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# Foreword

## A Note from the Editorial Board

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Welcome to this year's annual magazine from the Global Scientific Collaboration team.

uInnovation is a scientific magazine published by United Imaging Healthcare that has been successfully distributed for over past three years. It aims to serve as a platform for sharing ground-breaking advancements, emerging trends, and future possibilities in the vast expanse that is oncology.

uInnovation is currently in its fourth edition. This year's edition will inform, engage, and inspire you about the latest developments and applications of United Imaging Healthcare. This journal includes quick read sections for those in a rush, and appealing images to promote visual understanding.

United Imaging Healthcare is a provider of high-end medical equipment and medical IT solutions. From our headquarters in Shanghai's Jiading district to our network of research and development centers throughout the world, our global mission is to provide medical institutions with a full range of healthcare solutions, from diagnostic imaging and radiation therapy equipment to service, training, and medical IT solutions.

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# Interview with Prof. Akram Al-Ibraheem: Navigating Challenges and Opportunities in FAPI Imaging and Theranostics

Akram Al-Ibraheem

King Hussein Cancer Center, JORDAN

**Interviewer:** Professor Akram, thank you for joining us. You recently gave a webinar on the expanding role of theranostic medicine. Could you begin by telling us what you focused on in your talk?

**Prof. Akram:** Thank you, and I would like to thank United Imaging Healthcare for inviting me. My talk centered on Fibroblast Activation Protein Inhibitors—what we call FAPI. Specifically, I discussed the pitfalls, challenges, and opportunities when integrating FAPI PET/CT into clinical practice, and its enormous potential in theranostics. FAPI imaging is one of the most exciting innovations in nuclear medicine in recent years, but like any breakthrough, it comes with its own hurdles. Understanding these challenges is critical if we want to fully harness FAPI's potential—not just in cancer imaging, but also in therapy and even beyond oncology

**Interviewer:** For readers unfamiliar with FAPI, could you explain what makes it so promising?

**Prof. Akram:** Absolutely. For decades, FDG PET/CT was the workhorse of molecular imaging. But FDG has limitations, particularly in tumors with low glucose metabolism or where background uptake is high. FAPI is a game changer. It targets fibroblast activation protein, which is abundantly expressed in the tumor stroma—essentially the microenvironment that supports cancer growth. Unlike most normal tissues, these cancer-associated fibroblasts are activated and highly visible with FAPI tracers. This selective uptake results in excellent tumor-to-background contrast.

What makes FAPI truly exciting is that it is not only a powerful imaging agent but also a theranostic probe. Labelled appropriately, it can combine precise imaging with targeted therapy. That's why many call it a "molecule of the century."

**Interviewer:** You mentioned pitfalls. What are the major challenges in interpreting FAPI PET/CT scans?

**Prof. Akram:** One of the biggest challenges is non-malignant uptake. FAPI can accumulate in sites of inflammation, infection, or benign conditions. For example, uptake may be

seen in uterine fibroids, arthritis, or post-surgical changes. In our experience at King Hussein Cancer Center (KHCC), we reported more than 220 such pitfalls across 48 patients. These findings can lead to false positives if not carefully interpreted.

However, these pitfalls are not just limitations, they represent opportunities. For instance, uptake in inflammatory or fibrotic diseases could allow us to extend FAPI imaging into non-oncologic applications, such as arthritis, liver fibrosis, or even cardiac remodeling after injury.

**Interviewer:** That's fascinating. How does FAPI compare to FDG in terms of performance?

**Prof. Akram:** Several studies have shown that FAPI provides superior lesion contrast with very low background activity compared to FDG. For example, FDG shows intense uptake in the brain and liver, which can obscure lesions. With FAPI, those tissues show minimal uptake, making it easier to detect tumors in challenging regions like the pancreas and abdomen.

That said, FAPI is not meant to replace FDG entirely, it is complementary. In some cancers where FDG performs poorly, FAPI could become the first-line imaging agent.

