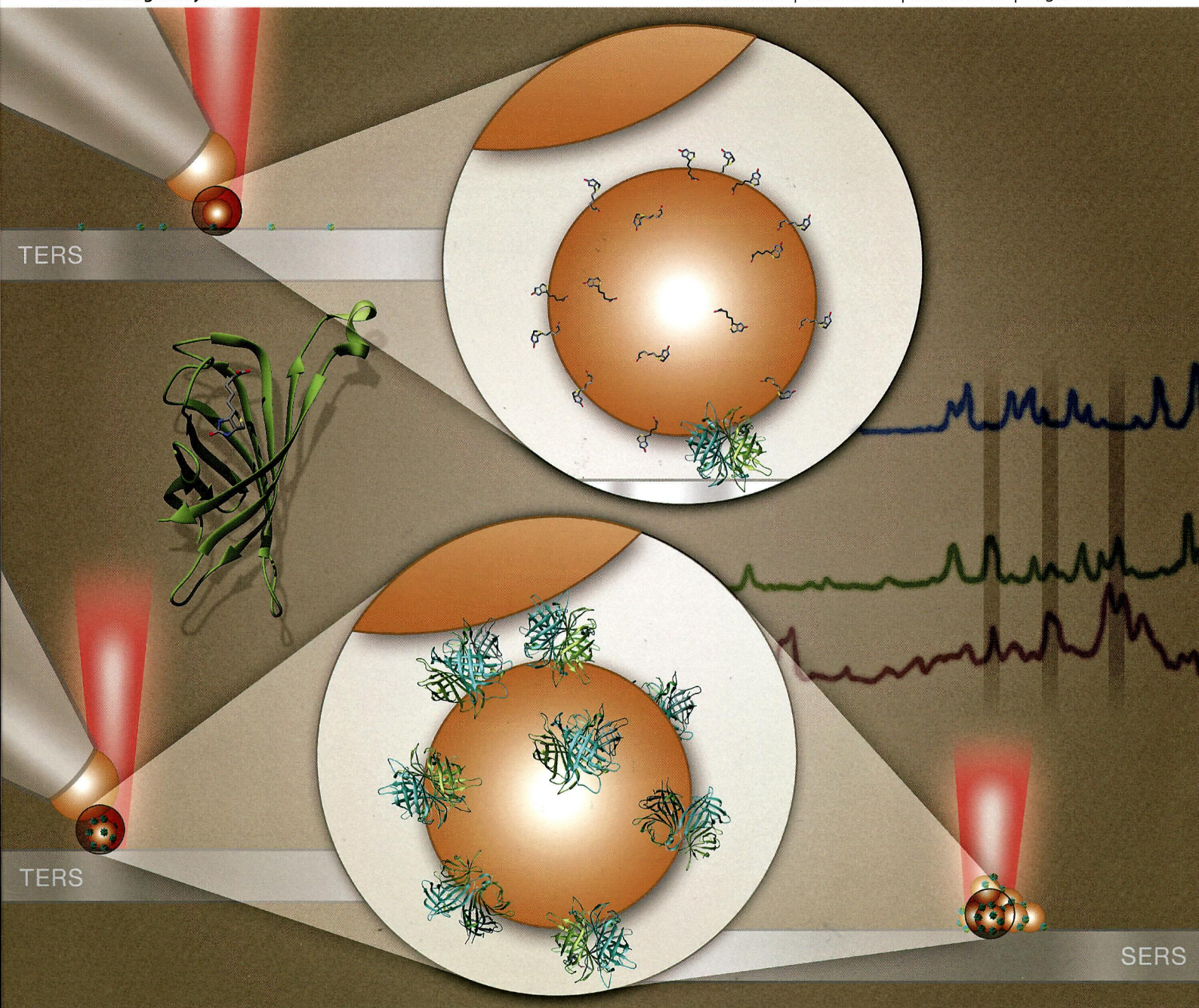


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Volume 138 | Number 11 | 7 June 2013 | Pages 3085–3322



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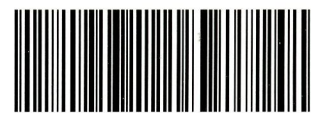
ISSN 0003-2654

