

Advances in Intelligent Biomaterials for Recognitive Systems, Biosensors and Protein Delivery Systems

Date: Friday, 12 December 2014
Time: 4:30 pm - 5:30 pm
Venue: CPD-2.37, Centennial Campus, HKU



Speaker:
Nicholas A Peppas, Sc.D.
Cockrell Family Chair No 6 in Engineering
Professor of Biomedical Engineering, Chemical Engineering and Pharmacy
Chairman, Biomedical Engineering Department
Director, Institute of Biomaterials, Drug Delivery and Regenerative Medicine
The University of Texas at Austin

Abstract:

Recent developments in delivery of drugs, proteins and active agents have been directed towards the preparation of targeted formulations and products for 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 responsive behavior and cell recognition. We can now engineer the molecular design of intelligent biopolymers by controlling their recognition and specificity as the first step in coordinating and duplicating complex biological and physiological processes. We address design and synthesis characteristics of novel biopolymers capable of protein release as well as artificial molecular structures capable of specific molecular recognition of biological molecules. We address molecular imprinting and microimprinting techniques, as methods to create stereo-specific three-dimensional binding cavities based on a biological compound of interest and to preparation of biomimetic materials for intelligent drug delivery, drug targeting, and tissue engineering.

Biography of the Speaker:

Nicholas A. Peppas is the Cockrell Family Chair No 6 in Engineering; Professor of Chemical Engineering, Biomedical Engineering and Pharmacy; Chairman of the Department of Biomedical Engineering, and Director of the Institute of Biomaterials, Drug Delivery and Regenerative Medicine of the University of Texas at Austin. He is known for his pioneering research in biomaterials, polymer physics, drug delivery, bionanotechnology and medical devices. He is the inventor of numerous medical products including contact and intraocular lenses, artificial kidney membranes, cartilage, devices for oral delivery of insulin for treatment of diabetics, calcitonin for osteoporosis and interferon beta for multiple sclerosis, and recognitive delivery systems. He is the 2012 Founders Award recipient of the National Academy of Engineering (NAE). Peppas is an elected member of the National Academy of Engineering (NAE), the Institute of Medicine of the National Academy, the National Academy of France, the Royal Academy of Spain, the Academy of Athens (Greece) and the Texas Academy of Medicine, Engineering and Sciences. In 2008, AIChE named him one of the One Hundred Chemical Engineers of the Modern Era. He is President (2008-16) of the International Union of Societies of Biomaterials Science and Engineering (IUSBSE) and Chair (2014-15) of the Engineering Section of the American Association for the Advancement of Science (AAAS). Nicholas Peppas is a Fellow of the American Chemical Society (ACS), American Physical Society (APS), Materials Research Society (MRS), AAAS, AIChE, BMES, AIMBE, SFB, CRS, American Association of Pharmaceutical Scientists (AAPS), and the American Society for Engineering Education (ASEE). Peppas holds a Dipl. Eng., National Technical University of Athens (1971), a Sc.D. from MIT (1973), honorary doctorates from the Universities of Ghent (Belgium), University of Parma (Italy), University of Ljubljana (Slovenia) and University of Athens (Greece), and an honorary professorship from Sichuan University, China.