REVIEW

by Prof. Dr. Irena Dimitrova Kostadinova, DMScClinic of Nuclear Medicine,University Hospital "Acibadem City Clinic – Mladost";
Member of the Scientific Jury for the competition for the academic position of *Associate Professor* in the scientific specialty "Nuclear Medicine" within Higher Education Area 7. "Healthcare and Sports", Professional Field 7.1. "Medicine", for the purposes of the Department of "Nuclear Medicine, Metabolic Therapy and Radiotherapy", Medical University – Varna, announced in State Gazette No. 30/08.04.2025

Subject:
Evaluation of the application submitted by the sole candidate Chief Assistant Professor Dr. Marina Ivanova Dyankova, PhD,
from the Department of "Nuclear Medicine, Metabolic Therapy and Radiotherapy", Medical University – Varna.

Professional Development

Dr. Dyankova was born in 1985 in Odessa, Ukraine. She graduated with distinction in Medicine from Odessa State Medical University, Ukraine, in 2008. Between 2008 and 2010, she completed a residency in Family Medicine at the same university. In 2010, she obtained a specialty in General Practice and Family Medicine, and in 2013, her diplomas were officially recognized in Bulgaria.

Since 2015, Dr. Dyankova has held successive positions as a resident physician at the Clinic of Nuclear Medicine and Metabolic Therapy at University Hospital "St. Marina" – Varna. She has also served as a part-time and later full-time assistant at the Department of Diagnostic Imaging, Interventional Radiology and Radiotherapy. In 2019, she enrolled in a doctoral program and successfully defended her PhD thesis in 2022, titled *"68Ga-PSMA PET/CT in Prostate Cancer: Advantages and Potential Diagnostic Pitfalls"*, obtaining the educational and scientific degree "Doctor" (PhD). Since June 2023, she has held the position of Chief Assistant Professor at the Department of Diagnostic Imaging, Interventional Radiology and Radiotherapy at the Medical University of Varna.

Dr. Dyankova continuously advances her professional qualifications by actively participating in numerous scientific events both in Bulgaria and abroad. These include continuing education courses organized by the IAEA and EANM in Latvia and Bulgaria, as well as annual European congresses such as EANM, ESOR, ESHI, and the Bulgarian Association of Radiology (BAR), along with the international WARMTH symposium in Finland. She has also taken part in seminars of the European School of Nuclear Medicine organized by EANM and ESMIT, as well as annual online courses for medical professionals organized by SNMMI, EFRS, and CHILI.

She is a member of WiN Bulgaria – the "Women in Nuclear – Bulgaria" Association, the European Society for Hybrid, Molecular and Translational Imaging (ESHI), the European School of Radiology (ESOR), the Bulgarian Society of Nuclear Medicine, the Bulgarian Association of Radiology (BAR), and the European Association of Nuclear Medicine (EANM).

She is fluent in Russian, Ukrainian, and English.

Research Activity

In the current competition for the academic position of *Associate Professor*, Dr. Dyankova presents a total of 37 scientific works, including 15 full-text publications in Bulgarian and international peer-reviewed journals (11 of which are indexed in refereed databases), and 22 conference abstracts. Notably, 27 of these works have been published after the defense of her doctoral dissertation, demonstrating sustained research activity.

Due to her high level of engagement in international scientific forums—particularly in the European Congresses of Nuclear Medicine, where submitted works undergo anonymous peer review—Dr. Dyankova has achieved an exceptionally high cumulative Impact Factor (IF) of 369.979. This not only reflects the scientific value and relevance of her research contributions but also highlights the increased prestige and international recognition of Bulgarian nuclear medicine within the European scientific community.

Her work has received a total of 5 citations from both Bulgarian and foreign authors. In terms of scientometric indicators, Dr. Dyankova has accumulated 65 points, exceeding the minimum requirement of 50 points as set by the Medical University of Varna, thus fully meeting the academic criteria.

Dr. Dyankova's primary research interests lie in the field of nuclear urology, with a particular focus on prostate cancer, as well as multiple myeloma, malignant melanoma, ovarian carcinoma, and several rare diseases, such as Langerhans cell histiocytosis.

