

To Assoc. Prof. Stoyan Pavlov Pavlov, MD, PhD
Chairman of the Scientific Jury,
designated by an order No. P-109-224/26.07.2024
of the Rector of the Medical University of Varna
55, Marin Drinov St.
9002 Varna

Regarding your protocol No. 1/08.08.2024

Attached is: Review

on the competition for two academic positions "Associate Professor"

Scientific specialty: Anatomy, Histology and Cytology

announced for the needs of the Medical University-Varna, Department of Anatomy and Cell Biology
in the State Newspaper, Issue 45/28.05.2024

Candidates:

Meglana Valdemarova Angelova, MD, PhD

Desislava Marinova Marinova, MD, PhD

Reviewer: Prof. Nikolai Elenkov Lazarov, MD, PhD, DSc

Scientific specialty: Anatomy, Histology and Cytology

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The review is composed in accordance with the requirements of The Law on the Development of Academic Staff in the Republic of Bulgaria, and Sections 3 and 4 of the Rules for placing into practice of the Law on the Development of Academic Staff in the Republic of Bulgaria – Terms and Procedure for Academic Position "Associate Professor"

In the competition for holding two academic positions "Associate Professor" in the scientific specialty "Anatomy, Histology and Cytology" for the needs of the Department of Anatomy and Cell Biology at the Medical University (MU) "Prof. Dr. Paraskev Stoyanov" – Varna, two candidates (ordered alphabetically by surname) applied: Meglena Valdemarova Angelova, MD, PhD, and Desislava Marinova Marinova, MD, PhD.

Meglana Valdemarova Angelova was born on April 21, 1979 in the town of Varna. In 2003 she graduated with honors from the MU-Varna with a master's degree in "Medicine" and a professional qualification of "Doctor of Medicine". In 2006, Meglena Angelova was appointed an assistant-professor at the Department of Anatomy, Histology and Embryology of the MU-Varna, and since 2011 she is a head assistant-professor in the same department. Following a successful defense of a doctoral thesis entitled "*Analysis of Progenitor Cells During Development of Human Pallium*", in 2015 he was awarded a PhD degree in the scientific field of Anatomy, Histology and Cytology. Since 2010 she is a certified specialist in this medical specialty. From the beginning of the academic year 2021-2022, Dr. Angelova is the administrative assistant of the department. Dr. Angelova is a member of the Bulgarian Anatomical Society. She has good computer literacy and in 2022 she acquired an additional qualification in digital skills. According to the applicant, she is fluent in English as the primary language in academic communication.

Dr. Meglena Angelova has a total of over 20 years of experience in the specialty, of which nearly 18 years of teaching experience, incl. over 13 years as a head assistant-professor. In her long-standing practice as an assistant-professor, she has given the entire practical course in macroscopic and microscopic anatomy in Bulgarian and English with students of medicine, dentistry, and pharmacy, has delivered a lecture course and conducted practical classes on the discipline of human anatomy to students in Nursing and Dental Technology specialties. From the attached academic transcript, it is evident that in the last five years she covered almost twice the teaching horarium required for assistant professors in the university. Dr. Angelova co-authored a test book collection of human anatomy tests for nursing students.

All the above-mentioned information makes me believe that Dr. Angelova is an experienced and respected university teacher with proven high level of professionalism in the field of anatomy and histology, and a certain contribution to anatomy education at the university.

In the present competition, Dr. Angelova submitted the PhD thesis summary (indicator A1) and a list of 26 papers which are not an integral part of this thesis, including 6 articles presented in the competition for promotion to head assistant-professor. The profile of the scientific production submitted for the habilitation process includes a peer-reviewed monograph, equivalent to a habilitation thesis (indicator B3), 8 articles in journals which appeared in the largest abstract and citation database of peer-reviewed literature, i.e. Scopus and Web of Science, and 11 (+6) papers in peer-reviewed non-referred journals or in edited scientific event proceedings (indicators G7 and G8, respectively). Twelve of the research articles are published in English, and 7 are in Bulgarian, in 3 of these publications Angelova is the first co-author. One of these articles was published in the academic journal *Science Advances*, which has a relatively high impact factor of 11.7 (2023). The scientific activity of Meglena Angelova also includes 18 reports, presented at national scientific events, incl. with international participation and at international science forums.

