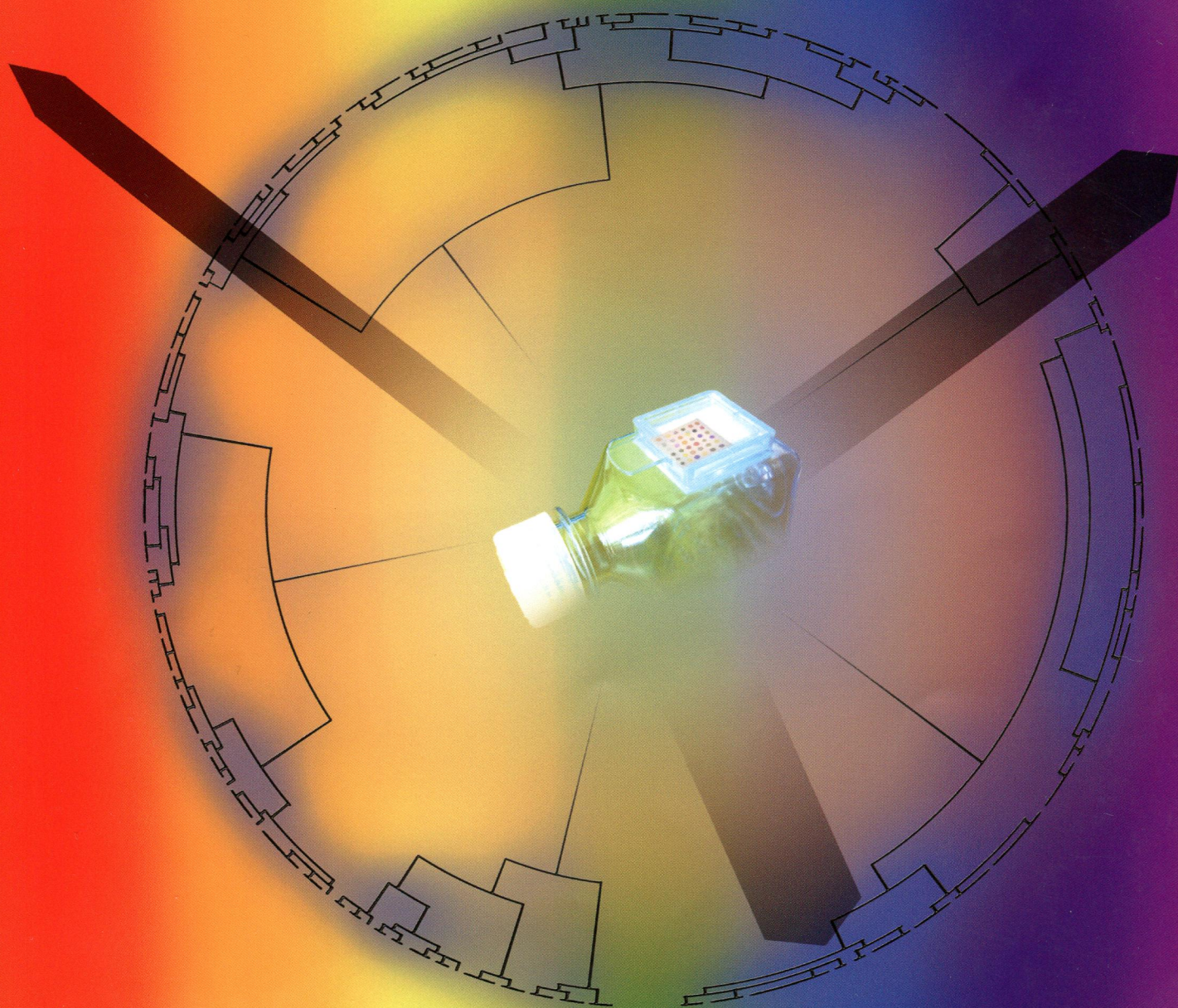


PII
A53/2

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Volume 138 | Number 20 | 21 October 2013 | Pages 5841–6198



ISSN 0003-2654

RSC Publishing

HOT ARTICLE

James R. Carey *et al.*

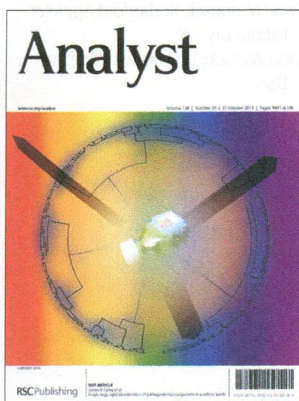
Single step, rapid identification of pathogenic microorganisms in a culture bottle



0003-2654 (2013) 138:20;1-Y

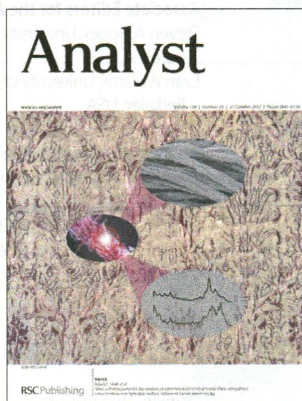
IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 138(20) 5841–6198 (2013)



Cover

See James R. Carey *et al.*, pp. 5879–5885.
Image reproduced by permission of James R. Carey from *Analyst*, 2013, **138**, 5879.



Inside cover

See Nilam C. Shah *et al.*, pp. 5895–5903.
Image reproduced by permission of Nilam C. Shah from *Analyst*, 2013, **138**, 5895.

