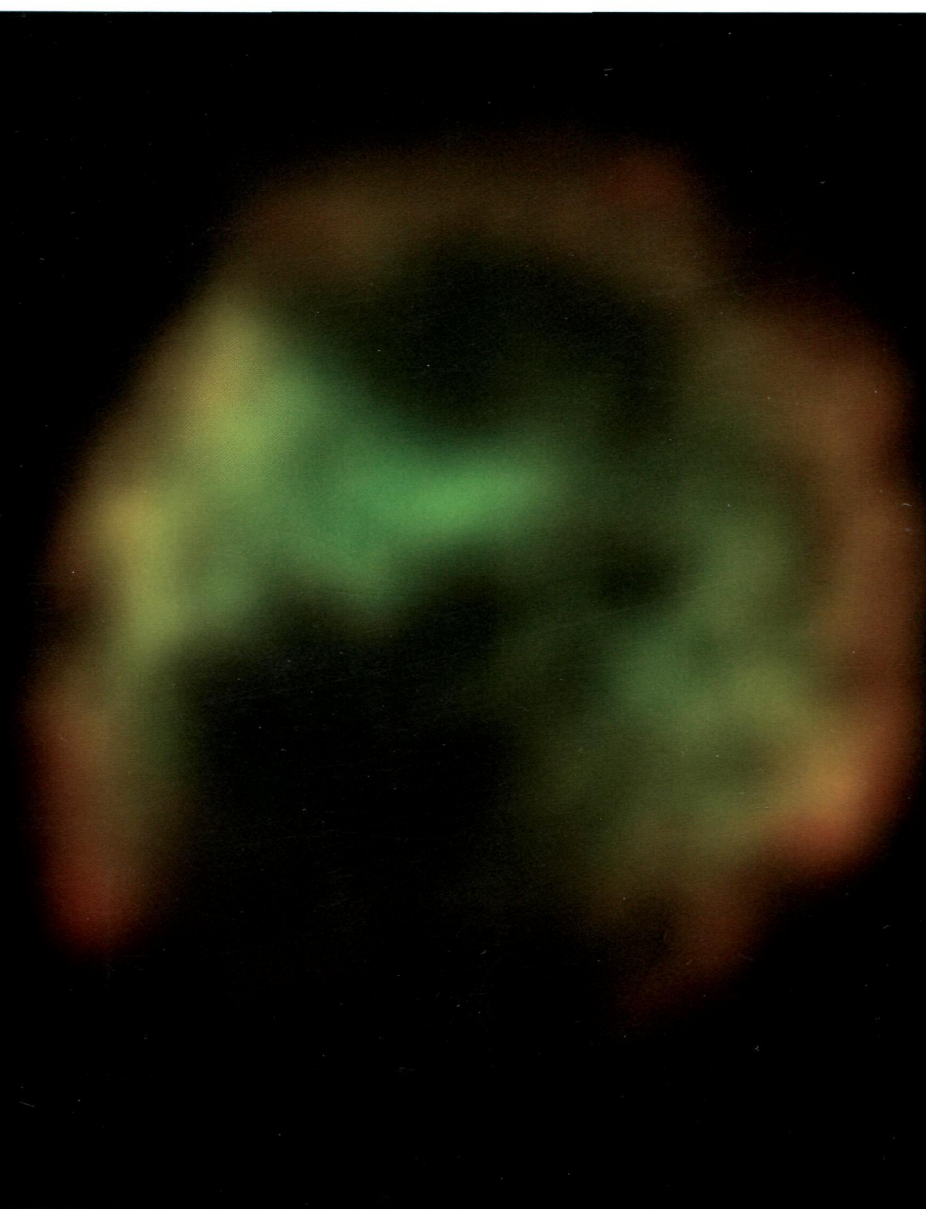


Analyst

www.rsc.org/analyst



ISSN 0003-2654



PAPER

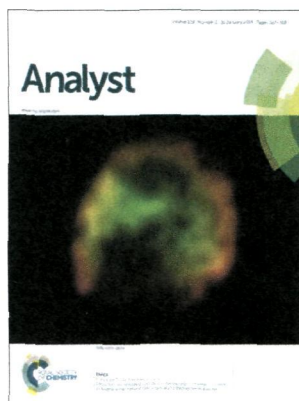
Francesco Trotta, Alex Fragoso *et al.*
Peroxidase-encapsulated cyclodextrin nanosponge immunoconjugates
as a signal enhancement tool in optical and electrochemical assays

www.rsc.org/analyst

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 139(2) 327–518 (2014)



Cover

See Francesco Trotta, Alex Fragoso *et al.*, pp. 375–380. Image reproduced by permission of Alex Fragoso from *Analyst*, 2014, **139**, 375.

