

Carnegie Mellon

Materials Science and Engineering Seminar Series

Professor Newel Washburn

Department of BioMedical Engineering
Department of Chemistry
Carnegie Mellon University

"(Toward the) Development of Interactive Biomaterials"

Friday, October 28, 2005

11:00 A.M. Seminar in Hamerschlag Hall B103

Refreshments precede seminar at 10:30 A.M. in the R. F. Mehl Room (2325 Wean Hall)

In this talk I will present the research infrastructure we are establishing to develop polymers capable of interacting with native repair processes for wound healing and tissue engineering applications. These polymers will be designed to regulate the activities of soluble signaling proteins, such as growth factors and cytokines, to guide cells toward regenerating missing or damaged tissue. Fluorescence correlation spectroscopy is being developed to provide design principles for these materials by providing measurements of the diffusion and binding of signaling proteins in biological matrices. Small-molecule ligands based on peptides, DNA, or oligosaccharides with specific affinities for these proteins are being synthesized. By incorporating these ligands into gel-forming polymers, they will increase the biological activity of these matrices by providing them with biomimetic signaling capabilities. Finally, combinatorial screening of the interactions of cells and signaling proteins with these matrices will be undertaken to provide a global understanding of how materials can participate in and regulate repair processes. This talk will be presented for non-experts in the biomedical sciences.

Newell Washburn received a B.S. in Chemistry from University of Illinois at Urbana-Champaign in 1993 and a Ph.D. in Chemistry from the University of California, Berkeley in 1998. Following post-doctoral research at the University of Minnesota in the Department of Chemical Engineering and Materials Science, he moved to the Polymers Division at the National Institute of Standards and Technology, first as a National Research Council Post-Doctoral Fellow then as Leader of the Biomaterials Group. During this time he was also an Adjunct Professor at Johns Hopkins University in the Graduate Program in Biotechnology. He joined the faculty of Carnegie Mellon University in the Departments of Chemistry and Biomedical Engineering in 2004. His research interests center on biomaterials development.