Distinguished Visitor Programme

Prof John Kuriyan
Chancellor's Professor, University of California, Berkeley

Biography

Prof John Kuriyan is the Chancellor's Professor at the Department of Molecular and Cell Biology and Department of Chemistry, at the University of California, Berkeley. Since 1993, he has been a Howard Hughes Medical Institute Investigator. He is also the Divisional Deputy for Structural Biology, Physical Biosciences Division at the Lawrence Berkeley National Laboratory. He received a B.Sc. in Chemistry from Juniata College, Pennsylvania, and a Ph.D. from the Massachusetts Institute of Technology, where he worked with Gregory Petsko and Martin Karplus (Harvard University) on the dynamics of proteins. After a year, he moved to the Rockefeller University as Assistant Professor and University Fellow, where he remained for 14 years. Prof. Kuriyan is a member of the National Academy of Sciences.

Prof Kuriyan is interested in the construction, mechanism, and regulation of the molecular machines and switching devices that carry out signal transduction and DNA replication. His laboratory uses x-ray crystallography to determine the three-dimensional structures of the component proteins, along with biochemical and biophysical analyses to elucidate mechanisms.

Lecture Abstract

23 July 2003, 6.15 pm - 7.15 pm, Clinical Research Centre (CRC) Auditorium, Faculty of Medicine, MD 11, National University of Singapore, 10 Medical Drive, Singapore 117597

"ON-OFF Switches and Cancer Drugs: Understanding Oncogenes and Cellular Signaling"

"Each of the cells in a healthy human being is responsive to the demands of neighbouring cells, and lives or dies so as to satisfy the needs of the whole body. The breakdown of this unselfish behavior leads to cancer, a class of diseases that result from the runaway proliferation of rogue cells due to malfunctioning cellular signals. I shall discuss how signaling systems within the cell work at the atomic level, focusing on the results of X-ray crystallography, which is a kind of microscopy that lets us look at atoms and molecules at very high magnification. I shall describe the structure and properties of a set of protein molecules, coded by oncogenes, that serve as critical ON-OFF switches that tell a cell whether to multiply or not. Certain mutations cause these switches to fail, and I shall explain how a new class of cancer drugs (tyrosine kinase blockers) are achieving success by specifically turning off malfunctioning cellular switches."