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Diversity and function of microorganisms from ultramafic- and basalt-hosted vent systems on the Mid-Atlantic Ridge

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The host rock of a hydrothermal system defines that system's fluid chemical composition. Therefore, the type of host rock plays a major role in determining the most abundant energy sources that are available for microorganisms. In ultramafic-hosted systems hydrogen concentrations are significantly higher than in basalt-hosted systems. In this study, we investigated the influence of ultramafic- and basalt-hosted systems on the distribution of the indigenous microorganisms.

For this purpose, samples were collected from vent sites on the Mid-Atlantic Ridge (MAR), namely the ultramafic-hosted Logatchev (15^{o}N) and basalt-hosted hydrothermal fields from the southern MAR. The microbial community analysis of the hydrothermal fluids based on 16S rRNA genes showed that the diversity of microorganisms closely related to hydrogen oxidizers was higher at Logatchev than at the southern MAR sites (Perner et al. 2007a, FEMS Microbiology Ecology 61: 97-109; Perner et al. 2007b, Environmental Microbiology 9: 1186-1201). Correspondingly, the diversity of the gene used for hydrogen uptake by *Epsilonproteobacteria* was also higher

at Logatchev than at the Southern MAR vent sites. This suggests that the high hydrogen concentrations at Logatchev have led to a higher diversity of hydrogen-oxidizing microorganisms. We are currently using uptake experiments with labeled inorganic carbon to investigate the relative contribution of hydrogen versus other energy sources to microbial CO_2 fixation at these ultramafic- and basalt-hosted systems.