

Abstract Submitted
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Amphiphilic Diblock Copolypeptides that Controllably Self-Assemble into Hydrogels and Vesicles LISA PAKSTIS, University of Delaware, ANDREW NOWAK, ERIC HOLOWKA, JEFFERY THOMPSON, TIMOTHY DEMING, University of California Los Angeles, DARRIN POCHAN, University of Delaware — Diblock copolypeptides consisting of a hydrophilic lysine (K) block and a hydrophobic leucine (L) block assemble into stiff, porous hydrogels at low volume fractions of polymer (< 0.5 wt %) or vesicle assemblies depending on the polymer molecular weight. In both the hydrogels and vesicles, nanoscale assembly is dictated by the alpha helical secondary structure of the leucine block whereas any hierarchical, microscale assembly is controlled through the assembly environment and molecular design. In the hydrogels, laser scanning confocal and cryogenic transmission electron microscopies and ultra small angle neutron scattering data revealed the formation of membranes on the nanoscale that interconnect to create a porous network on the nano- and microscale. Block copolymer relative composition and molecular weight can be changed to controllably alter the bulk network moduli. Decreasing the degree of polymerization ~ 100 resulted in the break-up of interconnected membranes for network structure and the consequent formation of vesicles.

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