

Polymer-DNA hybrids nano-objects

Fabienne Gauffre, Renée Mayap Talom, Gad Fuks

Sciences Chimiques de Rennes, Rennes University and Laboratoire des IMRCP, Toulouse

E-mail : gauffre@chimie.ups-tlse.fr

Abstract:

Watson-Crick binding of DNA single strands is a powerful tool for the assembly of nanostructures. We developed polymer nanoparticles equipped with DNA strands which can bind to gold surfaces or nanoparticles grafted with complementary strands, taking advantage of the DNA technology, in particular recognition and reversibility. These nanoparticles were obtained from the self-assembly of DNA-block copolymer hybrids. It is shown that in water, the hybrid polymers forms nanoparticles with a hydrophobic core and a hydrophilic corona containing DNA.

The nanoparticles were thoroughly characterized using electron microscopy (TEM and cryoTEM) and small angle neutron scattering. The binding of these DNA-nanoparticles to a surface via DNA recognition is monitored using a quartz crystal microbalance and imaged with atomic force microscopy. The nanoparticles can be released from the surface by competitive displacement events. The nanoparticles can also be decorated by gold nanoparticles.

