

The Analyst

Interdisciplinary detection science

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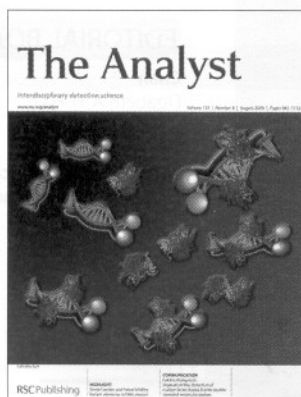
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Cover

See H. J. Lee, A. W. Wark and R. M. Corn, pp. 975–983.
Creating ultrasensitive microarray sensors for the detection of protein biomarkers to provide new opportunities for disease treatment and understanding.

Image reproduced by permission of Hye Jin Lee from *Analyst*, 2008, **133**, 975.



Inside cover

See Z. Wang, V. Gidwani, D. D. Zhang and P. K. Wong, pp. 998–1000.
Double-stranded DNA probes for the detection of specific DNA and DNA binding proteins.

Image reproduced by permission of Pak Kin Wong from *Analyst*, 2008, **133**, 998.

CHEMICAL TECHNOLOGY

T57

Drawing together research highlights and news from all RSC publications, *Chemical Technology* provides a 'snapshot' of the latest applications and technological aspects of research across the chemical sciences, showcasing newsworthy articles and significant scientific advances.

Chemical Technology

August 2008/Volume 5/Issue 8

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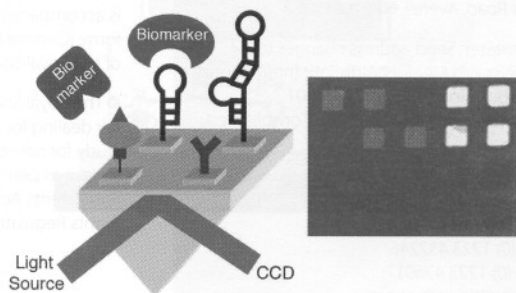
HIGHLIGHTS

975

Microarray methods for protein biomarker detection

Hye Jin Lee,* Alastair W. Wark and Robert M. Corn

The application of microarray-based detection platforms for the high-throughput analysis of protein biomarkers found in easily accessible biological samples such as serum holds significant opportunities for improving patient care. Here, we highlight some recent developments and challenges in this endeavor.

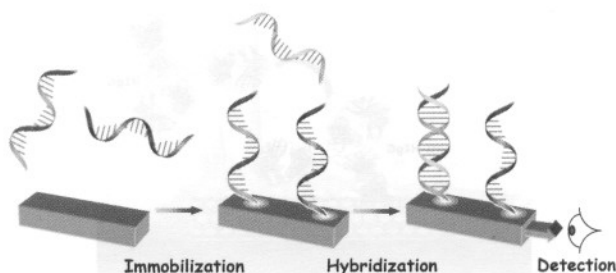


984

Recent advances in DNA sensors

Serge Cosnier and Pascal Mailley

This review points out emerging trends over the past three years concerning the immobilization of DNA and the transduction of the hybridization step.



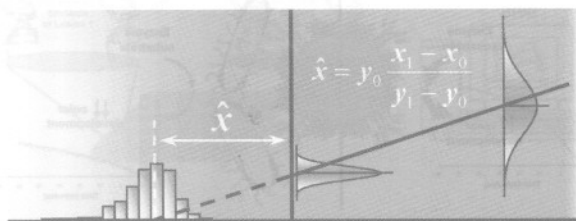
PERSPECTIVE

992

Standard additions: myth and reality

Stephen L. R. Ellison and Michael Thompson

A generalised model of an analytical system is used to derive the uncertainty involved in the method of standard additions and to show that, when the method is executed optimally, there is no noteworthy loss of precision.



