

Lecture to be Presented
Monday, June 15, 2009
ASEE Chemical Engineering Division
2009 ASEE Annual Conference

Building a Better Biomaterial

Initial strategies in the field of biomaterials focused upon the application of existing materials to fill specific medical needs. Early biomaterials commonly served structural/functional roles, while being biologically inert. Recent advances, however, have enabled the development of biomaterials specifically engineered to actively interact with the biological environment. For instance, our laboratory has applied a variety of techniques to impart biological activity to otherwise biologically inert materials for medical applications. These efforts have ranged from the controlled release of bioactive molecules from materials to applying advanced cell culture techniques to coat materials with a biologically active matrix. The principles underlying this paradigmatic shift in biomaterials science form the foundation of the undergraduate-level biomaterials textbook, *Biomaterials: The Intersection of Biology and Materials Science*, recently published by Pearson Prentice Hall. This text seeks to reflect the interdisciplinary scope and dynamic nature of the field of biomaterials in an effort to develop the interest of undergraduate chemical engineers in building better biomaterials.

ASEE
Chemical Engineering Division

Presents the 2009 Winner of the
Chemical Engineering Division
Lectureship Award
Sponsored by Chemstations

Antonios G. Mikos

Louis Calder Professor of Bioengineering and
Chemical and Biomolecular Engineering
Rice University



Biographical Sketch

Professor Antonios G. Mikos

Antonios G. Mikos is the Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering at Rice University. He is the Director of the J.W. Cox Laboratory for Biomedical Engineering and the Director of the Center for Excellence in Tissue Engineering at Rice University. He received his Dipl.Eng. (1983) from the Aristotle University of Thessaloniki, Greece, and his Ph.D. (1988) in chemical engineering from Purdue University. He was a postdoctoral researcher at the Massachusetts Institute of Technology and the Harvard Medical School before joining the Rice Faculty in 1992 as an assistant professor.

Mikos' research focuses on the synthesis, processing, and evaluation of new biomaterials for use as scaffolds for tissue engineering, as carriers for controlled drug delivery, and as non-viral vectors for gene therapy. His work has led to the development of novel orthopaedic, dental, cardiovascular, neurologic, and ophthalmologic biomaterials. He is the author of over 380 publications and 24 patents. He is the editor of 10 books and the author of one textbook (*Biomaterials: The Intersection of Biology and Materials Science*, Pearson Prentice Hall, 2008). He has been cited over 13,000 times and has an h-index of 62.

Mikos is a Fellow of the International Union of Societies for Biomaterials Science and Engineering and a Fellow of the American Institute for Medical and Biological Engineering. He has been recognized by various awards including the *Alpha Chi Sigma Award for Chemical Engineering Research* of the American Institute of Chemical Engineers, the *Robert A. Pritzker Distinguished Lecturer Award* of the Biomedical Engineering Society, the *Edith and Peter O'Donnell Award in*

Engineering of The Academy of Medicine, Engineering and Science of Texas, the *Marshall R. Urist Award for Excellence in Tissue Regeneration Research* of the Orthopaedic Research Society, the *Clemson Award for Contributions to the Literature* of the Society for Biomaterials, and the *Outstanding Chemical Engineer Award* of Purdue University.

Mikos is a founding editor of the journals *Tissue Engineering Part A*, *Tissue Engineering Part B: Reviews*, and *Tissue Engineering Part C: Methods* and a member of the editorial boards of the journals *Advanced Drug Delivery Reviews*, *Cell Transplantation*, *Journal of Biomaterials Science Polymer Edition*, *Journal of Biomedical Materials Research (Part A and B)*, and *Journal of Controlled Release*. He is currently president of the North American Tissue Engineering and Regenerative Medicine International Society. He is the organizer of the continuing education course *Advances in Tissue Engineering* offered annually at Rice University since 1993.

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