Until

The chairman of the scientific jury,

determined by Order No. R-109-514/30.11.2023

of the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

55 "Marin Drinov" St

9002 Varna

On your Protocol No. 1 / dated 14.12.2023

Attached I present: **OPINION**

by competition for the academic position "PROFESSOR"

by field of higher education 7. Health care and sports, professional direction 7.1 Medicine and specialty "Diagnostic Imaging" one, 0.5 full-time position for the "Magnetic resonance tomography" department at the department "Diagnostic Imaging and interventional radiology", faculty "Medicine" MU- Varna and 1 full-time position for the "Diagnostic Imaging" Clinic at "Sveta Marina" UMBAL EAD - Varna.

announced in SG No. 83/03.10.2023

Prof. Dr. Nachko Iliev Totsev, d.m. - head of the department "Diagnostic Imaging and radiation therapy" - MU-Pleven

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The review was compiled in accordance with the requirements of Art. 4, para. 2, Art. 29 a, para. 1 of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB) and Art. 6, para. 1, Art. 139, paragraph 1 and paragraph 3 of the Regulations for the Development of the Academic Staff at the Medical University - Varna.

One candidate has submitted documents for participation in the competition: Associate Professor Dr. Radoslav Yosifov Georgiev, PhD, Associate Professor in the scientific specialty "Diagnostic Imaging".

The candidate has submitted all the necessary documents within the deadline, in accordance with the requirements of the LDASRB, the Regulations for its application and the Regulations for academic development at the MU - Varna.

Candidate Career Profile:

Associate Professor Dr. Radoslav Yosifov Georgiev was born on 07/04/1976 in the town of Dobrich. He graduated medicine in 2001 at the Medical University - Sofia.

From 2002-2003 - he was a clinical resident and specialist in diagnostic imaging at the MBAL, Dobrich.

From 2003–2011 - Assistant, Department of Diagnostic Imaging and Radiotherapy, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

In the period 2003-2007, he specialized in diagnostic imaging at the Medical University of Varna.

Since February 2008, he has a recognized specialty in diagnostic imaging.

From 2012 to 2015, he was a doctoral student at the Department of Diagnostic Imaging, Medical University - Varna.

In May 2015, after a successfully defended dissertation on the topic "Magnetic resonance diffusion and perfusion for differentiation and evaluation of primary glial brain tumors", he was awarded the educational and scientific degree "Doctor" in the specialty "Medical Radiology and roentgenology(including use of radioactive isotopes)" from MU-Varna.

From 2011-2016 - Chief Assistant, Department of Diagnostic Imaging, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna.

From December 2016, ch. assistant Dr. Radoslav Georgiev was awarded AP "associated professor" in the scientific specialty "Diagnostic Imaging", department "Diagnostic Imaging, interventional radiology and radiotherapy", Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

From 2020 - to 2023 - Head of the Diagnostic Imaging Clinic at "Sveta Marina" UMBAL EAD, Varna.

Associate Professor Georgiev's additional qualifications include:

2023 – Digital Skills. Creation of a multidisciplinary educational environment for the development of personnel with integral competencies in the field of biomedicine and health care. Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

2022 – Specilization for sharing of good practices and teaching. Creating of a multidisciplinary aducational environment for development of specialists with integral competencics in biomedicine and health care. Turin University, Italy;

2021 – Diagnostic Work-Up of the Liver and Biliary Disorders. PV Masterclass – education and training European Primovist Masterclass. Vienna, June 9-11, 2021;

2019 – Sports Imaging Course. MSIC 2019 Ultrasound Course. DGMSR, Munich, Germany;

2019 – US of the muskulo-skeletal system, hands-on course, MSIC 2019 Ultrasound course, DGMSR, Munich, Germany;

2019 – Breast Imaging. ESOR Visiting Professorship Programme Creece. Heraklion, Greece;

2019 – Paediatric Radiology. ESOR Visiting Professorship Programme Bulgaria. Varna, Bulgaria;

