

Characterisation of new microbial players and biomarker genes of chloromethane production and degradation processes in the marine environment

We are looking for an inquisitive, dynamic and motivated person for this thesis project in microbiology, at the interface with environmental sciences. The work will be carried out under the supervision of Dr. Thierry Nadalig, senior lecturer in the team "Adaptations and interactions of microorganisms in the environment" (AIME) at GMGM (UMR 7156 CNRS) at University of Strasbourg, and of Prof. Stéphane Vuilleumier, team head. It will take place within the framework of the French-German research project MAHABIO "Cruising the marine halomethane cycle: microbiology, biochemistry and geochemistry of reference bacteria, new microbial players and underlying processes" led by Thierry Nadalig and funded by the French National Research Agency ANR in 2021.

Chloromethane (CH_3Cl) is a gas involved in the destruction of atmospheric ozone and is produced mainly naturally. The oceans represent an important source of CH_3Cl production but also a potential sink, poorly known, linked to its degradation by marine bacteria. The MAHABIO research project aims to study the marine cycle of CH_3Cl using cultural, analytical and molecular approaches.

The thesis project will be part of an innovative interdisciplinary and collaborative work aiming to discover and characterise the microbial diversity and processes involved in the production and consumption of CH_3Cl in the marine environment. It will draw on the complementary expertise of the French-German MAHABIO consortium, and will also involve the preparation of reports, seminar and conference presentations, and scientific publications.

The experiments to be conducted will include :

- isolation of CH_3Cl degrading strains and characterisation of genetic biomarkers of CH_3Cl degradation.
- characterisation of the taxonomic and functional bacterial diversity of CH_3Cl degradation in coastal marine sediments and during enrichment experiments with CH_3Cl .
- the study of interactions between CH_3Cl producing and consuming bacteria using synthetic communities.

Eligible applicants will have:

- a Master degree in microbiology, molecular biology or equivalent (delivered before September 2022, or obtained in 2021);
- practical experience of several experimental techniques in molecular biosciences;
- good command of oral and written communication, in French and/or in English;

An interest in environmental issues, working knowledge of bioinformatic tools and of biostatistics, knowledge in pollutant transformation processes, and/or international experience will represent additional assets.

Work context and complementary information

The team AIME (GMGM, UMR 7156 CNRS, <https://aime.unistra.fr>) aims to understand the molecular basis of bacterial metabolism of organohalogenes, and to characterise microbial communities in the environment by applying functional genomics approaches.

Research at University of Strasbourg covers all areas of science, and encourages interdisciplinary and international collaborations. Located at the heart of Europe in a trinational region of dynamic economic activity, Strasbourg is a pioneer city in terms of environmental awareness in France, and a very pleasant place to live in.

Application and contact address: Dr. Thierry Nadalig (nadalig@unistra.fr) and Prof. Stéphane Vuilleumier (vuilleumier@unistra.fr).

To apply, please send letter of motivation, CV, copies of certificates, and the names and contact information of potential referees as a single pdf file.

Applications will be processed as received, starting from March 2022. Final closing date for applications is April 30, 2022. Preferred starting period will be October 2022.