The research activity of Dr. Angelova is characterized with a wide thematic scope and clinical orientation. Her scientific interests are in the field of neuroanatomy, anatomical variations, and reproductive biology. The main contributions of her research are related to the study of neurogenesis in the central nervous system, particularly in the intact spinal cord and post-ischemic brain with emphasis on proliferative processes in the developing human dorsal pallium. The dissertation work of the candidate [A1] and the publications included in it [G7.1; D8.4-8.7] deal with this topic. In addition, a university project on the subject was successfully implemented with her participation. The research contributions of a study of this problem have essential practical significance for understanding the role of transcription factors Sox2 and Zbtb20 as internal signals for the control of human neocortico-genesis and their potential involvement in the genesis of some congenital disorders in the cerebral cortex development. These original findings give researchers reasonable hope to direct the process of adult cortical neurogenesis toward the development of effective cell replacement therapy for certain neurodegenerative diseases and traumatic brain injuries, leading to massive neuronal loss in the cerebral cortex. Specifically, Angelova has described for the first time the presence of glial and neural progenitor cells in an intact primate spinal cord, analyzed the phenotype of proliferating cells in the postischemic cerebellum, demonstrated expression of the transcription factor Zbtb20 in the human fetal dorsal pallium, and identified the cell phenotype. These studies have

given indisputable evidence for the presence of an apico-basal and rostro-caudal gradient in the density of radial stem cells expressing Sox2 and Zbtb20.

Another important scientific problem studied by Dr. Angelova is related to the description of certain muscular and vascular anatomical variations in the human body with a primary emphasis on elucidating their relevance to human clinical practice. Particularly, she has described a rare anatomical variant of the sternalis muscle [D7.2], an unusual occurrence of a multiple tendon abductor pollicis longus muscle [G7.3], variations of anatomical structures, specifically the muscles and their tendons passing through the carpal tunnel [G8.8], a hitherto unknown, unilateral variation of a double-bellied superior rectus muscle [D7.5], as well as atypical vascular variations such as the presence of superficial brachial artery [G7.7] and variant testicular artery arising from an aberrant renal artery [G8.10]. Along with their descriptions, Angelova has made a successful attempt to characterize and categorize the abnormal morphological traits considering their diagnostic and interventional value.

An important issue in Angelova's research work in recent years has been the study of the anatomical structure and function of the human foot. She has published a monograph entitled "*The anatomical features of the human foot*" [B3] and was the principal investigator of a successfully implemented scientific project on this topic. The focus of both studies was on elucidating the relationship of anatomical features and variations of the human foot to its functions and biomechanics. During the investigations, the most common typing and examining methods of human feet were described, plantograms of the main foot types among the Bulgarian population were presented [G7.4], the correlation between its individual morphological indices and their relationship with the general body constitution was emphasized [G7.6], anatomical variations of the articular surfaces of the hindfoot bones, the most posterior aspect of the foot, are described [D7.8; D8.11]. The complex morpho-functional evaluation of the foot allowed Angelova to draw valuable conclusions about its common features and personality traits, which are important for the prevention and treatment of its diseases and deformities.

In the early years of his academic career, Dr. Angelova was member of a research team that studied in detail the male fertility, particularly the parameters of human seminal fluid. As a result of these studies, the definition of new normal values of the components in its content has a real practical contribution to reproductive medicine.

The research achievements of Dr. Angelova have been reflected in the international periodical literature. From the attached original academic transcript, issued by the Library of the MU-Varna, it is clear that two of the scientific articles she co-authored have been cited a total of 4 times (indicator D10). The reference in Scopus shows that 2 documents by the author are cited a total of 18 times and that she possesses a personal h-index = 1.

In conclusion, I found that Dr. Meglena Angelova has enough teaching experience, possesses excellent methodological knowledge, very good computer literacy and linguistic skills, and has provided convincing evidence of an established scientist studying morphology. She meets the necessary conditions for holding the academic degree of Associate Professor according to the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), i.e. she has a PhD degree, has held the position of a head assistant-professor for more than 13 years, and presents enough publications, apart from those for obtaining a PhD degree, which make an original contribution to the scientific specialty. As can be seen in the table below, the candidate's scientific asset and metrics comply with the actual minimum national requirements for the academic degree of Associate Professor developed in the Regulations on the Implementation of the DASRBA. They also logically meet the threshold of minimum scientometrics of the MU-Varna, according to Appendix No. 1, area 7. Health care and sports, and cover the additional indicators for evaluating candidates, according to Appendix No. 2 of the Regulations for the Development of the Academic Staff at the MU-Varna:

Indicator by groups	Content indicator	Mandatory quantitative criteria for becoming an associate professor (minimum number of points)	Scientometric indicators of Dr. Meglena Angelova (verified number of points)
A	1. PhD thesis	50	50
B	3. Habilitation work – monograph	100	100
G	7. Publications and reports in peer-reviewed journals, indexed in the leading databases with scientific information 8. Publications and reports in peer-reviewed non-referred journals or in scientific event proceedings	200	Total number = 209.74 139.14 70.6
D	10. Citations or reviews in scientific journals, referred and indexed in the leading databases with scientific information or in monographs and collective monographs	50	60
E	15. Acquired medical specialty 23. Published university manual or manual used in the school network		Total number = 50 40 10
Total number		400	469.74

The second participant in this competition, Desislava Marinova Marinova was born on July 23, 1981 in the city of Varna. In 2006, Marinova graduated in medicine at the Medical University of Varna, and in 2007 she was appointed an assistant-professor in the Department of Anatomy, Histology and Embryology at the same university, where she currently holds the academic position of a head assistant-professor. In 2013 she obtained specialty in anatomy, histology and cytology and after a defense of a doctoral thesis entitled „*Proliferation and differentiation of progenitor cells in the spinal cord of adult primates*“, she was awarded a PhD degree in the scientific field of Anatomy, Histology and Cytology in 2014. During the period 2011-2014, Dr. Marinova is the person in charge of the dissection sector in the department, and in the years 2012-2014, she was the academic coordinator of second-year medical students, English language training at the university. She declares English language proficiency and computer skills, and in 2022 she upgraded her knowledge, acquiring an additional qualification in digital skills. Desislava Marinova is a member of the Bulgarian Anatomical Society.

For more than 16 years, Dr. Marinova has been teaching the entire practical course in anatomy, histology and embryology in Bulgarian and English to students of medicine, dentistry and pharmacy at the MU-Varna, as well as to students in Nursing and Dental Technology specialties in the university affiliates in the cities of Sliven, Shumen and Veliko Tarnovo, where she also delivered the lecture course on the human anatomy. Dr. Marinova has participated in a specialized course in anatomical surgery and surgical approaches to the pelvis and hip joint. Her teaching horarium for the last five academic years, certified by an official reference, significantly exceeds the mandatory standard for assistant-professors at the MU-Varna. She co-authored a university teaching aid, i.e. a human anatomy quiz for nursing students. Summarizing the overall educational and teaching activities of Dr. Marinova, I believe that she has the professional qualifications and pedagogical experience necessary for occupation of the academic position of associate professor in this scientific specialty.

Dr. Desislava Marinova participates in the current competition with the PhD thesis summary (indicator A1) and 22 papers, including a peer-reviewed monograph entitled “*Analysis of proliferative processes in the intact mammalian spinal cord*”, which was not submitted as a habilitation thesis (indicator B), 9 articles in English in peer-reviewed journals which appeared in international academic research databases and 5 papers in English published in non-referred journals or in edited scientific event proceedings (indicators G7 and G8, respectively). In 4 of the

scientific articles on this indicator, Marinova is the first co-author. Two of the articles on the list have been published in journals with an impact factor, one of them, in which she is a lead author, is published in an open access journal *Heliyon* (IF 2023 3.4). The total impact factor of the journals in which D. Marinova's articles were published is 9.3. Her publication activity also includes 7 articles used in a competition for the academic position of head assistant-professor. The scientific activity of the candidate also includes 16 communications, presented at three international and 11 national scientific events with international participation. As an additional asset of Dr. Marinova's scientific and expert experience, scientific supervision of students, including joint research publications, would also be accepted.

Scientific interests of Dr. Marinova are in the field of neurogenesis, anatomical varieties, and anatomy of the foot. A major theme to which a large part of her creative energy was devoted, incl. her PhD thesis [A1] and monograph [B3] and related scientific publications, is the examination of the proliferative niches of the CNS, and the concomitant changes after ischemia. Specifically, the cell proliferation in the intact primate spinal cord was investigated in detail and the presence of a stem cell niche in its central canal zone was demonstrated for the first time. During this study, original data on the presence of a high percentage of proliferating microglial cells [G7.1; D7.7], which are defined as the major progenitor pool in the primate CNS, were provided. In another study, a detailed analysis of the cell proliferation in different parts of the cerebellum following induced global cerebral ischemia was performed [G8.1], and phenotyping of the proliferating cells found a predominance of microglia, astrocytes, as well as a few new neurons in the postischemic cerebellum. For the first time, an age-related expression of transcription factors Pax2 and Pax6 in the different layers of the cerebellar cortex and after global cerebral ischemia was experimentally demonstrated in primates [G8.2]. An original contribution provided a study on the human embryonic and fetal dorsal pallium (the future cortex), in which new signaling molecules were identified, in particular the transcription factors Zbtb20 and Sox2.

