Bioengineering at the Inorganic Interface

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Abstract:

Sensors to measure the levels of biomarkers are critical for human performance monitoring. The next generation of sensors will likely include metal or metal oxide nanoparticles with biomolecules at the interface for biological recognition. To enable these sensors we have been using a combined experimental and computational approach to measure the structure and dynamics of peptides and nucleic acids at inorganic interfaces in nanoparticles. We have developed high-resolution NMR methods to measure the structure and orientation of peptides bound to silica, titanium, palladium and gold nanoparticles. The results provide an insight into the relationship between the primary peptide sequence and the functional properties at the interface.

Bio:

Peter Mirau obtained his B.S. in chemistry from University of California at Santa Barbara and his Ph.D. in Pharmaceutical from the University of California at San Francisco. After a Postdoctoral position at the University of California at San Diego he became a Member of Technical Staff at AT&T Bell Laboratories where he studied polymer physics using solution and solid-state NMR methods. He moved to the Air Force Research Laboratories in 2002 and his current research focuses on interfacial studies of polymer and biopolymer nanocomposites.