2018 – Pedagogical foundations of academic teaching. Creation of a modern system for the career growth of teachers at the Medical University - Varna;

2015 – 23rd Zurich Course on Diagnostic and Interventional Neuroradiology, Zurich, Switzerland;

2012 - Bayer short course Abdomen MRI, Berlin, Germany;

2009-2011 – European Course in Neuroradiology (ECNR), Tarragona, Spain; Rome, Italy; Antwerp, Belgium;

2009 – Radiology course and seminars. Open medical Institute of the AAF Salzburg WEILL CORNELL;

2009 – Neuroimaging. Semmelweis University MR Research Center, Budapest, Hungary;

2008 – GALEN ESOR Cardiovascular cross sectional imaging. Rome, Italy;

2001 – internship in MRI department of "G. HATZICOSTA" hospital, Ioannina, Greece;

1999 - internship in the MRI department of "HACETTEPE" University Hospital, Ankara, Turkey;

Expert activity:

- President of the 20th Congress of the Bulgarian Association of Radiology (BAR) 2024, Albena;

- Lecturer at the Academy of Molecular Pathology and Personalized Medicine "Brain Tumors" 2023, Varna;

- Participation in the state examination commission for the specialty "Diagnostic Imaging" 2020, 2021, 2022, 2023 at MU-Pleven.

- Expert educational activities in an expert group in a scientific project: Project No. BG05M2OP001-2.016-0025 "Creation of a multi-disciplinary educational environment for the development of personnel with integral competencies in the field of biomedicine and healthcare", under the EP "Science and education for intelligent growth" ".

- Expert in an expert group in a scientific project "Physical breast anthropomorphic models and technology for their production", (PHENOMENO), No. 101008020, under EP "Horizon 2020" to the EC.

- Member of the Scientific Committee of the XIX Congress of the Bulgarian Association of Radiology (BAR) 2022, Plovdiv;

- Reviewer of project No. 22006, 2022 "Clinical manifestations, functional disorders and computed tomography findings in long-term COVID-19", headed by Assoc. Dr. Darina Nikolova Miteva-Mihailova, funded by the "Science" fund at the Medical University - Varna.

- National delegate of the Bulgarian Association of Radiology (BAR) in the ESR Quality, Safety and Standards Committee (QSSC). ECR 2020, Vienna, Austria;

- National delegate of the Bulgarian Association of Radiology (BAR) in the ESR Quality, Safety and Standards Committee (QSSC). ECR 2019, Vienna, Austria;

- Member of the organizing committee of Balkan MR - 5th Magnetic Resonance Balkan Outreach Program 2019, Sofia;

- Chairman of the local committee of the XVIII Congress of the Bulgarian Association of Radiology (BAR) 2019, Varna;

- Lecturer in the 2019 International course MRI and US examination of the musculoskeletal system, Pravets;

- Lecturer at the First Summer School on Stroke 2019, MU Varna, Varna;

- Member of the scientific jury for the awarding of the ONS "Doctor" at the University of Varna (2019), candidate Dr. Emilian Kalchev.

- Member of the scientific jury in the competition for the academic position "Associated professor" in the Medical University of Varna (2018), candidate Dr. Chavdar Hristov Bachvarov, MD;

- Member of the scientific jury in the competition for the academic position "Professor" for the University of Varna (2018), candidate Assoc.prof. Dr. Elitsa Encheva-Mitsova, MD;

- Case expert from judicial practice:

Forensic medical examination according to the civil case 1609/2019, GO-I-20 composition of the SCC. Appointed expert by the Ministry of Health.

Administrative case No. 780/2018 of the Administrative Court of Dobrich.

DP No. 251-3M-177/2016 according to the inventory of the Office of the Ministry of Internal Affairs, Burgas. Five-member forensic examination.

