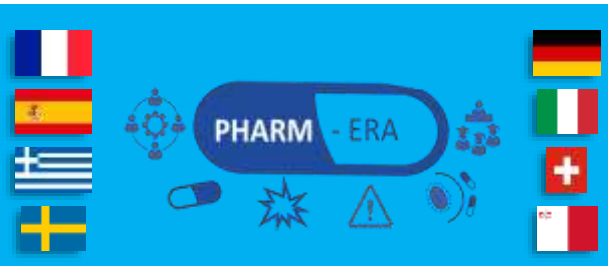
Marie Skłodowska-Curie Actions

Grant agreement 101119261

DOCTORAL NETWORK



PhD POSITION N°4

Project title	Context-dependency on the fate and ecotoxicological effects of antibiotics and antimicrobial resistance on river sediment
Recruiting institution	University of Gothenburg, Sweden

BACKGROUND

This doctoral position is 1 of 10 doctoral positions offered within the he HORIZON Marie Sklodowska-Curie Action (MSCA) Doctoral Network Pharm-ERA: "**Improving monitoring and Environmental Risk Assessment of PHARMaceuticals, antimicrobial resistance and pathogens from terrestrial to aquatic environments**".

Global contamination of soil and aquatic ecosystems by pharmaceutical and microbiological pollutants (such as antimicrobial-resistant microorganisms and/or pathogens) raises severe concerns about impacts on ecosystem health and repercussions on humans and animals. Preserving ecosystems from adverse ecotoxicological effects of pharmaceuticals and their transformation products, and limiting the environmental spread of antimicrobial resistance and pathogens is imperative to reach several UN Sustainable Development Goals as well as the European Green Deal, Water Framework Directive and Biodiversity Strategy for 2030. In this context, the main scientific objective of Pharm-ERA is to develop and implement innovative concepts, methods and strategies to improve the monitoring and assessment of the environmental effects and risks of pharmaceuticals, their transformation products, antimicrobial resistances and pathogens from terrestrial to aquatic environments. The ultimate goal is to provide scientific evidence and expertise to contribute to reducing the environmental spread and impact of these chemical and microbiological contaminants and to preserve microbial diversity and functions across the soil-water-sediment continuum.

By joining Pharm-ERA, you will integrate a high-level interdisciplinary and intersectoral research and training network based on 10 doctoral projects covering scientific disciplines including environmental and analytical chemistry, microbial ecology, ecotoxicology, molecular biology (incl. multi-omics approaches) and chemical fate/effect modelling. Pharm-ERA involves 9 Beneficiaries (including 2 non-academics) and 6 Associated Partners (including 5 non-academics), committed to contribute to research, training, dissemination, communication and exploitation of results targeting end-users such as environmental consultancies and agencies.

DESCRIPTION OF THE PhD PROJECT

Antibiotics and antimicrobial resistance (AMR) pollution in urban rivers receiving waste water treatment plants (WWTP) effluents is common, but their fate, and environmental risk remains poorly studied in river sediment. Context-dependency (ecological abiotic and biotic factors) influences the assembly of natural communities of bacteria and may affect their sensitivity to antibiotics and AMR. This PhD project will provide new knowledge on the interactions between pollutants (residues of antibiotics and AMR) and sediment bacteria, under altered abiotic and biotic contexts: a gradient of microbial diversity, pre-exposure history and/or pollution levels. Experimental studies using natural microbial communities in microcosms facilities and field sampling will be implemented for hypothesis testing. Effects will be quantitatively assessed by linking microbial composition and function using a combination of molecular tools such as metagenomics, quantitative PCR, and eco(tox)logical methods such as nitrogen turnover processes and antibiotics transformation rates.

The PhD student will join the Algal and Microbial Ecotoxicology Lab at the University of Gothenburg (Sweden) and work with experimental testing, environmental microbiology, molecular approaches, microbial functions, and sequencing-based tools. In addition, the PhD student will have hand-on isolation of antibiotics resistance bacteria and antibiotics turnover in collaboration with the Agroécologie Laboratory at INRAE BFC, Dijon (France) and on environmental analytical chemistry in collaboration with IDAEA-CSIC, Barcelona (Spain). Overall this PhD will prepare you to become an environment expert in environmental microbiology, ecotoxicology, community ecology and risk assessment.

PRACTICAL INFORMATION

Recruiting institution	University of Gothenburg, Sweden
Doctoral school	University of Gothenburg, Sweden
Supervisors	Dr. Natàlia Corcoll Cornet (University of Gothenburg, Sweden), Dr. Fabrice Martin-Laurent (INRAE, France), Dr. Victoria Osorio (IDAEA-CSIC, Spain).
Non-academic mentor	Dr. Alexandra Meziti (SmallOmics, Greece)
Main host laboratory	University of Gothenburg, Sweden, Dr. Natàlia Corcoll Cornet (Algal and Microbial Ecotoxicology Lab), to perform experimental studies, environmental microbiology and molecular approaches, measure microbial functions, and use sequencing-based tools.
Secondments (1 to 6 hosting months)	1) INRAE BFC (Dijon, France) to assess the mineralization of selected antibiotics in sediments using 14C-radiorespirometry experiments and isolation of antibiotic-resistant bacteria, under the supervision of Dr. Fabrice Martin-Laurent 2) IDAEA-CSIC, Barcelona, Spain to determine the levels of antibiotics, including their transformation products, in water and sediment samples produced in field and lab-based studies, under the supervision of Dr. Victoria Osorio 3) SmallOmics, Greece, to get training on bioinformatics and realisation of sequencing data analysis, under the supervision of Dr. Alexandra Meziti

RECRUITMENT CRITERIA

General criteria

- MSCA Mobility Rule: researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their date of recruitment
- All researchers recruited in a DN must be doctoral candidates (i.e. not already in possession of a doctoral degree at the date of the recruitment)
- Scientific excellence to fit the PhD project
- Fluent (oral and written) English skills as the project operates in English language
- Knowledge of the language of the host country may be considered a merit
- Team-mindedness

Criteria specific for PhD4

- Knowledge in environmental microbiology, microbial ecology, molecular biology, laboratory work, some bioinformatics, environmental analytical chemistry, academic writing and data analysis
- Master degree in environmental microbiology, ecotoxicology, aquatic ecology, environmental sciences or similar programs
- Be aware that the University of Gothenburg asks each candidate to apply through its web portal in parallel to Pharm-ERA email application. Please follow the link to complete your application on line. **Be aware that candidates who will not go through the University of Gothenburgh online application will be discarded.**

APPLICATION

Documentation to be sent in by the applicants

- Application form completed
- CV + Letter of motivation
- Contact of two reference persons to be contacted by the selection committee (name, relation to the candidate, e-mail address and phone number)
- Complete list of publications and academic works
- Proof of language proficiencies
- Proof of master diploma or 2024 registration to master degree

How to apply?

- Apply directly through the UNIVERSITY OF GOTHENBURG web portal
- **Be careful to join all documentation required** (see list above)

Deadline for application

April 2024, 24th – Apply directly through the UNIVERSITY OF GOTHENBURG web portal

Contact

pharm-era@inrae.fr