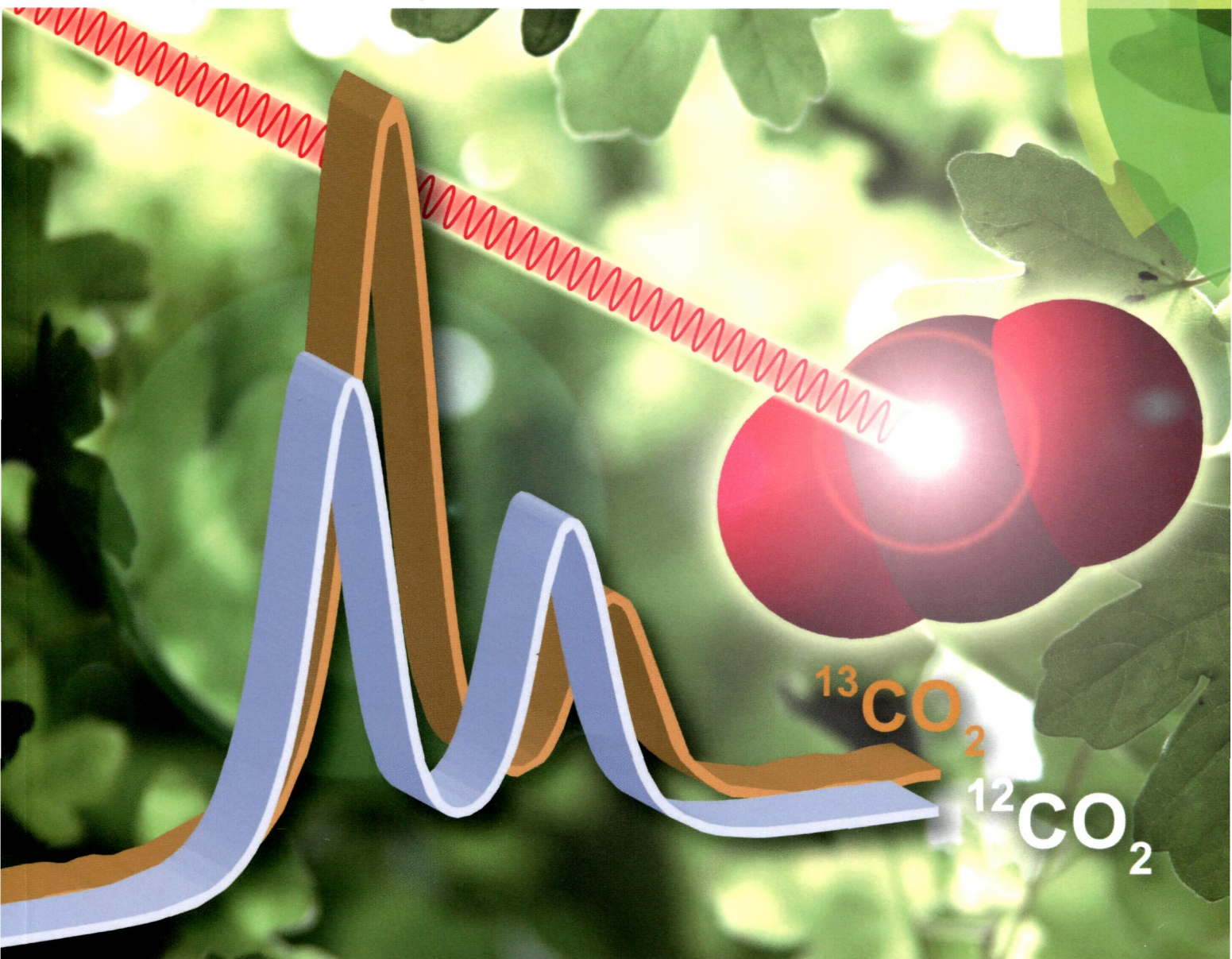
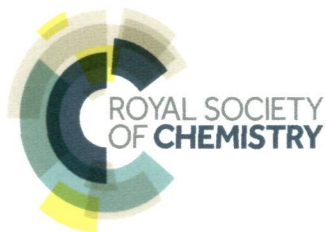


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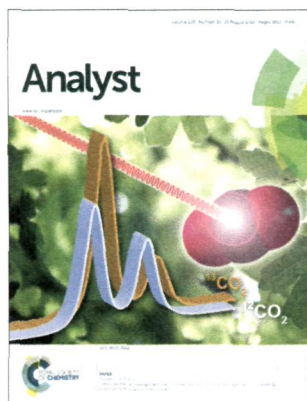
PAPER