- Member of the Scientific Committee of the XVII Congress of the Bulgarian Association of Radiology (BAR) 2017, Plovdiv;

- Reviewer of the Bulgarian edition of Torsten Möller, Emil Reif. Taschenatlas Einstelltechnik: Röntgendiagnostik, Angiographie, CT, MRT. Stuttgart, Georg Thieme Verlag, 2004. 334 pp. : Torsten Möller, Emil Reif. Pocket atlas-working techniques: X-ray diagnostics, angiography, computed tomography, magnetic resonance tomography. Varna, STENO-Varna, 2006, edited. of Prof. Dr. Boyan Balev, MD, Dr. Dilyana Baleva.

Assoc.Prof. Georgiev is a member of the following organizations:

Bulgarian Association of Radiology (BAR) since 2003;

European Society of Radiology (ESR) since 2007;

European Society of Neuroradiology (ESNR) since 2011.

From 2020 until now Associate Professor Georgiev is a member of the State Examination Commission for the acquisition of a specialty in Diagnostic Imaging at MU-Pleven.

He is fluent in written and spoken Russian, English and German.

Evaluation of the candidate's scientific works and publications submitted for participation in the competition:

Assoc. Dr. Radoslav Yosifov Georgiev, PhD presents a total of **143** scientific papers, of which **91** are related to the awarding of the academic position "Associate Professor" and **53** published afterwards, including:

- Full text articles – 44

- Published reports from scientific forums at home and abroad - 2

- Published summaries of reports from scientific forums at home and abroad - 7

The scientific output of Assoc.Prof. Georgiev, covering the minimum scientometric requirements for occupying the academic position "professor", is as follows:

1. Indicator A1: Dissertation work for obtaining the educational and scientific degree "doctor" - 1

2. Indicator C4: Scientific publications referenced and indexed in world-renowned databases with scientific information - 11

3. Indicator D7: Publications in scientific publications, referenced and indexed in world-famous databases with scientific information - 3

4. Indicator D8: Publications in non-refereed peer-reviewed journals or published in edited collective volumes – 29

5. Indicator E10: Citations or reviews in scientific publications, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes - 7

	Independent author	First author	Second author	Third and more author	Total
Indicator C4 Publications in publications referenced in world-renowned databases of scientific information, equivalent to a habilitation thesis	–	1	3	7	11
Indicator D7 Publications and reports in scientific publications, referenced and indexed in world-renowned databases with scientific information	2	–	–	1	3
Indicator D8 Publications and reports in non-refereed peer-reviewed journals or edited collective volumes	–	3	15	11	29
Additional publications beyond the minimum scientometric requirements	–	–	7	3	10

Table 1. Distribution of author positions in scientific works

The scientific works presented, equivalent to a habilitation thesis, show a variety of scientific interests, primarily related to neuroradiology and the establishment of magnetic resonance imaging as a basic method in neuro-oncology. Gliomas are mainly presented, with an emphasis on magnetic resonance imaging with intravenous contrast, diffusion, non-contrast perfusion with arterial spin labeling (ASL) for differentiation, grading, assessment of therapeutic response, as well as the relationship of tumor genetic markers with specific image characteristics. Magnetic resonance diffusion (DWI) and perfusion (PWI) are able to differentiate gliomas from other lesions - strokes, lymphoma, metastases, to assess the grade of gliomas, to detect the early transformation of low-grade to high-grade gliomas, before the presence of post-contrast enhancement, to assess tumor spread, tumor progression, to indicate the ideal site for biopsy and to assess therapeutic response. According to the new WHO classification, the genetic profile of the tumor plays a major role in the etiology, pathogenesis, evolution and therapeutic response of CNS tumors!

Of interest is the author's work on artificial intelligence and its application in diagnostic imaging, specifically for the evaluation of lumbar stenosis. The advent of radiomics and artificial intelligence marks new horizons independent of the human eye alone. The comparison of the results between the work of the radiologist with and without the help of artificial intelligence is important in view of the impartial and fair evaluation of the diagnostic activity and its improvement for the benefit of the patient.