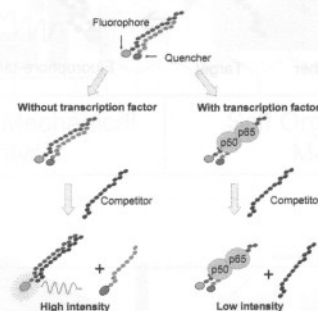
COMMUNICATIONS

998

Separation-free detection of nuclear factor kappa B with double-stranded molecular probes

Zhaohui Wang, Vinay Gidwani, Donna D. Zhang and Pak Kin Wong*

This paper reports a simple, rapid molecular binding scheme for the detection and quantification of the transcription factor nuclear factor kappa B and other DNA binding proteins without any separation or immobilization step.

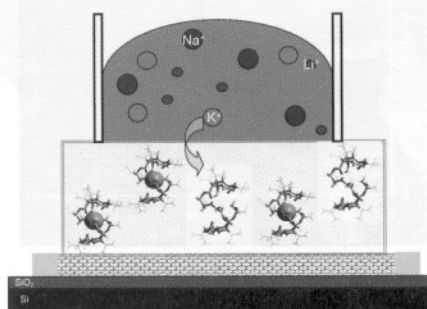


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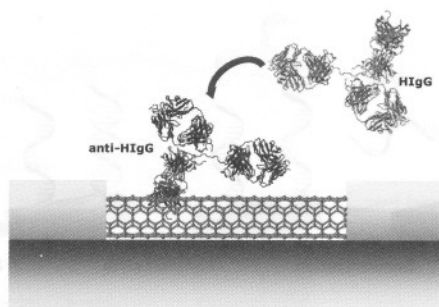
Ion-sensitive field effect transistors using carbon nanotubes as the transducing layer

Cristina C. Cid, Jordi Riu,* Alicia Maroto and F. Xavier Rius

A new type of ion-sensitive field effect transistor (ISFET) is presented. This ISFET is based on a network of carbon nanotubes covered by a PVC membrane selective to potassium ions. Our configuration makes an external reference electrode unnecessary.



1005

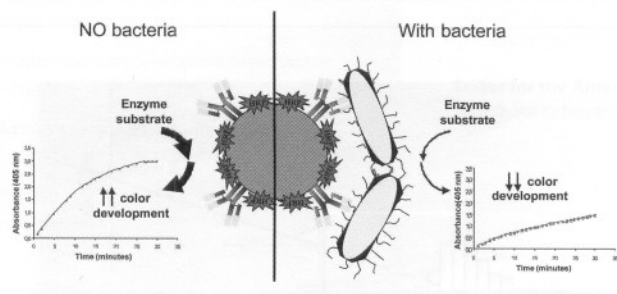


Carbon nanotube field effect transistors for the fast and selective detection of human immunoglobulin G

Cristina C. Cid, Jordi Riu,* Alicia Maroto and F. Xavier Rius

A carbon nanotube field effect transistor (CNTFET) for the selective detection of human immunoglobulin G (HIgG) is presented. Nanomolar concentrations of HIgG are detected with this rapid-to-build, label-free and reagentless device.

1009



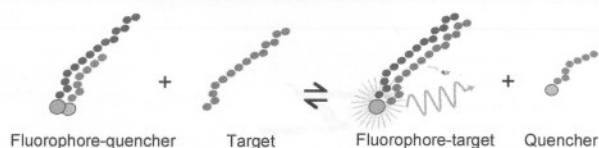
Enzyme shadowing: using antibody–enzyme dually-labeled magnetic particles for fast bacterial detection

Eva Baldrich* and Francesc Xavier Muñoz

This work demonstrates that simultaneous incorporation of capture and reporter biocomponents onto the sensing surface is possible and provides sandwich assays that are extremely fast and easy to carry out.

