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Eva.S: Evaluation Strategies and Data Processing of Indicator Values

Peter-Diedrich Hansen, Ben Gabriel, Henry Liebrecht,
Sabine Herig, Rainer vom Lehn

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Damià Barceló, Peter-Diedrich Hansen (Eds.): Biosensors for the environmental monitoring of aquatic systems. Bioanalytical and chemical methods for endocrine disruptors

Boguslaw Buszewski

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Bibliography

Biosensors for the environmental monitoring of aquatic systems. Bioanalytical and chemical methods for endocrine disruptors Damià Barceló, Peter-Diedrich Hansen (Eds.)

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Contents Thirty-eight authors contributed to the nine chapters in *Biosensors for Environmental Monitoring of Aquatic Systems. Bioanalytical and Chemical Methods for Endocrine Disruptors*. The first chapter by M. Farré et al. introduces the principles, advantages and limitations of using biosensor technology for environmental monitoring, and summarize the advances obtained in this field under the support of public institutions. In “Achievements of the RIANA and AWACSS EU projects: immunosensors for the determination of pesticides, endocrine disrupting chemicals and pharmaceuticals” (Chap. 2), S. Rodriguez-Mozaz et al. focus on basic technology, immunoassays, and software networking developed within the research projects RIANA (European Commission River Analysis) and AWACSS (Automated Water Analyser Computer Supported System). Their systems were used for real sample measurements and the biosensors were validated with conventional analytical methods. “Biosensors for pharmaceuticals and emerging contaminants based on novel micro and nanotechnology approaches” (Chap. 3) by J. Adrián and co-authors provides an overview of the potential novel micro(nano) technology approaches for developing biosensors that are useful for the analysis of pharmaceutical and emerging pollutants. In Chap. 4, B. Piña et al. describe two tools for studying potential or actual impacts of endocrine disruptors in wildlife and humans (RYA, PCR). These methods are rapid screening for potential ligands of hormone receptors, and the identification of endocrine disruptor signals at low concentrations and short exposure times. In the following chapter, M. Farré and D. Barceló concentrate on new technologies for ecotoxicological studies, such as microorganisms, embryo tests, microinvertebrates, algae, cell lines and tissues. The topic of “Genetically engineered bacteria for genotoxicity assessment” (Chap. 6) is discussed by A. Biran and co-

Book's topic Progress in the fields of miniaturization, nanotechnology and biotechnology is stimulating practical achievements in the field of biosensors for environmental monitoring in Europe. The book is a balanced review of current theory combined with a discussion of the scientific developments and results achieved by research groups in this field. Topics such as the sensitivity, selectivity and simplicity of biosensors for environmental analysis and monitoring are covered in this book. The authors introduce the reader to all aspects of biosensor technology, which is a key tool for the environmental monitoring of aquatic systems, and other measurement methodologies, including traditional chromatographic techniques.

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authors. They review the main directions undertaken in the construction and testing of bacterial-based genotoxicity bioassays. The seventh chapter, written by T. Grummt et al., deals with sensitive testing methods for practical applications that allow genotoxic (mutagenic) agents to be discovered in aquatic ecosystems. P.D. Hansen and co-authors show a significant time- and dosage-dependent influence of UV-B radiation on mortality and sublethal ecogenotoxic effects in mussels and fish embryos (DNA damage in the environment). The last chapter, by P. Pastigo et al., describes analytical methods (including sample preparation and analysis) based on LC–MS for the determination of different classes of endocrine disruptors (alkylphenolic compounds, pesticides, phthalates, bisphenol A, pharmaceuticals and estrogens) in wastewater and their occurrence in this kind of matrix.

Comparison with existing literature This book is a useful supplement to other well-established collections in the field of biosensors. Thus, it may be of particular interest to those readers intending to broaden their overview about the biosensors. The editor has put much effort in the all chapters, so that the reader may participate in his experiences and points of view.

The book provides a good and fairly complete overview of the biosensors that are used in bioanalytical and chemical methods for the analysis of endocrine disruptors, with many references provided.

Readership recommendation The book serves as an excellent compendium of the achievements of the field of new measurement devices such as biosensors used in environmental monitoring for anyone interested in this topic. The book highlights recent developments in biosensor technology that will be of great value to many environmental chemists, water management operators, and analytical chemists who wish to know more about biosensor technology and analytical and environmental chemistry. Finally, the book is especially written for scientists by scientists.

Summary *Biosensors for the Environmental Monitoring of Aquatic Systems* is a carefully written work that provides exact definitions and is based on the scientific developments and results achieved by research groups around the world. I believe that this book, with its vast coverage, will be an invaluable source of information for active researchers in this field.