

REVIEW

By

Prof. Dr. Yavor Petkov Enchev, MD, PhD, DSc

Head of the Department of Neurosurgery and ENT", Faculty of Medicine, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna, habilitated in the professional domain 7.1 Medicine, Medical University - Varna, member of a Scientific Jury of a competition for awarding the academic title "Professor" for the specialty "Ear-nose-throat diseases", announced in State Gazette, issue 32/26.04.2022

Subject:

Competition for awarding the academic title "Professor" in Higher education area 7. Health care and sports, Professional domain 7.1. Medicine, Specialty „Ear-nose-throat diseases“, announced in State Gazette, issue 32/26.04.2022.

Candidate: Assoc. prof. Dr. Mario Petrov Milkov, MD, PhD

I. Brief details of the candidate's career and biographical profile:

Assoc. prof. Dr. Mario Petrov Milkov, MD, PhD was born on 06.06.1968 in the town of Varna, Republic of Bulgaria. In 1986, he graduated from the Third Science and Mathematics High School-Varna. In 1995, he graduated as a master's doctor from the Faculty of Medicine, Medical University "Prof. Dr. Paraskev Stoyanov" – Varna. From 1998 to 2005, he was a full-time PhD-student at the Department of Otorhinolaryngology of Medical University "Prof. Dr. Paraskev Stoyanov" – Varna. In 2006, he obtained the title of "Doctor" after successfully defending his dissertation on the topic: "Creation of Bulgarian prostheses for ossicular reconstruction in case of defects of the auditory circuit". In the period 1998-2001, he was a resident in Otorhinolaryngology at Medical University – Varna. He obtained his specialty in 2002. In the period 2012-2014, he acquired an additional qualification in the field of Business Administration and Health Management at the University "Prof. Dr. Asen

Zlatarov" – Burgas and Medical University – Varna. Over the years, he has conducted numerous short- and long-term specializations in clinics of otorhinolaryngology, head and neck surgery at: University "Kopf Clinic", Würzburg, Germany; "Inselspital", Bern, Switzerland; "Ruhr University" - Bochum, Germany; Bergen, Norway; "Suara Medical Center" Tel Aviv, Israel; Cos Clinic Beziere, France; "UPMS" Pittsburgh, USA, and others.

In the period 2008-2013, he held the academic position "Assistant professor" in the Department of Prosthetic Dentistry and Orthodontics at the Faculty of Dental Medicine, Medical university – Varna. In 2013, he completed his habilitation and was appointed the position of Associate Professor in the same department. From 2018, assoc. prof. Mario Milkov has been the Head of the Department of Dental Materials Science and Propaedeutics of Prosthetic Dental medicine. Since 2018, he is the Chairman of the "Alumni Club and Friends" at Medical University "Prof. Dr. Paraskev Stoyanov" – Varna. Since the same year, he has also been chosen to be the Head of the Scientific Group "Biomaterials, Implantology and Genetic Engineering" - at the "Scientific Research Institute" of Medical university – Varna.

He is the head and in charge of 3 ongoing projects: two under the Science Fund and one under the Scientific Research Fund. He participated in a project under the Medical Science Fund of Medical university – Varna.

Assoc. prof. Milkov is author of monographs, published in the country and abroad, of numerous full-text scientific publications, and a participant in international symposia as an invited speaker.

Permanent member of the editorial board of numerous international scientific journals. Founder and Editor-in-Chief of the International Bulletin of Otorhinolaryngology. He has a patent registration and 3 separate certificates for brand registrations.

He is a member of numerous international scientific and professional organizations in the field of otorhinolaryngology, head and neck surgery, neurotology, otoneurology, cochlear implantation, obstructive sleep apnea and others.

He is fluent in German, English and Russian.

He is married and has one child.

II. Overall evaluation of the materials, handed in for the competition:

The review of the materials provided, clearly demonstrates that the procedure for disclosure, announcement and participation in the competition has been fully followed. The documents for the competition have been prepared in accordance with the requirements of the

Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation in Medical university - Varna.

