Merck Sharp & Dohme Lecturers

1990-2005

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Rubén G. Carbonell
Warren E. Stewart
J.M. Prausnitz
Keith Gubbins
Lorenz T. Biegler
Michael F. Doherty
Ross Taylor
John Villadsen
Phillip C. Wankat
H. Scott Fogler
Matthew Tirrell
Ronald E. Rosensweig
Nair Rodríguez
Gabriel Tardos
Esin Gulari
Joseph F. Louvarv
Alice P. Gast
Carol K. Hall
John H. Seinfeld
Michael L. Shuler
Matthew R. Reyne
Jack Wehman
Wesley Eckenfelder
Ron Darby
Urmila Diwekar
William H. Velander
Gerald W. Boicourt
Lynn Walker
Joseph DeSimone
Chris Buxton
Gary Powers
James S. Ultman
Mark Z. Jacobson
Wayne R. Curtis
Daniel Crowl
Gintaras Reklaitis

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The Merck Sharp & Dohme Lecture Series in Chemical Engineering

proudly presents one seminar by

Dr. Nicholas L. Abbott

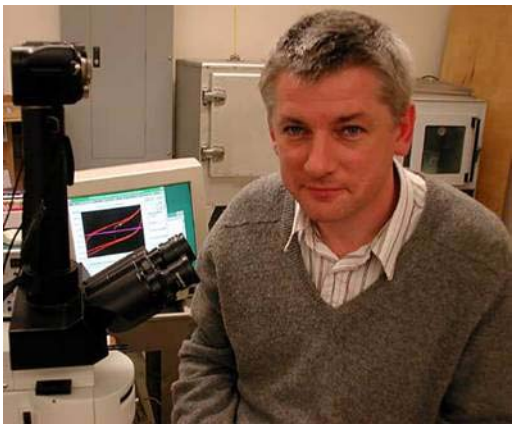
University of Wisconsin-Madison

Using Liquid Crystallinity to Engineer Interfaces between Synthetic and Biological Materials

Thursday, October 18, 2007
10:30 am
Chemical Engineering Auditorium (IQ-04)

MERCK

Department of Chemical Engineering
University of Puerto Rico
Mayagüez, Puerto Rico



Nicholas Abbott received his Bachelor of Engineering from University of Adelaide, Australia and his Ph.D in chemical engineering from the Massachusetts Institute of Technology. After postdoctoral work in chemistry at Harvard University in 1993, he joined the faculty of chemical engineering and materials science at University of California at Davis as an Assistant Professor. In 1998, he joined University of Wisconsin in Madison as Professor of Chemical Engineering. His research interests revolve around investigations of molecules at interfaces. A particular focus is directed towards the design of new surfactants that can be placed under active control, the use of liquid crystalline materials to amplify biomolecular interactions, and the design of solid surfaces with chemistry and topography patterned on nanometer scales. His work has been recognized by honors which include a Fellowship in Science and Engineering from the Packard Foundation, a Presidential Early Career Award in Science and Engineering, a Camille Dreyfus Teacher-Scholar Award and a Fulbright Fellowship.

Using Liquid Crystallinity to Engineer Interfaces between Synthetic and Biological Materials

This presentation will address the spontaneous assembly of amphiphiles and biological macromolecules at interfaces between thermotropic liquid crystalline phases and immiscible aqueous phases. This assembly process gives rise to patterned orientations of the liquid crystals that reflect the spatial and temporal organization of the amphiphiles and macromolecules. Strong and weak specific binding events involving proteins at these interfaces drive the reorganization of phospholipids and trigger orientational transitions in the liquid crystals. Because these interfaces are fluid, processes involving the lateral organization of proteins (e.g., formation of protein and phospholipid-rich domains) are also readily imaged via the orientational response of the liquid crystal, as are stereospecific enzymatic events. These results suggest new principles for designing interfaces between synthetic and biological systems.