Torsten Frosch *et al.*

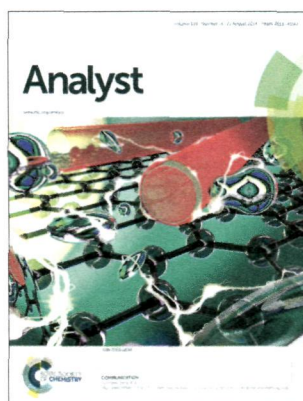
Enhanced Raman multigas sensing – a novel tool for control and analysis of $^{13}\text{CO}_2$ labeling experiments in environmental research

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 139(16) 3813–4090 (2014)



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pp. 3852–3855.
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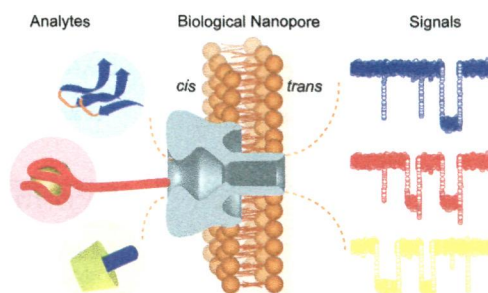
MINIREVIEW

3826

Single molecule analysis by biological nanopore sensors

Yi-Lun Ying, Chan Cao and Yi-Tao Long*

This mini review discusses current strategies for the analysis of an individual analyte in the field of nanopore biosensors.



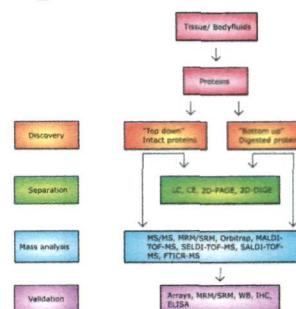
CRITICAL REVIEW

3836

Recent developments in proteomic methods and disease biomarkers

Nina Bergman and Jonas Bergquist*

Due to the difficulties with poor sample quality, high complexity combined with low concentrations of relevant biomarkers in their respective matrices, the success of proteomics have been rather limited. We have however now finally reached the situation where more and more identified and validated biomarkers/biomarker panels are presented and used in clinical routine.

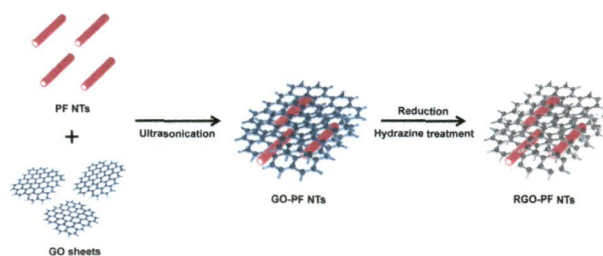


3852

High-performance Hg^{2+} FET-type sensors based on reduced graphene oxide–polyfuran nanohybrids

Jin Wook Park, Seon Joo Park, Oh Seok Kwon, Choonghyen Lee and Jyongsik Jang*

A new type of field-effect transistor (FET) sensor, based on reduced graphene oxide (rGO)–polyfuran (PF) nanohybrids, was strategically developed.

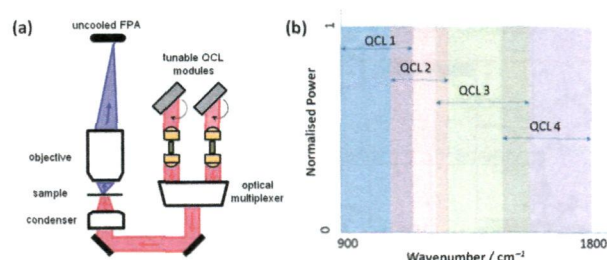


3856

Large scale infrared imaging of tissue micro arrays (TMAs) using a tunable Quantum Cascade Laser (QCL) based microscope

Paul Bassan, Miles J. Weida, Jeremy Rowlette and Peter Gardner*

Chemical imaging in the field of vibrational spectroscopy is developing into a promising tool to complement digital histopathology.

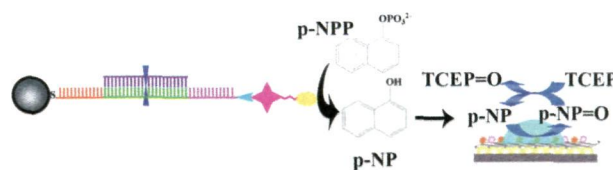


3860

Bimetallic Pd–Pt supported graphene promoted enzymatic redox cycling for ultrasensitive electrochemical quantification of microRNA from cell lysates

Fang-Fang Cheng, Jing-Jing Zhang, Ting-Ting He, Jian-Jun Shi, E. S. Abdel-Halim and Jun-Jie Zhu*

A novel electrochemical biosensor with triple signal amplification for the ultrasensitive detection of miRNA was developed.