III. Evaluation of the research activity. Characteristics of publication activity and scientific production:

In the attached Academic reference for publications, citations, monographs, scientific profiles of the candidate for the appointment of the Academic position "Professor" - Assoc. prof. Dr. Mario Petrov Milkov, MD, PhD has included:

- Dissertation work for the acquisition of the educational and scientific degree "Doctor" on the topic: "Creation of Bulgarian prostheses for ossicular reconstruction in defects of the auditory circuit", 2006, Medical University - Varna (Indicator A1)
- Habilitation work - monograph on the topic: "Prevention of obstructive sleep apnea and snoring in professional drivers", 2021, Medical University - Varna (Indicator B3)
- Published monographs that are not presented as the main habilitation work on the topics: "Clinical Audiology" Nedev P., Milkov M. 2015, Steno; Prostheses for reconstruction of the Auditory ossicles. Milkov M., Marinov G., Guidoin R. 2018, Steno (Indicator D5)
- Publications and reports published in scientific journals, referenced and indexed in world-renowned databases with scientific information - 5 items (Indicator D7)
- Publications and reports published in non-referenced journals with scientific review or published in edited collective volumes – 23 items (Indicator D8)
- Published chapter of a collective monograph – 3 chapters (Indicator D9)

The candidate has submitted 2 more articles, beyond the minimum scientometric requirements for acquiring the academic title "Professor".

The required total number of points was repeatedly fulfilled by the candidate - 597.81pts.

Assoc. prof. Milkov has submitted 23 citations for the competition with a total number of 225 points (Indicators D10-D12). It makes a very good impression that the stated articles

were published in both Bulgarian and international journals, which contributes to the greater visibility of the production of scientists from Medical University - Varna.

Associate prof. Milkov is a participant in 1 project under the Medical Science Fund of MU-Varna according to protocol 20.11.2012. and certificate number ND-99-135 on the topic: "Evaluation of the effect of the application of endooral, endonasal devices in the treatment of patients with habitual snoring and obstructive sleep apnea." He is the Head of 3 current projects - 2 under the Science Fund: 20011 - "Investigation of vestibular function with the method of static and dynamic posturography in patients with craniofacial deformities", 2020, 2020-2023; 21006 - "Rhinomanometer study of the characteristics and quality of nasal breathing in patients with obstructive sleep apnea and snoring proposed for conservative treatment with intraoral devices", 2021, 2022-2025; and 1 under the Scientific Research Fund: "Investigation of the characteristics and quality of speech in patients before and after dental treatment using a laryngostroboscope", 2021, 2021-2024. (Indicators E16, E18)

In the attached documents, the applicant has added a reference to the participation in Bulgarian and international forums with lectures and posters, which for the period 2014-2022, are 70.

Assoc. prof. Milkov has prepared a report on the contributions of his scientific works, in which they are described in greater details and in depth and characterized by several criteria - language of publication of the scientific articles, their type, authorship, fields and directions.

The main directions of the research work and the resulting publication activity, which is significant in terms of volume and quality, where the competition candidate works, are related to the theoretical, applied and clinical aspects of biomaterials, otorhinolaryngology, clinical audiology and vestibulology, as well as the diagnostics, treatment and prevention of obstructive sleep apnea and a number of disorders from the domain of ear, nose and throat diseases. There is both continuity in terms of the thematic focus of scientific research during this period after the habilitation as an associate professor in 2013, as well as significant enrichment of the studied issues, the emergence of the latest and most relevant interdisciplinary scientific areas. A significant place is given to the prophylaxis and prevention of socially significant diseases such as sleep medicine, auditory-cognitive disorders, the introduction of new biomaterials and modern research in the field of audiovestibulology. The candidate has described the main directions of his work:

1. Application of biomaterials in otology
2. Obstructive sleep apnea and snoring
3. Clinical audiology and vestibulology
4. Otorhinolaryngological diseases related to other medical specialties

In Direction 1: Associate professor Milkov researches biomaterials in a historical aspect and the development of the shape and physical-acoustic parameters of ossicular prostheses in the scientific literature. Modern biomaterials used for the reconstruction of the ossicular chain have been studied in biological models in interdisciplinary international teams. Using modern methods, he succeeded in validating a new ossicular prosthesis from the material "Targis Vectris" and "Adoro" in an experimental guinea pig model. General principles in the study of the morphological features of ossicular prostheses are summarized. The mechanical and dynamic properties of the newly created prosthesis have been fully investigated. The bioactivity and biostability of the prosthesis were monitored. The sound conductivity of the prosthesis was also investigated.

