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Title: The molecular universe of seawater from an ultrahigh-resolution mass spectrometry (FT-ICR-MS) perspective

Abstract: Dissolved organic matter (DOM) in the oceans remains arguably the most mysterious carbon pool on Earth. It is an enigma how reduced organic molecules persist in thermodynamic disequilibrium for millennia in the deep ocean. With help of ultra-high resolution mass spectrometry and mathematical modeling, we estimated that there are possibly more than one trillion different organic compounds dissolved in each liter of seawater. As such, DOM is among the most diverse molecular mixtures known on Earth. Microbes cannot cope with such substrate diversity which explains the resistance of DOM against microbial utilization in the deep ocean.