PAPERS

1013

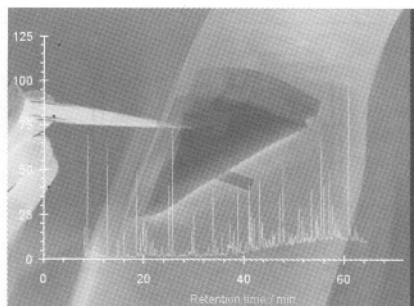


A double-stranded molecular probe for homogeneous nucleic acid analysis

Daniel Meserve, Zhaohui Wang, Donna D. Zhang and Pak Kin Wong*

A double-stranded molecular probe has been designed and optimized for the detection of single nucleotide mismatches in a single step without any separation step or measurement of melting profile.

1020



The analytical utility of thermally desorbed polydimethylsilicone membranes for *in-vivo* sampling of volatile organic compounds in and on human skin

S. Riazanskaia, G. Blackburn, M. Harker, D. Taylor and C. L. P. Thomas*

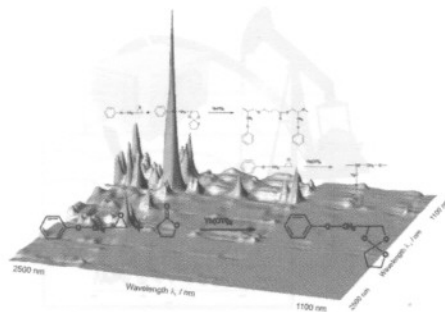
A new and highly sensitive thermal desorption methodology for profiling volatile organic compounds in and on human skin yields reproducible data. The complicated interactions of bio-kinetics, physical chemistry and micro-biology require careful experimental design and sample handling.

1028

Spectroscopic and quantitative analysis of spiroorthoester synthesis by two-dimensional correlation and multivariate curve resolution methods of NIR data

Nicolás Spegazzini, Itziar Ruisánchez, M. Soledad Larrechi,* Virginia Cádiz and Judit Canadell

Quantitative analysis of spiroorthoester synthesis that includes several competitive reactions was performed using two-dimensional correlation and multivariate curve resolution-alternating least squares using data NIR spectroscopy.

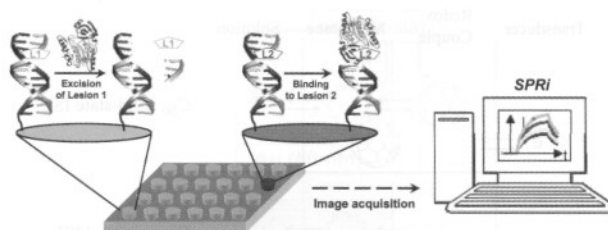


1036

SPR imaging for label-free multiplexed analyses of DNA N-glycosylase interactions with damaged DNA duplexes

Christelle Corne, Jean-Bernard Fiche, Didier Gasparutto,* Valérie Cunin, Emmanuel Suraniti, Arnaud Buhot, Julia Fuchs, Roberto Calemczuk, Thierry Livache* and Alain Favier

We report SPR imaging-based assays to analyze enzymatic DNA repair activities. This miniaturized and multiplexed bioanalytical approach provides a new powerful tool to develop screening platforms to search for new DNA repair activity modulators.

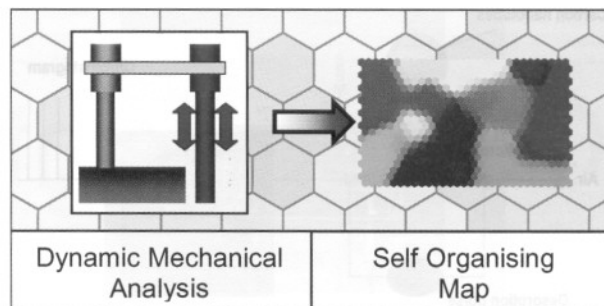


1046

Self Organising Maps for distinguishing polymer groups using thermal response curves obtained by dynamic mechanical analysis

Gavin R. Lloyd, Richard G. Brereton* and John C. Duncan

Self Organising Maps are applied to thermo-mechanical profiles of polymers characterised by type, group and grade and several different approaches for visualisation are described.

