UNIVERSITÀ POLITECNICA DELLE MARCHE

## Supervisor: Prof. Francesco Regoli

## Activities

Expert on environmental pollution, ecotoxicology and risk assessment, with particular emphasis to legacy pollutants and contaminants of emerging concern, such as microplastics, pharmaceuticals, novel pesticides, PFAS and mixtures. Research activities are focused on mechanisms of action and trophic transfer of pollutants, risk to human health, effects of climate change, dredging and disposal operations, impact assessment of gas and oil exploitation, environmental management of highly polluted industrial areas, protection of extreme environments.

**Most recent Research Projects:**

- International Coordinator of the Project "**Hazard Assessment of Marine Mixtures and New Pollutant Synergies, HARMONY**", funded within HORIZON-CL6-2025-01-ZEROPOLLUTION-05, 2026-2029

- Coordinator of the Project "**Innovative approaches and Weight of Evidence elaborations for Environmental Risk Assessment, NEWERA**" funded within National Resilience and Recovery Programme (PNRR) "Multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate" (RETURN)

-National Coordinator of the Activity "**Zero pollution strategy for biodiversity protection**" within the National Biodiversity Future Center, **NBFC**, 2022-2025

- Coordinator of the Research project "**MicroPLASTICs in edible aquatic organisms: ecotoxicological effects, transfer of chemical and biological CONtaminants and susceptibility to bacteria biodegradation** (**PLASTICON**)", 2021-2024, funded by Italian Ministry of Health

-Coordinator of the Research Project "**Development of innovative technologies and circular economy to mitigate the impact of plastic pollution in rocky shores with elevated environmental value** (**SOLVING**)", 2021-2024

- International Coordinator of the Project "**Presence, behavior and risk assessment of pharmaceuticals in marine ecosystems PHARMASEA**" 2021-24

- International Coordinator of the Project "T**owards a risk-based assessment of microplastic pollution in marine ecosystems (RESPONSE)**", 2020-23

- National Responsible of the project "**Ecotoxicological Effects of Microplastics in Marine Ecosystems** (**EPHEMARE**)", 2015-2018,

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### Description

**Vice Rector for Research** at Polytechnic University of Marche
**Former Director** of the Department of Life and Environmental Sciences (DiSVA), 2019-2025.

**Full Professor** in Applied Biology - **Chair** of "Ecotoxicology" and of "Biological and Ecological Risk Assessment", **former Director** of the Master Degree Program in "Environmental Risk and Civil Protection".

Past **Editor-in-Chief** of *Marine Environmental Research* (2011-2021).

**Italian Delegate for the Ministry** of University and Research MUR within Horizon **Missions** "**Restore our Ocean and Waters by 2030**"

Member of the **United Nations Pool of Experts** for the assessment of Ocean and Human Health

Expert on marine pollution from **traditional** and **emerging pollutants** including pharmaceuticals and microplastics, impact of harbor and oil & gas exploitation activities, **ecological risk assessment**. He has been responsible for several projects at international and national level.

Author of more than **270 peer-reviewed publications** in international journals and book chapters, with an ***h*-index= 83**, i10-index= 231 with 28.385 citations (from Google Scholar, http://scholar.google.it/citations); *h*-index= 70, 20.502 citations (from Scopus). Orcid profile: https://orcid.org/0000-0001-6084-6188

Included in the list of **Highly Cited Researcher since 2022** (by Clarivate, Web of Science, ranking the top 1% of most influential researchers for their field over the past decade).

