

Séminaire de l'axe Formulation et analyse du médicament

Developing Multifunctional Soft Materials Through Tunable Intermolecular and Surface Interactions



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The intermolecular interactions and surface characteristics of materials mostly determine their physicochemical properties and functionalities. Characterization of the intermolecular and surface interaction mechanisms (e.g., adhesion) in soft materials (e.g., surfactants, polymers, biopolymers) and engineering systems (e.g., adsorption of proteins in bioengineering) has attracted much research interest. In this talk, the basics of intermolecular and surface forces and some commonly used nanomechanical techniques, such as surface forces apparatus and atomic force microscope coupled with drop/bubble probe, will be briefly introduced. The recent progress on how we applied these advanced nanomechanical techniques for quantifying intermolecular and surface interactions of polymer/biopolymer materials and biological systems (e.g., wet adhesion of marine mussel) will be presented. The fundamental interaction mechanisms elucidated have been further applied for the development of advanced multifunctional soft materials (e.g., self-healing polymers/hydrogels, wet adhesives) with important engineering and bioengineering applications.