

CN5: National Biodiversity Future center (NBFC)

Spoke: Biodiversity Valorization

Proponent: Professor Marco Trifuoggi

Research project title

Emerging contaminants in extreme urban environments and their effects in microbial diversity

Key words

Emerging contaminants; POPs; Rare Earth Elements (REEs); REEs for circular economy; microbial diversity, Exposoma.

Research project abstract.

The aim of the project is the study of extreme urban environments and geothermal, natural, and anthropogenic environments, aimed at identifying emerging contaminants and assessing their impact on biodiversity. These environments represent natural niches, of thermophilic and hyperthermophilic organisms, and their study are of particular interest for the development of eco-sustainable methods for reducing environmental impact.

An advanced characterization of emerging contaminants, such as rare earths (REEs) and POPs, will be carried out, with particular attention to the identification of methylated polycyclic aromatic hydrocarbons (PAHs) congeners that will be significant for the relationship between natural and anthropogenic components. The determinations will be carried out by means of spectroscopy techniques (ICP-OES, MP-AES), inductively coupled plasma mass spectrometry (ICP-MS) and gas-chromatographic techniques (GC-FID, GC-ECD, and GC-MS/MS).

In accordance with the principles of circular economy, the possibilities of recovery of REEs from characterized environments will be investigated, given the growing interest in their applications in numerous fields, from agriculture to nanotechnologies.

Comparison studies of biodiversity and the variation in the composition of microbial communities according to the presence of the identified contaminants will be carried out in collaboration with the Department of Biology and the Department of Agriculture of the Federico II University of Naples, the Department of Biology of the Aldo Moro University of Bari and INGV of Naples