# STANOVISHE

By Assoc. Dr. Chavdar Hristov Bachvarov MD, interventional radiologist at the Imaging Diagnostics Clinic of "Sveta Marina" UMBAL, city of Varna, determined by Order No. R-109-514/30.11.2023 of the Rector of the Medical "Dr. Paraskev Stoyanov" University - Varna, for an internal member of the jury in the procedure for acquiring the academic position "Professor" in the specialty "Imaging diagnostics" in the field of higher education 7. "Healthcare and sports" in the professional direction 7.1. "Medicine " and scientific specialty "Medical radiology and radiology (incl. use of radioactive isotopes)" at the Department of Imaging, Interventional Radiology and Radiotherapy of the Faculty of Medicine of the Medical University "Dr. Paraskev Stoyanov" - Varna.

**Biographical data**

Radoslav Yosifov Georgiev was born on April 7, 1976 in the city of Dobrich.

He completed his secondary education in 1995 at the Geo Milev English Language School in Dobrich. In the period 1995-2001, he received his higher education at the Medical University - Sofia as a doctor with a diploma MUS series No. 011342 from 2001.

From 2003 to 2007, he specialized in imaging diagnostics at the Medical University of Varna.

In 2008, he obtained a specialty in imaging diagnostics - Certificate series МУВ № 2553, reg. № / 18.02.2008. From 2012 to 2015 he was a doctoral student at the Department of Imaging Diagnostics, MU - Varna, and in 2015 - Acquisition of the ONS "Doctor" in the scientific specialty "Image diagnostics", Diploma No. 121 of 18.12.2015 of the University of Varna.

From 2011-2016 Associate Professor Dr. R.Georgiev, Ph.D. is the chief assistant at the Imaging Diagnostics Department, Medical University "Prof. Dr. Paraskev Stoyanov" - Varna. Since December 2016, I have been awarded the academic position of "Docent" in the scientific specialty "Imaging diagnostics", Department of "Imaging diagnostics, interventional radiology and radiation therapy", Medical University "Prof. Dr. Paraskev Stoyanov" - Varna

From 2020 to 2023, he is the Head of the Imaging Diagnostics Clinic at "Sveta Marina" UMBAL EAD, Varna.

Prof. R. Georgiev participated in numerous educational courses in Austria, Germany, Spain, Italy, Belgium, Greece, Turkey, Hungary and Switzerland, as well as undergoing specialization in magnetic resonance imaging at Hacettepe University in Ankara and the University Hospital in Ioannina. He is a member of the Bulgarian Association of Radiology, the European Society of Radiology, and the European Society of Neuroradiology. Assoc. R. Georgiev has been elected Chairman of the upcoming XX Congress of the Bulgarian Association of Radiology. He is fluent in

written and spoken English, German and Russian.

**Expert activity:**

Assoc. Dr. R. Georgiev, d.m. participated in many national and international events.
He was elected Chairman of the 20th Congress of the Bulgarian Association of Radiology (BAR) 2024, Albena;
- Participated in the scientific committee of the XVII and XIX congresses of the Bulgarian Association of Radiology (BAR) 2022, Plovdiv;
He is a lecturer at the Academy of Molecular Pathology and Personalized Medicine "Brain Tumors" 2023, Varna;
- Lecturer at the First Summer School on Stroke 2019, MU Varna, Varna;
Participates as an expert in 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 health care", under the OP "Science and education for intelligent growth" and in the scientific project "Physical breast anthropomorphic models and technology for their production", (PHENOMENO), No. 101008020, under the OP "Horizon 2020" to the EC.
Elected as a national delegate of the Bulgarian Association of Radiology (BAR) in the ESR Quality, Safety and Standards Committee (QSSC). ECR 2019 and 2020, Vienna, Austria;
Member of the organizing committee of the Balkan MR - 5th Magnetic Resonance Balkan Outreach Program 2019, Sofia;
Lecturer in the 2019 International course MRI and US examination of the musculoskeletal system, Pravets;
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.
- 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.

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

Assoc. Dr. R. Georgiev, Ph.D presents a total of 143 scientific papers, of which 91 related to the awarding of the academic position "Docent" 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 production of Assoc. Dr. R. Georgiev, Ph.D which covers the minimum scientometric requirements for occupying the academic position "professor" is as follows:

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

Indicator C4: Scientific publications, referenced and indexed in world-famous databases with scientific information – 11, with one article being the first author, 3 second and 7 third or subsequent.

