

From *October 1st 2020* to *October 1st 2023*

Title: Metal accumulation and toxicity towards microalgae in presence of organic compounds

Thesis abstract:

Metals are natural components of aquatic ecosystems and, some of them are essential to sustain life so that their assimilation is a critical physiological need for organisms. Anthropogenic activities increase their natural concentrations in inland waters, leading to potential degradation of water quality and negative impacts on aquatic life. In order to protect aquatic organisms, environmental quality standards are internationally established and are defined as being the concentration above which a negative impact may occur. These regulatory thresholds are derived from ecotoxicological tests performed in the laboratory, on one model organism exposed to one contaminant at a time. Community impacts are then further assessed through modeling of compiled organism responses (e.g. Species Sensitivity Distributions), omitting direct and indirect relations between organisms. Mixtures of contaminants are still rarely addressed and often with lack of climate change perspective. In this context, the present project focuses on mechanistic understanding of metal accumulation and effects towards microalgae living in microbial communities in the presence of organic compounds, of natural and synthetic origins.

Key words: Ecotoxicology, biogeochemistry, limnology

Funding: E2S UPPA project from the university of "Pau et des Pays de l'Adour" UPPA

Working conditions:

Hosting laboratory: IPREM

Localisation address: 2 avenue du Président Angot,

Laboratory expertise: Ecotoxicology laboratory

Thesis Director: Dr Séverine Le Faucheur

Starting Date: *September 1st 2020*

Duration: 3 years

Gross salary: 1 870 € / month (which includes extra gratification for teaching duties – 32h per year)

Mission - Main activities:

Scientific framework

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Species Sensitivity Distributions), omitting direct and indirect relations between organisms. Mixtures of contaminants are still rarely addressed and often with lack of climate change perspective. In this context, the present project focuses on mechanistic understanding of metal accumulation and effects towards microalgae living in microbial communities in the presence of organic compounds, of natural and synthetic origins.

Purpose(s)

In this context, the present project focuses on mechanistic understanding of metal accumulation and effects towards microalgae living in microbial communities in the presence of organic compounds, of natural and synthetic origins. This work will be carried out through laboratory experiments in which model algae will be exposed to media containing various metal and organics concentrations and nature. Algae will be analyzed for accumulation, intracellular distribution, and toxicity. In addition, similar approach will be used with biofilms (communities living on immersed substrata) in natural (*in-situ*) and artificial rivers (PERL facilities hosted by Total).

Expected results

The overall results will bring insights on the evaluation of mixture toxicity towards biofilm communities and are expected to improve current metal-toxicity predicting model.

Research collaborations

Total and Rio Tinto scientists

UPPA: Dr Bruno Grassl, Dr Marie-Pierre Isaure, Dr Stéphanie Reynaud and Dr Dirk Schaumlöffel

Applicant's profile:

The candidate will work with metal speciation techniques and bioanalytical approaches, develop rigorous ecotoxicological bioassays in laboratory and mesocosms, and use computational techniques. The ideal candidate has a master's degree in environmental sciences or analytical chemistry with a special interest in ecotoxicology or biogeochemistry. He/She is passionate for environmental problematics, rigorous and highly motivated to be part of our scientific teams composed of ecotoxicologists, biogeochemists and analytical specialists. A previous experience in ecotoxicological testing would be a plus. The candidate must have a good English level and the capacity to work autonomously.

Application - Evaluation criteria:

Application file assessment: Selection committee

Candidates will first be selected based on their application file.

Those selected after this first step, will then be interviewed.

Application files will be evaluated based on the following criteria:

- Grades and ranking during your Master degree, steadiness in your academic background
- English language proficiency
- Candidate's ability to present her/his work and results



DOCTORAL POSITION



Work experience similar to an internship in a laboratory – or likewise; previously achieved research work (reports, publications).

Application will include: *(in a single pdf file)*

- CV
- Cover letter
- Master degree grade transcripts and ranking
- Reference letter
- Contact details of at least two people, from you work environment, who can be contacted for further reference

Application must be sent to the following email address with the title “Doctoral application”:
severine.le-faucheur@univ-pau.fr

For more details, please visit our websites: <http://e2s-uppa.eu/en/index.html> and <https://iprem.univ-pau.fr/fr/collaborations/chaire/ecotox/presentation.html>

Application deadline:

July 17th 2020