MOLECULAR IMAGING CORE UNIT

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Technicians
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Titulado Superior (Advanced Degree)
***Plan de Empleo Joven-Licenciado* (Youth Employment Plan-Graduate)

OVERVIEW

Molecular imaging involves specialised instrumentation, used alone or in combination with targeted imaging agents, to visualise tissue characteristics and/or biochemical markers. The data generated from molecular imaging studies can be used to help understand biological phenomena, identify regions of pathology, and provide insight regarding the mechanisms of disease. At the Molecular Imaging Unit, we offer state-of-the-art techniques such as Positron Emission Tomography (PET), Computed Tomography (CT), Ultrasounds (US) and Densitometry (DeXa).

"Molecular Imaging, especially PET, goes beyond the role of tumour detection and has also taken on the role of tumour characterisation."

RESEARCH HIGHLIGHTS

The main objectives of the Unit are to provide CNIO researches with state-of-the-art molecular imaging equipment and human resources in order to: guarantee the highest quality studies, develop and update protocols and techniques to optimise visualisation of tumours in both preclinical and clinical fields, as well as assess and advise researchers on the best-suited imaging modality for their research projects.

With the Immuno-PET strategy, the high specificity of the antibody is coupled with the high sensitivity of PET imaging to obtain a strong, non-invasive, tool for glioblastoma (GBM) and pancreatic carcinoma diagnosis and follow-up. In 2016, we published the results of our collaboration with the Seve-Ballesteros Foundation Brain Tumour Group and the Crystallography and Protein Engineering Unit at the CNIO. We reported the development of a new tracer (^{89}Z-LEM2/15) for the efficient detection of MT1-MMP in preclinical GBM models.

We have also provided imaging support in clinical trials conducted under CNIO's Clinical Research Programme. With the Breast Cancer Clinical Research Unit, we published the ^{18}F-FMISO-PET imaging results from a clinical trial aimed at selecting patients who will benefit from treatment with angiomodulators knowing the degree of tumour hypoxia by using this PET biomarker (FIGURE).

Furthermore, we continued our active participation in the international consortium focused on imaging, 'M+Visión' led by the Massachusetts Institute of Technology (MIT). ■

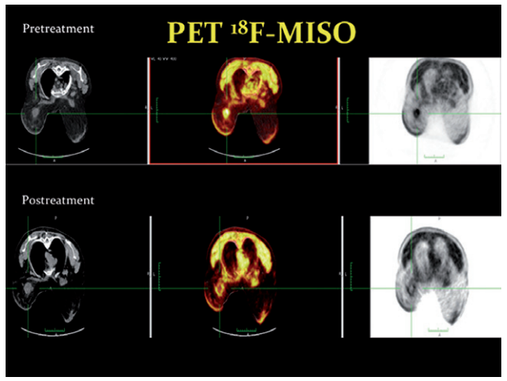

Figure PET-CT imaging with radiolabelled ^{18}F-MISO in patients with breast carcinoma. MISO uptake before treatment (upper panel) and after treatment (lower panel). We observe the reduction in uptake intensity and the change in the shape of the hypoxic volume after treatment.

PUBLICATIONS

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- Hernández-Agudo E, Mondejar T, Soto-Montenegro ML, Megías D, Mouron S, Sanchez J, Hidalgo M, Lopez-Casas PP, Mulero F, Desco M, Quintela-Fandino M. (2016). Monitoring vascular normalization induced by antiangiogenic treatment with (18)F-fluoromisonidazole-PET. *Mol Oncol* 10, 1704-1718.
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- Muñoz-Mediavilla C, Cámara JA, Salazar S, Segui B, Sanguino D, Mulero F, de la Cueva E, Blanco I (2016). Evaluation of the foetal time to death in mice after application of direct and indirect euthanasia methods. *Lab Animal* 50, 100-107.

AWARDS AND RECOGNITION

- Scientific Advisory Board Chair and Faculty, the Madrid-MIT *M+Visión* Consortium, Spain.