Polymers and Biology: a constructive partnership
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Polymers are commonly included in drug formulations and used in medical devices such as catheters, stents, and implants. Yet, due to strict safety regulations only a limited number of polymer structures are in clinical use today. This situation is frustrating for polymer chemists who have at their disposal wonderful tools to synthesize macromolecules of precisely controlled architecture and compositions...but of uncertain fate in vivo! It is important at this point to understand the interactions between biological interfaces and synthetic polymers and nanoparticles. This concept will be illustrated by several examples under study in my research group, including the stabilisation of therapeutic proteins by modified poly(acrylates) and the promotion of cell aggregation through chemical modulation of the cell/substrate and the cell/cell adhesion energies.