The author has formulated the main scientific contributions with great precision and clarity, the most significant of which are as follows:

I. In the Field of **Nuclear Urology Related to Prostate Cancer (PC)**

The author's scientific contributions in this domain are reflected in the following key findings from her research:

1. For the first time in Bulgaria, a comprehensive and in-depth study has been conducted on the application of the novel hybrid imaging modality 68Ga-PSMA PET/CT in a large cohort of 386 patients with prostate cancer. The substantial sample size enhances the scientific credibility and validity of the findings. The following aspects were investigated:
    - Restaging of patients, with identification of prognostic factors influencing positivity, detection rates, and the advantages of 68Ga-PSMA PET/CT over conventional CT imaging. Particular emphasis was placed on low PSA levels, including cases with PSA < 0.2 ng/mL.
    - Initial regional nodal and distant metastatic staging in patients with primary prostate cancer at intermediate and high risk, prior to radical treatment.
    - Imaging characteristics in patients with large tumor volume and ISUP grade 5.
    - Assessment of key diagnostic performance parameters, including detection rate, sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and overall accuracy of the method.
2. A study of clinical significance examined the correlation between pathologic 68Ga-PSMA PET/CT findings and clinical parameters such as PSA levels, Gleason score (GS), ISUP grade, and T-stage in patients with:
    - Biochemical recurrence after radical prostatectomy,
    - Biochemical progression following radical prostatectomy,
    - As well as in primary staging.

3. For the first time, a reliable comparative analysis has been performed between 68Ga-PSMA PET/CT and conventional imaging modalities, aiming to define an optimal diagnostic algorithm for the management of patients with prostate cancer.

The author's work also offers clinico-methodological contributions, grounded in her research on a large patient cohort. Based on her findings, she formulates highly professional and evidence-based recommendations, including:

1. 68Ga-PSMA PET/CT is clinically justified in patients with biochemical progression following radical prostatectomy, even in cases with low PSA levels, where conventional imaging may be limited.
2. Due to its superior diagnostic performance compared to conventional imaging modalities such as CT and bone scintigraphy, 68Ga-PSMA PET/CT is recommended for initial staging in patients with high-risk prostate cancer.
3. In patients with ISUP grade 5 tumors and absent PSMA expression, it is advisable to consider additional imaging studies, such as 18F-FDG PET or 68Ga-DOTA PET, for accurate staging or restaging.
4. Patients who show positive 68Ga-PSMA PET/CT results, have undergone radical prostatectomy, and have undetectable or very low PSA levels, are generally at low risk for further disease progression. In such cases, the findings should be carefully evaluated by a multidisciplinary team to guide clinical decision-making.
5. 68Ga-PSMA PET/CT is recommended as a monitoring tool for assessing the response to androgen deprivation therapy (ADT) in hormone-sensitive prostate cancer, where it has demonstrated the ability to reveal heterogeneous responses across different metastatic sites.
6. The method can effectively support the personalization of salvage radiotherapy planning, given its high sensitivity in detecting both local recurrences and distant metastases.
7. Of significant practical value for all nuclear medicine specialists in the country is the in-depth analysis conducted by the author of potential diagnostic pitfalls—including false-positive and false-negative findings—as well as the incidental detection of metachronous tumors on 68Ga-PSMA PET/CT. This analysis is essential for ensuring accurate interpretation and accurate assessment of the disease in clinical practice.

In the Field of Nuclear Oncology Beyond Prostate Cancer

The author's research contributions in broader oncologic applications of nuclear medicine are evidenced by the following key findings:

1. The significant role of ^{18}F-FDG PET/CT in the early detection of operable secondary lesions in cases of first regional recurrence of malignant melanoma (MM) has been investigated and substantiated. The method proved to be more accurate than conventional imaging in the follow-up of high-risk patients. Due to its high sensitivity, including in detecting subclinical metastases, the imaging enables more precise definition and, where necessary, modification of the therapeutic strategy.
2. Quantitative parameters of ^{18}F-FDG PET/CT have been investigated in patients with multiple myeloma during initial staging and restaging, demonstrating both prognostic and predictive value. In cases of suspected unknown primary tumor suggestive of multiple myeloma, the method can not only aid in its localization and staging but also guide the optimal site for biopsy.
   The high diagnostic capacity of whole-body hybrid imaging allowed detection of the

primary tumor site in 57.6% of patients, with a specificity of 64.3% and positive predictive value (PPV) of 79.2%, supporting its use as a first-line diagnostic tool in cases of cancer of unknown primary (CUP).
Moreover, the method has prognostic significance regarding overall survival, based on both a visual scale and semi-quantitative metabolic parameters. Patients with osteolytic lesions scored as 5 (5-PS) had shorter overall survival compared to those with scores of 3 or 4, while patients with lower SUVmax values demonstrated longer survival.

