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Molecular Views of Water at the Water/Air and Water/Lipid Interface

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At the surface of water, the water hydrogen-bonded network is interrupted, conferring properties on interfacial water different from bulk water. We elucidate, using a combined experimental and computational molecular dynamics approach, how the water hydrogen bond network is terminated at a phospholipid interface, and how this is different from conventional surfactant interface [1]. Moreover, for the water/air interface, we show that the evaporation of water – i.e. the release of individual water molecules from the bulk into the gas phase – is not a purely stochastic event. Rather, the evaporation follows one specific pathway, involving a delicately timed, concerted motion of several water molecules to ‘launch’ a single molecule from the surface [2]. [1] Lipid Carbonyl Groups Terminate the Hydrogen-Bond Network of Membrane-Bound Water, T. Ohto, E.H.G. Backus, C. Hsieh, M. Sulpizi, M. Bonn, Y. Nagata, *J. Phys. Chem. Lett.* **6**, 4499–4503 (2015). [2] Molecular Mechanism of Water Evaporation, Nagata, Y.; Usui, K.; Bonn, M., *Phys. Rev. Lett.* 2015, in print.