

# **ISPRA**

## **NATIONAL CENTER FOR THE NATIONAL NETWORK OF LABORATORIES (CN-LAB)**

ISPRA is the National Research Institute for Environmental Protection and Research with leading and coordination function of the National Network System for Environmental Protection (SNPA) made by Regional Environmental Agencies. The main objective of SNPA is to ensure homogeneity and an effective knowledge of the environmental quality to support sustainable environmental policies and to protect public health with preventive health care programmes. ISPRA leads and coordinates the process for definition of mandatory technical guidance for monitoring and control and promotion of national network of laboratories for the implementation of QA/QC procedure and their accreditation. ISPRA is responsible for the collection and sharing of official environmental monitoring data and information for the production of quality status report, for the implementation of national and international legislation, authorization process and support for national governmental bodies. In particular, ISPRA supports all governmental bodies in civil and criminal trial for the identification, description and quantification of environmental damage through technical and scientific consulting for the protection of public interest. It provides support to Italian Ministry of Environment (MASE) in controlling the quality of the marine environment and coordinates regional environmental agencies in the field of community regulations regarding the sectors of protection of the sea against pollution, fisheries and aquaculture with special reference to marine and water regulations, common fisheries policy, the environmental directives referring to the protection of flora and fauna and European Union action concerning the integrated coastal zone management. The National Center for the Laboratories Network (CN LAB) of ISPRA was created to respond to the tasks assigned by Law no. 132/2016 establishing the SNPA with the aim of ensuring support for the network of laboratories of the ARPA / APPA Agencies. Its technical-scientific activities are aimed at improving the effectiveness, efficiency and homogeneity of analytical methods and monitoring programs of environmental matrices (air, inland and marine waters, soil, waste) in order to protect citizens and the environment. CN-LAB brings together laboratories qualified for environmental analytical activities with a division into 5 Areas: Biology, Chemistry, Ecotoxicology, Physics and Metrology.

ISPRA current organization includes three Departments and 5 National Centres:

### **EU Research infrastructures**

The National Center for the National Network of Laboratories (CN LAB) carries out studies on the relationship between the presence of chemical contaminants in environmental matrices and health-related effects, especially with regard to the entry of contaminants through the food web and diet, and morphological and molecular taxonomy studies (environmental DNA) to identify species toxic to human health. CN-LAB brings together qualified laboratories for environmental analytical activities with a subdivision into 5 Areas: Biology, Chemistry, Ecotoxicology, Physics and Metrology.

CN LAB was created to respond to the tasks assigned by Law no. 132/2016 establishing the SNPA with the aim of guaranteeing support to the network of laboratories of the ARPA/APPA Agencies. Its technical and scientific activities are aimed at improving the effectiveness, efficiency and homogeneity of analytical methods and monitoring programs of environmental matrices (air, inland and marine waters, soil, waste) in order to protect citizens and the environment.

The Center has a Quality Management System for certification and accreditation to guarantee the accuracy of measurements and analytical activities that allows controlled management of the laboratories and which, together with the competence of the staff, determine a 'high quality of the product / service.

CN-LAB current organization include 5 units: Chemistry, Biology, Ecotoxicology, Physic and Metrology.

The Chemistry, Biology and Ecotoxicology Areas, which actively participate in the project, include 4, 5 and 4 laboratories respectively. The Chemistry Unit has 4 laboratories for determination of the following parameters: organic contaminants; metals and trace elements; organic micropollutants and volatile compounds; nutrients and physico-chemical parameters. Its major topics are chemical analyses and integrated quality assessment of the different environmental matrices; chemical speciation studies, bioaccumulation and biomagnification studies in organisms exposed to toxic substances. The Biology Unit has the following laboratories: benthos ecology; nekton ecology; soil ecology; ecophysiology, histology and morphology; marine molecular biology, that carry out studies on biodiversity and human pressures interactions; morphological and molecular taxonomy of aquatic organisms and terrestrial infauna; marine litter pollution and interactions with living organisms; stress physiology and reproduction biology of aquatic organisms. The Ecotoxicology Unit has the following laboratories: marine ecotoxicity and microbiology; biomarkers; fish-ecotoxicity; aquatic and terrestrial ecotoxicity, that carry out on development and application of standardized protocols for ecotoxicity tests; biomarkers at subcellular and cellular level in order to evaluate the effects of exposures to chemical substances; Environmental Risk Assessment by mean of comparison of different results from chemical, biological and ecotoxicity analysis.

