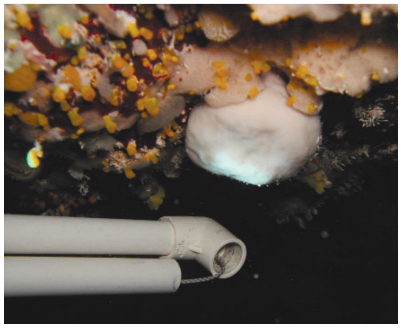
Expedition Produces Results for Magellan and Applied Subsea

Magellan Bioscience Group Inc. of St. Petersburg, FL, a developmental biotechnology company and Applied Subsea Technologies Inc. of Providence, RI, a marine technology development company, recently returned from an expedition to the Bahamas focused on bioexploration, in extreme environments for new marine natural products.



Sponge sample on cave wall
—Photo by Michael R. Lombardi (Applied Subsea Technologies)

Several research & development dives were conducted on the D3X CCR2000 closed-circuit rebreather, a revolutionary new computerized underwater life support system. The CCR2000 is capable of supporting dives up to 8 hours in duration and to depths in excess of 1,000 feet. Applied Subsea reports that the unit performed flawlessly, and is enthusiastic about continuing to apply this technology to science at depths in excess of 500 feet, which will significantly reduce operational costs associated with using submersibles in similar environments by the larger oceanographic institutes.

This technology was utilized to extend routine operational range of this team of scientists to extensively survey, and selectively sample new marine life. A preliminary overview of recent discoveries indicated that the team has likely unveiled nearly a half dozen new sponge species from several newly explored cave systems named sites BEC-0005 and BEC-0009. These discoveries will be more closely examined for anti-cancer, anti-infective, anti-viral and anti-AIDS/HIV activity by partners in industry and academia over the next several months.

Several national and international initiatives in ocean exploration are currently in development. The Applied Subsea/Magellan collaboration is proving significant as business development groups are clearly recognizing the benefit of supporting growth of small to mid-sized businesses proprietary technology and techniques to capture the full potential of exploration and drug discovery.

Sponge sample from cave BEC-005, demonstrating anticancer activity
—Photo by Michael R. Lombardi

Todd R. Daviau, Ph.D. (left) and John M. Cronan, Jr. , Ph.D. (right) preparing marine microbial samples for drug discovery screening assays
—Photo by Michael R. Lombardi

The expedition was funded privately and through program development funds granted to Magellan Bioscience Group, Inc.

Web Alert ☛
www.magellanbioscience.com

Ozone Loss Tied to Molecule

For years, scientists theorized that a molecule called ClOOCl in the stratosphere played a key role in destroying ozone. Now, using measurements from a NASA aircraft flying over the Arctic, Harvard scientist Rick Stimpfle and colleagues have observed the molecule for the first time. They report their discovery in the Journal of Geophysical Research-Atmospheres, published by the American Geophysical Union."We knew from observations dating from 1987, that the high ozone loss was linked with high levels of chlorine monoxide, but we had never actually detected the ClOOCl before,"Stimpfle said in an interview. The common name atmospheric scientists use for ClOOCl, he said, is "chlorine dimer", two identical chlorine-based molecules, ClO or chlorine monoxide--bonded together. The rare dimer exists only in the particularly cold stratosphere over polar regions where chlorine monoxide levels are relatively high. "Most of the chlorine in the stratosphere," Stimpfle adds, "continues to come from human-induced sources." ClOOCl triggers ozone destruction, he explains, in three basic steps: ClOOCl absorbs sunlight and breaks into two chlorine atoms and an oxygen molecule. The n two chlorine atoms react with two ozone molecules, forming two chlorine monoxide molecules and two oxygen molecules. Then two chlorine monoxide molecules then react with each other to reform ClOOCl. "You are now back to where you started with respect to the ClOOCl molecule," Stimpfle says, "but in the process you have converted two ozone molecules into three oxygen molecules. This is the definition of ozone loss." These results were acquired during a joint U.S.-European science mission.