Attitude of Reviewer

by Professor Nina Atanassova, PhD, DSc,
Corresponding Member of Bulgarian Academy of Sciences
Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgarian Academy of Sciences

Re: competition for the academic position „ASSOCIATED PROFESSOR“ in the Professional field 4.3. Biological Sciences, specialty "Anthropology" in the Department "Anthropology and Anatomy" of the Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgarian Academy of Sciences, announced in the Newspaper of State no. 60/29.07.2022

Assistant Professor Silvia Nikolova is the only candidate in the announced competition for the occupation of the academic position "Associated Professor" in the Department "Anthropology and Anatomy" of the Institute of Experimental Morphology, Pathology and Anthropology with Museum, Bulgarian Academy of Sciences. She presents detailed documentation of an active and promising scientists with perspective for quick career development in the field of anthropology.

Silvia Nikolova graduated from the Faculty of Biology of the Sofia University “St. Kliment Ohridski" with a master's degree in general anthropology in 2005. She started her carrier in the Institute of Experimental Morphology and Anthropology of the Bulgarian Academy of Sciences as a PhD student in 2006. She defended a dissertation for the acquisition of PhD degree in 2010 on the topic "Anatomical variations of the cranium – anthropological characterization and assessment of the sexual and bilateral differences" in the specialty of the announced competition. After she finished PhD training, she was appointed as a researcher in the Department of Anthropology of the Institute. In 2011, she was appointed to the academic position "assistant" at IEMPAM-BAN, and in 2012, she was promoted in Assistant Professor.

Dr. Nikolova's scientific production includes 71 publications, of which 29 were published in international journals with Impact Factor (IF) and/or Impact Rank (SJR); 20 are in journals indexed in Web of Science (WoS) and SCOPUS without IF/SJR; 17 are in publications not indexed in these databases and 5 are in proceedings of national scientific forums. Three of the articles are included in her PhD thesis.

The candidate participated in the current competition with 21 scientific articles, of which 20 were published in journals with quartiles according to the Web of Science and SCOPUS metrics (with IF/SJR), and 1 book chapter of international publisher. The total IF is 15.956. According to Web of Science and SCOPUS metrics, the articles are distributed in the following quartiles: 4 articles with Q1; 7 articles with Q2; 7 articles with Q3; 2 article with Q4. Dr. Nikolova has published her data in prestigious international journals in the field of anthropology and macroscopic anatomy: HOMO - Journal of Comparative Human Biology, Anthropological Science, Anthropologischer Anzeiger, Annals of Anatomy, Anatomical Record, Anatomical Science International, Legal Medicine, International Journal of Legal Medicine, Journal of Craniofacial Surgery. In the 21 articles presented in the competition, the candidate is the first or second author (in 11 of them she is the first author), that demonstrates her significant personal contribution. Her ability to work in an interdisciplinary team with physicians and specialists in informatics and computer technology is evident.

Dr. Nikolova has 74 participations in 43 scientific forums, of which 18 in international events.

The candidate's citation reference includes 172 citations of 38 publications and an h-index of 5 according to SCOPUS. Thirty five citations are included in the current competition.

The scientometric analysis of the research activity clearly indicates that she meets the criteria/requirements of the Regulations on the terms and conditions for obtaining scientific degrees and for academic positions in IEMPAM. According to indicators "G" and "D", Dr. Nikolova exceeds the required minimum according to the regulations of IEMPAM-BAN. For example, according to "G7" (*Scientific publications in journals refered and indexed in Web of Science and Scopus, that are not included in the habilitation thesis*), which requires at least 200 points, she has 279 points; according to indicator D (*citations*, requiring minimum of 60 points) she has got 70 points.

Dr Nikolova's main scientific contributions are presented in concise and at the same time comprehensive form, which demonstrates her ability to summarize and systematize the results of her scientific research activity and assess their fundamental and applied value and significance for science and practice. They are in the field of virtual anthropology and gross anatomy, forensic anthropology and micro-computed tomography. They are the result of her extensive innovative research on human bones and soft tissues of the face. She has developed original interdisciplinary approaches using biomedical methods, modern statistics, computer technology/artificial intelligence to generate 2D and 3D images. Dr. Nikolova has systematized her scientific contributions into two groups: contributions of a theoretical nature and contributions of applied importance.

