

TO THE CHAIRMAN OF THE SCIENTIFIC JURY,
DETERMINED BY ORDER No RD-09-49/17.08.2022
OF THE DIRECTOR OF THE IEMPAM, BAS

STATEMENT

by Assoc. Prof. Dimitrinka Yordanova Atanasova-Dimitrova, PhD
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Higher education field 4. Natural sciences, mathematics and informatics,
Professional direction 4.3 Biological sciences,
Elected as a member of the scientific jury

Regarding: Conducting a competition for the occupation of an academic position "Associate Professor" in a field of Higher education 4. Natural sciences, mathematics and informatics, professional direction 4.3. Biological sciences, scientific specialty "Anthropology" (01.06.01) announced for the needs of the Department of Anthropology and Anatomy at the Institute of Experimental Morphology, Pathology and Anthropology with a Museum at the Bulgarian Academy of Sciences (IEMPAM-BAS). The competition was announced in the State Gazette, issue 60 of 29.07.2022, according to the Order of the Director of IEMPAM-BAS.

A candidate for the announced competition

One candidate participated in the competition – **Silviya Yanakieva Nikolova**, PhD in Anthropology, Chief Assistant Professor in the Department of Anthropology and Anatomy at IEMPAM-BAS. The necessary complete set of administrative documents is presented according to the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for occupying the academic position "Associate Professor" of the Rules of IEMPAM-BAS.

I. Analysis of the candidate's career profile

1. Education and qualification

Candidate Silviya Yanakieva Nikolova completed her higher education at the Faculty of Biology of Sofia University "St. Kliment Ohridski" in 2005, Specialty "Biology" and obtained a master's degree in "General Anthropology". Immediately after completing her higher education, at the beginning of 2006, Silvia Nikolova was enrolled as a full-time doctoral student at the Institute of Experimental Morphology and Anthropology with a Museum, BAS. On 10.06.2010, after a successful defence of a PhD thesis on the topic: "Anatomical variations of the skull - anthropological characterization and evaluation of intersex and bilateral differences", before the Specialized Scientific Council for Morphology at the Higher Attestation Commission, she was awarded in 2011 the educational and scientific degree "Doctor of Philosophy" in the scientific specialty "Anthropology".

2. Work experience and specializations

Silviya Nikolova has 13 years of work experience in the specialty. From January 2009 to June 2010, the candidate held the position of a specialist biologist at the Institute of Experimental Morphology and Anthropology with a Museum at the Bulgarian Academy of Sciences. From July 2010 to April 2011, Silviya Nikolova was a specialist biologist at the Institute of Experimental Morphology, Pathology and Anthropology with a Museum at the Bulgarian Academy of Sciences. From May 2011 to June 2012, he worked as an Assistant Professor. From July 2012 to the present, she has been the Chief Assistant Professor at the Institute of Experimental Morphology, Pathology and Anthropology with a Museum at the Bulgarian Academy of Sciences..

Chief Assistant Professor Silviya Nikolova participated in 2015 in an intensive course held within the framework of the European project under the 7th Framework Program AComIn: Advanced Computing for Innovation FP7-REGPOT-2012-2013, thereby improving her knowledge of digitization, creation of replicas of cultural heritage objects, use of new technologies and mobile applications for museums.

The candidate has computer skills and competencies for working with Microsoft Office, SPSS, VGStudio MAX /for analysis and visualization of data obtained from industrial computed tomography/, 3D CT /for 3D reconstruction of models from images obtained through computed tomography/, MeshLab / for processing 3D triangular networks/, ITK-snap /for segmentation of structures from 3D images/, Geomagic Verify Viewer /for visualization and digital measurements of 3D models/, ImageJ /for processing and digital measurements of 2D and 3D images/.

II. Fulfillment of the requirements for occupying the academic position "Associate Professor"

To participate in the current competition, Chief Assistant Professor Silviya Nikolova applied 21 scientific works (16 publications in journals with an impact factor, six publications in journals with an impact rank and one chapter of a monograph) for the period 2012-2021, of which five scientific publications as an equivalent of habilitation thesis (indicator V, item 4). Of these five publications, one is in a first-quartile journal (Q1), and the remaining four publications are in quartile Q2 journals. Of the 16 publications attached (indicator D, item 7 and item 8), three publications are in journals falling in Q1, 3 are in journals with quartile Q2, seven articles in Q3, two publications are in journals with quartile Q4 and one chapter from the monograph. The total impact factor of the articles submitted for participation in the competition is 15.956, and the H-index is 5. All publications applied for participation in the competition indexed in *Web of Science* and/or *Scopus*, printed in English and published in refereed international journals such as *Anthropological Science*, *Anthropologischer Anzeiger*, *Collegium Anthropologicum*, *Studies in Computational Intelligence*, *Anatomical Science International*, *Journal of Craniofacial Surgery*, *Folia Morphologica*, *Legal Medicine*, *HOMO - Journal of Comparative Human Biology*, *Annuaire Roumain d'Anthropologie*, *International Journal*

of Legal Medicine, Anatomical Record-Advances in Integrative Anatomy and Evolutionary Biology, Forensic Science International, Journal of Forensic Radiology and Imaging, Forensic Imaging.

According to the attached general reference for citations, it can be seen that 38 of the scientific articles of Chief Associate Professor Silviya Nikolova has been cited 172 times in journals indexed in *WoS* and in *Scopus*. To participate in the competition, the candidate applies 35 citations (indicator D). According to the Regulations for the development of the academic staff at IEMPAM-BAS, the scientometric indicators of the candidate in the competition exceed the mandatory minimum requirements (indicators V, G, D from the attached table) and meet the quantitative criteria for occupying the academic position "Associate Professor".

