Proposal for SPP 1144, 3rd phase

Microbial communities and metabolisms responsible for chemolithoautotrophic energy and carbon transfer at the Mid-Atlantic Ridge

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The project aims at investigating the temporal and spatial variations of the free-living chemolithoautotrophic microorganisms at different hydrothermal vents on the Mid-Atlantic Ridge and their associated physiological properties involved in transferring energy and carbon from the geological into the biological world. The focus lies on the role that substrates and fluid chemical compounds play as energy sources for the autotrophic community and on the CO_2 fixation pathways used. In this regard, chemolithoautotrophic Epsilonproteobacteria will be of special interest. For the proposed studies, molecular biology tools as well as cultivation experiments will be used. The applicant will cooperate with geophysicists, geochemists and geologists because the proposed microbiology studies depend on a solid physico-chemical and mineralogical characterization of the ambient habitat the chemolithoautotrophs live in. The resultant findings will expand our knowledge of the freeliving chemolithoautotrophic microorganisms and their functioning in their natural habitat. This will provide a better understanding of geological-biological interactions at deep-sea hydrothermal vents.