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A New Theranostics Center of Excellence in Europe: GE HealthCare and University Medicine Essen Collaborate to Advance Theranostics and Personalized Medicine

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- Bringing together leading global healthcare innovator and European healthcare institutions, this relationship aims to advance Theranostics in clinical practice and the development of new tracers and technologies for more personalized medicine
- Theranostics is a transformative approach to cancer treatment, giving hope to patients and their loved ones and the potential for an improved quality of life
- The practice of Theranostics is supported by advanced imaging devices as well as digital and artificial intelligence (AI) solutions

CHICAGO--(BUSINESS WIRE)--Oct. 16, 2024-- With the aim of increasing access to precision care, GE HealthCare is proud to collaborate with University Medicine Essen (UME) in the establishment of a new Theranostics Center of Excellence. The Center will be outfitted with the latest technologies and solutions to support the clinical practice and advanced research of more personalized approaches to cancer care in Germany and around the world.

Cancerous diseases continue to threaten the lives of patients, with over 10 million new cancer cases diagnosed annually.[i] Fortunately, the advancement of precision diagnostics solutions and regulatory approval of new treatment options enables the growing practice of precision care – namely Theranostics – giving hope to patients and their loved ones and the potential for an improved quality of life.

"Theranostics has revolutionized the way we approach patient care by combining targeted therapy with precise diagnostic tools, offering a personalized treatment strategy," shares Ken Herrmann, MD, director and chair, scientific advisory board at the Clinic for Nuclear Medicine, University Medicine Essen. "This growing practice allows us to deliver treatments that are tailored to each patient's specific condition. However, the true potential of Theranostics can only be fully realized with continuous research and development. As we advance precision medicine, it is crucial that we collaborate with industry leaders – like GE HealthCare – and invest in innovation to refine and expand personalized medicine, helping ensure even better outcomes for patients in the future."

Theranostics represents a growing medical practice, leveraging diagnostic tools to precisely diagnose and monitor disease for the targeted delivery of therapy to patients. These therapeutic and diagnostic technologies work together to provide a personalized, highly precise, patient-centric approach to medical diagnosis and treatment.

GE HealthCare and University Medicine Essen are proud to be at the forefront of this quickly developing practice, moving away from traditional one-size-fits-all cancer treatments toward connected, patient-centric, and highly personalized care. Together, the two institutions aim to:

- Expand production of and access to radioisotopes for precise disease diagnoses and monitoring;
- Outfit facilities with innovative technologies and solutions capable of improved image quality, dose calculation, care coordination, and operations for more personalized treatment recommendations and an improved patient experience; and
- Support research activities with the aim of advancing precision care now and in the future, beginning with collaboration on GE HealthCare's total body PET/CT technology.

Enabling precision health: Tracer production
The practice of Theranostics begins with the production and development of radioisotopes for use in diagnostic tracers, which are administered to the patient, attach to specific cancer cells, and release radioactive emissions to provide detailed molecular information unique to each patient.

To enable this work, GE HealthCare will outfit University Medicine Essen's new tracer development center with a full suite of radio pharmacy solutions – including cyclotron, synthesizer, and lab technologies – which will support the production and supply of radioactive materials for patients. These solutions work together to create a steady, more cost-effective supply of diagnostic tracers, helping ensure clinicians get the quick, accurate, personalized data necessary to diagnose, stage, and monitor each patient's unique disease state.

Staging and quantifying disease: Theranostics Center of Excellence
To read the emissions released by these tracers, the patient must be imaged using highly sensitive imaging systems. These technologies provide the clinician detailed information that is used to better understand the structure and function of each patient's tissue and disease state to help form personalized therapy recommendations:

- *Positron Emission Tomography/Computed Tomography* and *Magnetic Resonance* (*PET/CT* and *PET/MR*): reveal the metabolic or biochemical function of tissues and organs using a radioactive drug (tracer) to detect both typical and atypical metabolic activity before the disease would typically show up on other imaging tests;
- *Single Photon Emission/Computed Tomography* (*SPECT/CT*): use a radioactive substance (tracer) and a special camera to create 3D pictures showing how well the organs are working; and
- *Digital and artificial intelligence (AI) solutions*: leverage advancements in digital, machine learning and AI to help improve

diagnosis quality and enhance radiology and clinical workflows.

"Building a therapeutics program requires access to highly sophisticated equipment," adds Dr. Herrmann. "Visualization of disease and treatment efficacy is made possible by molecular imaging techniques – such as PET and SPECT – and enhanced by digital and AI solutions, which work together to aid our clinicians in staging disease as well as provide ongoing assessments and characterizations of disease over time. The more advanced the imaging solution, the more information we have to better care for our patients. We are thrilled to leverage GE HealthCare's impressive suite of solutions and work with them on their next generation long axial field of view PET/CT technology that has the potential to further enhance our ability to practice precision care."[ii]

To support these efforts, GE HealthCare is delivering a new Omni Legend 32cm PET/CT, SIGNA PET/MR, and several SPECT/CT systems, including StarGuide, NM/CT 870 DR, and NM 830. These systems' capabilities are further enhanced by deep learning and AI solutions – including auto positioning, Precision DL, Clarify DL[iii] – and digital technologies from MIM Software's impressive suite of imaging analytics and digital workflow solutions – a recent addition to GE HealthCare's leading global medical technology, pharmaceutical diagnostics, and digital portfolio.