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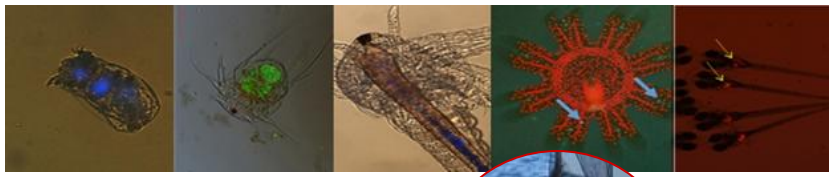
## Staff, equipment and laboratories

## The Research Group: Environmental Chemistry and Ecotoxicology

The research group of Ecotoxicology and Environmental Chemistry of DiSVA, UNIVPM (https://www.disva.univpm.it/content/ecotoxicology-and-environmental-chemistry?language=en) has a strong vocation for the study of **ecotoxicology** and **marine pollution**. The Team has great experience in the use of marine organisms as bioindicators of **environmental stressors**, like **contaminants of emerging concern** (e.g. pharmaceuticals and microplastics) and **climate change**.



The group has the availability of an **advanced Environmental Chemistry Laboratory** (with sophisticated ICP-MS; LC-MS/MS, GC-MS), a **laboratory for microplastics** extraction and characterization equipped with µFTIR spectrometers, fully equipped laboratories for **biomarker analyses**, biochemical and cellular alteration in model species including enzymatic determinations, aromatic metabolites, immunohistochemical, molecular and gene expression, genotoxicity analyses, batteries of main ecotoxicological bioassays.

The research group has multidisciplinary specialization ranging from chemical characterization of environmental matrices and bioaccumulation, development and **application of health-tools** at molecular, cellular and organism level, ecotoxicological bioassays, procedures for weighted elaborations and **environmental risk assessment**.

The **"Aquarium Laboratory"** facility contains more than 100 experimental aquaria, with a total water volume of more than 25.000 L, allowing to maintain and investigate the impact of several stressors under controlled conditions for temperate, tropical and polar marine species.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# PROJECT CONCEPT NOTE:

CALL FOR POSTDOCTORAL CANDIDATES

*MSCA Postdoctoral Fellowship Opportunity*

**AI-MIX: Artificial Intelligence for Predictive Toxicology of Marine Chemical Mixtures**

**Host Institution**: Università Politecnica delle Marche (UNIVPM), Ancona, Italy

**Collaborating Institution**: King's College London (KCL), United Kingdom

We are seeking **outstanding postdoctoral researchers** interested in applying for a Marie Skłodowska-Curie Postdoctoral Fellowship hosted by the Department of Life and Environmental Sciences at **Università Politecnica delle Marche (UNIVPM)** under the supervision of Professor Francesco Regoli**, in collaboration with King's College London** (Dr Luigi Margiotta-Casaluci).

The proposed fellowship will contribute to the development of **innovative approaches for predicting the biological effects of chemical mixtures** in marine environments, combining advances in **environmental toxicology**, **New Approach Methodologies (NAMs)**, and **artificial intelligence**.

**Marine ecosystems** are increasingly exposed to **complex mixtures of emerging contaminants**, including pharmaceuticals, plastic-associated chemicals, pesticides, PFAS and other emerging pollutants. Understanding and predicting the effects of these mixtures represents a major scientific and regulatory challenge. The AI-MIX initiative aims to explore how **mechanistic toxicology data**, **environmental exposure** information and **advanced computational approaches** can be integrated to improve prediction of mixture toxicity within a **One Health perspective**, linking marine **ecosystem health and potential human health** implications.

The fellowship may involve a combination of:

- experimental approaches, such as next-generation *in vitro* models and effect-based assays relevant to marine organisms and/or human exposure pathways
- data-driven approaches, including artificial intelligence, machine learning and mechanistic modelling
- integration of environmental monitoring data and toxicological datasets
- development of predictive tools for mixture toxicity

The exact project will be co-developed with the selected candidate, allowing the fellow to shape the research direction according to personal expertise and scientific interests.

We welcome applicants with backgrounds in areas such as:

- environmental toxicology or ecotoxicology
- computational toxicology or data science
- artificial intelligence or machine learning applied to biological systems
- marine biology or environmental sciences
- mechanistic toxicology and New Approach Methodologies (NAMs)

The fellowship will provide a unique opportunity to work at the interface of marine ecotoxicology, predictive toxicology and data science, benefiting from the **complementary expertise of UNIVPM and King's College London**.

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