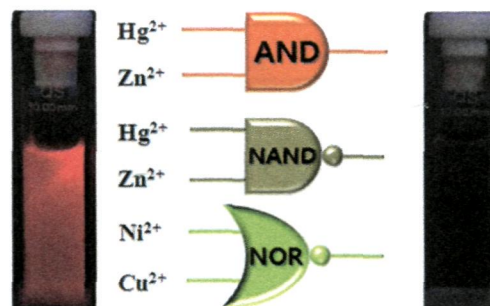


3866

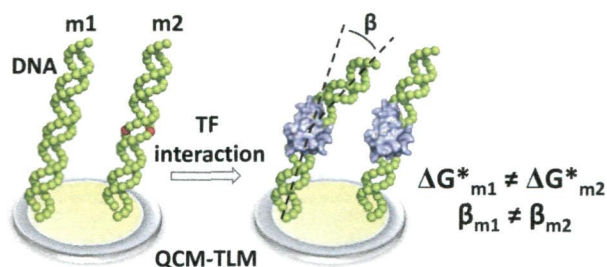
Fluorometric/colorimetric logic gates based on BODIPY-functionalized mesoporous silica

Heekyoung Choi, Ji Ha Lee and Jong Hwa Jung*

We have demonstrated that metal ions acting as modulators in BODIPY-functionalized SiO_2 nanoparticles can generate absorbance changes in accordance with the operation of a half-adder digital circuit.



3871

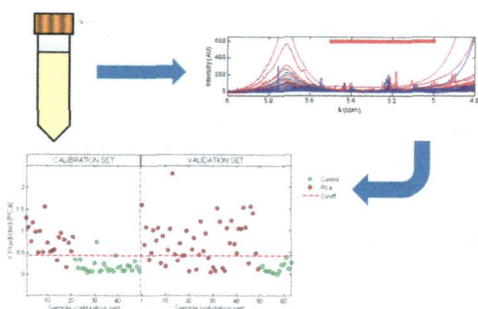


Transmission line model analysis of transcription factors binding to oligoduplexes – differentiation of the effect of single nucleotide modifications

Rogério M. M. Rodrigues, Jorge de-Carvalho, Silvia F. Henriques, Nuno P. Mira, Isabel Sá-Correia and Guilherme N. M. Ferreira*

A QCM bioanalytical methodology based on the transmission line model assesses the mechanical effects of single point mutations upon the DNA recognition by transcription factors.

3875



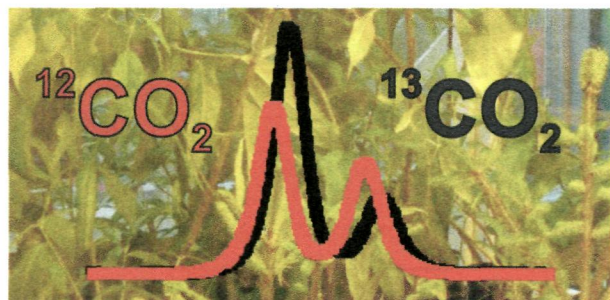
Towards the potential use of ^1H NMR spectroscopy in urine samples for prostate cancer detection

Patricia Zaragoza, Jose Luis Ruiz-Cerdá,* Guillermo Quintás, Salvador Gil, Ana M. Costero, Zacarías León, José-Luis Vivancos and Ramón Martínez-Mañez*

An multivariate approach based on ^1H NMR spectra profiles of urine samples to detect patients with prostate cancer.

PAPERS

3879

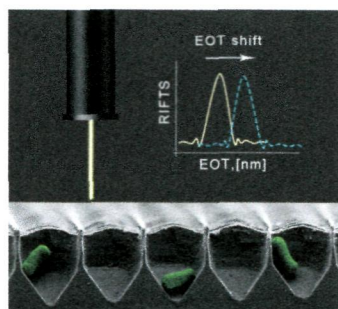


Enhanced Raman multigas sensing – a novel tool for control and analysis of $^{13}\text{CO}_2$ labeling experiments in environmental research

Robert Keiner, Torsten Frosch,* Tara Massad, Susan Trumbore and Jürgen Popp

Cavity-enhanced Raman multigas spectrometry is introduced as a versatile technique for monitoring of $^{13}\text{CO}_2$ isotope labeling experiments, while simultaneously quantifying the fluxes of O_2 and other relevant gases across a wide range of concentrations.

