Supporting Information

Encapsulation of Curcumin in Self-Assembling Peptide Hydrogels as Injectable Drug Delivery Vehicles

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Supplemental Results

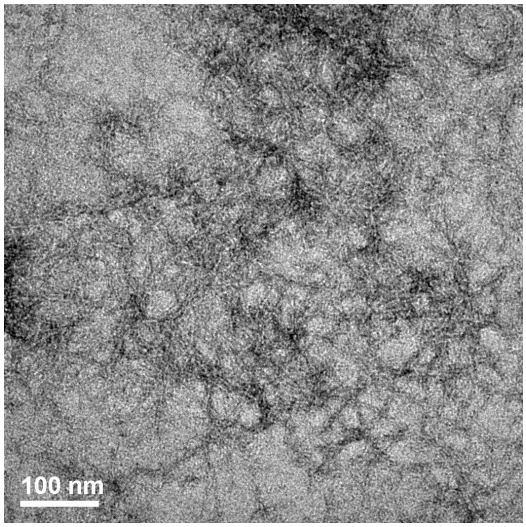

Fig. S1. Transmission electron microscope image of negatively stained 0.5 wt% MAX8 fibrils. Hydrogel was loaded with 0.5 mM curcumin.

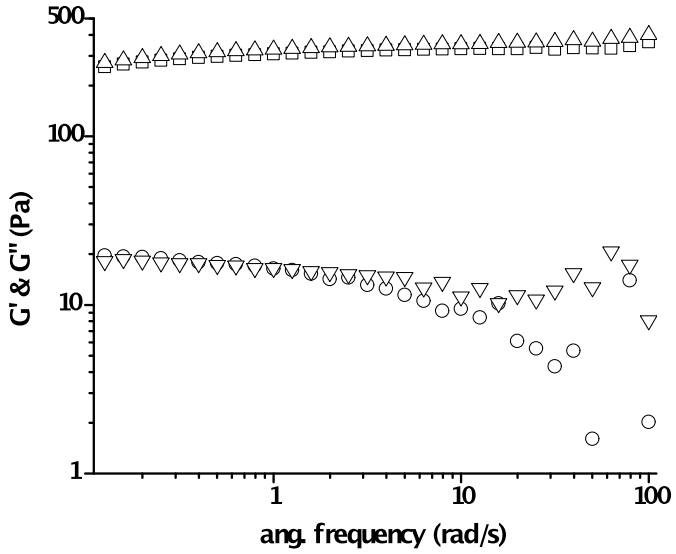

Fig. S2. Dynamic frequency sweep of 0.5 wt% MAX8 with and 0.5 wt% MAX8 with 4 mM curcumin at 0.2% strain. Measurements were made in triplicate. Δ: average G' 0.5 wt% MAX8 with 4 mM curcumin, ∇: average G" 0.5 wt% MAX8 with 4 mM curcumin and □: average G' 0.5 wt% MAX8 ○: average G" 0.5 wt% MAX8.

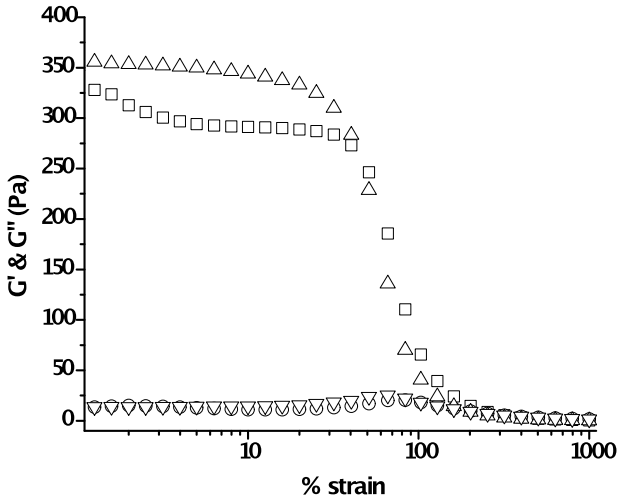

Fig. S3. Dynamic strain sweep of 0.5 wt% MAX8 and 0.5 wt% MAX8 with 4 mM curcumin at 0.2% strain. Measurements were made in triplicate. Δ: average G' 0.5 wt% MAX8 with 4 mM curcumin, ∇: average G" 0.5 wt% MAX8 with 4 mM curcumin and □: average G' 0.5 wt% MAX8 ○: average G" 0.5 wt% MAX8.

