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**“Engineering the
Nanoparticle-Biology
Interface for
Biomedical
Applications”**

Thursday, Feb 12
90 Snell Library
11:00am – 12:15pm

*Refreshments will be
served*

ABSTRACT The synergistic combination of nanotechnology and biology has resulted in numerous innovative approaches for sensors, new therapies for diseases, and biomolecular machines. One of the most exciting prospects of nanotechnology is that nanoparticles can act as a “handle” by which one can control nanoscale processes, in particular biological function. Unfortunately, one of the biggest challenges for effectively using nanoparticles in biology is non-specific adsorption, where proteins and DNA non-covalently stick to nanoparticles. This often results in formation of a protein corona, a cloud of weakly bound proteins surrounding the nanoparticle. However, non-specific adsorption can actually be exploited for biological applications. We demonstrate a means to reversibly control blood clotting with laser excitation by using the unique size and shape dependent properties of gold nanorods as well as

exploiting their tendency to adsorb to proteins. In addition, we will discuss the use of gold nanoparticles in rapid diagnostics for different infectious diseases in rugged environments.

BIOGRAPHY Kimberly Hamad-Schifferli obtained her S.B. in Chemistry from MIT in 1994. She obtained her Ph.D. in Chemistry from the University of California at Berkeley in 2000 in the group of A. Paul Alivisatos. Following this, she was a postdoctoral associate in the Molecular Machines at the MIT Media Lab with Joe Jacobson. She joined MIT in the Department of Mechanical Engineering and the Department of Biological Engineering as a faculty member from 2002-2012. She has received the ONR YIP award. Currently, she is a scientist at MIT Lincoln Laboratory in the Bioengineering Systems and Technologies Group.