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Breathable NIPAAm Network with Controllable Hydration Supports Model Lipid Membrane MICHAEL JABLIN, HILLARY SMITH, MIKHAIL ZHERNENKOV, Lujan Neutron Scattering Center, AJAY VIDYASAGAR, RYAN TOOMEY, University of South Florida, JESSICA SAIZ, Lujan Neutron Scattering Center, BORIS TOPERVERG, Ruhr Universitat Bochum, ERIK WATKINS, TONYA KUHL, University of California, Davis, ALAN HURD, JAROSLAW MAJEWSKI, Lujan Neutron Scattering Center — The interaction of a model lipid bilayer composed of DPPC with a surface-tethered poly(N-isopropylacrylamide) (NIPAAm) was explored with neutron reflectometry (NR). The Langmuir-Blodgett / Langmuir-Schaeffer method was used to deposit a lipid bilayer onto the polymer. NR measurements were used to probe the in- and out-of-plane structure of the system as a function of temperature. NR with fluorescence microscopy show that the polymer supports a lipid bilayer, and hydration of the support can be controlled. At low temp. the membrane develops out-of-plane undulations visible in off-specular scattering. Analysis of the off-specular reveals in-plane correlation of the bilayer fluctuations. The separation of the lipid bilayer from the solid support of a substrate constitutes a significant step towards a more realistic model of biological membranes.

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