RSC Publishing

HOT ARTICLE

Hao Wang and Zachary D. Schultz

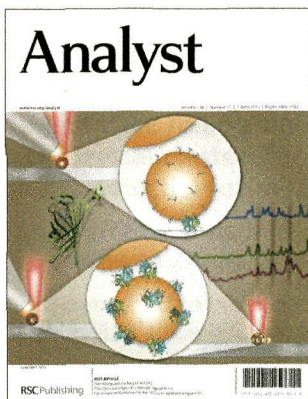
The chemical origin of enhanced signals from tip-enhanced Raman detection of functionalized nanoparticles



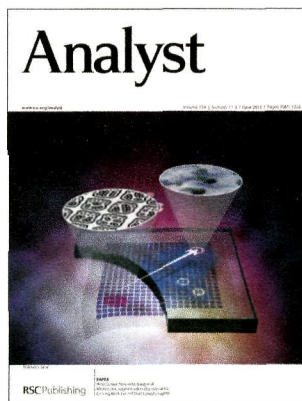
0003-2654(2013)138:11;1-#

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 138(11) 3085-3322 (2013)



Cover
See Hao Wang and Zachary D. Schultz, pp. 3150–3157. Image reproduced by permission of Zachary D. Schultz from *Analyst*, 2013, **138**, 3150.



Inside cover
See Won Gu Lee, Hyunwoo Bang *et al.*, pp. 3196–3200. Image reproduced by permission of Won Gu Lee from *Analyst*, 2013, **138**, 3196.

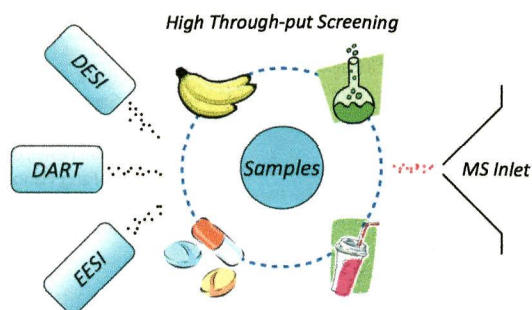
MINIREVIEW

3097

Applications of ambient mass spectrometry in high-throughput screening

Li-Ping Li, Bao-Sheng Feng, Jian-Wang Yang, Cui-Lan Chang, Yu Bai* and Hu-Wei Liu*

Different ambient mass spectrometry (AMS) techniques and their applications in high-throughput screening have been summarized in the fields of drug discovery, food safety, quality control, etc.



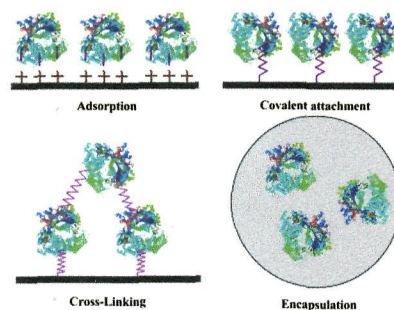
CRITICAL REVIEW

3104

Advances in immobilized enzyme microreactors in capillary electrophoresis

Jamshed Iqbal,* Shoaib Iqbal and Christa E. Müller

Miniaturized bioanalytical systems are increasingly being used in the field of biochemical research.

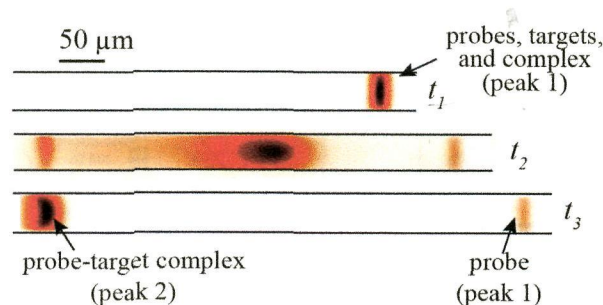


3117

Isotachopheresis with ionic spacer and two-stage separation for high sensitivity DNA hybridization assay

Charbel Eid, Giancarlo Garcia-Schwarz and Juan G. Santiago*

We present a rapid and high sensitivity assay that uses on-chip isotachopheresis to enhance DNA hybridization and an ionic spacer to separate reaction products.

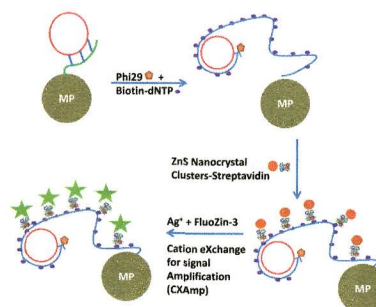


3121

Tagging the rolling circle products with nanocrystal clusters for cascade signal increase in the detection of miRNA

Jingjing Yao, Kenneth Flack, Liangzi Ding and Wenwan Zhong*

A new method to label and detect the long ssDNA products from rolling circle (RC) amplification was reported.