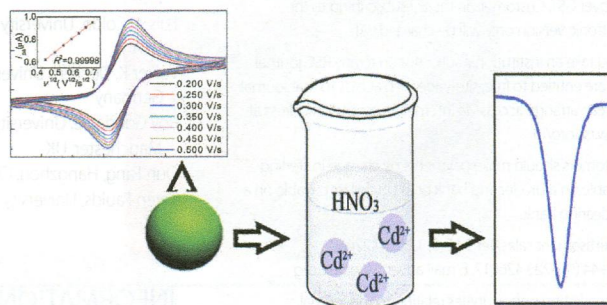
MINIREVIEW

5855

The electrochemical applications of quantum dots

Haiping Huang and Jun-Jie Zhu*

This review presents a general description of the electrochemical properties of QDs with their electrochemical applications.



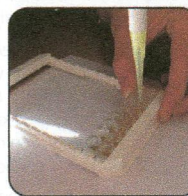
COMMUNICATIONS

5866

Convenient detection of *E. coli* in Ringer's solution

Martha Schwarz, Susanne Pahlow, Thomas Bocklitz, Carolin Steinbrücker, Dana Cialla, Karina Weber and Jürgen Popp*

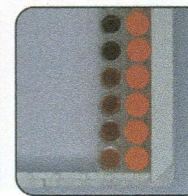
An easy and inexpensive detection method for DNA hybridization assays combining magnetic beads and enzymatically generated silver nanoparticles is introduced.



transfer samples to micro well plate



take picture with digital camera



analyze colour with image editing

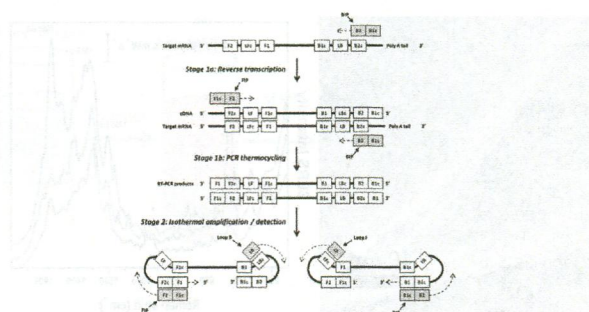
Федеральное государственное
бюджетное учреждение науки
Центральная научная библиотека
Уральского отделения
Российской академии наук (ЦНБ УрО РАН)

5871

RT-isoPCR: nested, high multiplex mRNA amplification

Martin Jensen S e* and Peter Warthoe

RT-isoPCR provides high multiplex, sensitive and specific amplification of mRNA targets using a first-stage multiplex RT-PCR reaction with subsequent isothermal amplification for individual target loci detection.

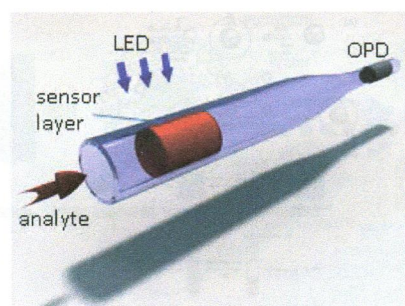


5875

A luminescence lifetime-based capillary oxygen sensor utilizing monolithically integrated organic photodiodes

Bernhard Lamprecht,* Andreas Tschopp, Merima Cajlakovi , Martin Sagmeister, Volker Ribitsch and Stefan K stler*

A novel optical sensor device based on monolithically integrated organic photodiodes on a glass capillary is demonstrated by realizing oxygen sensing.



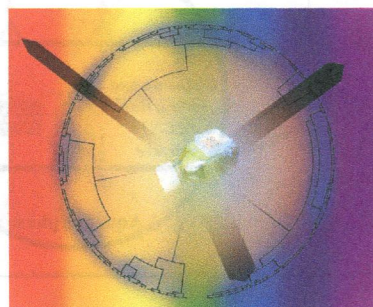
PAPERS

5879

Single step, rapid identification of pathogenic microorganisms in a culture bottle

Yu W. Chu, Bo Y. Wang, David A. Engebretson and James R. Carey*

Smelling disease: The detection and identification of sepsis causing bacteria by smell in a single step during culture is reported.

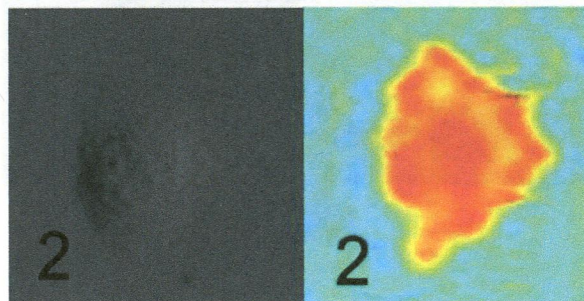


5886

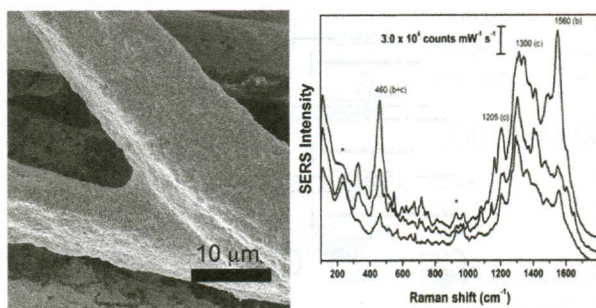
Photonic crystal enhanced microscopy for imaging of live cell adhesion

Weili Chen, Kenneth D. Long, Meng Lu, Vikram Chaudhery, Hojeong Yu, Ji Sun Choi, James Polans, Yue Zhuo, Brendan A. C. Harley and Brian T. Cunningham*

In this investigation, we demonstrate a novel label-free, live-cell imaging technique quantifying cell-surface interactions with high spatial resolution to provide dynamic information about cell attachment morphology over biologically relevant timescales.