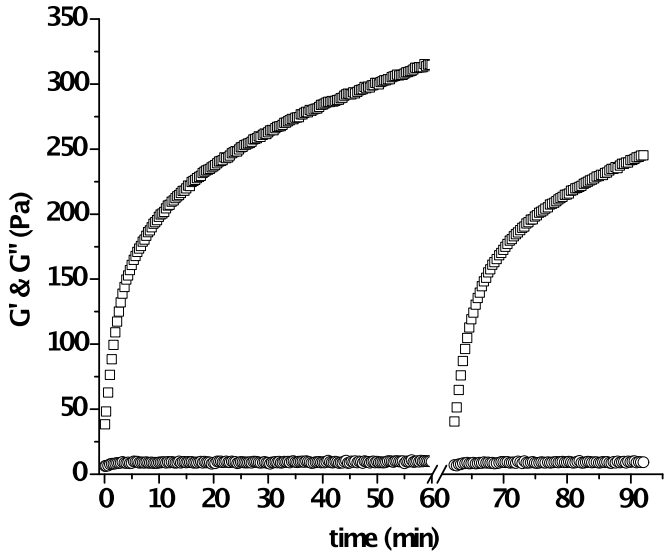

Fig. S4. Dynamic time sweep of 0.5 wt% MAX8 with 2%v DMSO (without curcumin) at 0.2% strain and 6 rad/sec. Measurements were made in triplicate. □: average G' and ○: average G"

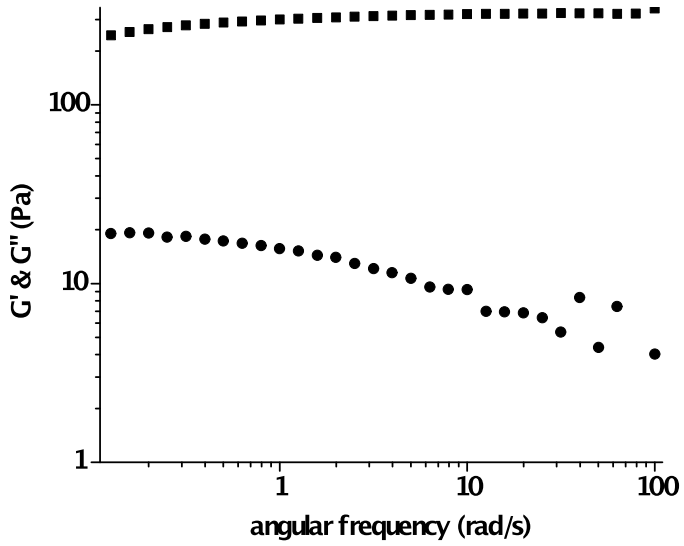

Fig. S5. Dynamic frequency sweep of 0.5 wt% MAX8 hydrogel with 2 v% DMSO at 0.2% strain. Measurements were made in triplicate. ■ : average G' and ● : average G"

