Deep Ocean Drilling Reveals Extensive Microbial Populations Beneath the Sea Floor

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One of the major achievements of the Ocean Drilling Program (ODP) has been the discovery that bacteria are not only present at much greater depths (>750 meters) beneath the deep seafloor than was previously thought but actually thrive there in colossal numbers. Sampling deep within the oceanic sedimentary section and in basaltic crust has revealed a complex and very active microbial fauna. Results to date indicate that the deep sub-seafloor microbial ecosystems found in both oceanic crust and the deep subsea sediments comprise a hidden world entailing a new form of life, previously unrecognized. The extent of this major biosphere and the nature of the "extremophiles" living there are essentially unknown. Deep ocean drilling offers the potential to probe this unexplored world of the deep sub-seafloor, which represents a unique habitat that couples biosphere/geosphere cycles.

During the last decade of the 20th century, the ODP has made a concerted effort to begin the exploration and sampling of the Earth's deep, sub-seafloor biosphere. A Pilot Project was initiated in the current phase of the ODP to meet the emerging challenges in the study of the deep biosphere. Recent sampling efforts have demonstrated that uncontaminated samples of the microbial fauna can be recovered from the deep sea for laboratory study. The next phase of deep ocean drilling, currently designated the Integrated Ocean Drilling Program (IODP), will emphasize a major new initiative to explore for new species of ancient, but still living biota that lie deep within the Earth, and decipher their physiology and life cycles.