

Seminars in Biotechnology BTEC 592 & BTEC 692

“Templated Vapor Deposition Methods for Fabrication of Functional Nanostructures”

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11:30

GTU Institute of Biotechnology, Lecture Hall

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Dr. Gozde Ozaydin Ince received her BS degree in Physics from Boğaziçi University and her Ph.D.degree in Mechanical Engineering from Boston University. During her Ph.D. she focused on synchrotron x-ray studies of surface morphology evolution of semiconductors and thin film growth. During her post-doctoral studies, she focused on design and synthesis of polymeric thin films and nanoparticles for various applications. Since 2010, she is a full-time faculty member in Materials Science and Nanoengineering program at Sabancı University. Her research interests are synthesis and development of smart polymeric nanostructures for drug delivery and biosensors and vapor deposition of dielectric and ferroelectric thin films for electronic applications.

Abstract

Polymeric nanostructures which respond to environmental stimuli by undergoing physical or chemical changes enable the development of smart materials for molecular separation or drug delivery applications. One limitation for the wider utilization of these nanostructures in biotechnology lies in the challenge of functionalization of patterned surfaces with high homogeneity and conformality. Fabrication of high aspect ratio nanostructures while preserving the functionalities of the polymers and functionalization of surfaces with highly conformal and homogeneous coatings can be achieved via vapor deposition methods.

In this talk, I will present the templated initiated chemical vapour deposition (iCVD) technique as a method to produce conformal polymeric structures in the nanoscale. In the first part of the talk, methods to obtain conformal iCVD coatings in confined spaces by optimizing the process parameters will be introduced. In the second part of the talk, fabrication of stimuli responsive nanostructures as molecular carriers will be presented and the effects of system parameters on the synthesis and the release kinetics of these nanocarriers will be discussed. In the last part of the talk, smart membranes, which have tunable pore sizes that depend on the pH or temperature will be presented and the performance of these hybrid membranes in macromolecular separation and protein gating applications will be discussed.