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Electronic Supplementary Information (ESI) for "Hydrogel-colloid interfacial interactions: a study of tailored adhesion using optical tweezers"

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Rheological properties of polyacrylamide (PA) hydrogels

The dynamic storage and loss moduli of the pre-gel solutions during gelation are reported from small amplitude oscillatory shear (SAOS) using an ARES-G2 rheometer (TA Instruments). The pre-gel solution with catalyst (APS) was nitrogen purged, and immediately following the addition of initiator (TEMED) an aliquot of the liquid was placed on a 4 cm diameter rheometer plate, forming an ≈ 1 mm thick sample. Silicone oil gently deposited around the periphery was used to minimize solvent evaporation. The storage and loss moduli time series (at an angular frequency $\omega = 10$ rad s⁻¹ where the shear modulus is frequency independent) are shown in figure S1. To acquire the steady moduli, a function

$$G' = A \exp\left(\frac{-\tau_1}{t - t_0}\right) + B \exp\left(\frac{-\tau_2}{t - t_0}\right) \quad (A, B \ge 0)$$
(S1)

was fit to the data, furnishing the steady-state moduli $G'_{t\to\infty}$ listed in table S1.

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Table S1: Parameters and steady-state shear moduli from Eqn. (S1) fit to the data in figure S1.

			G'			
PA gel	A (Pa)	B (Pa)	τ_1 (s)	τ_2 (s)	t_0 (s)	$G'_{t \to \infty}$ (Pa)
А	3145	472	1252	1074	566	3617
В	1928	152	900	550	416	2080
С	396	18	1217	345	396	414
			G''			
PA gel	A (Pa)	B (Pa)	τ_1 (s)	τ_2 (s)	t_0 (s)	$G_{t\to\infty}^{\prime\prime}$ (Pa)
А	-	-	-	-	-	-
В	-	-	-	-	-	-
С	3	10	484	3427	328	13



Fig. S1: Storage G' (black symbols) and loss G'' (blue symbols) moduli time series for PA hydrogels A, B, and C (top to bottom) from small amplitude oscillatory shear (SAOS) at angular frequency $\omega = 10$ rad s⁻¹. All gels contained 5% acrylamide in PBS buffer with monomer:crosslinker ratios 19:1 (A), 33.3:1 (B), and 102:1 (C). Lines are fits of Eqn. (S1), furnishing the steady shear moduli $G'_{t\to\infty}$ (and other fitting parameters) in Table S1.