

## **Deep-sea particles and microbes: resolving the discrepancy between organic carbon demand and supply**

GERHARD J. HERNDL<sup>1,2</sup>

<sup>1</sup> Dept. of Limnology and Bio-  
Oceanography, University of Vienna,  
Austria

<sup>2</sup> Dept. of Marine Microbiology and  
Biogeochemistry, Royal Netherlands for  
Sea Research, Utrecht University, The  
Netherlands

Based on mass balance calculations, the input of organic carbon into the ocean's interior is not sufficient to meet the organic carbon demand of the heterotrophic microbial community in the deep ocean. The apparent mismatch between the organic carbon supply and consumption reported for the Atlantic as well as for the Pacific needs to be resolved as it indicates that we have a significant gap in our knowledge of the deep ocean. One major, thus far largely unrecognized, source of organic carbon in the deep ocean is the presence of neutrally buoyant marine snow-type particles, which escape quantification using sediment traps. These buoyant marine snow particles are heavily colonized by microbes including fungi. Another potential source of error is assuming that changes in the hydrostatic pressure does not affect microbial activity measurements as almost all metabolic rate measurements on deep-sea microbes are made under surface pressure conditions. In this presentation, I will highlight recent advances made in understanding microbial carbon production and consumption in the ocean's interior with specific emphasis on particle-associated microbial activity in the deep ocean.