Job Announcement

Postdoc and PhD Positions

Group of Alexander Loy, Division of Microbial Ecology (www.microbial-ecology.net)
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within the Austrian Science Fund (FWF) project

The wetland sulfur microbiome - Intra- and interspecies metabolic interactions

Wetlands are responsible for about a third of the global annual emission of the potent greenhouse gas methane and are key ecosystems in global carbon cycling and climate change. Sulfur-cycling microorganisms have an important but undervalued role in organic matter degradation and in controlling methane emissions from wetlands. They suppress methane production by diverting the carbon flow away from methanogenic archaea. While a few studies provided first insights into the identity and ecological role of sulfate-reducing bacteria, microorganisms involved in the various individual steps of sulfur cycling in wetlands are under-characterized. It is also largely unknown how cycles of the various elements in the wetlands are connected through interacting microbial metabolisms, both within and between species.

This project thus aims at establishing the first comprehensive overview of the sulfur microbiome in wetlands. Selected research questions that will be addressed are: What is the identity and ecophysiology of microorganisms that reduce or oxidize sulfur compounds of intermediate oxidation states, e.g. sulfite, thiosulfate, tetrathionate, elemental sulfur, for energy generation? What is the physiological interplay between generalists that utilize diverse sulfur compounds of various oxidation states and specialists that utilize only selected sulfur compounds? How is sulfur metabolism in wetland microorganisms linked to complementary utilization of compounds of other element cycles such as carbon, nitrogen, and iron?

We will initially draw on available metagenome, metatranscriptome, and supporting biogeochemical data from diverse native wetlands or wetland experiments to establish a genome collection of uncultured sulfur-cycling microorganisms and reveal their putative physiological functions and interspecies interactions. Genome-based physiological predictions will be evaluated through monitoring microbial activities in a series of defined soil microcosm experiments by molecular biology, stable isotope probing, and biogeochemical techniques. The combination of modern genome-centric and strain-level Omics approaches with experiments designed to test specific metabolic hypotheses will lead to a better understanding of the identity and distribution of sulfur-cycling microorganisms and the physiological mechanisms that allow them to provide central ecosystem services in the different wetlands.

Required qualifications. I am looking for highly motivated and independently working scientists. Applicants should have a strong background in microbial ecology & physiology, geomicrobiology, and computational microbiome data analyses and interpretation. Experience in the following areas/techniques is advantageous: molecular microbial community analyses, bioinformatics (i.e. analyses of large metaOmics and environmental datasets), stable isotope probing, isotope analytics, and anaerobic cultivation techniques. Proficiency in spoken and written English is mandatory.

Conditions of appointment. Up to 3 years of appointment according to the salary scheme of the FWF https://www.fwf.ac.at/en/research-funding/personnel-costs/. The University of Vienna is an equal opportunity employer.

Mode of application. By **email** (subject: **Postdoc Wetland Sulfur Microbiome** or **PhD Wetland Sulfur Microbiome**) to Alexander Loy, loy@microbial-ecology.net containing a **single pdf-file** with

- **a short letter of motivation**,
- a **detailed CV** (including a brief description of research interests, previous employments, and publication list),
- **contact details of at least two references** (letters of recommendation are optional), and
- (postdoc applicants) **reprints of your two most important published articles**.

Application deadline. Open until filled. **Job start** is flexible but preferably in early 2019.