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# Department of Chemistry

# Student Seminar Series

9:45 a.m. Tuesday, March 10, 2015 • 331 Smith Hall

Professor

**Christopher Ober**

Department of Materials Science & Engineering  
Cornell University

***Polymer Brushes:  
Patternable Structures  
as Interfaces  
with Biomolecular Materials***

Website:

<http://www.mse.cornell.edu/people/profile.cfm?netid=cko3>

## Abstract

Polymer brushes are ideal materials for interfacing with biological systems as they share many of the same molecular components and properties. Polymer brushes, or surface tethered polymers, provide remarkable screening power in shielding a substrate from the environment through both steric and charge interactions. However, the majority of biomolecular species will still non-specifically bind to polymer brush surfaces unless some care is given to molecular design. We have recently explored the effect of brush thickness on non-specific binding and cellular attachment. Several polymer brush systems are described to control interaction of biomacromolecules and cells by design of specific and non-specific interactions in polymer brush architectures. “Grown from” and block copolymer brushes are discussed, both of which provide excellent substrates for study of brush surfaces. Nanostructured polymer “carpets” are also reported. Examples of polymer brushes used for sensor creation and for investigation of cellular interaction are provided. Brushes used in non-fouling coatings tailored for marine applications and in which amphiphilic structures play an important role are discussed.

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Christopher Kemper Ober is the Francis Bard Professor of Materials Engineering at Cornell University. After several years in industry at the Xerox Research Centre of Canada, Ober moved to Cornell as an assistant professor in 1986. His research is focused on lithography, patterning, the biology materials interface and control of surface structure in thin films.

As a reflection of his contributions to lithography, Ober received the 2003 International Sematech Outstanding Contribution Award and in 2004 was honored with the Photopolymer Science & Technology Award. An associate editor of *Macromolecules* and the president of the IUPAC Polymer Division, he is the 2006 winner of the American Chemical Society Award in Applied Polymer Science. He received a Humboldt Research Prize in 2007. In 2007, he chaired the National Science Foundation's Polymers Workshop. In 2009, Ober was named a Fellow of the American Chemical Society and was awarded the Gutenberg Research Prize by the University of Mainz. Ober served as Interim Dean of Engineering from 2009 to 2010.

**Host:  
Cecilia Hall**