Biomolecular Sensors. Electra Gizeli and Christopher R. Lowe (eds). Taylor and Francis Books Ltd., New Fetter Lane, London EC 4P 4EE. 2002. 322 pp. Price: £ 70.00.

A search for the word 'biosensor' on the net takes one to sites as diverse as medical telesensors, microcantilevers, bioreporters and miniaturized devices and to their applications such as in detecting cancer and health abnormalities, biosensors and DNA analysis and anthropometry. One of the scientists to take keenest of interests in anthropometry was Leonardo da Vinci, who drew the famous 'Proportions of the human figure' some 500 years ago. Now, one can do the same by using laser beams, mirrors and amplitude-modulated laser radars. A few years ago, one could draw clear distinctions between the various disciplines, namely physics, chemistry and biology. However, increasingly, the ideas of one are applied to the other and thus the emergence of fields such as the biosensors. To put it simply, biosensors is a field where complex rules of physics are applied to the study of biological systems.

In today's world of genomics and proteomics, new molecules are being identified each day. Genomics basically deals with sequencing of the complete genome of a particular organism. Proteomics on the other hand, can be defined as the study of all the proteins present in the genome of an organism. With new genomes and proteomes being identified at such a rate, the need would be to identify molecules that interact or to find various binding partners, which could give us deep insights into biological pathways. Now, with the whole human genome available for scrutiny to the biologists, there would be many new small molecules as potential drug candidates and hence a greater need to study interactions at the molecular level. All this leads one to realize the importance of more sophisticated and sensitive instruments that could help us in such endeavours. Thus, this book has been published at an appropriate time.

The field of biosensors is not old and has received a great impetus in the last decade due to the development of sensitive commercial instruments and user-friendly software. Biosensors have come a long way and now find applications in fields such as protein–protein interactions, determining rates of reactions, determining concentrations of molecules, identifying binding partners and thermodynamics of molecular interactions.

The book has been divided into four sections, namely biological recognition, immobilization of biomolecules, transducer technology and applications of biosensors. The book deals in detail about the various interactions that are biologically relevant like antigen–antibody, protein–protein and DNA interactions. This would help a user of biosensors to understand the kind of possible interactions. How molecules behave in solution could be very different from when one of the interacting molecules is immobilized on a surface. Under immobilization conditions factors such as orientation of groups, steric hindrance and matrix effects among others, come into play and can affect the results to a great extent. Thus, an in-depth knowledge of these factors would help in better designing of the experiments and also in judicious choice of models during the analyses of the results. This fact has been kept in mind during the production of the book and the section on immobilization deals first with the possible strategies available for immobilization and another chapter is devoted to the kinetics of such systems. The third section explains how a biological interaction can be converted into a signal by optical, acoustic and electrical approaches. Amongst all, optical transducers have received the greatest attention. This is so because UV–Vis absorption spectroscopy, fluorescence spectroscopy and Raman spectroscopy have demonstrated the extent to which optical analysis methods are established and the wide range of molecular structure, conformation and environment that they can give. The chapters describe in detail the physical principles involved and how they have been used in the development of various instruments. The last section deals with the applications of biosensors wherein it has been shown how the different physical principles have been commercialized into instruments which are now being used in both basic and applied research. Surface plasmon resonance (SPR), its development and use as BIACORE instruments forms the first of the four chapters in this section. The chapter on IAsys, a resonant mirror biosensor, describes its applications in analysis of whole eukaryotic and prokaryotic cells, viruses and liposomes. The last two chapters in the book deal with commercial quartz crystal microbalance (QCM) and QCM-D (with dissipation monitoring). QCM has found a wide range of applications in areas of food, environmental and clinical analysis due to its inherent ability to monitor analyses in real time. However, QCM still has not received the kind of success that SPR has seen, and the authors discuss this in some detail.

On the whole the book describes the fundamentals of physics in the development of new technology through to their applications. The book will be informative to both newcomers in the field of biosensors as well as to those who are already into it.

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Recombinant Protein Drugs. Milestones in Drug Therapy Series. (ed. Buckel, P.), Birkhauser Verlag AG, P.O. Box 133, CH-4010, Basel, Switzerland. 2001. 207 pp. Price sFr 158/DM 210.

One of the true success stories of the biotechnology and rDNA revolution emanating from the 1970s has been the availability of various recombinant protein drugs for different therapeutic applications. Some of these, particularly the growth hormones and an array of cellular growth factors would just have been unavailable to clinicians, if rDNA technologies had not been plugged into their production processes. These now number well over 30, with nearly ten times this number in various stages of pre-clinical trials. Thus, at least

in terms of therapeutic rDNA-based proteins, the biotechnology industry has truly heralded a new dawn, even though other more ambitious enterprises such as gene therapy have had relatively limited success till now.

