

# IODP Proposal-The DEEP HOT BIOSPHERE Drilling

# Ken Takai[1]

[1] SUGAR Program, JAMSTEC

Possible existence of functionally active, metabolically diverse microbial ecosystem beneath deep-sea hydrothermal seafloor, so-called 'subvent biosphere', has been postulated by a number of interdisciplinary investigations in a variety of hydrothermal systems with different tectonic and geological settings, but it has been yet-unproved. We propose here to undertake a drilling expedition of the subvent biosphere that we call 'DEEP HOT BIOSPHERE (subseafloor biosphere in deep-sea hydrothermal systems in mid Okinawa Trough) Drilling', with the goal of characterizing the architecture of microbial ecosystem in physical, geochemical and hydrogeologic variations strongly associated with the hydrothermal activities in the mid Okinawa Trough (Iheya North as primary target and Izena Hole as secondary target), a sediments-hosted, backarc rifting, continental margin. The proposed project focuses on the compositional and isotopic shift in biologically essential chemical components in fluids such as carbon dioxide, methane, hydrogen, sulfur/sulfide, oxygen and organic compounds, which are enriched or depleted by physical, chemical and biological processes throughout the overall hydrothermal fluid circulation of the mid Okinawa Trough.