**Interviewer:** Could you share insights from your own institution's experience with FAPI?

**Prof. Akram:** Certainly. At KHCC, we introduced FAPI PET/CT in late 2022 with a state-of-the-art digital PET/CT scanner from United Imaging Healthcare. We recently published our first experience with 48 patients, covering a range of malignancies, especially gastrointestinal cancers. We found that biliary tumors had the highest uptake with excellent tumor-to-background ratios. Importantly, FAPI imaging impacted management decisions in about one-third of cases.

At the same time, we encountered numerous pitfalls—such as uptake in musculoskeletal or inflammation-related update — underscoring the importance of cautious interpretation.

**Interviewer:** You mentioned FAPI's potential beyond

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oncology. Could you elaborate?

**Prof. Akram:** Yes. FAPI's role in non-oncologic diseases is gaining momentum. Active fibroblasts are not unique to cancer; they also appear in chronic inflammation and fibrosis. We've seen promising results in liver fibrosis, pulmonary fibrosis, and inflammatory arthritis. In fact, there are already more than 40 clinical trials exploring FAPI's role in non-oncologic applications. This could open the door to monitoring disease progression, guiding treatment, and evaluating response in conditions far beyond cancer.

**Interviewer:** And what about FAPI as a theranostic agent?

**Prof. Akram:** That is perhaps the most exciting frontier. When labelled with therapeutic radionuclides, such as Lutetium-177 or Actinium-225, FAPI can deliver targeted radiation directly to tumors. Early studies report disease control rates ranging from 65% to 95% in heavily pretreated patients, with acceptable safety profiles.

Of course, challenges remain—particularly rapid tracer washout, which can limit therapeutic efficacy. Researchers are working on strategies like albumin binders or multimeric

constructs to improve tumor retention. Large-scale Phase II and III trials are still needed, but the progress so far is remarkable.

**Interviewer:** Finally, where do you see FAPI imaging and theranostics in the near future?

**Prof. Akram:** I believe FAPI will soon complement, and in some cases even surpass FDG PET/CT in selected tumors such as gastric cancer, sarcomas, and pancreatic cancer. Its theranostic applications are equally promising—offering targeted treatment options for patients with limited alternatives. Beyond oncology, I see FAPI playing a major role in fibrotic and inflammatory diseases.

In short, FAPI is not just another tracer—it is redefining what we can achieve in nuclear medicine. But as with any innovation, physicians must remain vigilant, understand the pitfalls, and interpret results in the right clinical context.

**Interviewer:** Thank you, Professor Akram, for these valuable insights into the future of FAPI imaging and theranostics.

**Prof. Akram:** Thank you. It's been a pleasure.

## Expert's Biography

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**Prof Dr Akram Al-Ibraheem**

Chairman,

Department of Nuclear Medicine at King

Hussein Cancer Center, JORDAN

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Prof Dr. Akram Al-Ibraheem is President of Jordanian Society of Nuclear Medicine, JOSNM (2016-2022), Vice-President of the Asia Oceania Federation of Nuclear Medicine and Biology (AOFNMB) and past-President of Arab Society of Nuclear Medicine, ARSNM (2014-2019). Since 2012, he has served as an expert for the international Atomic Energy Agency. He has been the course director for many regional and international workshops in Amman, Jordan as joint projects by the IAEA and King Hussein Cancer Center (KHCC). Dr. Al-Ibraheem introduced state-of-the art nuclear medicine services to KHCC and Jordan such as DOTATOC and PSMA PET/CT imaging as well as peptide receptors radionuclide therapy (PRRT) and PSMA-ligand radionuclide therapy (PLRT). He is a faculty and board examiner of the Asian Nuclear Medicine Board and the Jordanian Board of Nuclear Medicine. He is the Director of Nuclear Medicine Residency and Nuclear Oncology Fellowship Programs at KHCC which receives many fellows from the region. Dr. Al-Ibraheem has authored and published many articles in international peer-reviewed journals focusing on molecular imaging and the role of PET/CT in cancer management and he is an editorial board member of several international journals. He is the principal investigator for several ongoing clinical trials and multi-centric research projects.

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