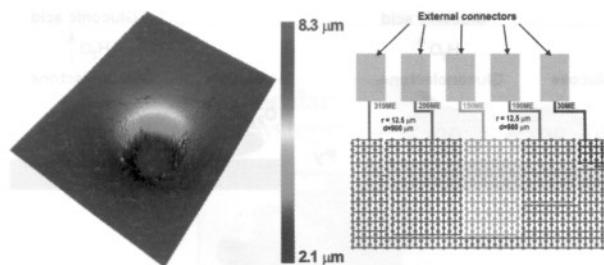


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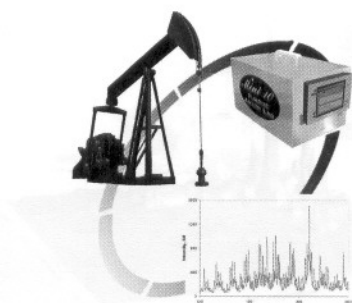
Towards multifunctional microelectrode arrays

Francisco. A. Aguiar, Mark. C. Rosamond, David Wood and Ritu Katakya*

Identification of defective clusters of sensors and multi-analyte analyses in a single sensor array platform comprised of microelectrodes can be achieved by flexible multiplexing of groups of microelectrodes.



1064

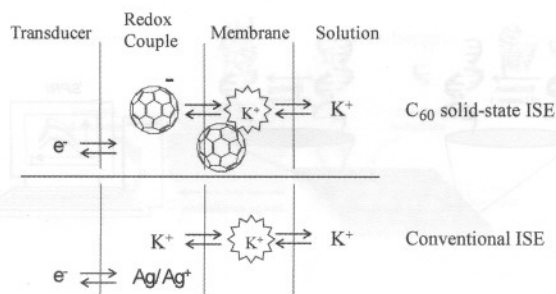


Rapid hydrocarbon analysis using a miniature rectilinear ion trap mass spectrometer

Ewa Sokol, Kathleen E. Edwards, Kuangnan Qian* and R. Graham Cooks*

A hand-held mass spectrometer can be used to identify and quantify a variety of compounds of interest in the petroleum and petrochemical industry, including trace organics in air and water, odiferous compounds, and naphtha distillates.

1072

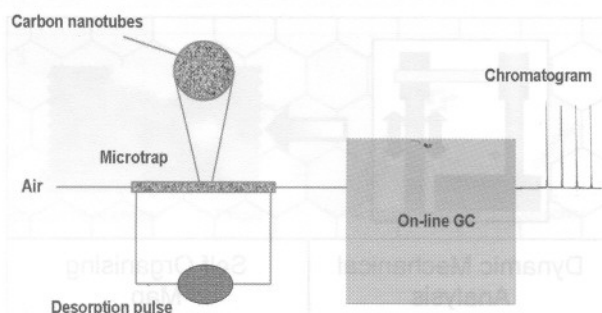


Fullerene-based electrochemical buffer layer for ion-selective electrodes

Maria Fouskaki and Nikos Chaniotakis*

C_{60} fullerene is used as electrochemical mediator for the development of an all-solid-state ion-selective electrodes (ISEs). The unique electrochemical characteristics of the fullerenes allow for the facile ion-to-electron transduction across the ionically active polymeric ion-selective membrane and the electrochemically active glassy carbon transducer, providing a stable and reversible solid-state ISE system.

1076

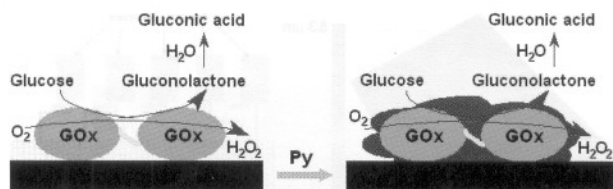


Carbon nanotubes as sorbents for the gas phase preconcentration of semivolatile organics in a microtrap

Chaudhery Mustansar Hussain, Chutarat Saridara and Somenath Mitra*

We report the application of carbon nanotubes (CNTs) as the high performance sorbents in the fabrication of a microtrap. The high aspect ratios of CNTs lead to high sorption capacity, and their nonporous nature reduces mass transfer resistance, which allows easy desorbability. Together, these extend the range of compounds that can be analyzed.

