

Amgen Seminar Series in Chemical Engineering  
in  
Cherry Auditorium, Kirk Hall, 1 PM

**Presents on April 18, 2013**

**Designer Materials by Self- and Directed Assembly:  
Photorheological Fluids, Magnetic Microchains and Hemostatic Dressings**

By

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Our laboratory seeks to engineer the assembly of “building blocks” such as polymers, surfactants, or colloids into higher-order materials. Such assembly can be induced spontaneously, guided by thermodynamic forces – this is called *self-assembly*. Alternately, assembly can be directed in specific ways, e.g., by bringing materials into contact at interfaces or around predefined templates – this can be termed *directed assembly*. Both processes have their analogs in biology and nature, and both are of great technological interest.

This talk will provide illustrative examples of our work with self- and directed assembly. We have created assemblies that respond to stimuli such as temperature, pH or light; an example of the latter are photorheological fluids. Also, we have used microfluidic techniques to create magnetic microcapsules of biopolymers, which we have then linked into flexible microchains. We have also developed self-assembling biopolymers that have the ability to gel blood cells and thereby serve as effective hemostatic dressings for both military and civilian use.

This series at the University of Rhode Island is made possible through the generosity of Amgen, West Greenwich, R.I.