3885



Trap and track: designing self-reporting porous Si photonic crystals for rapid bacteria detection

Naama Massad-Ivanir, Yossi Mirsky, Amit Nahor, Eitan Edrei, Lisa M. Bonanno-Young, Nadav Ben Dov, Amir Sa'ar and Ester Segal*

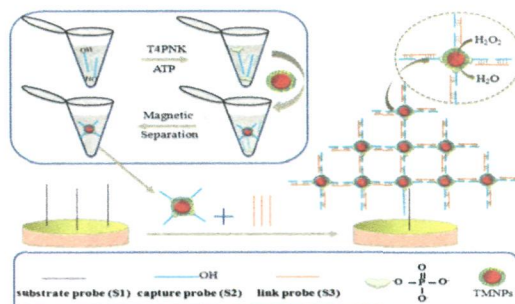
Self-reporting optical structures that can detect and quantify bacteria in real-time, based on 2D porous Si photonic crystals. The sensors can be easily modified to monitor concentration, growth and physiological state of bacteria cells.

3895

Detection of polynucleotide kinase activity by using a gold electrode modified with magnetic microspheres coated with titanium dioxide nanoparticles and a DNA dendrimer

Guangfeng Wang,* Ling Chen, Xiuping He, Yanhong Zhu and Xiaojun Zhang*

Detection of polynucleotide kinase activity based on a DNA dendrimer.

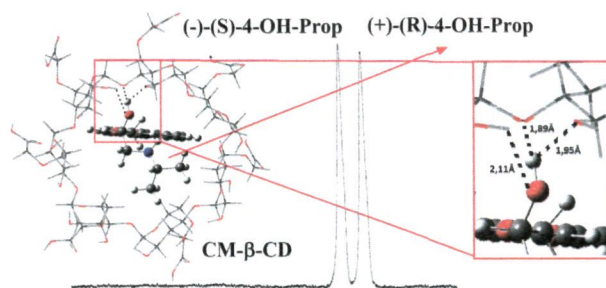


3901

Molecular modeling study of the recognition mechanism and enantioselective separation of 4-hydroxypropranolol by capillary electrophoresis using carboxymethyl- β -cyclodextrin as the chiral selector

Clebio Soares Nascimento Jr.,* Juliana Fedoce Lopes, Luciana Guimarães and Keyller Bastos Borges*

Elution order elucidation of 4-hydroxypropranolol by capillary electrophoresis and theoretical methods.

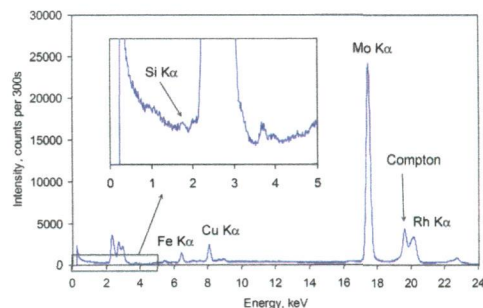


3911

Indirect determination of dissolved silicate in surface water using energy-dispersive X-ray fluorescence spectrometry

Katarzyna Pytlakowska,* Marzena Dabioch and Rafal Sitko

An ultrasound-assisted methodology for the determination of dissolved silicate in water has been developed by combining the miniaturized ion-associated based preconcentration method with energy dispersive X-ray fluorescence spectrometry (EDXRF).

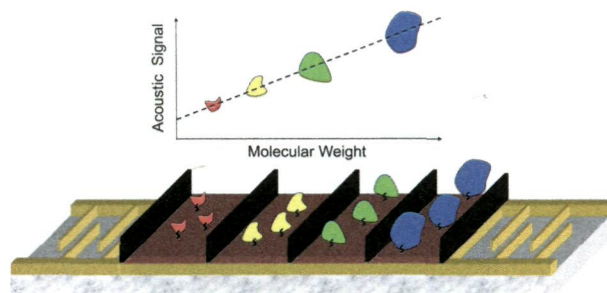


3918

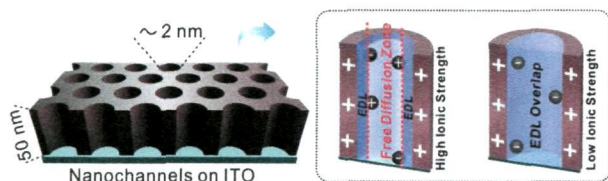
Quantitative determination of protein molecular weight with an acoustic sensor; significance of specific versus non-specific binding

Konstantinos Mitsakakis, Achilleas Tsortos* and Electra Gizeli*

A multi-analyte acoustic biosensor determines the molecular weight of proteins via the phase change of the acoustic signal.



