

Description of Research Project

The ERC-funded project aims to investigate interactions of various metallophilic chemolithoautotrophic microorganisms with complex mineral materials. We examine laboratory and environmental microbial-mineral interactions at the micrometer and nanometer scale and characterise microbial fingerprints left on minerals of terrestrial and extraterrestrial origin (<https://www.nature.com/articles/s43247-021-00105-x#Ack1>; <https://www.frontiersin.org/articles/10.3389/fmicb.2019.01492/full>).

We further aim to investigate the ecological distribution of metallophilic microorganisms in diverse extreme environments through metagenomic approach and characterise previously uncultivated microorganisms in laboratory conditions by studying their physiology, biochemistry, and probing novel microbial interactions with terrestrial and extraterrestrial minerals. This approach aims to reveal novel microbial species capable of living on, interacting with and utilizing metals from extraterrestrial material at the edge of living limits. We are currently looking for a highly motivated postdoc to examine microbial genomes and transcriptomes from diverse extreme ecosystems and laboratory cultures. The candidates with strong background in microbiology, microbial isolation, bioinformatic skills coupled to next-generation-sequencing methods for assembling and characterizing microbial genomes and phylogeny will be given preference. Knowledge of microbial genomes, general biochemistry and physiology of metal-transforming microorganisms is equally expected.

Description of CBM

The Center for Molecular Biophysics (CBM, <http://cbm.cnrs-orleans.fr>) is a research unit of the French National Center for Scientific Research (CNRS), affiliated with the University of Orléans. At the Exobiology Group of the CBM in Orléans, PostDoc position is available in the field of microbiology, bioinformatics, bio(geo)chemistry, astrobiology, and the genomics-based study of microbial interactions with various minerals within the framework of a project funded by the ERC. The Exobiology Group at the CBM provides extensive supervision and expertise for cultivation and physiological characterisation of metallophilic microorganisms, biochemistry of extremophiles, molecular techniques, electron microscopy and analytical spectroscopy techniques, as well as participation in a continuously evolving scientific projects.

Activities

Domains of the research: microbiology, genomics, molecular biology, astrobiology, microbial bio(geo)chemistry.

The activities of the recruited person:

- Participation and implementation of research projects with a focus on genomics and molecular biology of microbial-mineral interactions, including field campaigns and analysis of environmental samples from extreme environments;
- Supervision of students and participation in the administration of the laboratory, teaching and research;
- Process and interpret experimental data;
- Present and promote the results obtained (reports, publications, conferences);
- Collaborate with team and consortium members, exchange and share knowledge;
- Ensure compliance with milestones and deliverables.

Specificities

Service / Laboratory

Centre de biophysique moléculaire (CBM) d'Orléans, France.

Starting date of the employment

As soon as possible. The vacancy is available for several years with the subsequent opportunity to apply for a permanent position.

Required research profile

Expected skills:

- PhD in microbiology, bioinformatics, molecular biology, biogeochemistry, or related biology fields.
- Fundamental techniques and computational tools of microbial ecology and microbiology.
- Previous work experience in one or more programming languages.
- A strong interest and a passion for science and research.
- Excellent command of written and spoken English, French would be desirable.

Tools:

- Genetics, genomics, and other microbial ecology tools.
- Cultivation, microbial isolation techniques, molecular biology, and biochemistry tools.
- Conventional laboratory techniques, such as spectroscopy and electron microscopy.

Qualities :

- Strong interest in experimental work;
- Autonomy and a taste for teamwork (6 other persons from our group are involved in this ERC project);
- English: excellent read, written and spoken;
- Know how to communicate and promote research;
- Spirit of initiative, analysis and synthesis;
- Organised, rigorous, respectful of safety instructions.

Applications

If you are interested, please send your application including CV, list of publications, and 3 references to Prof. Tetyana Milojevic: tetyana.milojevic@cnrs-orleans.fr (Chair of Exobiology at the University of Orléans, Head of Exobiology Team, CNRS-Centre de Biophysique Moléculaire, Rue Charles Sadron, 45071 Orléans cedex 2, France).