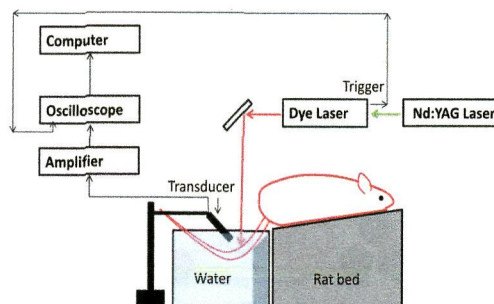


3126

Sonophoric nanoprobe aided pH measurement *in vivo* using photoacoustic spectroscopy

Aniruddha Ray, Hyung Ki Yoon, Yong Eun Koo Lee, Raoul Kopelman* and Xueding Wang*

Presented here is a novel nanoprobe based photoacoustic spectroscopy method enabling *in vivo* pH sensing.

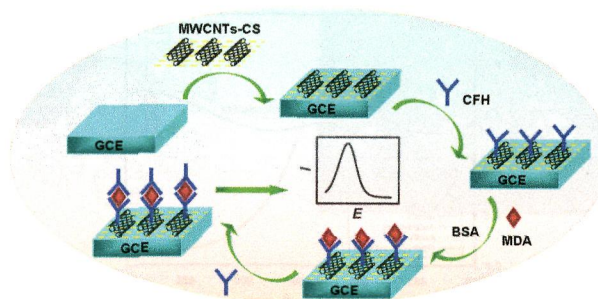


3131

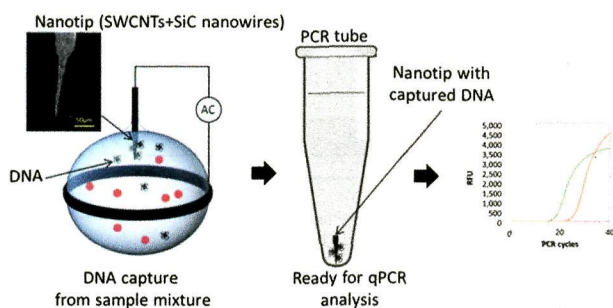
Label-free and facile electrochemical biosensing using carbon nanotubes for malondialdehyde detection

Ling Yuan, Yaqian Lan, Min Han, Jianchun Bao, Wenwen Tu* and Zhihui Dai*

A novel label-free electrochemical biosensor for malondialdehyde was developed based on malondialdehyde binding human complement factor H with high sensitivity.



3135

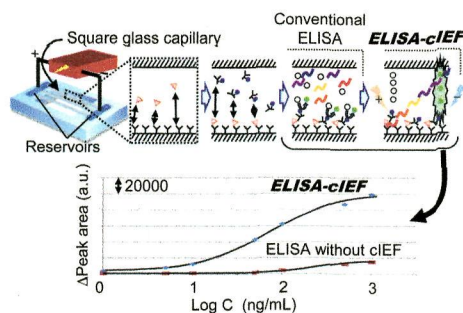


Nanotips for single-step preparation of DNA for qPCR analysis

Dinesh Kalyanasundaram, Jong-Hoon Kim, Gareth Fotouhi, Hyun-Boo Lee, Morgan Hiraiwa, Kieseok Oh, Kyong-Hoon Lee and Jae-Hyun Chung*

A single-step preparation method of genomic DNA from human samples is demonstrated using a nanotip.

3139

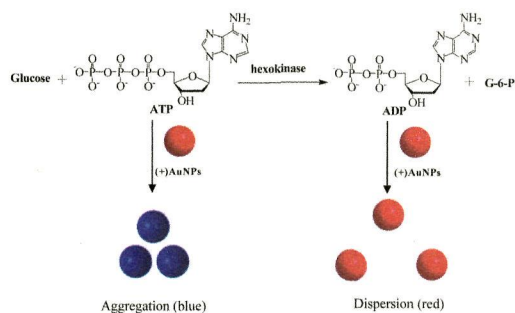


Novel fluorescent probe for highly sensitive bioassay using sequential enzyme-linked immunosorbent assay-capillary isoelectric focusing (ELISA-cIEF)

Terence G. Henares, Yuta Uenoyama, Yuto Nogawa, Ken Ikegami, Daniel Citterio, Koji Suzuki, Shun-ichi Funano, Kenji Sueyoshi, Tatsuro Endo and Hideaki Hisamoto*

Sensitivity improvement was achieved by developing a novel substrate producing a fluorescent ampholyte.