3925

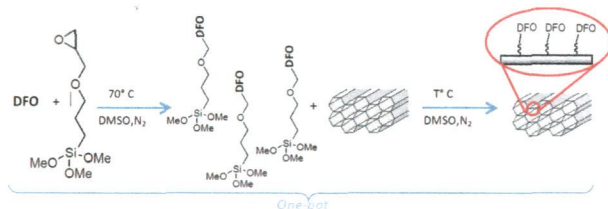


Differential pulse voltammetry detection of dopamine and ascorbic acid by permselective silica mesochannels vertically attached to the electrode surface

Wanzhen Li, Longhua Ding, Qiaohong Wang and Bin Su*

Silica mesochannels vertically aligned on the electrode surface have been employed for permselective detection of dopamine and ascorbic acid.

3932

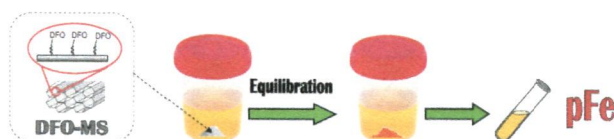


Novel DFO-SAM on mesoporous silica for iron sensing. Part I. Synthesis optimization and characterization of the material

Raffaella Biesuz,* Giovanni Emma, Chiara Milanese, Giacomo Dacarro, Angelo Taglietti, Valeria Marina Nurchi and Giancarla Alberti

Novel synthesis of deferoxamine immobilized on MCM-41 mesoporous silica (DFO-SAMMS). Chemico-physical characterisation, kinetics and isotherms of iron uptake. Optimisation of synthesis conditions according to experimental design techniques.

3940



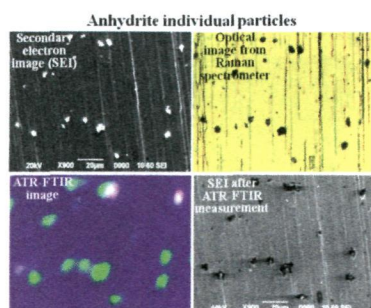
- ✓ New sorbent: deferoxamine immobilized on MCM-41 mesoporous silica (DFO-MS)
- ✓ Mechanism of Fe(III) sorption on DFO-MS in synthetic solutions and urine
- ✓ Application of DFO-MS to assess pFe in SPU (*Simulating Pathology Urine*) samples

Novel DFO-functionalized mesoporous silica for iron sensing. Part 2. Experimental detection of free iron concentration (pFe) in urine samples

G. Alberti,* G. Emma, R. Colleoni, M. Pesavento, V. M. Nurchi and R. Biesuz

New sorbent: deferoxamine immobilized on MCM-41 mesoporous silica (DFO SAMMS). The mechanism of Fe(III) sorption on DFO SAMMS in synthetic solutions and urine. Application of DFO SAMMS to assess pFe in SPU (*Simulating Pathology Urine*) samples.

3949



Combined use of quantitative ED-EPMA, Raman microspectrometry, and ATR-FTIR imaging techniques for the analysis of individual particles

Hae-Jin Jung, Hyo-Jin Eom, Hyun-Woo Kang, Myriam Moreau, Sophie Sobanska and Chul-Un Ro*

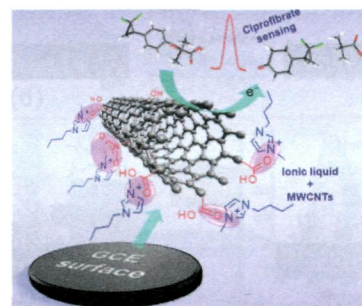
Quantitative ED-EPMA, RMS, and ATR-FTIR imaging techniques were used in combination for the analysis of the same individual particles for the first time.

3961

A novel architecture based upon multi-walled carbon nanotubes and ionic liquid to improve the electroanalytical detection of ciprofibrate

Fernando Campanhã Vicentini, Amanda Elisa Ravanini, Tiago Almeida Silva, Bruno C. Janegitz, Valtencir Zucolotto and Orlando Fatibello-Filho*

A new voltammetric method for ciprofibrate detection is proposed, in which an ionic liquid improved the electrochemical performance of MWCNTs-GCE. Pharmaceutical samples were analysed with excellent accuracy.

