



**TEXAS TECH UNIVERSITY**  
**Mechanical Engineering**  
**Presidents' Distinguished Lecture Series**  
**in Engineering, Science and Medicine**

**“Responsive and Intelligent Biopolymers for Recognitive Systems, Biosensing and Protein Delivery”**

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**Abstract**

In recent years several groups have started designing advanced hybrid systems that can provide recognition of the causes of various diseases. These systems are based on smart biomaterials that can be deigned to recognize various undesirable analytes and inform the medical practitioner of the early stages of a disease. This revolutionary method of detection is based on engineering principles, good materials properties and interaction in “real” systems. Recent developments in protein delivery have been directed towards the preparation of targeted formulations for protein delivery to specific sites, use of environmentally-responsive polymers to achieve pH- or temperature-triggered delivery, usually in modulated mode, and improvement of the behavior of their mucoadhesive behavior and cell recognition. We address design and synthesis characteristics of novel biomaterials capable of protein release as well as artificial molecular structures capable of specific molecular recognition of biological molecules. With such systems we can prepare biomimetic materials for intelligent drug delivery, drug targeting, and tissue engineering.

**Bio**



Nicholas A. Peppas is the Cockrell Family Regents Chaired Professor in the Departments of Chemical, Biomedical Engineering, Surgery in the Dell Medical School, and Pharmacy, and Director of the Institute of Biomaterials, Drug Delivery and Regenerative Medicine of the University of Texas at Austin. His work in biomaterials, drug delivery, regenerative medicine and bionanotechnology follows a multidisciplinary approach by blending modern molecular and cellular biology with engineering principles to design the next-generation of medical systems and devices for patient treatment. Over the past 40 years he has set the fundamentals and rational design of drug delivery systems and developed models of drug and protein diffusion in controlled release devices and biological tissues. In 2012 he received the Founders Award of the National Academy of Engineering (NAE), the highest recognition of the Academy, for these contributions to the field. Peppas is a member of the NAE, National Academy of Medicine, National Academy of Inventors, the National Academy of France, the Royal Academy of

Spain, the Academy of Athens (Greece) and the Academy of Texas. He has been recognized with awards from AIChE (Founders Award, William Walker Award, Institute Lecture, Jay Bailey Award, Bioengineering Award, Materials Award), the Biomedical Engineering Society (Distinguished Scientist Award), the American Institute of Medical and Biological Engineering (Galletti Award), the Society for

Biomaterials (Founders, Clemson and Hall Awards), the Controlled Release Society (Founders, Heller and Eurand Awards) and other societies. In 2008, AIChE named him one of the One Hundred Chemical Engineers of the Modern Era. He is President of the International Union of Societies of Biomaterials Science and Engineering, Chair of the Engineering Section of the American Association for the Advancement of Science, and Past-Chair of the Council of BME Chairs. Previously, he served as President of SFB and the Controlled Release Society. He is a fellow of AAAS, AIChE, APS, ACS, MRS, SFB, BMES, AIMBE, CRS, AAPS, and ASEE. He has supervised the research of more than 100 PhDs and about 180 postdocs and graduate students. Peppas holds a Dipl. Eng. from the NTU of Athens (1971), a Sc.D. from MIT (1973), and honorary doctorates from the Universities of Ghent, Parma, Athens, Ljubljana and Patras, and an honorary professorship from Sichuan University.

**Monday, December 5, 2016**  
**Livermore Center 101 | 2:00 – 3:00 pm**  
**Introduction TBD**