

EXPRESSION OF INTEREST FOR A HORIZON 2020/HORIZON EUROPE PROJECT

Title of the targeted call for proposals and/or Topic of interest:

Area 8: Zero-pollution, toxic free environment

Topic 8.1: Innovative, systemic zero-pollution solutions to protect health, environment and natural resources from persistent and mobile chemicals

Contact details

Country	FRANCE
Name of the organisation	Aix-Marseille University (AMU)
Laboratory	M.I.O.
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Short description of AMU:

Aix-Marseille University (AMU) was created in 2012, resulting from the merger of the University of Provence, University of the Mediterranean and Paul Cézanne University. It has more than 78,000 students including 10,000 international students, 7,680 faculty and staff members, 12 doctoral schools and nearly 3,300 PhD students. AMU is home to 132 research facilities. It has undertaken the HRS4R labeling process since June 1st, 2019 and is coordinator of the Erasmus + European University Network "CIVIS". AMU has been involved in more than 100 FP7 projects and until now 101 H2020 projects.

AMU Laboratory/ies involved:

Mediterranean Institute of Oceanography. The MIO is research laboratory of 250 persons that is a component of the OSU-Pytheas Institute and is under the joint direction of Aix-Marseille University, Toulon University, the CNRS and the IRD. Our goal is to better understand the oceanic system and its evolution in response to global changes. The MIO constitutes a center of expertise in marine biology, ecology, biodiversity, microbiology, halieutics, physics, chemistry, biogeochemistry and sedimentology. Our working environment is the world ocean, alongside its continental, atmospheric and sediment interfaces.

Areas of potential contribution:

Indicate your expertise and areas of potential contribution + a short profile of the persons who may be involved in the project

Ecotoxicology of microorganisms

The MIO Microbiology Team has experiences in assessing the impact of contaminants on microorganisms using both field and laboratory approaches at the population scale and the community scale. The impact of contaminants on biota must be assessed by taking into account the complexity of

contamination observed in the environment characterized by mixture of different contaminants (organic and inorganic) often detected at low dose. The MIO Microbiology team conduct projects that take into account this complexity to better assess the impact of contaminants on the first level of the trophic web.

Biomarkers for the detection of pollutants

MIO Microbiology Team has extensive experience in the identification of microorganisms and microbial ecology studies in marine environments. Our team has therefore all the necessary expertise to identify specific microorganisms for the presence of certain pollutants in marine environments. These microorganisms could then be used as a "biomarker" of a given pollution. Rapid and specific tests based on the detection of these "biomarkers" in biotopes would, for example, could be used to map the presence of the considered pollutants and thus improve the assessment and management of the risks generated by these pollutants.

Bioremediation and bioprocesses to remove toxic molecules using marine microorganisms

Our team is expert in bioprocesses (laboratory scale process) using aerobic and anaerobic marine microorganisms (including extremophilic microorganisms). Particular attention is paid use microbial consortia mainly microalgae and bacteria to get benefit of the cometabolism that favors biodegradation of recalcitrant toxic molecules. The team know-how could be taken advantage in projects seeking to clean up aquatic environments.

Keywords :

Microorganisms; bioremediation; ecotoxicology; inorganic and organic contaminants; aquatic ecosystems; extremophiles, ecology, ecophysiology, physiology, anaerobes, bioprocesses.

Short profiles of the main persons involved:

Olivier Pringault <olivier.pringault@mio.osupytheas.fr>

Research director (IRD) at the Mediterranean Institute of Oceanography, (MIO), Olivier Pringault's main interest concerns the ecology of microorganisms in aquatic systems. He conduct projects aiming at understanding the interactions between microorganisms and contaminants. He is particularly interested in the interactions between microalgae and bacteria and how these interactions can be i) affected by contaminants ii) used for the bioremediation of contaminants. He has experience of working with a wide range of techniques (cultures, mesocosms, *in situ*) and situations (on ship, in the field, in the laboratory) and countries (Vietnam, New Caledonia, Fiji, USA, and across Europe), both alone and as part of a group, either as a simple participant or as the coordinator of the program.

Author and co-author of 76 articles published in rank A journals

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Yannick Combet-Blanc <yannick.combet-blanc@mio.osupytheas.fr>

Researcher (IRD) at the Mediterranean Institute of Oceanography (MIO). The ecology of marine microorganisms including the extremophiles, and the bacterial taxonomy, physiology, ecophysiology and bioenergy are the main interests addressed by Yannick Combet-Blanc. Basic research questions concern the trophic interactions between microorganisms such as the H₂-transfer-interspecies in anoxic environments and in oxic-anoxic interfacial areas. Furthermore, he conducts numerous projects aiming to design process using microorganisms (remediation, acid lactic production, hydrogen and methane production, etc.). Among those, projects are or have been developed in south countries such as Tunisia, Morocco, Mexico, and Senegal.

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Other people involved :

- Pierre-Pol Liebgott, Yannick Combet-Blanc : Bioenergy, electromicrobiology
- Marianne Quemeneur, Gael Erauso : extremophiles, metagenomics
- Patricia Bonin, Alain Dolla, Valérie Michotey : microbial ecology, omics, genetics
- Guillaume Blanc/Christelle Desnues : interaction virus/microalgae.
- Benjamin Misson : relationships microorganisms/contaminant