Reviewed by

Concerning a competition for an academic post of „Associate Professor", in area 4. Natural Sciences, Mathematics and Informatics, professional field 4.3. 60/29.07.2022, for the needs of the section "Anthropology and Anatomy" of the Institute of Experimental Morphology, Pathology and Anthropology with Museum of the Bulgarian Academy of Sciences.

Reviewer: prof. dr. Lina Georgieva Malinova, Ph,

Professor at the Department of Anatomy, Histology and Embryology, Faculty of Medicine, Medical University, Sofia.

In the competition for the academic position of „Associate Professor" for the needs of the section „Anthropology and Anatomy" of the Institute of Experimental Morphology, Pathology and Anthropology with Museum of the Bulgarian Academy of Sciences, documents were submitted by one candidate: Assoc. Sylvia Yanakieva Nikolova, PhD in Anthropology.

Biographical data for chief asst. Sylvia Nikolova

Principal asst. Sylvia Nikolova was born on 14.03.1982 in the town of. Sofia. She graduated from Sofia University "St. Kliment Ohridski" in 2003. In 2005 she graduated with a Master's degree in General Anthropology, majoring in Biology at Sofia University "St. She graduated from the University of St. Kliment Ohridski with a degree in Biology. From January 2009 to June 2010, Silvia Nikolova worked as a specialist - biologist at the Institute of Experimental Morphology and Anthropology with Museum of the Bulgarian Academy of Sciences, Sofia. She worked at the University of Sofia, Sofia, Bulgaria. From July 2010 to April 2011, she worked as a specialist biologist at the Institute of Experimental Morphology, Pathology and Anthropology with Museum, BAS. After successfully defended in 2011 her dissertation on "ANATOMIC VARIATIONS OF THE CHERAPO - ANTHROPOLOGICAL CHARACTERISTICS AND ASSESSMENT OF INTERDUPLEX AND BILATERAL DIFFERENCES" she was awarded the scientific degree "Doctor" in the scientific specialty "Anthropology". In May 2011, she joined the Institute of Experimental Morphology,

Pathology and Anthropology with Museum, BAS as an assistant professor, and since 2012 and currently, Silvia Nikolova is a senior assistant professor at the Institute of Experimental Morphology, Pathology and Anthropology with Museum, BAS.

The work experience in the specialty of the chief assistant Nikolova is 13 years.

Research:

In the current competition for the academic position of „Associate Professor", Assistant Professor Nikolova has presented 21 scientific publications and 74 participations in national and international congresses for the period from 2012 to 2021. All articles have been published in reputable Western journals. It is noteworthy that 11 of the 21 papers presented by the candidate are first author, 14 of which are in journals with impact factor, and 6 are in journals with impact rank. In addition, the main as. Nikolova has participated in writing a chapter of a monograph.

The candidate's scientific output can be divided into several sections:

➢ Defended dissertation thesis for obtaining PhD, with 3 publications and 6 participations in national scientific forums, congresses and symposia with international participation;

➢ Publications in refereed international journals, of which 14 have IF and 6 with impact rank;

➢ Participation in a monographic work;

➢ 74 participations in national congresses and symposia with international participation, as well as in international congresses.

With regard to the minimum national requirements for the acquisition of the academic position of "Associate Professor" according to the Law on Academic and Research Education and the Regulations for Application in IEMPAM, BAS, Asst. Nikolova, Section "Anthropology and Anatomy" has submitted the following reference:

- Group of indicators A /Indicator 1/ - Dissertation for the award of the degree "Doctor" - 50 pts.

- Group of indicators B /Indicator 4/ - 105 points (out of 100 points required)

- Group of indicators D /Indicators 7 and 8/ - 279 points (out of required 220 points)

- Published chapter of a book or collective monograph (15p.).

It is clear from this report that the applicant not only meets but also exceeds the minimum national requirements in some indicators to a significant extent. Principal as. Nikolova has h-index (Scopus) - 5.

During her career development, the candidate in the competition for the academic position of „Associate Professor", received a series of various awards, which again highlights her active participation in various scientific forums, as well as project activity:

1. Award for excellent reporting of the First stage of the project DFNP - 73/27.04.2016, Program for support of young scientists in BAS, 2016.
2. Award of the Bulgarian Anatomical Society "Professor Dimitar Kadanov" for publication activity in the period 2019-2021.
3. Best Poster Award at the XXV National Congress of the Bulgarian Anatomical Society (28- 30.05.2021, Pleven, Bulgaria).

She has been a reviewer of scientific publications in reputable international journals.

According to the reference for citations, ch.as. Nikolova has 172 citations in dissertations, national and international publications.

