



FORTISSIMO
PLUS

FFPLUS SUCCESS STORY: INNOVATION STUDY

A GENAI-BASED TOOL FOR 3D PRECLINICAL DOSIMETRY FROM 2D DYNAMIC IMAGING

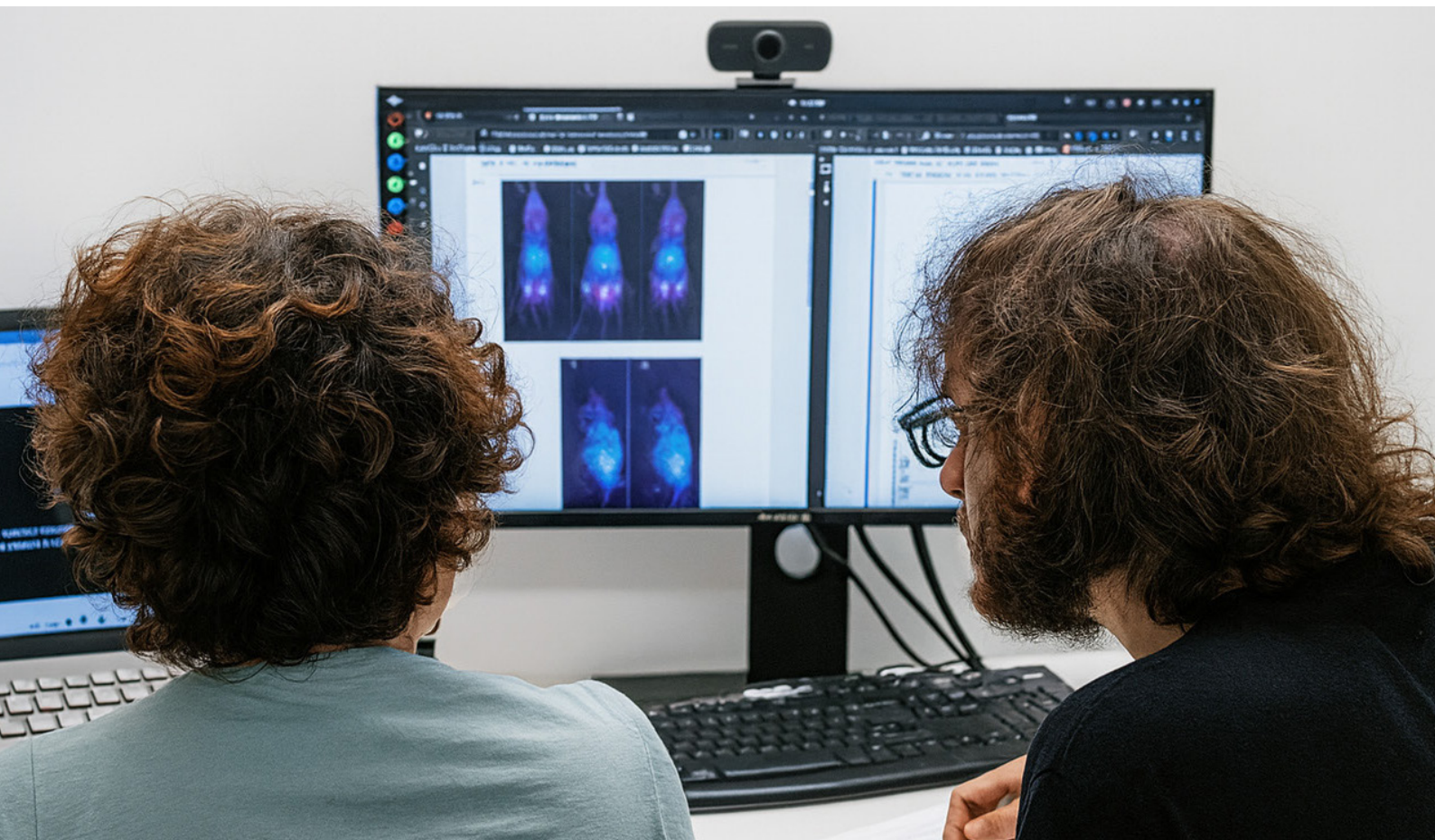
ORGANIZATIONS

BIOEMTECH is a Greek SME specialising in biomedical engineering, delivering advanced hardware and software solutions for preclinical imaging and dosimetry. **ALETHIA** is a start-up focused on AI monitoring, explainability and governance. **GRNET** provides national-scale networking, cloud and HPC services, and coordinates the National Competence Centre for HPC in Greece.



THE CHALLENGE

Pre-clinical dosimetry typically relies on simplified assumptions or post-mortem analysis, limiting accuracy and driving extensive animal use. BIOEMTECH sought to differentiate its imaging systems by enabling real-time 3D dosimetry during acquisition, but developing and validating such a capability required large-scale Monte Carlo simulations and AI training that are only feasible using HPC, and beyond the financial and computational capacity of an SME.



Technology used: HPC, AI, GenAI
Industry Sector: Biotechnology

THE SOLUTION

DosimetrEYE AI-powered solution is delivering real-time 3D dosimetry during preclinical imaging. Large-scale Monte Carlo simulations were used to generate ground-truth dose maps from around 1,000 SPECT/CT image pairs, which then trained Generative AI models using large-scale HPC resources. This enabled the volume, speed and precision required for reliable real-time dosimetry. Explainable AI and automated outlier detection provide quality control, robustness and trust, supporting reliable industrial and regulatory adoption.

THE IMPACT

DosimetrEYE transforms dosimetry from a time-consuming research bottleneck into a real-time capability, reducing analysis time from several hours to under 20 seconds and cutting per-study costs by around 60%. This significantly strengthens BIOEMTECH's product portfolio by enabling simultaneous imaging and dosimetry, supporting access to new customer segments and B2B collaborations, with projected additional revenues of €0.8–1.0 million.

Access to European HPC infrastructure was a critical enabler, allowing BIOEMTECH to achieve results otherwise only feasible for large industrial or academic players.

The solution enhances the competitiveness of EU medical imaging SMEs in a market dominated by US vendors and has attracted new research collaborations and follow-on EU funding. Socially, DosimetrEYE supports personalised medicine by enabling more accurate organ-level dose assessment in radionuclide research, improving safety and translational potential. Environmentally and ethically, precise in-vivo dose estimation enables a substantial reduction in animal sacrifice in preclinical studies, directly supporting European objectives for responsible, sustainable biomedical research.

BENEFITS

- Real-time GenAI-based 3D dosimetry delivered in under 20 seconds during imaging.
- ~60% reduction in per-study dosimetry analysis costs.
- Reduction of animal sacrifice by more than 80% in preclinical studies.
- ~1,500× faster dosimetry workflows compared to conventional methods.
- Creation of new revenue streams, with ~€800k expected from DosimetrEYE services.



EuroHPC
Joint Undertaking