1083



Self-encapsulation of oxidases as a basic approach to tune the upper detection limit of amperometric biosensors

Arunas Ramanavicius,* Asta Kausaite and Almira Ramanaviciene

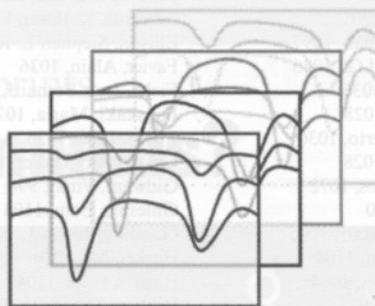
A new, basic procedure for the tuning of some analytical parameters of enzymatic biosensors that are based on hydrogen peroxide-producing oxido-reductases is described.

1090

Multi-analyte sensing: a chemometrics approach to understanding the merits of electrode arrays *versus* single electrodes

Diako Ebrahimi, Edith Chow, Justin J. Gooding and David B. Hibbert*

An array of peptide-modified electrodes for sensing metal ions gives a better calibration than a single electrode modified with all the peptides when there is substantial overlap of voltammetric peaks.

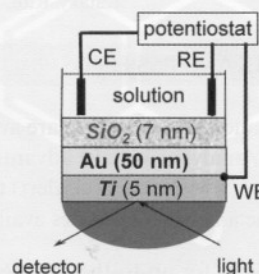


1097

Electrochemical impedance spectroscopy and surface plasmon resonance studies of DNA hybridization on gold/SiO_x interfaces

Maël Manesse, Valerie Stambouli, Rabah Boukherroub and Sabine Szunerits*

The use of Au/SiO_x interfaces for the investigation of DNA hybridization using, simultaneously, electrochemical impedance spectroscopy (EIS) and surface plasmon resonance (SPR) is demonstrated.

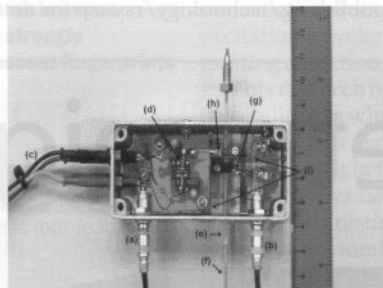


1104

Development of a contactless conductivity detector cell for 1.6 mm O.D. (1/16th inch) HPLC tubing and micro-bore columns with on-column detection

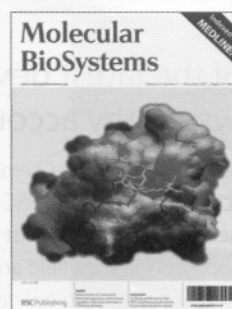
Eoin Gillespie, Damian Connolly, Mirek Macka, Peter Hauser and Brett Paull*

A contactless conductivity cell for use with 1/16th inch O.D. tubing and on-column detection of ionic species has been developed.



MOLECULAR BIOSYSTEMS

It's official, *Molecular BioSystems* has separated from host journal, *Chemical Communications*, and is now a fully fledged solo publication. Its availability since launch to readers of *Chemical Communications* and the online hosts, *Organic & Biomolecular Chemistry*, *Lab on a Chip*, *The Analyst* and *Analytical Abstracts*, has ensured that *Molecular BioSystems* received a large and interdisciplinary audience from the outset. *Analyst* readers wishing to continue to read *Molecular BioSystems* now need to recommend the journal to their librarian. Fill in the online recommendation form at www.rsc.org/libraryrecommendation



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