Title:	Colloid-in-Liquid Crystal Gels that Respond to Biomolecular Interactions
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Abstract:	This paper advances the design of stimuli-responsive materials based on colloidal particles dispersed in liquid crystals (LCs). Specifically, thin films of colloid-in-liquid crystal (CLC) gels undergo easily visualized ordering transitions in response to reversible and irreversible (enzymatic) biomolecular interactions occurring at the aqueous interfaces of the gels. In particular, LC ordering transitions can propagate across the entire thickness of the gels. However, confinement of the LC to small domains with lateral sizes of ~10 μm does change the nature of the anchoring transitions, as compared to films of pure LC, due to the effects of confinement on the elastic energy stored in the LC. The effects of confinement are also observed to cause the response of individual domains of the LC within the CLC gel to vary significantly from one to another, indicating that manipulation of LC domain size and shape can provide the basis of a general and facile method to tune the response of these LC-based physical gels to interfacial phenomena. Overall, the results presented in this paper establish that CLC gels offer a promising approach to the preparation of self-supporting, LC-based stimuli-responsive materials.
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