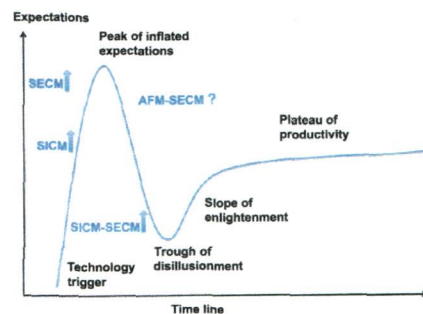
CRITICAL REVIEWS

336

Recent advancements in nanoelectrodes and nanopipettes used in combined scanning electrochemical microscopy techniques

Christine Kranz*

In recent years, major developments in scanning electrochemical microscopy (SECM) have significantly broadened the application range of this electroanalytical technique from high-resolution electrochemical imaging *via* nanoscale probes to large scale mapping using arrays of microelectrodes.



353

Emerging technologies for hybridization based single nucleotide polymorphism detection

Karel Knez, Dragana Spasic, Kris P. F. Janssen and Jeroen Lammertyn*

Detection of single nucleotide polymorphisms (SNPs) is a crucial challenge in the development of a novel generation of diagnostic tools.

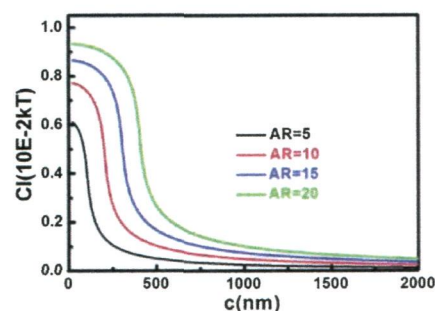


371

Quantitative evaluation of Coulombic interactions in the oriented-attachment growth of nanotubes

Yuqian Zhang, Weidong He,* Kechun Wen, Xiaoning Wang, Hongliang Lu, Xiao Lin and James H. Dickerson

Coulombic interaction in oriented-attachment growth of nanotubes is investigated *via* a derived analytical expression of Coulombic interactions.



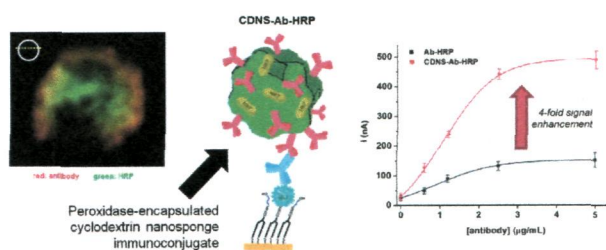
PAPERS

375

Peroxidase-encapsulated cyclodextrin nanosponge immunoconjugates as a signal enhancement tool in optical and electrochemical assays

Ewelina Wajs, Fabrizio Caldera, Francesco Trotta* and Alex Fragoso*

Peroxidase-encapsulated cyclodextrin nanosponge immunoconjugates provide up to 4-fold sensitivity enhancement in optical and electrochemical assays.

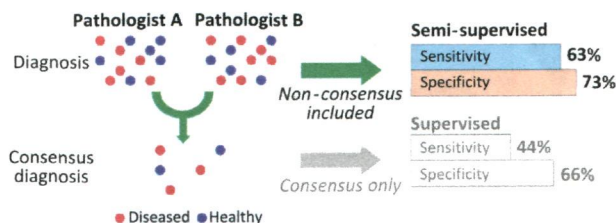


381

Utilising non-consensus pathology measurements to improve the diagnosis of oesophageal cancer using a Raman spectroscopic probe

Gavin Rhys Lloyd, L. Max Almond, Nick Stone, Neil Shepherd, Scott Sanders, Joanne Hutchings, Hugh Barr and Catherine Kendall*

The application of semi-supervised methods allows inclusion of samples without consensus pathology and leads to an improvement in diagnostic performance.



