



**Prof .dr. John Ladbury**

*Dean Faculty of Biological Sciences, Professor of Mechanistic Biology*

*School of Molecular and Cellular Biology*

***Background:***

*Postdoctoral Research Fellow, Yale University, Harvard University Medical School, New York University Medical Center 1990-1994; Wellcome Trust Career Development Fellow, University of Oxford 1994; Wellcome Trust Senior Research Fellow & Honorary Senior Lecturer, 1996, Professor of Biophysics 2003, University College London; Endowed Chair in Cancer Research and Director of the Center for Biomolecular Structure and Function, UT MD Anderson Cancer Center, 2008.*

***Research Interests***

*Mechanistic basis of pathological signal transduction*

***Current Projects***

*Focusing on early signalling events we are exploring the structural, biophysical, and cellular outcomes of protein complex formation at receptors. Perturbation of these complexes by inhibiting assembly or modifying the time course reveals how the*

*exquisite sensitivity of early signalling complex formation can ensure specificity and lead to disease.*

***Current major projects include:***

*Aberrancies in signaling lead to cancer*

*Signaling in growth factor-deprived cells*

*Biophysical characterization of complex formation*

*Thermodynamics in drug development*

*Professor Ladbury's independent research is strongly influenced by his background in biophysical chemistry. He has published seminal investigations on the application of biophysical data to the understanding of signal transduction and in drug development. This experience was also exploited for investigating the mechanisms by which proteins are able to propagate and maintain mutually exclusive signals in mammalian cells. This work questioned existing dogma regarding specificity in interactions involved in tyrosine kinase-mediated signal transduction. His observations in this area led him to investigate the role of multi-protein complexes in signalling pathways. This has culminated in the development of a probabilistic view of signalling regulated by control and switching mechanisms, perturbation of which can lead to disease states such as cancer.*

*The Ladbury laboratory adopts methods including cell biology, biophysical instrumental techniques and high resolution structure determination. He has combined the use of cell-based fluorescent life time imaging microscopy with in vitro measurement of biomolecular interactions to investigate the formation protein ensembles on plasma membrane receptors.*

*Professor Ladbury has also maintained an interest in the area of structure-based drug design and has pioneered approaches to integrate thermodynamic parameterisation into this process. Professor Ladbury has always been an enthusiastic collaborator and has published with many of the leading scientists in his field.*

*He has also worked closely with industrial partners and has received research funding from UCB/Celltech and AstraZeneca. In his previous role in the USA he successfully developed the interface between biophysics/structural biology and clinical scientists at MDACC. This activity in which researchers are encouraged to include biophysical/structural data in their interpretation of clinical outcomes will continue at the University of Leeds.*