Another thematic focus of her research is related to a description of certain muscle varieties and anatomical variations of the vascular bed [G7.3-7.5, G7.8; D8.3, D.8-4]. Their description is a joint work with the other candidate in the competition, and the specific scientific and applied contributions of these studies are described above in the review.

The same fully applies to the study of the anatomical features of the human foot. The detailed study of this complex anatomical structure, which has extremely important practical

implications for orthopaedics, sports medicine, physiotherapy and kinesitherapy, undoubtedly requires team-training research, and therefore it is no surprise to me that it was carried out with the participation of both candidates in the competition, indeed with the leading role of Dr. M. Angelova. However, the contribution of authors to the available knowledge on the subject is a merit of their joint creative efforts.

According to the official transcript issued by the Library of the MU-Varna, the scientific contributions and achievements of Dr. Marinova have been cited a total of 4 times (indicator D10) in foreign literature sources. However, it is not unusual, since the two cited articles by Marinova were published in the last two years. According to Scopus three documents by this author have been cited a total of 9 times and she has a personal h-index = 1. Since the citing sources were not provided, I am not able to assess the gist of these citations.

When summarizing the overall production of the candidate, I found that Dr. Marinova complies with the formal legal requirements and the rules for promotion to Associate Professor, i.e. she holds the educational and scientific degree PhD, has a recognized speciality required for the position and she has been a head assistant-professor for over 8 years. As can be obtained from the attached official certificate, the scientific production of Desislava Marinova meets the minimum national scientometric requirements and comply with all mandatory quantitative and qualitative criteria, according to the Regulations on Academic Staff Development at the MU-Varna for participation in the competition for the academic position of Associate Professor:

Indicator by groups	Content indicator	Mandatory quantitative criteria for becoming an associate professor (minimum number of points)	Scientometric indicators of <i>Dr. Desislava Marinova</i> (verified number of points)
A	1. PhD thesis	50	50
B	3. Habilitation work – monograph	100	100
G	7. Publications and reports in peer-reviewed journals, indexed in the leading databases with scientific information 8. Publications and reports in peer-reviewed non-referred journals or in scientific event proceedings	200	Total number = 201.29 157 44.29
D	10. Citations or reviews in scientific journals, referred and indexed in the leading databases with scientific information or in monographs and collective monographs	50	60
E	15. Acquired medical specialty 23. Published university manual or manual used in the school network		Total number = 50 40 10
Total number		400	461.29

Common conclusion: I believe that both candidates in the contest possess the necessary teaching skills, have enough academic and research experience, and have provided convincing evidence for being highly affirmed morphologists. They also possess very good methodological competence, computer literacy and language skills. Their scientific production meets the minimum national standards for participation in the competition for the academic position of "Associate Professor", as they have submitted the required minimum number of scientific publications in the field of the competition, apart from those used to get a PhD degree, and their research activity has received international recognition, and has reflected in sufficient citations of their publications in specialized scientific periodicals. This fact and numerous participations in national and international scientific events undoubtedly indicate that the research findings of the two candidates have become available to the morphological community in our country and abroad.

All the above-mentioned information convinced me to express a positive opinion on the overall teaching and research activities of the two candidates in the contest, and as a member of the Scientific Jury on the procedure to give my positive vote and recommend to the members of the Faculty Council of the Faculty of Medicine at the MU-Varna to vote positively for the election of **DR. MEGLENA VALDEMAROVA ANGELOVA AND DR. DESISLAVA MARINOVA MARINOVA** to the academic position of "ASSOCIATE PROFESSOR" in the area of higher education 7. Healthcare and sports, professional field 7.1. Medicine in the scientific specialty "Anatomy, Histology and Cytology" for the needs of the Department of Anatomy and Cell Biology at the Medical University of Varna.

Sofia, 05.09.2024

Reviewer:

(Prof. Nikolai Lazarov, MD, PhD, DSc)

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