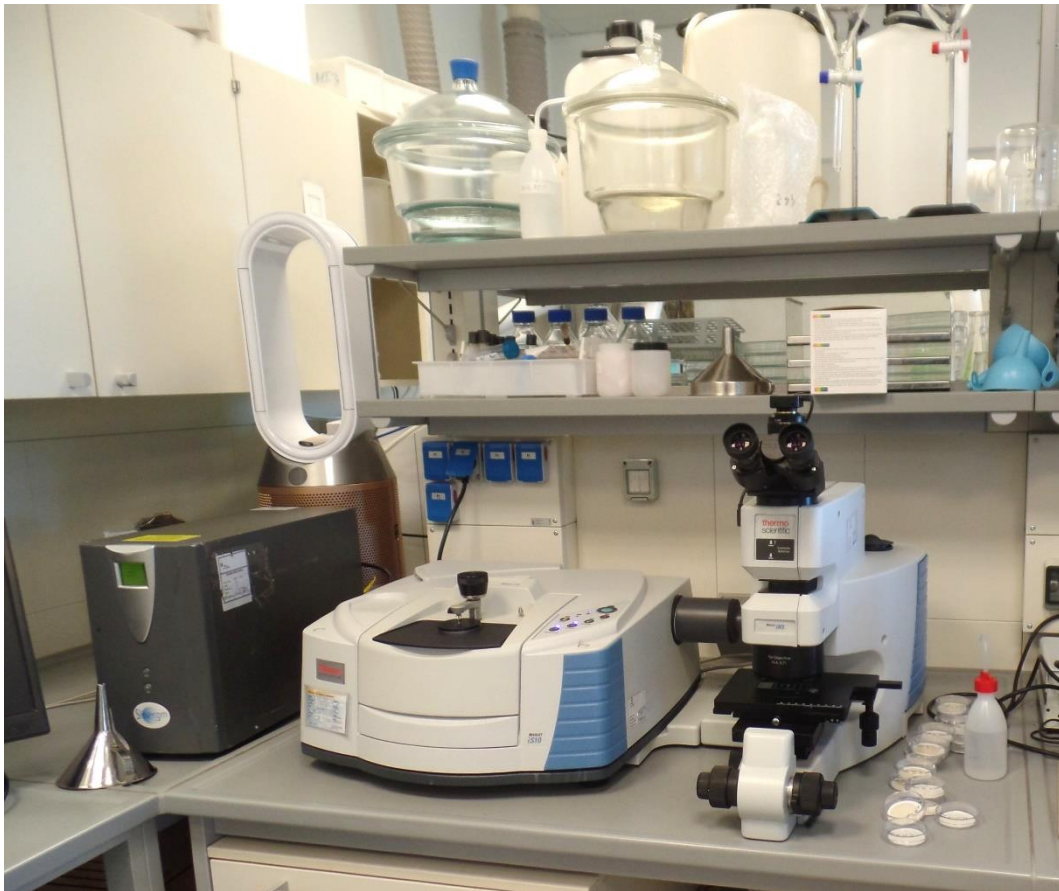
The main instruments of the Chemisty Area are: LC/MS/HRMS(Q-Orbitrap); GC-MS/MS (triple quadrupole); HPLC/DAD/FLD; Direct Mercury Analyzer ; ICP-MS and ICP-OES; GC/MS (single quadrupoles); P&T-W&S-GC/MS; SPME-GC/MS; GC/ECD and GC/FID; CHNS analyser . The main instruments of the biology area are: chemiluminometer; UV-VIS spectrophotometer with microplate reader; automatic clinical chemistry analyzer; emogas; osmometer; respirometer and swimming chamber; stereo and optic microscopes at various levels of magnification; Nicolet iN10 infrared microscope; Nicolet iS10 FTIR spectrometer with Nicolet iN5 FTIR microscope. The main instruments of the ecotoxicology area are: UV-VIS spectrophotometer, absorbance microplate reader, spectrofluorometer, cryostat microtome machine, ultracentrifuge, two fluorecence microscopes, coulter counter analyzer, Microtox® analyzer, thermostatic chambers and cabinets for bioassays execution and test organisms maintenance.

The CN-LAB also has the following boats and sampling gears and instruments: research vessel ASTREA, 24 m length overall and 2 x 735 kW engines; grabs and box-corers of different sizes; multiparametric probes (Seabird), ADCPs, R.O.V., multibeam; side scan sonar.

The CN-LAB also has a team of 5 scientific divers specially trained to carry out sampling and study activities in situ.

The above research infrastructures are functional to the scientific activities that ISPRA will carry out in the project, namely: sediment and water sampling and oceanographic parameters collection at the Mediterranean scale; sampling and collection of marine and brackish organisms; environmental analytical chemistry and micro plastics characterization; chemical analysis on environmental matrices; molecular biology for aquatic species taxonomic identification, metabarcoding, eDNA; environmental analysis of nutrients, chlorophyll a, Dissolved Organic Carbon and its chromophoric fraction; taxonomic identification of marine macrobenthic organims, teleosts and elasmobranchs; analisys of Microplastics. Conducting toxicity tests on sediment and water samples using marine organisms, bioaccumulation tests

of chemicals in specific sentinel organisms, biomarker analysis at subcellular and cellular levels on marine organisms (fish, mollusks, crustaceans, polychaetas). **PHOTO ATTACHMENT**