389

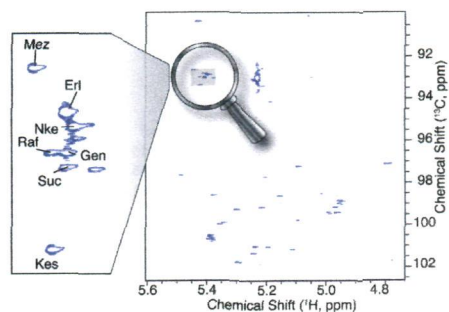
Forensic electrochemistry: the electroanalytical sensing of synthetic cathinone-derivatives and their accompanying adulterants in "legal high" products

Jamie P. Smith, Jonathan P. Metters, Craig Irving, Oliver B. Sutcliffe* and Craig E. Banks*

The first electroanalytical sensing strategy for quantifying "legal highs" is presented.



401

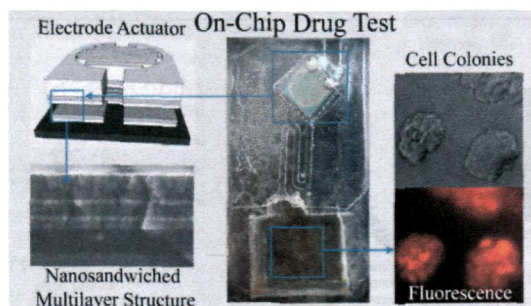


Profiling of carbohydrate mixtures at unprecedented resolution using high-precision ^1H - ^{13}C chemical shift measurements and a reference library

Bent Ole Petersen, Ole Hindsgaul and Sebastian Meier*

NMR-spectroscopic analysis of carbohydrate mixtures shows that practical resolution limits can be largely abolished for this central substance class.

407

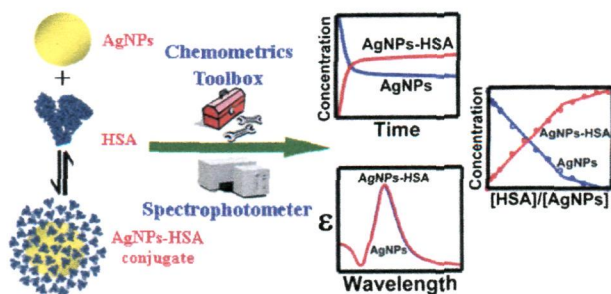


High reliability nanosandwiched Pt/Ti multilayer electrode actuators for on-chip biomedical applications

Danny Jian Hang Tng, Peiyi Song, Rui Hu, Chengbin Yang and Ken-Tye Yong*

A nanosandwiched Pt/Ti multilayer structured electrochemical microactuator is proposed to provide excellent performance with increased lifetime for on-chip biomedical applications.

416

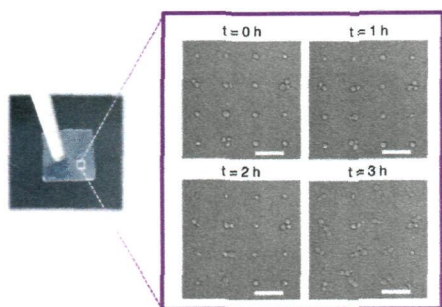


New insight into protein–nanomaterial interactions with UV-visible spectroscopy and chemometrics: human serum albumin and silver nanoparticles

Yong Wang and Yongnian Ni*

UV-visible spectroscopy together with multivariate curve resolution by alternating least squares algorithm is used to study silver nanoparticles–human serum albumin interactions and for the fabrication of a sensitive HSA biosensor.

425



Monitoring of cellular behaviors by microcavity array-based single-cell patterning

Kyoko Osada, Masahito Hosokawa, Tomoko Yoshino and Tsuyoshi Tanaka*

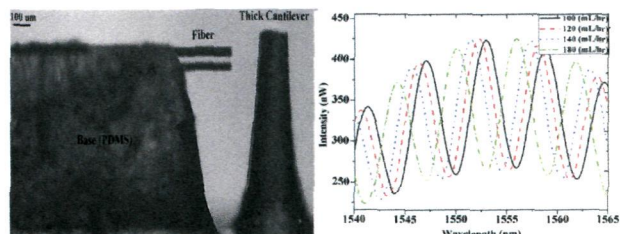
A less invasive and rapid cell patterning method for monitoring of cellular behaviors at the single-cell level is presented.