5895

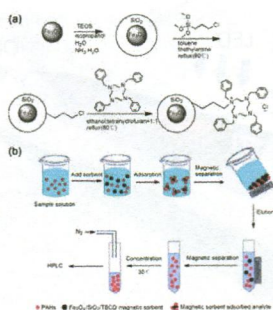


Silver colloidal pastes for dye analysis of reference and historical textile fibers using direct, extractionless, non-hydrolysis surface-enhanced Raman spectroscopy

Ambra Idone, Monica Gulmini, Anne-Isabelle Henry, Francesca Casadio, Lauren Chang, Lorenzo Appolonia, Richard P. Van Duyne and Nilam C. Shah*

Silver colloidal pastes, characterized by SEM, allowed the first extractionless SERS identification of two dyes simultaneously on historical Fortuny textiles.

5904

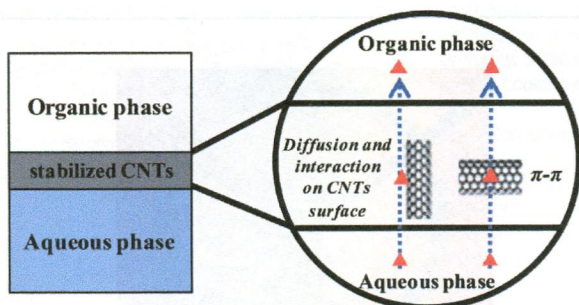


Magnetic solid-phase extraction based on tetrabenzyl modified Fe_3O_4 nanoparticles for the analysis of trace polycyclic aromatic hydrocarbons in environmental water samples

Ying Zou, Yingzhuang Chen, Zhihong Yan, Chunyan Chen, Jianping Wang and Shouzhao Yao*

TBCD-functionalized MNPs were prepared as a novel sorbent for the extraction of PAHs from environmental water samples.

5913

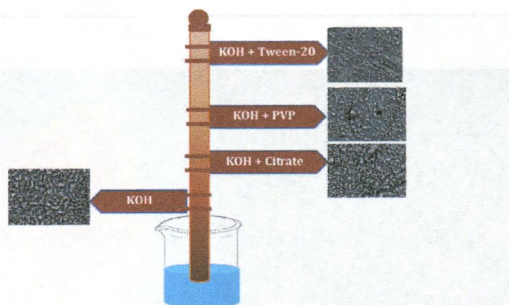


Liquid-liquid extraction assisted by a carbon nanoparticles interface. Electrophoretic determination of atrazine in environmental samples

Encarnación Caballero-Díaz, Bartolomé Simonet and Miguel Valcárcel*

A carbon nanotubes interface located between two immiscible phases is proposed to enhance the liquid-liquid extraction of atrazine from different environmental matrices.

5920



Effects of surfactants on electrochemically prepared Ag nanostructures

Farkhondeh Fathi and Heinz-Bernhard Kraatz*

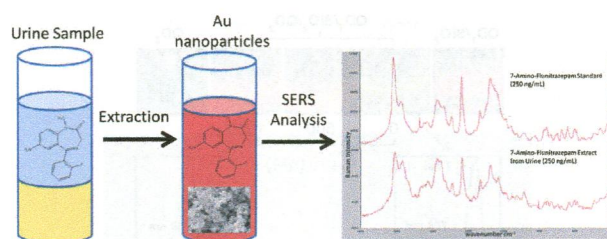
Addition of surfactants and capping agents to the alkaline solution changes the morphology and corrosion aspects of prepared Ag NSs.

5926

Comparison of aggregating agents for the surface-enhanced Raman analysis of benzodiazepines

Erika L. Doctor and Bruce McCord*

A method for the detection of benzodiazepines in urine at trace concentrations using surface-enhanced Raman spectroscopy was developed.

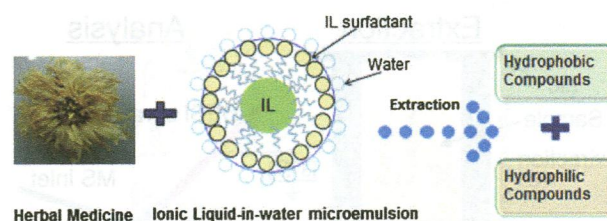


5933

Environmentally friendly ionic liquid-in-water microemulsions for extraction of hydrophilic and lipophilic components from Flos Chrysanthemi

Jue Chen, Jun Cao, Wen Gao, Lian-Wen Qi* and Ping Li*

An environmentally friendly IL-in-water microemulsion with an IL surfactant was developed for simultaneous extraction of hydrophilic and hydrophobic constituents from Flos Chrysanthemi.

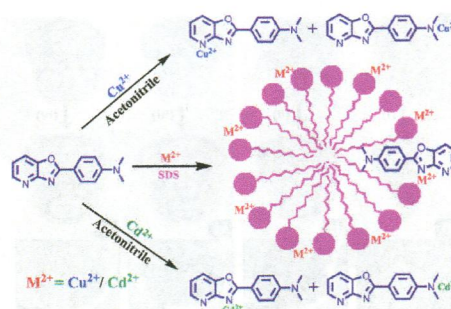


5942

Specific site binding of metal ions on the intramolecular charge transfer fluorophore in micelles

Saugata Sahu, Anasuya Mishra and G. Krishnamoorthy*

The binding interactions of Cu^{2+} , an essential trace metal ion, and Cd^{2+} , a deleterious metal ion, with 2-(4'-N,N-dimethylaminophenyl)oxazolo[4,5-b]pyridine were studied in acetonitrile and sodium dodecyl sulphate.