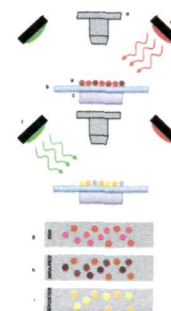


3968

6-Plex microsphere immunoassay with imaging planar array detection for mycotoxins in barley

Jeroen Peters,* Alice Cardall, Willem Haasnoot and Michel W. F. Nielen

A rapid, bead-based multiplex immunoassay is developed for some major mycotoxins and validated for barley, using imaging planar array detection.

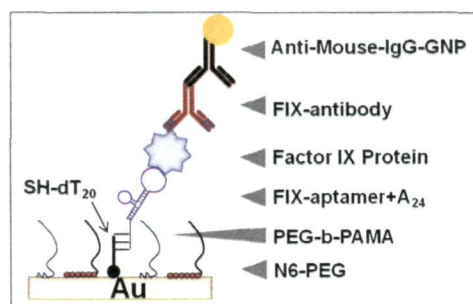


3977

Co-immobilized poly(ethylene glycol)-block-polyamines promote sensitivity and restrict biofouling on gold sensor surface for detecting factor IX in human plasma

Thangavel Lakshmipriya, Yukichi Horiguchi and Yukio Nagasaki*

In order to detect a low amount of human coagulation factor IX (FIX), poly(ethylene glycol) (PEG)/aptamer co-immobilized surface was constructed using original PEG-polyamine on surface plasmon resonance (SPR) sensor chip.

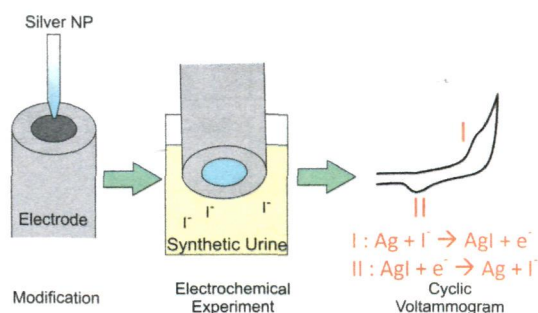


3986

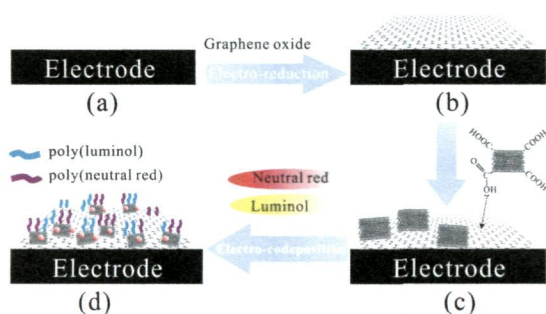
Electrochemical quantification of iodide ions in synthetic urine using silver nanoparticles: a proof-of-concept

Her Shuang Toh, Kristina Tschulik, Christopher Batchelor-McAuley and Richard G. Compton*

A novel method for detecting urinary iodide levels with silver nanoparticle modified electrodes.



3991

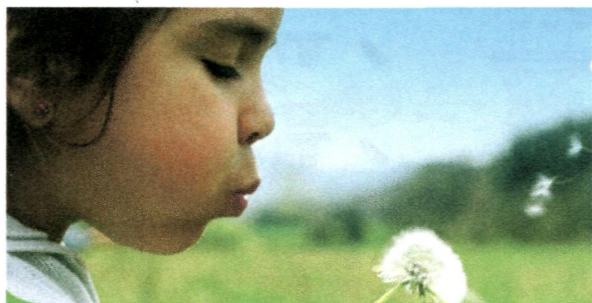


A highly sensitive NADH sensor based on a mycelium-like nanocomposite using graphene oxide and multi-walled carbon nanotubes to co-immobilize poly(luminol) and poly(neutral red) hybrid films

Kuo Chiang Lin, Szu Yu Lai and Shen Ming Chen*

An illustration of electro-codeposition of poly(luminol) and poly(neutral red) hybrid films using highly conductive and steric MWCNT–GO as a template is provided.

3999

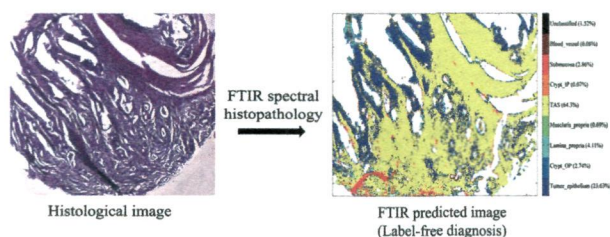


Electrochemistry provides a point-of-care approach for the marker indicative of *Pseudomonas aeruginosa* infection of cystic fibrosis patients

Jonathan P. Metters, Dimitrios K. Kampouris and Craig E. Banks*

Proof-of-concept electrochemical based sensors are shown to provide a potential point-of-care approach for the chemical marker indicative of *Pseudomonas aeruginosa* infection of cystic fibrosis patients.

