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Hydrophobic Drug Encapsulation Mechanisms of an Injectable Self-Assembling Peptide Hydrogel JESSIE E.P. SUN, University of Delaware, JOEL P. SCHNEIDER, National Cancer Institute at Frederick, DARRIN J. POCHAN, University of Delaware — We examined a beta-hairpin peptide network that is a shear thinning injectable solid with immediate rehealing behavior. These rheological properties result from the entangled and branched fibrillar nanostructure of the hydrogel networks. The fibrils are formed by the intramolecular folding and subsequent intermolecular assembly of the self-assembling peptides. Taking advantage of the nanofibrillar peptide structures, the hydrogel can be used to encapsulate curcumin, a hydrophobic, natural anticancer agent and indian spice. The hydrogel shields curcumin from the environment while depositing it exactly where it is intended through syringe injection, taking advantage of the hydrogel shear thinning and rehealing behavior. How the network envelopes and interacts with the curcumin is examined using fluorescence and electron microscopy methods to better understand the exact mechanisms and behaviors of the gel itself and the gel-curcumin construct.

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