

Postdoc Position

Discovering Secreted Small-Molecule Chelators in the Environment

The Baars group (<https://baarslab.wordpress.ncsu.edu>) at NC State University invites applications for a Postdoctoral position. We use new analytical approaches in a biological context to profile and characterize biologically secreted metabolites that are triggered by abiotic and biotic interactions in the environment.

This position will focus on molecular controls on metal limitation and toxicity via secreted metal chelating metabolites (the 'chelome') in soil and freshwater. There are almost no measurements of biogenic chelators in the field because of the technical challenge to analyze these compounds at trace-concentrations in the extremely complex soil matrix. There is an urgent need for direct measurements of the concentrations, structures, and chemistries of secreted biogenic chelators in soil and freshwater to understand the extent of limitation of plant productivity and microbial activity by iron and other required or toxic metals.

The first goal of this position will be the implementation of a new analytical platform to analyze soil and freshwater samples for biogenic metal chelators and provide answers to these questions under environmentally relevant conditions. The instrumental approach utilizes recently published methods based on the sensitivity and separation power of high-resolution LC-MS and LC-ICPMS. Ancillary analyses, for example by electrochemistry, can also be performed. Further projects can involve controlled cultures with microorganisms and plants, isolation and chemical characterization of new secondary metabolites, the development of methods for imaging mass spectrometry, and system-wide exometabolomics.

Apart from the direct interest for agriculture and human health (nutrition, toxic metal uptake, and sequestration), the results will provide insight into metal controls on terrestrial carbon and nitrogen fixation.

Screening of applicants will begin immediately, and applications will be considered until the position is filled. The position will be available as early as July 2018 for up to three years based on annual performance evaluation. For further information, contact Dr. Oliver Baars (obaars@ncsu.edu). Formal applications, including a Cover Letter, CV, and list of three references should be submitted at:

<https://jobs.ncsu.edu/postings/99958>

The ideal candidate will combine strong skills in instrumental analysis with prior experience in microbiology, microbiome research, metals in biology, biogeochemistry, metabolomics, natural products research or related areas.