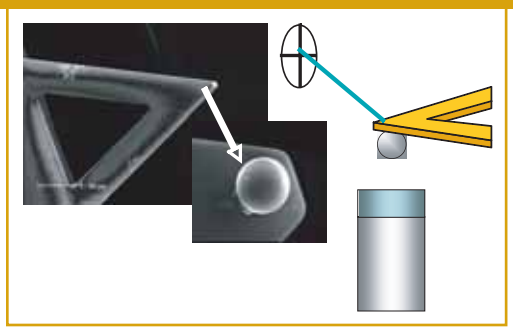

Schematic diagram of an AFM. The sample is placed on a piezoelectric scanner. A laser is reflected off the upper side of the cantilever and into a split photodiode via a mirror. *Courtesy of J. Ralston and A. Feiler, Ian Wark Research Institute, University of South Australia.*

the tip and surface to be calculated. One can routinely quantify both the net surface force (and its separation dependence) as the probe approaches the sample, and any adhesion (pull-off) force on retraction.

Interactions in relevant or practical systems may be studied, and, in such cases, a distinct advantage of the AFM technique is that a particle of interest can be attached to the end of the cantilever and the interaction with a sample of choice can be studied, a method often referred to as colloid probe microscopy. The AFM, or, more correctly, the scanning probe microscope, can thus be used to measure surface and frictional forces, the two foci of this report. There have been a wealth of force and friction measurements performed between an AFM tip and a surface, and many of the calibration and analysis issues are identical to those necessary for colloid probe work. This report confines itself primarily to elements of colloid probe measurement using the AFM.

www.iupac.org/publications/pac/2005/7712/7712x2149.html

Supramolecular Assemblies With DNA (Special Topic Article)

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Information storage in chemical and biological systems involves recognition processes occurring at the molecular and macromolecular level. The implementation of a "code" can consist of multiple noncovalent interactions that include hydrogen bonds, π-stacking, hydrophobic interactions, and appropriate molecular and supramolecular architectures.

With the double-helical DNA structure stabilized by Watson-Crick hydrogen bond base-pairing and aryl π–π stacking interactions, nature provides to scientists an example of one of the most sophisticated supramolecular systems. Molecular organization using these types of processes has become a very powerful strategy for the construction of well-defined nanostructures. Self-assemblies using noncovalent interactions have been designed to build fibers, membranes, two-dimensional monolayers, hydro, and organo gels, for example.

This article highlights the research presented at the *DNA Supramolecular Assemblies* workshop held in Avignon, France, on 5–6 May 2004. It first focuses on the recent progress achieved in the design of supramolecular self-assemblies that mimic the molecular recognition functionalities found with nucleic acids. It next presents several synthetic-DNA supramolecular assemblies currently developed to transport nucleic acids into cells. The marriage of supramolecular chemistry with nucleic acids as illustrated through examples opens new avenues for designing artificial molecular devices and expand the current repertoire of supramolecular assemblies available.

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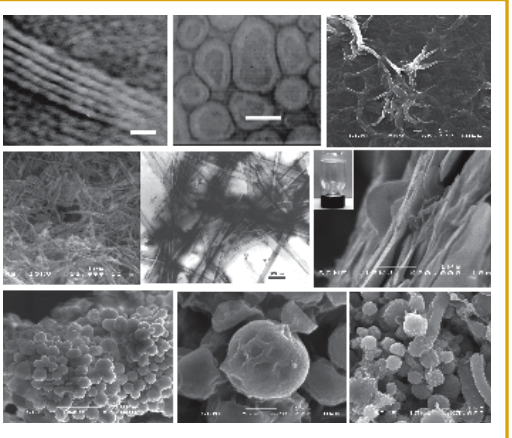

Examples of supramolecular assemblies formed by nucleolipids. See PAC article for details. *Courtesy of P. Barthélémy, Université de Bordeaux, France.*