA, such as acetylation, methylation, and phosphorylation. These changes can change how tightly the DNA is coiled, which affects gene accessibility and transcription.

- **Noncoding RNAs (ncRNAs):** Molecules that regulate gene expression at the translational level.

Role in type 2 diabetes

- **Pathogenesis:**

Epigenetic changes may link environmental factors (such as lifestyle) with genetic predisposition, contributing to the development of type 2 diabetes.

- **Complications:**

These changes have been implicated in the development of various complications of type 2 diabetes, including nephropathy, retinopathy, and cardiomyopathy.

- **“Metabolic memory”:**

Epigenetic mechanisms could help explain the long-term damage that persists even after blood sugar levels are controlled, a phenomenon known as metabolic memory.

Therapeutic and diagnostic potential

- **Biomarkers:**

Epigenetic modifications are being investigated as biomarkers to predict the risk of type 2 diabetes and the likelihood of developing complications.

- **Drug targets:**

Researchers are investigating therapies that can correct epigenetic dysregulation. Some approved drugs, such as certain DNA methyltransferase (DNMT) inhibitors, have been used for diabetic retinopathy.

- **Personalized medicine:**

Understanding the epigenetic landscape in individuals may lead to more personalized treatments.

3. Study of oxidative status and plasma anti-radical capacity in patients - searching for correlations with disease course and prognosis.

Six (6) publications are included in this thematic area. Five (5) of the publications are related to the monitoring of oxidative status and radical-scavenging properties in blood plasma

from patients with oncological diseases: patients with lung cancer and patients with tumors of the gastrointestinal tract.

Scientometric data

The total number of all publications of Senior Asst. Miglena Koprinarova in specialized journals and collections - international, foreign and Bulgarian is fifty-two (25). Nineteen (19) of them are published in prestigious international and Bulgarian publications with an impact factor. Publications in periodical scientific publications, referenced and indexed in SCOPUS, but without an impact factor, are twenty-four (24). Senior Asst. Miglena Koprinarova is a co-author of nine (9) scientific papers without an impact factor in secondary literature sources.

For participation in the competition, a list of forty (25) publications indexed in the SCOPUS database of ELSEVIER Publishing House, excluding scientific works for the award of the educational and scientific degree "doctor", is attached.

Teaching and learning activities

Participates as a scientific supervisor of 3 graduates from Sofia University, consecutively from 2010 to 2021

1. Petya Plamenova Markovska

Topic: "Increasing the sensitivity of cancer cells to DNA-damaging agents through epigenetic influence with the histone deacetylase inhibitor sodium butyrate"

Year of defense: 2010

2. Rositsa Hristova Hristova

Topic of the thesis: "The phosphatidylinositol-3-kinase inhibitor Caffeine increases apoptosis in HeLa cells induced by the HDAC inhibitor Sodium butyrate and by the DNA-damaging agents: cisplatin, UV-C and ionizing radiation"

Year of defense: 2011

3. Maria Dimitrova Lakova

Topic of the thesis: "Microbial profiling of Bulgarian sourdough starters"

Year of defense: 2021

Guest lecturer is

University lecturer

Author of a course on nutrigenomics

University of Food Technologies, Plovdiv

Conclusion

Senior asst. Miglena Antonova Koprinarova has extensive experience in the specialty entirely related to the requirements of Burgas State University "Prof. Dr. Asen Zlatarov". Diverse and high-quality scientific production of senior asst. Miglena Antonova Koprinarova presents her as an expert in the scientific community in the field of molecular genetic research and in particular of Oxidative stress as a cofactor for epigenetic changes during cervical carcinogenesis. The numerous publications, good citation and high impact factor of her works are the result of active research work and professional development.

Arguing my opinion with all this, I allow myself to recommend with conviction to the esteemed Scientific Jury that she be awarded the title of "associate professor"