Indicator D7: Publications in scientific publications, referenced and indexed in world-renowned databases with scientific information – 3, of which he is an independent author in two and a third or next.

Indicator D8: Publications in non-refereed peer-reviewed journals or published in edited collective volumes - 29, of which 3 are first author, 15 second and 11 third or subsequent.

In addition to the cited articles, Assoc. Dr. R. Georgiev, Ph.D has participated in 10 other articles in which he is the second or third author.

Indicator D10: Citations or reviews in scientific publications, referenced and indexed in world-renowned databases of scientific information or in monographs and collective volumes - 7

The scientific works presented are equivalent to habilitation work and show diverse scientific interests related to neuroradiology and the establishment of magnetic resonance imaging as a basic method in neuro-oncology.

Brain gliomas are of main interest with an assessment of the degree of therapeutic response, as well as the relationship of tumor genetic markers with specific imaging characteristics. The author emphasizes certain magnetic resonance sequences - diffusion (DWI) and perfusion (PWI) as basic magnetic resonance imaging techniques that can differentiate gliomas from other lesions - ischemic incidents, hematological diseases, metastases, etc. The author's effort is related to determining the grade of gliomas, detection of transformational changes from low to high grade before the presence of postcontrast enhancement, to evaluate tumor spread, progression, to determine a possible position for biopsy and evaluation of therapeutic response.

Assoc. Dr. R. Georgiev, Ph.D. works actively on the topic of artificial intelligence and its application in imaging diagnostics and specifically for the assessment of lumbar stenosis.

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:

1. Neuroradiology.
2. Tumors of the head and neck.
3. Oncology and neuro-oncology.
4. Gastroenterology.
5. Cardiology.
6. Musculoskeletal radiology

On the basis of the mentioned scientific works and results of the scientific research work, the following contributions can be made:

**Neuroradiology:**

1.1 The author describes the role of magnetic resonance imaging in the evaluation of the tumor after radiotherapy, including the side and unwanted effects (D_8-8, D_8-28).

1.2 The author draws attention to the role of contrast-enhanced magnetic resonance imaging of the head and neck in the detection of leptomeningeal metastases (Д_8-17, Д_8-20, DOP-4, Д_8-27), as well as a possible connection to metastasis by lymphatic route through the newly discovered glial lymphatic pathways, the so-called glymphatic system (D_8-18).

1.3 In a series of publications, the author investigated gliomagenesis, imaging characteristics and structure of gliomas, as well as 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 (B_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 (B_4-9, DOP-9).

1.4 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 (B_4-8).

1.5 The author describes the role of MRI in the differential diagnosis of demyelinating diseases – multiple sclerosis, transverse myelitis, Lyme disease with other pathology, monitoring the effect of treatment and the presence of activity (D_8-3).

1.6 The author shares his experience with non-contrast ASL (arterial spin labeling) magnetic resonance perfusion for the assessment of arterio-venous malformations, often undetectable on conventional images, even post-contrast ones (D_8-8, D_8-10). There are also scientific publications related to the assessment in this way of asymptomatic cerebrovascular disorders and microangiopathy (D_8-11).

1.7 The author contributes new cases of relatively rare and newly discovered diseases - such as CLIPPERS syndrome, rather a diagnosis of exclusion, but sometimes with very characteristic magnetic resonance imaging features, which, in combination with clinic, follow-up and histology, can recognize the disease and to contribute to the understanding of its etiology, pathogenesis and prognosis (D_7-3).

1.8 The author examines the magnetic resonance findings in patients with dementias - Alzheimer's disease, etc., emphasizing the physiological assessment through non-contrast ASL (arterial spin labeling) perfusion to detect early hemodynamic disorders, and not only the morphological assessment of brain atrophy.

Head and neck tumors:

The author points to magnetic resonance imaging as the method of choice for the detection and staging of nasopharyngeal carcinoma because of its exceptional soft-tissue resolution, sensitivity to perineural and intracranial spread, and assessment of bone marrow for possible infiltration (D_8-6, D_8-5). The author presents a case of advanced achromatic sinonasal melanoma, with an excellent outcome after combined treatment, without complications of the type of radiation-induced optic nerve demyelinating syndrome, thanks to the high radiosensitivity of this tumor variant (DOP-1).