4005

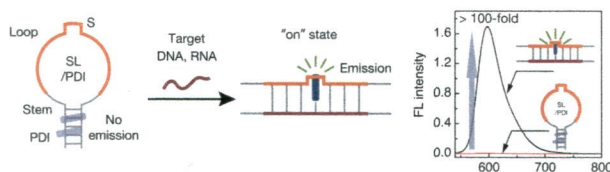


Infrared spectral histopathology for cancer diagnosis: a novel approach for automated pattern recognition of colon adenocarcinoma

Jayakrupakar Nallala, Marie-Danièle Diebold, Cyril Gobinet, Olivier Bouché, Ganesh Dhruvananda Sockalingum, Olivier Piot and Michel Manfait*

Automated and label-free colon cancer diagnosis and identification of tumor-associated features using FTIR spectral histopathology directly on paraffinized tissue arrays.

4016



Light-up fluorescent probes utilizing binding behavior of perylene-3,9,10-tricarboxylic diimide derivatives to a hydrophobic pocket within DNA

Tadao Takada,* Kosato Yamaguchi, Suguru Tsukamoto, Mitsunobu Nakamura and Kazushige Yamana*

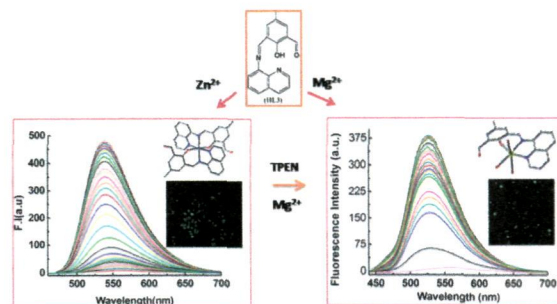
Here we study the binding behavior of perylene-3,9,10-tricarboxylic diimide (PDI) derivatives to a hydrophobic pocket created inside DNA and their photochemical properties capable of designing a light-up fluorescent sensor for short single-stranded DNA or RNA.

4022

A novel chromo- and fluorogenic dual sensor for Mg^{2+} and Zn^{2+} with cell imaging possibilities and DFT studies

Rabiul Alam, Tarun Mistri, Atul Katarkar, Keya Chaudhuri, Sushil Kumar Mandal, Anisur Rahman Khuda-Bukhsh, Kalyan K. Das and Mahammad Ali*

A diformyl-*p*-cresol-8-aminoquinoline based probe exhibits dual colorimetric and fluorogenic properties on selective binding towards Mg^{2+} and Zn^{2+} . This probe could be made selective towards Mg^{2+} over Zn^{2+} in the presence of TPEN.

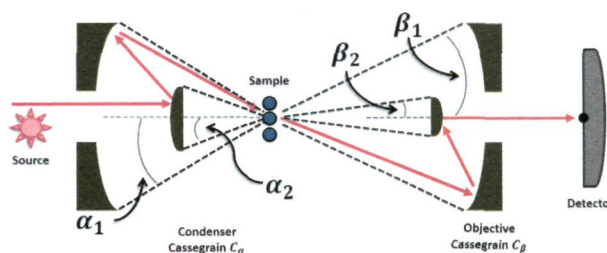


4031

On the importance of image formation optics in the design of infrared spectroscopic imaging systems

David Mayerich, Thomas van Dijk, Michael J. Walsh, Matthew V. Schulmerich, P. Scott Carney and Rohit Bhargava*

Theory explains the influence of optical configuration on recorded data in infrared spectroscopic imaging.

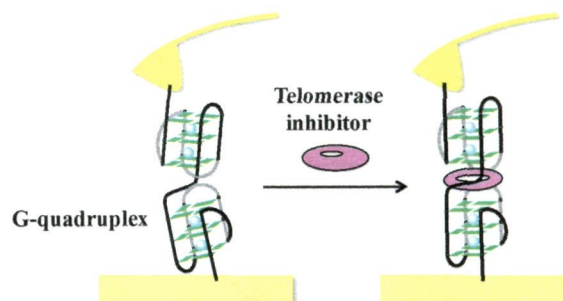


4037

A single-molecule force-spectroscopic study on stabilization of G-quadruplex DNA by a telomerase inhibitor

Ryoto Funayama, Yoshio Nakahara, Shinpei Kado, Mutsuo Tanaka and Keiichi Kimura*

The stabilization of G-quadruplex DNA by a telomerase inhibitor was semi-quantitatively evaluated by AFM-based SMFS.

