Spatial distribution and diversity of microbes in deep marine sediments on the Pacific Ocean

Fumio Inagaki[1]; Takuro Nunoura[2]; Satoshi Nakagawa[3]; Ken Takai[3]

[1] JAMSTEC; [2] XBR, JAMSTEC; [3] SUGAR Program, JAMSTEC

Marine subsurface sediments harbor huge microbial biomass on Earth; however, the diversity and distribution of microbes as well as their biogeochemical functions and roles remain poorly understood. We studied the biogeographical distribution and diversity of microbes in deep marine sediments at several locations on the Pacific Ocean (i.e., West Philippine Basin [KR99-10], Sea of Okhotsk [IMAGES2002], Peru Margin [ODP Leg 201], Eastern Equatorial Pacific [ODP Leg 201], Cascadia Margin [ODP Leg 204], Juan de Fuca Ridge Flank [IODP Leg 301]). Molecular analyses based on 16S rRNA and other functional genes suggest that microbial communities in deep sediments are highly diverse and composed mostly of as-yet-unidentified components. In addition, the community structures are significantly affected by sedimentological and geochemical characteristics such as the presence of methane hydrate, regardless of the location on the Pacific Ocean∗. Our results are significant foward investigating the ecological roles how deep microbes play in Earth's essential biogeochemical processes.

∗Inagaki, F., Nunoura, T., Nakagawa, S., Takai, K., et al., (2006) Biogeographical distribution and diversity of microbes in methane hydrate-bearing deep marine sediments on the Pacific Ocean Margin. Proc. Natl. Acad. Sci. USA. In press.