



Department of Chemical
and Biological Engineering
UNIVERSITY OF WISCONSIN-MADISON

2020 Fall CBE Seminar Series

presents:



PADMA GOPALAN

Professor
Dept. of Materials Science & Engineering
University of Wisconsin-Madison

Chemistry and Physics of Blocks, Brushes and Nanopatterns

Surface anchored polymer chains provide a stable and versatile route to modifying a range of interfacial properties. These include biological, electronic, optical or frictional properties. However, the wide-scale usage of polymer brushes is limited by the scalability of the synthetic methodologies. We have developed a highly versatile universal approach to grow polymer brushes from a variety of substrates with high grafting density by using a single-component coating. We describe a random copolymer which consists of a polymerizable initiator, copolymerized with a thermal crosslinker by reversible addition-fragmentation chain transfer polymerization. The chemistry of the coating is modified to implement a bottom up approach to fabricate nano-patterned polymer brushes. By self-assembly of a block copolymer film on top of the coating, nanopatterned brushes are grown after selective removal of one domain from the block copolymer. The initiator containing cross-linkable copolymer can be viewed as a single component ultra-thin polymeric coating which is applicable to a range of substrates to grow high chain density polymer brushes. The ease of synthesis, chemical tunability, homogeneity of composition, stability in organic solvents and applicability by simple spin-coating to a wide range of substrates makes this a versatile approach to create functionalized interfaces.

Tuesday, Sept. 15, 2020

Lecture at 4:00 p.m.

<https://uwmadison.zoom.us/j/91376473708>