3142

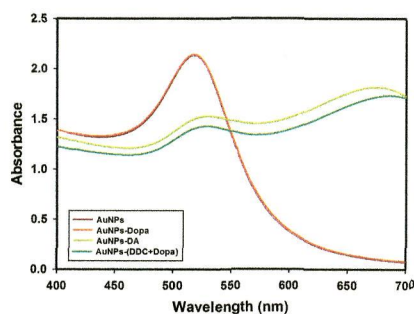


Visual detection of hexokinase activity and inhibition with positively charged gold nanoparticles as colorimetric probes

Shan Ren, Baoxin Li* and Lin Zhang

Positively charged gold nanoparticles can effectively differentiate ATP and ADP, thus providing a simple and visual approach to colorimetric detection of hexokinase activity and inhibition.

3146



Simple and rapid detection of L-Dopa decarboxylase activity using gold nanoparticles

So Young Park, Dohyoung Kwon, Hyejung Mok and Bong Hyun Chung*

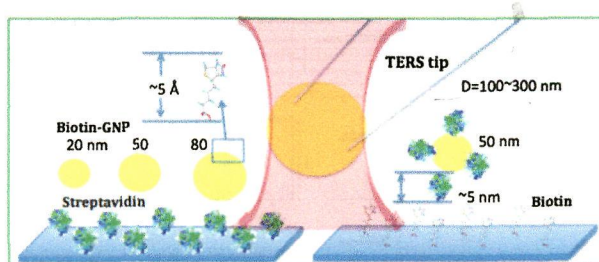
We developed a new detection method for L-Dopa decarboxylase (DDC) activity using gold nanoparticles (AuNPs).

3150

The chemical origin of enhanced signals from tip-enhanced Raman detection of functionalized nanoparticles

Hao Wang and Zachary D. Schultz*

The detection of proteins outside of gap junctions is demonstrated with ligand-functionalized nanoparticles using SERS and TERS.

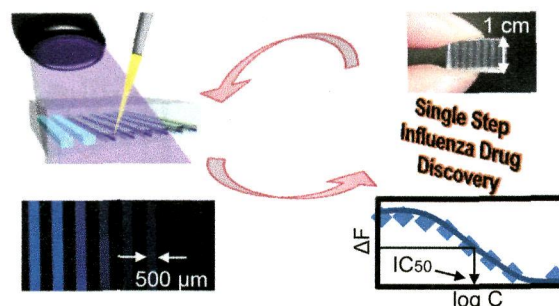


3158

Integration of neuraminidase inhibitor assay into a single-step operation using a combinable poly(dimethylsiloxane) capillary sensor

Tadashi Ishimoto, Kaede Jigawa, Terence G. Henares, Tatsuro Endo and Hideaki Hisamoto*

The conventional neuraminidase inhibitor assay was successfully integrated into a "single step" operation using a combinable poly(dimethylsiloxane) capillary (CPC) sensor.

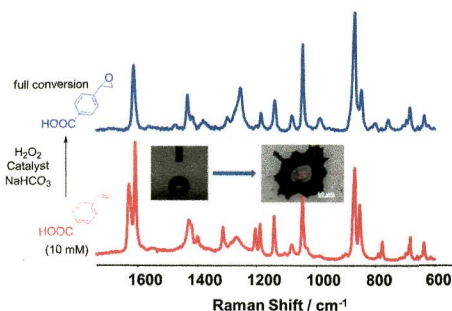


3163

Off-line reaction monitoring of the oxidation of alkenes in water using drop coating deposition Raman (DCDR) spectroscopy

Shaghayegh Abdolazadeh, Nicola M. Boyle, Apparao Draksharapu, Andrew C. Dennis, Ronald Hage, Johannes W. de Boer and Wesley R. Browne*

The application of drop coating deposition Raman (DCDR) spectroscopy to the field of reaction progress monitoring is addressed in this contribution.