In a modern aspect, the creation of a 3D-model of an ossicular prosthesis was also proposed, which is currently being worked on.

In Direction 2: Associate Professor Milkov works hard on prevention, diagnosis and treatment of Obstructive Apnea and Snoring. In 2006, he managed to be one of the first in Bulgaria to use radiofrequency surgery to treat patients with snoring and sleep disorders. Thanks to the interdisciplinary approach of diagnosis and treatment and international contacts with scientists in this field, he managed to be one of the founders of the Society of Obstructive Sleep Apnea and Snoring. Intensive scientific projects to study sleep and apply new methods to treat patients with such symptoms began. In the Faculty of Dental Medicine at Medical university – Varna, as well as in the University medical and dental center, the problem of dental sleep medicine is being developed and prophylactic examinations of professional drivers have been started. Diagnostics is carried out with new innovative equipment, won by a project of patients with obstructive sleep apnea and snoring (OSAS). A critical analysis of previously treated patients is performed and an algorithm for the treatment of patients with different types of OSA and snoring is introduced. At the University medical and dental center, treatment with intraoral appliances was introduced for patients with mild forms of sleep apnea and snoring, according to the specific clinical case.

Together with the management of Public Transport - Varna, more than 800 professional drivers from City Transport - Varna (on which the main habilitation work was written) were examined and screened for the presence of OSAS. As a priority, preventive free examinations are held under the auspices of Medical university - Varna during World Sleep Day, with the campaign lasting a month. Patients from risk groups are examined by an interdisciplinary team. The results are shared through the media to educate the public about this socially significant and dangerous disease and the annual road trauma and mortality. During World and European scientific forums, the results of the diagnostic and treatment activities were reported. The opportunity to examine the quality and quantity of sleep in patients at home, which in the context of the global pandemic of COVID-19 provides convenience, security and cost-effectiveness, is highlighted.

Methods for treating children with impaired nasal breathing and tonsillar hypertrophy with the modern methodology of radiofrequency surgery and coablation are proposed.

On the initiative of assoc. prof. Milkov since 2016 the celebration of World Sleep Day is organized at Medical university – Varna. The free course "Obstructive sleep apnea and snoring. Diagnosis. Treatment. Prevention", in which students of Bulgarian-language and English-language programme from the 4th and 5th year can be trained in the methods of diagnosis, treatment and prevention of OSA syndrome and snoring.

In 2018, at the suggestion of Associate professor M. Milkov, the "Bulgarian Academy of Sleep Medicine" was established with the aim of developing and generalizing scientific approaches in this field and uniting specialists from various specialties.

In Direction 3: Assoc. Prof. Milkov introduced the use of otoacoustic emissions (OAE) for the first time in Varna and the district. For the first time, he examined children in maternity hospitals and initiated the screening of newborns in Varna. He has organized a number of free preventive hearing screening campaigns for newborns, as well as children of early childhood and pre-school age. He participated in a project of the Health commission of Varna municipality to conduct preventive examinations in nurseries and children of different ages in schools in Varna, having examined over 900 children for a period of two years. Children are studied in schools and in remote regions of the district under the auspices of the MU - Varna. The World Hearing Day, organized by the WHO, is being celebrated for the first time in Bulgaria at Medical University - Varna. In addition to mass screening free examinations, the aim is to promote the prevention of hearing disorders at different ages. Attention is paid to the environment and noise, hearing hygiene and tinnitus.

Significant progress in the scientific and medical activities of Associate Professor Milkov was observed after the establishment of the Audio-vestibular and sleep laboratory at Medical university – Varna in the summer of 2020 with the most modern and high-tech equipment. In the University medical and dental center, equipment was purchased and began to function for the examination of hearing, tinnitus, vestibular symptoms, many patients with neurological problems and gait instability. After winning a Science Fund project - a posturologic office also began to function. Recent advances in the interdisciplinary field of audio-vestibular and dental diseases are discussed. The important interrelations between the science of posture of the human body - posturology, vestibular disorders and dentistry - are identified. Its importance in pediatric dentistry is highlighted. Correlations between malocclusions and abnormalities in body posture, as well as between posture and dentofacial deformities, were investigated. The pathogenesis and treatment of tinnitus in patients with dental disorders are analyzed. Correlation between sleep problems and vestibular manifestations in patients with proven sleep apnea, unsteadiness, dizziness, and vertigo was confirmed. Prevention and examination of patients, professional divers and amateurs are introduced.