3. The role of ^{18}F-FDG PET/CT as a screening tool for the detection of metachronous and synchronous primary tumors in patients with head and neck carcinomas has been demonstrated, showing a sensitivity of 88.8%, a negative predictive value (NPV) of 100%, and an overall accuracy of 99%.

Clinico-Methodological Contributions
The author's research also includes several clinically valuable and methodologically innovative contributions:

1. For the first time, she has proposed the implementation of IMPeTUs criteria for the standardization of 18F-FDG PET/CT interpretation in patients with multiple myeloma. Based on the Deauville scale, these criteria not only facilitate uniform reporting but also possess prognostic value.
2. In cases of multiple myeloma, she strongly recommends the use of total body imaging to enable detection of occult osteolytic metastases associated with a high risk of fracture. Her findings reveal no correlation between clinical stage, laboratory values, and SUVmax in patients with pathologic fractures, highlighting the added diagnostic value of PET/CT.
3. Of considerable practical significance is her recommendation for dual-time-point PET/CT imaging to accurately assess therapeutic response after radiotherapy, particularly in patients with head and neck tumors. This approach helps detect delayed complete responses and avoid unnecessary or premature treatments.
4. Through a series of additional studies, Dr. Dyankova has demonstrated broad and in-depth scientific interest across a range of rare and complex clinical cases, including:
    - Langerhans cell histiocytosis,
    - Malignant peripheral nerve sheath tumors (MPNST),
    - Pancreatic neuroendocrine tumors (NET),
    - Leptomeningeal metastases,

    among others. These cases not only reflect her comprehensive knowledge of general medicine but also provide valuable insights for daily nuclear medicine practice.

In conclusion, Dr. Dyankova is a young and highly motivated professional who continuously advances her development as both a scientist and educator. Her research, organizational capabilities, and the respect she commands among colleagues—not only within the Clinic of Nuclear Medicine but also across other specialties—are evidenced by her election to the Academic Council of the Medical University of Varna. She demonstrates strong teamwork skills and actively shares her knowledge and practical experience with junior colleagues, contributing meaningfully to the academic and clinical community.

Teaching and Educational Activities

The submitted documentation clearly shows that Dr. Dyankova possesses over 9 years of teaching experience, exceeding the minimum requirement of 5 years set by the Regulations of the Medical University of Varna. She conducts practical sessions in Bulgarian and English for fourth-year medical students, as well as for radiography students from the Medical College – Varna, and actively participates in their examination boards.

The candidate maintains an annual teaching workload exceeding 100 hours, thereby fully complying with institutional requirements. Additionally, she plays an active role in the instruction of the National Basic Training Course for Nuclear Medicine Residents, which, in Bulgaria, is exclusively organized and conducted by the Clinic of Nuclear Medicine, Faculty of Medicine – Varna.

Conclusion:

Chief Assistant Professor Dr. Marina Dyankova, PhD, is the only applicant in the competition for the academic position of Associate Professor in the scientific specialty "Nuclear Medicine", for the needs of the Faculty of Medicine, Department of Nuclear Medicine, Metabolic Therapy and Radiotherapy at the Medical University – Varna.

Throughout her professional career, she has consistently demonstrated excellence as a specialist with broad and in-depth knowledge in nuclear medicine, general medicine, and imaging diagnostics. Dr. Dyankova is a motivated and inquisitive researcher, an experienced organizer within the Clinic of Nuclear Medicine and Metabolic Therapy, and an engaged educator of medical students, allied health professionals, and nuclear medicine residents.

Her scholarly works make significant scientific and clinical-methodological contributions, not only at the national level but also within the international scientific community.

Considering her substantial professional and organizational experience, her recognized scientific achievements both in Bulgaria and abroad, and in full compliance with the Regulations on Academic Staff Development, I firmly conclude that she meets all legal and institutional requirements.

I therefore issue a strong positive recommendation and confidently propose to the esteemed members of the Scientific Jury that Chief Assistant Professor Dr. Marina Dyankova, PhD. be elected to the academic position of Associate Professor.

Reviewer:
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