In the period from 2006 to 2022, Silviya Nikolova participated in oral or poster presentations in 43 scientific forums in our country and abroad, presenting the results of her research. For these 16 years, the candidate has had 74 participations, both at national forums and abroad. Some of the results have been presented at prestigious international forums in Rome (Italy), Naples (Italy), Prague (Czech Republic), Zagreb (Croatia), Prague (Czech Republic), Belgrade (Serbia), Herceg Novi (Montenegro) and Berlin (Germany).

GROUP OF INDICATORS	CONTENTS	Mandatory quantitative criteria for holding the academic position "Associate Professor" at IEMPAM-BAS	Scientometric indicators of Chief Assistant Professor Silviya Nikolova
A	1. Dissertation for educational and scientific degree "Doctor of Philosophy" труд за ОНС	50	50
V	4. Habilitation work - monograph, or scientific publications in journals that are referenced and indexed in world famous databases with scientific information (Web of Science and Scopus)	100	105
G	7. Scientific publications in peer-reviewed and indexed scientific journals (Web of Science and Scopus), outside the habilitation thesis. 8. Published chapter of a collective monograph	Total: 220	Total: 279
D	11. Citation in scientific journals, monographs, collective volumes and patents, referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus).	60	70

III. Participation in projects and scientific and creative accomplishments

Silviya Nikolova is the head of an ongoing national project funded by the Bulgarian National Science Fund (BNSF). The candidate was the head of one project and a participant in two successfully completed projects on scientific research and a young scientist-leader of a project under a program to support young scientists at the BAS. She was a member of the target group under the project "Building and development of young highly qualified researchers for effective application of biomedical research

to improve the quality of life" /Contract No. BG051PO001-3.3.06-0048/04.10.2012/ carried out with financial support of the Operational Program "Development of Human Resources" 2007-2013, co-financed by the European Social Fund of the European Union.

Chief Assistant Professor Silviya Nikolova was awarded the "Professor Dimitar Kadanoff" award for high publication activity in the period 2019-2021 by the Bulgarian Anatomical Society. At the XXV National Congress of the Bulgarian Anatomical Society (May 28-30, 2021) in Pleven, she was awarded the best poster presentation. As a result of the obtained results and excellent reporting First stage of the project DFNP - 73/27.04.2016, Program to support young scientists at BAS, 2016, the candidate was awarded.

Chief Assistant Professor Silviya Nikolova is a member of the Bulgarian Anatomical Society, the European Anthropological Association and the Federated International Program on Anatomical Terminologies, Working Group: Anthropology.

IV. Brief description of the scientific works/publications presented

The publications included in the list for participation in the competition are 21, and the scientific contributions from these publications can be conditionally divided into two large groups, namely: contributions of a theoretical nature and contributions of an applied nature.

The contributions of a theoretical nature include the studies related to the study of anatomical variations in the structure of the skull [1-4, 8], the mandible bone [5, 6] and the postcranial skeleton [12], as well as the study of the reorganization of the sagittal suture during its closure [7] and study of the skull configuration in premature closure of the scaly suture [10]. The theoretical contribution of publications [1-6, 8, 12] is related to researching the frequency of occurrence, discussing the aetiology and discussing the potential clinical complications of the investigated variations.

Applied contributions include publications that emphasize the application of modern communication and information technologies and the transfer of conventional morphometric studies to digital studies. This includes generating and processing 2D and 3D images, capturing morphometric data from images, and verification and reliability assessment of digital morphometry. This approach enables the application of methods from the field of artificial intelligence, such as extracting knowledge from data mining and machine learning to analyze the data and create mathematical models to solve the problems.

Methods have been developed to determine the biological sex by the size and area of the large occipital foramen [15], the mastoid triangle [16], as well as by the dimensions of the entire skull [19, 21]. The dimensions of the mastoid triangle show a discriminatory ability to determine gender in Bulgarians reaching up to 89%, and the total area of the right and left mastoid triangles is the best sign for distinguishing the two sexes [16].

The extent to which the degree of sagittal suture closure is a reliable predictor of age at death was investigated using symbolic and subsymbolic machine-learning algorithms designed to solve regression problems. The most accurate models for predicting age at death were found to be based solely on the degree of lamina closure along the sagittal suture [11].

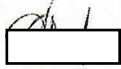
Facial soft tissue thickness is the basis of cranial soft tissue reconstruction. It has been found that facial soft tissues in adult Bulgarians change in accordance with the individual's nutritional status and increase with increasing body mass index. In both body mass index categories, normal and overweight, men have thicker soft tissues at most points on the face than women, with the only exceptions occurring in the cheek area, where facial soft tissue thicknesses are thicker in women.

The candidate successfully applied micro-computed tomography (μ CT) in bioarchaeology to study skulls from archaeological excavations [17].

V. Conclusion

According to the overall presentation of the candidate in the competition, I believe that the Chief Assistant Professor Silviya Nikolova is a highly qualified scientist with valuable scientific output, an anthropologist with very rich research experience and meets the mandatory and specific conditions and scientometric criteria for occupying the academic position "Associate Professor".

Based on the above and in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for its Implementation and the Regulations for the Development of the Academic Staff of the Institute of Experimental Morphology, Pathology and Anthropology with a Museum. I recommend to the esteemed Scientific Jury to propose a Chief Assistant Professor Silviya Nikolova for the selection of the academic position "Associate Professor" in Anthropology for the needs of the Department of Anthropology and Anatomy at IEMPAM-BAS.

Prepared the statement, 

Assoc. Prof. Dimitrinka Atanasova-Dimitrova, PhD

12.12.2022 г.

Sofia