In Direction 4: Assoc. prof. Mario Milkov is working in the field of respiratory disorders related to allergic rhinitis and hypertrophy of the palatine tonsils. He has special interests in oral pathology and the usage of novel biomaterials in the oral cavity. Actively participates in detection and research of neoplasms in the oral cavity. Of scientific interest for him are the phoniatic problems in professional singers and dysphagia.

Assoc. Prof. Milkov is a pioneer in the creation of interdisciplinary teams of otorhinolaryngologists, dentists, neurologists, pulmonologists, health care specialists. Proof of this is the main diagnostic and treatment activities and expertise that he gives to his patients.

Assoc. Prof. Milkov has active scientific profiles in Google Scholar, ORCID, ResearchGate.

An IF-reference is also presented.

IV. Evaluation of teaching activity:

From the provided Teaching Experience Certificate, it can be seen that the candidate for the competition has been working at Medical University - Varna since 2008. Over the years, he has successively held the academic positions of "Assistant professor" (2008-2010), "Chief Assistant professor" (2010-2013), "Associate professor" (from 2013 up to the moment). The total teaching experience at the time of submitting the documents for the competition is 13 years and 8 months.

It is clearly seen from the provided Study Load Report for the last four years that Associate Professor Milkov has fully fulfilled the annual norm for teaching activity of 126 academic hours, established by decision of the Academic council of Medical university – Varna (Protocol No. 30/11.04.2011) – for the 2017/2018 academic year – 152 academic hours, for the 2018/2019 academic year – 219 academic hours, for the 2019/2020 academic year – 190 academic hours, for the 2020/2021 academic year – 199 academic hours.

Assoc. prof. Milkov is a respected and experienced university teacher. He participates in the teaching (lectures and exercises) of the mandatory disciplines "Otorhinolaryngology", "Dental Materials Science" for students of the Bulgarian and English language programme, the elective subject "Obstructive sleep apnea and snoring. Diagnosis. Treatment. Prevention". He is an examiner of semester exams in the listed disciplines. It is evident from the attached Doctoral Student Training Reference that Associate Professor Milkov has successfully supervised four doctoral students, and is currently the supervisor of five more:

- Lyudmil Hristov Matev - doctoral student in independent form of study in the doctoral program "Orthopedic Dentistry", field of higher education 7. Health care and sports, professional domain 7.2. Dental Medicine, with a second scientific supervisor - Assoc. prof. Dr. Hristina Ivanova Arnautska, DMD, PhD, at the Department of "Dental Materials Science and Propaedeutics of Prosthetic Dental medicine", Faculty of Dental Medicine, Medical University - Varna. The doctoral student acquired the educational and scientific title "doctor" on 25.02.2022.
- Boris Yankov Borisov – doctoral student in full-time study in the doctoral program "Orthopedic Dentistry", field of higher education 7. Health care and sports, professional domain 7.2. Dental medicine, with a second supervisor - Prof. Dr. Mariana Yordanova Dimova-Gabrovska, DMD, PhD, DSc, at the Department of "Dental Materials Science and Propaedeutics of Prosthetic Dental medicine", Faculty of Dental Medicine, Medical University – Varna. The doctoral student acquired the educational and scientific title "doctor" on 18.04.2022.

