Title:	Label-Free Imaging of Fibronectin Adsorption at Poly-(l-lysine)-Decorated Liquid Crystal Droplets
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Abstract:	Interactions and subsequent structural organization of fibronectin (FibN) (major component of an extracellular matrix) molecules in contact with chemically modified surfaces form an essential basis to the understanding of the regulation of matrix assembly in pathological states and to the development of new biomedical devices. Here, using poly-l-lysine (PLL)-coated liquid crystal (LC) droplets, we present a simple but fruitful advance of an experimental system that can report label-free imaging of adsorption of FibN at the LC–aqueous interface. We observed that the interfacial intermolecular interactions of anionic FibN molecules and cationic PLL residues is accompanied by a director configuration transition of the LC droplets from radial to bipolar/preradial, giving a distinct optical output. Specifically, it is found that the ordering transitions of LC can be effectively tuned by blocking the anionic sites of FibN with divalent cations (Ca2+). Combination of fluorescence measurements, circular dichroism, and atomic force microscopy further revealed that PLL induces significant conformational changes in FibN at the aqueous–LC interface. This report provides a simple method based on LC droplets to understand polymer–protein interactions at membrane interfaces which would have potential applications in biomedical and interfacial systems.
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