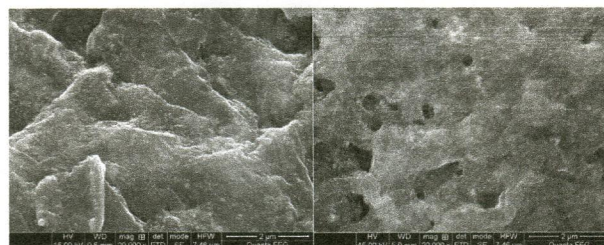


5949

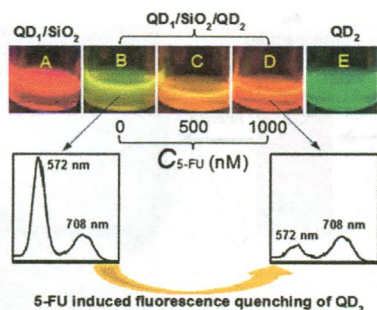
A molecularly-imprinted electrochemical sensor based on a graphene-Prussian blue composite-modified glassy carbon electrode for the detection of butylated hydroxyanisole in foodstuffs

Min Cui, Su Liu, Wenjing Lian, Jie Li, Wei Xu and Jiadong Huang*

Using the good conductivity of graphene and Prussian blue we developed an imprinted electrochemical sensor for the detection of butylated hydroxyanisole (BHA).



5956

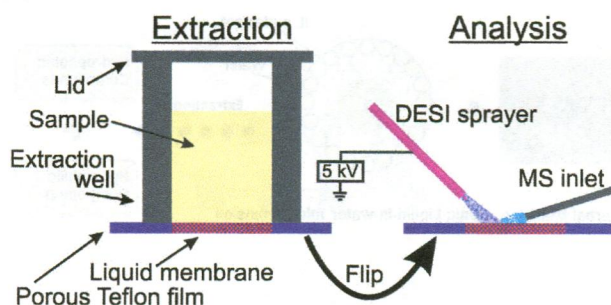


Facile synthesis of quantum dots/mesoporous silica/quantum dots core/shell/shell hybrid microspheres for ratiometric fluorescence detection of 5-fluorouracil in human serum

Rijun Gui, Ajun Wan* and Hui Jin

Quantum dots/mesoporous silica/quantum dots core/shell/shell microspheres were developed toward the ratiometric fluorescence detection of 5-fluorouracil in human serum.

5965

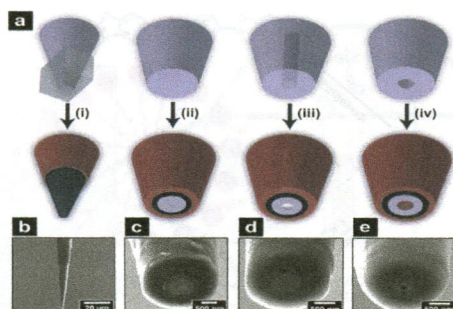


High-throughput analysis of drugs in biological fluids by desorption electrospray ionization mass spectrometry coupled with thin liquid membrane extraction

Cecilie Rosting, Stig Pedersen-Bjergaard, Steen Honoré Hansen and Christian Janfelt*

TLME-DESI provides simple and efficient clean-up and detection of drugs from various biological fluids.

5973

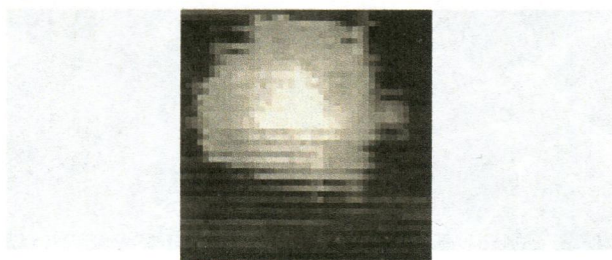


Multifunctional carbon nanoelectrodes fabricated by focused ion beam milling

Rahul Thakar, Anna E. Weber, Celeste A. Morris and Lane A. Baker*

We report a strategy for fabrication of sub-micron, multifunctional carbon electrodes and application of these electrodes as probes for scanning electrochemical microscopy (SECM) and scanning ion conductance microscopy (SICM).

5983



Discrimination of circulating tumor cells of breast cancer and colorectal cancer from normal human mononuclear cells using Raman spectroscopy

Václav Ranc,* Josef Srovnal, Libor Kvítek and Marian Hajduch

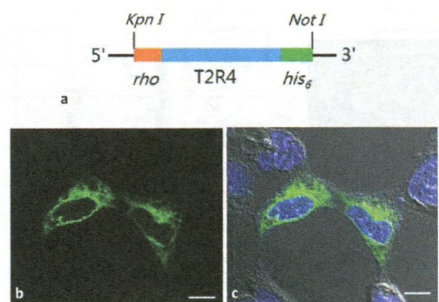
We have evaluated the importance of various fixation methods and their influence on the classification of the tumor cell lines based on the performed principal component analysis on Raman spectra.