431

Real-time measurement of flow rate in microfluidic devices using a cantilever-based optofluidic sensor

Mohammad Sadegh Cheri, Hamid Latifi,* Jalal Sadeghi, Mohammadreza Salehi Moghaddam, Hamidreza Shahraki and Hasan Hajghassem

Real-time and accurate measurement of flow rate is an important requirement in lab on a chip (LOC) and micro total analysis system (μ TAS) applications.

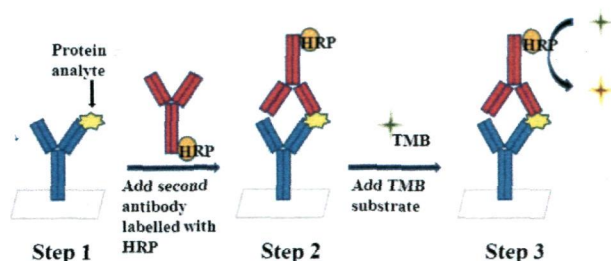


439

Predicting detection limits of enzyme-linked immunosorbent assay (ELISA) and bioanalytical techniques in general

Shiyun Zhang, Alexa Garcia-D'Angeli, Joseph P. Brennan and Qun Huo*

This paper presents a general method to predict the detection limits of enzyme-linked immunosorbent assay (ELISA) and other bioanalytical techniques.

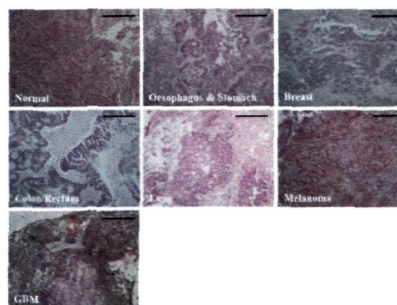


446

Effect of substrate choice and tissue type on tissue preparation for spectral histopathology by Raman microspectroscopy

Leanne M. Fullwood, Dave Griffiths, Katherine Ashton, Timothy Dawson, Robert W. Lea, Charles Davis, Franck Bonnier, Hugh J. Byrne and Matthew J. Baker*

Spectral Histopathology is a non-destructive, non-invasive, rapid and economical technique which has the potential to be an excellent method for the diagnosis of cancer and understanding disease progression through retrospective studies of archived tissue samples.

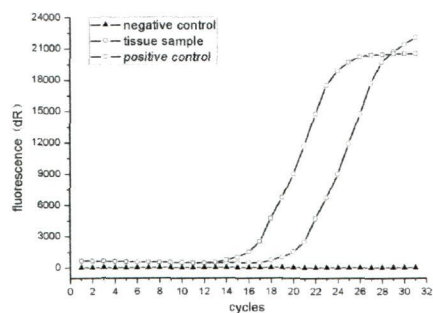


455

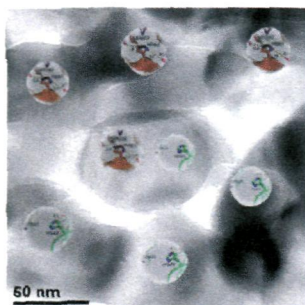
Evaluation of Raman spectroscopy for diagnosing EGFR mutation status in lung adenocarcinoma

Lei Wang, Zhipei Zhang, Lijun Huang, Weimiao Li, Qiang Lu, Miaomiao Wen, Ting Guo, Jinhai Fan, Xuejiao Wang, Xinwei Zhang, Jixiang Fang, Xiaolong Yan, Yunfeng Ni* and Xiaofei Li*

Somatic mutations in the epidermal growth factor receptor (EGFR) gene were associated with sensitivity to small molecule tyrosine kinase inhibitors for patients with lung adenocarcinomas.