- Alexander Metodiev Donchev – doctoral student in part-time study in the doctoral program "Organization and management outside the sphere of material production" (Social activities), enrolled on 05.02.2018 in the Department of "Social Work" of Shumen University "Bishop Konstantin Preslavski", with second supervisor Prof. Georgi Kolev, (leaders from various scientific fields) The doctoral student acquired the educational and scientific title "doctor" on 04.10.2020.
- Stefan Ivanov Mirchev - doctoral student in the doctoral program "Otorhinolaryngology", with second supervisor, Assoc. prof. Dr. Alexander Valkov, MD, PhD. The doctoral student acquired the educational and scientific title "doctor" on 27.11.2017.
- Boris Plamenov Kyosev – doctoral student in full-time study in the doctoral program "Orthopedic Dentistry", field of higher education 7. Health care and sports, professional domain 7.2. Dental medicine, with a second scientific supervisor - Prof. Dr. Metodi Zahariev Abadjiev, DMD, PhD, DSc at the Department "Clinic of Prosthetic Dental Medicine", Faculty of Dental Medicine, Medical University - Varna.
- Stoyanka Hristova Yancheva – full-time doctoral student in the "Health Care Management" doctoral program, field of higher education 7. Health care and sports, professional domain 7.4. Public Health, with a second supervisor - Associate Professor Mariana Nikolova Dimitrova, PhD, at the Department of Health Care, Faculty of Public Health, Medical University – Varna.
- Damyan Tsankov Tsanev – doctoral student in full-time study in the doctoral program "Orthopedic Dentistry", field of higher education 7. Health care and sports, professional domain 7.2. Dental medicine, with a second supervisor - Assoc. prof. Dr. Desislava Atanasova Konstantinova, DMD, PhD, at the Department of "Dental Materials Science and Propaedeutics of Prosthetic Dental medicine", Faculty of Dental Medicine, Medical University - Varna.
- Dimo Krasimirov Nedelchev – full-time doctoral student in the doctoral program "Orthopedic Dentistry", field of higher education 7. Health care and sports, professional domain 7.2. Dental medicine, with a second supervisor - Assoc. prof. Dr. Desislava Atanasova Konstantinova, DMD, PhD, at the Department of "Dental Materials Science and Propaedeutics of Prosthetic Dental medicine", Faculty of Dental Medicine, Medical University - Varna.
- Miroslav Stoykov Stoykov - full-time doctoral student in the "Orthopedic Dentistry" doctoral program, higher education field 7. Health care and sports, professional domain

7.2. Dental medicine, with a second scientific supervisor - Assoc. prof. Dr. Hristina Ivanova Arnautska, DMD, PhD, at the Department of "Dental Materials Science and Propaedeutics of Prosthetic Dental medicine", Faculty of Dental Medicine, Medical University – Varna.

I believe that the data provided to the candidate fully meet the requirements of the recruitment competition for acquiring the academic position "Professor". Assoc. Prof. Milkov has the necessary experience and knowledge for holding it.

V. Evaluation of the medical and diagnostic activity:

The interdisciplinary approach in the healing activity of Assoc. Prof. Mario Milkov is the jewel in the crown in his long-standing practice. The pursuit of improvement and application of new methods of diagnosis and treatment has deepened over the years.

His passion for applying the latest scientific achievements in the areas in which he works in the treatment of patients is highly appreciated by them. His path as a doctor-specialist in otorhinolaryngology passes through various medical units in Bulgaria and abroad. During certain periods of his medical career, he worked with proven world leaders in modern otology, ossicular reconstruction, biomaterials, audiology and vestibulogy, sleep medicine, head and neck surgery.

When creating the first Bulgarian ossicular prosthesis, he not only developed the model and tested the biostability and biotolerability, again in an international team, but also participated in the ossicular reconstructions with this prosthesis. He then made a critical analysis of the patients who have undergone radiofrequency somnoplasty and introduced a mandatory polygraphic or polysomnographic analysis before the final decision for a conservative or surgical approach in these patients. For the first time, he introduced hearing screening for newborns in Varna and performed it himself for two years in maternity homes.

The enthusiasm with which preventive examinations and treatment-diagnostic programs are carried out during World Sleep Day and World Hearing Day, organized by the WHO, are his merit, in which he involved many of his colleagues. The result is beneficial for the patient's health, both in Varna and in hard-to-reach areas of the Varna region, where he

CONCLUSION

The candidate for the competition, Assoc. prof. Dr. Mario Petrov Milkov, MD, PhD fully meets the requirements for occupying the academic position of "Professor", according to the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its implementation at Medical University – Varna. The submitted documentation is complete and meets all the requirements.

The in-depth scientific work, extensive professional experience as a specialist in otorhinolaryngology and personal qualities of the candidate give me reason to confidently give my **POSITIVE** evaluation and to recommend to the respected Scientific Jury the awarding of academic position "Professor" to Assoc. prof. Dr. Mario Petrov Milkov, MD, PhD.

12.07.2022

Varna

Reviewer: 

Prof. Dr. Yavor Petkov Enchev, MD, PhD, DSc
Head of the Department of Neurosurgery and ENT",
Faculty of Medicine, Medical University – Varna