5989

A biomimetic bitter receptor-based biosensor with high efficiency immobilization and purification using self-assembled aptamers

Chunsheng Wu, Liping Du, Ling Zou, Liquan Huang and Ping Wang*

A bitter detection biosensor was developed with a self-assembled aptamer-based strategy for highly efficient immobilization and purification of bitter receptors on sensor surfaces.

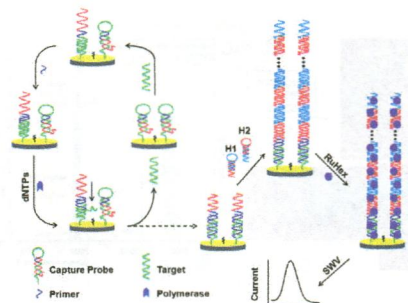


5995

Label-free electrochemical DNA sensing with a one-target-multitriggered hybridization chain reaction strategy

Zhu Zhu, Jianping Lei, Lin Liu and Huangxian Ju*

A one-target-multitriggered hybridization chain reaction strategy was designed for electrochemical detection of DNA by using absorbed $[\text{Ru}(\text{NH}_3)_6]^{3+}$ as a signal reporter. The amperometric response demonstrated a perfect multiple amplification without the need for a modification or labelling process.

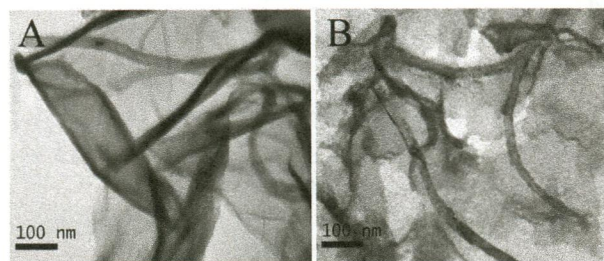


6001

An electrogenerated chemiluminescence sensor prepared with a graphene/multiwall carbon nanotube/gold nanocluster hybrid for the determination of phenolic compounds

Dehua Yuan, Shihong Chen,* Ruo Yuan,* Juanjuan Zhang and Wen Zhang

A dispersible graphene/multiwall carbon nanotube/gold nanocluster (GP/MWCNTs/AuNCs) hybrid in aqueous solution was prepared *in situ*, and characterized by transmission electron microscopy and ultraviolet-visible spectroscopy.

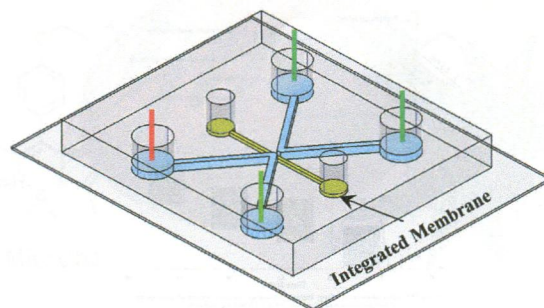


6007

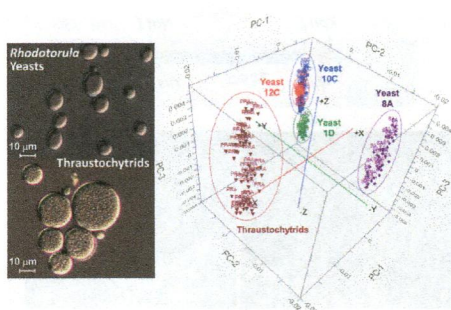
Integration of nanoporous membranes into microfluidic devices: electrokinetic bio-sample pre-concentration

Minseok Kim and Taesung Kim*

We describe simple and robust methods for microfabricating nanoporous materials as leakage-tight membranes in a microfluidic channel network.



6016

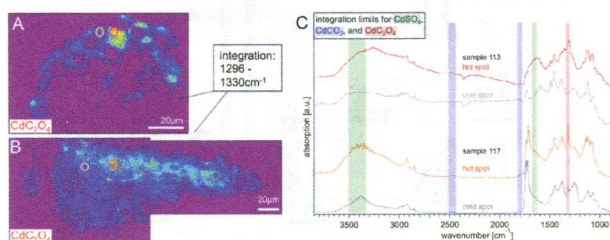


FTIR microspectroscopy for rapid screening and monitoring of polyunsaturated fatty acid production in commercially valuable marine yeasts and protists

Jitraporn Vongsvivut,^{*} Philip Heraud, Adarsha Gupta, Munish Puri, Don McNaughton and Colin J. Barrow

FTIR spectroscopy and multivariate data analysis provided rapid non-invasive approaches for taxonomic classification and quantitative determination of valuable fatty acids in marine microorganisms suited for bioprocessing applications.

6032

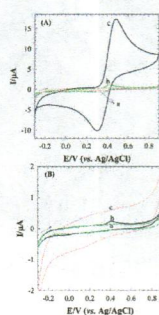


SR-FTIR imaging of the altered cadmium sulfide yellow paints in Henri Matisse's *Le Bonheur de vivre* (1905–6) – examination of visually distinct degradation regions

Jennifer Mass,^{*} Julia Sedlmair, Catherine Schmidt Patterson, David Carson, Barbara Buckley and Carol Hirschmugl

Cadmium yellow photo-degradation products are imaged in thin sections from Matisse's *Le Bonheur de vivre* allowing for degradation mechanism elucidation.