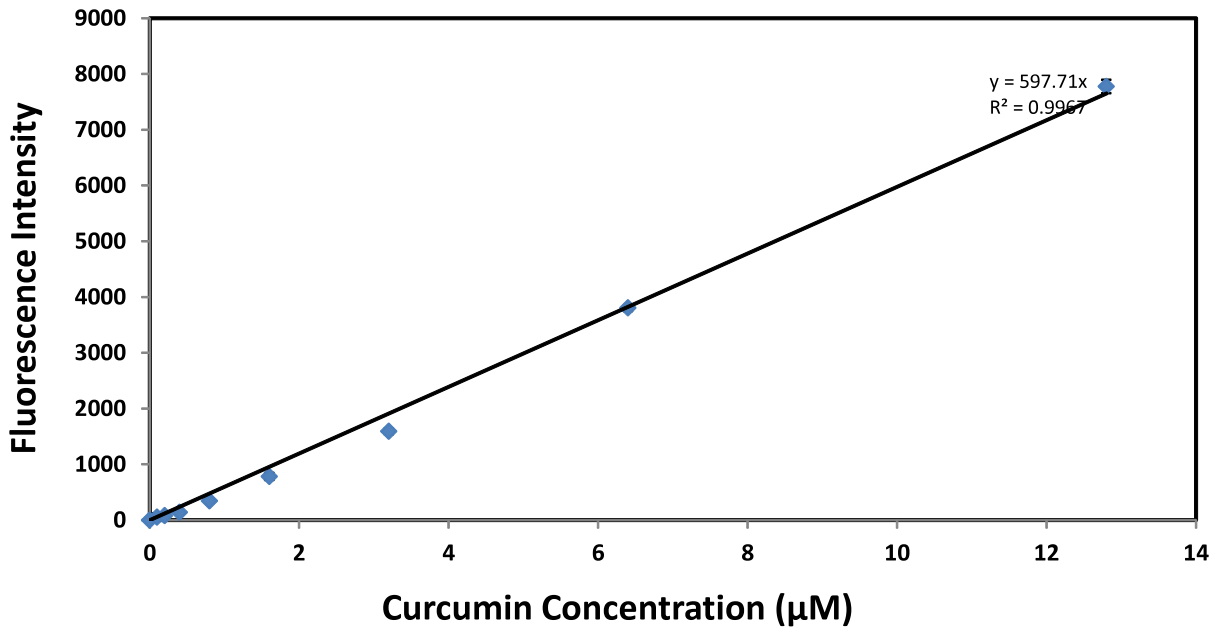

Fig. S6. Curcumin fluorescence in PBS was measured by serial dilutions of curcumin (in DMSO) into PBS ($12.8 : 10^6$ (v:v) to $1 : 10^6$ (v:v)) that afforded 12.8, 6.4, 3.2, 1.6, 0.8, 0.4, 0.2, 0.1 µM curcumin in PBS. The linear calibration curve was acquired by plotting fluorescence intensities of 100 µL of 0, 0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4 and 12.8 µM curcumin in PBS. Settings of the plate reader were the same as used for measuring PBS supernatants of curcumin loaded hdyrogels. The slope of the PBS subtracted standard curve was used to correlate fluorescence intensities of supernatants to curcumin concentrations (Figure 6 (b)).