The presented scientific works and the results of the research work of Assoc. Dr. Radoslav Yosifov Georgiev, d.m. are distinguished in the following scientific directions:

I. Neuroradiology

II. Head and neck imaging

III. Gastroenterology

IV. Musculoskeletal imaging

Main scientific contributions in areas:

I. Neuroradiology

1. Theoretical contributions:

1.1 The author is interested in the new WHO classification of brain tumors, the genetic and pathological structure of gliomas and their possible relationship with magnetic resonance imaging characteristics (C_4-5). The author draws attention

to the most aggressive representative of diffuse gliomas - glioblastoma, which according to the guidelines of the World Health Organization (WHO) from 2021 is isocitrate dehydrogenase (IDH) wild type without change in histone 3, has glomeruloid vascular proliferation, tumor necrosis, telomerase reverse transcriptase (TERT) promoter mutation, epidermal growth factor receptor (EGFR) gene amplification, or +7/-10 chromosomal copy number changes, and describes the very rapid growth and dismal prognosis in these patients (C_4- 6). The author investigated the role in gliomagenesis of the Diaph3 gene, which encodes a protein that stabilizes the cytoskeleton, and based on its different expression can be used to differentiate normal brain parenchyma, reactive gliosis and tumor proliferation, as well as to predict response to some chemotherapeutics (C_4- 7). The author also points out the difficult differential diagnosis between pleomorphic xanthoastrocytoma and giant cell glioblastoma due to the significant overlap of histological, immunohistochemical criteria and imaging features, but with a very different prognosis, much more favorable in astrocytoma(9). The author reports a case of extracranial cervical metastasis in a patient with glioblastoma, addressing the role of the glymphatic system as a potential pathway for tumor dissemination (C_4-10).

1.2 The author describes a rare localization of DNET (dysembryoplastic neuroepithelial tumor) – a complex variant in the cerebellum with atypical clinical and radiological signs such as gait instability, strabismus and a cystic-solid structure with contrast enhancement (C_4-8).

1.3 The author examines and discusses the moderate radiosensitivity of brain PNET (primitive neuro-ectodermal tumor) and the possibilities of overcoming it by hyperfractionated craniospinal radiotherapy in combination with chemotherapy and subsequent bone marrow transplantation of peripheral stem cells (C_4-2).

1.4 The author uses software techniques for volumetric assessment of brain parenchyma. Through segmentation methods and analysis of quantitative deviations in brain volume in patients with multiple sclerosis, a real picture of brain atrophy and assessment of neurodegenerative disorders can be achieved (C_4-1).

II. Head and neck imaging

1. Theoretical contributions:

1.1 The author reports an interesting case of the so-called "empty nose" syndrome, described as a paradoxical sensation of nasal obstruction in the

presence of actually dilated nasal airways, resulting from the dissociation of the efferent neuronal signal accompanying changes in the nasal mucosa (C_4-4).

III. Gastroenterology

1. Theoretical contributions:

1.1 The author shows the role of magnetic resonance cholangio-pancreatography in the diagnosis of liver abscesses and the proof of a possible connection between the abscesses and the biliary tree, detection of important concomitant pathology such as strictures, gallstones, tumors and secondary hepatic lesions (C_4-3).

IV. Musculoskeletal imaging

1. Theoretical contributions:

1.1 The author participated in a country-unique study of the role of artificial intelligence in diagnostic imaging, investigating the level of correspondence between the magnetic resonance readings of the lumbar spine, created by a deep learning neural network (CoLumbo) and the readings of radiologists (C_4 -11). This prospective study shows that radiologists' assessment supported by an artificial intelligence system for the classification of central stenosis results in high kappa agreement (C_4-11). The implementation of such AI-based tools in practice would accurately predict the presence of stenosis and thus reduce observer variability in assessing the severity of lumbar spinal stenosis based on MRI and its relationship with the cross-sectional area of the spinal canal . This would lead to timely and effective surgical treatment and improved quality of life for these patients.