6044

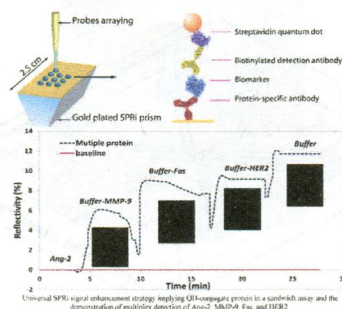


Electrochemical detection of dopamine based on pre-concentration by graphene nanosheets

Mojtaba Bagherzadeh^{*} and Maryam Heydari

The behavior of the graphene nanosheet (GNS) towards dopamine (DA) and ascorbic acid (AA) was investigated by electrochemical methods and the obtained results showed that the GNS had adsorption only to DA.

6052



Design of a universal biointerface for sensitive, selective, and multiplex detection of biomarkers using surface plasmon resonance imaging

Arghavan Shabani and Maryam Tabrizian^{*}

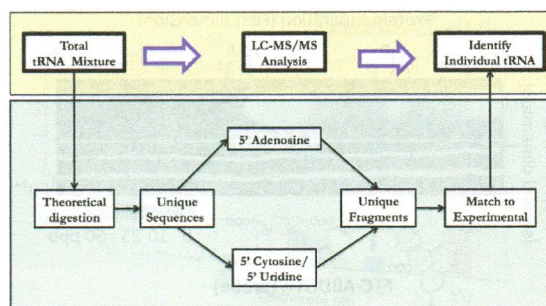
A universal SPRi signal enhancement strategy employing QD-conjugate protein in a sandwich assay and the demonstration of multiplex detection of Ang-2, MMP-9, Fas, and HER2.

6063

The global identification of tRNA isoacceptors by targeted tandem mass spectrometry

Collin Wetzel and Patrick A. Limbach*

Targeted tandem mass spectrometry can be used to identify individual transfer RNAs (tRNAs) from a complex pool of total tRNA samples.

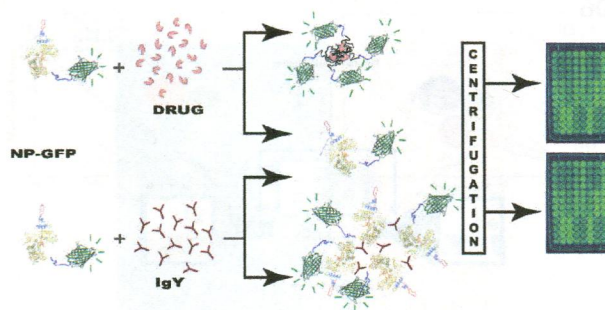


6073

A GFP-tagged nucleoprotein-based aggregation assay for anti-influenza drug discovery and antibody development

Helma Antony and Patrick M. Schaeffer*

A simple fluorimetric assay was developed for screening of nucleozin-induced aggregation and antibody-mediated agglutination of influenza nucleoprotein tethered to GFP.

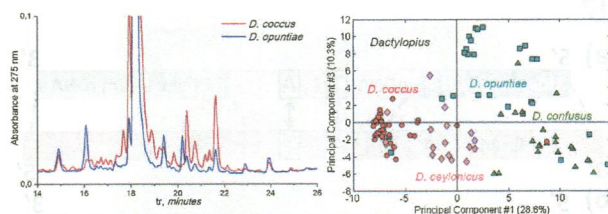


6081

Identification of *Dactylopius* cochineal species with high-performance liquid chromatography and multivariate data analysis

Ana Serrano, Micaela Sousa, Jessica Hallett, Monique S. J. Simmonds, Mark Nesbitt and João A. Lopes*

HPLC-DAD in combination with multivariate analysis has revealed a very suitable approach to distinguish related *Dactylopius* cochineal insect species.

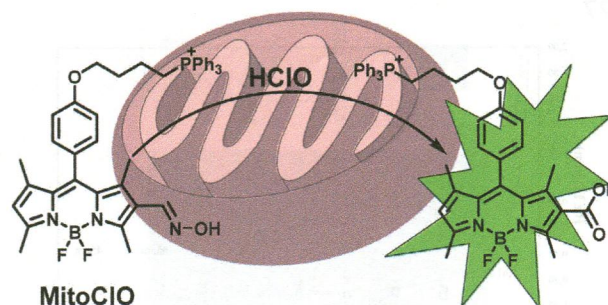


6091

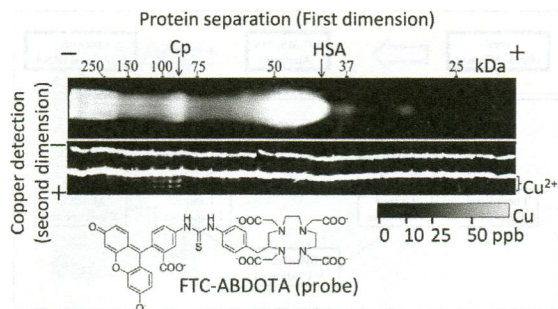
A highly specific BODIPY-based probe localized in mitochondria for HClO imaging

Guanghui Cheng, Jiangli Fan,* Wen Sun, Kun Sui, Xin Jin, Jingyun Wang and Xiaojun Peng*

A BODIPY-based fluorescent probe was designed and used for HClO determination in mitochondria; it has a low detection limit and high selectivity.