Altogether, University Medicine Essen's new Theranostics Center of Excellence will drive innovation in clinical collaboration, research, and education throughout the region, equipping healthcare practitioners with the tools and knowledge necessary to offer more personalized treatments to patients.

Preparing for the future of personalized medicine
Researchers at University Medicine Essen are also collaborating with GE HealthCare to further expand the potential of PET/CT, which is used broadly for disease diagnosis, staging, therapeutic planning, and treatment response assessment – especially cancer.

"Access to comprehensive imaging is crucial in healthcare, significantly impacting decision-making and patient outcomes," shares Jean-Luc Procaccini, President & CEO, Molecular Imaging and Computed Tomography, GE HealthCare. "That's why we are thrilled to collaborate with University Medicine Essen to explore the potential of a new, innovative long axial field of view PET/CT technology. Designed for exceptionally high image quality at ultra-low doses, this technology aims to enable the investigation of new clinical pathways in oncology, combining cutting-edge research with the demands of a busy daily routine. Sensitivity is essential for the next generation of tracers and use of dual tracers, which can offer higher diagnostic confidence and better operational efficiency."

To support this advanced research, encourage new discoveries, and meet growing clinical demands, GE HealthCare is designing its long axial field of view PET/CT technology to deliver record high sensitivity for ultra-low dose scans; fast acquisitions; multi organ dynamic imaging; and impressive imaging of slow decaying, low activity tracers. In parallel, this technology aims to improve healthcare system efficiency by enhancing clinical workflows, supporting routine clinical practice, and improving operational efficiency with deep learning-based technologies.

"Looking at all our current and future needs, we believe the unique technology direction that GE HealthCare has chosen for their total body PET/CT will help us fulfill our ambition," shares Wolfgang Fendler, MD, Vice Chair at the Clinic for Nuclear Medicine, University Medicine Essen. "We are excited to collaborate once again with GE HealthCare and other leading global health institutions and be one of the first to adopt this technology."

University Medicine Essen previously collaborated with GE HealthCare to validate AI models designed to predict patient response to immunotherapies. Based on a cohort of over 4,000 UME patients, the collaboration confirmed the AI models' ability to predict efficacy outcomes and the likelihood of an individual patient developing an immune-related adverse event (in this case, hepatitis) with 70 to 80 percent accuracy.[iv] These findings could further enable precision care by unlocking the potential for clinicians to select the appropriate personalized treatment pathway sooner while potentially sparing unnecessary side effects and cost.

GE HealthCare is at the forefront of driving a connected healthcare transformation and revolutionizing cancer care. Its integrated portfolio of solutions provides clinicians with the isotopes, imaging, informatics, and molecular imaging agents necessary for the practice and advancement of precision care.

By connecting clinicians along every step of the oncology care pathway with innovations and strategic collaborations, this collaboration aims to empower researchers and clinicians and enable better outcomes for cancer patients around the globe.

For more information on GE HealthCare's impressive Molecular Imaging portfolio, visit GEHealthCare.com.

About GE HealthCare Technologies Inc.
GE HealthCare is a leading global medical technology, pharmaceutical diagnostics, and digital solutions innovator, dedicated to providing integrated solutions, services, and data analytics to make hospitals more efficient, clinicians more effective, therapies more precise, and patients healthier and happier. Serving patients and providers for more than 125 years, GE HealthCare is advancing personalized, connected, and compassionate care, while simplifying the patient's journey across the care pathway. Together our Imaging, Ultrasound, Patient Care Solutions, and Pharmaceutical Diagnostics businesses help improve patient care from diagnosis, to therapy, to monitoring. We are a $19.6 billion business with approximately 51,000 colleagues working to create a world where healthcare has no limits.

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[i] Cancer. World Health Organization. Published February 3, 2022. https://www.who.int./news-room/fact-sheets/detail/cancer. Accessed March 2, 2023.

[ii] Long axial field of view PET/CT represents ongoing research and development efforts. Not for sale. Not CE-marked and not cleared or approved by the U.S. FDA, or any other national regulatory authority for commercial availability.

[iii] Clarify DL is CE marked as part of StarGuide and Xeleris V, and 510(k) pending at the US FDA. Not available for sale in the United States.

[iv] Poster "Evaluation of Machine Learning Models to Predict Efficacy and Toxicity of Immune Checkpoint Inhibitors Using an External Real-World Pan-Cancer Cohort" presented at SITC 38th Annual meeting

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