Appendix 12d

REPORT
to occupy the academic position:

"Professor"	
"Associate Professor"	**X**
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	**Assistant Professor**	**PhD**	**Tsvetelina**	**Georgieva**	**Foteva**	**UCTM - Sofia**
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	**Technical Sciences**
code	name

Professional area:

5.11.	**Biotechnology**
code	name

Scientific specialty:

Technology of biologically active substances

The competition has been announced:

96	**17.11.2023**	**Biotechnology**	**Faculty of Chemical and Systems Engineering**
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Professor	**PhD**	**Petar**	**Todorov**	**Todorov**	**UCTM - Sofia**
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Assistant Professor	**PhD**	**Tsvetelina**	**Georgieva**	**Foteva**
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	**X**
B) The candidate doesn’t meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.
The candidate's main research investigations are presented in a total of 37 scientific publications, 29 of which are in journals summarized and indexed in world databases Web of Science or Scopus databases with Impact Factor or SJR, 8 of which are published in non-refereed peer-reviewed journals, 1 textbook, and over 100 citations. Dr. Foteva presents for the contest participation in 19 national research projects, 4 of which belong to the Scientific Research Fund.

1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	**X**
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.

The publications with which Assistant Professor PhD Tsvetelina Foteva participates in the competition for associate professor reflect scientific, scientific-applied, and applied research on current problems in the field of biotechnology, in particular, microbiology: the antimicrobial activity of polymeric materials containing metal ions; biocompatibility and cytotoxicity of hybrid materials; as well as synthesis, characterization, analysis and activity research of biomolecules with the aim of their application in medicine, pharmacy, and diagnostics.

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	**X**
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified
The goals set by Assistant Professor PhD Foteva in developing the scientific works are of scientific and applied interest and are generally grouped into 3 thematic areas. The investigation of the antibacterial activity of polymer materials including metal nanoparticles in hybrid materials is particularly important. This enables the development of resistant compounds with antibacterial and antifungal activities. In addition, they could be used as antibacterial agents against extremely pathogenic and drug-resistant microbes, in imaging diagnostics, tissue regeneration, and so on. Assistant Professor Foteva's other areas of directions include the biocompatibility and cytotoxicity of hybrid materials, as well as the synthesis, characterization, analysis, and activity study of biomolecules for use in medicine, pharmacy, and diagnostics.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	**X**
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given

		is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.

The main scientific contributions of Assistant Prof. PhD Tsvetelina Foteva presented for participation in the competition can be summarized as follows:

1. Antimicrobial activity of polymeric materials containing metal ions:
- Three types of inorganic-organic hybrid materials based on silica, hydroxypropyl cellulose (HPC), hydroxypropyl methylcellulose (HPMC), carboxymethyl cellulose (CMC), and included silver nanoparticles (AgNPs) were obtained by the sol-gel method. The structure and surface morphology of the obtained materials were characterized using infrared spectroscopy, atomic force microscopy, scanning electron microscopy (SEM), transmission electron microscopy (TEM), and Brunauer–Emmett–Teller (BET) analyses. The antimicrobial properties of the hybrid materials against prokaryotic and eukaryotic microorganisms were investigated;
- Spherical silver nanoparticles included in porous collagen structures were obtained. UV-Vis and TEM analyses were performed to confirm the presence and sizes of the nanoparticles. The bactericidal properties of the structures against B. subtilis NBIMCC 3562 and E. coli K12 were evaluated. The results obtained could find medical applications such as antibacterial implants;
- Nanocomposite materials with the participation of SiO_2, ZnO, TiO_2, and reduced graphene oxide (RGO), as well as materials based on TiO_2 and SeO_2, were investigated. All have shown good antibacterial properties;
- Research has been conducted on the possibility of preserving wood by modifying it with alkaline-activated hydrolyzed lignin, Cu_2S, and maleic anhydride. All modified samples showed antibacterial resistance to Gram-negative bacteria.

2. Biocompatibility and cytotoxicity of hybrid materials:
- Cell survival and adhesiveness of 3T3 mouse fibroblasts on hybrid materials with silver nanoparticles were studied;
- The anti-adhesion ability of SiO_2/HPC/Ag and SiO_2/HPMC/Ag hybrid materials during biofilm formation by P. aeruginosa PAO1 was investigated;
- A series of SiO_2/HPC hybrid materials have been successfully obtained and characterized;
- The cytotoxicity of different hybrid materials containing SiO_2/cellulose and copper from different sources was investigated.

3. Synthesis, characterization, analysis, and activity research of biomolecules for their application in medicine, pharmacy, and diagnostics:
- New bioconjugates of monofluorinated analogs of BIM-23052 containing a second pharmacophore naphthalimide, caffeic acid, or the tripeptide Arg-Gly-Asp were investigated;
- Single and double sequence analogs of the antimicrobial peptide with additional antitumor activity $(KLAKLAK)_2$-NH_2 were designed synthesized and characterized by introducing the unnatural amino acids Nle and β-Ala into its primary structure;
- A liquid chromatography method with UV detection was developed and validated for the determination of 6 prohibited active substances yohimbine, vardenafil, sildenafil, tadalafil,

dapoxetine, and sibutramine in nutritional supplements for erectile dysfunction and weight loss; - Structural analogs of memantine, which has an active action against Alzheimer's, have been studied.

1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	
B) The candidate has at least an equal participation in most of the submitted papers	7 points	**X**
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked. Assistant Professor PhD Tsvetelina Foteva's participation in the competition demonstrates her active involvement in the development and ideas of the majority of the works presented. She is the first/second author in most of the publications and conducts one independent review.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	**X**
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

1.7. Critical notes:

A) Lack of critical notes	8 points	**X**
B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.
I have no critical remarks.

1.8. Conclusion

A) The evaluation of the candidate's activity is **POSITIVE**	This evaluation is assigned to a total number of at least 50 points	**X** **(73 points)**
B) The evaluation of the candidate's activity is **NEGATIVE**	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury

Based on the above, with conviction, I propose Assistant Professor PhD Tsvetelina Foteva to be appointed as an Associate Professor in the scientific specialty 5.11. Biotechnologies (Technology of biologically active substances).

20.02.2024	The report was written by:	
date	**Prof. PhD Petar Todorov**	signature