

# RETIMAGER

## RETIMAGER PROJECT OFFICIAL LAUNCH.

An international multidisciplinary consortium of European organizations composed of Universidad Carlos III de Madrid (Spain), Universidad Complutense de Madrid (Spain), Forschungszentrum Jülich (Germany), Institut National de la Santé et de la Recherche Médicale (France), Weeroc (France) and Tecnologías Avanzadas Inspiralia (Spain), is pleased to announce the launch of the project RETIMAGER: “Real Time Molecular Imager With Unsurpassed Resolution”, granted by the European Union under the European Innovation Council Pathfinder programme.

Over the last decades, Positron Emission Tomography (PET) has been firmly established as the predominant molecular imaging technique due to its unmatched sensitivity and capability to address many different metabolic processes. However, there is huge room for improvement, as current clinical PET scanners are limited to spatial resolutions higher than 2.5 mm and temporal resolutions longer than 5 seconds. This hampers applications of PET for preclinical research and clinical diagnosis in small tissues or lesions and precludes real-time reconstruction of metabolic images. RETIMAGER is a proposal for a molecular imaging system with a ten-fold spatial and temporal improvement on the reconstructed image with respect to current PET devices. This will not only boost the quantitative performance, but it will enable new applications in cardiology, vascular oncology, oncology, neurology, and other areas. We will achieve this milestone by developing smart radiation detectors with non-conventional geometries that combine the advantages of both pixelated and monolithic detectors, the two dominant and seemingly incompatible technologies employed in PET scanners. Our new scanner will provide 0.25 mm pixel resolvability with time frames as short as 0.01 sec. By aggregating these blocks in a unique gantry self-adapting to the geometry of the field-of-view, RETIMAGER will achieve an unprecedented increase in sensitivity and in in vivo real-time imaging with submillimeter resolution. We will pair it with high-throughput data processing and AI tools to assess with a single tracer both perfusion and metabolism in preclinical and clinical models. In the long run, RETIMAGER’s faster, lower dose, and less invasive molecular imaging technology will become a game-changer for understanding disease processes by unveiling new accurate image-based quantitative biomarkers, taking scientific and healthcare stakeholders a step closer to personalized precision medicine.

Project execution: 01/09/2023 to 28/02/2027.

Funder contribution: 3,126,347.50 EUR.