**Photo 1 – Spectrophotometer IR for polymer analysis**

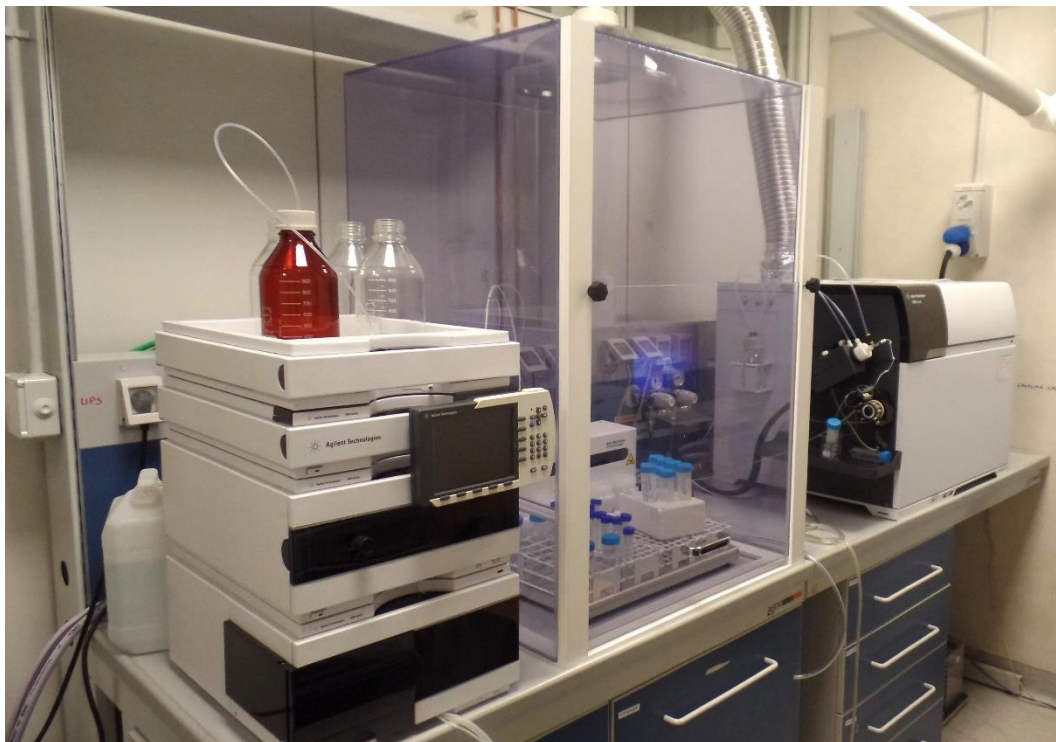


**Photo 2 – Stereomicroscope 180 x**





**Photo 3 – ICP-OES**



**Photo 4 – HPLC-ICP-MS**



**Photo 5 – Cryostat microtome**

**Photo 6 – UHPLC/MS/HRMS (Q-Orbitrap)**



**Photo 7 – GC-MS/MS (triple quadrupole)**



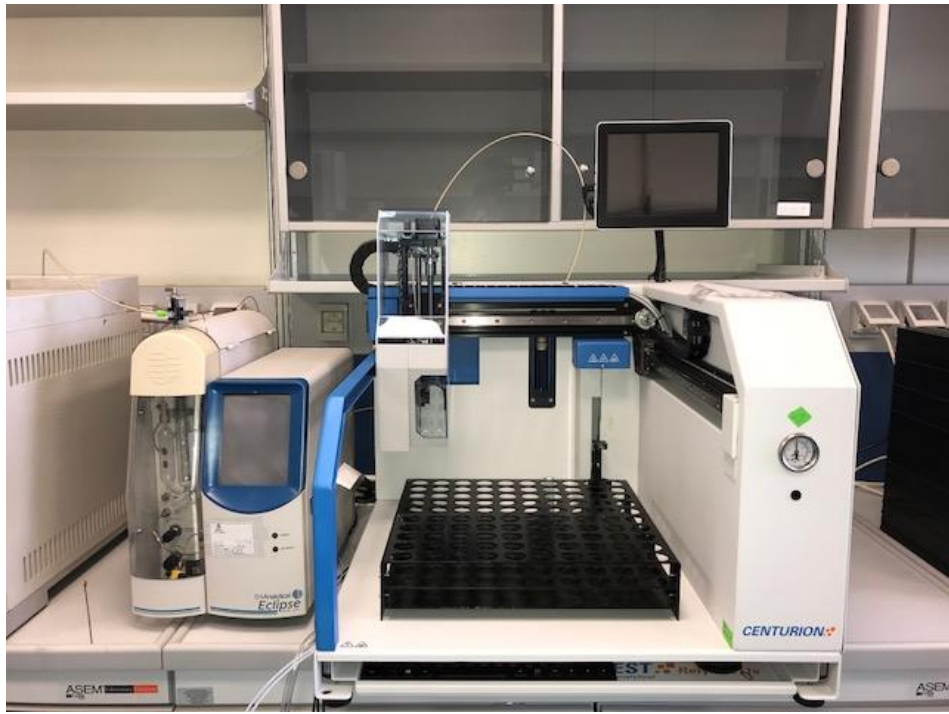


Photo 8 – P&T-W&S-GC-MS



Photo 9 – SPME-GC-MS