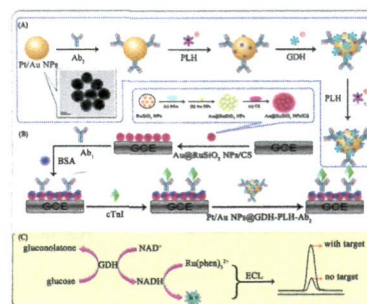


4044

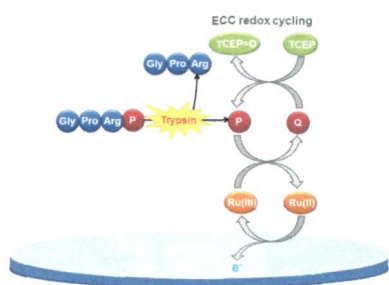
Electrochemiluminescence immunosensor using poly(L-histidine)-protected glucose dehydrogenase on Pt/Au bimetallic nanoparticles to generate an *in situ* co-reactant

Lijuan Xiao, Yaqin Chai,* Haijun Wang and Ruo Yuan

A new ECL immunosensor based on poly(L-histidine)-protected glucose dehydrogenase on Pt/Au bimetallic nanoparticles to generate co-reactant *in situ*.



4051

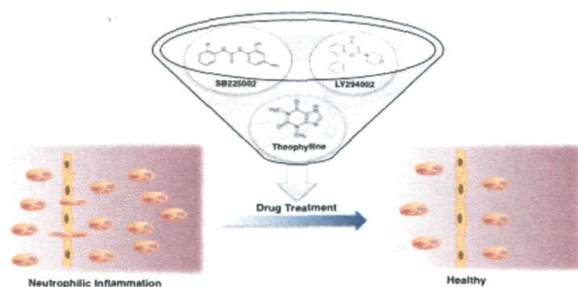


Sensitive and selective trypsin detection using redox cycling in the presence of L-ascorbic acid

Seonhwa Park and Haesik Yang*

We report a simple, sensitive, and selective electrochemical method for trypsin detection that can cover a wide range of concentrations.

4056

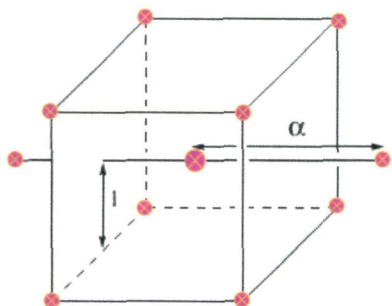


Exploring inflammatory disease drug effects on neutrophil function

Xiaojie Wu, Donghyuk Kim, Ashlyn T. Young and Christy L. Haynes*

Combined use of a novel platform and traditional approaches yield new insight into drug effects on neutrophil function.

4064

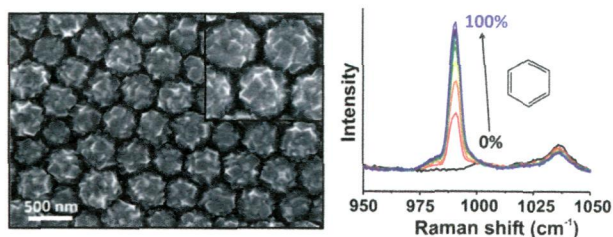


Sensitive and selective determination of hydroxychloroquine in the presence of uric acid using a new nanostructure self-assembled monolayer modified electrode: optimization by multivariate data analysis

Asma Khoobi, Sayed Mehdi Ghoreishi* and Mohsen Behpour

A highly sensitive electrochemical nanosensor was developed using covalent modification of a glassy carbon electrode (GCE) by self-assembly of a novel Schiff base.

4073



SERS of molecules that do not adsorb on Ag surfaces: a metal–organic framework-based functionalization strategy

Lauren E. Kreno, Nathan G. Greeneltch, Omar K. Farha, Joseph T. Hupp* and Richard P. Van Duyne*

A nanocrystalline metal–organic framework thin film traps organic vapors that are otherwise difficult to detect by SERS due to their lack of surface adsorption.

4081

Constructing a fluorescent probe for specific detection of cysteine over homocysteine and glutathione based on a novel cysteine-binding group but-3-yn-2-one

Yawei Liu, Song Zhang, Xin Lv, Yuan-Qiang Sun, Jing Liu and Wei Guo*

Based on a novel Cys-binding group "but-3-yn-2-one", a new fluorescent probe was exploited, which could specifically detect Cys over Hcy/GSH in pure PBS buffer and cells.