6097

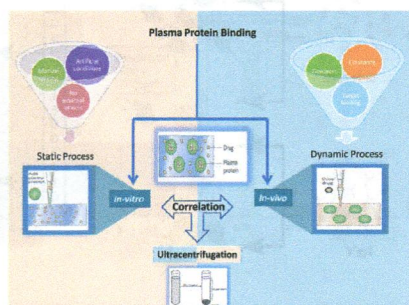


Separation of metalloproteins using a novel metal ion contaminant sweeping technique and detection of protein-bound copper by a metal ion probe in polyacrylamide gel electrophoresis: distribution of copper in human serum

Shingo Saito,* Mitsuyoshi Kawashima, Hiroki Ohshima, Kazuki Enomoto, Makoto Sato, Hajime Yoshimura, Keitaro Yoshimoto, Mizuo Maeda and Masami Shibukawa

Two novel types of PAGE were developed to obtain an accurate distribution of protein-bound copper ions in serum.

6106

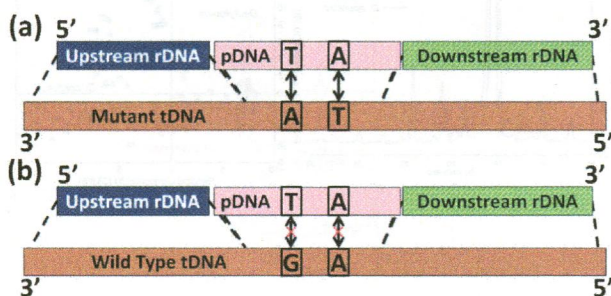


Correlation of *in vitro* and *in vivo* plasma protein binding using ultracentrifugation and UPLC-tandem mass spectrometry

Cheruvu Hanumanth Srikanth,* Tridib Chaira, Sunitha Sampathi, Sreekumar V. B. and Ramesh B. Bambal

Correlation of *in vitro* and *in vivo* plasma protein binding using ultracentrifugation – a novel high-throughput technique by validating the correlation.

6117

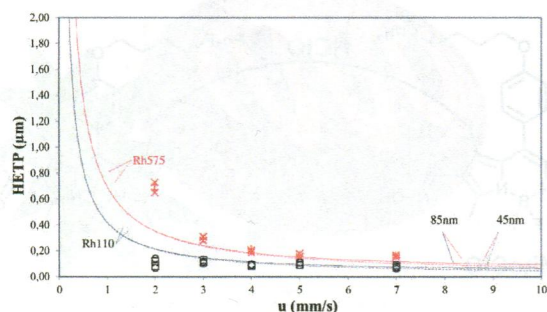


Temperature- and flow-enhanced detection specificity of mutated DNA against the wild type with reporter microspheres

Ceyhun E. Kirimli, Wei-Heng Shih and Wan Y. Shih*

Detection of mutated (MT) deoxyribonucleic acid (DNA) amongst the wild type (WT) requires the probe DNA (pDNA) that is complementary to the MT to discriminate the WT by one or two nucleotide mismatches.

6127



Exploring the speed limits of liquid chromatography using shear-driven flows through 45 and 85 nm deep nano-channels

Selm De Bruyne, Wim De Malsche,* Veronika Fekete, Hugo Thienpont, Heidi Ottevaere, Han Gardeniers and Gert Desmet

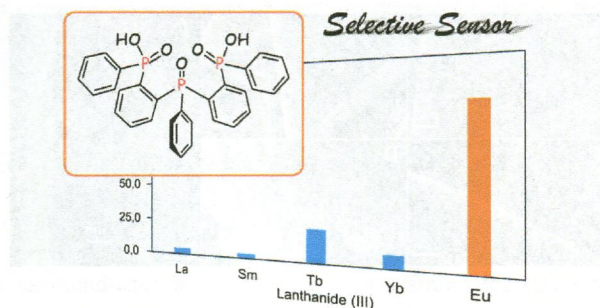
Shear-driven chromatography was performed in a sub-100 nm channel, yielding 50 000 to 100 000 theoretical plates in 1–1.5 seconds.

6134

A novel tridentate bis(phosphinic acid)phosphine oxide based europium(III)-selective Nafion membrane luminescent sensor

F. J. Sainz-Gonzalo, C. Popovici, M. Casimiro, A. Raya-Barón, F. López-Ortiz,* I. Fernández,* J. F. Fernández-Sánchez* and A. Fernández-Gutiérrez

A new europium(III) membrane luminescent sensor has been developed. It shows short response time, good selectivity toward europium(III) ions, large linear range, very low detection limit (5.8×10^{-9} M) and good sensitivity.

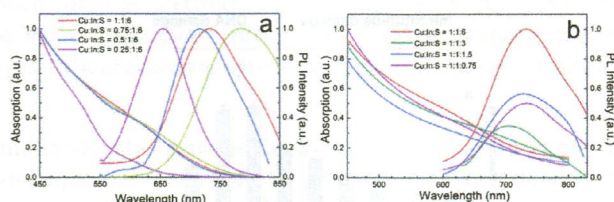


6144

Optimizing the synthesis of red- and near-infrared CuInS₂ and AgInS₂ semiconductor nanocrystals for bioimaging

Liwei Liu,* Rui Hu, Wing-Chueng Law, Indrajit Roy, Jing Zhu, Ling Ye, Siyi Hu, Xihe Zhang and Ken-Tye Yong*

This work reports the study of optimization of the reaction parameters on the synthesis of high quality CuInS₂ and AgInS₂ nanocrystals for bioimaging applications.