For her career advancement, memberships and leadership of a number of research projects have been important:

- In 2009 she was a member of the scientific project "Characteristics of the anthropogenetic identity of the Bulgarian people", at the Scientific Research Fund.
- In 2012 she was a member of the task force of the project "Building and development of young highly qualified researchers for effective application of biomedical research to improve the quality of life" under the Operational Programme: Human Resources Development.
- In 2016, she was a young scientist-leader of the project "Application of digital radiography in the study of cranial structures osteometry" under the Program for support of young scientists at BAS.
- In 2016 and 2021, Assistant Professor Nikolova is the lead researcher of two research projects at the Scientific Research Fund.

Personal and computer skills of the head asst. Nikolova

The candidate has computer skills and competences to work with Microsoft Office (Word, Excel, PowerPoint), SPSS, VGStudio MAX /for analysis and visualization of data

obtained from industrial computed tomography/, 3D CT /for 3D reconstruction of models from images, 3D models obtained by computed tomography/, MeshLab /for processing 3D triangular meshes/, 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/.

He has conducted an intensive course on digitization and creation of replicas of cultural heritage objects, and on the use of new technologies and mobile applications for museums /May 2015, Smart Fab Lab workshop, UASG/ (The course was conducted within the European project under the 7th Framework Programme AComIn: Advanced Computing for Innovation FP7-REGPOT-2012-2013).

Assistant Professor Nikolova is a member of the European Anthropological Association, the Bulgarian Anatomical Society, and a member of the Federative International Programme for Anatomical Terminology (FIPAT), Working Group: Anthropology (TAnthr).

The candidate's research interests and contributions can be divided as follows:

1. Scientific contributions of a theoretical nature

Knowledge of the limits of normal variation in the structures of the human body, as well as the etiology and frequency of occurrence of anatomical variations, is important from a theoretical point of view, and ignoring them can lead to misinterpretation and complications in surgical interventions in clinical practice. The theoretical contribution of publications [1-6, 8, 12] is related to the study of the frequency of occurrence, discussion of the etiology and discussion of the potential clinical complications of the studied variations

    1.1.   This group brings together research related to:
- the study of anatomical variations in the structure of the skull [1-4, 8], mandible [5, 6];
- postcranial skeleton [12];
- Studying the reorganization of the sagittal suture during its closure [7];
- Study of the skull configuration in premature closure of the scaly suture [10].

    1.2.   Study of cranial sutures related to the biological age of the individual. Knowledge of the morphology of cranial sutures and the remodeling processes during obliteration are essential for the early diagnosis and

treatment of their premature closure (craniosynostosis), which leads to various craniofacial deformities [7, 10].

2. Scientific contributions of an applied nature

Included in this section are publications that apply modern information and communication technologies and transfer conventional morphometric studies to digital ones. This includes 2D and 3D image generation and processing, morphometric data acquisition from images, and verification, i.e. comparison and reliability assessment of digital morphometry. This approach enables the application of artificial intelligence methods such as data mining and machine learning to analyse the data and create mathematical models to solve the problems at hand.

2.1 Validation of digital morphometry methods [9,13,18];

2.2 Development of methods for sex, age and facial approximation with applications in forensic medicine (forensic anthropology) and bioarchaeology, with biological sex determined by the size and area of the greater occipital foramen [15], the mastoid triangle [16], and the dimensions of the entire skull [19,21];

2.3. Determination of biological age [11];

2.4 Face approximation. Facial soft tissue thickness (FST) is the basis of facial approximation i.e. soft tissue reconstruction on the skull. Stronger correlations have been found between DMTL in the jaw region and between cheek and jaw soft tissues [14,20];
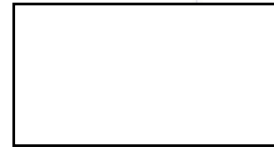
3. Application of micro-computed tomography (μCT) in bioarchaeology (paleopathology) [17].

Conclusion:

Principal asst. Sylvia Nikolova has 13 years of successful career development in IEMPAM - BAS, has computer skills not only for computer work, but also skills for generating three-dimensional surface models of the skull and skin from computed tomographic data, as well as micro-computed tomography (paleopathology), which makes her an extremely successful scientist-anthropologist. She has a PhD from 2011, which is a prerequisite for the academic position of Associate Professor. Her main interests and scientific contributions are in the field of anthropology and bioarchaeology. All her scientific activity has found national and even more international recognition, not only with her active publication activity, but also with

the citations of her works, which number 172 (out of the required 35). What is more, prof. Nikolova meets and even exceeds the minimum national requirements for holding the academic position „Associate Professor". All this, together with the large number of participations in editorial boards, projects, receiving awards from various scientific forums and project participations, her scientific contributions of theoretical and applied nature, make the head as. Nikolova is an indispensable member of the morphological and anthropological community in the country and abroad. **On this basis, I consider and strongly recommend to the members of the esteemed scientific jury to vote positively for the election of Asst. Sylvia Yanakieva Nikolova and to award her the academic position of "Associate Professor" for the needs of the section "Anthropology and Anatomy" of the Institute of Experimental Morphology, Pathology and Anthropology with Museum of the Bulgarian Academy of Sciences.**

Reviewer:

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28.11.2022г.

gr. Sofia