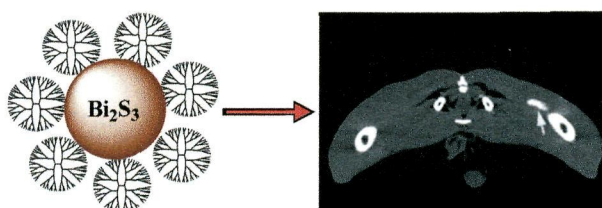


3172

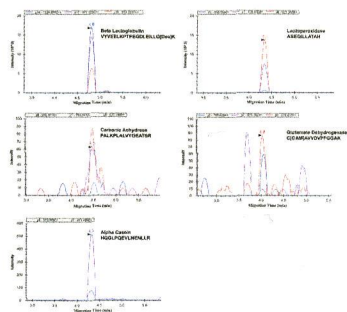
Dendrimer-stabilized bismuth sulfide nanoparticles: synthesis, characterization, and potential computed tomography imaging applications

Yi Fang, Chen Peng, Rui Guo, Linfeng Zheng, Jinbao Qin, Benqing Zhou, Mingwu Shen, Xinwu Lu,* Guixiang Zhang* and Xiangyang Shi*

Dendrimer-stabilized bismuth sulfide nanoparticles can be synthesized using hydroxylated poly(amidoamine) dendrimers as stabilizers for potential computed tomography imaging applications.



3181

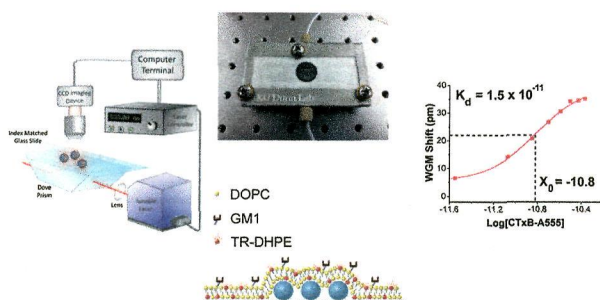


Capillary zone electrophoresis-multiple reaction monitoring from 100 pg of RAW 264.7 cell lysate digest

Liangliang Sun, Yihan Li, Matthew M. Champion, Guijie Zhu, Roza Wojcik and Norman J. Dovichi*

Capillary zone electrophoresis-multiple/single reaction monitoring (CZE-MRM/SRM), which employed an electrokinetically driven sheath-flow electrospray interface, was used for the rapid and highly sensitive detection of protein analytes in complex tryptic digests.

3189

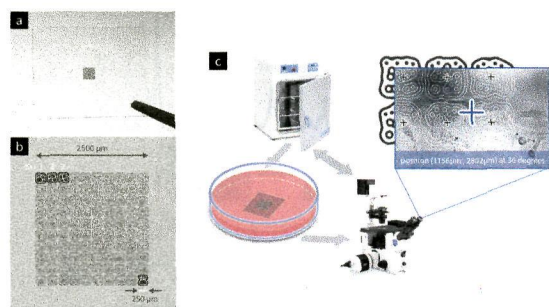


Integration of microsphere resonators with bioassay fluidics for whispering gallery mode imaging

Daniel C. Kim, Kevin P. Armendariz and Robert C. Dunn*

The immobilization of microsphere whispering gallery mode resonators without degradation in optical performance is demonstrated and shown to be compatible with assay fluidics through the sensitive, label-free detection of cholera toxin.

3196

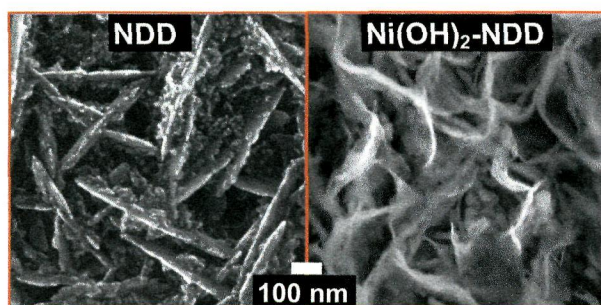


Microscopic augmented-reality indicators for long-term live cell time-lapsed imaging

Kyungwon Yun, Jungman Chung, Yong Park, Byungjoo Lee, Won Gu Lee* and Hyunwoo Bang*

A method for the precise relocation of the previously observed region of interest for many optical microscopy applications, this may be useful for obtaining the exact locations of individual cells inside biological samples in a rapid and controlled manner.

3201



A high performance non-enzymatic glucose sensor based on nickel hydroxide modified nitrogen-incorporated nanodiamonds

Chih-Yu Ko, Jin-Hua Huang,* Supil Raina and Weng P. Kang

A highly selective, sensitive, and stable non-enzymatic glucose sensor based on $\text{Ni}(\text{OH})_2$ modified nitrogen-incorporated nanodiamonds ($\text{Ni}(\text{OH})_2$ -NND) was developed.

