Deep sub-seafloor microbiology research by Anna Kaksonen

Extensive sampling of previously unexplored deep sub-seafloor sediments was performed for microbiological studies on November 16 through December 19, 2007 when Dr. Anna Kaksonen from the Tampere University of Technology (TUT) participated in the IODP Expedition 315 in the Nankai Trough, offshore the Kii Peninsula in Japan. This was one of the expeditions in the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE).

Figure: Deep Sea Drilling Vessel CHIKYU.

Figure: Deep Sea Drilling Vessel CHIKYU.

During the expedition, samples were retrieved from whole round cores and preserved for cell counting, DNA- and RNA-based studies, and culturing of micro-organisms. Enrichment cultures of sulfate reducers were set up using different electron and carbon sources and incubation temperatures. Cells in selected samples were stained with a DNA-binding dye and examined with epifluorescence microscopy.

Dr. Fumio Inagaki, a marine microbiologist of Kochi Institute for Core Sample Research of Japan Agency for Marine-Earth Science and Technology (JAMSTEC-KOCHI), Japan, participated in the next IODP Expedition 316 and collected sediment samples from the geologically active splay fault zone. Samples collected during these two expeditions will be further characterized by molecular ecological and culturing techniques during Dr. Kaksonen's three-year research project funded by the Academy of Finland. The IODP Expeditions 315 and 316 have excellent potential to serve as a start-up for research cooperation between TUT and JAMSTEC-KOCHI.

Figure: Preserving samples in an anaerobic chamber for culture-based studies.