Press release

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New PET imaging approach detects almost all lesions in common form of kidney cancer

(Vienna, Austria, Tuesday, 20 October 2026) A new PET imaging approach detected 97.9% of lesions in clear cell renal cell carcinoma (ccRCC), potentially giving clinicians a more complete picture of the location and extent of a patient's disease, according to research presented today at the 39th Annual Congress of the European Association of Nuclear Medicine (EANM'26).[1]

Renal cell carcinoma (RCC) is the most common form of kidney cancer, with ccRCC its most common subtype.[2] While ^{18}F-FDG is commonly used as a radiotracer in cancer PET/CT imaging, it has limitations in RCC, driving interest in more targeted imaging approaches.[3-7]

Against this background, researchers investigated a different imaging approach targeting carbonic anhydrase IX (CAIX), a protein highly expressed in ccRCC but with minimal expression in normal renal tissue. In a prospective multicentre study of 68 patients with RCC, researchers compared the CAIX-targeted imaging agent [^{68}Ga]Ga-DPI-4452 PET/CT with ^{18}F-FDG PET/CT.[3]

Across 492 true lesions evaluated in the study, [^{68}Ga]Ga-DPI-4452 PET/CT detected 90.9%, compared with 56.7% using ^{18}F-FDG PET/CT. The difference was even greater in ccRCC, where [^{68}Ga]Ga-DPI-4452 PET/CT detected 97.9% of lesions compared with 47.1% using ^{18}F-FDG PET/CT. Patient-level diagnostic accuracy in ccRCC was also higher, at 98.2% compared with 77.2%.

"CAIX gives us a highly selective biological target," explained lead author Professor Esra Arslan. "It is expressed at a very high rate in ccRCC, while expression in normal renal tissue remains minimal. This gives us the potential to distinguish tumour from surrounding healthy tissue much more clearly."

By contrast, ^{18}F-FDG measures glucose metabolism, but its effectiveness in RCC can be limited by high physiological glucose uptake and intense urinary excretion in the kidneys, which can make tumours harder to distinguish from surrounding tissue. Some low-grade tumours also take up relatively little ^{18}F-FDG, making them more difficult to detect.

Tumour uptake with [^{68}Ga]Ga-DPI-4452 was approximately five times higher than with ^{18}F-FDG, while the tumour-to-background ratio — a measure of how clearly a tumour stands out from surrounding tissue — was around ten times greater. Higher lesion detection was seen across several metastatic sites, including the lymph nodes, lungs, bones, brain and soft tissues.

The difference was particularly striking in brain metastases, where high physiological ^{18}F-FDG uptake can make lesions difficult to distinguish. [^{68}Ga]Ga-DPI-4452 PET/CT detected all identified brain metastases, with a median maximum tumour-to-background ratio of 281.3 compared with 0.7 for ^{18}F-FDG. [^{68}Ga]Ga-DPI-4452 PET/CT also detected all identified lung metastases compared with around half using ^{18}F-FDG PET/CT, while lymph-node detection was 95.0% versus 68.9%.

One exception was liver metastases. Across the overall RCC cohort, FDG performed better in the liver, reflecting lower and more variable CAIX expression in some non-clear cell RCC subtypes. Within

the ccRCC subgroup, however, performance again favoured [^{68}Ga]Ga-DPI-4452.

Importantly, [^{68}Ga]Ga-DPI-4452 PET/CT resulted in a change in clinical management or disease stage in 30.9% of patients, compared with 5.9% using ^{18}F-FDG PET/CT. Changes included identifying previously undetected recurrent or residual disease, detecting nodal or distant metastases that resulted in upstaging and reclassifying some patients from oligometastatic to more widespread metastatic disease. In three patients, findings considered positive on ^{18}F-FDG PET/CT were excluded by [^{68}Ga]Ga-DPI-4452 PET/CT, which the researchers reported avoided unnecessary interventions.

Looking ahead, the researchers, Professor Arslan and Professor Dr Halil Kömek, who contributed equally to this work, see potential roles for CAIX-targeted PET/CT in initial staging before nephrectomy or metastasectomy, restaging when recurrence is suspected and, in the future, as part of a theranostic approach in which [^{68}Ga]Ga-DPI-4452 PET/CT could help identify patients suitable for treatment with [^{177}Lu]Lu-DPI-4452.

"[^{68}Ga]Ga-DPI-4452 has the potential to become a valuable tool across several stages of RCC management," said Professor Arslan. "However, it is premature to claim that this agent represents a 'new molecular imaging standard' without validation in larger, multicentre studies stratified by subtype."

Further research will be needed to validate the findings in larger patient populations and across different RCC subtypes, where CAIX expression can be lower and more variable. Longer-term prospective studies will also be important to determine whether the observed changes in disease staging and clinical management ultimately translate into improved patient outcomes.

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Notes to Editors

A reference to the 39th EANM Annual Congress (EANM'26) must be included in all coverage and/or articles associated with this study.

For more information or to arrange an expert interview, please contact press@eanm.org

About the study authors

Professor Dr Esra Arslan is Head of the Nuclear Medicine Clinic at Istanbul Training and Research Hospital, University of Health Sciences, Türkiye, and Chair of the Oncology Working Group of the Turkish Nuclear Medicine Society. She leads a translational research program in PET/CT molecular imaging, radiopharmaceutical development, and theranostics, with clinical expertise in ^{177}Lu-PSMA and ^{177}Lu-DOTATATE radioligand therapy.

Her research focuses on novel PET tracers in oncology, including CAIX-, FAP-, PSMA-, integrin-, and GRPR-targeted imaging agents. She has an established body of work in breast cancer PET/CT imaging, with more than 20 publications in the field.

Professor Dr Halil Kömek is a nuclear medicine physician at the Department of Nuclear Medicine, Gazi Yaşargil Training and Research Hospital, University of Health Sciences, Diyarbakır, Türkiye. His department is a major regional referral center for oncologic PET/CT imaging and radionuclide therapy in southeastern Türkiye, providing radioiodine, ^{177}Lu-based radioligand therapies, and liver-

directed radioembolization. His clinical and research interests include oncologic PET/CT, theranostics, prostate and neuroendocrine tumors, multiple myeloma, and novel PET tracers.

About EANM

EANM is the largest non-profit medical organisation dedicated to nuclear medicine in Europe. Since its establishment in 1985, EANM has consistently aimed to provide an interactive platform for the sharing and discussion of cutting-edge developments in the field.

EANM brings together nuclear medicine professionals from a range of medical specialties. EANM also collaborates with 40 European nuclear medicine national societies, 20 non-European affiliated societies, EU institutions, international bodies, industry and other medical societies to enhance patient care through the transformative potential of nuclear medicine. The Annual Congress, which attracts around 9,400 participants, stands as a testament to the organisation's active engagement and leadership in the field.

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