3209

A polymeric waveguide resonant mirror (RM) device for detection in microfluidic flow cells

Ruchi Gupta* and Nick J. Goddard

A novel resonant mirror (RM) device, which consisted of silica sol-gel spacer and polystyrene waveguide layers on a standard microscope slide glass substrate, was developed in this work.

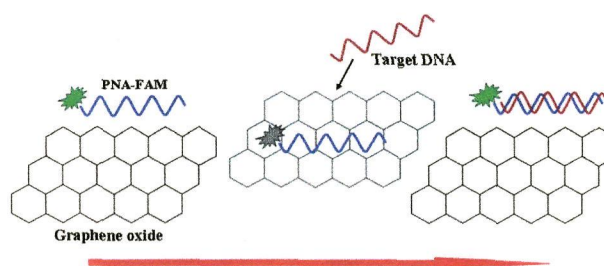
Water, $n = 1.333$, $t = 10 \mu\text{m}$	Dye, $n = 1.333-0.009i$, $t = 10 \mu\text{m}$	Water, $n = 1.333$, $t = 10 \mu\text{m}$
Polystyrene, $n = 1.585$, $t = 1 \mu\text{m}$	Polystyrene, $n = 1.585$, $t = 1 \mu\text{m}$	Polystyrene and dye, $n = 1.585-0.009i$, $t = 1 \mu\text{m}$
Silica sol-gel, $n = 1.42$, $t = 0.5 \mu\text{m}$	Silica sol-gel, $n = 1.42$, $t = 0.5 \mu\text{m}$	Silica sol-gel, $n = 1.42$, $t = 0.5 \mu\text{m}$
Glass, $n = 1.517$, $t = 10 \mu\text{m}$	Glass, $n = 1.517$, $t = 10 \mu\text{m}$	Glass, $n = 1.517$, $t = 10 \mu\text{m}$
(a)	(b)	(c)

3216

PNA-assembled graphene oxide for sensitive and selective detection of DNA

Shuang Guo, Danxin Du, Lina Tang, Yong Ning, Qunfeng Yao* and Guo-Jun Zhang*

Fluorescent DNA detection based on a GO platform by using PNA as the probe.



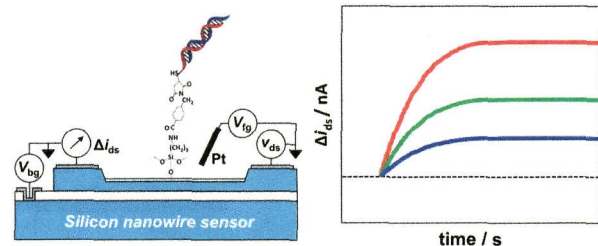
3221

Integrated label-free silicon nanowire sensor arrays for (bio)chemical analysis

Arpita De, Jan van Nieuwkastele, Edwin T. Carlen* and Albert van den Berg

A label-free (bio)chemical analysis platform that uses all-electrical silicon nanowire sensor arrays integrated with a microfluidic flow-cell for real-time measurements.

Automated real-time label-free (bio)chemical analysis

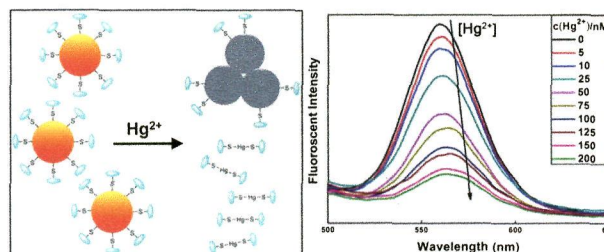


3230

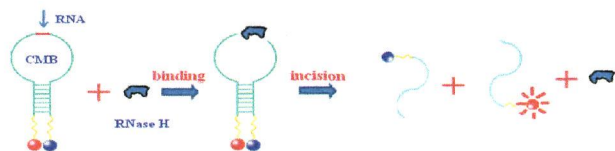
Facile, sensitive, and ratiometric detection of mercuric ions using GSH-capped semiconductor quantum dots

Xianglong Zhu, Zhenghuan Zhao, Xiaoqin Chi and Jinhao Gao*

We report a simple method based on GSH-capped CdTe quantum dots for rapid detection of Hg^{2+} with high sensitivity (5 nM) and uncover the mechanism of fluorescence quenching of CdTe@GSH in the presence of Hg^{2+} .