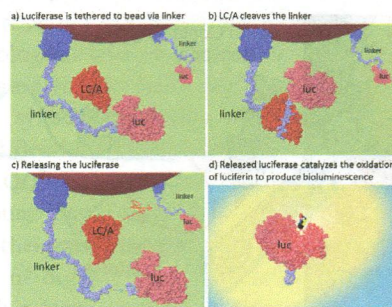


6154

Bioluminescence assay for the highly sensitive detection of botulinum neurotoxin A activity

G. B. Stevens,* D. A. Silver, A. Zgaga-Griesz, W. G. Bessler, S. K. Vashist, P. Patel, K. Achazi, J. Strotmeier, S. Worbs, M. B. Dorner, B. G. Dorner, D. Pauly, A. Rummel, G. A. Urban and M. Krueger

Bioluminescence assay for the detection of botulinum neurotoxin type A activity, at sub-picomolar concentrations in buffer and complex matrices.

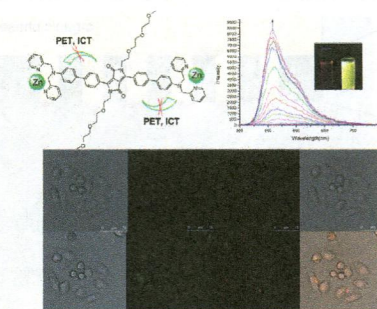


6163

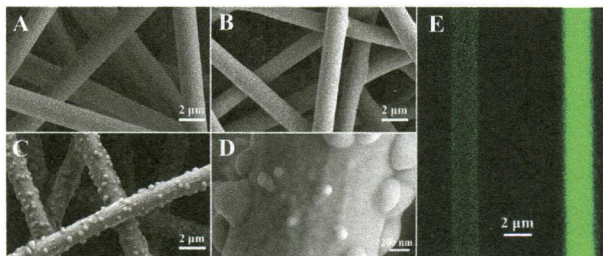
A new turn-on fluorescent chemosensor based on diketopyrrolopyrrole (DPP) for imaging Zn²⁺ in living cells

Guanjun Zhang, Haiying Li, Shiming Bi, Longfeng Song, Yunxiang Lu, Liang Zhang, Jianjun Yu and Limin Wang*

A new turn-on and ratiometric fluorescent chemosensor for Zn²⁺ based on diketopyrrolopyrrole (DPP) is reported for the first time.



6171

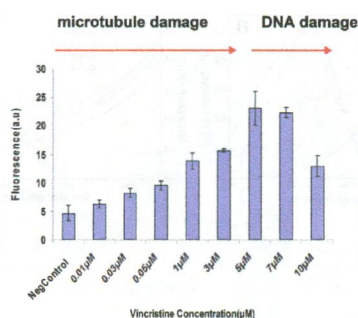


The self-assembled $\text{Ru}(\text{bpy})_3(\text{PF}_6)_2$ nanoparticle on polystyrene microfibers and its application for ECL sensing

Jiaojiao Luo, Cuisong Zhou,* Yalin Shi, Lei Zhang and Dan Xiao*

A very simple and cost-effective method is described for the fabrication of water-insoluble ruthenium(II) ionic complex nanoparticles (RuNP) on polymer microfibers which have great potential in the field of chemo/biosensors.

6177

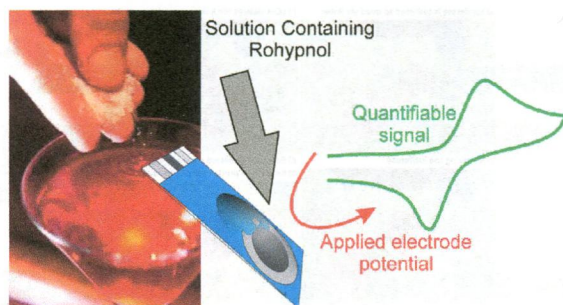


Raman micro spectroscopy study of the interaction of vincristine with A549 cells supported by expression analysis of bcl-2 protein

Haq Nawaz,* Amaya Garcia, Aidan D. Meade, Fiona M. Lyng and Hugh J. Byrne

Raman spectroscopy demonstrates that, as well as the accepted mode of action of disruption of the cellular microtubule assembly, vincristine intercalates with the nuclear DNA, causing cell death by DNA damage at high doses.

6185

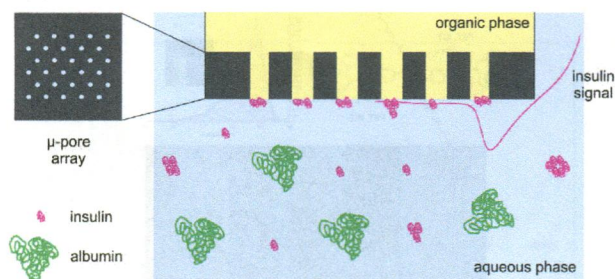


Forensic electrochemistry: the electroanalytical sensing of Rohypnol® (flunitrazepam) using screen-printed graphite electrodes without recourse for electrode or sample pre-treatment

Jamie P. Smith, Jonathan P. Metters, Dimitrios K. Kampouris, Carlos Lledo-Fernandez, Oliver B. Sutcliffe and Craig E. Banks*

The mother of all hangovers: we demonstrate a simple electrochemical screening methodology for Rohypnol in drinks and beverages using screen-printed sensors.

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Stripping voltammetric detection of insulin at liquid-liquid microinterfaces in the presence of bovine albumin

Shane O'Sullivan, Eva Alvarez de Eulate, Yiu Hang Yuen, Erik Helmerhorst and Damien W. M. Arrigan*

Insulin was detected voltammetrically following adsorptive accumulation at the microinterface array and in the presence of albumin.