2. Methodological contributions:

2.1 The author examined 382 patients in three different centers who underwent magnetic resonance imaging of the lumbar spine for the presence of central stenosis at all lumbar levels. It takes an interesting comparative approach to the performance of artificial intelligence, comparing the accuracy of the lumbar stenosis measurements of a radiologist using the software with the accuracy of a radiologist not using the software and the accuracy of the artificial intelligence (AI) algorithm itself. The study showed that the radiologist using the CoLumbo software achieved the best results. Algorithm scores were lower but still better than radiologists who did not use the software in any published study (C_4-11).

3. Applied clinical-diagnostic contributions:

3.1 COLUMBO software supports some of the most common spine pathologies: disc herniation, general disc bulging, stenosis, spondylolisthesis, hypo- and hyperlordosis. It is an auxiliary type of software whose main task is to detect pathology through the artificial intelligence integrated into it. CoLumbo evaluates this pathology and draws the radiologist's attention to them, marks the relevant tissues and measurements with different colors in the images and gives an automated report. Magnetic resonance imaging is the diagnostic gold standard for assessing the degree of lumbar spinal stenosis and its classification. However, relying on MRI is time-consuming, expensive, and error-prone. In this regard, the use of software applications, such as CoLumbo, would lead to a reduction in the time required for MRI reading, without reducing the accuracy of the final report for some pathologies and improving it for others. This prospective study consistently demonstrated the performance evaluation of the software showing very good sensitivity, specificity, positive and negative predictive values (C_4-11).

Assoc. Prof. Dr. Radoslav Yosifov Georgiev, PhD, participated in 2 national scientific projects as an expert.

Comprehensive evaluation of the teaching-methodical and teaching activities:

Assoc. Dr. Radoslav Georgiev, MD teaches medical students in Bulgarian and English. A study load report for the last 4 years is presented, with the hours covering the statutory 100 h annual study load.

Assoc.Prof. Georgiev is the head of a total of 7 specialists, 5 of whom already have a certificate for a recognized specialty in diagnostic imaging.

Assoc.Prof. Georgiev is the supervisor of two successfully defended doctoral students.

Fulfillment of the requirements for hiring JSC "Professor":

Assoc.Prof Dr. Radoslav Yosifov Georgiev, MD,PhD. has met and even exceeded the requirements for all groups of scientometric indicators, for

occupying the academic position of "professor" at the MU - Varna. The relevant evidentiary material has been presented.

Main critical remarks and recommendations:

I have no substantive critical remarks on the documents presented in the procedure by Assoc.Prof. Dr. Radoslav Yosifov Georgiev, MD.

Conclusion:

Assoc.Prof. Dr. Radoslav Yosifov Georgiev, PhD, is an established specialist and name in the radiology community in our country. The documents, publications, citations and evidentiary material presented in the competition convincingly show that **Assoc. Dr. Radoslav Georgiev meets the requirements for quantitative and qualitative indicators for scientific and teaching activity for occupying the academic position of "Professor", in accordance with the requirements of LDASRB, the Regulations for application of LDASRB, as well as the Regulations for academic development in the MU - Varna.**

Based on the above arguments and evidence, I give my positive vote and warmly recommend the respected members of the Scientific Jury to award **Assoc.Prof. Dr. Radoslav Yosifov Georgiev, MD, the academic position "Professor"** in the field of higher education 7. "Health and Sports", professional direction 7.1. Medicine and specialty "Diagnostic Imaging" one, 0.5 full-time position for the "Magnetic resonance imaging" department at the "Diagnostic Imaging and interventional radiology" department, Faculty of Medicine of the Medical University of Varna, and 1 full-time position for the "Diagnostic Imaging" clinic at UMBAL "Sveta Marina" EAD - Varna.

12.02.2024 Prepared the opinion:

Pleven (Prof. Dr. Nachko Totsev, MD)