464

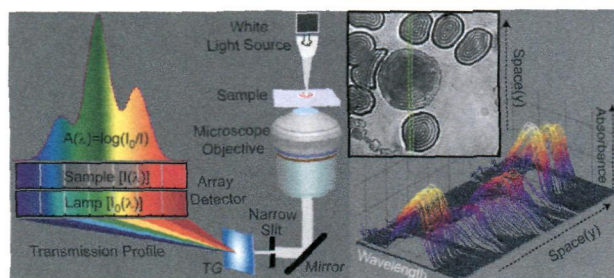


Screening of serine protease inhibitors with antimicrobial activity using iron oxide nanoparticles functionalized with dextran conjugated trypsin and *in silico* analyses of bacterial serine protease inhibition

Santi M. Mandal, William F. Porto, Debasis De, Ajit Phule, Suresh Korpole, Ananta K. Ghosh, Sanat K. Roy and Octavio L. Franco*

A novel nano-approach associated with *in silico* techniques allowed selection of antimicrobial serine proteinase inhibitors.

473

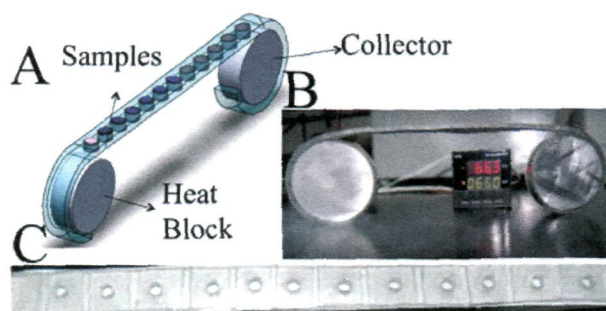


Spectrally resolved optical microscopy using a transmission grating spectrograph: importance of spatial selection

Dharmendar Kumar Sharma* and Arindam Chowdhury*

A simple yet efficient method to obtain reliable spatially resolved absorption spectra using a transmission grating and CCD based spectrograph.

482

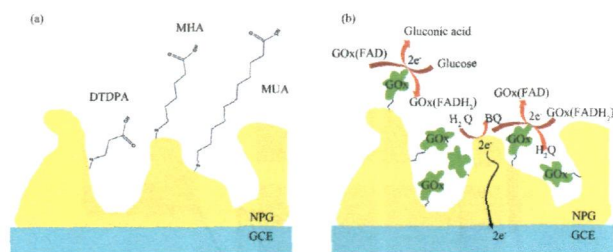


A simple cassette as point-of-care diagnostic device for naked-eye colorimetric bacteria detection

Mohammadali Safavieh, Minhaz Uddin Ahmed, Esen Sokullu, Andy Ng, Liliana Braescu and Mohammed Zourob*

Effective pathogen detection is necessary for treatment of infectious diseases.

488



Examining the effects of self-assembled monolayers on nanoporous gold based amperometric glucose biosensors

Xinxin Xiao, Hui Li, Meng'en Wang, Kai Zhang* and Pengchao Si*

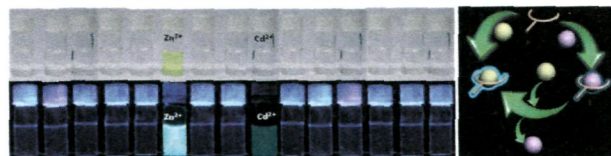
Nanoporous gold (NPG) based biosensors have been constructed by covalently immobilizing glucose oxidase (GOx) onto self-assembled monolayers (SAMs).

495

A novel 2,6-diformyl-4-methylphenol based chemosensor for Zn(II) ions by ratiometric displacement of Cd(II) ions and its application for cell imaging on human melanoma cancer cells

Atanu Jana,* Pradip K. Sukul, Sushil K. Mandal, Saugata Konar, Sangita Ray, Kinsuk Das, James A. Golen, Arnold L. Rheingold, Sudipa Mondal, Tapan K. Mondal, Anisur R. Khuda-Bukhsh and Susanta K. Kar*

A novel Zn(II) sensor was prepared by the condensation of 2-hydrazinylpyridine with 2,6-diformyl-p-cresol.



505

UHPLC UHD Q-TOF MS/MS analysis of the impact of sulfur fumigation on the chemical profile of Codonopsis Radix (Dangshen)

Xiao-qing Ma, Alexander Kai Man Leung, Chi Leung Chan, Tao Su, Wei-dong Li, Su-mei Li, David Wang Fun Fong and Zhi-Ling Yu*

UHPLC UHD Q-TOF MS/MS analysis discriminates sulfur-fumigated and air-dried Codonopsis Radix samples.

