



CHEMICAL AND BIOLOGICAL ENGINEERING DEPARTMENT SEMINAR SERIES

Bioengineering: Fifty years of progress, but still only a beginning

Presented by: Robert M. Nerem, Petit Institute for Bioengineering and Science
Georgia Institute of Technology

Time: April 1; 3:15 – 4:30 pm

Location: Perlstein Hall Auditorium

Abstract

Although the formative years began in the 1940s, a critical mass of therapeutic medical technologies emerged in the second half of the last century. The impact of these technologies has been greatest in orthopedics, cardiovascular disease, and neurological disorders. The bioengineering activities in academia have also evolved dramatically, from the application of classical engineering disciplines to solve medical problems, to the revolutionary biology-based engineering that has emerged today. With this there are a number of new biomedical engineering/bioengineering departments that have been established. This expanding portfolio of engineering capabilities predicts an exciting range of possibilities for patients suffering from serious diseases as innovative new medical technologies are developed to restore function and replace failing organs with living engineered ones. In the future, however, this new biology-based engineering will have just as much an application outside of the medical field as within it. There is a merging of the life sciences with physical sciences and engineering, creating a transdisciplinary endeavor that will address major problems facing human society. Thus, although the future cannot be predicted, it is clear that it will be very bright.

Biography

Professor Nerem joined the Georgia Tech faculty in 1987 when he assumed the Parker H. Petit Distinguished Chair for Engineering in Medicine. Currently he is also director of the Parker H. Petit Institute for Bioengineering and Bioscience and director of the Georgia Tech/Emory (GTEC) for the Engineering of Living Tissues, an NSF-funded engineering research center.

Dr. Nerem received his Ph.D. in 1964 from Ohio State University and joined the faculty there in the Department of Aeronautical and Astronautical Engineering. In 1972, he was promoted to full professor, and from 1975 to 1979 he was associate dean for research in the graduate school. He then moved to the University of Houston, where he was professor and chair of the Department of Mechanical Engineering from 1979 to 1986.

Professor Nerem is a past president (1991–1994) of the International Union for Physical and Engineering Sciences in Medicine and past president (1988–1991) of the International Federation for Medical and Biological Engineering. In addition, he is a past chair of the U.S. National Committee on Biomechanics (1988–1991) and is currently a Fellow, and was the founding president (1992–1994), of the American Institute of Medical and Biological Engineering (AIMBE); in 2002, he was the recipient of the AIMBE Pierre Galletti Award. From 2002 to 2004 he was president of the Tissue Engineering Society International, and from 2003 to 2006 he was a part-

time senior advisor for bioengineering in the new National Institute for Biomedical Imaging and Bioengineering at the National Institutes of Health. Professor Nerem is a fellow of the American Association for the Advancement of Science, the Council of Arteriosclerosis, the American Heart Association, the American Physical Society, the American Academy of Arts and Sciences, and the American Society of Mechanical Engineers (ASME); from 1988 to 1997, he was technical editor of the ASME *Journal of Biomechanical Engineering*, and in 1989 he received the ASME H.R. Lissner Award.

In 1988, Professor Nerem was elected a member of the National Academy of Engineering (NAE); he served as a councilor on the NAE Council for six years (1998–2004). In 1992, he was also elected a member of the Institute of Medicine. In March 1990, Professor Nerem was presented with an honorary doctorate from the University of Paris, and in 1994 he was elected a Foreign Member of the Polish Academy of Sciences. He was made an Honorary Fellow of the Institution of Mechanical Engineers in the United Kingdom in 1998, was elected an Honorary Foreign Member of the Japan Society for Medical and Biological Engineering in 2004, and became a Foreign Member of the Swedish Royal Academy of Engineering Sciences in 2006.

Professor Nerem's research interests include atherosclerosis, biomechanics, cardiovascular devices, cellular engineering, vascular biology, tissue engineering, and regenerative medicine, and he is the author of more than 200 publications. He is also a member of the scientific advisory boards of AtheroGenics Inc. and Tengion Inc.