3238

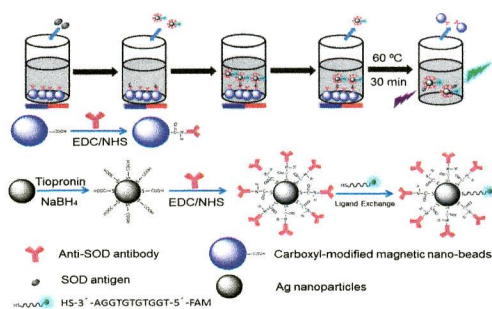


Real time monitoring of junction ribonuclease activity of RNase H using chimeric molecular beacons

Bin Liu,* Dan Xiang, Ying Long and Chunyi Tong

A real time fluorescence method for detecting RNase activity has been developed by applying chimeric molecular beacons as substrates.

3246

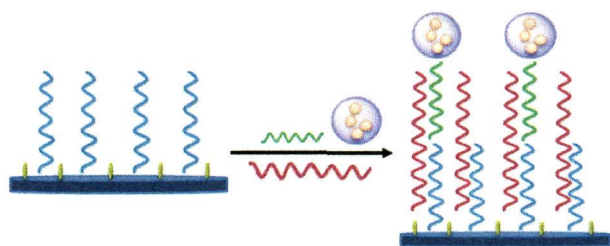


Highly sensitive detection of superoxide dismutase based on an immunoassay with surface-enhanced fluorescence

Xiaoming Yang,* Yao Dou and Shanshan Zhu

A successful effort towards the development of highly sensitive quantification of SOD depending on surface-enhanced fluorescence (SEF) on silver nanoparticles and immuno-magnetic separation.

3253

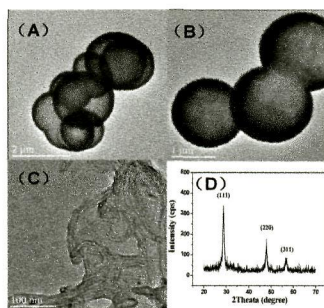


Fabrication of CdTe@SiO₂ nanoprobe for sensitive electrogenerated chemiluminescence detection of DNA damage

Wei Wei, Jie Zhou, Henan Li, Lihong Yin, Yuepu Pu and Songqin Liu*

An electrogenerated chemiluminescence biosensor was fabricated to detect specific sequences of DNA by using CdTe@SiO₂ as nanoprobe.

3259



Pseudo-bi-enzyme glucose sensor: ZnS hollow spheres and glucose oxidase concerted catalysis glucose

Ying Shuai, Changhua Liu,* Jia Wang, Xiaoyan Cui and Ling Nie

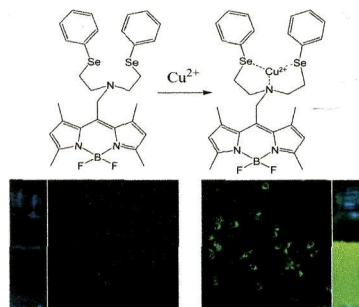
This work creatively uses peroxidase-like ZnS hollow spheres (ZnS HSs) to cooperate with glucose oxidase (GOx) for glucose determinations.

3264

A highly selective turn-on fluorescent sensor for Cu(II) based on an NSe₂ chelating moiety and its application in living cell imaging

Cho-Yen Chou, Shi-Rong Liu and Shu-Pao Wu*

In this study, a boron-dipyrromethene (BODIPY)-based fluorescent chemosensor **CBS** was developed for metal ion sensing.

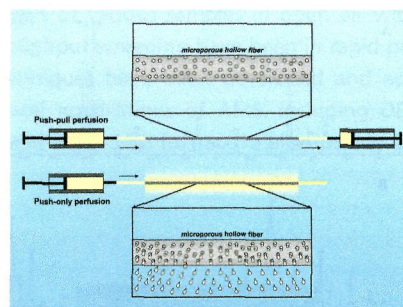


3271

An on-line push/pull perfusion-based hollow-fiber liquid-phase microextraction system for high-performance liquid chromatographic determination of alkylphenols in water samples

Yu-Ying Chao, Zhi-Xuan Jian, Yi-Ming Tu, Hsaio-Wen Wang and Yeou-Lih Huang*

A novel on-line method was used to extract alkylphenols from river and tap water samples. These alkylphenols were then separated and quantified using high-performance liquid chromatography (HPLC).

