Nanoscale mechanical characterizations of biomaterials

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Mechanical properties are among those more often investigated when characterizing a biomaterial. Indeed, in the case of biocompatible films and coating, mechanical properties are fundamental to design materials well adherent to the substrates or nanocomposites with specific mechanical properties. Also, in the case of biological sample, e.g., cells or tissues, the characterization of mechanical properties has been proposed as a way to identify specific cellular processes or functionalities, as well as to indirectly study the interaction between these biological structures with nanomaterials. These studies require techniques capable to characterize mechanical properties of biomaterials at the nanoscale. Among other methods, for example, atomic force microscopy (AFM) represents a powerful platform to develop such techniques. Several methods have been developed to perform quantitative mechanical characterizations at the nanoscale, including force spectroscopy, contact resonance AFM, ultrasonic force microscopy, peak force quantitative nanomechanical method, multifrequency AFM.

This session is devoted to present innovative techniques, e.g., including but not limiting to AFM, for the nanoscale mechanical testing of biomaterials as well as to discuss recent results obtained on the use of these methods on materials of biological and biomedical interest.