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Going Beyond the Dream

*Justin Gooding**

Optical Biosensors: Present and Future

Frances S. Ligler and
Chris A. Rowe Taitt (Eds)
Elsevier Science B.V.,
Amsterdam, The Netherlands
ISBN 0 444 50974 7
Hardcover, 249 USD

Optical Biosensors: *Present and Future* edited by Frances S. Ligler and Chris A. Rowe Taitt of the Center for Bio/Molecular Science and Engineering at the U. S. Naval Research Laboratory in Washington aims to be a comprehensive synopsis of the optical biosensor field. As the editors rightly point out, despite the myriad of reports on optical biosensors there has been little attempt to provide an overview of the field in a single volume. The editors achieve their aim and more, subdividing the book into the present and the future. The present covers the history and state of the art of established optical biosensor formats, while the future deals with emerging technologies that the editors have identified as possibly having a significant impact on future developments in optical biosensing. The book is suitable for both those entering the field of optical biosensors and experienced workers in the field who are looking for information regarding recent advances. The book manages to satisfy such a broad range of readership because of the expertise of authors and the well-defined structure of each chapter.

Part 1—the present, contains nine chapters all dealing with different optical-biosensing formats. Topics covered are optrode-based fiber optic biosensors, evanescent wave fiber optic biosensors, planar waveguides for fluorescence biosensors, flow immunosensors, time resolved fluorescence, electrochemiluminescence, surface plasmon resonance, the resonant mirror optical biosensors and interferometric biosensors. Part 2—the future, focuses more on new recognition elements, and methods of fabricating and patterning the biorecognition interface. The nine chapters in this section review genetic engineering of signaling molecules, artificial receptors for chemosensors, nucleic acids for reagentless biosensors, new materials based on imprinted polymers, sol-gel based optical biosensors, membrane based biosensors, nanosensors for real-time chemical imaging inside cells (called PEBBLE), quantum dots as labels, and finally soft lithography and microfluidics. Throughout the book each chapter has a reasonably uniform style, which is relaxed and accessible.

The authors who contribute each chapter have usually been involved in the specific field from its inception and hence provide excellent analysis of the important historic literature, which has paved the way to the current state of the art. With regards to the chapters that deal with the present, many of the authors have been the researchers who have seen an idea make the transition from the research lab to commercialization, and therefore the reader is given a unique insight into the commercialization route. As for the structure, each chapter is subdivided into five key sections. Firstly the principles are covered at a level assuming the reader has some knowledge of spectroscopy but knows little about the specific optical technique being discussed. The principles section is followed by a history section, which acknowledges the important works upon which the third section, the state of the art, is based. The fourth section of each chapter, advantages and limitations of the subject, was one I found most interesting and refreshing to read. The authors were surprisingly candid. The final section of each chapter required the author to take out a crystal ball and predict what they think the future holds. The strength of the books structure is it allowed the reader to enter a chapter at the appropriate place for their knowledge and quickly gain the required information. The weakness of the structure, and because the book in general is transduction based, was their was considerable repetition relating to the biomolecules used and methods of immobilization. In hindsight, it may have been better to have a couple of basic chapters in the beginning on biorecognition molecules and the fabrication of recognition interfaces. This, however, is a minor criticism as there are a number of other biosensor books that cover this information.

In conclusion I felt this was one of the best books on biosensors I have read. I liked the accessibility of the book, I felt it ably catered for a broad audience and went beyond the dream of biosensors by educating the reader on some of the challenges involved in bring a biosensor to market. With the book being so up to date (containing references from 2001) it is timely and I would thoroughly recommend it to researchers considering investigating optical biosensors as well as to those already exploring this exciting field.

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