PRECLINICAL IMAGING

A Look Into Prof. Gabriela Kramer-Marek's Translational Imaging Career

A personal journey from early inspiration to leading-edge translational research in brain and breast tumor imaging

Innovation with Integrity

Prof. Gabriela Kramer-Marek leads translational imaging research at the Institute of Cancer Research (ICR), London, and the National Research Institute of Oncology (NIO) Gliwice. Integrating hybrid PET/SPECT/CT and MRI platforms, her teams develop and validate novel cancer imaging agents, recently focusing on glioblastoma (GBM) and breast cancer, and moving probes from concept to clinical testing. Robust instrumentation and hands-on vendor support have enabled a true bench-to-bedside pipeline, accelerating progress in precision therapy.

At the intersection of physics and medicine, Prof. Gabriela Kramer-Marek has built a career advancing molecular imaging for cancer research. Now leading the Preclinical Molecular Imaging Group at the ICR in London and managing the Department of Radiopharmacy and PET Laboratory Imaging at the NIO in Gliwice, Poland, Prof. Kramer-Marek's journey is defined by scientific rigor and personal resolve.

"I grew up in Poland convinced that oncology is, at its core, a triumph of physics," she notes. *"Maria Sklodowska-Curie, patron of the National Research Institute of Oncology, in Gliwice, Poland where I completed my PhD was my earliest hero."*

She remembers being handed Curie's biography at the NIH after a colleague joked about her skipping meals during studies—an anecdote that underscored Curie's own relentless pursuit of discovery. That moment stayed with her, a reminder that persistence and dedication stand on the shoulders of pioneers like Curie, whose work continues to illuminate paths in science and medicine.

Where It Started: A Personal and Scientific Mission

Prof. Kramer-Marek's early fascination with biology and physics, shaped by her mother's experience with breast cancer, led her to medical physics at the University of Silesia, Katowice.

"I loved biology from primary school and once wrote that I wanted to be a neurosurgeon. In the end, I became the kind of scientist who builds tools for neurosurgeons and neuro-oncologists to see disease earlier and treat it more precisely." she explains.

Her doctoral work on light-activated anti-cancer drugs set the stage for a career focused on imaging probes and translational research.

Across Cultures, Toward Discovery

Relocating across continents has been both an adventure and a lesson in adaptability for Prof. Kramer-Marek. Reflecting on her move from Poland to the United States, she recalls the pivotal moment that set her career in motion:

"Dr. Jacek Capala at NCI/NIH (Bethesda, MD, U.S.) asked after my interview: 'Would you join my team?' I did not blink and answered: 'Yes.' I was ready, my mom less so. With time, she came around."

After several years in the U.S., new opportunities led her to the U.K., where she once again had to adjust—not only to a new research environment but also to cultural and practical differences. She jokes,

"When I moved to the U.K., though switching F° to C° and Ci to Bq was the easy part (laugh)."

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>
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Collaboration: Building Capability and Confidence

Prof. Kramer-Marek's translational pipeline thrives on interdisciplinary teamwork. At the ICR, physicists, radiochemists and biologists worked closely to optimize instrumentation, with vendor support playing a key role.

"Bruker's scientific support, their applications team has been genuinely hands-on, which is invaluable for a young scientist building capability and, now that I am not in the lab every day, for keeping studies on track," she says.

In Gliwice, the integration of cyclotron, radiochemistry, and clinical partners under one roof accelerates the journey from probe design to clinical testing.

Approach & Technology: Hybrid Systems for Mechanistic Insight

Modern hybrid imaging systems have transformed Prof. Kramer-Marek's research from static snapshots to dynamic, quantitative science. At the ICR, she has worked extensively with the Bruker Albira PET/SPECT/CT, contributing feedback during its early development. In Poland, she secured funding for Bruker's PET/CT Si78 and BioSpec Maxwell 7T platforms.

"The new generation is unquestionably more robust and reliable, which matters when you are running demanding therapy-response studies," she notes.

For her brain tumor program, co-located PET/CT and 7T MRI systems provide the throughput, flexibility, and control needed to answer mechanistic questions rapidly. Prof. Kramer-Marek emphasizes that having both PET/CT and MRI in the same lab enables her team to tailor protocols for translational and preclinical studies.

Results & Impact: From Bench to Bedside

Prof. Kramer-Marek's team has developed non-invasive imaging biomarkers and theranostic agents targeting GBM and HER2-positive breast cancer. Their work includes translating [89Zr]-DFO-Atezolizumab (PD-L1) from preclinical studies into clinical imaging of GBM, and using [68Ga]Ga-ABY-025 to detect HER2-positive breast cancer in patients.

"We have built a true bench-to-bedside pipeline, so we can design, radiolabel, validate and then clinically test our most promising probes," she explains.

Next Steps: Toward Precision Therapy

Looking ahead, Prof. Kramer-Marek is focused on PET/SPECT-guided precision therapy—using imaging to select and adapt treatments in near real time. Currently, her team is advancing radioligand therapy concepts for GBM and pediatric high-grade glioma, and aims to seed similar translational programs.

"With sustained support to push our best candidates into early clinical trials, we can sharpen bedside decision-making and, ultimately, improve outcomes for people with brain tumors and other hard-to-treat cancers," she says.

"Modern hybrid systems have transformed our work from 'snapshot' biology to truly quantitative, longitudinal science."

— Gabriela Kramer-Marek, PhD

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