



## **Diversity of deep-water ecosystems: Investigating mat-forming giant sulfide-oxidizing bacteria at cold seeps**

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Typical features of cold seep ecosystems are microbial mats commonly associated with highly sulfidic, and often gassy sediments. These mats are formed by a yet unknown diversity of giant sulfide-oxidizing bacteria. The mats are often formed by large vacuolated filamentous bacteria belonging to the genus *Beggiatoa*, which thrive at the oxic/anoxic sediment interface, using oxygen or nitrate as terminal electron acceptor in sulfide oxidation. Based on 16S rDNA analysis these bacteria are closely related to marine filamentous *Thioploca* spp. and to the spherical shaped “sulfur pearl” *Thiomargarita*. Identification of the different types of sulfide oxidizers has been so far primarily based on morphological properties such as cell diameter and shape. However, microscopical analyses of the composition of microbial mats from HERMES study sites off Norway and the Eastern Mediterranean show a much larger variety of unknown morphotypes than previously anticipated. This study aims at investigating the biodiversity and ecological role of giant sulfide-oxidizing bacteria at cold seep systems on the margins of European Seas. By using molecular tools of increasing resolution, phylogenetic differentiation of morphologically similar filaments is investigated, and some of the missing links between morphology and phylogeny for those giant bacteria will be filled. We combine the biodiversity studies with the in situ investigation of physico-chemical and biological parameters of the environment, to identify and characterize typical habitats of different mat-forming sulfide oxidizers at continental margins as well as to investigate their link to the geological drivers of such ecosystems.