



2 Post Doc positions in microbial ecology in the MMG Group at the University of Calgary

Groundwater Microbial Ecology

At the University of Calgary, the Microbial Markets Lab and the Applied Geochemistry Group have an opening for a postdoctoral scholar. The position is for at least two years with potential for extension with a preferred start date some time in 2023.

The ideal candidate combines experience in microbial ecology and metagenomics with expertise in groundwater biogeochemistry. We are looking for a candidate with 0-4 years of experience after completing their PhD.

The project investigates the natural and anthropogenic causes of groundwater contamination with fertilizer N and P, sulfate, selenium, manganese, arsenic and salts and potential remediation. Approaches include multi-omics analyses of fresh groundwater samples to assess the potential for microbial remediation as well as stable isotope probing of same groundwater samples. Further, long-term mesocosm experiments will be set up to study the effect of selected contaminants on groundwater quality and microbiomes.

The postdoc will join the Microbial Markets and Geomicrobiology (MMG) group at the University of Calgary (<https://www.ucalgary.ca/labs/ebg>). MMG is embedded in a multidisciplinary network of geochemists, ecologists and microbiologists at the University of Calgary, Alberta Environment and Protected Areas and other collaborating agencies.

The science is enabled by a large regional-scale historical groundwater dataset that is unique worldwide and links microbial-community compositions to geochemistry across hundreds of samples collected in the past 6 years [1]. Groundwater is a current frontier in biogeochemistry/microbial ecology with excellent potential for groundbreaking discovery. Groundwater is also an existential resource for human well-being under critical threat of climate change and over-exploitation.

Interested applicants should send a CV and cover letter to Prof. Marc Strous: mstrous@ucalgary.ca

[1] S. Emil Ruff, Pauline Humez, Isabella Hrabec de Angelis, Michael Nightingale, Muhe Diao, Sara Cho, Liam Connors, Olukayode O. Kulojo, Alan Seltzer, Samuel Bowman, Scott D. Wankel, Cynthia N. McClain, Bernhard Mayer, Marc Strous (2022) Hydrogen and dark oxygen drive microbial productivity in diverse groundwater ecosystems. Nature Communications 14, 3194 <https://doi.org/10.1038/s41467-023-38523-4>.



2 Post Doc positions in microbial ecology in the MMG Group at the University of Calgary

Geomicrobiology of Underground Hydrogen Storage

The Geomicrobiology Group at the University of Calgary has an opening for a postdoctoral research associate in the geomicrobiology of underground hydrogen storage [1].

The ideal candidate will have expertise in microbial ecophysiology and metagenomics, hydrogen metabolism and the deep biosphere. Candidates may be eligible as post docs (0-4 years since PhD) or research associates (>4 years).

The project aims to understand the fate of hydrogen temporarily stored underground, a critical component of the future hydrogen economy. Storing hydrogen at scale requires large volumes such as salt caverns or petroleum reservoirs. Whether or not microbiomes in these extreme environments will oxidize stored H₂ represents an operational risk that will be investigated. Work will examine hydrogenases in new and existing metagenomic datasets, quantify hydrogenase genes in subsurface samples using molecular methods, and incubate subsurface samples under different relevant conditions.

The postdoc will join the Microbial Markets and Geomicrobiology (MMG) group at the University of Calgary (<https://www.ucalgary.ca/labs/ebg>). MMG is embedded within a broader network of ecologists, microbiologists, geoscientists and engineers, including collaborators at the Geological Survey of Canada, within energy companies and at other universities (e.g., UC Berkeley and Monash University).

In addition to analyzing existing metagenomes [2], new subsurface samples are being provided by government and industry partners. Field sampling where elevated H₂ concentrations exist will provide additional opportunities to understand geobiological systems relevant to underground storage. This is an opportunity to integrate geomicrobiology and genomics of deep biosphere environments to support an energy transition toward green and renewable alternatives.

Interested applicants should send a CV and cover letter to Prof. Casey Hubert: chubert@ucalgary.ca

[1] <https://doi.org/10.1016/j.ijhydene.2020.12.058>

[2] <https://journals.asm.org/doi/10.1128/msystems.00884-22>