

**Prof. Dr. Alexander J. Probst**

Aquatic Microbial Ecology, Biofilm Center, University of Duisburg-Essen,  
Essen, Germany

---

**Pirating the pirates:  
Microbial interactions in the deep terrestrial biosphere**

Little is known about the microorganisms that live hundreds of meters below our feet due to the little accessibility of sampling material. We investigated this so-called deep biosphere via sampling groundwater that was brought to the surface by cold, CO<sub>2</sub>-driven geysers. We show that great diversity of organisms resides in these ecosystems forming complex microbial interactions. Lipid analysis provides evidence that dark carbon fixation is the primary process driving the carbon flux in these ecosystems and suggests that parts of microbial membranes are redistributed within the community. Detailed metagenomic analyses demonstrate that one specific microorganism from these communities, *Candidatus Altiarchaeum* sp., is globally abundant and heavily targeted by parasites and viruses. Using fluorescence microscopy of samples directly from the environment, we show the infection of this organism by parasites and by viruses. Our research contributes a growing body of literature that demonstrates the complexity of microbial life hundreds of meters below the surface.