**Oncology:**

In a series of publications, the author examines locally advanced chordomas in the lumbosacral and paravertebral regions, highlighting the role of magnetic resonance imaging, pathohistological and immunohistochemical analysis for accurate diagnosis, the radioresistance of this tumor and the prognosis closely related to the histological variant - poor in the rhabdoid and anaplastic variants. Good results are achieved with early diagnosis and with combined therapy - maximum radical surgery and postoperative combined photon and proton radiation therapy (DOP-2, Д_8-22). Assoc. Dr. R.Georgiev, Ph.D. describes a case of giant cell tumor of the sacrum, a borderline benign but locally aggressive tumor in which radiotherapy is not routinely used because of the increased risk of secondary neoplasms in young people, as well as the risk of cellular transformation to sarcoma, but appropriate for incomplete resection and relapse (D_8-21).

Gastroenterology:

The author pays attention to the diagnosis and follow-up in patients with Crohn's disease, pointing out the importance of low-dose CT enterography in the conditions of the dual-energy mode and magnetic resonance diffusion, perfusion with dynamic contrast to evaluate inflammatory changes in the intestinal wall and mesentery (B_8-13 , DOP-10). 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

accompanying pathology such as strictures, gallstones, tumors and secondary hepatic lesions (B_4-3).

**Musculoskeletal radiology:**

In this group, Associate Professor R. Georgiev, Ph.D. presents theoretical, methodological and applied clinical-diagnostic contributions.

1. Theoretical contributions:

1.1 The author participated in a country-unique study of the role of artificial intelligence in diagnostic imaging, examining the level of correspondence between magnetic resonance readings of the lumbar spine, created by a deep learning neural network (CoLumbo) and radiologists' readings. This prospective study shows that radiologists' assessment supported by an artificial intelligence system for the classification of central stenosis results in high kappa agreement (B_4-11). The introduction into practice of such AI-based tools 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 to 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.

1.2 The author discusses spondyloarthropathies - a heterogeneous group of immune-mediated inflammatory arthritis affecting the spine, sacro-iliac joints and peripheral joints, touching on the key role of MRI in the detection of sacroiliitis in the early stages of the disease, much earlier than X-ray examination ( D_8-25).

1.3 The author describes the features of the magnetic resonance image of the child's knee, considering anatomical variants, variants of red bone marrow distribution, additional centers of ossification, irregular ossification, etc. conditions that can mimic pathology (B_8-26).

1.4 The author examines bony hemangiomas, specifically in the long tubular bones and tibia, discusses the differential diagnosis and imaging features, as well as the role of radiation therapy in inoperable cases (D_8-9).

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. The author takes an interesting comparative approach to the performance of artificial intelligence, comparing the accuracy of measurements for lumbar stenosis 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 (B_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 to read an MRI, 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 (B_4-11).

**Teaching and learning activity:**

Prof. Radoslav Georgiev has more than 20 years of teaching experience in the field of diagnostic imaging. The range of disciplines and specialties taught is wide: imaging diagnostics of the III, IV course of medicine in Bulgarian and English; X-ray laboratory technician specialty; specialty rehabilitator; specialty kinesitherapist; specialty nurse; specialty of midwifery, as well as specialists in imaging diagnostics at MU-Varna.

His study load in the last two academic years exceeds 100 study hours. Associate Professor Georgiev supervised two doctoral students who successfully defended theses for the acquisition of the educational and scientific degree "doctor" (certificate 109-862 dated 24.10.2023). From the date of acquiring a 5-year internship in the specialty of Imaging diagnostics, associate professor Georgiev has supervised seven doctors specializing in Imaging diagnostics.

**Critical Notes:**

I have none of these.

**Conclusion:**

Assoc. Dr. Radoslav Yosifov Georgiev, MD is an established teacher, researcher and specialist 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 scientific and teaching activity for the occupation of the academic position "Professor", in accordance with the requirements of ZRASRB, the Regulations for Application of

ZRASRB, as well and the Regulations for Academic Development at the MU - Varna.
Based on the above-mentioned facts, I give my positive vote and recommend the respected members of the Scientific Jury to award Assoc. Dr. Radoslav Yosifov Georgiev, MD. the academic position "Professor" in the field of higher education 7. "Health and sport", professional direction 7.1. Medicine and specialty "Imaging diagnostics" one, 0.5 full-time position for the Department of "Magnetic resonance imaging" at the department "Imaging diagnostics and interventional radiology", faculty "Medicine" of the Medical University of Varna and 1 full-time position for the "Imaging diagnostics" clinic at UMBAL "Sveta Marina" EAD - Varna.

Заличено на основание чл. 5, §1, б. „В“ от Регламент (ЕС) 2016/679

16.02.2024 Signature:

Varna / Assoc. Ph.D. Ch. Bachvarov, d.m./