

## Special Session

### Nanotheranostics, Medical Imaging and Biomedical Applications

#### **Session Organizers:**

Sergio Casciaro – National Research Council – Institute of Clinical Physiology (CNR-IFC), Lecce, Italy.  
[sergio.casciaro@cnr.it](mailto:sergio.casciaro@cnr.it).

Francesco Conversano – National Research Council – Institute of Clinical Physiology (CNR-IFC), Lecce, Italy.  
[conversano@ifc.cnr.it](mailto:conversano@ifc.cnr.it).

Luca Menichetti – National Research Council – Institute of Clinical Physiology (CNR-IFC), Pisa, Italy.  
[luca.m@ifc.cnr.it](mailto:luca.m@ifc.cnr.it).

#### **Session Abstract:**

Early and accurate diagnoses typically require the combined adoption of different imaging modalities with molecular sensitivity. A successful employment of molecular imaging is often related to the development of smart fully biodegradable nanoparticle contrast agents, detectable by non-ionizing imaging techniques and suitably sized for disease targeting. The possibility of loading these nanosized particles with therapeutic agents is also opening completely new horizons towards the so-called “nanotheranostics”, an innovative and extremely exciting biomedical field consisting in the development of multi-functionalized smart nanoparticles, capable of carrying out both the tasks of personalized diagnosis and self-tailored therapy through a single contrast agent injection.

This special session will include, but will not be exclusively limited to, the following topics:

- Nanosized contrast agents for molecular imaging;
- Numerical simulations for contrast agent design;
- Experimental characterization of the diagnostic behavior of novel nanoparticles;
- Biocompatibility profiles of nanosized contrast agents;
- Nanoparticle functionalization strategies for selective pathology targeting;
- Novel algorithms for automatic or semi-automatic detection of tissue-targeted contrast agents;
- Nanocomposites for multimodal diagnostic imaging;
- Innovative medical imaging techniques and protocols;
- Design of nanovectors for localized drug/gene delivery;
- Therapeutic monitoring through smart nanosystems;
- Nanoparticle-aided laser hyperthermia;
- Experimental trials of nanotheranostic approaches.