

Deep-sea prokaryotes (and others) and their role in the biological carbon pump

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The deep sea (considered here as the water column at depths below 200m) represents the largest habitat in the biosphere, in terms of volume. Around 5 to 15% of the carbon photosynthetically produced in the sunlit upper ocean is exported as particulate organic carbon (POC) below 200m depth. These particles sink through the water column, primarily by gravitational processes, constituting the main input of organic carbon (OC) into the mesopelagic zone. Only around 10% of sinking POC reach depths greater than 1000 m due to multiple degradation processes involving zooplankton grazing and heterotrophic prokaryotes degradation that colonize these particles or through interactions with the free-living microbial communities in the surrounding water. However, relatively little is known about dark-ocean biological processes even though this topic has received greater attention over the past two decades. In this presentation, I will present the current status of knowledge of the deep-sea prokaryotic activity (and diversity), emphasizing the importance of distinguishing between suspended and sinking prokaryotes and the role of hydrostatic pressure. I will present also our preliminary results concerning the effect of hydrostatic pressure on zooplankton. Finally, I will conclude on the importance to better communicate about the deep sea.