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Edgcomb Laboratory: Water Column Sampler Development

Most studies of marine microbiology have historically relied on sampling with Niskin bottles mounted on a rosette, that capture water samples from selected positions in the water column. These bottles are returned to the surface where water samples are typically processed by filtering and/or preserving them. The problem with this approach is that many microorganims, particularly protists, do not survive the journey to the surface from positions deep in the water column, and hence, any snapshot of the community is going to be altered to an unknown extent from what it is *in situ*. This is a particular problem when studying gene expression. Message RNA only lasts seconds to minutes, and the same genes that are expressed *in situ* are likely not expressed by the time the sample is processed. Cells in bottles that experience significant pressure changes, and perhaps temperature changes and some exposure to oxygen, almost certainly change their gene expression patterns if they are still alive. In collaboration with C. Taylor at WHOI and McLane Research Laboratories in Falmouth, MA, we developed a new water column sampler that can filter and preserve samples *in situ*, capturing a much better snapshot of *in situ* gene expression. This sampler can also collect whole water samples and preserve the cells in those samples for microscopy before returning to the surface. This is a significant advance for marine microbiology, and we are in the process of testing this new instrument.

Last updated: October 6, 2011

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SID-ISMS in Mediterranean Sea. (V. Edgcomb)

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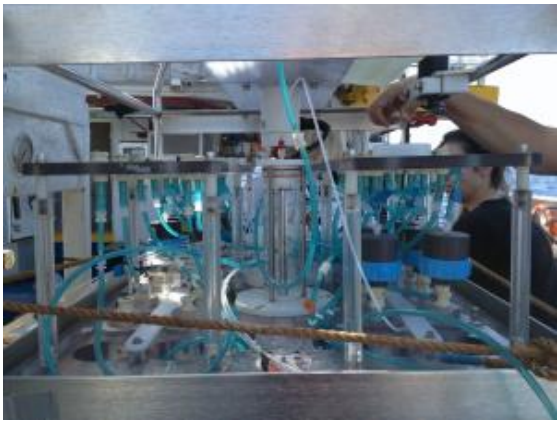
C. Taylor and M. Pachiadaki working on SID-ISMS (V. Edgcomb)



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C. Taylor and M. Pachiadaki preparing SID-ISMS for deployment (V. Edgcomb)

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