

PERSPECTIVES IN BIOANALYSIS

VOLUME 1

For almost 40 years electrochemistry of nucleic acids was a domain of a mere handful of laboratories in Europe. In the 1990's progress in genomics and particularly in the Human Genome Project greatly stimulated interest in new methods capable to unravel the genetic information stored in the nucleotide sequence of DNA. Development of DNA sensors and construction of DNA arrays (chips) with electrochemical detection (which is simpler and should be less expensive than optical detection) have become a booming field involving large number of laboratories all over the world. Similar increase in the interest in electrochemistry of proteins is foreseen in connection with the rapid development of proteomics. This book offers an up-to-date presentation of the interaction of nucleic acids and proteins with electrodes and about the development of sophisticated electrochemical biosensors for DNA hybridization and damage as well about modern sensors for protein identification. In addition it summarizes the ways, which in the past century led to the present state of electrochemical analysis of nucleic acids and proteins. The book, written by renowned experts, represents the basic literature for those who already entered the field as well as for physicists, chemists and biologists, both professionals and students, who are interested in new biophysical-chemical methods and approaches useful in modern biotechnologies.

After the TV coverage of some crime cases, DNA analysis has become popular among the public. But DNA analysis is not only important in forensic analysis, but together with protein analysis, it represents the basis of new medicine of the 21st century. This book is concerned with the electron transfer between electrodes on one hand and DNA, RNA and proteins on the other hand and with the use of electrochemistry and electrochemical sensors in DNA and protein analyses. Electrochemical bioassays involve newly emerging fields of genomic, proteomics, biomedicine and biotechnology. DNA and protein chips with electrochemical detection represent new tools of science, medicine and other areas of practical life in this century.



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