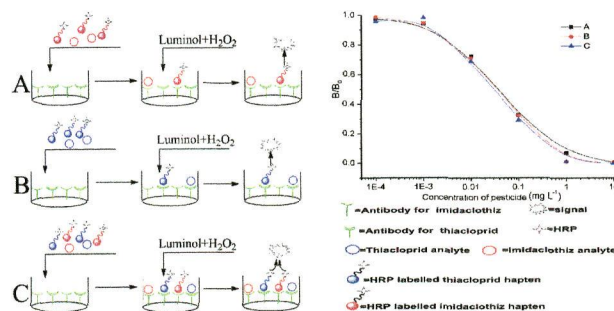


3280

Development of a chemiluminescence enzyme-linked immunosorbent assay for the simultaneous detection of imidaclothiz and thiacloprid in agricultural samples

Zhen-jiang Liu, Xu Yan, Xiu-ying Xu and Ming-hua Wang*

A novel and sensitive enhanced chemiluminescence enzyme-linked immunosorbent assay (ECL-ELISA) for the simultaneous analysis of imidaclothiz and thiacloprid is described.

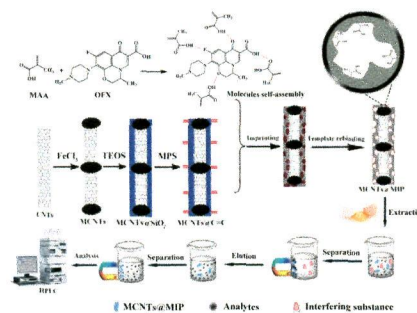


3287

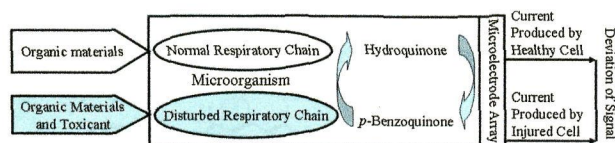
Preparation of molecularly imprinted polymers on the surface of magnetic carbon nanotubes with a pseudo template for rapid simultaneous extraction of four fluoroquinolones in egg samples

Deli Xiao, Pierre Dramou, Nanqian Xiong, Hua He,* Danhua Yuan, Hao Dai, Hui Li, Xiaomei He, Jun Peng and Nan Li

In this paper, a new strategy for the isolation and enrichment of FQs from egg samples was achieved by molecularly imprinted polymers on the surface of magnetic carbon nanotubes (MCNTs@MIP).



3297

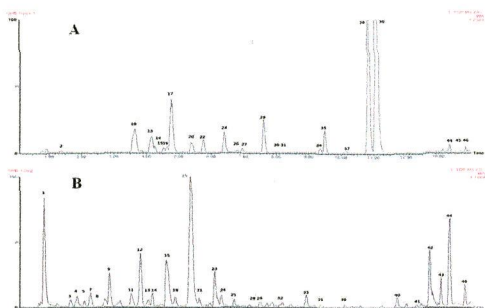


A rapid and sensitive *p*-benzoquinone-mediated bioassay for determination of heavy metal toxicity in water

Dengbin Yu, Junfeng Zhai, Daming Yong and Shaojun Dong*

The heavy metal toxicity can be determined by measuring changes in the *p*-benzoquinone-mediated respiration chain activity with a Pt ultramicroelectrode array.

3303

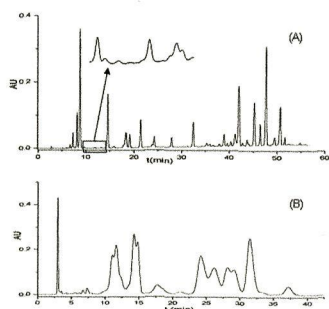


Rapid discovery and global characterization of chemical constituents and rats metabolites of *Phellodendri amurensis* cortex by ultra-performance liquid chromatography-electrospray ionization/quadrupole-time-of-flight mass spectrometry coupled with pattern recognition approach

Huiyu Wang, Guangli Yan, Aihua Zhang, Yuan Li, Yangyang Wang, Hui Sun, Xiuhong Wu and Xijun Wang*

A pattern recognition approach was applied for the discovery of natural compounds from herbal medicines.

3313



Purification of amide alkaloids from *Piper longum* L. using preparative two-dimensional normal-phase liquid chromatography × reversed-phase liquid chromatography

Kuiyong Li, Wenya Zhu, Qing Fu, Yanxiong Ke, Yu Jin* and Xinmiao Liang*

An offline 2D NPLC × RPLC method was developed for purification of amide alkaloids from *P. longum* L. at a preparative scale.