Theoretical contributions are the result of research on anatomical variations in the structure of the skull, mandible and postcranial skeleton, as well as from studying the reorganization of the sagittal suture during its closure and studying the configuration of the skull during premature closure of the scaly suture. Different anatomical variations of the skull (foramen spinosum, foramen ovale, bones, of the cranial vault, single cases of supernumerary bones) were studied, and for each variation the etiology and possible clinical consequences were discussed.

Applied contributions are related to the application of modern information and communication technologies and the transfer of conventional morphometric studies to digital ones. This includes generating and processing 2D and 3D images, capturing morphometric data from images and verification ie. comparison and evaluation of the reliability of digital morphometry. This approach enables the application of methods from the field of artificial intelligence (artificial intelligence), such as extracting knowledge from data (data mining) and machine learning (machine learning) to analyze the data and create mathematical models to solve the problems. The candidate has developed methods for determining sex, age and facial approximation with application in forensic medicine (forensic anthropology) and bioarchaeology. She proposes the application of micro-computed tomography (μCT) in bioarchaeology and paleopathology.

Project funding is a strong point in Dr. Nikolova's scientific research activity. She is the coordinator of 2 project and a participant in 2 projects funded by the National Research Institute for which more than BGN 600,000 was allocated. These projects are in the field of virtual anthropology and are characterized by high innovative potential, such as creating a virtual anatomical collection. She was a young scientist-leader of a project under the Program to Support Young Scientists at the BAS and a participant in the target group of a project funded by the OP "Development of Human Resources."

The candidate showed strong expert activity - she has reviewed 23 articles for international publications indexed in WoS and SCOPUS. She is a member of the European Anthropological Association and the Bulgarian Anatomical Society.

Dr. Nikolova in tandem with Dr. Toneva is a winner of the prestigious award "Prof. Dimitar Kadanov" of the Bulgarian Anatomical Society (BAS). She was awarded the best poster at the XXV National Congress of BAD in Pleven, 2021 as well as for excellent report on the first stage of the project DFNP -73/27.04.2016, financed under the Program for supporting young scientists in the Bulgarian Academy of Sciences, 2016.

Conclusion: Based on the materials presented in the competition, I find that assistant professor Silvia Nikolova, PhD is a promising active scientist, a specialist in the field of anthropology and human anatomy. As a results of her research, fundamental and applied scientific contributions have been generated that are of significant importance to biomedicine, forensic medicine and bioarchaeology. The candidate conducts interdisciplinary scientific research with medical doctors, mathematicians and specialists in computer technologies, which corresponds to the most modern trends in the development of anthropology. With the use of artificial intelligence, she developed a new trend in IEMPAM - virtual anthropology and was the winner of a prestigious BAD award. Dr Nikolova has high scientometric indicators that exceed the criteria in the Regulations of IEMPAM-BAS for obtaining the academic position "Associate Professor". The candidate has a significant contribution to the project financing. It is also distinguished by active expert activity. I believe that Assistant Professor Dr. Silvia Nikolova fully meets the requirements of the National Academy of Medical Sciences and the resulting regulations (of BAS and IEMPAM) for holding the academic position of "Associate Professor" in the specialty "Anthropology" in the Department "Anthropology and Anatomy" at IEMPAM-BAS. All this gives me sufficient grounds to convincingly recommend to the Scientific Jury to vote positively for the proposal to the Scientific Council of IEMPAM, Assistant Professor Dr. Silvia Nikolova to be promoted into "Associate Professor" in the scientific specialty "Anthropology" (01.06.01), Professional Field 4.3. Biological Sciences.

28.11.2022

Sign: .....

(Prof. Nina Atanassova, PhD, DSc)