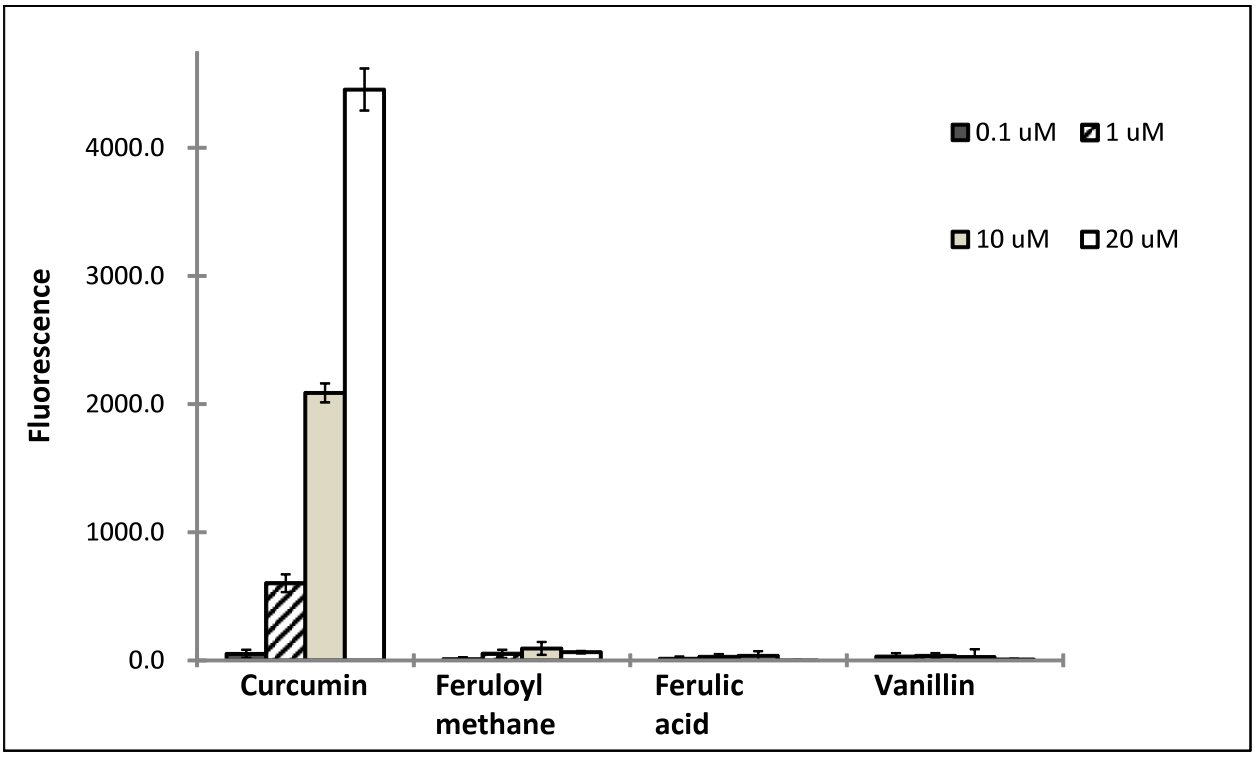

Fig. S7. Fluorescence intensities of curcumin, feruloyl methane, ferrulic acid and vanillin measured with plate reader. For fluorescence measurements of curcumin and possible curcumin degradation products with the plate reader, 20 mM curcumin stock solution for each were prepared in DMSO. Serial dilutions in DMSO afforded 10 mM, 1 mM and 0.1 mM stock solutions in DMSO. The stock solutions for each molecule was further diluted (1μL of DMSO stock in 999 μL of PBS) in PBS to yield 20 μM, 10 μM, 1 μM and 0.1 μM solutions respectively. Fluorescence intensities of DMSO diluted in PBS (1:1000 dilution) was subtracted from measurements.

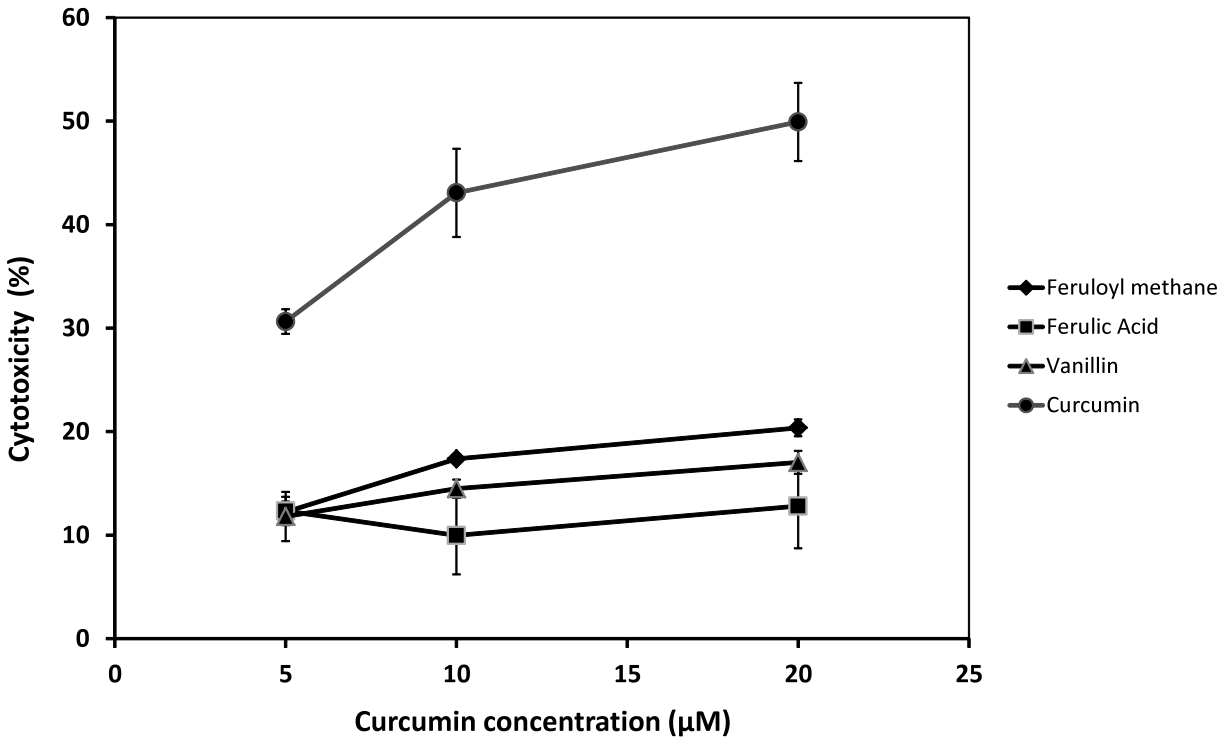

Fig. S8. Cytotoxic effect of curcumin, vanillin, ferulic acid and feruloyl methane as determined by released lactate dehydragenase (LDH) levels. DAOY cells were treated with indicated concentration of curcumin and possible curcumin metabolites for 16 hours before determining % cytotoxicity. Curcumin metabolites were dissolved in DMSO and mixed into the cell culture medium. Control experiments consisted of DMSO dissolved in DMSO cell culture medium. % cytotoxicity observed in control wells were equal to 12.37±0.40.