RESEARCH PROJECT

Name of Institution and Department:
Division of Radiology, European Institute of Oncology (IEO IRCCS)

Link to Website:
www.ieo.it

City and Country of Institution:
Milan, Italy

RESEARCH GROUP

Brief Description of the Research Group and Its Mission

The Division of Radiology is dedicated to oncologic imaging, with a particular focus on cancer screening, diagnosis, staging, treatment response assessment, and follow-up. The division has extensive expertise in advanced imaging techniques, including Computed Tomography (CT), CT Enterography, Magnetic Resonance Imaging (MRI), Whole-Body MRI, and MR Enterography.

TITLE OF THE PROPOSED RESEARCH PROJECT

Whole-Body MRI as Prognostic Biomarker in Breast Cancer Patients with Bone Metastases Receiving Systemic Anticancer Therapy

OBJECTIVES

- To gain expertise in the interpretation of Whole-Body MRI (WB-MRI) examinations in patients with bone-predominant metastatic breast cancer, including assessment of treatment response according to MET-RADS criteria.
- To evaluate the prognostic value of qualitative WB-MRI response assessment using Response Assessment Categories (RAC) and to investigate their association with progression-free survival and overall survival in patients receiving systemic anticancer therapy.
- To evaluate the prognostic value of quantitative WB-MRI biomarkers, including Apparent Diffusion Coefficient (ADC), lesion size, Signal-to-Muscle Ratio (SMR), and Fat Fraction (rF%), and to investigate their association with progression-free survival and overall survival.
- To compare the prognostic performance of qualitative and quantitative WB-MRI-derived biomarkers for treatment response assessment and risk stratification in patients with metastatic breast cancer involving the skeleton.
- To evaluate the potential role of WB-MRI imaging biomarkers in supporting personalized treatment monitoring and clinical decision-making in metastatic breast cancer.

APPLICANT'S DUTIES

- Participation in the scientific activities of the project, including data collection, image review, qualitative and quantitative imaging analysis, statistical analysis, and preparation of scientific manuscripts under the supervision of the project team.
- Assessment of Whole-Body MRI examinations in patients with metastatic breast cancer, including response evaluation according to MET-RADS criteria and extraction of quantitative imaging biomarkers.
- Participation in multidisciplinary meetings focused on breast cancer imaging and metastatic disease management.
- Attendance at scientific meetings, educational sessions, and imaging review conferences.
- Contribution to the preparation of abstracts, conference presentations, and peer-reviewed publications.

APPLICANT'S BENEFITS

- Access to the facilities, imaging platforms, and research infrastructure of the Division of Radiology for research purposes.
- Advanced training in Whole-Body MRI acquisition, interpretation, and quantitative imaging analysis.
- Participation in multidisciplinary clinical and research activities focused on oncologic imaging.
- Access to the institutional cafeteria and common facilities.
- Opportunity to contribute to scientific publications and presentations at national and international conferences.

PROJECT TEAM

Project Leader:
Prof. Giuseppe Petralia, MD

Project Members:
Caterina Pizzi, MD