This volume describes in interesting detail the historical, scientific and clinical aspects of the discovery and development of key rDNA proteins (which mostly cover the 'first-generation' of such useful therapeutic drugs as interferon, blood-clotting factors, clot-busters such as tPA, as well as some of the early vaccines *à la* Hepatitis B). These stories offer fascinating case studies of the travails, tribulations and triumphs of some of the more visible candidate drugs. Moreover, apart from interesting anecdotal information, they provide a solid background, replete with detailed reference material, on the scientific research that formed the foundation of their acceptance and approval as drugs. Thus, this book is a useful source for a reader directly interested in quickly accessing the scientific literature on some of the most successful and now well-accepted rDNA-based protein drugs. The fact that these descriptions emanate from some of the earliest practitioners of the art in the field lends a special ring of authenticity to the accounts, as well as provides an intimate insight into the human element involved in the pioneering work on this front. The formidable challenges involved in translating the science into commercially viable products – a novel experience in biology at that time – has been captured well in some of the chapters, most notably the one by Charles Weissmann, is a co-founder of one of the earliest biotechnology ventures, besides being a scientist of formidable reputation. There are many lessons in this book for some of the 'struggling souls' of the Indian biotechnology industry, especially that good products – apart from other factors – eventually ensure success in the market in the long run, and one cannot afford to overlook a solid commitment to basic science and quality control, even though it may be commercially more tempting to be the first in the market in the short run.

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Methods for Community Participation: A Complete Guide for Practitioners. Somesh Kumar. Vistaar Publications, M-32 Market, Greater Kailash-I, New Delhi 110 048. 2002. 333 pp. Rs 380.

The process of development in any country treads a path that primarily emerges from the imagination of planners and policy makers, who perhaps have a gross idea on the resource, livelihood pattern and culture of the country. However, when such a development concept spreads, it would be implemented uniformly over vast stretches of landscapes and cultures. While implementing these policies conflicts arise from the local community, though the policies may be well intended. Such conflicts may be because of lack of social benefits to the local community or the policies may not have been developed through consensus to meet the expectations of the local community. Thus it was realized, that while formulating the policies, it is essential to go to the people to understand their concerns and expectations. Further, it was realized that government programmes were not reaching the people, and that many of the development and livelihood programmes did not bring out expected results. One such example was the social forestry project in India. In the last decade, the programmes, particularly those supported by the international agencies, insisted that the implementation be done with the consent of the local populace. Programmes such as watershed development and Joint Forest Management need a lot of support and understanding of the local community behaviour, in order to be successful. Therefore, agencies that supported such programmes ensured participation of local community in planning, implementation and future management plans.

Development professionals, who generally did not have hands-on experience in dealing with the expectations of the community had to undergo radical change in their approach and therefore had to undergo training. Therefore, methods such as participatory rural appraisal (PRA) were developed in order to facilitate participation of people in planning, decision-making and managing the local resources, training them towards self-governance. In view of many programmes related to environment and natural resources prevalent nowadays, the book under review comes in handy. As an administrator, the author has put himself in many situations and tries to deal with them. The book deals with methods of enhancing community participation by making the process interesting for the community using locally available material, giving importance to the opinions and suggestions expressed by the local community. The book has five chapters, detailing the concepts of participation, methods of PRA to obtain information over landscapes, historical events and societal aspects, and finally, the summary.

Chapter 1 deals with conceptual issues related to PRA. It discusses various ways of eliciting responses from the rural/urban community and also how currently practised methods were evolved. The author explains in detail, the preliminary ways in which questionnaires were used to get responses and compares various methods that were evolved. It indeed captures various views on the current methods and answers some of the myths associated with PRA. As a book on the methodology, sufficient theoretical details are given for a practitioner. One of the problems, as the author quotes several examples, is of insufficient training and understanding of theoretical details for proper implementation in order to cope with the programme's objectives. The author indicates that the larger goal of the participatory appraisal is to empower people towards self-governance; it is difficult to imagine, given the inequity in the social system and implementation process, whether it could be truly achieved. We have several development models working in the country brought about by the efforts of illustrious personalities. These are isolated in nature and have failed to replicate themselves, though they were successful. No doubt, these development models are based on strong theoretical foundations, but when they are unable to replicate themselves through 'demonstration effect' there is a need to diagnose where the problems lie at a different level.

Chapters 2–4 illustrate various methods of understanding the perception of people about the space, time and their relation. The author vividly explains the method, the precautions that need to be taken, the importance of using locally available material, the advantages of allowing concerned people to dominate discussions, etc. Further, illustrations of the